



**Defense Special Weapons Agency  
Alexandria, VA 22310-3398**



**DNA-TR-95-14**

**Assessment for Single Integrated Operations  
Planning (ASIOP) Program**

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**April 1997**

**Technical**

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| 13. ABSTRACT ( <i>Maximum 200 words</i> )<br><br>The contract objective was to provide responsive, quick turn around analytical support in support of multiple customers that included SAC, STRATCOM, JCS, JOSDEPS, OSD, and USSPACECOM. Task areas included: Survivable adaptive planning, network analysis, updating NWE models in planning codes, offense-defense integration, impact of policy and arms control on strategic planning, earth penetrating weapons, MOE development and assessment, strategic basing, new SIOP planning hardware/software assessment, alternative employment, and quick reaction tasking. Force acquisition, Strategic Arms Reduction Talks (START), and Strategic Defense System (SDS) related issues prompted the need for the analytical support in the task areas described. Subsequent world events (proliferation of weapons of mass destruction (WMD)), prompted an increased need for analytical support during the last two years of this contract. Contract period of performance was from 14 November 1989 through 13 February 1995. In summary, the leveraging of on-going related work and the ability to commit the right mix of analytical resources became the signature characteristic of this contract. As DoD analytical needs shifted from traditional cold war issues to those associated with counter proliferation analysis, DSWA's analytical support to their customers was able to adapt analytical support to meet the dynamic needs of a multiple customer base. |                                                             |                                                            |                                                                                                   |                                                               |
| 14. SUBJECT TERMS<br><br>Strategic Analysis<br>Planning Employment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                             |                                                            | 15. NUMBER OF PAGES<br>108                                                                        |                                                               |
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## SUMMARY

This was a DNA funded multi-task contract in support of multiple customers that included SAC, STRATCOM, JCS, JOSDEPS, OSD, and USSPACECOM. The contract objective, tasks, and management are summarized on the right side of Figure S-1.

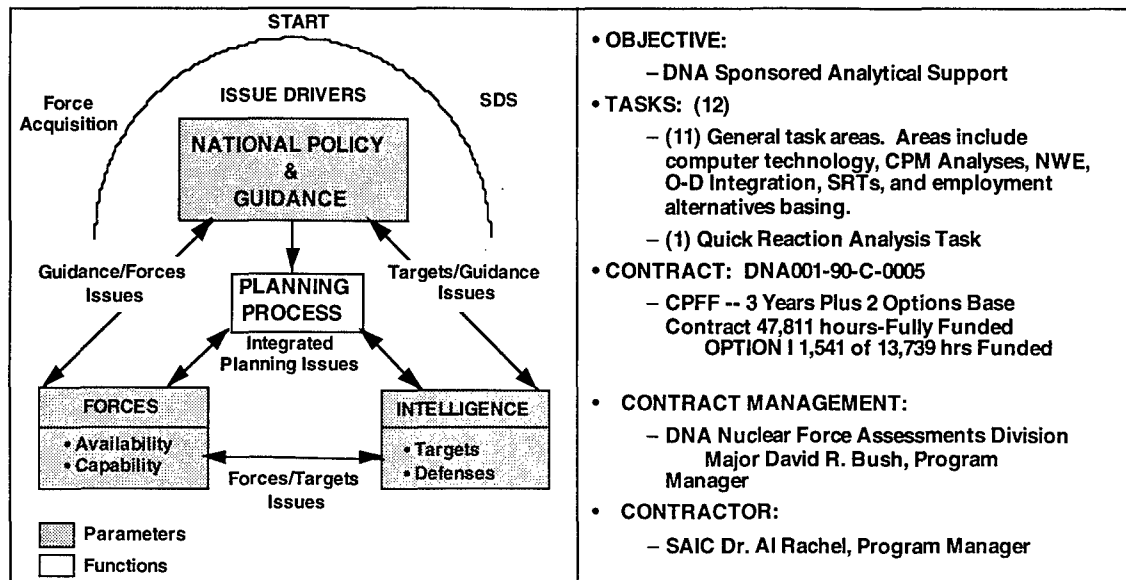


Figure S-1. Program overview.

The graphic on the left depicts the three major parameters, national guidance, intelligence derived threat, and force structure, that impact the planning process for any specific planning cycle. Force acquisition, Strategic Arms Reduction Talks (START), and Strategic Defense System (SDS) related issues prompted the need for analytical support of the type provided in this contract. Recent world events and considerations, driven primarily by proliferation of weapons of mass destruction (WMD), prompted an increased need for timely and responsive analytical support during the last two years of this contract. Contract period of performance was from 14 November 1989 through 13 February 1995. This includes the exercise of both option periods.

## PREFACE

The scope and depth of analytical issues addressed by the statement of work (SOW) was very extensive. Table P-1 reflects specific areas of inquiry. During the period of performance there were 87 separate analytical subtasks worked.

Table P-1. ASIOP Statement of work.

- |   |         |                                                      |
|---|---------|------------------------------------------------------|
| • | TASK 1  | NEW TECHNOLOGIES FOR ADAPTIVE AND SURVIVABLE SYSTEMS |
| • | TASK 2  | NETWORK ANALYSIS OF SIOP PROCESS                     |
| • | TASK 3  | NWE IMPLICATIONS                                     |
| • | TASK 4  | OFFENSE-DEFENSE INTEGRATION ANALYSIS                 |
| • | TASK 5  | TREATIES AND POLICY IMPLICATIONS                     |
| • | TASK 6  | MULTI-PURPOSE EPW EMPLOYMENT OPERATIONS              |
| • | TASK 7  | MOES' UTILITY IN PLANNING AND SIOP ASSESSMENT        |
| • | TASK 8  | ALTERNATE BASING MODES                               |
| • | TASK 9  | NEW TECHNOLOGIES ON TRICOMs                          |
| • | TASK 10 | ALTERNATE EMPLOYMENT OPTIONS                         |
| • | TASK 11 | SRT/RECONNAISSANCE IN A NUCLEAR ENVIRONMENT          |
| • | TASK 12 | QUICK REACTION ANALYSIS                              |

The customer, number of deliverables, and completion status for each of these subtasks is summarized in Table P-2. Details of task objective, technical approach, and deliverables are defined in Appendix A.

One of the most unique aspects of this contract was the number of customers supported. Tables P-3 and P-4 reflect the customers supported and the level of effort applied to each of the SOW tasks and subtasks. Table P-3 is an overview of this information. Table P-4 is a more detailed account of the individual customers supported, the subtasks involved and the level of effort applied to each subtask. Some subtasks were in support of dual customers and are appropriately indicated.

Table P-2. ASIOP task data.

| Task Area (SAIC Task Leader)                        | Customer/Office           | #  | Status      |
|-----------------------------------------------------|---------------------------|----|-------------|
| Task 1 New Technologies (Dr. Carl Rindfleisch)      |                           |    |             |
| 1.1 SAPE Test Criteria Assessment                   | JSTPS/JKCF                | D1 | SW / FEB90  |
| 1.2 SAPE Technical Support                          | JSTPS/JKCF                | D3 | SW / JUN92  |
| Task 2 Network Analysis (Mr. Roger Craver)          |                           |    |             |
| 2.1 JSTPS Analytical Support                        | JSTPS/JKCF                | D2 | C / MAY91   |
| 2.2 Strategic Defense Network Analysis              | JOSDEPS                   |    | SW / OCT90  |
| 2.3 Network Analysis for STRATCOM                   | STRATCOM/J-52             | D7 | C / MAR94   |
| Task 3 NWE Implications (Mr. Joe Manship)           |                           |    |             |
| 3.1 PEM Upgrade for MEM                             | JSTPS/JLWT                | D3 | C / MAR90   |
| 3.2 Fireball Model Implications                     | JSTPS/JLWT                | D1 | C / MAY90   |
| 3.3 Fireball Model Update for MEM                   | JSTPS/JLWT                | D2 | C / OCT90   |
| 3.4 Multiburst Requirements for MEM                 | JSTPS/JLWT                | D1 | CNX / OCT90 |
| 3.5 Wind Effects on RV Fratricide                   | JSTPS/JKCS; SAC/XOBM      | D3 | C / JUN90   |
| 3.6-3.12 Schedule MEM NWE Upgrade                   | JSTPS/JLWT                |    | C / MAR92   |
| 3.13 PDCALC Users' Group                            | STRATCOM/J-53             | D2 | SW / JUL94  |
| 3.14 NWE Upgrades for MEM                           | JSTPS/JLWT                | D2 | C / NOV92   |
| 3.15 Currency of MEM NWE Models                     | STRATCOM/J-52; JSTPS/JLWT | D4 | C / SEP93   |
| 3.16 Advanced Conventional Penetrator               | DNA/DFSP                  | D2 | C / JUL94   |
| 3.17 Insure Currency of MEM NWE                     | STRATCOM/J-52             | D4 | C / AUG94   |
| 3.18 Establish Future HISEMM Requirements           | STRATCOM/J-52             |    | SW / JAN94  |
| Task 4 Offense/Defense (Mr. Norm Fennelly)          |                           |    |             |
| 4.1 MMIII Review                                    | SAC/XRF                   | D1 | C / MAY90   |
| 4.2 NWE on MMIII                                    | SAC/XRF                   | D1 | C / JUN90   |
| 4.3 NWE on Peacekeeper                              | SAC/XRF                   | D1 | SW / JUL90  |
| 4.4 Battlespace Management                          | SAC/XRF                   | D1 | C / APR92   |
| 4.5 ODI White Paper                                 | DNA                       |    | CNX / MAR91 |
| 4.6 ODIOWG Support                                  | DNA/NACD                  | D2 | SW / MAY92  |
| 4.7 Future C2 Capabilities                          | J-36/NOCCD-PB             | D5 | C / JUL94   |
| Task 5 Treaties/Policy                              |                           |    |             |
| 5.1 National Security & Mutual Strategic Defenses   | OSD                       | D1 | C / AUG90   |
| 5.2 Hosting NIS at SAC                              | SAC/XPXX                  | D2 | C / FEB90   |
| 5.3 DNA Support to Joint Staff/J5                   | JCS/J5                    | D4 | C / NOV90   |
| 5.4 DNA Support to Joint Staff/J8                   | JCS/J8                    | D4 | CNX / MAY91 |
| 5.5 DNA Support to OSD/ISP/SFP                      | OSD/SFP                   | D4 | C / AUG91   |
| 5.6 DNA Support to JCS/J5                           | JCS/J5                    | D1 | SW / AUG94  |
| 5.7 Introduction to NWE and Employment Planning     | JCS/J5                    | D4 | SW / DEC91  |
| 5.8 Strategic Kinetic Weapon                        | OSD/SFP                   | D2 | C / AUG91   |
| 5.9 SIOP Planning Support                           | OSD/SFP                   | D3 | C/FEB92     |
| Task 6 Earth Penetrating Weapons (Mr. Roger Craver) |                           |    |             |
| 6.1 Feasibility of EPW Calculations                 | OSD/SFP                   |    |             |
| 6.2 EPW PSP/DGZ Methodology                         | JSTPS/JKCS                | D1 | C / MAY91   |
| 6.3 EPW Comparative Analysis                        | JSTPS/JKCS                | D5 | SW / MAR92  |
|                                                     | JSTPS/JKCS                | D2 | CNX / MAR91 |
| Task 7 MOEs (Mr. Roger Craver)                      |                           |    |             |
| 7.1 MOE Tutorial                                    | DNA/NASF                  | D2 | C / NOV92   |
| 7.2 JCS J5/J8 Support                               | JCS/J8                    | D1 | C / OCT90   |
| 7.3 Fire VN Analytical Support                      | JCS/J8                    |    | CNX / MAY91 |
| 7.4 VNTK Methodology                                | JSTPS/JKCS                | D3 | C / JUN92   |
| 7.5 Radiation Effects                               | STRATCOM/J-53             | D3 | SW / JUL94  |

D-Deliverables; C-Completed; SW-Stopped Work; CNX-Cancelled

Table P-2. ASIOP task data (Continued).

| Task Area (SAIC Task Leader)                         | Customer/Office         | #  | Status      |
|------------------------------------------------------|-------------------------|----|-------------|
| Task 8 Alternative Basing (Dr. Bill Woolson)         |                         |    |             |
| 8.1 PKRG Basing Issues                               | Hq.SAC/XRQ              |    | SW / JUN90  |
| 8.2 Advanced Missile & Basing Concepts               | Hq.SAC/XRQ              | D2 | CNX / MAY90 |
| 8.3 SICBM Basing Without MMII                        | Hq.SAC/XRQ              | D2 | CNX / MAY90 |
| 8.4 Fallout Risks to HML Operations                  | Hq.SAC/XOKM             | D2 | C / OCT90   |
| 8.5 ICBMs - 21st Century                             | Hq.SAC/XRQ              | D3 | CNX / MAY90 |
| Task 9 TRICOMs (Dr. Carl Rindfleisch)                |                         |    |             |
| 9.1 Algorithm Alternatives                           | JSTPS/JKCF              |    | SW / JAN90  |
| 9.2 Enhancing the NDL                                | JSTPS/JLWD              | D2 | C / MAR90   |
| 9.3 Blue Book Optimizer Code                         | JSTPS/JKCF              | D2 | C / JAN91   |
| 9.4 Review of Combined Timing & Resolution Code      | JSTPS/JPP               | D2 | C / MAY91   |
| 9.5 Enhancing NDL - SIOP Dev.Interfaces              | JSTPS/JLWD              | D2 | SW / MAY91  |
| 9.6 Enhancing NDL - Impact & Imp.                    | JSTPS/JLWD              | D2 | CNX / MAY91 |
| 9.7 CT&R Follow On                                   | JSTPS/JPPP              |    | SW / AUG91  |
| Task 10 Alternative Employment (Dr. Al Rachel)       |                         |    |             |
| 10.1 DNA Analytical Support to JOSDEPS               | JOSDEPS; JCS/J8         | D4 | C / OCT90   |
| 10.2 Roadmap                                         | JCS/J8                  |    | CNX / DEC90 |
| 10.3 JOSDEPS-JSTPS Tool Application & Roadmap        | JOSDEPS; JCS/J8         | D3 | C / MAY91   |
| 10.4 Joint Strategic Defense Ops Planning System     | JOSDEPS                 | D2 | C / SEP91   |
| 10.5 SIOP -94 Replanning Study                       | DNA Rep. to NPWG        | D3 | SW / SEP92  |
| 10.6 Future U.S. Strategic Planning Requirements     | DNA                     | D3 | SW / MAR94  |
| 10.7 Joint Strategic Defense Planning Requirements   | JOSDEPS                 | D2 | SW / MAY93  |
| 10.8 Alternative Force Structure Assessments         | JSTPS/JKAW; OSD/ISP/SFP | D2 | SW / MAR92  |
| 10.9 Alternative Employment Options                  | STRATCOM-SAC-DNA/DIR    | D4 | C / AUG94   |
| 10.10 Large Area Target Analysis                     | ACC                     | D2 | C / OCT93   |
| 10.11 Long-Range Strike Warfare                      | OSD Net Assessment      | D4 | C / APR94   |
| 10.12 OSD Support                                    | OSD Net Assessment      |    | CNX / SEP93 |
| Task 11 SRT/RECON (Mr. Barney Clark)                 |                         |    |             |
| 11.1 SIOP SRT Action Sequences                       | JSTPS/JKCC              |    | SW / FEB90  |
| 11.2 SRT Operational Perspectives                    | SAC/INAT                | D3 | C / APR91   |
| 11.3 Logistics Infrastructure Analysis System (LIAS) | JSTPS/JLT               | D2 | SW / APR91  |
| Task 12 QRA (Dr. Al Rachel)                          |                         |    |             |
| 12.1 J5/J8 Strategic Sufficiency                     | DNA                     | D3 | C / MAY90   |
| 12.2 SIOP Prototype Study (TOR - First Outline)      | JSTPS/JKCF              | D2 | C / JUL90   |
| 12.3 SAPE Program Mtg. Support                       | JSTPS/JKCF              | D3 | C / NOV90   |
| 12.4 ODI Issues in a GPALS Context                   | DNA                     | D2 | C / MAR91   |
| 12.5 Republic Nuclear Powers                         | DNA                     |    | C / DEC91   |
| 12.6 STRATCOM Support                                | DNA                     |    | SW / JUL92  |
| 12.7 DNA Analytical Support                          | DNA/NASF                | D5 | C / MAY94   |
| 12.8 No First Use                                    | DNA                     |    | C / DEC93   |
| 12.9 Strategic Futures 2                             | STRATCOM                |    | C / MAY94   |
| 12.10 Conventional Strategic Weapons                 | DNA/NASF                | D2 | C / DEC93   |
| 12.11 Conventional/Nuclear Deterrence                | DNA/NSCD                | D2 | C / MAY94   |
| 12.12 Strategic Futures 2 Phase II                   | STRATCOM                |    | C / OCT94   |

D-Deliverables; C-Completed; SW-Stopped Work; CNX-Cancelled

Table P-3. Level of effort overview.

| TASKS:                                            | CUSTOMERS: |         |           |         |         |         |         |        | TASK DOLLARS SPENT: |
|---------------------------------------------------|------------|---------|-----------|---------|---------|---------|---------|--------|---------------------|
|                                                   | USSTPS     | USODEPS | STRATCOM  | SAC     | DNA     | OSD     | JCS     | ACC    |                     |
| Task 1 New Technologies                           | \$214.7    | —       | —         | —       | —       | —       | —       | —      | \$214.7             |
| Task 2 Network Analysis                           | \$109.0    | \$22.0  | \$93.1    | —       | —       | —       | —       | —      | \$224.1             |
| Task 3 NWE Implications                           | \$866.3    | —       | \$391.5   | \$22.5  | \$94.4  | —       | —       | —      | \$1,374.7           |
| Task 4 Offense/Defense                            | —          | —       | —         | \$226.7 | \$65.2  | —       | \$162.8 | —      | \$454.7             |
| Task 5 Treaties/Policy                            | —          | —       | —         | \$3.5   | —       | \$183.9 | \$411.9 | —      | \$599.3             |
| Task 6 Earth Penetrating Weapons                  | \$187.9    | —       | —         | —       | —       | —       | —       | —      | \$187.9             |
| Task 7 MOEs                                       | \$28.2     | —       | \$166.0   | —       | \$16.1  | —       | \$25.3  | —      | \$235.6             |
| Task 8 Alternative Basing                         | —          | —       | —         | \$39.6  | —       | —       | —       | —      | \$39.6              |
| Task 9 TRICOMs                                    | \$90.4     | —       | —         | —       | —       | —       | —       | —      | \$90.4              |
| Task 10 Alternative Employment                    | \$4.3      | \$213.5 | \$147.6   | —       | \$184.1 | \$188.2 | \$59.6  | \$23.1 | \$820.4             |
| Task 11 SRT/RECON                                 | \$13.9     | —       | —         | \$80.0  | —       | —       | —       | —      | \$93.9              |
| Task 12 QRA                                       | \$24.3     | —       | \$334.2   | —       | \$180.7 | —       | —       | —      | \$539.2             |
| CUSTOMER DOLLARS SPENT:<br>(dollars in thousands) | \$1,539.0  | \$235.5 | \$1,132.4 | \$372.3 | \$540.5 | \$372.1 | \$659.6 | \$23.1 | \$4,874.5           |

Table P-4. Level of effort per customer and task.

|                                               | Customer             | POC                                                        | Task 1 |         | Task 2  |        |        | Task 3 |        |        |        |        |          |         |         |        |
|-----------------------------------------------|----------------------|------------------------------------------------------------|--------|---------|---------|--------|--------|--------|--------|--------|--------|--------|----------|---------|---------|--------|
|                                               |                      |                                                            | 1.1    | 1.2     | 2.1     | 2.2    | 2.3    | 3.1    | 3.2    | 3.3    | 3.4    | 3.5*   | 3.6-3.12 | 3.13    | 3.14    | 3.15*  |
| 1                                             | JSTPS                | JKCF<br>JLWT<br>JKCS<br>JKAW<br>JKCC<br>JLT<br>JLWD<br>JPP | \$4.6  | \$210.1 | \$109.0 |        |        |        | \$33.4 | \$15.0 | \$46.0 | \$0.0  | \$22.5   | \$572.6 | \$136.1 | \$40.7 |
| 2                                             | JOSDEPS              |                                                            |        |         |         | \$22.0 |        |        |        |        |        |        |          |         |         |        |
| 3                                             | STRATCOM             | J-52<br>J-53<br>J-55                                       |        |         |         |        | \$93.1 |        |        |        |        |        |          | \$312.3 |         | \$40.8 |
| 4                                             | STRATCOM-SAC-DNA/DIR |                                                            |        |         |         |        |        |        |        |        |        |        |          |         |         |        |
|                                               | SAC                  | XOBM<br>XPXX<br>XRFF<br>INAT<br>XRQ<br>XOKM                |        |         |         |        |        |        |        |        |        |        | \$22.5   |         |         |        |
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|                                               |                      |                                                            |        |         |         |        |        |        |        |        |        |        |          |         |         |        |
|                                               |                      |                                                            |        |         |         |        |        |        |        |        |        |        |          |         |         |        |
|                                               |                      |                                                            |        |         |         |        |        |        |        |        |        |        |          |         |         |        |
| 5                                             | DNA                  | NASF<br>NSCD<br>DFSP                                       |        |         |         |        |        |        |        |        |        |        |          |         |         |        |
| 6                                             | DNA Rep to NPWG      |                                                            |        |         |         |        |        |        |        |        |        |        |          |         |         |        |
|                                               |                      | OSD                                                        |        |         |         |        |        |        |        |        |        |        |          |         |         |        |
| 7                                             | OSD Net Assessment   | SFP                                                        |        |         |         |        |        |        |        |        |        |        |          |         |         |        |
|                                               |                      | ISP/SFP                                                    |        |         |         |        |        |        |        |        |        |        |          |         |         |        |
|                                               |                      |                                                            |        |         |         |        |        |        |        |        |        |        |          |         |         |        |
|                                               | JCS                  | J5<br>J8                                                   |        |         |         |        |        |        |        |        |        |        |          |         |         |        |
|                                               | J-36                 | NOCCD-PB                                                   |        |         |         |        |        |        |        |        |        |        |          |         |         |        |
| 8                                             | ACC                  |                                                            |        |         |         |        |        |        |        |        |        |        |          |         |         |        |
| TASK DOLLARS SPENT:<br>(dollars in thousands) |                      |                                                            | \$4.6  | \$210.1 | \$109.0 | \$22.0 | \$93.1 | \$33.4 | \$15.0 | \$46.0 | \$0.0  | \$45.0 | \$572.6  | \$312.3 | \$136.1 | \$81.5 |

\* Total task dollars divided between two customers

Table P-4. Level of effort per customer and task (Continued).

|                                               | Customer | POC                                                        | Task 3 |        |       | Task 4 |        |        | Task 5  |       |        |         |        |       |        |       |
|-----------------------------------------------|----------|------------------------------------------------------------|--------|--------|-------|--------|--------|--------|---------|-------|--------|---------|--------|-------|--------|-------|
|                                               |          |                                                            | 3.16   | 3.17   | 3.18  | 4.1    | 4.2    | 4.3    | 4.4     | 4.5   | 4.6    | 4.7     | 5.1    | 5.2   | 5.3    | 5.4   |
| 1                                             | JSTPS    | JKCF<br>JLWT<br>JKCS<br>JKAW<br>JKCC<br>JLT<br>JLWD<br>JPP |        |        |       |        |        |        |         |       |        |         |        |       |        |       |
| 2                                             | JOSDEPS  |                                                            |        |        |       |        |        |        |         |       |        |         |        |       |        |       |
| 3                                             | STRATCOM | J-52<br>J-53<br>J-55                                       |        | \$37.4 | \$1.0 |        |        |        |         |       |        |         |        |       |        |       |
|                                               |          | STRATCOM-SAC-DNA/DIR                                       |        |        |       |        |        |        |         |       |        |         |        |       |        |       |
| 4                                             | SAC      | XOBM<br>XPXX<br>XRFF                                       |        |        |       |        |        |        |         |       |        |         |        |       |        |       |
|                                               |          | INAT<br>XRQ<br>XOKM                                        |        |        |       | \$25.0 | \$48.5 | \$28.8 | \$124.4 |       |        |         | \$3.5  |       |        |       |
| 5                                             | DNA      | NASF<br>NSCD<br>DFSP                                       |        |        |       |        |        |        |         | \$0.0 |        | \$65.2  |        |       |        |       |
|                                               |          | DNA Rep to NPWG                                            |        |        |       |        |        |        |         |       |        |         |        |       |        |       |
| 6                                             | OSD      | SFP<br>ISP/SFP                                             | \$94.4 |        |       |        |        |        |         |       |        |         | \$38.9 |       |        |       |
|                                               |          | OSD Net Assessment                                         |        |        |       |        |        |        |         |       |        |         |        |       |        |       |
| 7                                             | JCS      | J5<br>J8                                                   |        |        |       |        |        |        |         |       |        |         |        |       | \$48.5 |       |
|                                               | J-36     | NOCCD-PB                                                   |        |        |       |        |        |        |         |       |        | \$162.8 |        |       |        | \$0.0 |
| 8                                             | ACC      |                                                            |        |        |       |        |        |        |         |       |        |         |        |       |        |       |
| TASK DOLLARS SPENT:<br>(dollars in thousands) |          |                                                            | \$94.4 | \$37.4 | \$1.0 | \$25.0 | \$48.5 | \$28.8 | \$124.4 | \$0.0 | \$65.2 | \$162.8 | \$38.9 | \$3.5 | \$48.5 | \$0.0 |

Table P-4. Level of effort per customer and task (Continued).

|                                               | Customer    | POC                                                        | Task 5 |         |        |        |        | Task 6 |         |       | Task 7 |        |       |        |         |
|-----------------------------------------------|-------------|------------------------------------------------------------|--------|---------|--------|--------|--------|--------|---------|-------|--------|--------|-------|--------|---------|
|                                               |             |                                                            | 5.5    | 5.6     | 5.7    | 5.8    | 5.9    | 6.1    | 6.2     | 6.3   | 7.1    | 7.2    | 7.3   | 7.4    | 7.5     |
| 1                                             | JSTPS       | JKCF<br>JLWT<br>JKCS<br>JKAW<br>JKCC<br>JLT<br>JLWD<br>JPP |        |         |        |        |        |        |         |       |        |        |       |        |         |
|                                               |             |                                                            |        |         |        |        |        | \$80.1 | \$107.8 | \$0.0 |        |        |       | \$28.2 |         |
| 2                                             | JOSDEPS     |                                                            |        |         |        |        |        |        |         |       |        |        |       |        |         |
| 3                                             | STRATCOM    | J-52<br>J-53<br>J-55                                       |        |         |        |        |        |        |         |       |        |        |       |        |         |
|                                               |             | STRATCOM-SAC-DNA/DIR                                       |        |         |        |        |        |        |         |       |        |        |       |        | \$166.0 |
| 4                                             | SAC         | XOBM<br>XPXX<br>XRFF<br>INAT<br>XRQ<br>XOKM                |        |         |        |        |        |        |         |       |        |        |       |        |         |
| 5                                             | DNA         | NASF<br>NSCD<br>DFSP                                       |        |         |        |        |        |        |         |       | \$16.1 |        |       |        |         |
|                                               |             | DNA Rep to NPWG                                            |        |         |        |        |        |        |         |       |        |        |       |        | \$11.2  |
| 6                                             | OSD         | SFP<br>ISP/SFP                                             | \$65.0 |         |        | \$30.0 | \$50.0 |        |         |       |        |        |       |        |         |
| 7                                             | JCS         | J5<br>J8                                                   |        | \$343.4 | \$20.0 |        |        |        |         |       |        | \$25.3 | \$0.0 |        |         |
| 8                                             | J-36<br>ACC | NOCDD-PB                                                   |        |         |        |        |        |        |         |       |        |        |       |        |         |
| TASK DOLLARS SPENT:<br>(dollars in thousands) |             |                                                            | \$65.0 | \$343.4 | \$20.0 | \$30.0 | \$50.0 | \$80.1 | \$107.8 | \$0.0 | \$16.1 | \$25.3 | \$0.0 | \$28.2 | \$166.0 |
|                                               |             |                                                            |        |         |        |        |        |        |         |       |        |        |       |        | \$11.2  |

Table P-4. Level of effort per customer and task (Continued).

| Customer                                      |                      | POC                                                        | Task 8 |       |        |       |       | Task 9 |        |        |        |       | Task 10 |       |        |       |  |
|-----------------------------------------------|----------------------|------------------------------------------------------------|--------|-------|--------|-------|-------|--------|--------|--------|--------|-------|---------|-------|--------|-------|--|
|                                               |                      |                                                            | 8.2    | 8.3   | 8.4    | 8.5   | 8.6   | 9.1    | 9.2    | 9.3    | 9.4    | 9.5   | 9.6     | 9.7   | 10.1*  | 10.2  |  |
| 1                                             | JSTPS                | JKCF<br>JLWT<br>JKCS<br>JKAW<br>JKCC<br>JLT<br>JLWD<br>JPP |        |       |        |       |       | \$5.0  |        | \$30.0 |        |       |         |       |        |       |  |
| 2                                             | JOSDEPS              |                                                            |        |       |        |       |       |        | \$40.0 |        |        | \$0.0 | \$0.0   |       |        |       |  |
| 3                                             | STRATCOM             | J-52<br>J-53<br>J-55                                       |        |       |        |       |       |        |        |        | \$15.4 |       |         |       | \$25.0 |       |  |
| 4                                             | STRATCOM-SAC-DNA/DIR | XOBM<br>XPXX<br>XRFF<br>INAT<br>XRQ<br>XOKM                |        |       |        |       |       |        |        |        |        |       |         |       |        |       |  |
| 5                                             | DNA                  | NASF<br>NSCD<br>DFSP                                       | \$0.0  | \$0.0 | \$28.4 | \$0.0 |       |        |        |        |        |       |         |       |        |       |  |
| 6                                             | DNA Rep to NPWG      |                                                            |        |       |        |       |       |        |        |        |        |       |         |       |        |       |  |
| 7                                             | JCS                  | J5<br>J8                                                   |        |       |        |       |       |        |        |        |        |       |         |       | \$25.0 | \$0.0 |  |
| 8                                             | J-36<br>ACC          | NOCCD-PB                                                   |        |       |        |       |       |        |        |        |        |       |         |       |        |       |  |
| TASK DOLLARS SPENT:<br>(dollars in thousands) |                      |                                                            | \$0.0  | \$0.0 | \$28.4 | \$0.0 | \$0.0 | \$5.0  | \$40.0 | \$30.0 | \$15.4 | \$0.0 | \$0.0   | \$0.0 | \$50.0 | \$0.0 |  |

Table P-4. Level of effort per customer and task (Continued).

|                                               | Customer           | POC                                                        | Task 10 |        |        |         |         |       |         |        |         |       | Task 11 |        |       |
|-----------------------------------------------|--------------------|------------------------------------------------------------|---------|--------|--------|---------|---------|-------|---------|--------|---------|-------|---------|--------|-------|
|                                               |                    |                                                            | 10.3*   | 10.4   | 10.5   | 10.6    | 10.7    | 10.8* | 10.9    | 10.10  | 10.11   | 10.12 | 11.1    | 11.2   | 11.3  |
| 1                                             | JSTPS              | JKCF<br>JLWT<br>JKCS<br>JKAW<br>JKCC<br>JLT<br>JLWD<br>JPP |         |        |        |         |         |       |         |        |         |       |         |        |       |
|                                               |                    |                                                            |         |        |        |         |         | \$4.3 |         |        |         |       | \$10.0  |        | \$3.9 |
| 2                                             | JOSDEPS            |                                                            | \$34.6  | \$25.2 |        |         | \$128.7 |       |         |        |         |       |         |        |       |
| 3                                             | STRATCOM           | J-52<br>J-53<br>J-55                                       |         |        |        |         |         |       |         |        |         |       |         |        |       |
|                                               |                    | STRATCOM-SAC-DNA/DIR                                       |         |        |        |         |         |       | \$147.6 |        |         |       |         |        |       |
| 4                                             | SAC                | XOBM<br>XPXX<br>XRFF<br>INAT<br>XRQ<br>XOKM                |         |        |        |         |         |       |         |        |         |       |         |        |       |
|                                               | Hq. SAC            |                                                            |         |        |        |         |         |       |         |        |         |       |         | \$80.0 |       |
| 5                                             | DNA                | NASF<br>NSCD<br>DFSP                                       |         |        |        | \$151.5 |         |       |         |        |         |       |         |        |       |
|                                               | DNA Rep to NPWG    |                                                            |         |        | \$32.6 |         |         |       |         |        |         |       |         |        |       |
| 6                                             | OSD                | SFP<br>ISP/SFP                                             |         |        |        |         |         |       |         |        |         |       |         |        |       |
|                                               | OSD Net Assessment |                                                            |         |        |        |         |         | \$4.3 |         |        | \$182.6 | \$1.3 |         |        |       |
| 7                                             | JCS                | J5<br>J8                                                   | \$34.6  |        |        |         |         |       |         |        |         |       |         |        |       |
|                                               | J-36               | NOCCD-PB                                                   |         |        |        |         |         |       |         |        |         |       |         |        |       |
| 8                                             | ACC                |                                                            |         |        |        |         |         |       |         | \$23.1 |         |       |         |        |       |
| TASK DOLLARS SPENT:<br>(dollars in thousands) |                    |                                                            | \$69.2  | \$25.2 | \$32.6 | \$151.5 | \$128.7 | \$8.6 | \$147.6 | \$23.1 | \$182.6 | \$1.3 | \$10.0  | \$80.0 | \$3.9 |

\* Total task dollars divided between two customers

Table P-4. Level of effort per customer and task (Continued).

|                                               | Customer             | POC                                                        | Task 12 |        |        |       |        |       |        |        |        |        |        |         | TOTAL<br>DOLLARS SPENT                                                                           |
|-----------------------------------------------|----------------------|------------------------------------------------------------|---------|--------|--------|-------|--------|-------|--------|--------|--------|--------|--------|---------|--------------------------------------------------------------------------------------------------|
|                                               |                      |                                                            | 12.1    | 12.2   | 12.3   | 12.4  | 12.5   | 12.6  | 12.7   | 12.8   | 12.9   | 12.10  | 12.11  | 12.12   |                                                                                                  |
| 1                                             | JSTPS                | JKCF<br>JLWT<br>JKCS<br>JKAW<br>JKCC<br>JLT<br>JLWD<br>JPP |         | \$11.8 | \$12.5 |       |        |       |        |        |        |        |        |         | \$383.0<br>\$843.8 *<br>\$238.6 *<br>\$4.3 *<br>\$10.0<br>\$3.9<br>\$40.0<br>\$15.4<br>\$235.5 * |
| 2                                             | JOSDEPS              |                                                            |         |        |        |       |        |       |        |        |        |        |        |         | \$334.2                                                                                          |
| 3                                             | STRATCOM             | J-52<br>J-53<br>J-55                                       |         |        |        |       |        |       |        |        | \$57.3 |        |        | \$276.9 | \$172.3<br>\$478.3<br>\$0.0<br>\$147.6                                                           |
|                                               | STRATCOM-SAC-DNA/DIR |                                                            |         |        |        |       |        |       |        |        |        |        |        |         | \$22.5<br>\$3.5<br>\$226.7                                                                       |
| 4                                             | SAC                  | XOBM<br>XPXX<br>XRFF<br>INAT<br>XRQ<br>XOKM                |         |        |        |       |        |       |        |        |        |        |        |         | \$80.0<br>\$11.2<br>\$28.4                                                                       |
| 5                                             | DNA                  | NASF<br>NSCD<br>DFSP                                       | \$24.1  |        |        | \$8.1 | \$12.4 | \$2.7 | \$74.6 | \$13.4 |        | \$23.1 | \$22.3 |         | \$212.2<br>\$179.0<br>\$22.3<br>\$0.0<br>\$127.0                                                 |
|                                               | DNA Rep to NPWG      |                                                            |         |        |        |       |        |       |        |        |        |        |        |         | \$38.9<br>\$145.0<br>\$4.3<br>\$183.9                                                            |
| 6                                             | OSD                  | SFP<br>ISP/SFP                                             |         |        |        |       |        |       |        |        |        |        |        |         | \$411.9<br>\$84.9<br>\$162.8<br>\$23.1                                                           |
| 7                                             | OSD Net Assessment   | J5<br>J8                                                   |         |        |        |       |        |       |        |        |        |        |        |         |                                                                                                  |
| 8                                             | JCS                  | J-36                                                       |         |        |        |       |        |       |        |        |        |        |        |         |                                                                                                  |
|                                               | ACC                  | NOCCD-PB                                                   |         |        |        |       |        |       |        |        |        |        |        |         |                                                                                                  |
| TASK DOLLARS SPENT:<br>(dollars in thousands) |                      |                                                            | \$24.1  | \$11.8 | \$12.5 | \$8.1 | \$12.4 | \$2.7 | \$74.6 | \$13.4 | \$57.3 | \$23.1 | \$22.3 | \$276.9 | \$4,874.5                                                                                        |

\* Total task dollars divided between two customers

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# SECTION 1

## PROGRAM PLANNING AND CONTROL

Subtask planning and control was the most challenging aspect in the administration of this contract. Careful project planning by both DNA and the customer ensured the best use of analytical resources. The process started with customer requirements and ended with the presentation of results in the form of briefings and topical reports. DNA played the key role in the staffing of the requirements to ensure that responsive subtask plans were developed. Key technical points of contact and the technical staff members from the SAIC team jointly developed a draft plan that included the objective, technical approach, and deliverables. This process ensured that analytical support needs were reflected in the plan. After requirements were staffed, DNA determined the cost related aspects in terms of man-hours and dollars. The investment of time and resources in the planning phase produced analytical results very responsive to the customer needs. This process also insured that the "right" analytical questions were asked and that both the analyst and the customer had confidence in the assumptions, models, and methodology associated with task performance. Figure 1-1 depicts the plan to completion flow followed for each subtask.

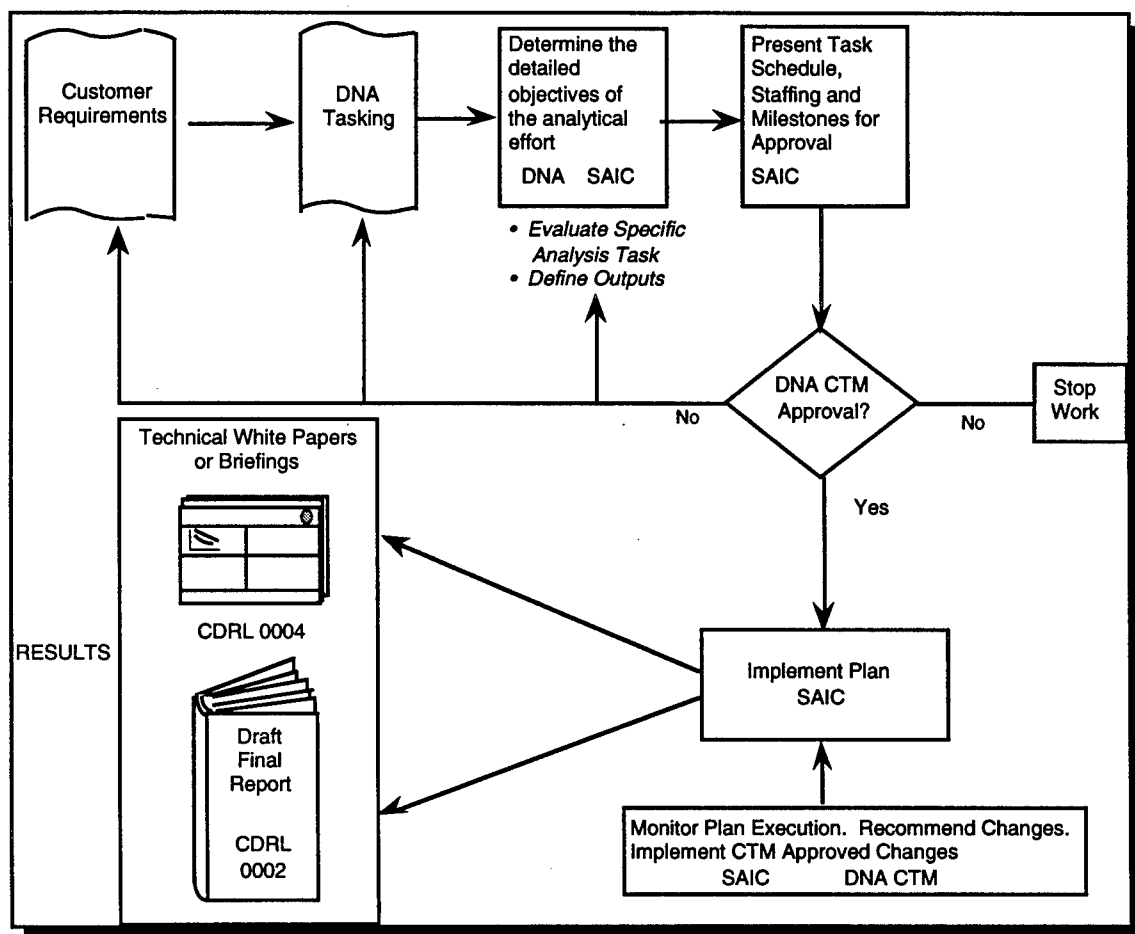


Figure 1-1. Program planning and control flow.

The contractor team provided technical analytical support from a variety of key locations. This proved to be very responsive to the "local support" aspect of many of the customers supported. During the five year period of this contract, very efficient network communications were established among the various technical support staff, customers supported, and the DNA contract technical monitor (CTM). At the conclusion of this contract, DNA transferred the in-process ASIOP subtask to the subsequent Strategic Force Planning Support contract (SFPS). Thus DNA was able to realize efficient travel savings without loss of customer responsiveness and without any contract start up delays or investment costs.

## SECTION 2

### PROGRAM HIGHLIGHTS

Responsiveness, leverage of on-going work, and the ability to draw on a wide range of analytical resources represent the ASIOP program highlights. Each of the subtasks were important in terms of responsiveness to a short term customer need. This quick response time was very much appreciated by customers and action officers. Leveraging of on-going work was reflected in the ability to incorporate related work of several on-going subtasks in a focused, quality response, provided at significantly less cost than would have been required in an "independent" effort. The ability to draw upon this wide range of resources was the key to quick turnaround on critical analytical tasks. Matching the right people to critical analytical tasks, without any "paperwork" delay, and the use of analytical staff from 29 different SAIC divisions reflects unprecedented flexibility in program planning and control. In summary, the leveraging of on-going related work and the ability to commit the right mix of analytical resources became the signature characteristic of this contract. As Department of Defense analytical needs shifted from traditional cold war issues to those associated with counter proliferation analysis, DNA's analytical support to their customers was able to adapt to meet the dynamic needs of a multiple customer base.

### SECTION 3

#### PROGRAM TRANSITION AND COMPLETION

By providing time to plan and transfer on-going ASIOP tasks to the SFPS contract, DNA was able to provide uninterrupted support to their customers. Highly responsive support was possible to the end and transition costs were insignificant.

APPENDIX A  
SUBTASK WORK PLANS

**Chart A-1. SAPE test criteria assessment.**

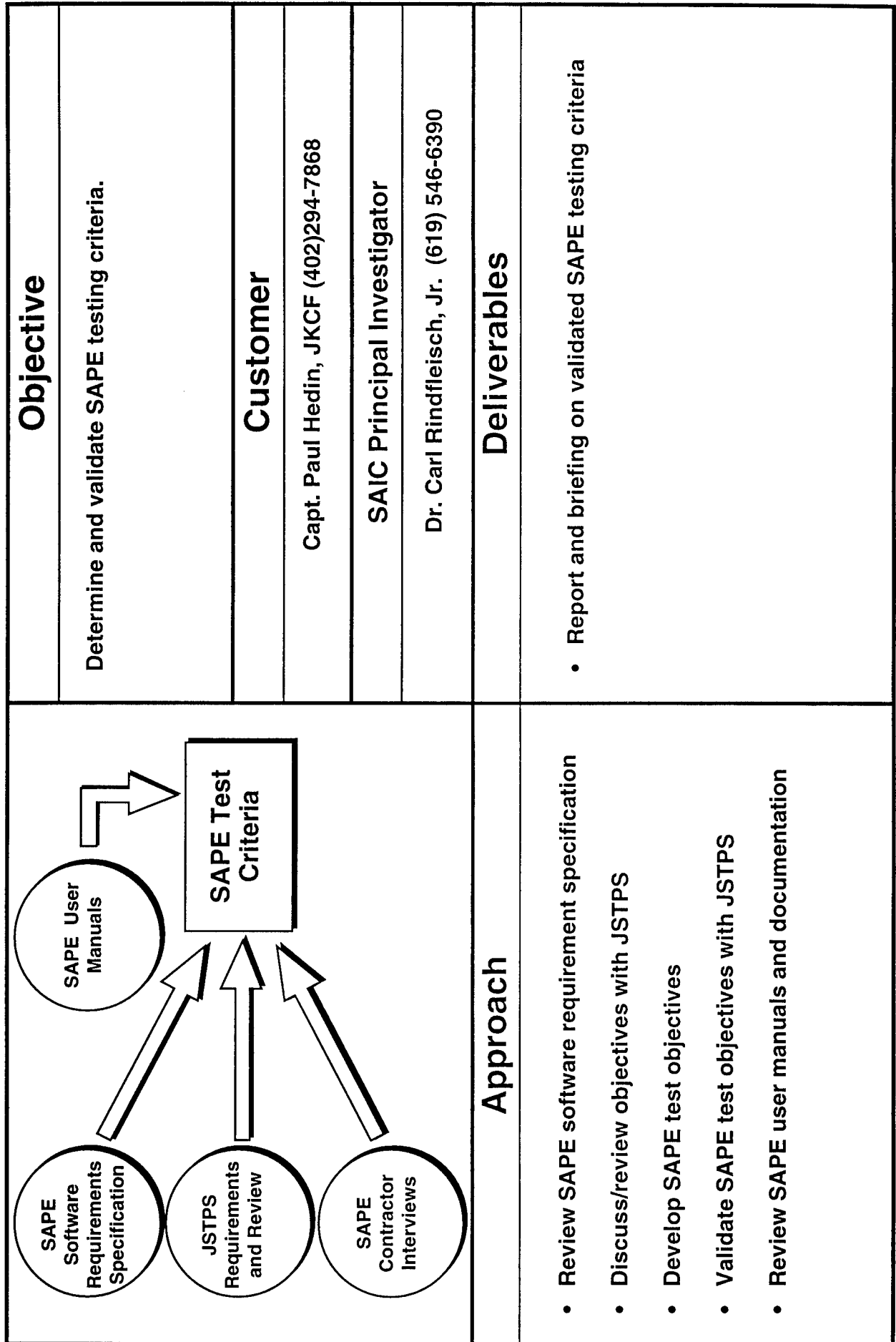


**Chart A-2. SAPE technical assistance to JSTPS.**

|  |  |                                                                                                                                                                                                                                                                                                                                                                                                           |                                               |
|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
|  |  | <b>Objective</b>                                                                                                                                                                                                                                                                                                                                                                                          |                                               |
|  |  | PROVIDE TECHNICAL ASSISTANCE TO JSTPS IN SUPPORTING ROLE OF THE SAPE EXPLORATORY DEVELOPMENT MODEL (EDM)                                                                                                                                                                                                                                                                                                  |                                               |
|  |  | Customer:                                                                                                                                                                                                                                                                                                                                                                                                 | Captain Paul Hedin, JSTPS/JKCF (402) 294-2495 |
|  |  | SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                              | Mr. Bob Wasilewski (402) 291-2233             |
|  |  | <b>Deliverables</b>                                                                                                                                                                                                                                                                                                                                                                                       |                                               |
|  |  | <ul style="list-style-type: none"> <li>● Scenarios</li> <li>● Evaluation inputs, MOE Reviews</li> <li>● Meeting support</li> </ul>                                                                                                                                                                                                                                                                        |                                               |
|  |  | <b>Benefits</b>                                                                                                                                                                                                                                                                                                                                                                                           |                                               |
|  |  | Enhanced JSTPS participation in demonstration of applications of advanced technology to war planning.                                                                                                                                                                                                                                                                                                     |                                               |
|  |  | <b>Approach</b>                                                                                                                                                                                                                                                                                                                                                                                           |                                               |
|  |  | <ul style="list-style-type: none"> <li>● Develop scenarios as JSTPS inputs to RADC for government test and evaluation.</li> <li>● Assist JSTPS with evaluation inputs for government T&amp;E and Offutt Secure Node Test</li> <li>● Review MITRE-developed MOE</li> <li>● Attend Program Reviews, T&amp;E Working Groups, Inter-connectivity working groups, "Knowledge Acquisition" sessions.</li> </ul> |                                               |

**Chart A-3. JSTPS analytical support.**

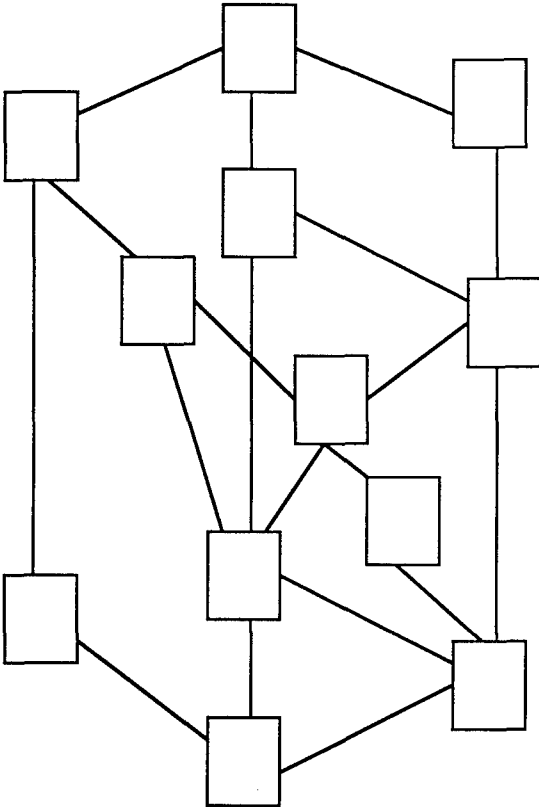
|                                                                                                                                                                                                                                           | <table><tr><th colspan="2">Objective</th></tr><tr><td colspan="2">To provide support to the JSTPS in adjusting and refining the CPM model of the SIOP development process, to include updating recent structural changes and developing a "point and click" tutorial.</td></tr><tr><td>Customer:</td><td>Capt. Anne Fletcher, JKCF (402) 294-7868</td></tr><tr><td>SAIC Principal Investigator:</td><td>Mr. Roger Craver (402) 291-2233</td></tr><tr><th colspan="2">Deliverables</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>• Updated versions of SIOP development networks</li><li>• Documented tutorial and help facility</li></ul></td></tr></table> | Objective                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                             | To provide support to the JSTPS in adjusting and refining the CPM model of the SIOP development process, to include updating recent structural changes and developing a "point and click" tutorial. |                                                                                                                                                                                                                                                                  | Customer: | Capt. Anne Fletcher, JKCF (402) 294-7868 | SAIC Principal Investigator: | Mr. Roger Craver (402) 291-2233 | Deliverables |  | <ul style="list-style-type: none"><li>• Updated versions of SIOP development networks</li><li>• Documented tutorial and help facility</li></ul> |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------|------------------------------|---------------------------------|--------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Objective                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                  |           |                                          |                              |                                 |              |  |                                                                                                                                                 |  |
| To provide support to the JSTPS in adjusting and refining the CPM model of the SIOP development process, to include updating recent structural changes and developing a "point and click" tutorial.                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                  |           |                                          |                              |                                 |              |  |                                                                                                                                                 |  |
| Customer:                                                                                                                                                                                                                                                                                                                    | Capt. Anne Fletcher, JKCF (402) 294-7868                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                  |           |                                          |                              |                                 |              |  |                                                                                                                                                 |  |
| SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                 | Mr. Roger Craver (402) 291-2233                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                  |           |                                          |                              |                                 |              |  |                                                                                                                                                 |  |
| Deliverables                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                  |           |                                          |                              |                                 |              |  |                                                                                                                                                 |  |
| <ul style="list-style-type: none"><li>• Updated versions of SIOP development networks</li><li>• Documented tutorial and help facility</li></ul>                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                  |           |                                          |                              |                                 |              |  |                                                                                                                                                 |  |
| <table><tr><th>Approach</th></tr><tr><td><ul style="list-style-type: none"><li>• Select software for tutorial</li><li>• Collect and organize structural changes</li><li>• Make model adjustments</li><li>• Develop and document the tutorial</li><li>• Consider development of a "help facility"</li></ul></td></tr></table> | Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"><li>• Select software for tutorial</li><li>• Collect and organize structural changes</li><li>• Make model adjustments</li><li>• Develop and document the tutorial</li><li>• Consider development of a "help facility"</li></ul> | <table><tr><th>Benefits</th></tr><tr><td><ul style="list-style-type: none"><li>• More rapid and thorough orientation of new personnel</li><li>• Improved ability to explain the SIOP development process to others having the need to know</li><li>• Availability of a powerful analytical tool</li></ul></td></tr></table> | Benefits                                                                                                                                                                                            | <ul style="list-style-type: none"><li>• More rapid and thorough orientation of new personnel</li><li>• Improved ability to explain the SIOP development process to others having the need to know</li><li>• Availability of a powerful analytical tool</li></ul> |           |                                          |                              |                                 |              |  |                                                                                                                                                 |  |
| Approach                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                  |           |                                          |                              |                                 |              |  |                                                                                                                                                 |  |
| <ul style="list-style-type: none"><li>• Select software for tutorial</li><li>• Collect and organize structural changes</li><li>• Make model adjustments</li><li>• Develop and document the tutorial</li><li>• Consider development of a "help facility"</li></ul>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                  |           |                                          |                              |                                 |              |  |                                                                                                                                                 |  |
| Benefits                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                  |           |                                          |                              |                                 |              |  |                                                                                                                                                 |  |
| <ul style="list-style-type: none"><li>• More rapid and thorough orientation of new personnel</li><li>• Improved ability to explain the SIOP development process to others having the need to know</li><li>• Availability of a powerful analytical tool</li></ul>                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                  |           |                                          |                              |                                 |              |  |                                                                                                                                                 |  |

**Chart A-4. SIOP prototype study.**

| <pre> graph TD     PI((Policy/Intelligence)) --&gt; TD((Target Development))     TD --&gt; TDB[Target Data Base]     TDB --&gt; SDB[Solution Data Base]     SDB --&gt; DGZ((DGZ Construction))     SDB --&gt; WA((Weapon Allocation))     SDB --&gt; WP((Weapon Application))     SDB --&gt; A((Analysis))     SDB --&gt; D((Document))     DGZ --&gt; WDB[Weapon Data Base]     WA --&gt; WDB     WP --&gt; WDB     WDB --&gt; TD     </pre> | <table border="1"> <tr> <th colspan="2">Objective</th></tr> <tr> <td colspan="2">To provide supplemental support to JSTPS and/or SNL, primarily in the area of software conversions and the integration of proposed approaches with existing ones.</td></tr> <tr> <td>Customer:</td><td>Capt. Anne Fletcher, JKCF (402) 294-7868</td></tr> <tr> <td>SAIC Principal Investigator:</td><td>Mr. Roger Craver (402) 291-2233</td></tr> <tr> <th colspan="2">Deliverables</th></tr> <tr> <td colspan="2">TBD</td></tr> <tr> <th colspan="2">Benefits</th></tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> <li>• Earlier completion of project</li> <li>• Continuity with existing procedures</li> </ul> </td></tr> </table> | Objective |  | To provide supplemental support to JSTPS and/or SNL, primarily in the area of software conversions and the integration of proposed approaches with existing ones. |  | Customer: | Capt. Anne Fletcher, JKCF (402) 294-7868 | SAIC Principal Investigator: | Mr. Roger Craver (402) 291-2233 | Deliverables |  | TBD |  | Benefits |  | <ul style="list-style-type: none"> <li>• Earlier completion of project</li> <li>• Continuity with existing procedures</li> </ul> |  |
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| Objective                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |  |                                                                                                                                                                   |  |           |                                          |                              |                                 |              |  |     |  |          |  |                                                                                                                                  |  |
| To provide supplemental support to JSTPS and/or SNL, primarily in the area of software conversions and the integration of proposed approaches with existing ones.                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |  |                                                                                                                                                                   |  |           |                                          |                              |                                 |              |  |     |  |          |  |                                                                                                                                  |  |
| Customer:                                                                                                                                                                                                                                                                                                                                                                                                                                     | Capt. Anne Fletcher, JKCF (402) 294-7868                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |  |                                                                                                                                                                   |  |           |                                          |                              |                                 |              |  |     |  |          |  |                                                                                                                                  |  |
| SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                                                  | Mr. Roger Craver (402) 291-2233                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |  |                                                                                                                                                                   |  |           |                                          |                              |                                 |              |  |     |  |          |  |                                                                                                                                  |  |
| Deliverables                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |  |                                                                                                                                                                   |  |           |                                          |                              |                                 |              |  |     |  |          |  |                                                                                                                                  |  |
| TBD                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |  |                                                                                                                                                                   |  |           |                                          |                              |                                 |              |  |     |  |          |  |                                                                                                                                  |  |
| Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |  |                                                                                                                                                                   |  |           |                                          |                              |                                 |              |  |     |  |          |  |                                                                                                                                  |  |
| <ul style="list-style-type: none"> <li>• Earlier completion of project</li> <li>• Continuity with existing procedures</li> </ul>                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |  |                                                                                                                                                                   |  |           |                                          |                              |                                 |              |  |     |  |          |  |                                                                                                                                  |  |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Determination of requirements</li> <li>• Coordination with JSTPS/SNL</li> <li>• Development of proposed solution</li> <li>• Execution of plan</li> </ul>                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |           |  |                                                                                                                                                                   |  |           |                                          |                              |                                 |              |  |     |  |          |  |                                                                                                                                  |  |

**Chart A-5. Network analysis for STRATCOM.**

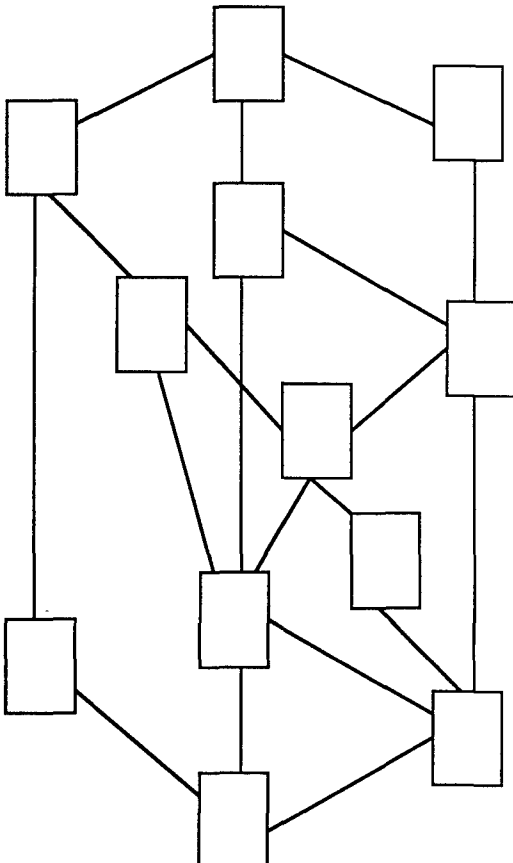
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <table><tr><th colspan="2">Objective</th></tr><tr><td colspan="2">To provide technical analytical support to STRATCOM J-523 in their development, testing and management of the new planning production system using a critical path version of network analysis.</td></tr><tr><td>Customer:</td><td>LTC Mike Elliot, J-52 (402) 294-7031</td></tr><tr><td>SAIC Principal Investigator:</td><td>Mr. Roger H. Craver (402) 291-2233</td></tr><tr><th colspan="2">Deliverables</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>• CPM networks of all the key functional steps in the planning process used for preplanned strikes</li><li>• Multiple levels of detail for more complex processes</li><li>• CPM networks of the adaptive planning process</li><li>• CPM networks of the SIOP maintenance process</li><li>• CPM networks of the application of conventional forces in strategic targeting</li><li>• Analytic and management tools for the production process</li><li>• Recommendations for alternative software improvements</li></ul></td></tr><tr><th colspan="2">Benefits</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>• Graphic depiction of planning processes that permit recognition and understanding of complex interrelationships</li><li>• Rapid analytics for planning processes</li><li>• High level of insight into planning/production dynamics</li><li>• Improved ease of presentation and management of the production process</li><li>• Baseline input on the current SIOP development process for the Strategic Planning Study Group (SPSG)</li></ul></td></tr></table> | Objective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | To provide technical analytical support to STRATCOM J-523 in their development, testing and management of the new planning production system using a critical path version of network analysis. |  | Customer: | LTC Mike Elliot, J-52 (402) 294-7031 | SAIC Principal Investigator: | Mr. Roger H. Craver (402) 291-2233 | Deliverables |  | <ul style="list-style-type: none"><li>• CPM networks of all the key functional steps in the planning process used for preplanned strikes</li><li>• Multiple levels of detail for more complex processes</li><li>• CPM networks of the adaptive planning process</li><li>• CPM networks of the SIOP maintenance process</li><li>• CPM networks of the application of conventional forces in strategic targeting</li><li>• Analytic and management tools for the production process</li><li>• Recommendations for alternative software improvements</li></ul> |  | Benefits |  | <ul style="list-style-type: none"><li>• Graphic depiction of planning processes that permit recognition and understanding of complex interrelationships</li><li>• Rapid analytics for planning processes</li><li>• High level of insight into planning/production dynamics</li><li>• Improved ease of presentation and management of the production process</li><li>• Baseline input on the current SIOP development process for the Strategic Planning Study Group (SPSG)</li></ul> |  |
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| Objective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                                 |  |           |                                      |                              |                                    |              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
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| Customer:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | LTC Mike Elliot, J-52 (402) 294-7031                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                                 |  |           |                                      |                              |                                    |              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Mr. Roger H. Craver (402) 291-2233                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                                 |  |           |                                      |                              |                                    |              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| Deliverables                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                                 |  |           |                                      |                              |                                    |              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
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| Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                                 |  |           |                                      |                              |                                    |              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| <ul style="list-style-type: none"><li>• Graphic depiction of planning processes that permit recognition and understanding of complex interrelationships</li><li>• Rapid analytics for planning processes</li><li>• High level of insight into planning/production dynamics</li><li>• Improved ease of presentation and management of the production process</li><li>• Baseline input on the current SIOP development process for the Strategic Planning Study Group (SPSG)</li></ul>                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                                 |  |           |                                      |                              |                                    |              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| <table><tr><th>Approach</th></tr><tr><td><ul style="list-style-type: none"><li>• Analysis of the planning process data to be modeled</li><li>• Development of drafts of the networks of each of the major functional areas</li><li>• Informal review of the draft versions by working elements of STRATCOM</li><li>• Refinement of the networks</li><li>• Review of the final networks by STRATCOM</li><li>• Installation of a projection capability</li><li>• Development of adaptive planning process network(s)</li><li>• Familiarization of J-523 personnel with the CPM process</li><li>• Development of SIOP maintenance networks</li><li>• Development of networks for strategic applications of conventional forces</li></ul></td></tr></table> | Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | <ul style="list-style-type: none"><li>• Analysis of the planning process data to be modeled</li><li>• Development of drafts of the networks of each of the major functional areas</li><li>• Informal review of the draft versions by working elements of STRATCOM</li><li>• Refinement of the networks</li><li>• Review of the final networks by STRATCOM</li><li>• Installation of a projection capability</li><li>• Development of adaptive planning process network(s)</li><li>• Familiarization of J-523 personnel with the CPM process</li><li>• Development of SIOP maintenance networks</li><li>• Development of networks for strategic applications of conventional forces</li></ul> |  |                                                                                                                                                                                                 |  |           |                                      |                              |                                    |              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                                 |  |           |                                      |                              |                                    |              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |
| <ul style="list-style-type: none"><li>• Analysis of the planning process data to be modeled</li><li>• Development of drafts of the networks of each of the major functional areas</li><li>• Informal review of the draft versions by working elements of STRATCOM</li><li>• Refinement of the networks</li><li>• Review of the final networks by STRATCOM</li><li>• Installation of a projection capability</li><li>• Development of adaptive planning process network(s)</li><li>• Familiarization of J-523 personnel with the CPM process</li><li>• Development of SIOP maintenance networks</li><li>• Development of networks for strategic applications of conventional forces</li></ul>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |  |                                                                                                                                                                                                 |  |           |                                      |                              |                                    |              |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |

**Chart A-6. PEM upgrade for MEM.**

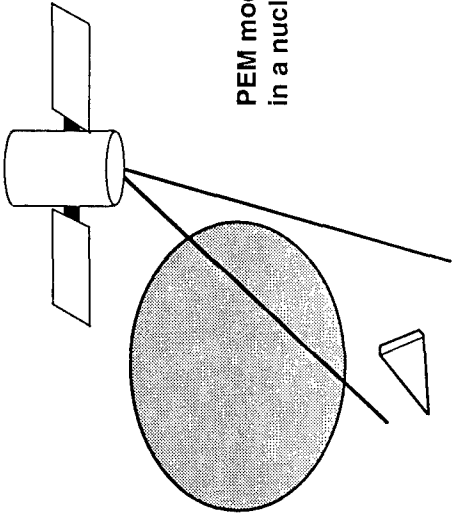
|                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>PEM models sensor degradation in a nuclear environment</p> <p>MEM ≡ Multiple Engagement Model<br/>PEM ≡ Propagation Engagement Model</p>                                                       | <p><b>Objective</b></p> <p>Evaluate PEM and incorporate current version (3.2) in MEM.</p> <p><b>Customer</b></p> <p>Lt. Kevin Zumbar USN, JSTPS/JLWT (402) 294-3997</p> <p><b>SAIC Principal Investigator</b></p> <p>Mr. Joe Manship (402) 291-2233</p>                                                                                                                                                                                         |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Extract required PEM modules</li> <li>• Insert modules into MEM</li> <li>• Compare results of MEM and PEM standalone test runs</li> <li>• Document and present results</li> <li>• Install at JSTPS and SAC</li> </ul> | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Report on PEM evaluation entitled "Subtask 3.1: Multiple Engagement Model (MEM) Propagation Engagement Module (PEM) Upgrade", SAIC-ASIOP/Subtask 3.1, 4 April 1990 (CDRL 0004).</li> <li>• Integrated code (PEM in MEM). Delivered to JSTPS and SAC and is scheduled for installation on 15 July 1990 with MEM version 15.</li> <li>• Subtask completed 4/13/90.</li> </ul> |

Chart A-7. Fireball model implications.

|                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>FIREBALL RADIUS EVOLUTION COMPARISON</b></p> <p>100 KT at 30 Km</p> <p>Radius (km)</p> <p>Time (seconds)</p> <p>MEM<br/>DNA 2000H<br/>PGM (Optimal)<br/>C/LAMP</p> <p>Single value for optimum radii indicates they are equal</p>                                                                                        | <p><b>Objective</b></p> <p>Compare MEM's current fireball model to C/LAMP and determine feasibility</p> <p><b>Customer</b></p> <p>Lt. Kevin Zumbar USN, JSTPS/JLWT (402)2 94-3997</p> <p>SAIC Principal Investigator</p> <p>Mr. Joe Manship (402) 291-2233</p> <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>White paper/report on MEM Fireball Comparison (CDRL 0004). Draft document entitled, "Subtask 3.2: Multiple Engagement Model (MEM) Fireball Validation" under internal review.</li> </ul> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Demonstrate sensitivity effects</li> <li>Review sensitivity results</li> <li>Identify appropriate Community Standard Codes (C/LAMP, etc.)</li> <li>Make comparison runs</li> <li>Evaluate effects on MEM results</li> <li>Create and present briefing</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |

**Chart A-8. Fireball model update.**

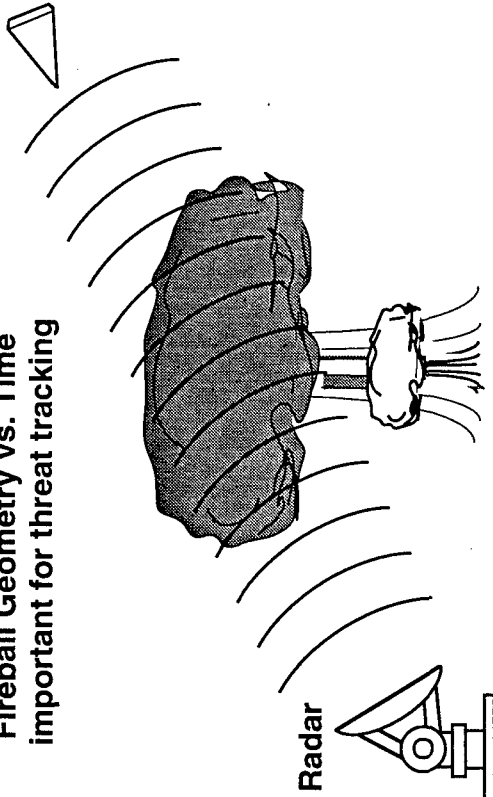
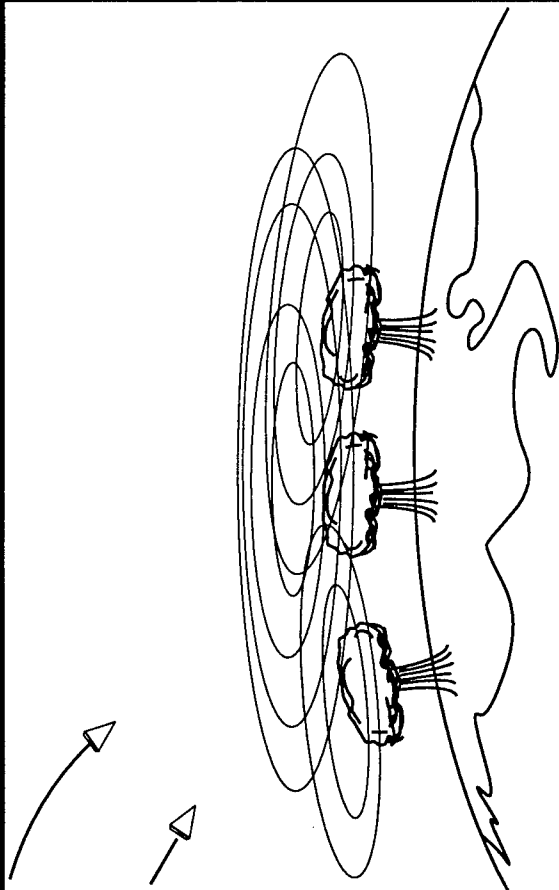
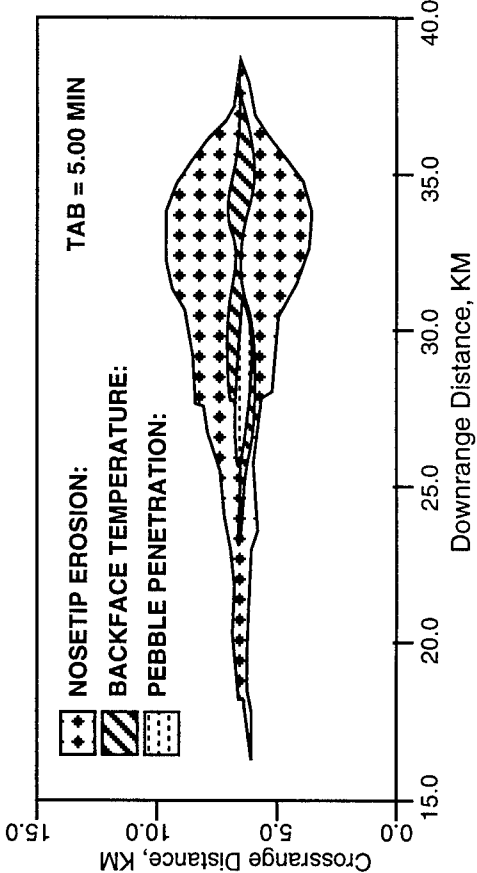
|                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Fireball Geometry vs. Time</b><br/>important for threat tracking</p>  <p><b>Radar</b></p> <p><b>MEM = Multiple Engagement Model</b></p>                                                          | <p><b>Objective</b></p> <p>Replace current MEM fireball model with one derived from C/LAMP (or other DNA approved standard).</p> <p><b>Customer</b></p> <p>Lt. Kevin Zumbar USN, JSTPS/JLWT (402) 294-3997</p> <p><b>SAIC Principal Investigator</b></p> <p>Mr. Joe Manship (402) 291-2233</p> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Extract appropriate coding from DNA community standard</li> <li>• Make comparison runs</li> <li>• Present results of comparison runs</li> <li>• Implement new model in MEM</li> <li>• Install at JSTPS and SAC</li> </ul> | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Updated MEM code installed at JSTPS and SAC</li> <li>• Informal subtask report</li> </ul>                                                                                                                                  |

**Chart A-9. Multiburst requirements for MEM.**

|                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p><b>MEM</b> <math>\equiv</math> Multiple Engagement Model</p>                                                                                                                                                                           | <p><b>Objective</b></p> <p>Evaluate the need for inclusion of Multiburst environments and effects in MEM</p> <p><b>Customer</b></p> <p>Lt. Kevin Zumbar USN, JSTPS/JLWT (402) 294-3997</p> <p><b>SAIC Principal Investigator</b></p> <p>Mr. Joe Manship (402) 291-2233</p> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Obtain geometries for bursts from typical JSTPS and SAC runs</li> <li>• Run C/LAMP and/or LAMB using geometries</li> <li>• Assess how and when multiburst phenomenology invoked</li> <li>• Assess impact on MEM results</li> <li>• Present results</li> </ul> | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Report (in briefing format) on the effect of including Multiburst environments and effects in MEM</li> </ul>                                                                                           |

# Chart A-10. Wind effects on RV fratricide.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>FEAR/SLAPEM FRATRICE FOOTPRINT<br/>CASE A05: OASIS TEST VEHICLE #7<br/>LM02 DUST &amp; ICE CLOUD, NO EJECTA, WINDSET # 3573</p>                                                                                                                                                                                                                                   | <p><b>Objective</b></p> <p>Assess operational impact of wind effects on RV fratricide.</p> <p><b>Customer</b></p> <p>Lt. Col. Jack Strickland USAF, JSTPS/JKCS (402) 294-4960<br/>Capt. J.O. Miller USAF, SAC/XOBM</p> <p><b>SAIC Principal Investigator</b></p> <p>Dr. James Stoddard (619) 546-6294</p> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Review SAC's current version of OASIS</li> <li>• Design new module for wind environments with OASIS</li> <li>• Review completed module design</li> <li>• Generate code for wind module</li> <li>• Perform offline tests and review results</li> <li>• Derive detailed validation plan and review</li> <li>• Install module at SAC</li> <li>• Perform validation and document</li> </ul> | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Installed wind effects module for OASIS (Delivered and installed on 2 April 1990).</li> <li>• Validation report. Draft report under development (provided to DNA in April Progress Report).</li> <li>• Subtask complete.</li> </ul>   |

# Chart A-11. NWE upgrades for MEM.

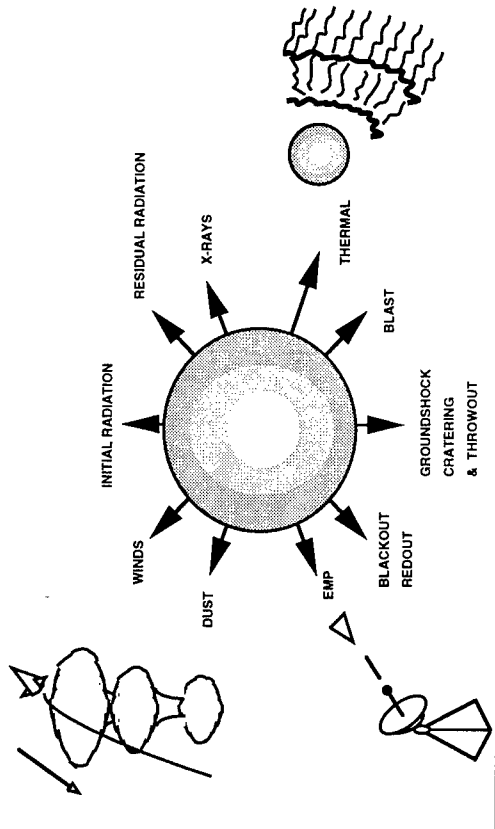
|                                                                                                                                                                                                                                                                                                                                                                                                                                          | <table><tr><th colspan="2">Objective</th></tr><tr><td colspan="2">To insure that MEM results are accurate and credible with respect to NWE.</td></tr><tr><td>Customer:</td><td>L.T. Dave States USN, USSTRATCOM/J-552<br/>(402) 294-3997</td></tr><tr><td>SAIC Principal Investigator:</td><td>Mr. Joe Manship (619) 458-2769</td></tr><tr><th colspan="2">Deliverables</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>Updated MEM Code installed at USSTRATCOM</li><li>Documentation</li></ul></td></tr><tr><th colspan="2">Benefits</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>Updated MEM Code with DNA approved NWE models</li><li>Documentation suitable for USSTRATCOM MEM users</li></ul></td></tr></table> | Objective                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  | To insure that MEM results are accurate and credible with respect to NWE. |  | Customer: | L.T. Dave States USN, USSTRATCOM/J-552<br>(402) 294-3997 | SAIC Principal Investigator: | Mr. Joe Manship (619) 458-2769 | Deliverables |  | <ul style="list-style-type: none"><li>Updated MEM Code installed at USSTRATCOM</li><li>Documentation</li></ul> |  | Benefits |  | <ul style="list-style-type: none"><li>Updated MEM Code with DNA approved NWE models</li><li>Documentation suitable for USSTRATCOM MEM users</li></ul> |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------|--|-----------|----------------------------------------------------------|------------------------------|--------------------------------|--------------|--|----------------------------------------------------------------------------------------------------------------|--|----------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Objective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                                          |                              |                                |              |  |                                                                                                                |  |          |  |                                                                                                                                                       |  |
| To insure that MEM results are accurate and credible with respect to NWE.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                                          |                              |                                |              |  |                                                                                                                |  |          |  |                                                                                                                                                       |  |
| Customer:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | L.T. Dave States USN, USSTRATCOM/J-552<br>(402) 294-3997                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                                          |                              |                                |              |  |                                                                                                                |  |          |  |                                                                                                                                                       |  |
| SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Mr. Joe Manship (619) 458-2769                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                                          |                              |                                |              |  |                                                                                                                |  |          |  |                                                                                                                                                       |  |
| Deliverables                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                                          |                              |                                |              |  |                                                                                                                |  |          |  |                                                                                                                                                       |  |
| <ul style="list-style-type: none"><li>Updated MEM Code installed at USSTRATCOM</li><li>Documentation</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                                          |                              |                                |              |  |                                                                                                                |  |          |  |                                                                                                                                                       |  |
| Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                                          |                              |                                |              |  |                                                                                                                |  |          |  |                                                                                                                                                       |  |
| <ul style="list-style-type: none"><li>Updated MEM Code with DNA approved NWE models</li><li>Documentation suitable for USSTRATCOM MEM users</li></ul>                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                                          |                              |                                |              |  |                                                                                                                |  |          |  |                                                                                                                                                       |  |
| <table><tr><th>Approach</th></tr><tr><td><ul style="list-style-type: none"><li>Compare/extract improvements from current NWE community codes or data (NORSE, C/LAMP, PEM, etc.)<ul style="list-style-type: none"><li>No new first principle physics</li><li>Extract only as appropriate</li><li>Run times</li><li>Adequate accuracy</li><li>Applicability to MEM analyses</li><li>Suitable for operational environment</li></ul></li><li>Produce a report documenting validation and new models</li></ul></td></tr></table> | Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"><li>Compare/extract improvements from current NWE community codes or data (NORSE, C/LAMP, PEM, etc.)<ul style="list-style-type: none"><li>No new first principle physics</li><li>Extract only as appropriate</li><li>Run times</li><li>Adequate accuracy</li><li>Applicability to MEM analyses</li><li>Suitable for operational environment</li></ul></li><li>Produce a report documenting validation and new models</li></ul> |  |                                                                           |  |           |                                                          |                              |                                |              |  |                                                                                                                |  |          |  |                                                                                                                                                       |  |
| Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                                          |                              |                                |              |  |                                                                                                                |  |          |  |                                                                                                                                                       |  |
| <ul style="list-style-type: none"><li>Compare/extract improvements from current NWE community codes or data (NORSE, C/LAMP, PEM, etc.)<ul style="list-style-type: none"><li>No new first principle physics</li><li>Extract only as appropriate</li><li>Run times</li><li>Adequate accuracy</li><li>Applicability to MEM analyses</li><li>Suitable for operational environment</li></ul></li><li>Produce a report documenting validation and new models</li></ul>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                                          |                              |                                |              |  |                                                                                                                |  |          |  |                                                                                                                                                       |  |



**Chart A-12. MEM NWE upgrade (Continued).**  
**(Prioritize NWE models)**

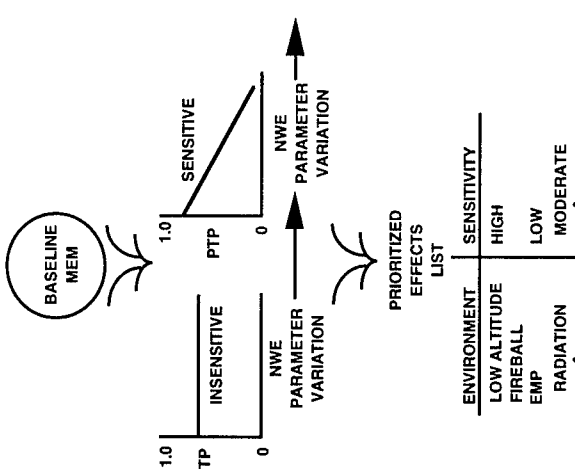
|  <table border="1" data-bbox="693 1447 826 1744"> <thead> <tr> <th>ENVIRONMENT</th> <th>SENSITIVITY</th> </tr> </thead> <tbody> <tr> <td>LOW ALTITUDE</td> <td>HIGH</td> </tr> <tr> <td>FIREBALL</td> <td>LOW</td> </tr> <tr> <td>EMP</td> <td>MODERATE</td> </tr> <tr> <td>RADIATION</td> <td>•</td> </tr> <tr> <td>•</td> <td>•</td> </tr> <tr> <td>•</td> <td>•</td> </tr> </tbody> </table> | ENVIRONMENT                                                                                                       | SENSITIVITY | LOW ALTITUDE | HIGH | FIREBALL | LOW | EMP | MODERATE | RADIATION | • | • | • | • | • | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>• Insure That No Important Effect Is Left Out</li> <li>• The Highest Priority NWE Models Are Addressed Early</li> </ul> <p><b>Customer:</b> LT. Kevin Zumbar USN, JSTPS/JLWT (402) 294-3997</p> <p><b>SAIC Principal Investigator:</b> Mr. Joe Manship (402) 291-2233</p> <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Prioritized NWE List</li> </ul> |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------|--------------|------|----------|-----|-----|----------|-----------|---|---|---|---|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ENVIRONMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | SENSITIVITY                                                                                                       |             |              |      |          |     |     |          |           |   |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| LOW ALTITUDE                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | HIGH                                                                                                              |             |              |      |          |     |     |          |           |   |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| FIREBALL                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | LOW                                                                                                               |             |              |      |          |     |     |          |           |   |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| EMP                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | MODERATE                                                                                                          |             |              |      |          |     |     |          |           |   |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| RADIATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | •                                                                                                                 |             |              |      |          |     |     |          |           |   |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | •                                                                                                                 |             |              |      |          |     |     |          |           |   |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| •                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | •                                                                                                                 |             |              |      |          |     |     |          |           |   |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Prioritize NWE Models Based On <ul style="list-style-type: none"> <li>- User Experience</li> <li>- Knowledge Of MEM Systems Models</li> <li>- Effect On MEM Outputs</li> </ul> </li> </ul>                                                                                                                                                                                                                         | <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Provides A Road Map For Upgrade Effort</li> </ul> |             |              |      |          |     |     |          |           |   |   |   |   |   |                                                                                                                                                                                                                                                                                                                                                                                                                                              |

**Chart A-12. MEM NWE upgrade (Continued).  
(Identify replacement NWE models)**

|                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>PRIORITIZED EFFECTS LIST</p> <p>REVIEW PANEL</p> <p>RECOMMENDED STANDARD CODES</p> <p>C/LAMP<br/>NORSE<br/>•<br/>•<br/>•</p>                                     | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>To Use DNA Approved Models Where Suitable In Terms Of <ul style="list-style-type: none"> <li>- Accuracy</li> <li>- Size</li> <li>- Run Time</li> </ul> </li> </ul> <p>Customer: LT. Kevin Zumbar USN, JSTPS/JLWT (402) 294-3997</p> <p>SAIC Principal Investigator: Mr. Joe Manship (402) 291-2233</p> <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>Recommended Community Standard Codes For Incorporation Into MEM</li> </ul> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Establish MEM NWE Upgrade Panel Of NWE Experts (DNA, AWE, SAIC) To Provide Recommendations</li> </ul> | <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>Will Insure MEM Code Credibility</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                          |

**Chart A-12. MEM NWE upgrade (Continued).  
(Upgrade MEM NWE models as appropriate)**

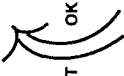
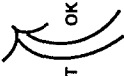
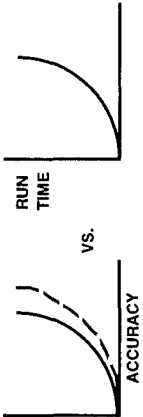
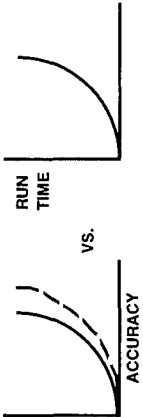
| <div><div><div>STANDARD CODES</div><div></div></div><div><div>MODULES</div><div></div></div><div><div>STANDALONE DRIVERS</div><div></div></div><div><div>ACHIEVE A BALANCE</div><div><div><div>NOT OK</div><div></div></div><div><div>OK</div><div></div></div></div><div><div>ACCURACY</div><div></div><div>vs.</div><div><div>RUN TIME</div><div></div></div><div><div>OK</div><div></div></div><div><div>NEW NWE MODEL</div></div></div></div></div> | <table><tr><th colspan="2">Objective</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>Upgrade NWE Models In MEM Achieving A Balance Between Accuracy and Run Time</li></ul></td></tr><tr><td>Customer:</td><td>L.T. Kevin Zumbar USN, JSTPS/JLWT (402) 294-3997</td></tr><tr><td>SAIC Principal Investigator:</td><td>Mr. Joe Manship (402) 291-2233</td></tr><tr><th colspan="2">Deliverables</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>Upgraded NWE Models</li></ul></td></tr><tr><th colspan="2">Benefits</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>Will Enhance Code Credibility While Maintaining Usability</li></ul></td></tr></table> | Objective                                                                                                      |  | <ul style="list-style-type: none"><li>Upgrade NWE Models In MEM Achieving A Balance Between Accuracy and Run Time</li></ul> |  | Customer: | L.T. Kevin Zumbar USN, JSTPS/JLWT (402) 294-3997 | SAIC Principal Investigator: | Mr. Joe Manship (402) 291-2233 | Deliverables |  | <ul style="list-style-type: none"><li>Upgraded NWE Models</li></ul> |  | Benefits |  | <ul style="list-style-type: none"><li>Will Enhance Code Credibility While Maintaining Usability</li></ul> |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------------------------------------------------|--|-----------|--------------------------------------------------|------------------------------|--------------------------------|--------------|--|---------------------------------------------------------------------|--|----------|--|-----------------------------------------------------------------------------------------------------------|--|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Objective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                |  |                                                                                                                             |  |           |                                                  |                              |                                |              |  |                                                                     |  |          |  |                                                                                                           |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"><li>Upgrade NWE Models In MEM Achieving A Balance Between Accuracy and Run Time</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                |  |                                                                                                                             |  |           |                                                  |                              |                                |              |  |                                                                     |  |          |  |                                                                                                           |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Customer:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | L.T. Kevin Zumbar USN, JSTPS/JLWT (402) 294-3997                                                               |  |                                                                                                                             |  |           |                                                  |                              |                                |              |  |                                                                     |  |          |  |                                                                                                           |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Mr. Joe Manship (402) 291-2233                                                                                 |  |                                                                                                                             |  |           |                                                  |                              |                                |              |  |                                                                     |  |          |  |                                                                                                           |  |
| Deliverables                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                |  |                                                                                                                             |  |           |                                                  |                              |                                |              |  |                                                                     |  |          |  |                                                                                                           |  |
| <ul style="list-style-type: none"><li>Upgraded NWE Models</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                |  |                                                                                                                             |  |           |                                                  |                              |                                |              |  |                                                                     |  |          |  |                                                                                                           |  |
| Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                |  |                                                                                                                             |  |           |                                                  |                              |                                |              |  |                                                                     |  |          |  |                                                                                                           |  |
| <ul style="list-style-type: none"><li>Will Enhance Code Credibility While Maintaining Usability</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                |  |                                                                                                                             |  |           |                                                  |                              |                                |              |  |                                                                     |  |          |  |                                                                                                           |  |
| <table><tr><th>Approach</th></tr><tr><td><ul style="list-style-type: none"><li>Incorporate Community Standard NWE Codes In MEM As Appropriate</li></ul></td></tr></table>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <ul style="list-style-type: none"><li>Incorporate Community Standard NWE Codes In MEM As Appropriate</li></ul> |  |                                                                                                                             |  |           |                                                  |                              |                                |              |  |                                                                     |  |          |  |                                                                                                           |  |
| Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                |  |                                                                                                                             |  |           |                                                  |                              |                                |              |  |                                                                     |  |          |  |                                                                                                           |  |
| <ul style="list-style-type: none"><li>Incorporate Community Standard NWE Codes In MEM As Appropriate</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                |  |                                                                                                                             |  |           |                                                  |                              |                                |              |  |                                                                     |  |          |  |                                                                                                           |  |

**Chart A-12. MEM NWE upgrade (Continued).**  
(Validation of upgraded models)

|                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                  |                                                  |                              |                                |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------|------------------------------|--------------------------------|
| <p>NEW MODELS</p> <p>CLAMP</p> <p>EXPERIMENTAL MEM</p> <p>NORSE</p> <p>MEM</p> <p>STANDARD CODE</p> <p>EFFECT</p> <p>TIME</p> <p>OPERATIONAL MEM</p> <p>TRICOMS DEMONSTRATION</p> | <h2>Objective</h2> <ul style="list-style-type: none"><li>To Demonstrate Accuracy Of New MEM Code To User</li></ul> <table><tr><td>Customer:</td><td>L.T. Kevin Zumbar USN, JSTPS/JLWT (402) 294-3997</td></tr><tr><td>SAIC Principal Investigator:</td><td>Mr. Joe Manship (402) 291-2233</td></tr></table> <h2>Deliverables</h2> <ul style="list-style-type: none"><li>Performance Evaluation Plan For Testing</li><li>"Formalize" Software Debug Code</li></ul> <h2>Benefits</h2> <ul style="list-style-type: none"><li>Will Establish Basis For Code Credibility</li></ul> | Customer:                                        | L.T. Kevin Zumbar USN, JSTPS/JLWT (402) 294-3997 | SAIC Principal Investigator: | Mr. Joe Manship (402) 291-2233 |
|                                                                                                                                                                                   | Customer:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | L.T. Kevin Zumbar USN, JSTPS/JLWT (402) 294-3997 |                                                  |                              |                                |
|                                                                                                                                                                                   | SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Mr. Joe Manship (402) 291-2233                   |                                                  |                              |                                |
|                                                                                                                                                                                   | <h2>Approach</h2> <ul style="list-style-type: none"><li>Develop Test Plan</li><li>Develop Software To Allow User To "See" NWE Models Operating</li><li>Conduct Performance Evaluation</li></ul>                                                                                                                                                                                                                                                                                                                                                                               |                                                  |                                                  |                              |                                |

**Chart A-12. MEM NWE upgrade (Continued).  
(Documentation)**

|  |  | Objective                                                                                                                                                                                                                                       |                                                |
|--|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|
|  |  | <ul style="list-style-type: none"> <li>• Provide A Complete Historical Record Of The Efforts And Findings From Task 3.6 Through 3.10</li> </ul>                                                                                                 |                                                |
|  |  | Customer:                                                                                                                                                                                                                                       | LT. Kevin Zumar USN, JSTPS/JLWT (402) 294-3997 |
|  |  | SAIC Principal Investigator:                                                                                                                                                                                                                    | Mr. Joe Manship (402) 291-2233                 |
|  |  | Deliverables                                                                                                                                                                                                                                    |                                                |
|  |  | <ul style="list-style-type: none"> <li>• Complete Documentation On Each NWE Model To Include: <ul style="list-style-type: none"> <li>- Comparison Tables</li> <li>- Assumptions/Limitations</li> <li>- Model Description</li> </ul> </li> </ul> |                                                |
|  |  | Benefits                                                                                                                                                                                                                                        |                                                |
|  |  | <ul style="list-style-type: none"> <li>• Provides Knowledge And Understanding Of The Code</li> </ul>                                                                                                                                            |                                                |

|  |                                                                                                                                                                                             |  |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|  |                                                                                                                                                                                             |  |
|  | <b>Approach</b>                                                                                                                                                                             |  |
|  | <ul style="list-style-type: none"> <li>• Document Each Upgrade NWE Model Using <ul style="list-style-type: none"> <li>- Graphical Aids</li> <li>- Reference Material</li> </ul> </li> </ul> |  |
|  | <ul style="list-style-type: none"> <li>• NWE Model Upgrade <u>Not</u> Complete Until Documented</li> </ul>                                                                                  |  |

**Chart A-12. MEM NWE upgrade (Continued).**  
(Maintain currency)

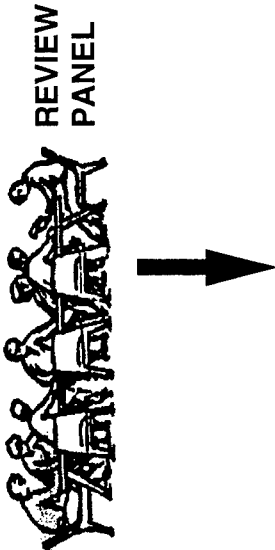
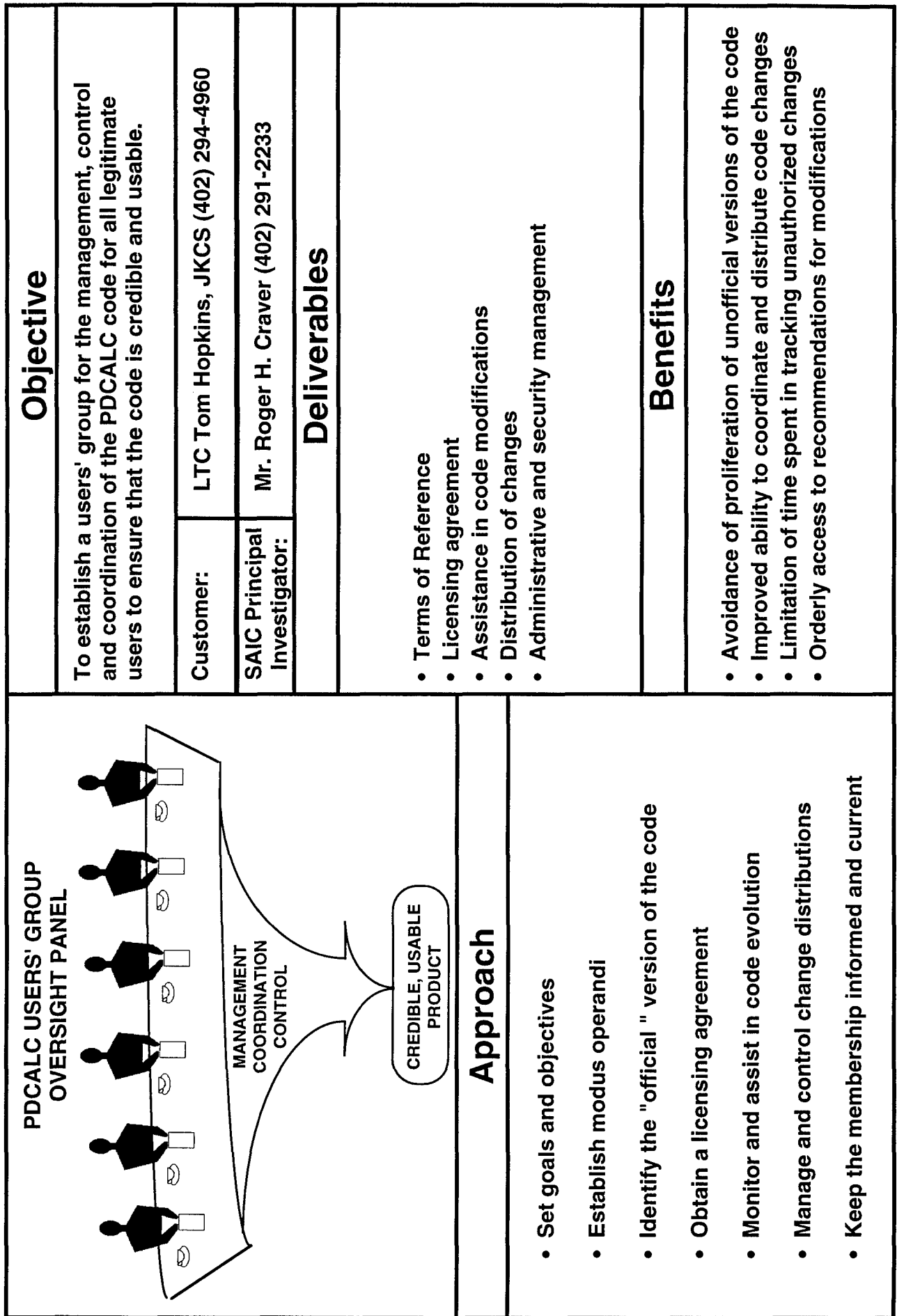
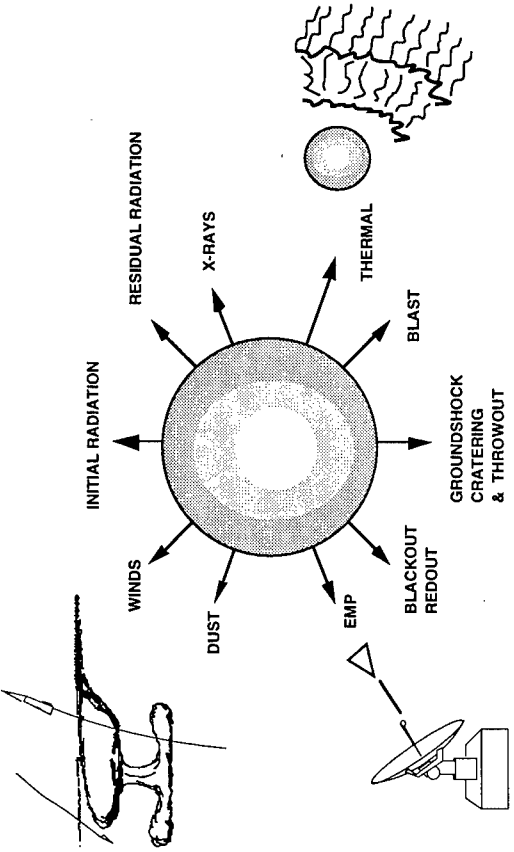
|                                                                                                                                    |  |                                                                                                                                                       |                                                 |
|------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------|
|  <p>REVIEW<br/>PANEL</p> <p>RECOMMENDATIONS</p> |  | <b>Objective</b>                                                                                                                                      |                                                 |
|                                                                                                                                    |  | <ul style="list-style-type: none"> <li>Maintain Currency Of The NWE Models In MEM And Understanding Of Their Limitations</li> </ul>                   |                                                 |
|                                                                                                                                    |  | Customer:                                                                                                                                             | LT. Kevin Zumbar USN, JSTPS/JLWT (402) 294-3997 |
|                                                                                                                                    |  | SAIC Principal Investigator:                                                                                                                          | Mr. Joe Manship (402) 291-2233                  |
|                                                                                                                                    |  | <b>Deliverables</b>                                                                                                                                   |                                                 |
|                                                                                                                                    |  | <ul style="list-style-type: none"> <li>Upgraded NWE Models</li> </ul>                                                                                 |                                                 |
|                                                                                                                                    |  | <b>Benefits</b>                                                                                                                                       |                                                 |
|                                                                                                                                    |  | <ul style="list-style-type: none"> <li>Will Maintain Credibility Of MEM Code</li> </ul>                                                               |                                                 |
|                                                                                                                                    |  | <b>Approach</b>                                                                                                                                       |                                                 |
|                                                                                                                                    |  | <ul style="list-style-type: none"> <li>Attend Community Standard Code User Meetings</li> <li>Implement Upgrades As Appropriate To MEM Uses</li> </ul> |                                                 |

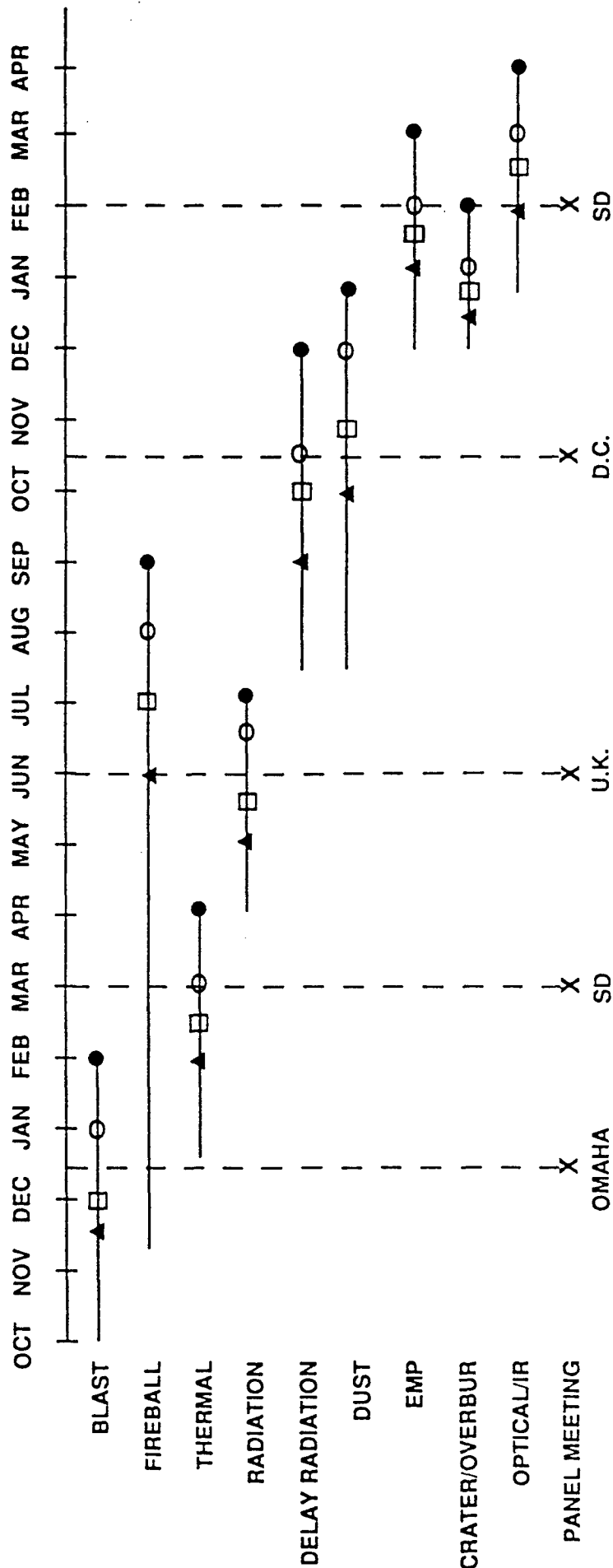
**Chart A-13. PDCALC users' group.**



# Chart A-14. NWE upgrades for MEM.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                         |                              |                                |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------|------------------------------|--------------------------------|
|  <p>The diagram illustrates the various effects of a nuclear warhead. At the center is a circular representation of the warhead. Arrows radiate from this center to various labels: INITIAL RADIATION, WINDS, DUST, EMP, BLACKOUT REDOUT, GROUND SHOCK CRATERING &amp; THROWOUT, BLAST, THERMAL, X-RAYS, and RESIDUAL RADIATION. To the left of the warhead is a sketch of a city skyline. To the right is a sketch of a satellite dish antenna.</p>                                                      | <h2>Objective</h2> <p>To insure that MEM results are accurate and credible with respect to NWE.</p> <table border="1"> <tr> <td>Customer:</td><td>LT. Dave States USN, USSTRATCOM/J-552<br/>(402) 294-3997</td></tr> <tr> <td>SAIC Principal Investigator:</td><td>Mr. Joe Manship (402) 291-2233</td></tr> </table> <h2>Deliverables</h2> <ul style="list-style-type: none"> <li>• Updated MEM Code installed at JSTPS</li> <li>• Documentation</li> </ul> | Customer: | LT. Dave States USN, USSTRATCOM/J-552<br>(402) 294-3997 | SAIC Principal Investigator: | Mr. Joe Manship (402) 291-2233 |
| Customer:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | LT. Dave States USN, USSTRATCOM/J-552<br>(402) 294-3997                                                                                                                                                                                                                                                                                                                                                                                                     |           |                                                         |                              |                                |
| SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Mr. Joe Manship (402) 291-2233                                                                                                                                                                                                                                                                                                                                                                                                                              |           |                                                         |                              |                                |
| <h2>Approach</h2> <p>Integrate NWE models into MEM as DNA updates are released and approved by DNA-UK MEM Oversight Panel.</p> <ul style="list-style-type: none"> <li>• Maintain currency               <ul style="list-style-type: none"> <li>- Upgrade new NWE models to latest versions</li> <li>- Attend user meetings</li> <li>- Additional NORSE validation</li> </ul> </li> <li>• Monitor/Provide inputs/Install new models for               <ul style="list-style-type: none"> <li>- Clutter</li> <li>- Dust</li> <li>- Fission Product Gamma</li> <li>- EMP</li> </ul> </li> </ul> | <h2>Benefits</h2> <ul style="list-style-type: none"> <li>• Updated MEM Code with DNA approved NWE models</li> <li>• Documentation suitable for JSTPS MEM users</li> </ul>                                                                                                                                                                                                                                                                                   |           |                                                         |                              |                                |

# Chart A-15. MEM NWE schedule.



OTHER REPORTS

• D O C T E M P

GFE

• H I S E M M

- ▲ DRAFT VALIDATION REPORT
- DRAFT FINAL REPORT
- FINAL REPORT
- SOFTWARE DELIVERY

# Chart A-15. MEM NWE schedule (Continued).

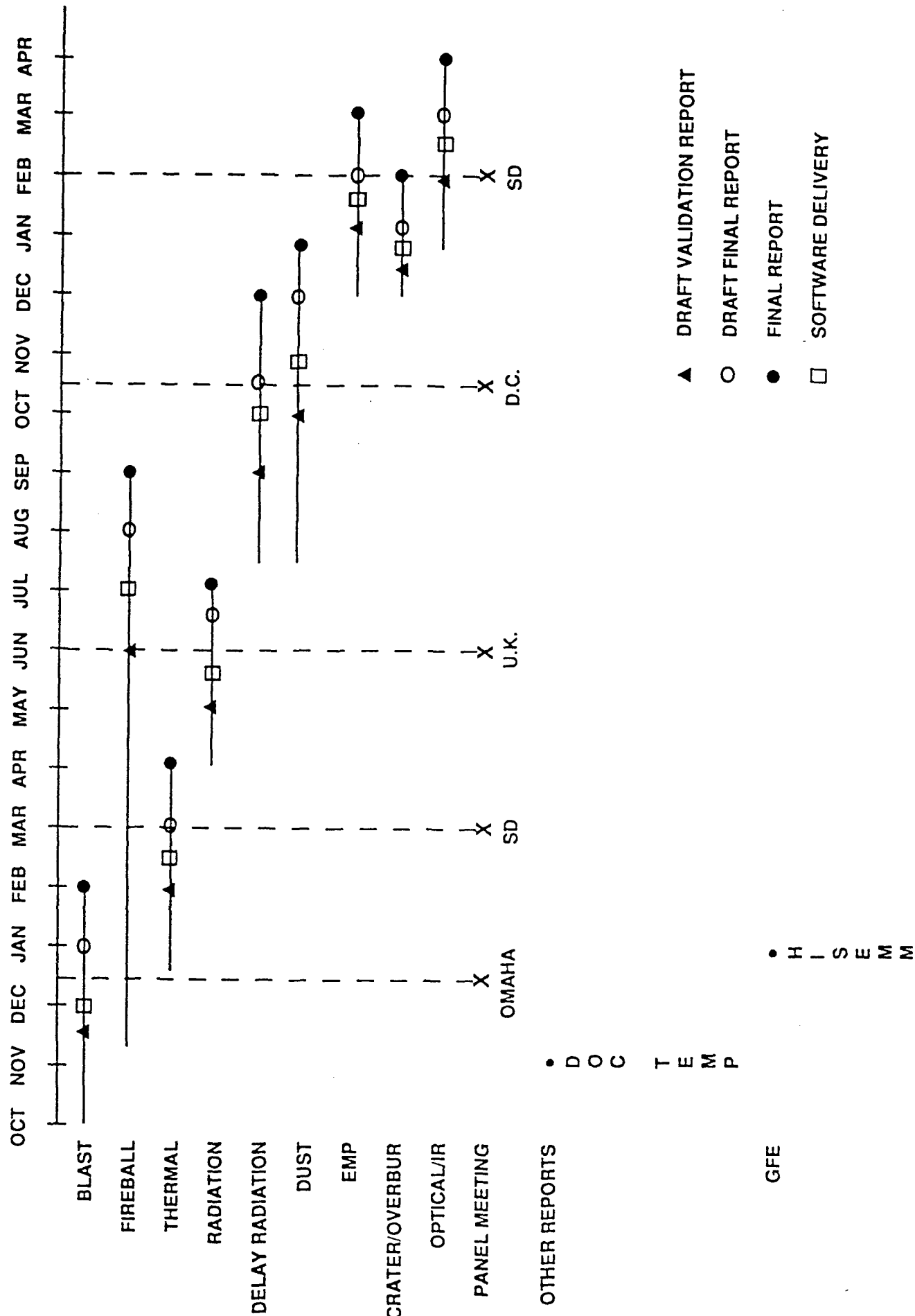


**Chart A-16. Maintain currency of MEM NWE models.**

| <pre>graph LR; subgraph PEM_versions [PEM]; P3.3[3.3]; P3.4[3.4]; P3.5[3.5]; end; subgraph HISEMM_versions [HISEMM]; H4.0[4.0]; H5.0[5.0]; H6.0[6.0]; end; subgraph CLAMP_versions [C/LAMP]; C4.5[4.5]; C4.6[4.6]; C4.7[4.7]; end; PEM_versions --&gt; MEM_X_X[MEM X.X]; HISEMM_versions --&gt; MEM_X_X; CLAMP_versions --&gt; MEM_X_X;</pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <table><tr><th colspan="2">Objective</th></tr><tr><td colspan="2">Maintain currency of Nuclear Weapons Effects models in MEM by incorporating latest versions of PEM, C/LAMP and HISEMM.</td></tr><tr><td>Customer:</td><td>Lt. Dave States, US STRATCOM/J-523<br/>(402) 294-3997</td></tr><tr><td>SAIC Principal Investigator:</td><td>Mr. Joe Manship (703) 683-6242</td></tr><tr><th colspan="2">Deliverables</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>• Delivery/installation/testing of upgraded MEM software.</li><li>• Updated versions of MEM documentation describing new NWE models.</li><li>• Minutes of PEM, C/LAMP, and HISEMM users meeting highlighting model enhancements affecting MEM results.</li><li>• Host Semi-annual MEM NWE Upgrade Oversight Panel Meetings.</li></ul></td></tr><tr><th colspan="2">Benefits</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>• Insures the continuing credibility of the MEM code with respect to its NWE models. These models were upgraded by DNA at a cost of 700K. A modest maintenance task is vital to maintain the currency of the upgraded models.</li><li>• Planned future enhancements for the HISEMM code (e.g. tilted fireballs, gamma ionization regions, etc.) if incorporated will allow for the complete removal of old RANC4/ROSCOE encoding now required to model currently missing phenomenon. This will greatly improve MEM code structure.</li></ul></td></tr></table> | Objective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | Maintain currency of Nuclear Weapons Effects models in MEM by incorporating latest versions of PEM, C/LAMP and HISEMM. |  | Customer: | Lt. Dave States, US STRATCOM/J-523<br>(402) 294-3997 | SAIC Principal Investigator: | Mr. Joe Manship (703) 683-6242 | Deliverables |  | <ul style="list-style-type: none"><li>• Delivery/installation/testing of upgraded MEM software.</li><li>• Updated versions of MEM documentation describing new NWE models.</li><li>• Minutes of PEM, C/LAMP, and HISEMM users meeting highlighting model enhancements affecting MEM results.</li><li>• Host Semi-annual MEM NWE Upgrade Oversight Panel Meetings.</li></ul> |  | Benefits |  | <ul style="list-style-type: none"><li>• Insures the continuing credibility of the MEM code with respect to its NWE models. These models were upgraded by DNA at a cost of 700K. A modest maintenance task is vital to maintain the currency of the upgraded models.</li><li>• Planned future enhancements for the HISEMM code (e.g. tilted fireballs, gamma ionization regions, etc.) if incorporated will allow for the complete removal of old RANC4/ROSCOE encoding now required to model currently missing phenomenon. This will greatly improve MEM code structure.</li></ul> |  |
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| Objective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                        |  |           |                                                      |                              |                                |              |  |                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Maintain currency of Nuclear Weapons Effects models in MEM by incorporating latest versions of PEM, C/LAMP and HISEMM.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                        |  |           |                                                      |                              |                                |              |  |                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Customer:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Lt. Dave States, US STRATCOM/J-523<br>(402) 294-3997                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                        |  |           |                                                      |                              |                                |              |  |                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Mr. Joe Manship (703) 683-6242                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                        |  |           |                                                      |                              |                                |              |  |                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Deliverables                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                        |  |           |                                                      |                              |                                |              |  |                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <ul style="list-style-type: none"><li>• Delivery/installation/testing of upgraded MEM software.</li><li>• Updated versions of MEM documentation describing new NWE models.</li><li>• Minutes of PEM, C/LAMP, and HISEMM users meeting highlighting model enhancements affecting MEM results.</li><li>• Host Semi-annual MEM NWE Upgrade Oversight Panel Meetings.</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                        |  |           |                                                      |                              |                                |              |  |                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Benefits                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                        |  |           |                                                      |                              |                                |              |  |                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <ul style="list-style-type: none"><li>• Insures the continuing credibility of the MEM code with respect to its NWE models. These models were upgraded by DNA at a cost of 700K. A modest maintenance task is vital to maintain the currency of the upgraded models.</li><li>• Planned future enhancements for the HISEMM code (e.g. tilted fireballs, gamma ionization regions, etc.) if incorporated will allow for the complete removal of old RANC4/ROSCOE encoding now required to model currently missing phenomenon. This will greatly improve MEM code structure.</li></ul>                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                        |  |           |                                                      |                              |                                |              |  |                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <table><tr><th>Approach</th></tr><tr><td><ul style="list-style-type: none"><li>• Attend and actively participate in all PEM, C/LAMP and HISEMM user meetings and prepare activity reports for MEM users.</li><li>• Organize/host 2 MEM NWE Upgrade Oversight Panel Meetings.</li><li>• Incorporate new releases of PEM, C/LAMP and HISEMM into MEM as they become available:<ul style="list-style-type: none"><li>(1) install released code on Bellevue computer;</li><li>(2) run installation tests to validate correct operation of code</li><li>(3) incorporate code or subset of code in current operational version of MEM</li><li>(4) perform test runs to validate correct installation</li><li>(5) deliver/install/test upgraded MEM code on STRATCOM computer.</li></ul></li><li>• Update MEM documentation as required.</li></ul></td></tr></table> | Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <ul style="list-style-type: none"><li>• Attend and actively participate in all PEM, C/LAMP and HISEMM user meetings and prepare activity reports for MEM users.</li><li>• Organize/host 2 MEM NWE Upgrade Oversight Panel Meetings.</li><li>• Incorporate new releases of PEM, C/LAMP and HISEMM into MEM as they become available:<ul style="list-style-type: none"><li>(1) install released code on Bellevue computer;</li><li>(2) run installation tests to validate correct operation of code</li><li>(3) incorporate code or subset of code in current operational version of MEM</li><li>(4) perform test runs to validate correct installation</li><li>(5) deliver/install/test upgraded MEM code on STRATCOM computer.</li></ul></li><li>• Update MEM documentation as required.</li></ul> |  |                                                                                                                        |  |           |                                                      |                              |                                |              |  |                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                        |  |           |                                                      |                              |                                |              |  |                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
| <ul style="list-style-type: none"><li>• Attend and actively participate in all PEM, C/LAMP and HISEMM user meetings and prepare activity reports for MEM users.</li><li>• Organize/host 2 MEM NWE Upgrade Oversight Panel Meetings.</li><li>• Incorporate new releases of PEM, C/LAMP and HISEMM into MEM as they become available:<ul style="list-style-type: none"><li>(1) install released code on Bellevue computer;</li><li>(2) run installation tests to validate correct operation of code</li><li>(3) incorporate code or subset of code in current operational version of MEM</li><li>(4) perform test runs to validate correct installation</li><li>(5) deliver/install/test upgraded MEM code on STRATCOM computer.</li></ul></li><li>• Update MEM documentation as required.</li></ul>                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |                                                                                                                        |  |           |                                                      |                              |                                |              |  |                                                                                                                                                                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |

**Chart A-17. Advanced conventional penetrator.**

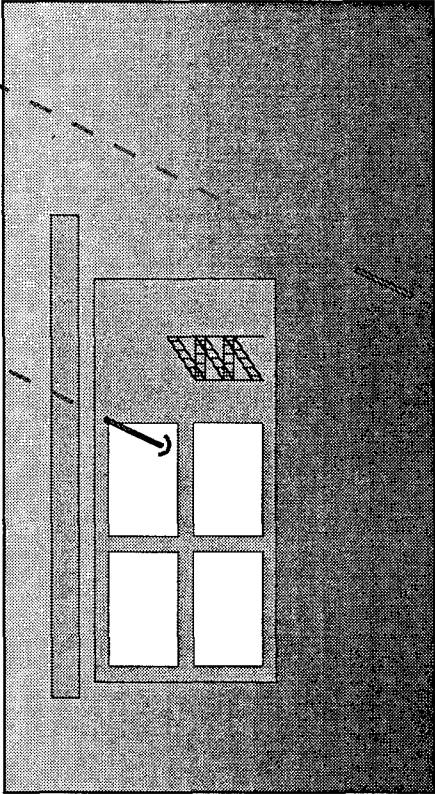
|                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |                                                |                              |                                      |
|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------|------------------------------|--------------------------------------|
|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |           |                                                |                              |                                      |
| <p><b>Approach</b></p>                                                              | <ul style="list-style-type: none"> <li>• Perform penetration analyses for advanced conventional penetrators including: <ul style="list-style-type: none"> <li>– hybrid hydrodynamic rigid penetrators</li> <li>– ICBM delivered penetrators</li> </ul> </li> <li>• Assess weapon lethality using structural response calculations to include: <ul style="list-style-type: none"> <li>– in-structure detonation effects</li> <li>– damage effects from near-miss</li> </ul> </li> </ul> |           |                                                |                              |                                      |
| <p><b>Objective</b></p>                                                             | <p>Assess the lethality and targeting effectiveness of advanced conventional munitions against fixed hard targets.</p> <table border="1" data-bbox="584 133 791 1116"> <tr> <td data-bbox="584 832 690 1116">Customer:</td><td data-bbox="584 133 690 832">Mr. Cliff McFarland DNA/DFSP<br/>(703) 325-7115</td></tr> <tr> <td data-bbox="690 832 791 1116">SAIC Principal Investigator:</td><td data-bbox="690 133 791 832">Ms. Suzanne Wright<br/>(703) 683-6242</td></tr> </table>   | Customer: | Mr. Cliff McFarland DNA/DFSP<br>(703) 325-7115 | SAIC Principal Investigator: | Ms. Suzanne Wright<br>(703) 683-6242 |
| Customer:                                                                           | Mr. Cliff McFarland DNA/DFSP<br>(703) 325-7115                                                                                                                                                                                                                                                                                                                                                                                                                                         |           |                                                |                              |                                      |
| SAIC Principal Investigator:                                                        | Ms. Suzanne Wright<br>(703) 683-6242                                                                                                                                                                                                                                                                                                                                                                                                                                                   |           |                                                |                              |                                      |
| <p><b>Deliverables</b></p>                                                          | <ul style="list-style-type: none"> <li>• Interim Progress Reports</li> <li>• Briefings as Required</li> </ul>                                                                                                                                                                                                                                                                                                                                                                          |           |                                                |                              |                                      |
| <p><b>Benefits</b></p>                                                              | <ul style="list-style-type: none"> <li>• Assessment of current US conventional capability against hardened structures</li> <li>• Guidance on development of near-term advanced conventional munitions</li> </ul>                                                                                                                                                                                                                                                                       |           |                                                |                              |                                      |

**Chart A-18. Insure currency of MEM NWE models.**

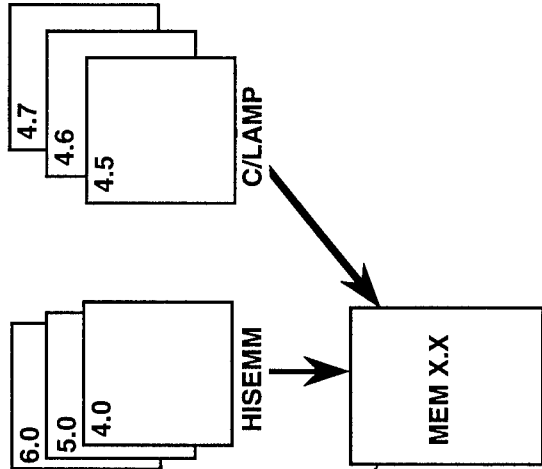
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p><b>Objective</b></p> <p>Insure currency of Nuclear Weapons Effects models in MEM by incorporating latest versions of PEM, C/LAMP and HISEMM.</p> <p><b>Customer:</b> Lt. Will Mitchell, US STRATCOM/J-523 (402) 294-1975</p> <p><b>SAIC Principal Investigator:</b> Mr. Joe Manship (703) 683-6242</p> <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Delivery/installation/testing of upgraded MEM software.</li> <li>• Updated versions of MEM documentation describing new NWE models.</li> <li>• Minutes of PEM, C/LAMP, and HISEMM users meeting highlighting model enhancements affecting MEM results.</li> <li>• Host Semi-annual MEM NWE Upgrade Oversight Panel Meetings.</li> </ul> <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Insures the continuing credibility of the MEM code with respect to its NWE models. These models were upgraded by DNA at a cost of 700K. Mdest effort is needed to insure the currency of the upgraded NWE models.</li> <li>• Planned future enhancements for the HISEMM code (e.g. tilted fireballs, gamma ionization regions, etc.) if incorporated will allow for the complete removal of old RANC4/ROSCOE coding now required to model currently missing phenomenon. This will greatly improve MEM code structure.</li> </ul> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Attend and actively participate in all PEM, C/LAMP and HISEMM user meetings and prepare activity reports for MEM users.</li> <li>• Organize/host 2 MEM NWE Upgrade Oversight Panel Meetings.</li> <li>• Incorporate new releases of PEM, C/LAMP and HISEMM into MEM as they become available:             <ol style="list-style-type: none"> <li>(1) install released code on Bellevue computer;</li> <li>(2) run installation tests to validate correct operation of code</li> <li>(3) incorporate code or subset of code in current operational version of MEM</li> <li>(4) perform test runs to validate correct installation</li> <li>(5) deliver/install/test upgraded MEM code on STRATCOM computer.</li> </ol> </li> <li>• Update MEM documentation as required.</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |

Chart A-19. Document HISEMM 3.2 errors.

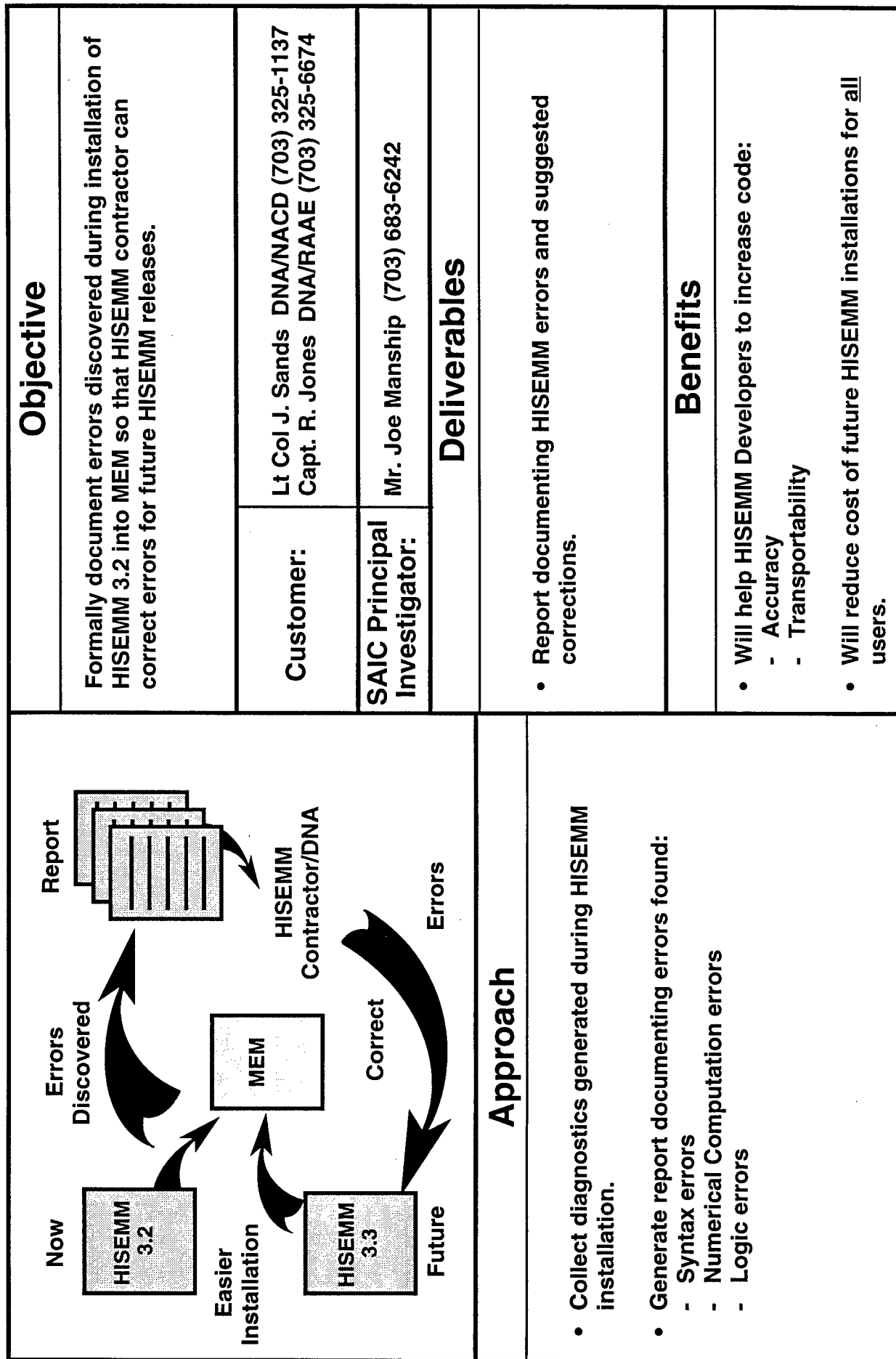


**Chart A-20. Minuteman III review.**

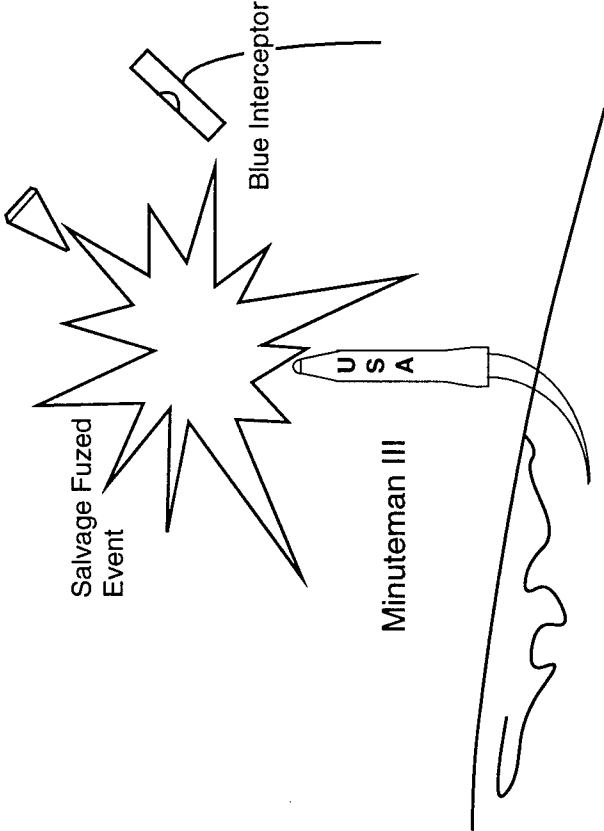
|  <p>Salvage Fuzed Event</p> <p>Blue Interceptor</p> <p>Minuteman III</p> <p>U S A</p>                                                                                                         |          | <table><tr><th>Objective</th></tr><tr><td>Review previous battlespace conflict work and prepare report.</td></tr><tr><td>Customer: Major Larry Colbert, SAC/XRFF (402) 294-3672</td></tr><tr><td>SAIC Principal Investigator: Mr. Ken Bryars (402) 291-2233</td></tr><tr><th>Deliverables</th></tr><tr><td><ul style="list-style-type: none"><li>• Draft briefing (B/W), entitled "Strategic Offense - Strategic Defense Potential Battlespace Conflict" submitted March 1990. Final briefing (color) 10 May 1990.</li></ul></td></tr><tr><th>Benefits</th></tr><tr><td><ul style="list-style-type: none"><li>• Baseline for initiation of DNA analysis</li><li>• Prevent duplication of effort</li></ul></td></tr></table> | Objective | Review previous battlespace conflict work and prepare report. | Customer: Major Larry Colbert, SAC/XRFF (402) 294-3672 | SAIC Principal Investigator: Mr. Ken Bryars (402) 291-2233 | Deliverables | <ul style="list-style-type: none"><li>• Draft briefing (B/W), entitled "Strategic Offense - Strategic Defense Potential Battlespace Conflict" submitted March 1990. Final briefing (color) 10 May 1990.</li></ul> | Benefits | <ul style="list-style-type: none"><li>• Baseline for initiation of DNA analysis</li><li>• Prevent duplication of effort</li></ul> |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------|--------------------------------------------------------|------------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------|
| Objective                                                                                                                                                                                                                                                                        |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                               |                                                        |                                                            |              |                                                                                                                                                                                                                   |          |                                                                                                                                   |
| Review previous battlespace conflict work and prepare report.                                                                                                                                                                                                                    |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                               |                                                        |                                                            |              |                                                                                                                                                                                                                   |          |                                                                                                                                   |
| Customer: Major Larry Colbert, SAC/XRFF (402) 294-3672                                                                                                                                                                                                                           |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                               |                                                        |                                                            |              |                                                                                                                                                                                                                   |          |                                                                                                                                   |
| SAIC Principal Investigator: Mr. Ken Bryars (402) 291-2233                                                                                                                                                                                                                       |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                               |                                                        |                                                            |              |                                                                                                                                                                                                                   |          |                                                                                                                                   |
| Deliverables                                                                                                                                                                                                                                                                     |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                               |                                                        |                                                            |              |                                                                                                                                                                                                                   |          |                                                                                                                                   |
| <ul style="list-style-type: none"><li>• Draft briefing (B/W), entitled "Strategic Offense - Strategic Defense Potential Battlespace Conflict" submitted March 1990. Final briefing (color) 10 May 1990.</li></ul>                                                                |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                               |                                                        |                                                            |              |                                                                                                                                                                                                                   |          |                                                                                                                                   |
| Benefits                                                                                                                                                                                                                                                                         |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                               |                                                        |                                                            |              |                                                                                                                                                                                                                   |          |                                                                                                                                   |
| <ul style="list-style-type: none"><li>• Baseline for initiation of DNA analysis</li><li>• Prevent duplication of effort</li></ul>                                                                                                                                                |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                               |                                                        |                                                            |              |                                                                                                                                                                                                                   |          |                                                                                                                                   |
| <table><tr><th>Approach</th></tr><tr><td><ul style="list-style-type: none"><li>• Review MMIII Battlespace Conflict results</li><li>• Prepare briefing on MMIII flyout in nuclear weapon environment</li><li>• Present briefing to DNA, JSTPS and SAC</li></ul></td></tr></table> | Approach | <ul style="list-style-type: none"><li>• Review MMIII Battlespace Conflict results</li><li>• Prepare briefing on MMIII flyout in nuclear weapon environment</li><li>• Present briefing to DNA, JSTPS and SAC</li></ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |                                                               |                                                        |                                                            |              |                                                                                                                                                                                                                   |          |                                                                                                                                   |
| Approach                                                                                                                                                                                                                                                                         |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                               |                                                        |                                                            |              |                                                                                                                                                                                                                   |          |                                                                                                                                   |
| <ul style="list-style-type: none"><li>• Review MMIII Battlespace Conflict results</li><li>• Prepare briefing on MMIII flyout in nuclear weapon environment</li><li>• Present briefing to DNA, JSTPS and SAC</li></ul>                                                            |          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |           |                                                               |                                                        |                                                            |              |                                                                                                                                                                                                                   |          |                                                                                                                                   |

**Chart A-21. NWE on MMIII flyout.**

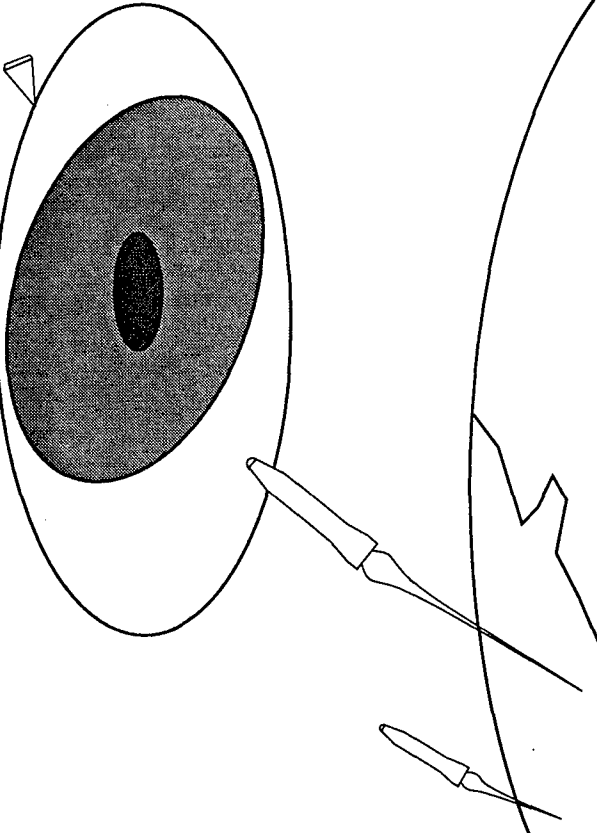
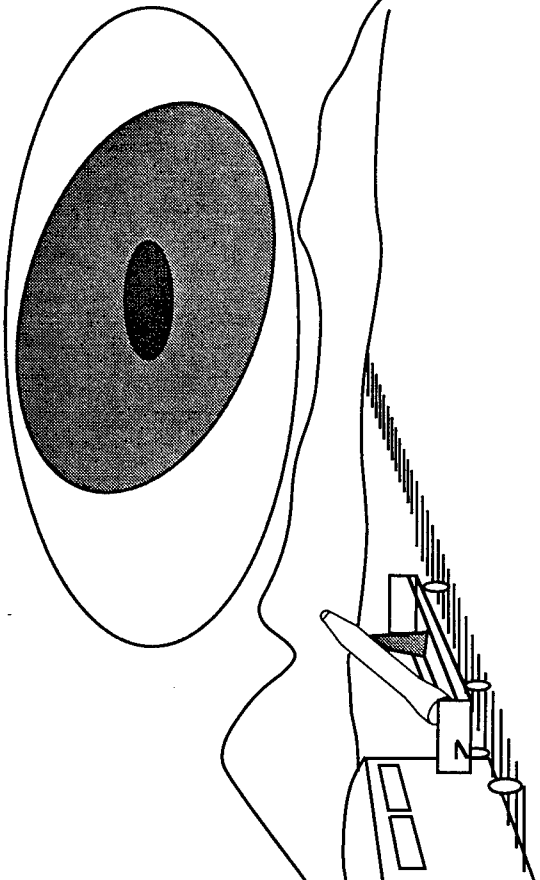
|                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                          | <p><b>Objective</b></p> <p>To determine the degree of conflict for battlespace between MMIII wings and the environments generated by defensive elements' intercepts of salvage fuzed RVs</p>                             |
|                                                                                                                                                                                                                                                                                                                                             | <p>Customer: Major Larry Colbert, SAC/XRF (402) 294-5683</p>                                                                                                                                                             |
|                                                                                                                                                                                                                                                                                                                                             | <p>SAIC Principal Investigator: Ken Bryars (402) 291-2233</p>                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                                             | <p><b>Deliverables</b></p>                                                                                                                                                                                               |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Run MOASIS against AMEM burst file for four (4) MMIII bases</li> <li>• Synthesize results - error bounds, confidence levels</li> <li>• Certify implications and issues</li> <li>• Write subtask report/briefing</li> <li>• Deliver report to DNA, JSTPS, and SAC</li> </ul> | <ul style="list-style-type: none"> <li>• Final facing page briefing delivered 25 October 1990</li> </ul>                                                                                                                 |
|                                                                                                                                                                                                                                                                                                                                             | <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Statistical validation of previous SAC "snapshot"</li> <li>• Introduction of Design-to-threat (DTT)</li> <li>• Insight to circumvention issue</li> </ul> |

**Chart A-22. NWE on Peacekeeper.**

|                                                                                     |                                                                                                                                                                                                                              |                                             |
|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
|  | <b>Objective</b>                                                                                                                                                                                                             |                                             |
|                                                                                     | To determine the degree of conflict for battlespace between Peacekeeper main operating bases (MOBs) and deployed launch locations and the environments generated by defensive elements' intercepts of salvage fuzed RED RVs. |                                             |
|                                                                                     | Customer:                                                                                                                                                                                                                    | Major Larry Colbert, SAC/XRF (402) 294-5683 |
|                                                                                     | SAIC Principal Investigator:                                                                                                                                                                                                 | Ken Bryars (402) 291-2233                   |
|                                                                                     | <b>Deliverables</b>                                                                                                                                                                                                          |                                             |
|                                                                                     | <ul style="list-style-type: none"><li>• Report on effects of salvage fuzing on Peacekeeper flyout</li></ul>                                                                                                                  |                                             |
|                                                                                     | <b>Benefits</b>                                                                                                                                                                                                              |                                             |
|                                                                                     | <ul style="list-style-type: none"><li>• Insight to potential problems in PK and PKRG flyout through an on-going conflict in space</li></ul>                                                                                  |                                             |
| <b>STOP WORK</b>                                                                    |                                                                                                                                                                                                                              |                                             |

|  |                                                                                                                                                                                                                                                                                                                                   |
|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>Approach</b>                                                                                                                                                                                                                                                                                                                   |
|  | <ul style="list-style-type: none"><li>• Run MOASIS against AMEM burst file for six (6) PKRG MOBs and deployed locations</li><li>• Synthesize results - error bounds, confidence levels</li><li>• Certify implications and issues</li><li>• Write subtask report/briefing</li><li>• Deliver report to DNA, JSTPS and SAC</li></ul> |

**Chart A-23. Battlespace management.**

| <pre>graph TD; BM[BLUE BATTLE MANAGER]; BD[BLUE DEFENSES]; BO[BLUE OFFENSES]; RO[RED OFFENSES]; BD -- ORDERS --&gt; BM; BM -- INTERCEPTS --&gt; RO; BO -- "FORCE POSTURE / STATUS" --&gt; BM; BM -- "FLY - OUT" --&gt; RO; style BM fill:#ccc,stroke:#333,stroke-width:2px; style BD fill:#fff,stroke:#333,stroke-width:1px; style BO fill:#fff,stroke:#333,stroke-width:1px; style RO fill:#fff,stroke:#333,stroke-width:1px;</pre> | <table><tr><th>Objective</th></tr><tr><td>To evaluate the effect on "Battlespace Conflict" if BLUE defensive battle manager considers BLUE offensive fly-out before engaging RED offense.</td></tr><tr><td>Customer: Major Larry Colbert, SAC/XRF (402) 294-5683</td></tr><tr><td>SAIC Principal Investigator: Ken Bryars (402) 291-2233</td></tr><tr><th>Deliverables</th></tr><tr><td><ul style="list-style-type: none"><li>Briefing/report on results of battle manager analysis</li></ul></td></tr><tr><th>Benefits</th></tr><tr><td><ul style="list-style-type: none"><li>Insight to measures that may be taken to reduce Battlespace Conflict</li><li>Enhance OFFENSE/DEFENSE interaction</li></ul></td></tr></table> | Objective                                                                                                                                                                                                                                                                                                                                 | To evaluate the effect on "Battlespace Conflict" if BLUE defensive battle manager considers BLUE offensive fly-out before engaging RED offense. | Customer: Major Larry Colbert, SAC/XRF (402) 294-5683 | SAIC Principal Investigator: Ken Bryars (402) 291-2233 | Deliverables | <ul style="list-style-type: none"><li>Briefing/report on results of battle manager analysis</li></ul> | Benefits | <ul style="list-style-type: none"><li>Insight to measures that may be taken to reduce Battlespace Conflict</li><li>Enhance OFFENSE/DEFENSE interaction</li></ul> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--------------------------------------------------------|--------------|-------------------------------------------------------------------------------------------------------|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Objective                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                 |                                                       |                                                        |              |                                                                                                       |          |                                                                                                                                                                  |
| To evaluate the effect on "Battlespace Conflict" if BLUE defensive battle manager considers BLUE offensive fly-out before engaging RED offense.                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                 |                                                       |                                                        |              |                                                                                                       |          |                                                                                                                                                                  |
| Customer: Major Larry Colbert, SAC/XRF (402) 294-5683                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                 |                                                       |                                                        |              |                                                                                                       |          |                                                                                                                                                                  |
| SAIC Principal Investigator: Ken Bryars (402) 291-2233                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                 |                                                       |                                                        |              |                                                                                                       |          |                                                                                                                                                                  |
| Deliverables                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                 |                                                       |                                                        |              |                                                                                                       |          |                                                                                                                                                                  |
| <ul style="list-style-type: none"><li>Briefing/report on results of battle manager analysis</li></ul>                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                 |                                                       |                                                        |              |                                                                                                       |          |                                                                                                                                                                  |
| Benefits                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                 |                                                       |                                                        |              |                                                                                                       |          |                                                                                                                                                                  |
| <ul style="list-style-type: none"><li>Insight to measures that may be taken to reduce Battlespace Conflict</li><li>Enhance OFFENSE/DEFENSE interaction</li></ul>                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                 |                                                       |                                                        |              |                                                                                                       |          |                                                                                                                                                                  |
| <table><tr><th>Approach</th></tr><tr><td><ul style="list-style-type: none"><li>Select preplanned battle manager (BM) measures to account for BLUE offense</li><li>Select ad hoc BM measures to account for BLUE offense</li><li>MOASIS/AMEM runs to evaluate measures in mitigating conflict</li><li>Identify implications and issues</li><li>Prepare and deliver report</li></ul></td></tr></table>                                 | Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <ul style="list-style-type: none"><li>Select preplanned battle manager (BM) measures to account for BLUE offense</li><li>Select ad hoc BM measures to account for BLUE offense</li><li>MOASIS/AMEM runs to evaluate measures in mitigating conflict</li><li>Identify implications and issues</li><li>Prepare and deliver report</li></ul> |                                                                                                                                                 |                                                       |                                                        |              |                                                                                                       |          |                                                                                                                                                                  |
| Approach                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                 |                                                       |                                                        |              |                                                                                                       |          |                                                                                                                                                                  |
| <ul style="list-style-type: none"><li>Select preplanned battle manager (BM) measures to account for BLUE offense</li><li>Select ad hoc BM measures to account for BLUE offense</li><li>MOASIS/AMEM runs to evaluate measures in mitigating conflict</li><li>Identify implications and issues</li><li>Prepare and deliver report</li></ul>                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                 |                                                       |                                                        |              |                                                                                                       |          |                                                                                                                                                                  |

# Chart A-24. Offense-Defense integration.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |            |                                                                                                                                                               |                              |                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|------------------------------------|
| <pre> graph TD     OSD[OSD] --- DNO[DNO<br/>OFFENSE]     OSD --- SDIO[SDIO<br/>DEFENSE]     DNO --- JCS[JCS]     SDIO --- JCS     JCS --- USSTRATCOM_ACC([USSTRATCOM<br/>ACC])     JCS --- USSPACECOM_JOSDEPS([USSPACECOM<br/>JOSDEPS])     JCS --- SERVICES[SERVICES]     USSTRATCOM_ACC --- USLANTCOM[USLANTCOM]     USSTRATCOM_ACC --- USPACOM[USPACOM]     USSPACECOM_JOSDEPS --- AFSPACE[AFSPACE]     USSPACECOM_JOSDEPS --- ARSPACE[ARSPACE]     USSPACECOM_JOSDEPS --- NAVSPACE[NAVSACE]         </pre>                                                                                                                                                                                                                                                                                                                                                    | <h2>Objective</h2> <p>Technical and analytical support to the Joint Staff, STRATCOM, ACC, JOSDEPS and DNA to define and accomplish the planning and integration of our strategic forces (ODI).</p> <table border="1"> <tr> <td>Customers:</td><td>Maj (P) James A. Sands, DNA/NAFS, (703) 325-1137<br/>Col Robert Chadbourne, the Joint Staff/J-5 (703) 693-2744<br/>Col Dennis Shepherd, JOSDEPS, (719) 554-9688</td></tr> <tr> <td>SAIC Principal Investigator:</td><td>Mr. Norman Fennelly (703) 683-6774</td></tr> </table>                | Customers: | Maj (P) James A. Sands, DNA/NAFS, (703) 325-1137<br>Col Robert Chadbourne, the Joint Staff/J-5 (703) 693-2744<br>Col Dennis Shepherd, JOSDEPS, (719) 554-9688 | SAIC Principal Investigator: | Mr. Norman Fennelly (703) 683-6774 |
| Customers:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Maj (P) James A. Sands, DNA/NAFS, (703) 325-1137<br>Col Robert Chadbourne, the Joint Staff/J-5 (703) 693-2744<br>Col Dennis Shepherd, JOSDEPS, (719) 554-9688                                                                                                                                                                                                                                                                                                                                                                                  |            |                                                                                                                                                               |                              |                                    |
| SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Mr. Norman Fennelly (703) 683-6774                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |            |                                                                                                                                                               |                              |                                    |
| <h2>Approach</h2> <ul style="list-style-type: none"> <li>• Maintain a network of members of the offense-defense community including OSD, DNA, SDIO, the Joint Staff, USSTRATCOM, ACC, USSPACECOM, JOSDEPS, the CINCs, and the Services.</li> <li>• Participate within this community to understand the important issues associated with integrating strategic forces and build meeting agenda based on these issues. Provide supporting briefs, papers and reports as requested.</li> <li>• Provide analytical and technical support to the Integrated Strategic Defense Concept Plan (ISDCP) and the Joint Strategic Defense Campaign Planning System (JSDCP).</li> <li>• Provide technical and analytical support to the user community in addressing offense-defense integration (ODI) issues and the operational deployment of strategic defenses.</li> </ul> | <h2>Deliverables</h2> <ul style="list-style-type: none"> <li>• Point papers, technical reports, issue papers, analysis summaries, and briefing materials in support of ODI.</li> <li>• ISDCP and JSDCP functional descriptions and supporting documentation.</li> <li>• ODI meeting agenda planning and preparation.</li> </ul> <h2>Benefits</h2> <ul style="list-style-type: none"> <li>• Provides the technical and analytical support required to support our Nation's evolving offense-defense strategy, doctrine, and tactics.</li> </ul> |            |                                                                                                                                                               |                              |                                    |

**Chart A-25. Future C2 capabilities.**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre> graph TD     KickOff[Kick-Off Meeting] --&gt; DevAlt[Develop Alternative Futures]     KickOff --&gt; Policy[Policy &amp; Req't's]     DevAlt --&gt; AltSysReq[Alternative System Req't's]     Policy --&gt; AltSysReq     AltSysReq --&gt; CapEval[Capability Evaluation]     CapEval --&gt; CurrSysCap[Current System Capabilities]     CapEval --&gt; CurrPOMCap[Current POM Capabilities]     CurrSysCap --&gt; DefineReq[Define Current Req't's]     DefineReq --&gt; DefineArch[Define Current Architectures]     DefineArch --&gt; CurrSysCap     DefineArch --&gt; CurrPOMCap     CurrSysCap --&gt; CurrPOMCap     CurrPOMCap --&gt; CurrSysCap         </pre> | <p><b>Objective</b></p> <p>Develop a Roadmap that depicts potential issues and milestones impacting the requirements and system needs for the nuclear command and control system for the period 1993-2003.</p>                                      |
| <p><b>Customer:</b></p> <p>Col. William J. Evans, Jr. (703) 614-5110<br/>J-36, Chief, C2 Procedures Branch</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | <p><b>SAIC Principal Investigator:</b></p> <p>Mr. Norm Fennelly (703) 683-6774</p>                                                                                                                                                                  |
| <p><b>Deliverables</b></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <ul style="list-style-type: none"> <li>• Interim Progress</li> <li>• Reports</li> <li>• Point Papers</li> <li>• Briefings as Required</li> <li>• Draft Road Map</li> <li>• Final Report</li> </ul>                                                  |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Establish baseline capability &amp; requirements.</li> <li>• Develop/Adopt alternative future scenarios/probabilities/planning parameters that include:             <ul style="list-style-type: none"> <li>– Threat</li> <li>– Force Structure</li> <li>– Employment Policy</li> </ul> </li> <li>• Derive alternative system requirements.</li> <li>• Assess planned (POM) system capability to meet future alternative scenario requests.</li> <li>• Conduct first order probability sensitivity analysis.</li> <li>• Develop, present, and revise deliverables as required.</li> </ul>                    | <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Provides an analytical framework to facilitate evaluation of the impact of significant changes in system capability and requirements.</li> <li>• Aid in decision making.</li> </ul> |

**Chart A-26. National security and mutual strategic defenses.**

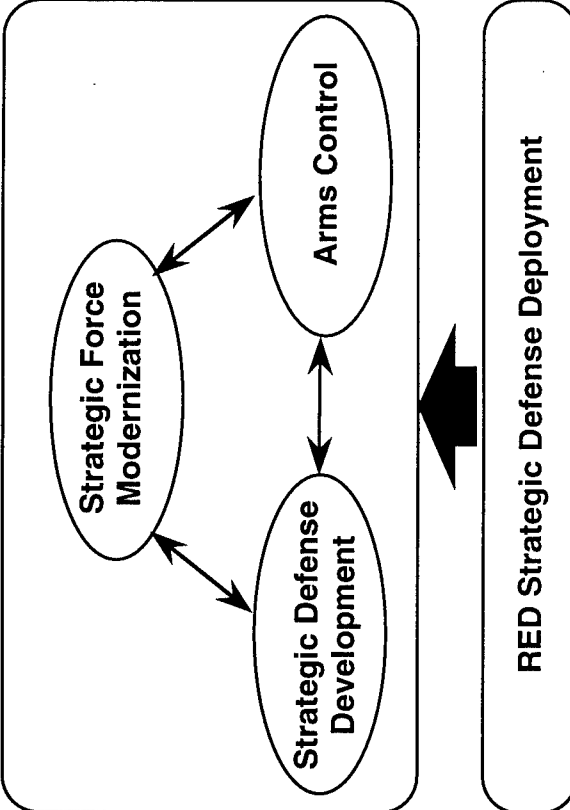
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>The diagram illustrates the components of national security and mutual strategic defenses. It features four ovals: 'Strategic Force Modernization' at the top, 'Strategic Defense Development' at the bottom left, 'Arms Control' at the bottom right, and 'RED Strategic Defense Deployment' in a rounded rectangle at the bottom. Double-headed arrows connect 'Strategic Force Modernization' to both 'Strategic Defense Development' and 'Arms Control'. A double-headed arrow also connects 'Strategic Defense Development' and 'Arms Control'. A large, solid black arrow points from the group of three ovals down towards the 'RED Strategic Defense Deployment' box.</p> | <p><b>Objective</b></p> <p>In the context of the U.S. approach to strategic force-related elements of national security, identify the impact of U.S. and Soviet deployment of defenses on U.S. ability to deter attack.</p> <p><b>Customer</b></p> <p>Mr. Greg Schulte, OSD (202)695-5678</p> <p><b>SAIC Principal Investigator</b></p> <p>Mr. Edward J. Ohlert (703)683-6586</p> <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Report on National Security and Mutual Strategic Defenses. Draft report entitled, "Mutual Deployment of U.S. and Soviet Strategic Defenses and National Security", SECRET, 12 April 1990, DC # SAIC/90:0081.</li> </ul> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Identify/review existing SDIO analysis</li> <li>• Identify additional analysis requirements</li> <li>• Conduct additional analysis</li> <li>• Document results (draft)</li> <li>• Coordinate within DoD</li> <li>• Deliver final report</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

**Chart A-27. Hosting NIS at SAC.**

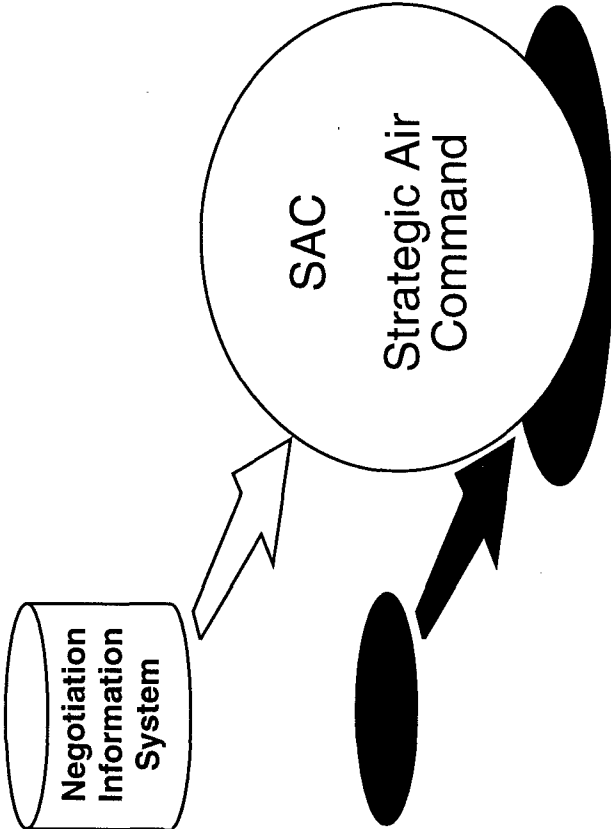
|                                                                                                                                                                            |                                                                                                                                                                                                                                                 |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                         | <p><b>Objective</b></p> <p>To provide SAC/XPXX with up-to-date negotiation information tools.</p> <p><b>Customer</b></p> <p>LTC B. Gifford, SAC/XPXX (402)294-7001</p> <p>SAIC Principal Investigator</p> <p>Mr. Robert Moser (703)556-7243</p> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Transport code database to SAC computers</li> <li>• Install software</li> <li>• Verify software</li> </ul> | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Hosted Negotiation Information System (NIS) at SAC, Offutt AFB, February 1990.</li> <li>• Subtask completed February 1990.</li> </ul>                                       |

Chart A-28. DNA support to Joint Staff/J-5.

| <pre> graph TD     NA[NEEDS ASSESSMENT] --&gt; GI[GUIDANCE/ISSUE DOCUMENTATION]     AS([ANALYTIC SUPPORT]) --&gt; GI     GI --&gt; ID[ISSUE DEFINITION]     PGC[POLICY, GUIDANCE, INTEL, FORCE CHANGE] --&gt; ID     ID --&gt; TA[/TRAINING AIDS/]         </pre>                                                                                                                                                                                                                                                                       | <table> <tr> <th colspan="2">Objective</th></tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> <li>• To develop training aids to assist assimilating the nuclear weapons employment policy and planning guidance formulation process.</li> <li>• To provide analytic support as required in the development of staff positions, assessing the impact of proposed policy changes on force structure and employment, including:                             <ul style="list-style-type: none"> <li>– Nuclear weapons effects calculations</li> <li>– Measures of effectiveness</li> </ul> </li> </ul> </td></tr> <tr> <th colspan="2">Customer</th></tr> <tr> <td colspan="2">LTC Bill Evans, JCS/J-5 (202) 697-6187</td></tr> <tr> <td colspan="2">SAIC Principal Investigator</td></tr> <tr> <td colspan="2">Mr. Edward J. Ohlert (703) 683-6586</td></tr> </table> | Objective |                                                                                                                                                                                                        | <ul style="list-style-type: none"> <li>• To develop training aids to assist assimilating the nuclear weapons employment policy and planning guidance formulation process.</li> <li>• To provide analytic support as required in the development of staff positions, assessing the impact of proposed policy changes on force structure and employment, including:                             <ul style="list-style-type: none"> <li>– Nuclear weapons effects calculations</li> <li>– Measures of effectiveness</li> </ul> </li> </ul> |                                                                                                                                                                                                                                                                                                                                                     | Customer     |  | LTC Bill Evans, JCS/J-5 (202) 697-6187                                                                                                                                                                                                                |  | SAIC Principal Investigator |  | Mr. Edward J. Ohlert (703) 683-6586 |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------------------------|--|-------------------------------------|--|
| Objective                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                     |              |  |                                                                                                                                                                                                                                                       |  |                             |  |                                     |  |
| <ul style="list-style-type: none"> <li>• To develop training aids to assist assimilating the nuclear weapons employment policy and planning guidance formulation process.</li> <li>• To provide analytic support as required in the development of staff positions, assessing the impact of proposed policy changes on force structure and employment, including:                             <ul style="list-style-type: none"> <li>– Nuclear weapons effects calculations</li> <li>– Measures of effectiveness</li> </ul> </li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                     |              |  |                                                                                                                                                                                                                                                       |  |                             |  |                                     |  |
| Customer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                     |              |  |                                                                                                                                                                                                                                                       |  |                             |  |                                     |  |
| LTC Bill Evans, JCS/J-5 (202) 697-6187                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                     |              |  |                                                                                                                                                                                                                                                       |  |                             |  |                                     |  |
| SAIC Principal Investigator                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                     |              |  |                                                                                                                                                                                                                                                       |  |                             |  |                                     |  |
| Mr. Edward J. Ohlert (703) 683-6586                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                     |              |  |                                                                                                                                                                                                                                                       |  |                             |  |                                     |  |
| <table> <tr> <th colspan="2">Approach</th></tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> <li>• Assess staff training needs</li> <li>• Document guidance/issue summaries</li> <li>• Define issues for analysis</li> <li>• Provide analytic support</li> </ul> </td></tr> </table>                                                                                                                                                                                                                                        | Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           | <ul style="list-style-type: none"> <li>• Assess staff training needs</li> <li>• Document guidance/issue summaries</li> <li>• Define issues for analysis</li> <li>• Provide analytic support</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <table> <tr> <th colspan="2">Deliverables</th></tr> <tr> <td colspan="2"> <ul style="list-style-type: none"> <li>• Staff Training Syllabus Outline</li> <li>• Strategic Nuclear Weapons Employment Policy: Staff Handbook</li> <li>• Measures of Effectiveness Evaluation</li> <li>• Analytic Summary -- as required</li> </ul> </td></tr> </table> | Deliverables |  | <ul style="list-style-type: none"> <li>• Staff Training Syllabus Outline</li> <li>• Strategic Nuclear Weapons Employment Policy: Staff Handbook</li> <li>• Measures of Effectiveness Evaluation</li> <li>• Analytic Summary -- as required</li> </ul> |  |                             |  |                                     |  |
| Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                     |              |  |                                                                                                                                                                                                                                                       |  |                             |  |                                     |  |
| <ul style="list-style-type: none"> <li>• Assess staff training needs</li> <li>• Document guidance/issue summaries</li> <li>• Define issues for analysis</li> <li>• Provide analytic support</li> </ul>                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                     |              |  |                                                                                                                                                                                                                                                       |  |                             |  |                                     |  |
| Deliverables                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                     |              |  |                                                                                                                                                                                                                                                       |  |                             |  |                                     |  |
| <ul style="list-style-type: none"> <li>• Staff Training Syllabus Outline</li> <li>• Strategic Nuclear Weapons Employment Policy: Staff Handbook</li> <li>• Measures of Effectiveness Evaluation</li> <li>• Analytic Summary -- as required</li> </ul>                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |           |                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                     |              |  |                                                                                                                                                                                                                                                       |  |                             |  |                                     |  |

Chart A-29. DNA support to Joint Staff/J-8.

|                                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
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| <pre> graph TD     A[Identify Requirements] --&gt; B[Structure Analysis<br/>• Offense/Defense<br/>• Force Structure<br/>• Nuclear Weapons Effects<br/>Develop Alternatives<br/>• Future Issues]     B --&gt; C[Provide Support]     C --&gt; D[Report/Brief]         </pre>                                                                                                                                                                   |  | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>To provide analytic support as required in the development of staff issues positions on:             <ul style="list-style-type: none"> <li>Strategic Offense/Defense Integration</li> <li>Force Posture/Force Mix</li> </ul> </li> <li>Assist in updating and Incorporating Nuclear Weapons Effects models used in Joint Staff</li> <li>Perform Special Projects as Required</li> </ul> <p><b>Customer:</b> Capt. Chris Chisholm, USN, Joint Staff/J-8<br/>Nuclear Forces Analysis Division Chief, (703)614-8311<br/>Maj. Raymond T. Bull (703) 325-1137</p> <p><b>SAIC Principal Investigator:</b> Ms. Gael Tarleton (206) 747-7152</p> <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>Analysis as Required</li> <li>Summary Reports as Required</li> <li>Briefings as Required</li> <li>Periodic program review and evaluation as requested by J-8</li> </ul> <p>Note: SAIC will provide fully finished briefing materials through secret classification. Top secret materials will not be removed from JCS controlled spaces.</p> <p><b>Benefits</b></p> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Identify Requirements and Develop Analytical Methodologies             <ul style="list-style-type: none"> <li>Strategic Offense/Defense Considerations</li> <li>Alternative Force Structures and Employment Concepts</li> <li>Nuclear Weapons Effects Models</li> </ul> </li> <li>Provide Timely Analytic and Staff Support</li> <li>Report/brief Analytical Results</li> </ul> |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

**Chart A-30. DNA support to OSD/ISP strategic forces policy.**

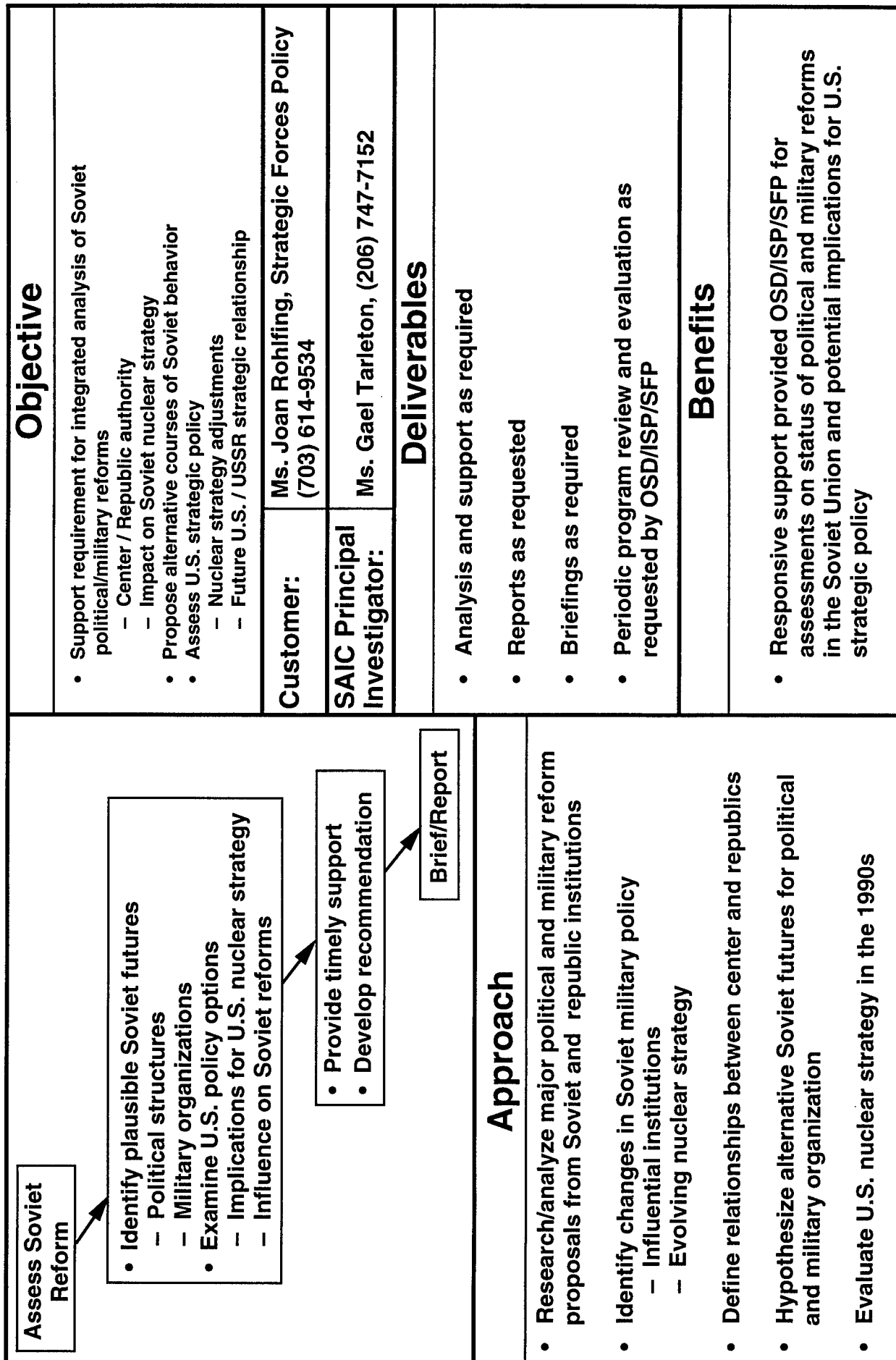




**Chart A-32. Introduction to nuclear weapons effects and employment planning.**

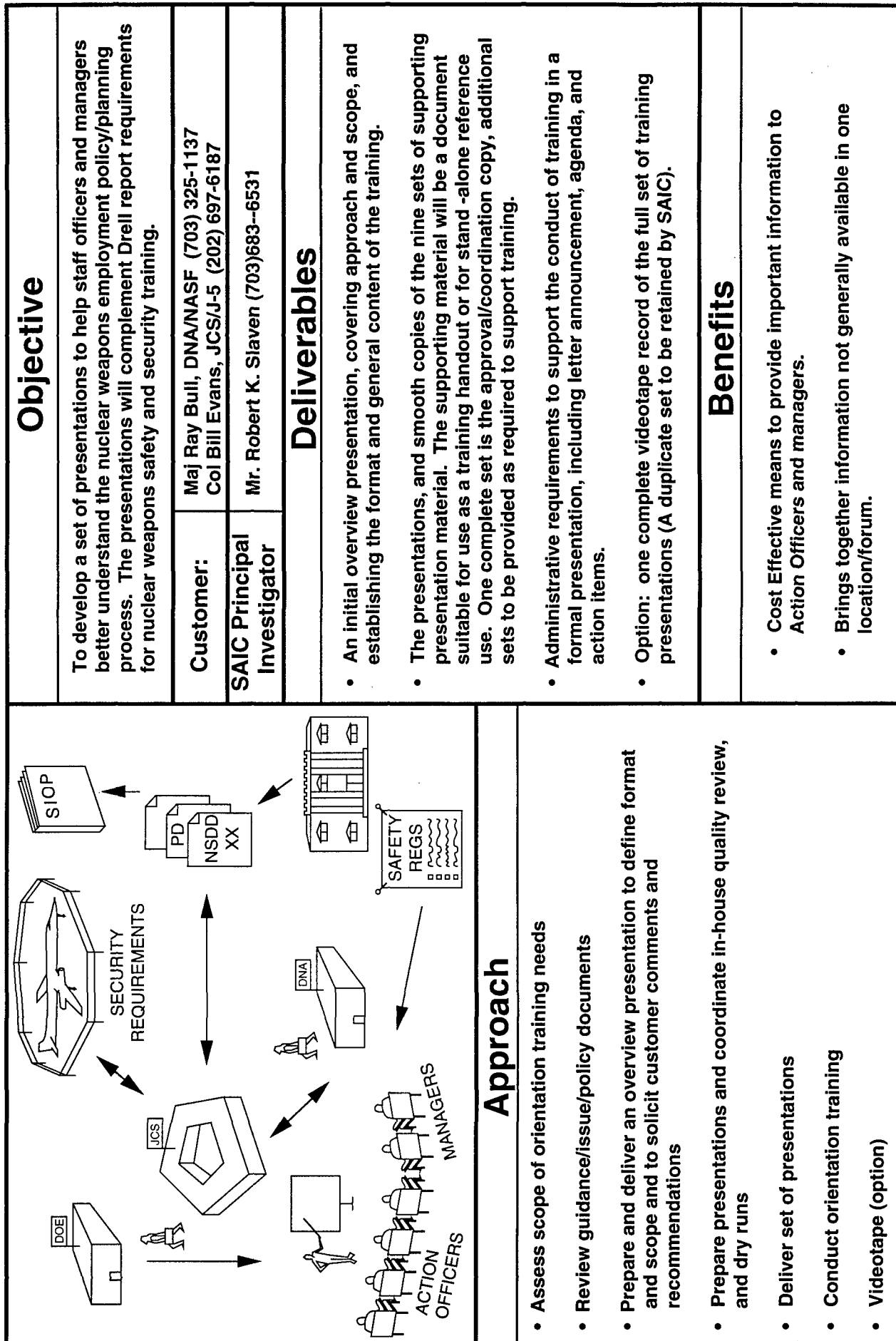


**Chart A-33. Strategic kinetic energy weapon policy issues.**

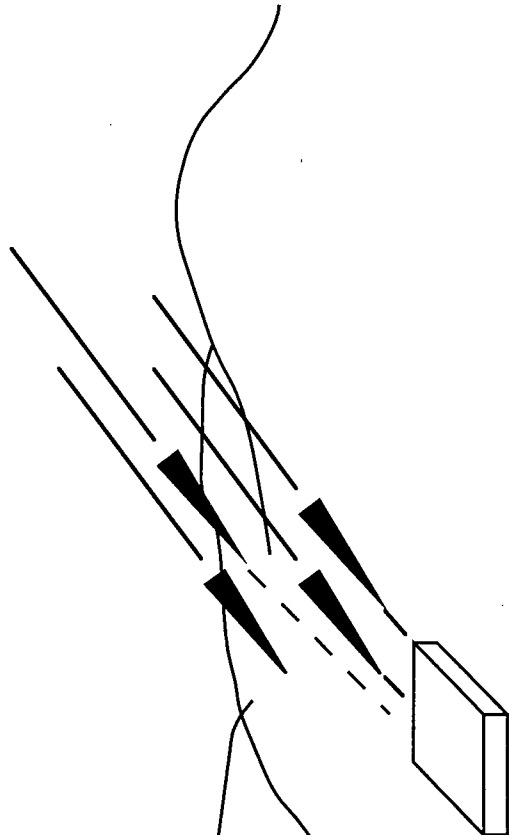
|                                                                                     |                                                                                                                                                                                               |
|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <b>Objective</b>                                                                                                                                                                              |
|                                                                                     | Produce a report summarizing the arms control, cost, effectiveness, and policy implications of using kinetic energy penetrators in a strategic attack role.                                   |
|                                                                                     | <b>Customer</b>                                                                                                                                                                               |
|                                                                                     | LCDR Bob Dotson, ASD/ISP/SFP (703) 614-9534                                                                                                                                                   |
|                                                                                     | <b>SAIC Principal Investigator</b>                                                                                                                                                            |
| Mr. Marc Warburton (619) 546-6368                                                   |                                                                                                                                                                                               |
| <b>Approach</b>                                                                     | <div>Task 1 Data Collection<br/>↓<br/>Task 2 Technical/Military Assessment<br/>↓<br/>Task 3 Cost Assessment<br/>↓<br/>Task 4 Arms Control Assessment<br/>↓<br/>Task 5 Policy Assessment</div> |
| <b>Deliverables</b>                                                                 | <ul style="list-style-type: none"><li>• Briefing to Working Group at the Mid-Study Meeting</li><li>• Report summarizing policy issues</li></ul>                                               |
| <b>Benefits</b>                                                                     | <ul style="list-style-type: none"><li>• Help ASD/ISP/SFP provide insightful and timely advice to the Secretary of Defense on an important national capability</li></ul>                       |

Chart A-34. DNA support to SIOP planning.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |  |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <p><b>SIOP PLANNING PROCESS</b></p> <pre> graph TD     IC[Intelligence Community] --&gt; PC[Policy Community]     IC --&gt; PlC[Planning Community]     PC --&gt; PlC     PlC --&gt; IC     PC --&gt; MSD[Methods for Supporting SIOP Development]         </pre> <p><b>Methods for Supporting SIOP Development</b></p>                                                                                                                                                                                                                                                                                                                  |  | <p><b>Objective</b></p> <ul style="list-style-type: none"> <li>• Provide expert support for researching, analyzing, and assessing the current capabilities and methods for SIOP support within the intelligence, policy, and planning communities.</li> <li>• Assist in coordinating the diverse interests of the working group participants in order to develop a consensus briefing for senior officials that recommends changes and enhancements to the support process.</li> </ul> |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | <p><b>Customer:</b></p> <p>Mr. Gil Klinger, OSD, Strategic Forces Policy, (703) 614-9534</p>                                                                                                                                                                                                                                                                                                                                                                                           |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | <p><b>SAIC Principal Investigator:</b></p> <p>Mr. Bill Hulvershorn, (703) 614-9534 or 683-1622</p>                                                                                                                                                                                                                                                                                                                                                                                     |  |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Provide support by participating in a recently formed special working group to assess the SIOP planning process and the responsibilities of various agencies in SIOP development and evaluation.</li> <li>• Define working group meeting agendas and objectives in consultation with customer, and prepare background papers and point papers for discussion items to be addressed by the group.</li> <li>• Assist in developing final annotated briefing for delivery to senior DoD officials, including recommendations for enhanced SIOP planning support.</li> </ul> |  | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Agenda planning and preparation, including point papers for discussion items</li> <li>• Memorandum on findings of each working group meeting</li> <li>• Final annotated briefing for senior officials, coordinated throughout intelligence, policy, and planning communities, with recommendations for enhanced SIOP planning support.</li> </ul>                                                                  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Understanding of new methods for ensuring effective SIOP support during period of major change in strategic planning</li> <li>• Briefing to senior officials that would provide historical record of effort and serve as guideline for future SIOP support review</li> </ul>                                                                                                                                           |  |

**Chart A-35. The feasibility of EPW calculations.**

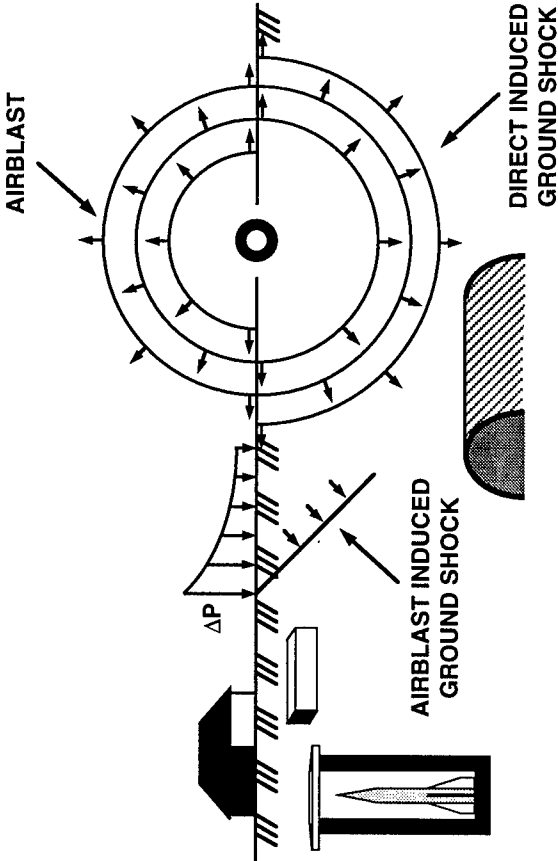
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|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                 | <p><b>Objective</b></p> <p>To determine whether it is feasible to develop a form of EPW methodology that is compatible with existing VNTK and PDCALC formats used by the JSTPS.</p> <p><b>Customer:</b> LTC Rich Hopson, JKCS (402) 294-4960</p> <p><b>SAIC Principal Investigator:</b> Mr. Roger Craver (402) 291-2233</p> <p><b>Deliverables</b></p> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Familiarization with existing DIA and JSTPS methods for doing EPW calculations</li> <li>• Survey of available alternatives</li> <li>• Comparison/testing of alternatives</li> <li>• Coordination with DIA/DNA</li> <li>• Illustration of feasibility of selected method</li> </ul> | <p>Feasibility study briefing and/or report</p> <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Examination of alternative methods</li> <li>• Opportunity for technical coordination with DNA and DIA during development</li> <li>• Proof of concept before commitment to full development</li> </ul>                                  |

**Chart A-36. EPW PSP/DGZ methodology.**

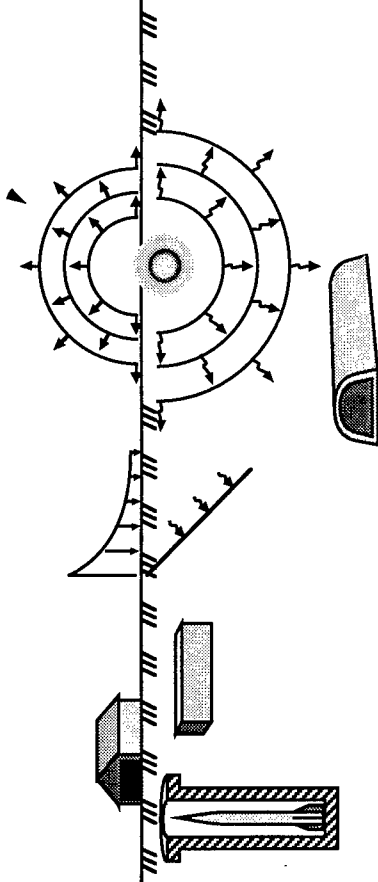
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |           |                                      |                              |                                    |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|--------------------------------------|------------------------------|------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <h3>Objective</h3> <p>To implement the JVN system for EPW damage calculations and develop a methodology for incorporating the probability of successful penetration (PSP) and warhead reliability (WHR) into the JSTPS DGZ construction process in a form that is operationally feasible for EPW targeting applications.</p> <table border="1"> <tr> <td>Customer:</td><td>LTC Rich Hopson, JKCS (402) 294-4960</td></tr> <tr> <td>SAIC Principal Investigator:</td><td>Mr. Roger H. Craver (402) 291-2233</td></tr> </table> <h3>Deliverables</h3>                                                                                                                      | Customer: | LTC Rich Hopson, JKCS (402) 294-4960 | SAIC Principal Investigator: | Mr. Roger H. Craver (402) 291-2233 |
| Customer:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | LTC Rich Hopson, JKCS (402) 294-4960                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |           |                                      |                              |                                    |
| SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Mr. Roger H. Craver (402) 291-2233                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |                                      |                              |                                    |
| <h3>Approach</h3> <ul style="list-style-type: none"> <li>• Coordination with DIA to implement the JVN system</li> <li>• Coordination with General Dynamics to incorporate uncertainties in impact velocity determinations</li> <li>• Modification of PDCALC to include use of JVN's</li> <li>• Development and coding of the DGZ construction process for EPW's involving PSP and WHR</li> <li>• Documentation of the EPW methodology for JSTPS and assistance in shakedown tests</li> <li>• Continued participation in EPW Effectiveness Group</li> </ul> | <ul style="list-style-type: none"> <li>• Updated version of JVN methodology</li> <li>• Modified version of PDCALC for use with JVN's</li> <li>• DGZ construction process which uses surface feature maps and interfaces with the JSTPS RPM model</li> <li>• Documentation of the JVN methodology</li> <li>• Updated PENDEPTH with impact velocity uncertainties</li> </ul> <h3>Benefits</h3> <ul style="list-style-type: none"> <li>• Ability to do EPW calculations on line and on time for the first SIOP involving their use; avoidance of "brute force" methods in the application of EPW's</li> <li>• Full use of valuable work done by the laboratories</li> </ul> |           |                                      |                              |                                    |

**Chart A-37. EPW comparative analysis.**

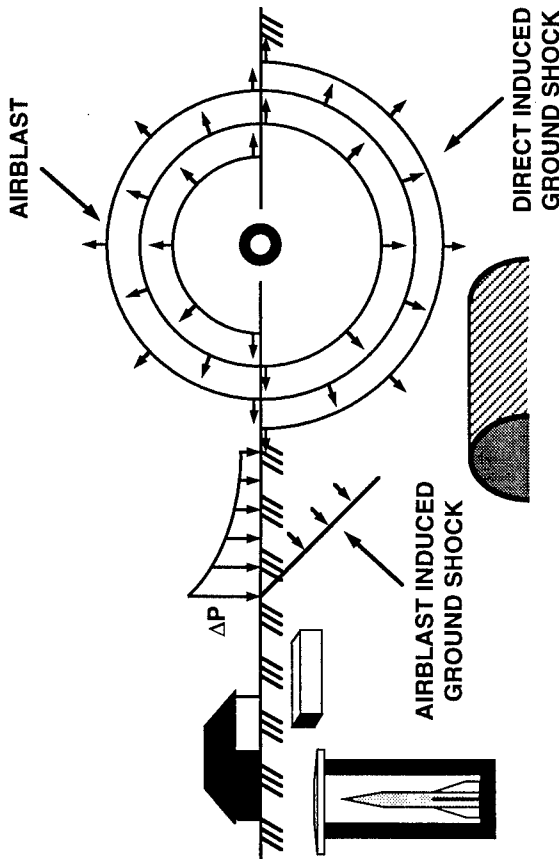
|                                                                                                                                                                                                                                                                                                                                          |                                      | <table><tr><th colspan="2">Objective</th></tr><tr><td colspan="2">To perform calculations that demonstrate the validity of the methodology.</td></tr><tr><td>Customer:</td><td>LTC Rich Hopson, JKCS (402) 294-4960</td></tr><tr><td>SAIC Principal Investigator:</td><td>Mr. Roger Craver (402) 291-2233</td></tr><tr><th colspan="2">Deliverables</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>• Results of the comparative analysis</li><li>• Final report and recommendations</li></ul></td></tr><tr><th colspan="2">Benefits</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>• Confirmation of validity of the methodology</li><li>• Availability of insights gained and guidance for proper use of the methodology</li></ul></td></tr></table> | Objective                                                                                                                                                                                                                                                                                                                                                        |  | To perform calculations that demonstrate the validity of the methodology. |  | Customer: | LTC Rich Hopson, JKCS (402) 294-4960 | SAIC Principal Investigator: | Mr. Roger Craver (402) 291-2233 | Deliverables |  | <ul style="list-style-type: none"><li>• Results of the comparative analysis</li><li>• Final report and recommendations</li></ul> |  | Benefits |  | <ul style="list-style-type: none"><li>• Confirmation of validity of the methodology</li><li>• Availability of insights gained and guidance for proper use of the methodology</li></ul> |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------|--|-----------|--------------------------------------|------------------------------|---------------------------------|--------------|--|----------------------------------------------------------------------------------------------------------------------------------|--|----------|--|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Objective                                                                                                                                                                                                                                                                                                                                                                                                                   |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                      |                              |                                 |              |  |                                                                                                                                  |  |          |  |                                                                                                                                                                                        |  |
| To perform calculations that demonstrate the validity of the methodology.                                                                                                                                                                                                                                                                                                                                                   |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                      |                              |                                 |              |  |                                                                                                                                  |  |          |  |                                                                                                                                                                                        |  |
| Customer:                                                                                                                                                                                                                                                                                                                                                                                                                   | LTC Rich Hopson, JKCS (402) 294-4960 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                      |                              |                                 |              |  |                                                                                                                                  |  |          |  |                                                                                                                                                                                        |  |
| SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                                | Mr. Roger Craver (402) 291-2233      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                      |                              |                                 |              |  |                                                                                                                                  |  |          |  |                                                                                                                                                                                        |  |
| Deliverables                                                                                                                                                                                                                                                                                                                                                                                                                |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                      |                              |                                 |              |  |                                                                                                                                  |  |          |  |                                                                                                                                                                                        |  |
| <ul style="list-style-type: none"><li>• Results of the comparative analysis</li><li>• Final report and recommendations</li></ul>                                                                                                                                                                                                                                                                                            |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                      |                              |                                 |              |  |                                                                                                                                  |  |          |  |                                                                                                                                                                                        |  |
| Benefits                                                                                                                                                                                                                                                                                                                                                                                                                    |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                      |                              |                                 |              |  |                                                                                                                                  |  |          |  |                                                                                                                                                                                        |  |
| <ul style="list-style-type: none"><li>• Confirmation of validity of the methodology</li><li>• Availability of insights gained and guidance for proper use of the methodology</li></ul>                                                                                                                                                                                                                                      |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                      |                              |                                 |              |  |                                                                                                                                  |  |          |  |                                                                                                                                                                                        |  |
| <table><tr><th>Approach</th></tr><tr><td><ul style="list-style-type: none"><li>• Selection/acquisition of EPW models accepted as having credibility</li><li>• Performance and comparison of calculation done using selected models versus the methodology that has been developed</li><li>• Coordination with DNA, DIA, and JSTPS</li><li>• Preparation of the final report and recommendations</li></ul></td></tr></table> |                                      | Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <ul style="list-style-type: none"><li>• Selection/acquisition of EPW models accepted as having credibility</li><li>• Performance and comparison of calculation done using selected models versus the methodology that has been developed</li><li>• Coordination with DNA, DIA, and JSTPS</li><li>• Preparation of the final report and recommendations</li></ul> |  |                                                                           |  |           |                                      |                              |                                 |              |  |                                                                                                                                  |  |          |  |                                                                                                                                                                                        |  |
| Approach                                                                                                                                                                                                                                                                                                                                                                                                                    |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                      |                              |                                 |              |  |                                                                                                                                  |  |          |  |                                                                                                                                                                                        |  |
| <ul style="list-style-type: none"><li>• Selection/acquisition of EPW models accepted as having credibility</li><li>• Performance and comparison of calculation done using selected models versus the methodology that has been developed</li><li>• Coordination with DNA, DIA, and JSTPS</li><li>• Preparation of the final report and recommendations</li></ul>                                                            |                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                  |  |                                                                           |  |           |                                      |                              |                                 |              |  |                                                                                                                                  |  |          |  |                                                                                                                                                                                        |  |

**Chart A-38. Measures of effectiveness tutorial.**

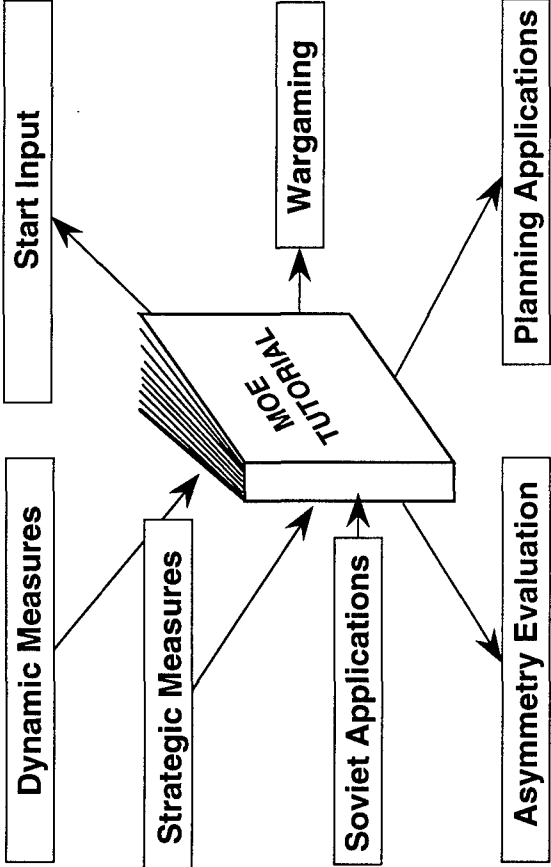
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|                                                                                                                                                                                                                                                                                                                                         | <p><b>Objective</b></p> <p>To provide a clear concise summary of strategic measures of effectiveness (MOEs) and their relevance to U.S. nuclear targeting policy. Format addresses the definition, calculation and utility vs. limitations of the various MOEs.</p> <p><b>Customer</b></p> <p>Maj. James A. Sands DNA/NASF (703)3 25-1137</p> <p>SAIC Principal Investigator</p> <p>Mr. Roger Craver (402) 291-2233</p> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Provide a brief overview of the key players and procedures in U.S. targeting policy</li> <li>• Define static vs. dynamic MOEs; identify uses and limitations</li> <li>• Compare key Soviet considerations to those of the U.S. in MOE applications</li> <li>• Highlight the most important aspects of understanding and applying strategic MOEs</li> </ul> | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Annotated briefing entitled "Strategic Measures of Effectiveness and U.S. Targeting Policy - A Tutorial" suitable for use either as an introduction to the subject or as a reference document (approximately 85 copies delivered)</li> <li>• Subtask completed 2 March 1990</li> </ul>                                                              |

**Chart A-39. JCS J5/J8 support.**

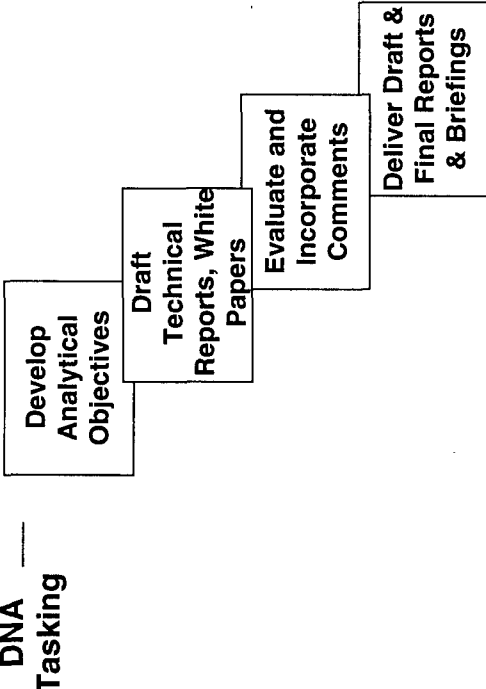
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|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>J5/J8 Analytical Requirements</b></p>  <pre> graph TD     A[DNA Tasking] --&gt; B[Develop Analytical Objectives]     B --&gt; C[Draft Technical Reports, White Papers]     C --&gt; D[Evaluate and Incorporate Comments]     D --&gt; E[Deliver Draft &amp; Final Reports &amp; Briefings]         </pre>                                                    | <p><b>Objective</b></p> <p>To provide analytical support through the DNA representative in areas of JSCP planning and employment to include fire VNs, MOEs, offense/defense integration, and planning guidance.</p> <p><b>Customer</b></p> <p>Maj. Raymond T. Bull, DNA/NASF (703) 325-1137</p> <p>SAIC Principal Investigator</p> <p>Mr. Ed Ohlert (703) 683-6586</p> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Develop analytical study objectives in consultation with DNA designated OPR</li> <li>• Prepare draft technical reports and white papers for review by DNA designated POC in J5/J8</li> <li>• Collect, evaluate and incorporate recommended improvements to draft materials</li> <li>• Provide technical interchange meeting support as required, including meeting support</li> </ul> | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Technical analysis, white papers, draft reports, and briefing materials</li> </ul>                                                                                                                                                                                                                 |

**Chart A-40. VNTK methodology.**

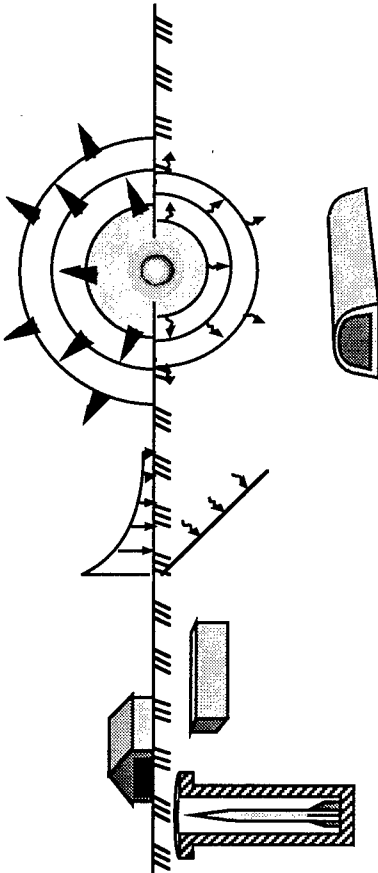
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|                                                                                                                                                                                                                         | <p><b>Objective</b></p> <p>To implement the "G" VN system for deeply buried targets and make the PDCALC modifications necessary for on-line calculations at JSTPS.</p> <p>Customer: LTC Rich Hopson, JKCS (402) 294-4960</p> <p>SAIC Principal investigator: Mr. Roger H. Craver (402) 291-2233</p>                                                                                                                                                                                                                                                  |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Coordination with JSTPS and DIA on the "G" VN methodology</li> <li>• Modification of PDCALC to accommodate the GVN methodology</li> <li>• Documentation of the methodology for JSTPS and technical assistance in shutdown tests</li> </ul> | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Updated version of the GVN methodology</li> <li>• Modified version of PDCALC for use with GVN's</li> <li>• Documentation of the GVN methodology</li> </ul> <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Ability to do DBT calculations on line without the use of separate physical vulnerability data sheets which require "brute force" methods</li> <li>• Applicability to earth penetrating weapons if R&amp;D work in that area is reinstated</li> </ul> |

**Chart A-41. Area denial.**

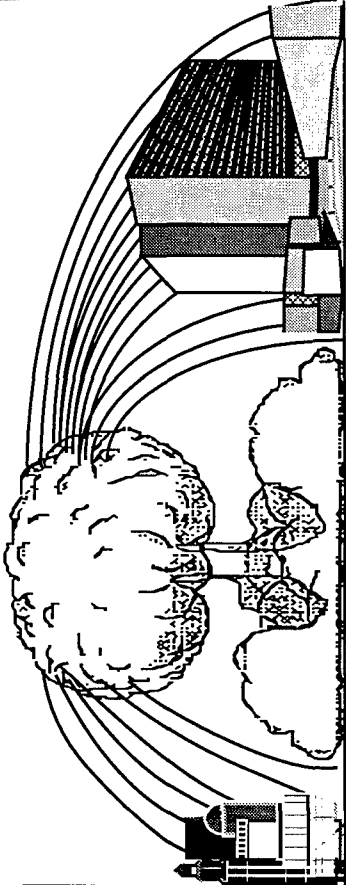
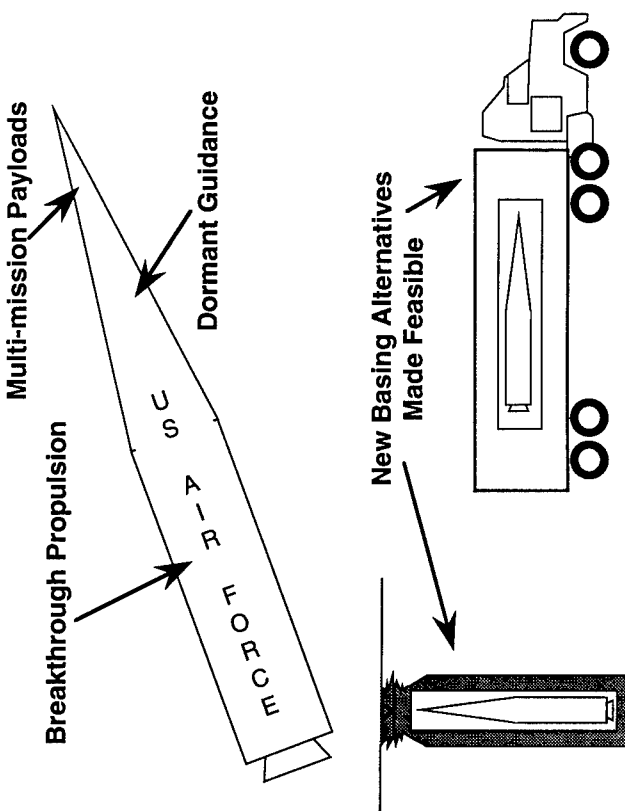
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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <h2>Objective</h2> <p>To determine the utility of developing a methodology/MOE for USSTRATCOM that includes the impact of fallout effects in achieving effective denial or delay of enemy access to key installations as a result of US nuclear strikes, with a view to using fewer weapons or smaller yields than are required when prompt effects alone are considered.</p> |                                             |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Customer:                                                                                                                                                                                                                                                                                                                                                                     | STRATCOM J535, LTCOL Hopkins (402) 294-4960 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                  | Mr. Roger Craver (402) 291-2233             |
| <h2>Approach</h2> <ul style="list-style-type: none"> <li>• Phased approach: <ul style="list-style-type: none"> <li>- Examination of utility using an exemplar case</li> <li>- Extension of the methodology to general use if it is found to have utility</li> </ul> </li> <li>• The exemplar case: <ul style="list-style-type: none"> <li>- USSTRATCOM provides a limited number of Z or H type targets to be attacked by surface burst</li> <li>- DIA specifies criteria for severe and moderate damage for the installations of interest</li> <li>- SAIC performs fallout calculations that include consideration of winds, exposure criteria, and shift-work scenarios for personnel at critical enemy facilities affected within a selected radius of the burst</li> </ul> </li> <li>• Probability distribution curves are developed to show denial/delay times compared to repair times and number of repair crews required</li> <li>• Impact on casualties and economic value evaluated</li> <li>• Utility is assessed</li> </ul> |                                                                                                                                                                                                                                                                                                                                                                               |                                             |
| <h2>Deliverables</h2> <ul style="list-style-type: none"> <li>• Briefing for STRATCOM which shows results of the exemplar case delay times, repair crew requirements, casualties, productive value denied, and recommendations regarding utility</li> <li>• Development of a methodology for general use if it is found to have utility</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                               |                                             |
| <h2>Benefits</h2> <ul style="list-style-type: none"> <li>• Ability to include the impact of fallout as well as prompt effects on denying or delaying enemy access to their facilities</li> <li>• Potential use of lower prompt damage criteria while still achieving desired access denial or repair delays</li> <li>• Potential reduction in number of DGZ's/weapons needed</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                               |                                             |

**Chart A-42. Advanced missile and basing concept design.**

|                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |                 |                                        |                                    |                                   |                     |                                                                                                                           |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------------------------|------------------------------------|-----------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                    | <table><tr><td><b>Objective</b></td></tr><tr><td>Define the impact dormant guidance and breakthrough technologies would have on ICBM missile cost, size, basing, preservation of location uncertainty (PLU), and price-to-attack. Provide resultant conceptual designs of ICBMs and their basing concepts using these technologies.</td></tr><tr><td><b>Customer</b></td></tr><tr><td>Capt. Ron Marx, SAC/XRQ (402)2 94-6236</td></tr><tr><td><b>SAIC Principal Investigator</b></td></tr><tr><td>Mr. Marc Warburton (619) 546-6368</td></tr><tr><td><b>Deliverables</b></td></tr><tr><td><ul style="list-style-type: none"><li>• Report documentary study results</li><li>• Briefing to summarize report</li></ul></td></tr></table> | <b>Objective</b>                                                                                                                                                                                                                                                                                    | Define the impact dormant guidance and breakthrough technologies would have on ICBM missile cost, size, basing, preservation of location uncertainty (PLU), and price-to-attack. Provide resultant conceptual designs of ICBMs and their basing concepts using these technologies. | <b>Customer</b> | Capt. Ron Marx, SAC/XRQ (402)2 94-6236 | <b>SAIC Principal Investigator</b> | Mr. Marc Warburton (619) 546-6368 | <b>Deliverables</b> | <ul style="list-style-type: none"><li>• Report documentary study results</li><li>• Briefing to summarize report</li></ul> |
| <b>Objective</b>                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |                 |                                        |                                    |                                   |                     |                                                                                                                           |
| Define the impact dormant guidance and breakthrough technologies would have on ICBM missile cost, size, basing, preservation of location uncertainty (PLU), and price-to-attack. Provide resultant conceptual designs of ICBMs and their basing concepts using these technologies.                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |                 |                                        |                                    |                                   |                     |                                                                                                                           |
| <b>Customer</b>                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |                 |                                        |                                    |                                   |                     |                                                                                                                           |
| Capt. Ron Marx, SAC/XRQ (402)2 94-6236                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |                 |                                        |                                    |                                   |                     |                                                                                                                           |
| <b>SAIC Principal Investigator</b>                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |                 |                                        |                                    |                                   |                     |                                                                                                                           |
| Mr. Marc Warburton (619) 546-6368                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |                 |                                        |                                    |                                   |                     |                                                                                                                           |
| <b>Deliverables</b>                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |                 |                                        |                                    |                                   |                     |                                                                                                                           |
| <ul style="list-style-type: none"><li>• Report documentary study results</li><li>• Briefing to summarize report</li></ul>                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |                 |                                        |                                    |                                   |                     |                                                                                                                           |
| <table><tr><td><b>Approach</b></td></tr><tr><td><ul style="list-style-type: none"><li>• Define study assumptions</li><li>• Synthesize missile design options</li><li>• Define basing options and operations concept</li><li>• Compare and contrast the missile and basing options generated</li><li>• Prepare study results documentation</li></ul></td></tr></table> | <b>Approach</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | <ul style="list-style-type: none"><li>• Define study assumptions</li><li>• Synthesize missile design options</li><li>• Define basing options and operations concept</li><li>• Compare and contrast the missile and basing options generated</li><li>• Prepare study results documentation</li></ul> |                                                                                                                                                                                                                                                                                    |                 |                                        |                                    |                                   |                     |                                                                                                                           |
| <b>Approach</b>                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |                 |                                        |                                    |                                   |                     |                                                                                                                           |
| <ul style="list-style-type: none"><li>• Define study assumptions</li><li>• Synthesize missile design options</li><li>• Define basing options and operations concept</li><li>• Compare and contrast the missile and basing options generated</li><li>• Prepare study results documentation</li></ul>                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                    |                 |                                        |                                    |                                   |                     |                                                                                                                           |

# Chart A-43. SICBM basing without Minuteman II.

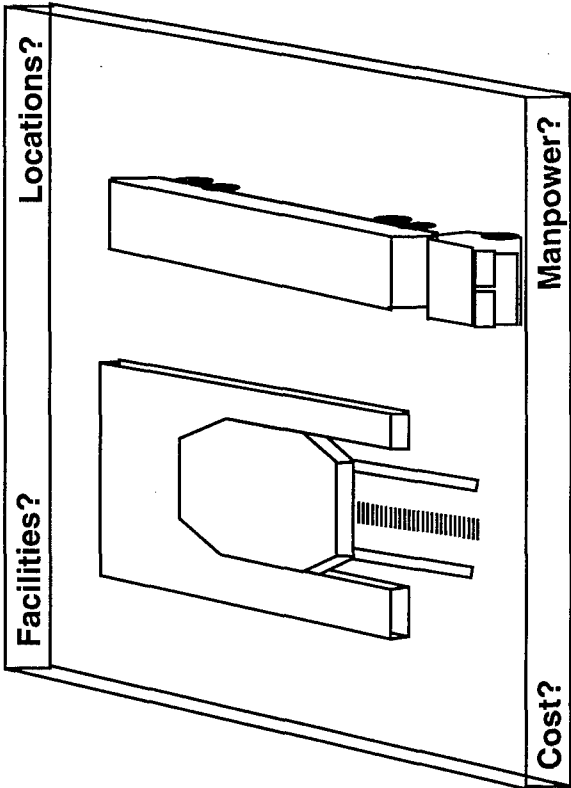
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|                                                                                                                                                                                                              | <p><b>Objective</b></p> <p>Reassess SICBM/HML basing assuming the possible retirement of Minuteman II. Reconsider such factors as deployment locations, peacetime and wartime operations, physical security, public interface, survivability, manpower and cost. Compare this deployment with Southwest basing and any other concept showing promise. Provide a recommendation on the preferred basing mode for SICBM/HML.</p> <p><b>Customer</b></p> <p>Capt. Ron Marx, SAC/XRQ (402) 294-6236</p> <p>SAIC Principal Investigator</p> <p>Mr. Marc Warburton (619) 546-6368</p> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Reassess HML/MM basing concept</li> <li>• Reassess HML/Southwest basing concept</li> <li>• Develop a conceptual basing concept</li> <li>• Compare basing alternatives</li> <li>• Prepare study results documentation</li> </ul> | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Report documentary study results</li> <li>• Briefing to summarize report</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                         |

**Chart A-44. Fallout risks to HML operations.**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <p>RISK-DOSE: 6-MONTH DOSES: 90TH-%ILE</p>                                                                                                                                                                                                                                                                                                                                                                   | <p><b>Objective</b></p> <p>Assess fallout risk to potential HML deployment locations' estimate safe reenter times for maintenance, recovery and/or sustained operations for all CONUS area within 900 mile radius of either Maltstrom or Warren AFB.</p> <p><b>Customer</b></p> <p>Capt. Andrew Manley, SAC/XOKM (402) 294-4464</p> <p><b>SAIC Principal Investigator</b></p> <p>Mr. Eugene Swick (619) 546-6487</p> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Modify existing unclassified OSD Strike File with SAC specified targeting changes</li> <li>• Determine wind sets that capture most of the expected variation in fallout with changes in wind patterns</li> <li>• Calculate fallout patterns and risk dose maps with FAS for each wind set and strike file</li> <li>• Provide maps and contours useful to assess HML deployment areas and estimate safe re-enter times</li> </ul> | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Fallout risk dose maps for times out to six months for all CONUS area within 900 miles of Maltstrom or Warren AFB</li> <li>• Safe re-enter contours for 12 hour and sustained operation based on 200 rad exposure for times out to six months for all CONUS area within 900 miles Maltstrom or Warren AFB</li> </ul>                             |

As of 11/9/90

# Chart A-45. ICBMs for the 21st century.

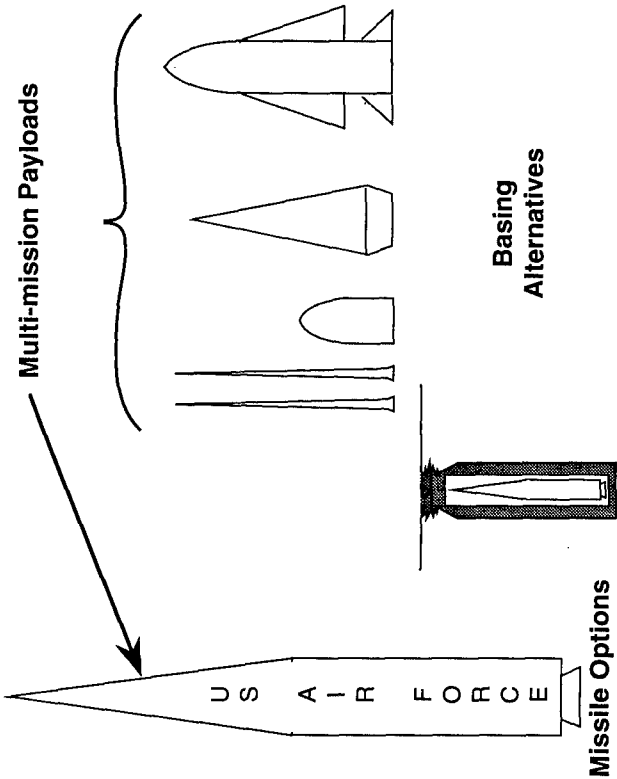
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|  <p>The diagram illustrates the components of ICBM development. At the bottom is a large missile labeled 'U S A I R F O R C E'. An arrow points from this missile to a bracketed group of four different missile silo/payload configurations labeled 'Multi-mission Payloads'. To the right of the 'U S A I R F O R C E' missile is a smaller missile labeled 'Missile Options'. Further right is a group of three different missile silo/payload configurations labeled 'Basing Alternatives'.</p> | <p><b>Objective</b></p> <p>Define ICBM requirements to support new missions.<br/>Assess current ICBMs ability to meet requirements.<br/>Develop a conceptual ICBM optimized to meet requirements.</p> <p><b>Customer</b></p> <p>Capt. Ron Marx, SAC/XRQ (402) 294-6236</p> <p><b>SAIC Principal Investigator</b></p> <p>Mr. Marc Warburton (619) 546-6368</p> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Analyze future mission requirements</li> <li>• Determine ICBM and basing system requirements</li> <li>• Determine current ICBM characteristics</li> <li>• Analyze current ICBM capabilities</li> <li>• Generate conceptual missile and basing design</li> </ul>                                                                                                                                                                                                                                                        | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Final report documentary study results</li> <li>• Briefing to summarize final report</li> <li>• Monthly progress reports</li> </ul>                                                                                                                                                       |

**Chart A-46. Enhancing the NDL developing additional NDL DGZs.**

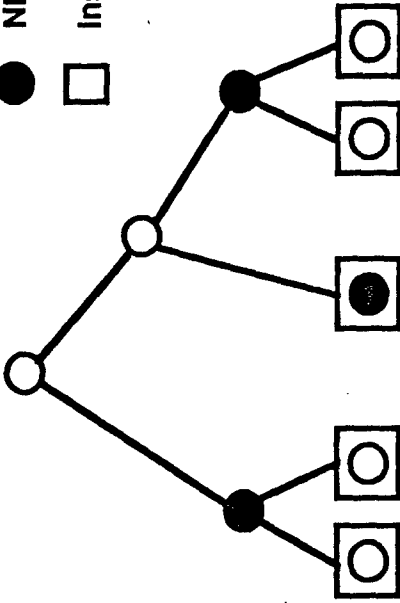
|                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div data-bbox="401 1179 589 1474"> <p>○ Potential DGZ<br/>● NDL DGZ<br/>□ Installation</p> </div>                                                                                                                                                                                                                    | <div data-bbox="315 159 375 1142"> <p><b>Objective</b></p> </div> <div data-bbox="375 159 623 1142"> <p>Determine the feasibility of adding additional DGZs to enhance the National DGZ List (NDL)</p> </div> <div data-bbox="623 159 725 1142"> <p>Customer: JSTPS/JLWD Maj. Keith Hendrickson (402) 294-6192</p> </div> <div data-bbox="725 159 828 1142"> <p>SAIC Principal Investigator: Dr. Carl Rindfleisch, Jr. Mgr. Div. 478 (619) 546-6390</p> </div> <div data-bbox="828 159 896 1142"> <p><b>Deliverables</b></p> </div> <div data-bbox="896 159 1238 1142"> <ul style="list-style-type: none"> <li>• Briefing - TRICOMS NDL enhancement and JLWD NDL development investigation</li> <li>• Final Report</li> </ul> </div> <div data-bbox="1238 159 1315 1142"> <p><b>Benefits</b></p> </div> <div data-bbox="1315 159 1557 1142"> <ul style="list-style-type: none"> <li>• More usable DGZs for SIOP development</li> <li>• More relationships between DGZs</li> <li>• Better installation coverage</li> </ul> </div> |
| <div data-bbox="965 1142 1033 2022"> <p><b>Approach</b></p> </div> <div data-bbox="1033 1142 1557 2022"> <ul style="list-style-type: none"> <li>• Investigate development and maintenance factors in adding additional DGZs used to enhance the NDL</li> <li>• Identify new graphic requirements for displaying enhanced NDL DGZs</li> <li>• Assess hardware and software implications</li> </ul> </div> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

**Chart A-47. Blue book optimizer coder.**

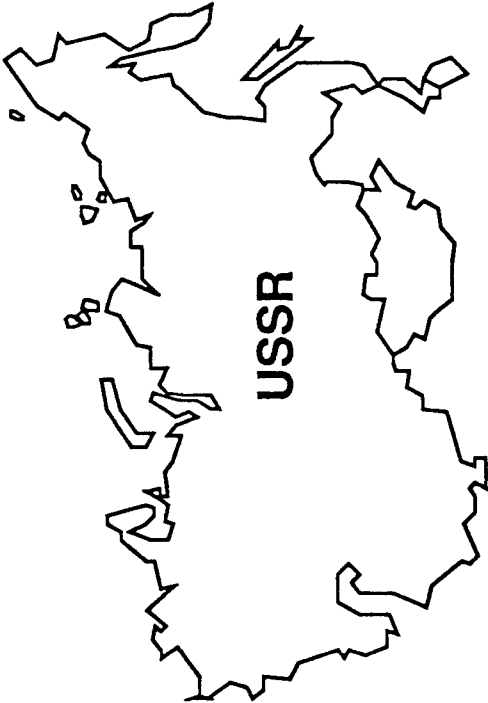
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|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                               | <p><b>Objective</b></p> <p>To Investigate alternative technology for application in automating the Blue Book.</p> <p><b>Customer</b></p> <p>Captain Mike Winfrey JSTPS/JKCF (402)294-7868</p> <p>SAIC Principal Investigator</p> <p>Mr. Eugene Swick (619) 546-6487</p>                                                                                                                                                                             |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Review available map capabilities; identify and install one satisfactory for the BBOC application</li> <li>• Identify the requirements for installing and interfacing JKCF's LISP-based program with I-80 and TRICOMS</li> </ul> | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• BBOC map capability on MicroExplorer and Sun Workstation</li> <li>• Report/Briefing on the Investigation of Interfacing JKCF's LISP-based program with I-80 and TRICOMS</li> </ul> <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Provide graphical context for Target Selection Function</li> <li>• Improved "rule based" target selection process</li> </ul> |

**Chart A-48. Review of Combined Timing and Resolution (CT&R) code.**

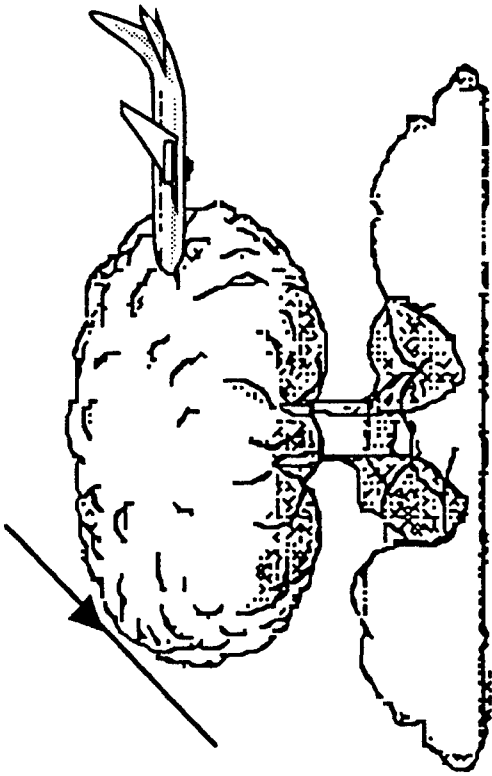
|                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |                                                                            |                              |                                 |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------------------|------------------------------|---------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                  | <p><b>Objective</b></p> <p>To continue review of the code and develop specific recommendations for modifications that will permit incorporation of Air Force and Navy wind-driven fratricide models, make the code more user friendly, and provide faster run times.</p> <table border="1" data-bbox="619 140 768 1110"> <tr> <td>Customer:</td><td>Capt. M.R. Tollefson, USN, JPP<br/>POC: LTC Jim Kinsey, JPPP (402) 294-5070</td></tr> <tr> <td>SAIC Principal Investigator:</td><td>Mr. Roger Craver (402) 291-2233</td></tr> </table> <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>Report on modifications required to meet the objectives.</li> </ul> | Customer: | Capt. M.R. Tollefson, USN, JPP<br>POC: LTC Jim Kinsey, JPPP (402) 294-5070 | SAIC Principal Investigator: | Mr. Roger Craver (402) 291-2233 |
| Customer:                                                                                                                                                                                                                                                                                                                                                                                                                                           | Capt. M.R. Tollefson, USN, JPP<br>POC: LTC Jim Kinsey, JPPP (402) 294-5070                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |           |                                                                            |                              |                                 |
| SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                                                        | Mr. Roger Craver (402) 291-2233                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |           |                                                                            |                              |                                 |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>Review Air Force and Navy concepts for treating fratricide; determine the implications for code modifications needed to accommodate both .</li> <li>Determine code outputs required by the Air Force and Navy.</li> <li>Develop specific recommendations for making the code more user friendly.</li> <li>Develop specific recommendations for providing faster run times.</li> </ul> | <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>Availability of specific recommendations for :             <ul style="list-style-type: none"> <li>Reconciling/Integrating Air Force and Navy concepts for treating fratricide</li> <li>Improving user friendliness</li> <li>Improving run times</li> </ul> </li> </ul>                                                                                                                                                                                                                                                                                                                                             |           |                                                                            |                              |                                 |

Chart A-49. Enhancing the NDL SIOP development interfaces.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div><div><div><div><div></div><div>Potential DGZ</div></div><div><div></div><div>NDL DGZ</div></div><div><div></div><div>Installation</div></div></div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div></div><div></div><div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div> </ |
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**Chart A-50. Enhancing the NDL impact and implementation.**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  |
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| <div><div><div><div><div><div></div><div>Potential DGZ</div></div><div><div></div><div>NDL DGZ</div></div><div><div></div><div>Installation</div></div></div><div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div><div></div><div></div><div></div></div></div></div></div></div></div><div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div><div></div><div></div><div></div></div><div><div><div><div><div><div></div><div></div><div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div></div> </ |  |
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**Chart A-51. DNA analytical support to JOSDEPS.**

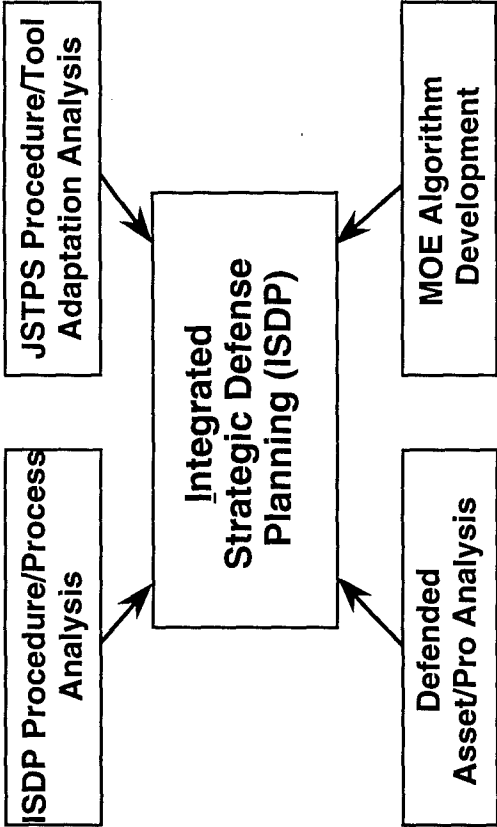
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|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                    | <p><b>Objective</b></p> <p>To provide analytical support in areas of strategic defense planning, offense-defense integration, MOE algorithm development, defended asset list/pro concept development.</p> <p><b>Customer</b></p> <p>Col Charles Rush , JCS/JOSDEPS (719) 554-9688</p> <p>SAIC Principal Investigator</p> <p>Mr. Gil Johnson (719) 576-2181</p> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Conduct Integrated Strategic Defense Planning analysis</li> <li>• Conduct JSTPS Tools/Procedures Adaptation analysis</li> <li>• Conduct Defended Asset/Preplanned Response Option analysis</li> <li>• Develop an integrated MOE algorithm that relates to probability of engagement, probability of kill, defended assets and assets saved</li> </ul> | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Technical Reports, Briefing Materials with supporting analysis</li> <li>• Integrated MOE algorithm</li> <li>• Informal Reports as required</li> </ul>                                                                                                                                      |

**Chart A-52. JOSDEPS-JSTPS tool application and roadmap.**

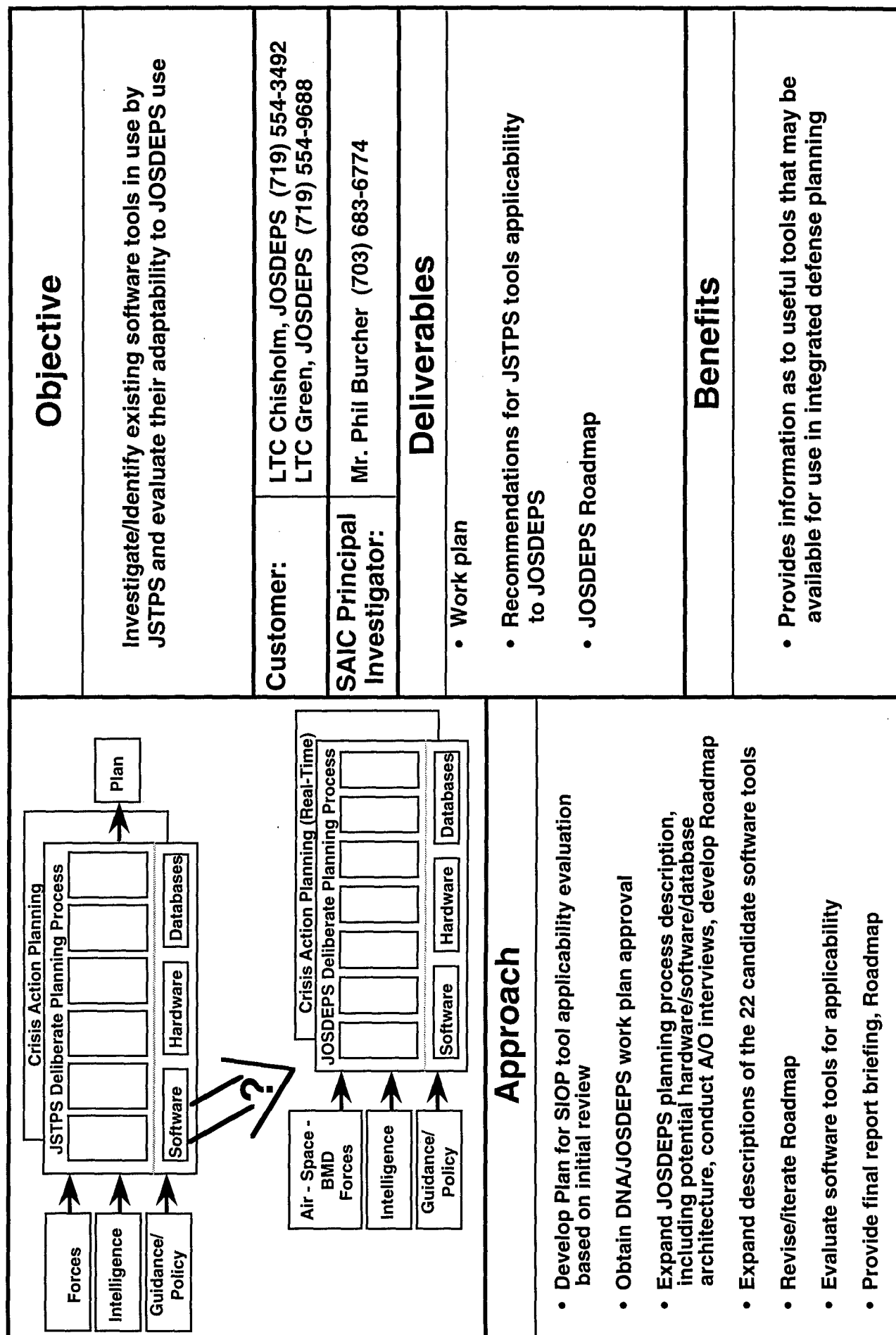


**Chart A-53. Joint Strategic Defense Operations Planning System.**

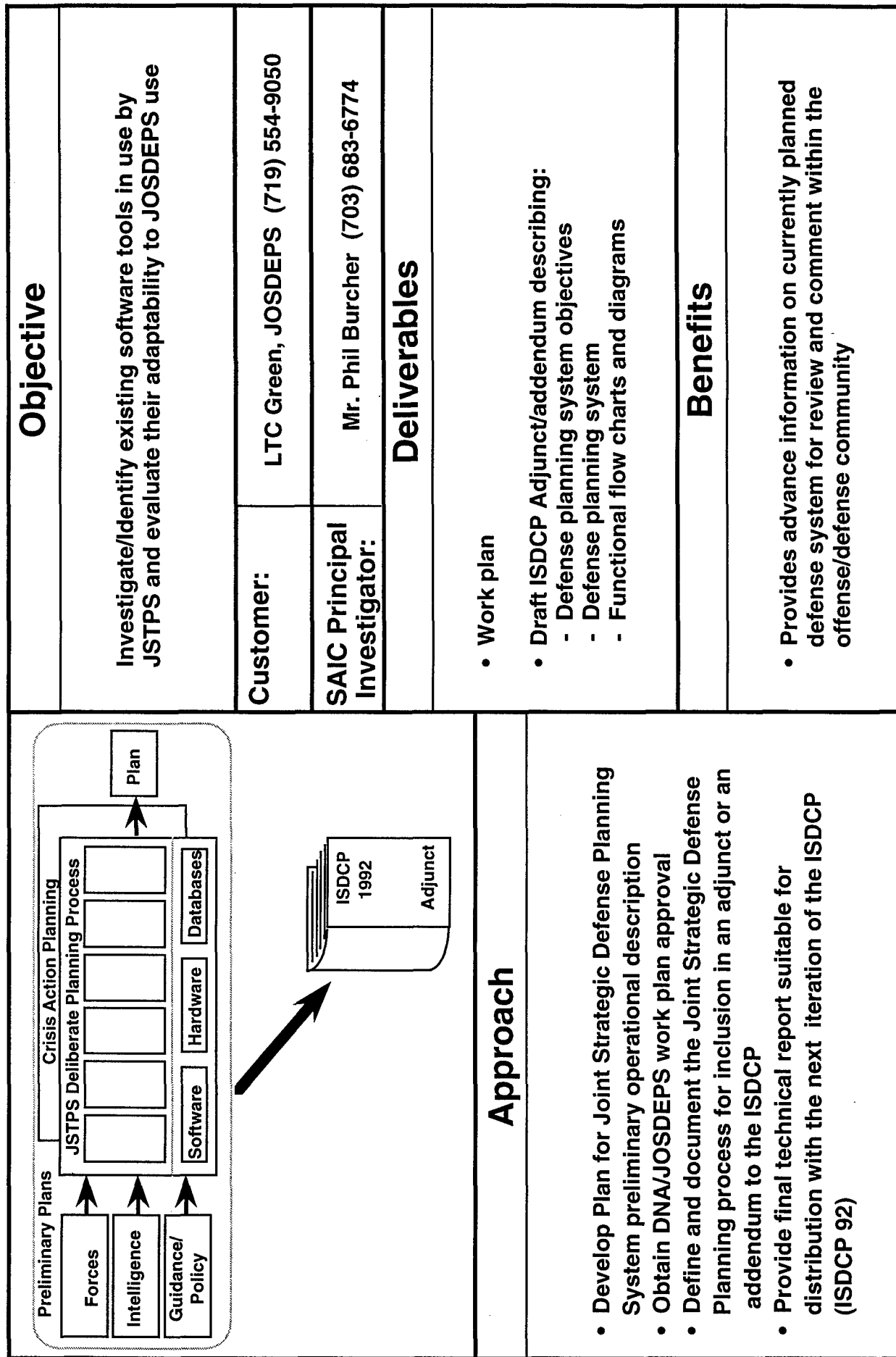


**Chart A-54. SIOP-94 replanning study.**

| STRENGTHENING NUCLEAR PLANNING                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |  | Objective                                                                                                                                                                                                                                                                                                                                                                                                                             |                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| <p>SECDEF/CJCS</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |  | <p>Provide support to the DNA representative to the NPWG and support to OSD/ISP/SFP. Support should include background analysis, advice and administrative assistance.</p>                                                                                                                                                                                                                                                            |                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | Customer:                                                                                                                                                                                                                                                                                                                                                                                                                             | DNA Representative to NPWG         |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                                          | Mr. Norman Fennelly (703) 683-6774 |
| Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  | Deliverables                                                                                                                                                                                                                                                                                                                                                                                                                          |                                    |
| <ul style="list-style-type: none"> <li>• Prepare and present, in the form of a briefing, a historical background of events leading to the establishment of the NPWG</li> <li>• Prepare papers on each issue addressed by the working group. Review of several issues already directed. Others will be assigned as appropriate.</li> <li>• Attend NPWG meetings when directed, document group proceedings and assist DNA representative in preparing for each meeting and summarize NPWG activities for DNA management. Provide assessment of actions taken/recommendations made during these meetings.</li> </ul> |  | <ul style="list-style-type: none"> <li>• Background Briefing               <ul style="list-style-type: none"> <li>– History</li> <li>– Previous Studies</li> </ul> </li> <li>• Issue Papers               <ul style="list-style-type: none"> <li>– NSNF; Intell support; Nuclear weapons development; Force Structure</li> <li>– DNA position and interest</li> </ul> </li> <li>• Reports and Analysis of NPWG proceedings</li> </ul> |                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | Benefits                                                                                                                                                                                                                                                                                                                                                                                                                              |                                    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  | <ul style="list-style-type: none"> <li>• Improve DNA ability to influence high level policy issues</li> </ul>                                                                                                                                                                                                                                                                                                                         |                                    |

**Chart A-55. Future U.S. strategic planning requirements.**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p style="text-align: center;"><b>US STRATEGIC PLANNING<br/>REQUIREMENTS</b></p> <div style="text-align: center;"> <pre> graph TD     STRATEGY[STRATEGY] --- THREAT[THREAT ASSESSMENT]     STRATEGY --- WEAPONS[WEAPONS EFFECTS]     STRATEGY --- FORCE[FORCE MIX]     STRATEGY --- REQUIREMENTS[US STRATEGIC PLANNING REQUIREMENTS]         </pre> </div>                                                                                                                                                                                                                                                                                  | <p style="text-align: center;"><b>Objective</b></p> <ul style="list-style-type: none"> <li>• Assess implications of changes and reductions in U.S. strategic force structures, especially the effects of strategic nuclear attacks.</li> <li>• Evaluate methods for integrating non-nuclear weapons into U.S. plans, and identify nuclear weapons technologies that might be relevant to application of non-nuclear weapons.</li> <li>• Identify issues and alternatives coupled to DNA technologies.</li> </ul> |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p><b>Customer:</b></p> <p>Dr. George Ullrich, DNA (703) 325-7300</p>                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p><b>SAIC Principal Investigator:</b></p> <p>Dr. Marv Atkins (703) 556-7098</p>                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <p style="text-align: center;"><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Study various strategic force mixes of reduced strategic arsenal, and examine effects of different strategic nuclear attacks.</li> <li>• Evaluate concepts for integrated planning of nuclear and nonnuclear strategic systems, including trade-offs inherent in choosing nonnuclear technologies.</li> <li>• Assess future alternatives in light of changes in U.S. strategic force posture and implications of Presidential announcement of de-emphasis on nuclear force readiness and emphasis on nuclear safety and reliability.</li> </ul> | <p style="text-align: center;"><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Interim briefing and report at three months on results of research and analysis on potential force mixes and applicability of nuclear weapons effects to assessing nonnuclear weapons performance.</li> <li>• Final briefing and report at project conclusion.</li> <li>• Ad-hoc support to customer as required.</li> </ul>                                                                                     |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <p style="text-align: center;"><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Understanding of longer-term ramifications of President's decision to alter readiness and size of strategic nuclear forces.</li> <li>• Anticipate near-term issues affecting DNA and prepare DNA to meet instant response demands in areas covered by this subtask.</li> </ul>                                                                                                                                       |

# Chart A-56. Joint Strategic Defense Operations Planning Support.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |  |                                                                                                                                                                                                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Joint Strategic Defense Deliberate Planning Steps</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  | <b>Objective</b> <ul style="list-style-type: none"> <li>• Provide support to JOSDEPS in development of 1993 Integrated Defense Campaign plan for North America.</li> <li>• Validate the Joint Strategic Defense Campaign Planning System. Modify as required.</li> </ul> |
| <b>Customer:</b> Col Dennis Shepherd, JOSDEPS (719) 554-9688                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |  |                                                                                                                                                                                                                                                                          |
| <b>SAIC Principal Investigator:</b> Mr. Norman Fennelly (703) 683-6774                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                                                                          |
| <b>Deliverables</b> <ul style="list-style-type: none"> <li>• Update/modify the Integrated Strategic Defense Campaign Planning Systems.</li> <li>• Develop and document a structured method for OPLAN, CONOPS, and MOAs decomposition into hierarchical data bases to support the planning system.</li> <li>• Develop and document a method of identifying congruent and noncongruent data to populate the planning system data bases.</li> </ul>                                                                                                                                                                                                         |  |                                                                                                                                                                                                                                                                          |
| <b>Approach</b> <ul style="list-style-type: none"> <li>• Collect/review supported, supporting Commands, OPLANs and MOAs.</li> <li>• Develop decomposition method for referenced OPLANs and MOAs.</li> <li>• Develop reverse engineering method to be applied to data extracted from OPLANs and MOAs.</li> <li>• Develop identification method for congruent and noncongruent data from OPLANs and MOAs.</li> <li>• Develop data base build method to support planning system reverse-engineering.</li> <li>• Maintain documentation of campaign planning system.</li> <li>• Assist JOSDEPS in building 1993 Integrated Defense Campaign Plan.</li> </ul> |  | <b>Benefits</b> <ul style="list-style-type: none"> <li>• Provides advance information on currently planned defense system for review and comment within the offense/defense community</li> </ul>                                                                         |

**Chart A-57. Alternative force structure assessments.**

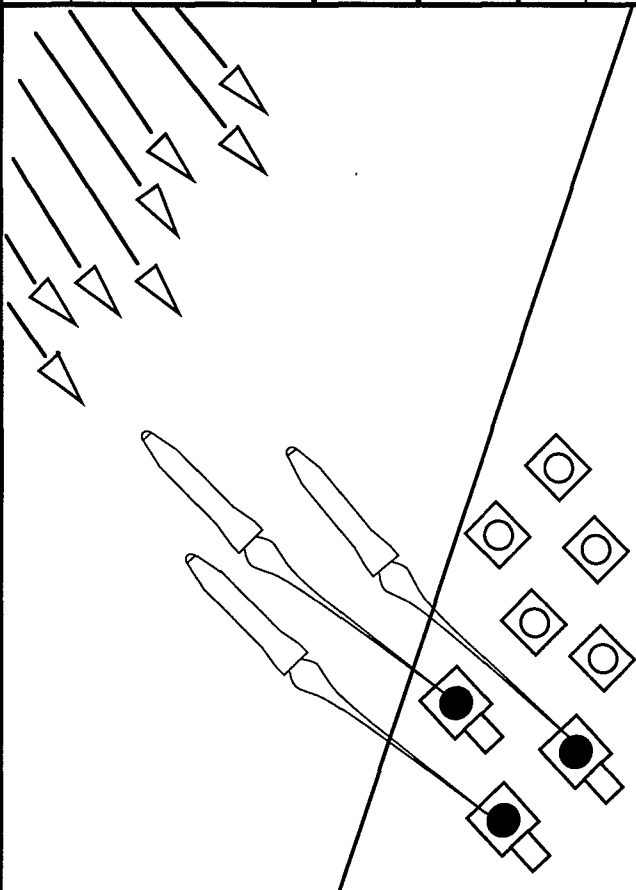
|                                                                                                                                                                                                                                                                                                                          |                                                                                                | <table><tr><th colspan="2">Objective</th></tr><tr><td colspan="2">To assess the effectiveness of U.S. strategic force structures considering uncertainties in alert rates, weapon characteristics, employment options, and threat characterizations.</td></tr><tr><td>Customer:</td><td>Mr. Greg Schulte, OSD/ISP/SFP (703) 614-9535<br/>Lt. Col. John Hayes, JSTPS/JKAW (402) 292-0138</td></tr><tr><td>SAIC Principal Investigator:</td><td>Ms. Gael Tarleton (206) 747-7152</td></tr><tr><th colspan="2">Deliverables</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>• Subtask reports on Alternative Force Structures, Threat estimates and Force Effectiveness Analyses</li><li>• Final Briefing/report on results of force structure analyses</li></ul></td></tr><tr><th colspan="2">Benefits</th></tr><tr><td colspan="2"><ul style="list-style-type: none"><li>• Insights into ramifications of large threat uncertainties</li><li>• Identification of alert status and force structure requirements</li></ul></td></tr></table> | Objective                                                                                                                                                                                                                                                                                                                                        |  | To assess the effectiveness of U.S. strategic force structures considering uncertainties in alert rates, weapon characteristics, employment options, and threat characterizations. |  | Customer: | Mr. Greg Schulte, OSD/ISP/SFP (703) 614-9535<br>Lt. Col. John Hayes, JSTPS/JKAW (402) 292-0138 | SAIC Principal Investigator: | Ms. Gael Tarleton (206) 747-7152 | Deliverables |  | <ul style="list-style-type: none"><li>• Subtask reports on Alternative Force Structures, Threat estimates and Force Effectiveness Analyses</li><li>• Final Briefing/report on results of force structure analyses</li></ul> |  | Benefits |  | <ul style="list-style-type: none"><li>• Insights into ramifications of large threat uncertainties</li><li>• Identification of alert status and force structure requirements</li></ul> |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-----------|------------------------------------------------------------------------------------------------|------------------------------|----------------------------------|--------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|----------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Objective                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                    |  |           |                                                                                                |                              |                                  |              |  |                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                       |  |
| To assess the effectiveness of U.S. strategic force structures considering uncertainties in alert rates, weapon characteristics, employment options, and threat characterizations.                                                                                                                                                                                                                          |                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                    |  |           |                                                                                                |                              |                                  |              |  |                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                       |  |
| Customer:                                                                                                                                                                                                                                                                                                                                                                                                   | Mr. Greg Schulte, OSD/ISP/SFP (703) 614-9535<br>Lt. Col. John Hayes, JSTPS/JKAW (402) 292-0138 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                    |  |           |                                                                                                |                              |                                  |              |  |                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                       |  |
| SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                | Ms. Gael Tarleton (206) 747-7152                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                    |  |           |                                                                                                |                              |                                  |              |  |                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                       |  |
| Deliverables                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                    |  |           |                                                                                                |                              |                                  |              |  |                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                       |  |
| <ul style="list-style-type: none"><li>• Subtask reports on Alternative Force Structures, Threat estimates and Force Effectiveness Analyses</li><li>• Final Briefing/report on results of force structure analyses</li></ul>                                                                                                                                                                                 |                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                    |  |           |                                                                                                |                              |                                  |              |  |                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                       |  |
| Benefits                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                    |  |           |                                                                                                |                              |                                  |              |  |                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                       |  |
| <ul style="list-style-type: none"><li>• Insights into ramifications of large threat uncertainties</li><li>• Identification of alert status and force structure requirements</li></ul>                                                                                                                                                                                                                       |                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                    |  |           |                                                                                                |                              |                                  |              |  |                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                       |  |
| <table><tr><th>Approach</th></tr><tr><td><ul style="list-style-type: none"><li>• Identify time-sensitive MOEs</li><li>• Collect required data, make any estimates necessary</li><li>• Develop Force Structure Implications Model (FSIM)</li><li>• Perform risk analyses using FSIM</li><li>• Perform wargaming analyses</li><li>• Identify key conclusions and document results</li></ul></td></tr></table> |                                                                                                | Approach                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <ul style="list-style-type: none"><li>• Identify time-sensitive MOEs</li><li>• Collect required data, make any estimates necessary</li><li>• Develop Force Structure Implications Model (FSIM)</li><li>• Perform risk analyses using FSIM</li><li>• Perform wargaming analyses</li><li>• Identify key conclusions and document results</li></ul> |  |                                                                                                                                                                                    |  |           |                                                                                                |                              |                                  |              |  |                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                       |  |
| Approach                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                    |  |           |                                                                                                |                              |                                  |              |  |                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                       |  |
| <ul style="list-style-type: none"><li>• Identify time-sensitive MOEs</li><li>• Collect required data, make any estimates necessary</li><li>• Develop Force Structure Implications Model (FSIM)</li><li>• Perform risk analyses using FSIM</li><li>• Perform wargaming analyses</li><li>• Identify key conclusions and document results</li></ul>                                                            |                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                  |  |                                                                                                                                                                                    |  |           |                                                                                                |                              |                                  |              |  |                                                                                                                                                                                                                             |  |          |  |                                                                                                                                                                                       |  |

**Chart A-58. Alternative employment options.**

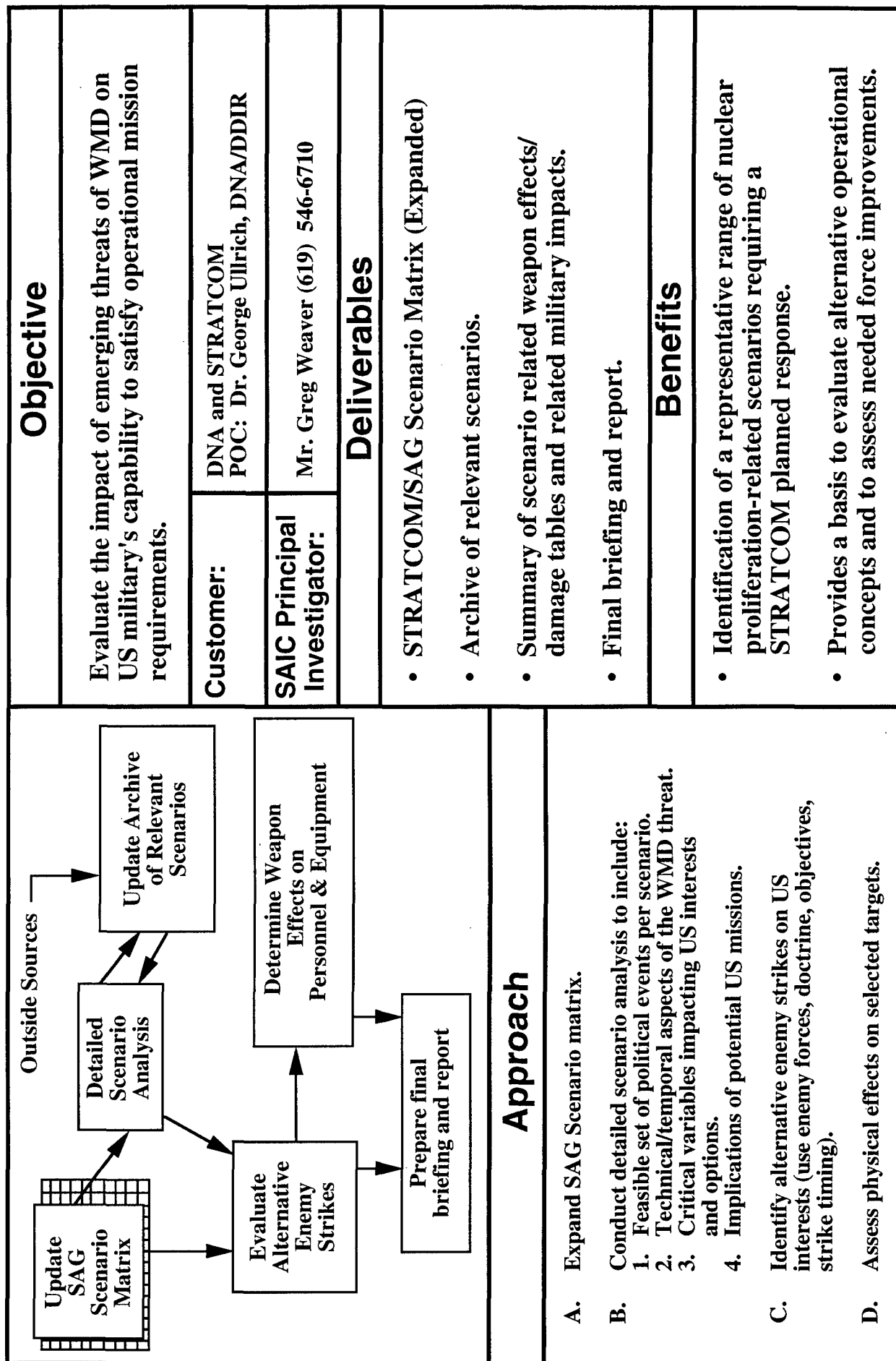


**Chart A-59. Large area target analysis.**

|                                                                                                                                                                                                     |  |                                                                                                                                                                                                                                                                                 |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <pre> graph TD     A[Select Targets] --&gt; B[Elementize into Critical Components]     B --&gt; C[Perform Weaponneering Analysis]     C --&gt; D[Perform Collateral Damage Analysis]         </pre> |  | <p><b>Objective</b></p> <p>Demonstrate the advantage in terms of collateral damage reduction in attacking large area targets with precision low yield nuclear weapons relative to the current inventory.</p>                                                                    |  |
|                                                                                                                                                                                                     |  | <p><b>Customer:</b></p> <p>Lt. Col. Pat Larkin, ACC (804) 764-6411</p>                                                                                                                                                                                                          |  |
|                                                                                                                                                                                                     |  | <p><b>SAIC Principal Investigator:</b></p> <p>Ms. Deedee White (619) 546-6918</p>                                                                                                                                                                                               |  |
|                                                                                                                                                                                                     |  | <p><b>Deliverables</b></p>                                                                                                                                                                                                                                                      |  |
|                                                                                                                                                                                                     |  | <ul style="list-style-type: none"> <li>Briefing to be presented to PLYWD (Precision Low Yield Warhead) Phase I Study which shows target layouts, weapon requirements and collateral damage analysis.</li> <li>Final written report submitted to PLYWD Study and DNA.</li> </ul> |  |
|                                                                                                                                                                                                     |  | <p><b>Benefits</b></p>                                                                                                                                                                                                                                                          |  |
|                                                                                                                                                                                                     |  | <ul style="list-style-type: none"> <li>Better understanding of weapon requirements.</li> <li>Reduction in collateral damage with no casualties from fallout.</li> <li>Reduction in total yield requirements to meet specified damage levels.</li> </ul>                         |  |

**Chart A-60. MTR, WMD & counter proliferation.**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                         |                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre> graph LR     subgraph Box1 [ ]         direction TB         TA[Technical Assessment]         MC[Military Consequences]         PS[Political/Strategic]     end     Box1 --&gt; WARGAMING[WARGAMING]     WARGAMING --&gt; IDoD[Implications for DoD]         </pre>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                         | <b>Objective</b><br><br>Evaluate U.S. Policy/Force Structure implications of the military-technical revolution and proliferation of weapons of mass destruction on the nature of strategic long-range strike warfare (LRSW) over the next three decades.                |
| Customer:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Mr. Andy Marshall, OSD Net Assessment<br>(703) 695-1811 |                                                                                                                                                                                                                                                                         |
| SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Dr. J.J. Martin, (619) 546-6297                         |                                                                                                                                                                                                                                                                         |
| <b>Approach</b><br><br><ul style="list-style-type: none"> <li>• Technical MTR/WMD Developments                             <ul style="list-style-type: none"> <li>– By type of Countries</li> <li>– Pivotal Technologies (3 decades)</li> </ul> </li> <li>• Military Consequences of MTR/WMD                             <ul style="list-style-type: none"> <li>– Technology to capability transforms</li> <li>– Relationships to other capabilities</li> <li>– Limits on contributions of LRSW</li> </ul> </li> <li>• Political-Strategic Consequences                             <ul style="list-style-type: none"> <li>– On U.S. Security Alliances</li> <li>– U.S. influence on LRSW of others</li> </ul> </li> <li>• Scenario Development (Incorporating Steps 1-3)</li> <li>• Wargaming (Political-Strategic-Military Consequences)</li> <li>• Implications for DoD on:                             <ul style="list-style-type: none"> <li>– U.S. Employment Policy for WMD</li> <li>– Force Structure Requirements</li> <li>– Regional Security Alliances</li> </ul> </li> </ul> |                                                         | <b>Deliverables</b><br><br><ul style="list-style-type: none"> <li>• Periodic progress reports</li> <li>• Interim Program Review (IPRs)</li> <li>• Administer Wargames</li> <li>• Final briefing</li> </ul>                                                              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                         | <b>Benefits</b><br><br><ul style="list-style-type: none"> <li>• Understanding of potential demands on U.S. Force capability.</li> <li>• Provides analytical basis to support evaluation of counter proliferation scenarios which will focus on WMD and LRSW.</li> </ul> |

**Chart A-61. Planning impacts of changing SRT OPSCONS.**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <pre> graph TD     A[SRT SYSTEM DESCRIPTIONS] --&gt; B[System Support]     A --&gt; C[Ops Characteristics]     B --&gt; D[SRT Operating Requirements]     C --&gt; D     D --&gt; E[Develop Candidate SRT Operational Concepts]     D --&gt; F[SRF C3 Capability]     F --&gt; E     E --&gt; G[Denial &amp; Deception]     E --&gt; H[Spectrum of Conflict]     G --&gt; I[Develop Matrix of OPSCONS Arrayed Versus the Spectrum of Conflict]     H --&gt; I     </pre> <p><b>System Support</b></p> <ul style="list-style-type: none"> <li>• Maintenance</li> <li>• Supply</li> <li>• Engineering</li> <li>• Troops</li> </ul> <p><b>Ops Characteristics</b></p> <ul style="list-style-type: none"> <li>• Movement</li> <li>• Responsiveness</li> <li>• Availability</li> </ul> <p><b>SRT Operating Requirements</b></p> <ul style="list-style-type: none"> <li>• Survivability</li> <li>• Sustainability</li> <li>• Connectivity</li> <li>• Positive Control</li> </ul> <p><b>SRF C3 Capability</b></p> <p><b>Develop Candidate SRT Operational Concepts</b></p> <ul style="list-style-type: none"> <li>• Signatures</li> <li>• Locations</li> </ul> <p><b>Denial &amp; Deception</b></p> <p><b>Spectrum of Conflict</b></p> <ul style="list-style-type: none"> <li>• Political</li> <li>• Military</li> <li>• NWE</li> </ul> <p><b>Develop Matrix of OPSCONS Arrayed Versus the Spectrum of Conflict</b></p> | <p><b>Objective</b></p> <p>Determine potential planning impacts as SRTs operationally respond to increased world tensions.</p> <p><b>Customer</b></p> <p>Capt. Jim Byrom, SAC/INA (402)2 94-2384</p> <p>SAIC Principal Investigator</p> <p>Mr. Barney Clark (619) 546-6899</p> <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Progress briefing on SRT deployment constraints and connectivity</li> <li>• Progress briefing on possible SRT Operations Concepts (OPSCONS) and counter-SRT planning</li> <li>• Final briefing, with text, on impacts of changing SRT OPSCONS on planned counter-SRT operations</li> </ul> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Determine SRT system descriptions</li> <li>• Determine SRT operational capability</li> <li>• Develop possible SRT operations concepts and planned U.S. counter-SRT posture</li> <li>• Estimate impact of possible/probable SRT OPSCONS on planning under increasing tensions and threat</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

**Chart A-62. Logistics Infrastructure Analysis System (LIAS).**

|                                                                                                                                                                                                                                                                                                             |  |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| <pre> graph TD     Guidance[Guidance] --&gt; SFA[SYSTEM FUNCTIONAL ANALYSIS]     Timelines[Timelines] --&gt; SFA     MOEs[MOEs] --&gt; SFA     Data[Data] --&gt; SFA     SFA --&gt; MFR[Model Functional Requirements]     MFR --&gt; MDP[Model Development Plan]         </pre>                            |  |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Define/coordinate the LIAS operational scenario</li> <li>• Describe the economic infrastructure of interest</li> <li>• Develop LIAS system measures of merit</li> <li>• Provide LIAS functional description and development plan</li> </ul> |  |
| <p><b>Objective</b></p> <p>Provide system development plan for a PC-based installation selection aide for the JLTE</p>                                                                                                                                                                                      |  |
| <p><b>Customer:</b></p> <p>Lt. Colonel John Ciriaco,<br/>JSTPS/JLT, (402) 294-7142</p>                                                                                                                                                                                                                      |  |
| <p><b>SAIC Principal Investigator:</b></p> <p>Mr Barney Clark (619) 546-6899</p>                                                                                                                                                                                                                            |  |
| <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Provide LIAS Functional Description</li> <li>• Provide LIAS System Development Plan</li> </ul>                                                                                                                                          |  |
| <p><b>Benefits</b></p> <ul style="list-style-type: none"> <li>• Provide the costs, benefits, and development plan for automating portions of the economic installation selection task</li> </ul>                                                                                                            |  |

**Chart A-63. J5/J8 strategic sufficiency.**

| <div><div>Planning Guidance</div><div><div><div>Current MOEs</div><div>DE Coverage</div></div><div><div>NSDD</div><div>NUWEP</div><div>JSCP</div><div>JSTPS Planning Manual</div></div><div><div>New and Emerging MOEs</div></div></div><div><div>SIOP</div><div>Alternate SIOP</div><div>Results</div></div></div> | <table><tr><th>Objective</th></tr><tr><td>Draft a White Paper to identify issues related to new and emerging MOEs and how they may impact the strategic planning process.</td></tr><tr><th>Customer</th></tr><tr><td>Maj. Raymond T. Bull, DNA (703) 325-1137</td></tr><tr><th>SAIC Principal Investigator</th></tr><tr><td>Dr. Allen K. Rachel (619) 546-6397</td></tr><tr><th>Deliverables</th></tr><tr><td><ul style="list-style-type: none"><li>• Draft for DNA internal review</li><li>• Draft for DNA external review</li><li>• Final draft (version 1)</li></ul></td></tr></table> | Objective | Draft a White Paper to identify issues related to new and emerging MOEs and how they may impact the strategic planning process. | Customer | Maj. Raymond T. Bull, DNA (703) 325-1137 | SAIC Principal Investigator | Dr. Allen K. Rachel (619) 546-6397 | Deliverables | <ul style="list-style-type: none"><li>• Draft for DNA internal review</li><li>• Draft for DNA external review</li><li>• Final draft (version 1)</li></ul> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------|----------|------------------------------------------|-----------------------------|------------------------------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Objective                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                                                                                                                                 |          |                                          |                             |                                    |              |                                                                                                                                                           |
| Draft a White Paper to identify issues related to new and emerging MOEs and how they may impact the strategic planning process.                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                                                                                                                                 |          |                                          |                             |                                    |              |                                                                                                                                                           |
| Customer                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                                                                                                                                 |          |                                          |                             |                                    |              |                                                                                                                                                           |
| Maj. Raymond T. Bull, DNA (703) 325-1137                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                                                                                                                                 |          |                                          |                             |                                    |              |                                                                                                                                                           |
| SAIC Principal Investigator                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                                                                                                                                 |          |                                          |                             |                                    |              |                                                                                                                                                           |
| Dr. Allen K. Rachel (619) 546-6397                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                                                                                                                                 |          |                                          |                             |                                    |              |                                                                                                                                                           |
| Deliverables                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                                                                                                                                 |          |                                          |                             |                                    |              |                                                                                                                                                           |
| <ul style="list-style-type: none"><li>• Draft for DNA internal review</li><li>• Draft for DNA external review</li><li>• Final draft (version 1)</li></ul>                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                                                                                                                                 |          |                                          |                             |                                    |              |                                                                                                                                                           |
| <div><div>Approach</div><ul style="list-style-type: none"><li>• Review objective/scope with DNA CTM</li><li>• Collect related reference material</li><li>• Develop drafts and revise</li><li>• Incorporate DNA comments on drafts</li><li>• Prepare final draft (version 1)</li></ul></div>                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |           |                                                                                                                                 |          |                                          |                             |                                    |              |                                                                                                                                                           |

**Chart A-64. SIOP prototype study (TOR – first outline).**

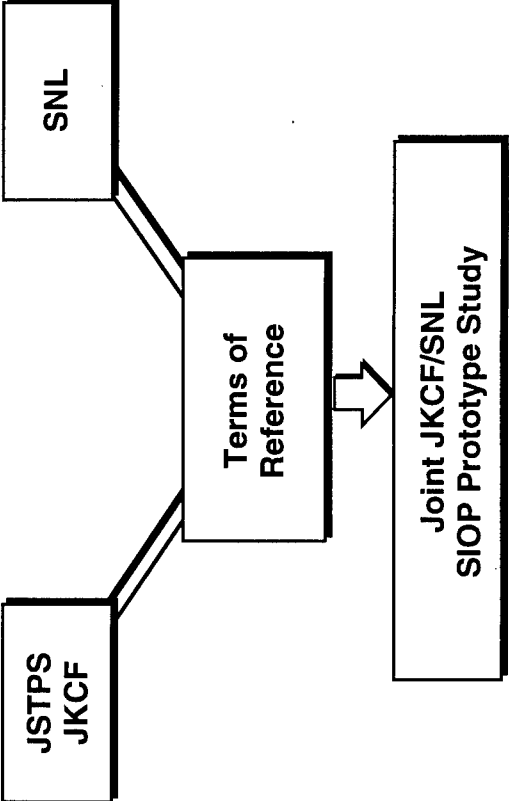
|                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <pre> graph TD     JSTPS["JSTPS<br/>JKCF"] --&gt; TOR["Terms of<br/>Reference"]     SNL["SNL"] --&gt; TOR     TOR --&gt; Study["Joint JKCF/SNL<br/>SIOP Prototype Study"]         </pre> | <p><b>Objective</b></p> <p>Provide draft outline for Terms of Reference for use by JSTPS/JK and Sandia National Laboratory to study ways to Streamline SIOP development process.</p> <p><b>Customer</b></p> <p>Capt. Anne Fletcher, JSTPS/JK (402) 294-7868</p> <p><b>SAIC Principal Investigator</b></p> <p>Mr. Roger Craver (402) 291-2233</p> <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Draft TOR outline for JKCF comment</li> <li>• Revised draft TOR outline</li> </ul> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Review objectives of Joint JSTPS/SNL study effect with JKCF</li> <li>• Develop draft for comment by JKCF</li> <li>• Incorporate JKCF Revisions</li> </ul>                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

**Chart A-65. SAPE program meeting support.**

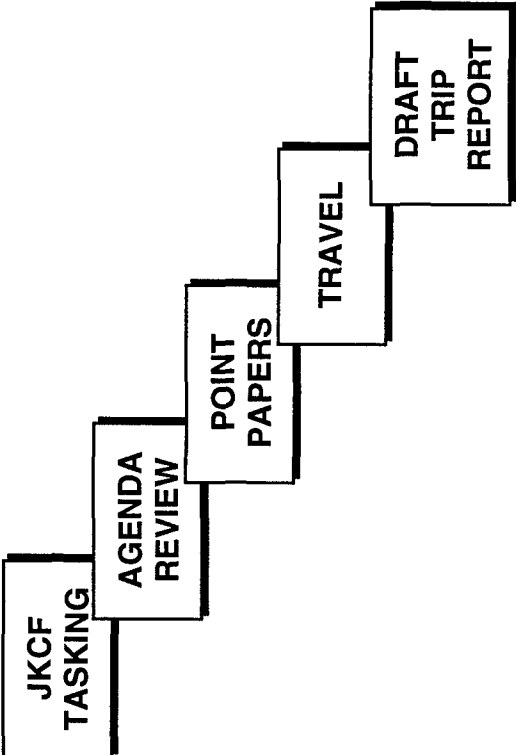
|                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  <pre> graph TD     A[JKCF TASKING] --&gt; B[AGENDA REVIEW]     B --&gt; C[POINT PAPERS]     C --&gt; D[TRAVEL]     D --&gt; E[DRAFT TRIP REPORT]             </pre> | <p><b>Objective</b></p> <p>Provide SAPE Program Meeting Analytical Support to JSTPS/JKCF.</p> <p><b>Customer</b></p> <p>Maj. Ron Haekel, JSTPS/JKCF (402) 294-7868</p> <p>SAIC Principal Investigator</p> <p>Mr. Ken Bryars (402) 291-2233</p> |
| <p><b>Approach</b></p> <ul style="list-style-type: none"> <li>• Review Meeting Prepare Materials as Requested</li> <li>• Develop Point Papers</li> <li>• Travel</li> <li>• Draft Trip Reports</li> </ul>                                                | <p><b>Deliverables</b></p> <ul style="list-style-type: none"> <li>• Document Review/Travel Preparation</li> <li>• Point Papers</li> <li>• Draft Trip Reports</li> </ul>                                                                        |

**Chart A-66. ODI issues in a GPALS context.**

|                                                                                                                                                                                               |  |                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------------------------------------------------------------------------------------------------------------------------------|
| <pre> graph TD     A[DNA ODI Issues White Paper] --&gt; D[Review Issues in GPALS context]     B[SDI GPALS Architecture] --&gt; D     D --&gt; C[Brief/Report]         </pre>                  |  | <b>Objective</b>                                                                                                              |
| <p>Update Issues briefing and descriptive materials for use in upcoming ODIOWG meeting to reflect recent SDI architectural changes from a Phase One architecture to a GPALS architecture.</p> |  | <p><b>Customer:</b> Major Raymond T. Bull, USAF<br/>Defense Nuclear Agency</p>                                                |
| <p><b>SAIC Principal Investigator:</b> Mr. Edward J. Ohlert<br/>(703) 683-6586</p>                                                                                                            |  | <p><b>Deliverables</b></p>                                                                                                    |
| <p><b>Approach</b></p>                                                                                                                                                                        |  | <ul style="list-style-type: none"> <li>• GPALS Issues Handout for ODIOWG meeting</li> <li>• Issues Briefing Update</li> </ul> |
| <ul style="list-style-type: none"> <li>• Review Issues in GPALS context</li> <li>• Draft GPALS addendum to Issues White Paper</li> </ul>                                                      |  | <p><b>Benefits</b></p>                                                                                                        |
|                                                                                                                                                                                               |  | <ul style="list-style-type: none"> <li>• Provides GPALS insight for ODIOWG on ODI issues</li> </ul>                           |

**Chart A-67. DNA analytical support.**

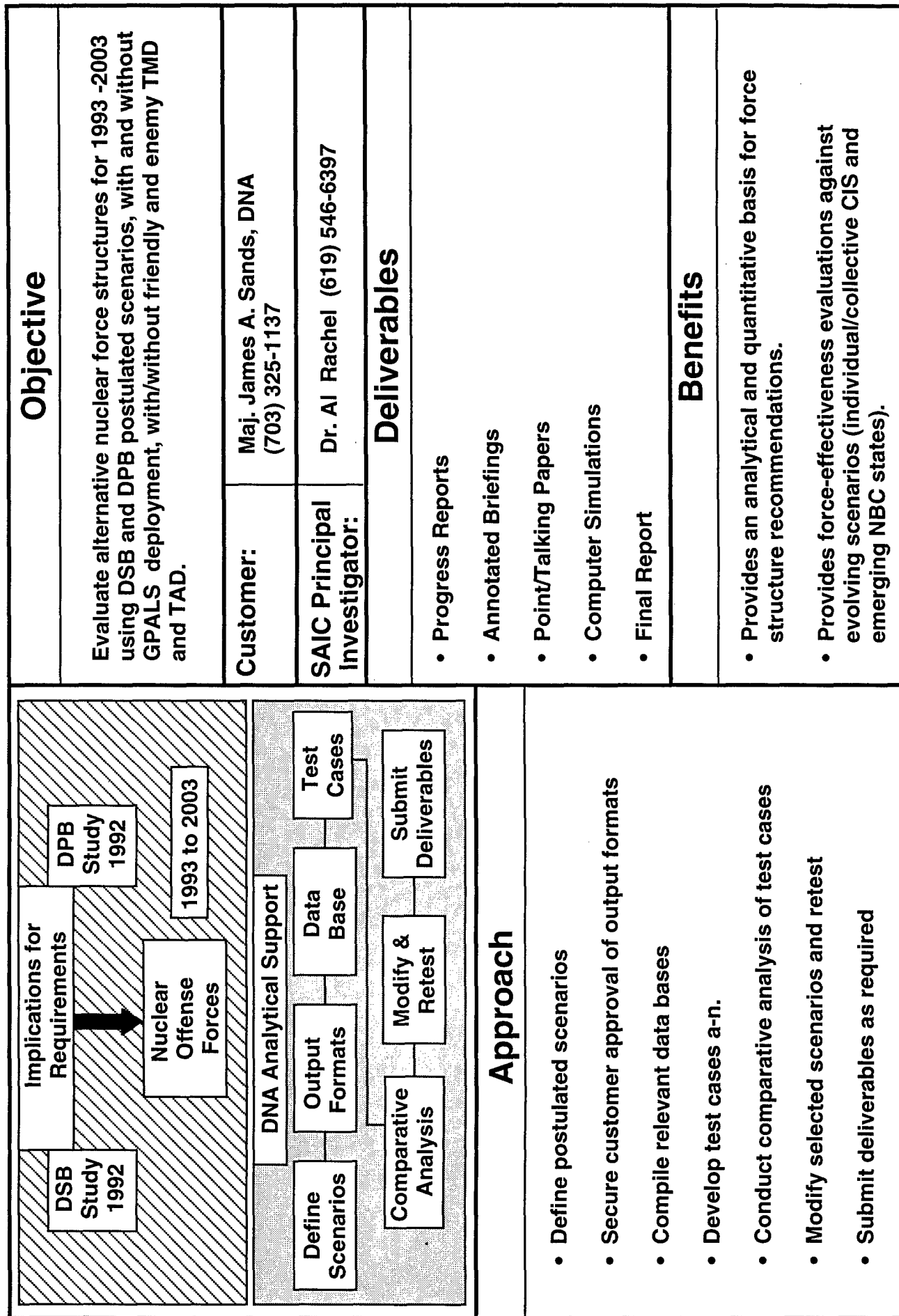


**Chart A-68. Conventional strategic weapons.**

|                                                                                                                                                                                                                                                                                   |  |                                                                                                                                                                                                                                                                                            |                                                                          |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| <pre> graph TD     A[Identify subject systems] --&gt; B[Identify tradeoff criteria]     A --&gt; C[Extract synthesize/data]     D[Research source material] --&gt; C     B --&gt; E[Conduct tradeoff analyses]     C --&gt; E     E --&gt; F[Prepare deliverables]         </pre> |  | <b>Objective</b>                                                                                                                                                                                                                                                                           |                                                                          |
|                                                                                                                                                                                                                                                                                   |  | To analyze the concept and viability of conventional warheads on nuclear systems and define the requirements for these systems.                                                                                                                                                            |                                                                          |
|                                                                                                                                                                                                                                                                                   |  | <b>Customer:</b>                                                                                                                                                                                                                                                                           | Lt Col Duane Tehee, DNA<br>(703) 325-1140                                |
|                                                                                                                                                                                                                                                                                   |  | <b>SAIC Principal Investigator:</b>                                                                                                                                                                                                                                                        | Dr. Al Rachel, PI (619) 546-6397<br>Ms. Brenda Poole, POC (703) 448-6421 |
|                                                                                                                                                                                                                                                                                   |  | <b>Deliverables</b>                                                                                                                                                                                                                                                                        |                                                                          |
|                                                                                                                                                                                                                                                                                   |  | <ul style="list-style-type: none"> <li>• Talking Points</li> <li>• Draft Briefing</li> </ul>                                                                                                                                                                                               |                                                                          |
|                                                                                                                                                                                                                                                                                   |  | <b>Benefits</b>                                                                                                                                                                                                                                                                            |                                                                          |
|                                                                                                                                                                                                                                                                                   |  | <ul style="list-style-type: none"> <li>• Identification of relevant factors impacting use of conventional weapons delivered by strategic delivery systems on strategic targets.</li> <li>• Usable and current reference data base to support on-going seminars and discussions.</li> </ul> |                                                                          |

## Chart A-69. Conventional/Nuclear deterrence.

|                 |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                          |
|-----------------|--|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|
| <b>N/A</b>      |  | <b>Objective</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                          |
|                 |  | To develop an executive level briefing with backup on the topic of conventional versus nuclear deterrence in context of regional aggression.                                                                                                                                                                                                                                                                                                                                                                          |                                                                          |
|                 |  | <b>Customer:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | CDR James Hamlin, DNA/NSCD<br>(703) 325-7824                             |
|                 |  | <b>SAIC Principal Investigator:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Dr. Al Rachel, PI (619) 546-6397<br>Ms. Brenda Poole, POC (703) 448-6421 |
|                 |  | <b>Deliverables</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                          |
|                 |  | <ul style="list-style-type: none"> <li>• Executive Level Briefing</li> <li>• Backup reference materials</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                          |
|                 |  | <b>Benefits</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                          |
|                 |  | Provide DNA with source material to support discussion of conventional versus nuclear deterrence of regional aggression.                                                                                                                                                                                                                                                                                                                                                                                              |                                                                          |
| <b>Approach</b> |  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                          |
|                 |  | <ul style="list-style-type: none"> <li>• Develop project outline and submit to DNA for approval.</li> <li>• Research relevant source materials based on DNA approved outline of briefing.</li> <li>• Extract and synthesize relevant data</li> <li>• Compile draft briefing and relevant backup.</li> <li>• SAIC dry-run before senior review group.</li> <li>• DNA dry-run for Lt Col Hamlin, Lt Col Sands, and other DNA designated attendees)</li> <li>• Brief senior DNA managers as requested by DNA.</li> </ul> |                                                                          |

# Chart A-70. Strategic Futures 2: Phase II

|                                                                                                                                                                                                                                                                                                                                                                      |                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <div> <div>GUIDANCE/PLANNING DIRECTION</div> <pre> graph TD     A[GUIDANCE/PLANNING DIRECTION] --&gt; B[SF 2 SCENARIOS]     B --&gt; C[Advanced Tech Concepts Tool Box]     C --&gt; D[Games]     D --&gt; E[Future Mission Needs]     E --&gt; F[Prioritized Technology Development Needs]     F --&gt; C     C --&gt; G[Analysis]     G --&gt; F     </pre> </div> |                                                                          | <b>Objective</b><br><br>Design, develop, and conduct a SAG seminar game to support STRATCOM in correlating future strategic mission requirements with technology acquisition opportunities.                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Customer:                                                                                                                                                                                                                                                                                                                                                            | Captain (USN) Richard J. Field<br>STRATCOM SAG Secretariat, 402-294-4102 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| SAIC Principal Investigator:                                                                                                                                                                                                                                                                                                                                         | Dr. Allen K. Rachel, 619 -546 -6397                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Deliverables</b>                                                                                                                                                                                                                                                                                                                                                  |                                                                          | <ul style="list-style-type: none"> <li>• Scenario selection methods</li> <li>• An album of detailed candidate scenarios</li> <li>• Game design and related materials</li> <li>• Analysis of game results</li> <li>• Prioritized list of potential mission needs</li> <li>• Prioritized technology acquisition requirements</li> </ul>                                                                                                                                                                                                                                                                                   |
| <b>Approach</b>                                                                                                                                                                                                                                                                                                                                                      |                                                                          | <ul style="list-style-type: none"> <li>• Identify recommended scenarios developed by use of the structured analysis presented /amended on 16 March 1994.</li> <li>• Obtain SAG approval of prioritized list of scenarios.</li> <li>• Develop detailed scenarios for gaming and the related vignettes and tool box composition.</li> <li>• Customize game design to stress selected scenarios.</li> <li>• Pre-test game design and data collection methods against specific scenario/tool box combinations.</li> <li>• Administer October 94 SAG game.</li> <li>• Analyze and report results/recommendations.</li> </ul> |
| <b>Benefits</b>                                                                                                                                                                                                                                                                                                                                                      |                                                                          | <ul style="list-style-type: none"> <li>• Provides an institutionalized approach to analysis of ever changing threat scenarios and mission capability needs.</li> <li>• Provides an analytical basis to support user prioritization (user pull) of technology development and related ACTD's.</li> </ul>                                                                                                                                                                                                                                                                                                                 |

APPENDIX B  
ACRONYMS AND ABBREVIATIONS

|           |                                                       |
|-----------|-------------------------------------------------------|
| ABM       | Anti-Ballistic Missile                                |
| ACC       | Air Combat Command                                    |
| ACDA      | Arms Control Disarmament Agency                       |
| ACE       | Allied Command, Europe                                |
| ACLANT    | Allied Command, Atlantic                              |
| ACM       | Advanced Conventional Munitions                       |
| AEM       | Arsenal Exchange Model                                |
| ALSOM     | Air-Launched Stand-Off Missile                        |
| AMEM      | Army Multiple Engagement Model                        |
| AOR       | Area of Responsibility                                |
| ASIOP     | Assessments for Single Integrated Operations Planning |
| ASW       | Anti-Submarine Warfare                                |
| ATBM      | Anti-Tactical Ballistic Missile                       |
| ATR       | Air Transport of Radiation                            |
| AW        | Air Warning; Automatic Weapon                         |
| BMD       | Ballistic Missile Defense                             |
| BMDO      | Ballistic Missile Defense Organization                |
| BMEWS     | Ballistic Missile Early Warning System                |
| BMO       | Ballistic Missile Office                              |
| BRV       | Ballistic Reentry Vehicle                             |
| BSD       | Ballistic Systems Division                            |
| BSTS      | Boost Surveillance and Tracking System                |
| C2        | Command and Control                                   |
| C3I       | Command, Control, Communications and Intelligence     |
| C4        | Command, Control, Communications and Computers        |
| CADOB     | Consolidated Air Defense Order of Battle              |
| CDRL      | Contract Delivery Requirement List                    |
| CEO       | Chief Executive Officer                               |
| CEP       | Circular Error Probable                               |
| CFE       | Conventional Forces Europe                            |
| CINC      | Commander in Chief                                    |
| CINCPAC   | Commander in Chief, Pacific                           |
| CINCSTRAT | Commander in Chief, Strategic Command                 |
| CPFF      | Cost Plus Fixed Fee                                   |
| CPM       | Critical Path Method                                  |

|        |                                                     |
|--------|-----------------------------------------------------|
| CRG    | Compliance Review Group                             |
| CRTEM  | Counter Relocatable Target Effectiveness Model      |
| CSLBM  | Conventional Sea-Launched Ballistic Missile         |
| CTB    | Comprehensive Test Ban                              |
| CTM    | Contract Technical Monitor                          |
| CT&R   | Combined Timing & Resolution                        |
| CWC    | Chemical Weapons Conference                         |
| DARPA  | Defense Advanced Research Project Agency            |
| DCA    | Dual Capable Aircraft                               |
| DCS    | Defense Communication System; Deputy Chief of Staff |
| DE     | Damage Expectancy                                   |
| DGZ    | Desired Ground Zero                                 |
| DIA    | Defense Intelligence Agency                         |
| DIS    | Defense Industrial Security                         |
| DISA   | Defense Industrial Security Agency                  |
| DMA    | Defense Mapping Agency                              |
| DNA    | Defense Nuclear Agency                              |
| DOB    | Depth of Burst                                      |
| DoD    | Department of Defense                               |
| DOE    | Department of Energy                                |
| DPB    | Defense Policy Board                                |
| DPRK   | Democratic Peoples Republic of Korea                |
| DSB    | Defense Science Board                               |
| DSTP   | Director, Strategic Target Planning                 |
| EADSIM | Enhanced Air Defense Simulation                     |
| ECM    | Electronic Counter-Measures                         |
| EDI    | Electronic Data Information                         |
| EMP    | Electromagnetic Pulse                               |
| EPW    | Earth Penetrating Weapon                            |
| ERINT  | Extended Range Interceptor                          |
| FCO    | Force Contingency Options                           |
| FSTL   | Future Strategic Target List                        |
| FSU    | Former Soviet Union                                 |
| GBI    | Ground Based Interceptor                            |
| GPALS  | Global Protection Against Limited Strikes           |
| HEMP   | High altitude Electro Magnetic Pulse                |
| HISEMM | High altitude Optical/RF Signal Degradation Model   |
| HML    | Hard Mobile Launcher                                |
| HOB    | Height of Burst                                     |
| IC     | Integration Concept                                 |

|         |                                                          |
|---------|----------------------------------------------------------|
| ICBM    | Intercontinental Ballistic Missile                       |
| INC     | Insertable Nuclear Component                             |
| INF     | Intermediate Range Nuclear Forces                        |
| IPR     | In-Progress Review                                       |
| IR&D    | Independent Research and Development                     |
| ISP     | Integrated Security Plan                                 |
| ITEM    | Integrated Theater Engagement Model                      |
| JCS     | Joint Chiefs of Staff                                    |
| JEM     | Joint Engagement Model                                   |
| JIEO    | Joint Intelligence Estimate Office                       |
| JMEM    | Joint Munitions Effectiveness Manual                     |
| JOSDEPS | Joint Strategic Defense Planning Staff                   |
| JSCP    | Joint Strategic Capabilities Plan                        |
| JSTPS   | Joint Strategic Target Planning Staff                    |
| KBS     | Knowledge Based System                                   |
| LAMB    | Low Altitude Multiburst Model                            |
| LIAS    | Logistics Infrastructure Analysis System                 |
| LRSW    | Long Range Strike Weapon                                 |
| M3      | Multi-aimpoint, Multi-criteria, Multi-weapon code        |
| MBA     | Master of Business Administration                        |
| MCCCM   | Missile Combat Crew Commander                            |
| MDA     | Multiattribute Decision Analysis                         |
| MEM     | Multiple Engagement Model                                |
| MIA     | Master of International Affairs                          |
| MMIII   | Minuteman III                                            |
| MOASIS  | Mini Operations Analysis Strategic Interaction Simulator |
| MOE     | Measure of Effectiveness                                 |
| MSC     | Major Subordinate Command (NATO)                         |
| MSTART  | Missile System To Attack Relocatable Targets             |
| MTR     | Military Technical Revolution                            |
| NATO    | North Atlantic Treaty Organization                       |
| NBC     | Nuclear/Biological/Chemical                              |
| NCA     | National Command Authority                               |
| NDL     | National Desired Ground-Zero List                        |
| NDU     | National Defense University                              |
| NIS     | Negotiation Information System                           |
| NMCC    | National Military Command Center                         |
| NNPS    | NATO Nuclear Planning System                             |
| NORAD   | North American Air Defense Command                       |
| NPR     | National Policy Review; National Posture Review          |

|           |                                                         |
|-----------|---------------------------------------------------------|
| NPT       | Non-Proliferation Treaty                                |
| NPWG      | Nuclear Planning Working Group                          |
| NSD       | National Security Directive                             |
| NSDD      | National Security Decision Directive                    |
| NSNF      | Non-Strategic Nuclear Forces                            |
| NSSSG     | National Security Studies and Systems Group             |
| NSTL      | National Strategic Target List                          |
| NTB       | National Target Data Base                               |
| NTF       | National Test Facility                                  |
| NUWEP     | Nuclear Weapons Employment Guidance                     |
| NWDG      | Nuclear Weapon Development Guidance                     |
| NWE       | Nuclear Weapon Effects                                  |
| NWEP      | New Force Employment Policy                             |
| OASIS     | Operational Analyses Strategic Interaction Simulator    |
| OASTD(AE) | Office of the Assistant to the SECDEF, Atomic Energy    |
| OD        | Offense-Defense                                         |
| ODI       | Offense-Defense Integration                             |
| ODIOWG    | Offense-Defense Integration Opportunities Working Group |
| OPNA      | Operations, Net Assessments (DNA Office)                |
| OSD       | Office of the Secretary of Defense                      |
| OSD(P)    | Office of the Secretary of Defense, Policy              |
| OSIA      | On-Site Inspection Agency                               |
| OUSD(A)   | Office of the Under Secretary of Defense, Acquisition   |
| PD        | Probability of Damage                                   |
| PDCALC    | Probability of Damage Calculator                        |
| PEM       | Optical Nuclear Signal Degredation Model                |
| PI        | Principal Investigator                                  |
| PK        | Peacekeeper                                             |
| PKRG      | Peacekeeper Rail Garrison                               |
| PLYWD     | Precision Low-Yield Warhead                             |
| PM        | Program Manager                                         |
| PNET      | Peaceful Nuclear Explosions Treaty                      |
| POC       | Point of Contact                                        |
| POL/MIL   | Political/Military                                      |
| PSC       | Principal Subordinate Command (NATO)                    |
| PTP       | Probability to Penetrate                                |
| QRA       | Quick Reaction Analysis                                 |
| RDT&E     | Research, Development, Test and Engineering             |
| RFP       | Request for Proposal                                    |
| RISOP     | Red Integrated Strategic Operations Plan                |

|          |                                               |
|----------|-----------------------------------------------|
| RPM      | Rapid Production Model                        |
| RV       | Reentry Vehicle                               |
| SAC      | Strategic Air Command                         |
| SAC&C    | Strategic Arms Control and Compliance         |
| SAG      | Scientific Advisory Group                     |
| SAIC     | Science Application International Corporation |
| SAM      | Surface to Air Missile                        |
| SAPE     | Survivable Adaptive Planning Experiment       |
| SCC      | Standing Consultative Commission              |
| SCI      | Sensitive Compartmented Information           |
| SDI      | Strategic Defense Initiative                  |
| SDIO     | Strategic Defense Initiative Office           |
| SDS      | Strategic Defense System                      |
| SDSL     | Strategic Defense Simulation Laboratory       |
| SE       | Shielding Effectiveness; Support Equipment    |
| SELM     | Simulated Electronic Launch of Minuteman      |
| SETA     | Systems Engineering and Technical Assistance  |
| SF2      | Strategic Futures 2                           |
| SFPS     | Strategic Force Planning Support              |
| SHAPE    | Supreme Headquarters, Allied Powers Europe    |
| SICBM    | Small Intercontinental Ballistic Missile      |
| SIOP     | Single Integrated Operations Plan             |
| SLBM     | Submarine or Sea-Launched Ballistic Missile   |
| SMW      | Strategic Missile Wing                        |
| SNDV     | Strategic Nuclear Delivery Vehicles           |
| SOF      | Special Operations Forces                     |
| SOW      | Statement of Work                             |
| SPACECOM | Space Command                                 |
| SRT      | Strategic Relocatable Target                  |
| SSPO     | Strategic Systems Program Office              |
| START    | Strategic Arms Reduction Treaty               |
| STIFF    | Strategic Intelligence Forecast File          |
| STRATCOM | Strategic Command                             |
| SWPS     | Strategic War Planning System                 |
| TAD      | Theater Air Defense                           |
| TAT      | Technology Assessment Team                    |
| TDI      | Target Data Inventory                         |
| THAAD    | Theater High-Altitude Air Defense             |
| TLAM/N   | Tomahawk Land Attack Missile, Nuclear         |
| TMD      | Theater Missile Defense                       |

|          |                                                  |
|----------|--------------------------------------------------|
| TOR      | Terms of Reference                               |
| TTBT     | Threshold Test Ban Treaty                        |
| USAC&GSC | United States Army Command General Staff College |
| USASDC   | United States Army Strategic Defense Command     |
| USG      | United States Government                         |
| USPACOM  | United States Pacific Command                    |
| VN       | Vulnerability Number                             |
| VNTK     | Vulnerability Number for a degree of hardness    |
| WCCS     | Wing Command and Control System                  |
| WESCOM   | Weapon Effects on Satellite Communications       |
| WMD      | Weapons of Mass Destruction                      |

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