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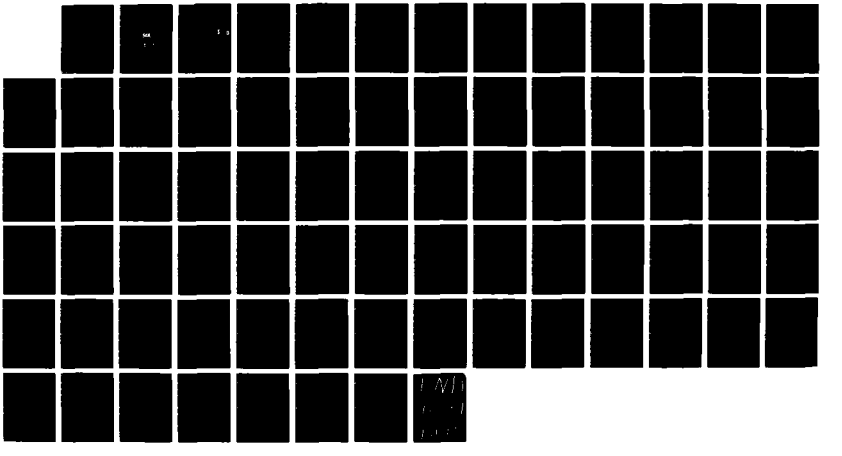

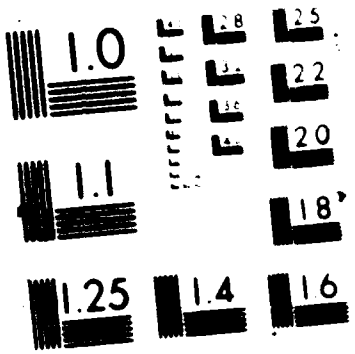
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DEVELOPMENT OF MILESTONE SCHEDULES FOR SELECTED LOGISTICS SUPPORT DIRECTORATE PROGRAMS

TECHNICAL REPORT

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DEVELOPMENT OF MILESTONE SCHEDULES FOR SELECTED LOGISTICS SUPPORT DIRECTORATE PROGRAMS

TECHNICAL REPORT

15 SEPTEMBER 1987

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"The views, opinions and/or findings contained in this report are those of the authors and should not be construed as an official Department of the Army position, policy or decision unless so designated by other documentation."

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The Logistics Support Directorate is responsible for numerous developmental programs requiring comprehensive milestone schedules to guide programs through the Army's extensive materiel acquisition cycle. Schedules are developed using micro-computers to assist Project Engineers with the management of key activities. The objective of this effort was to develop milestone schedules for selected developmental programs. Examples were generated for use by Project Engineers when they develop future milestone schedules. The document also includes examples of a data request form to extract data from Project Engineers and a user's manual for data base management.

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STUDY GIST - DEVELOPMENT OF MILESTONE SCHEDULES FOR SELECTED LOGISTICS SUPPORT DIRECTORATE PROGRAMS

PRINCIPAL FINDINGS

1. The Harvard Total Project Manager (HTPM) schedules developed to manage non-major acquisitions from start to Management Review Decision III and to account for all Acquisition Milestone Management System milestones are "used and useful" by 41% of the Project Engineers interviewed.

2. The Logistics Support Directorate (LSD) Project Management Model designed by this analysis provides an effective, acceptable management tool for directing, controlling and monitoring acquisition projects. The system needs to be completely developed before it is implemented.

3. Decisions concerning which acquisition process a program takes and acquisition tailoring appear overly decentralized.

4. A need exists to develop and use one, standardized information system that contains all the information necessary to satisfy all activities within LSD.

5. LSD personnel are not very familiar with the Army's evolving acquisition process and need continuous, periodic training to stay proficient.

MAIN ASSUMPTIONS None

PRINCIPAL LIMITATIONS None

SCOPE OF EFFORT

SAIC developed standardized event descriptions for two standard HTPM formats provided by LSD, provided examples of well developed milestone schedules for development formats normally used by LSD, developed HTPM formats for the ASAP acquisition and PIP processes, developed HTPM milestone schedules for selected projects, uploaded these milestone schedules into an R:Base System V database, and documented the results in this Technical Report. In addition, preliminary designs of a LSD Project Management Model were provided which, when fully developed, will provide an effective management tool for LSD's use.

OBJECTIVE

To develop milestone schedules for selected developmental programs within LSD. In doing this, adequate examples will be generated for use by the Project Engineers when they develop future milestone schedules.

BASIC APPROACH

1. Two LSD HTPM formats were updated to comply with current Army acquisition regulations and directives.

2. Event duration times were developed, coordinated and approved by study sponsor.

3. Two additional HTPM formats, one for the ASAP and one for the PIP acquisition processes, were developed.

4. The four standard HTPM formats were tailored to 26 acquisition projects selected by the study sponsor.

5. A database was developed using R:Base System V software to provide a means of storing and manipulating data concerning the status of acquisition projects.

6. At this point, it was determined the 26 schedules developed would not be used due to the complexity of trying to satisfy the numerous Army milestone reporting requirements. Fourteen schedules were provided by Division Chiefs in their own format to be loaded into the database for the purpose of demonstrating the Directorate's ability to monitor and present the status of assigned acquisition actions.

7. Using lessons learned in this analysis, a management model was designed that, when fully developed, can serve as an effective management tool.

REASON FOR PERFORMING THE STUDY

The Logistics Support Directorate is responsible for numerous developmental programs. Many of these programs require a comprehensive milestone schedule to guide the program through the Army's extensive materiel acquisition cycle. It is imperative that these schedules be developed expeditiously using microcomputers to assist the Project Engineer and leadership with the management of the key activities of these developmental efforts.

IMPACT OF THE STUDY

The study provides the Director an analysis upon which to develop and implement a management system to direct, control and monitor the key activities of assigned developmental efforts.

SPONSOR

US Army Belvoir Research, Development and Engineering Center.

PRINCIPAL INVESTIGATOR

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DEVELOPMENT OF MILESTONE SCHEDULES
FOR
SELECTED LOGISTICS SUPPORT DIRECTORATE PROGRAMS

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DEVELOPMENT OF MILESTONE SCHEDULES
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SECTION I: INTRODUCTION

A. Background

The Logistics Support Directorate (LSD) is responsible for over 100 developmental programs in various stages of the US Army's materiel acquisition cycle. Many of these programs are tailored to the extent that it is difficult to categorize them into specific types of acquisition processes. Three distinct acquisition cycles are currently prevailing: the traditional Research and Development (R&D) cycle normally consisting of four phases and three milestone decision reviews before the award of a production contract; the acquisition process for nondevelopment items (NDI) consisting of two or three phases and combined milestone decision reviews; and the streamlined acquisition process which is a tailored R&D/NDI process for faster acquisition. This last process, referred to as the Army Streamlined Acquisition Process (ASAP), has three distinct phases, combines milestone decision reviews, and reduces the traditional R&D acquisition time from 11-15 years to 6.5-8.5 years.

Some of the acquisition programs for which the Directorate is responsible require comprehensive planning consisting of milestone schedules and data base manipulations to guide the programs through the Army's extensive mandatory management process. In fact, any program with a requirements document must be managed to the extent that the requirements of this Army-wide management system, the Acquisition Management Milestone System (AMMS), are satisfied.

The AMMS described in Department of the Army Pamphlet 700-26 and other documents is a standard, integrated life-cycle management milestone reporting system and central data repository for recording system status in the acquisition cycle through fielding. It provides a means to assist

coordination between Headquarters, Department of the Army (HQDA) and major Army Commands that have responsibility for development, testing, production, deployment (fielding), support, and disposition of Army materiel. The US Army Belvoir Research, Development and Engineering Center (BELVOIR) falls under AMMS for acquisition management.

Under AMMS, LSD is responsible for complying with the materiel developer reporting requirements for the 181 milestones of the traditional R&D development cycle, the 155 milestones of the NDI cycle, and the 172 milestones of the ASAP cycle. LSD initiated this effort to develop a system which ensures these reporting requirements can be met consistently.

Since prime responsibility for project management is delegated down to the project engineer (PE) responsible for the development of an item of equipment, management at Directorate level, or even Division level, becomes extremely difficult without imposing some form of standardized management structure on all PEs. In an earlier effort at standardization, LSD developed a milestone management system using the Harvard Total Project Manager (HTPM) software and microcomputers which were available to each PE. The attempt was not successful because the PEs' perception was that the system was too cumbersome, did not match their particular projects and, in short, did not help them manage their projects.

A decision was made in December 1986, to develop a workable, usable management system that would be useful to both the PE and management at the same time, ensuring compliance with the AMMS reporting requirements. The new system, as provided by this task order, includes updated and upgraded versions of the R&D and NDI Category A templates previously developed by LSD and new templates detailing the ASAP and Product Improvement Program (PIP) acquisition processes. Guidance was given to tailor the templates to the individual projects rather than have the projects conform to the templates as before.

B. Objective

One objective of this effort was to develop milestone schedules for selected developmental programs within LSD and to load them into a data base with which the PEs and management could monitor project status. In doing this, adequate examples of schedules were to be generated for use by PEs when they develop future milestone schedules.

Another objective was to annotate by asterisk in the comments section of the two standard formats provided by LSD, those events which would most commonally be considered for elimination for the expeditious fielding of a LSD developmental item of equipment. In lieu of this objective, with BELVOIR's concurrence, a separate template, fashioned after the ASAP acquisition process was developed and provided as a deliverable.

C. Statement of the Problem

To develop an effective milestone management system using HTPM and R:Base System V Data base computer software that will be used by both PEs and management to assist in managing LSD's acquisition programs while ensuring compliance with the reporting requirements of the AMMS System.

SECTION II: GENERAL APPROACH

A number of sequential tasks were accomplished. First, by applying HTPM standard formats (templates) used by LSD for scheduling R&D and NDI Category A projects, each event and its related description was standardized in accordance with the requirements of Army Regulation (AR) 70-1, System Acquisition Policy and Procedures, 12 November 1986, and Department of Army (DA) Pamphlet 700-26, Acquisition Management Milestone System, 22 May 1987, which govern the materiel acquisition process.

The LSD standard formats included event duration times. The accuracy of these event duration times was further developed by coordinating this type data with the appropriate activities, divisions, and offices at BELVOIR and

the US Army Troop Support Command (TROSCOM). At this stage of the study, the LSD R&D and NDI standard templates had been coordinated and updated to comply with current Army guidance and were approved by the study sponsor. In addition, a third standard format for the ASAP acquisition process as described in AR 70-1, US Army Materiel Command/US Army Training and Doctrine Command (AMC/TRADOC) Pamphlet 70-2 and DA Pamphlet 700-26 had been developed using the previously approved event description and duration times of the R&D and NDI formats. In the course of developing these schedules, it also became necessary to design a format for a PIP. This PIP schedule was developed in a generic fashion and is included as the fourth standard format. Appendix A to this report contains the templates discussed above.

Next, PEs of 26 of the 40 projects selected by the Program Management Division, LSD, were interviewed. The purpose of these interviews was to gain familiarity with the project and to attempt to tailor one of the four standard formats to the project being reviewed. Of the 26 milestone schedules derived from this effort (provided at Appendix B), four were selected as examples of well developed milestone schedules (one for each standard format) and are available as contract deliverables. The reasons for selection are stated as shown below:

R&D: Signature Suppressed Lightweight Electric Energy Plants (SLEEP)

This program was selected because the template provides this project the tasks and milestones required through its program life in order to arrive at a production contract award. Because this project is recently defined, the template did not require extensive modifications to fit a tailored acquisition process. (Appendix B, page B-10).

NDI: Signature Suppressed Diesel Engine Driven (SSDED) Generator Sets

Although plagued with conflicting information concerning suspense dates for critical milestones and tasks, this project provides one of the best examples of a well developed schedule which could be used as a model for other PEs. A word of caution is in order, however. NDI projects being managed within LSD are extremely tailored. No two projects look alike. Accordingly, PEs should be prepared to modify the schedule to fit their own tailored NDI acquisition process. (Appendix B, page B-11).

ASAP: Free Piston Power Unit

This project has not yet started. The ASAP template was applied with excellent results: no modifications were necessary. (Appendix B, page B-9).

PIP: Lightweight Expandable Tophandler

The ASAP template was modified so that it would contain the milestones for a PIP described in AR 700-26. This became necessary when it was discovered that this project is being managed as a PIP using 6.5 funds. The critical milestones provided by the PE fit the modified ASAP template very well, providing an example of a well developed milestone schedule. (Appendix B, page B-19).

A data base was developed using the R:Base System V software and tested with four of the HTPM schedules previously developed. The purpose of this data base was to provide a means of storing and manipulating data concerning the status of acquisition actions assigned to LSD. The data base was constructed to respond to user queries and to provide a periodic reporting method of acquisition program status. The format of the data base and an analysis of its potential usefulness are discussed in Section VII.

At this point in the project, a feasibility assessment was made regarding the usefulness of the schedules developed. It was determined that the newly developed schedules were not useful due to the complexity brought about by trying to satisfy the AMMS reporting requirements. Because of this complexity, it was feared the schedules would not be used by the PE nor could it be expected that updates would be submitted routinely. As a result of the feasibility assessment, no further effort was devoted to the interactions with the PEs that would have been necessary to finalize each of the 26 milestone schedules. Instead of continuing in the same manner (contractor interacting with PEs), Division Chiefs of the Directorate were tasked to provide 14 project schedules in a format determined by the PEs that reflect acquisition activities for the next 18 months. The 14 schedules were reviewed, ensuring that standardized terms were used and loaded into HTPM and the R:Base System V data base for future use. The instructions given to the LSD Division Chiefs and an analytical description of the results obtained are at Section X. In short, this effort will permit the preparation of periodic briefings that will clearly demonstrate the

Directorate's ability to monitor and present the status of assigned acquisition actions.

In summary, the study objective was met in that milestone schedules for specified developmental programs were developed and adequate examples were generated which will prove useful to PEs as they begin planning new acquisition programs. As will be shown in this report, however, the complex initial formats developed are not useful to either PEs or management in monitoring and managing projects underway.

Using lessons learned during this effort, the framework of an LSD milestone management model was designed that, when fully developed, could serve as a useful management tool within LSD and, at the same time, ensure that all AMMS required milestones are met and properly reported.

Figure 1 on the next page is a graphic portrayal of the general approach used in this study and analysis.

SECTION III: DESCRIPTION OF THE HARVARD TOTAL PROJECT MANAGER II SOFTWARE

Two software packages were prescribed by LSD to develop a milestone schedule/management system: HTPM II and the R:Base System V Data Base Programs. This Section and the following Section provide brief descriptions of each software package.

The HTPM II system provides standardized capabilities for project planning, resource management, tracking actual versus planned progress, and production of key reports. Without a computerized, automated system, such as HTPM II, these functions are limited by the experience and time available for manual graphics and calculations by individual PEs or management personnel and the results do not provide the tool for proper management at Division and Directorate levels.

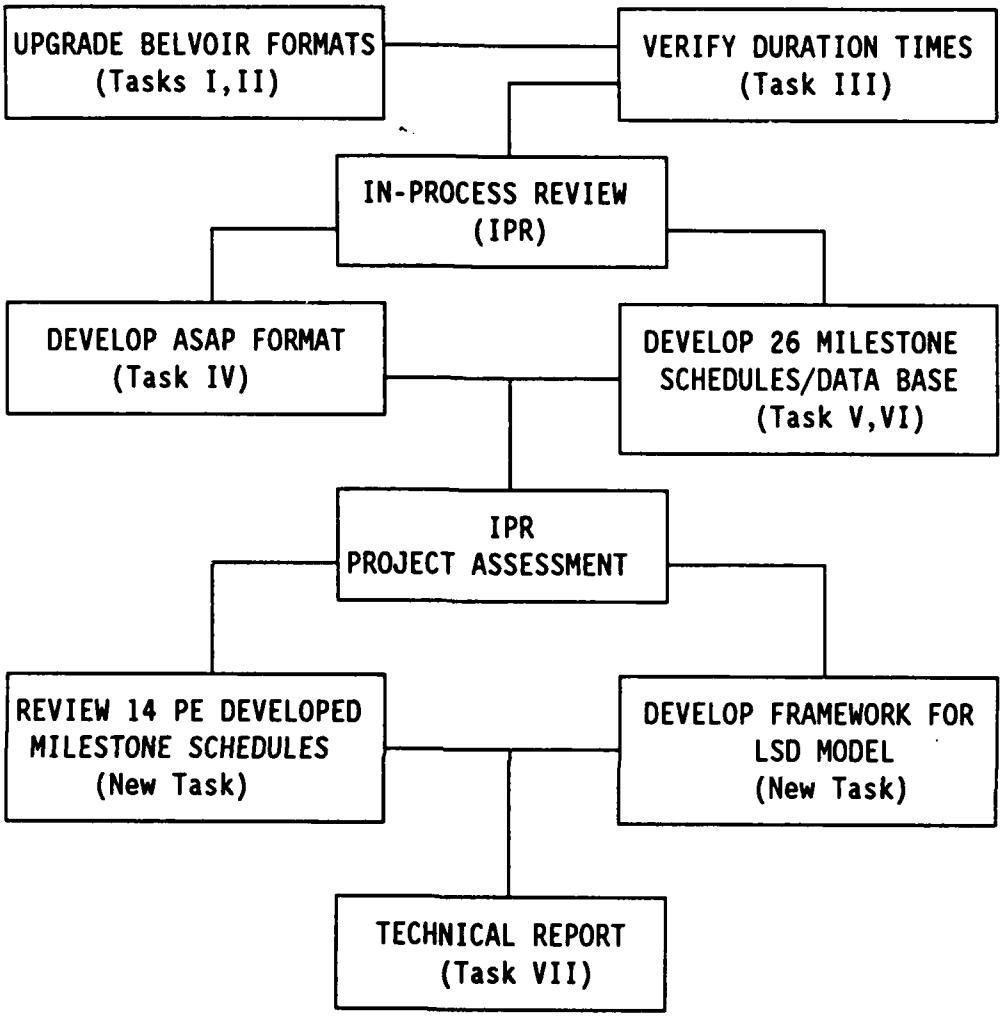


FIGURE 1. SCHEMATIC OF GENERAL APPROACH

Use of the HTPM II software requires the PE to create a project plan by considering all required activities associated with an acquisition process (R&D, NDI Category A, PIP, or ASAP) and tailoring those activities to fit the acquisition being considered. The PE has the option of adding activities not included in either AR 70-1 or DA Pamphlet 700-26 that would improve the ability to manage the acquisition process. The PE is required to establish relationships between the activities, changing the provided LSD acquisition process format, as necessary.

LSD provides resources to projects. The PE must be able to identify these available resources, such as time, people, facilities and dollars, and allocate these resources to the project tasks he/she has identified. HTPM II can assist the PE by recognizing overcommitted resources across multiple tasks and conducting automatic resource leveling efforts.

Once tasks are determined and resources have been properly allocated, HTPM II assists the PE by tracking actual completion times against projected completion times and thus allows analyses of project completion status. In this regard, HTPM II provides options for the automatic calculation of critical paths, backwards scheduling from desired project completion dates, lag relationships between tasks, integrated subproject capabilities, graphics depicting Work Breakdown Structures, and either PERT or Gantt charts. HTPM II also provides 24 standard reports, the capability to customize those reports, and the capability to export generated data in Lotus 1-2-3, dBase, and American Standard Code for Information Interchange II (ASCII) file format.

SECTION IV: DESCRIPTION OF THE R:BASE SYSTEM V SOFTWARE

A data base helps manage data and produce useful information. It provides a way of recording and storing data that a PE or manager wants to keep and consult. R:Base System V is a relational data base product that requires the design of a set of tables to store and to retrieve data easily. An R:Base data base is a collection of up to 80 of these tables. Each data base may have a combined total of up to 800 columns for all tables. For

each column, a data type is specified that tells R:Base what kind of data the column will hold, such as dates, currency or text. Columns are also available that hold a value computed from other columns. For example, if elapsed project time is stored in one column and total project time in another, a computed column can hold the percent of project completed (elapsed time/total time).

The power of R:Base System V is in the control the user has over the tables he/she creates. Data can be manipulated from one or a combination of tables in the data base. Tables can be organized so that any particular piece of information rarely needs to be entered more than once. R:Base System V allows the user to put together information from the tables so that the combined information answers questions asked of the data base. Information can be combined from several tables into one table that permanently stores the combined information. Tables can also be created that show updated information from other tables each time it is displayed.

R:Base System V is a state-of-the-art solution to data base development and management. Some of the features and characteristics that make it particularly useful to management of acquisition programs are listed below. A detailed description and analysis of the data base developed for LSD is contained in Section VII of this report.

- Program allows entry and updates on up to five tables.
- Report widths up to 255 characters and exact placement of page footings are possible.
- Easy data base definition through menu selections is allowed.
- The user can generate multi-level applications without programing.
- A full set of arithmetic, mathematical, string conversion, financial and logical functions are available.
- A "Prompt by Example" feature provides a context-driven data base query system allowing novice users to perform complex data base functions.

- Record and Playback modes allow capture of repetitive steps for later playback.

- Statistics such as average, count, minimum, maximum, standard deviation, variance and sum cross-referencing are available.

- The system is capable of being used by either single or multiple users.

- The "NOTE" data type allows up to 4,092 characters of text storage in a single data item.

- Multi-table views are available that allow inquiry into five tables with a single command.

SECTION V: DEVELOPMENT OF THE LSD TEMPLATES

Two previously LSD developed HTPM I templates served as the starting point. One template depicted the tasks, activities and milestones involved in the Program Initiation; and Concept Exploration, Demonstration and Validation, Full Scale Engineering Development, and Production/Deployment Phases of the traditional R&D acquisition process. The other modeled the Requirements and Technology Base Activities, the Proof of Principle and the Production and Deployment Phases of a NDI Category A acquisition process. The templates were very complex, outdated because some of the requirements of current Army regulations were not included, and difficult to interpret because some activities seemed out of sequence with respect to others. The objective was to ensure: 1) the templates contained all the requirements and milestones stated in current regulations and directives (AR 70-1 and DA Pamphlet 700-26), 2) the event times were accurate and were verified by appropriate BELVOIR and TROSCOM activities and offices, and 3) the event node descriptions were complete, easy to understand and contained AMMS or BELVOIR code numbers, if appropriate, assignment of responsibility for task accomplishment, and event duration times. The results are at Appendix A.

SECTION VI: MILESTONE SCHEDULES: DEVELOPMENT AND ANALYSES

The original task order directed that milestone schedules be developed for 40 projects within LSD. As discussed earlier, a feasibility assessment

conducted after the first 26 schedules were completed concluded that fitting the HTPM templates to acquisition programs already underway resulted in complex, complicated project management schedules that would be neither used nor useful to the PEs and LSD management personnel. This Section of the report provides a short description of the first 26 projects to which a HTPM template was applied. Problems associated with that effort are discussed. The HTPM schedules associated with each project are provided in hard copy at Appendix B. Computer diskettes will be provided by separate correspondence to the Technical Point of Contact. PE attitudes toward use of HTPM and R:Base System V are summarized in the Issues Section of this report.

A. Power Conversion and Distribution Division Projects

1. 2 KVA Power Conditioner Module. This program combines the Concept Exploration and the Demonstration/Validation Phases and several events of the Full Scale Development Phase of the R&D acquisition process to shorten the time for fielding and reduce the cost of development. This tailored acquisition process is further characterized by integrated Technical and User Tests leading to a combined Milestone Decision Review (MDR) II/III.

The ASAP template was selected as a "best fit" for this tailored acquisition program. Extensive rearrangement of the template was necessary to accommodate the combined MDR II/III. (The ASAP process suggests a combined MDR I/II). Program execution since its inception in June 1980, resulted in the completion of many tasks out of order with the sequence of tasks contained in the template, causing further rearrangement. Additional fitting of the template to this project is necessary to make it a useful management tool for the PE. The project may be so tailored that the template will serve no useful purpose or the cost in time expended to make the template fit may exceed the utility of the effort.

The Power Conversion and Distribution Division Chief selected this project as one of two schedules his division submitted after the feasibility assessment. A comparison of the latter simplistic schedule at Appendix C with the same 18 months' activities on the schedule prepared with the fitted

template at Appendix B, illustrates clearly the degree of detail found useful by the PE and the tremendous complexity of the first effort.

2. 6 KVA Power Conditioner Module. The Power Conditioner Test Integration Working Group (TIWG) that met in September 1985 combined the 2 KVA and 6 KVA power conditioner programs for all deliberations. Although the Integrated Logistics Support Management Team (ILSMT) decided to continue to manage each program separately, the tailored acquisition process described above for the 2 KVA power conditioner also applies to the 6 KVA version, except that the 6 KVA program lags the former by five to six months. For the purposes of this study effort, the 2 KVA HTPM schedule discussed above was used to develop the HTPM schedule for this project. The same problems previously discussed with the 2 KVA version also apply here.

3. PATRIOT - EPU II. This project provides a good example of the peculiarity of LSD projects compared to major acquisition actions. For example, approval to design and build the item was given by the Project Manager for the PATRIOT system in October 1984. The design was completed by October 1985 and the first prototype was built. Since then, approximately 129 units have been built and fielded. Deliveries are scheduled through February 1993. Testing is currently being done, even though the First Unit Equipped Date (FUED) has already occurred. Program documentation and Integrated Logistics Support (ILS) management were accomplished by a contractor. A modified ASAP template was fit to this project with marginally acceptable results.

4. Regency Net (20 KW Power Unit). Direction to type classify this item was given on 25 February 1987. This is a fast moving developmental program with a FUED of 30 November 1987. As a NDI item, a tailored acquisition strategy is planned that eliminates the need for MDRs I and II and many of the activities leading up to those milestones. The major items of this power unit are already in the Army inventory. The program is currently heading for a MDR III decision on the way to being type classified.

This program is a part of the larger Regency Net System. As such, many of the acquisition tasks and AMMS milestones and the LSD templates were not applicable to this project. The PE is using an abbreviated HTPM schedule of his own to manage his program. Although useful to the PE, the schedule would not contribute much information to the data base used by management personnel because the critical tasks selected by the PE are not the same as the critical tasks selected by LSD management personnel.

5. Suppressed Tactical Army Generator (STAG). STAG is a technology demonstration project funded with 6.2 funds. The goal of the program is to study the feasibility of providing sound, radar, and infrared suppression together with chemical, biological, electromagnetic pulse, transient radiation electromagnetic effect, and blast protection for certain tactical Army generators. It is not a developmental program that falls in any category supported by the LSD templates. AR 70-1 and DA Pamphlet 700-26 do not seem to apply. STAG is basically a test program with well defined tasks and milestones.

The HTPM schedule included in Appendix B was developed without benefit of a template, but with the excellent outline of tasks, milestones and completion dates provided by the PE. The PE will not require an extensive data base to assist him in managing this program.

6. Vehicle Under the Hood Power (UHP) System. UHP is a NDI Category B acquisition tailored to include only the activities and milestones associated with the Concept Exploration Phase and the Production and Deployment Phase. The item will not be type classified. Subject to an affirmative decision at a special IPR, the production contract for the UHP will be awarded during FY87 to ensure a fielding in the second quarter, FY90.

Due to the uncertainties and rapid changes that characterize the UHP acquisition, an HTPM schedule based on the NDI template would be of minimal use unless there existed a means of continual updates. Use of the NDI Category A template was extremely difficult because of the large degree of

tailoring of this project to the NDI Category B acquisition process. The UHP project is an excellent example of a project that could be managed by an HTPM schedule created specifically for the project. The template was of little use.

B. Environmental Control Division Projects

1. 250,000 BTUH Self-Powered Multi-Fuel Army Space Heater (SMASH). SMASH is a NDI Category A acquisition requiring no significant research, development or testing. Acquisition actions for this item began in 1973. Since then, at least two requirement reviews and program redirections have occurred. The current acquisition effort began in December 1985. Work is now in progress to establish evaluation criteria by feasibility and suitability testing of heaters procured from interested, qualified manufacturers. The severely tailored acquisition, consisting only of a stylized Development/Validation Phase and a Production/Deployment Phase, planned a MDR III milestone in September 1987, a production contract award in June 1988, and a FUED in August 1989.

Even though this project is a NDI Category A acquisition, it has proven difficult to schedule by attempting to fit the NDI template to it because of its maturity and extreme tailoring. The PE is very comfortable working with HTPM and has developed and successfully uses his own HTPM schedule. His schedule contains the same tasks and milestones as contained in the template, although not nearly as many. Understandably, he is reluctant to forego his workable, useful management tool for the more complex schedule developed with standardized tasks and titles. Standardization would be necessary before entering his project data into the data base.

2. Combat Vehicle Environmental Support Systems (CVESS). CVESS is a 6.2 funded feasibility testing program for an item that will be a subcomponent of a combat vehicle system. Requirements documentation and program documentation have not been required. AMMS milestone reporting is not necessary and the LSD templates are not applicable to this project. The PE is presently using his own HTPM developed schedule and believes it to be

a useful management tool. This schedule is contained in Appendix B and has been revised by standardizing the titles of tasks and milestones and adding appropriate milestones from the template. A comparison of this schedule with the LSD templates (developed in coordination with and concurred in by the support divisions and offices of the BELVOIR community) highlights the complexity of the templates and the simplicity of the individually prepared schedules. For the same time period, the PE proposed to manage his project with 170 tasks and milestones as compared to more than double that in the LSD template. The contrast is significant and suggests that a model representing the "middle road" be developed.

3. Free Piston Power Unit. This project has not yet started. The PE is very enthusiastic about using a HTPM generated schedule to alert him to tasks and milestones of which he is not cognizant. He also discussed using the schedule and its accompanying data base to know when and with whom he was to interact from other activities. The only planned date the PE knew he was to meet was the contract award date. The ASAP template was applied to this project with excellent results.

C. Power Generation Division Projects

1. Signature Suppressed Lightweight Electric Energy Plants (SLEEP). A technology base assessment and risk analysis is currently being conducted to determine the feasible technical characteristics of SLEEP. A tailored acquisition process has not been determined in order to meet a June 1994 production contract award. SLEEP appears to be in the Concept Formulation phase of a traditional R&D acquisition process. Accordingly, the LSD R&D template was applied to this project.

This project provides a good example of how the LSD templates can best be used. SLEEP is in an early developmental stage. The PE is in the process of defining the direction of the project. The template provides an excellent management tool that informs the PE of the tasks and milestones he should meet to arrive at a production contract award. Further, HTPM will

compute for him the suspense dates for each task in order to be able to award the contract in 1994 as planned.

2. Signature Suppressed Diesel Engine Driven Generator Sets. Information received from the PE and ILS Manager indicates this project is following a NDI Category B acquisition cycle with type classification and a production contract award scheduled after a February 1988 IPR. A combined MDR I/II was held in November 1983. This contradicts information contained in a draft Acquisition Strategy dated 30 May 1987. According to this document, the February 1988 review will be held to type classify the Purchase Description following which, prototypes will be produced for testing. MDR III, according to this Acquisition Strategy, is scheduled for 2QFY90. The HTPM schedule in Appendix B was generated using a modified NDI template with data received from the ILS Manager.

This project illustrates the inconsistencies resulting from multiple information sources who have updated their information on different dates. It supports the concept of a central data base from which all reports are derived that serves both PEs and management.

3. Commercial Generator Set Assemblies (CGSA). CGSA was directed to expedite the provision of quiet and reliable generator sets to Corps and Division tactical headquarters. In order to accelerate the acquisition of this item, it was categorized as a Limited Production-Urgent item and a combined MDR I/III was targeted for February 1988. Type classification is also scheduled at that time.

The NDI template had to be extensively modified to model the acquisition of this project. This modification was required in order to properly depict this accelerated NDI program. Many special tasks and milestones described during the interview with the PE and listed in the program management documentation were added to the schedule in order to characterize properly the history and future of the program.

4. 3 KW Free Piston Stirling Generator Set. The prototype contract for this item was awarded on 26 September 1984. The prototype testbed was delivered to BELVOIR in April 1987. Testing is scheduled through the combined MDR I/II in October 1989. MDR III is currently scheduled for July 1992 in preparation for an October 1992 production contract award. The ASAP template was applied to this program because of the plans for a combined MDR I/II.

Development of the 3KW Stirling Generator Set program schedule posed few problems. In spite of the 1984 start date, this program is still in the early stages of development and the ASAP template was relatively easy to fit. Anticipated milestone dates were based upon the LSD approved event duration times.

D. Mechanical Equipment Division Projects

1. ARAPAHO. ARAPAHO is a traditional R&D project currently in the Concept Exploration Phase. The MDR I decision to move to the Development and Validation Phase is scheduled for January 1988. A combined MDR II/III will move the project directly into Production and Deployment in June 1992, bypassing the Full Scale Development Phase.

The PE uses a HTPM generated schedule that she periodically updates to manage her project. She is comfortable using the software and finds it very useful. She is rather skeptical that the schedule generated by this effort will be more useful to her if the new schedule contains standardized titles unfamiliar to her. Her concern is valid. However, if she should be reassigned and a new PE given responsibility for the project, that person would probably have more difficulty using her schedule than one with standardized titles.

The ARAPAHO schedule at Appendix B is the PE's schedule with standardized titles. Tasks and milestones added by the PE outside the AMMS scope were left unchanged.

2. Authorized Stockage List (ASL) Van. This is a tailored NDI acquisition with a combined MDR I/III scheduled for January 1990. The bulk of the program data was derived from program management documentation provided by the PE. Tailoring the NDI template to accommodate an MDR I/III event presented problems because of difficulty in merging the tasks associated with an MDR I with the tasks leading to an MDR III.

3. Electric Pneumatic Tire Forklift. This project is programmed as a NDI procurement. No formal Technical and User Testing is planned since the candidate item will be off-the-shelf and used in an environment similar to commercial use. The key milestones for the program are a limited Technical Feasibility Test, a combined MDR I/III, type classification, First Article Test and FUED. A modified NDI template was used to generate the schedule found at Appendix B.

The team chief associated with this project was very supportive. He was excited about developing a new detailed HTPM schedule that could be used as a checklist of required actions and suspenses for those actions. He intends to use the schedule to brief the Joint Working Group to indicate to them how long it is going to take to complete the project.

4. Graves Registration Support Equipment (GRREG). GRREG is another NDI procurement project being managed by the same PE responsible for the ASL Van discussed above. Like many of the LSN projects, this program is directed at type classification via a combined MDR I/III scheduled for January 1988. Most of the data used to develop the schedule came from program documentation provided by the PE. Program execution to date has been out of sequence with regard to the AMMS milestones contained in the NDI template because of the tailoring required to work toward a combined MDR I/III rather than a combined MDR I/II. Because of this, the developed schedule in Appendix B requires more work to be considered as a useful management tool.

5. Intra Installation Ammunition Transporter (IIAT). The IIAT Acquisition Strategy closely approximates that depicted by the NDI template. BELVOIR has primary responsibility for project management through the Proof

of Principle Phase culminating with type classification at the MDR I/III. Prime responsibility then shifts to the US Army Tank and Automotive Command (TACOM) for the Production and Deployment Phase.

In this case, the PE's project completion dates were inserted into the NDI template and produced negative slack or an indication that actions could not be accomplished on time as planned. If the PE were to input only the most critical date(s) and direct HTPM to compute the remaining dates, he could then compare his planned dates with the computed dates and determine the areas where management decisions would be required. He could allocate mores resources to task completions or change the target dates of critical events to eliminate the negative slack. The resultant schedule with negative slack portrayed was selected for inclusion in Appendix B.

6. Lightweight Expandable Tophandler. This project is being managed as a PIP using 6.5 funds in FY87, switching to Operations and Maintenance Appropriations in FY88. Critical milestones identified by the PE are: TRADOC Concept Evaluation Phase (CEP) Testing; CEP Test Report completion; approval of the Independent Evaluation Report (IER); approval of the TRADOC Feasibility Study; Operational and Organizational (O&O) Plan preparation; approval of the Acquisition Strategy; PIP preparation; follow-on PIP evaluation; and a FUED of March 1990. The project may be terminated.

The ASAP template was modified so that it would contain the milestones for a PIP as described in DA Pamphlet 700-26. Following this modification, specific tasks described in the program description, contained in the milestone list, and described by the PE were added to the schedule.

The modified ASAP template is enclosed at Appendix A as a PIP template. The modified template with the PE's planned additional tasks to acquire the Lightweight Expandable Tophandler is at Appendix B.

7. Universal Self-Deployable Cargo Handler (USDCH). The USDCH can be categorized as a streamlined acquisition with a combined MDR I/II targeted for September 1989 and MDR III planned for 2QFY93. Information received

from a milestone schedule prepared by the Directorate of Product Assurance and Engineering indicates the program is in its early stages, dating back to August 1985 when a final draft O&O Plan was circulated by TRADOC. The ASAP template was used to model the acquisition process.

The PE appeared to have used neither the quality assurance milestone schedule nor the HTPM schedule prepared last year for managing his project. He had not had the opportunity to contribute to the development of either document. This circumstance supports the discussions that subsequently took place during IPRs on this effort, that, in order for the schedules to be used and useful, the PE must be a major contributor to their development.

8. Rough Terrain Container Straddle Truck (RTCST). The RTCST is following a tailored ASAP acquisition cycle for non-major system development. Its acquisition strategy follows the streamlined approach described in AR 70-1, consisting of a Proof of Principal Phase followed by Development Prove Out and Production Phases. As a non-major development item, decision making is at the IPR level versus the more formal MDRs. Attempts were made to fit the ASAP template to the project with limited success. The tasks and milestones defining the project comprise elements of the ASAP, NDI and parts of the R&D templates. In addition, the dates of task accomplishments and milestones provided by the PE caused negative slack problems. Much more work is needed to fit one of the four LSD templates to this project. The results of the feasibility assessment precluded this work from being done.

The HTPM schedule developed last year does not reflect this project accurately and is considered too difficult to use efficiently. Further, because of the uncertainties involved in projecting completion dates so far in the future, the utility of a schedule that programs milestones to project completion is questionable. Such a schedule adds unnecessary complexity and contributes to the difficulty of using the schedule effectively.

9. TRIDENT II Boxcar. This high visibility project is a Navy acquisition action. Neither the PE nor the ILS manager believe that AR 70-1

and DA Pamphlet 700-26 are applicable. A review of the data provided by the PE supports this belief because there is little correlation between the AMMS milestones and those milestones the Navy considers critical and necessary. The HTPM schedule developed for this project was made without regard to the AMMS requirements and reflects the milestones currently being used by the PE.

10. Unit Basic Load - Upload Equipment (UBL-UE). This project is highly tailored, consisting of only the Proof of Principal and Production and Deployment Phases. MDR III is not required because the items involved will not be type classified. An attempt was made to fit an ASAP template to the project. Subsequent coordination with the PE indicated that the resulting schedule was too complex for him to use. Part of this complexity was due to the fact that five sub-projects constituting the upload equipment being developed were fit into one schedule. The second schedule was developed without use of a template, but included AMMS milestones, standardized titles and task completion dates provided by the PE. Acceptability of this second schedule to the PE was not determined due to task order redirection by the sponsor which precluded further work on this schedule.

E. Marine Division Project: Large Tug. The Army Large Tug is an example of a mature and apparently successful acquisition program. It successfully completed MDR III and was type classified in March 1987. It is currently in the Production and Deployment Phase of the NDI acquisition cycle. The production contract award is scheduled for September 1987.

Due to the tailoring involved with this project, the Production and Deployment Phase of the traditional R&D template best fit and was consequently used to develop the HTPM schedule. Problems were encountered loading the dates of task accomplishments provided by the PE because of the task default times contained in the template. These times may not reflect actual times required - some appear too short, others too long. A relook by the LSD staff may be appropriate.

F. Fuel and Water Supply Division Projects

1. AAFARS/HEMMT Refueling Kit (ARRES). This project is being driven by an Expedited Essential Required Operational Capability (EEROC). It has been streamlined by eliminating and merging many tasks and milestones and accelerated by intensive management and reduction of normal task completion times. Fundamentally, it is a NDI program. Development of the HTPM schedule involved merging sections from each template in an attempt to model the highly tailored acquisition strategy. Templates proved of minimal use with a project of this type. The HTPM schedule should have been built without use of a template.

2. Water Quality Analysis Unit - Purification. This traditional R&D program passed a combined MDR I/II in January 1986. MDR III is scheduled for January 1988 with a FUED on 30 September 1988. The Full Scale Development and Production/Deployment Phases of the R&D template were used, tailoring the tasks and milestones to conform as best as possible to the tailored acquisition strategy.

The Milestone Status Report (MSR), prepared by TROSCOM and available on request by any PE, was used to identify AMMS milestones applicable to this project. It is interesting that the dates entered in the MSR required several tasks to be performed in duration times inconsistent with those of the approved templates. These problem areas were noted and presented to the PE together with a newly developed HTPM schedule.

SECTION VII: DATA BASE: DEVELOPMENT AND ANALYSIS

A. Discussion. The Program Management and Monitoring Data Base System is made up of two distinct parts: (1) Program Management and Monitoring Data Base and (2) Program Management and Monitoring Data Base Query System (MS). The Program Management and Monitoring Data Base provides the managers of LSD a tool with which they can monitor and manage all assigned projects. This data base includes a menu driven query and reporting system helpful to persons unfamiliar with R:Base System V or data base systems in general. MS

is a set of application programs that actually perform the queries.

B. Development. The Program Management and Monitoring Data Base contains data obtained from program schedules developed using HTPM (versions I and II). For each project in the data base, the following data have been gathered: project name; acronym; proponent school; Project Management System (PMS) number; project description; PE's name, office symbol, and office telephone number; type of program; type of funding; funding level for the current fiscal year; HTPM program schedule (yes/no); date the HTPM program schedule was last updated; and HTPM schedule data.

The HTPM schedule data were converted to a format compatible with R:Base System V (-DIF file format for HTPM I and delimited ASCII for HTPM II). This data was then loaded into the data base using FILE GATEWAY, a data conversion system available in R:Base. MS was developed in R:Base System V command language. The Programs Management Division chose a set of queries providing an accurate measure of the effectiveness of a complete management/reporting system. MS was designed around these queries and provides a limited querying capability to users unfamiliar with the data base or the operation of R:Base System V. The following types of queries may be answered using the query program:

-- Find the PMS number of a particular project.

-- For a particular PMS number, display completed tasks and milestones.

-- For a particular PMS number, display tasks and milestones which are not applicable.

-- For a particular PMS number, display tasks and milestones which are still to be completed.

-- For a particular PMS number, flag tasks which are behind schedule.

-- For a particular PMS number, flag milestones which have been missed.

-- For a particular PMS number, flag milestones occurring between two dates.

-- For a particular PMS number, report the current status of AMMS and BELVOIR milestones.

-- Display a list of programs which are behind schedule.

-- Display the dates when each schedule was updated.

-- List PMS numbers for programs whose names contain STRING.

-- Across all programs which milestones are expected between two dates.

-- Which projects are funded between some minimum and maximum dollar values this fiscal year?

MS will find the programs meeting the condition chosen. The user is given the option of where the output is to be written, either to the screen, a data file, or the printer. In order to operate MS, a copy of R:Base System V and the Program Management and Monitoring Data Base is required. R:Base requires an IBM PC or PC-compatible computer with 540 kilobytes (Kb) of random access memory (RAM), a fixed hard disk, and the Microsoft Disk Operating System (MS-DOS) version 3.1. The projects presently in the data base require 1,000 Kb of disk space. The data base will occupy more space as projects are added.

Table 1 contains the name of each program currently in the data base and its associated PMS number sorted by the program name. These numbers were assigned by LSD personnel. Tables 2 and 3 list the data base entries for TRADOC proponents and types of programs respectively. The names of the PEs assigned to LSD and contained in the data base are shown at Table 4. Table 5 is a list of tables contained in the data base. Tables 6-8 describe the columns contained in each table within the data base.

C. Analysis. The success of the data base designed by this effort is dependent upon the data submitted by PEs through the HTPM schedules they prepare. If the PEs are not very well familiarized with the Army's acquisition process or how their schedules affect AMMS and other reporting systems to which LSD is responsible, there is a high probability that the data will be inadequate or incomplete. For the most part the PEs understand what is required of them; missing is their understanding of the other LSD

TABLE 1.
ACQUISITION PROGRAMS IN THE DATA BASE

PROGRAM NAME	PMS#
2KVA POWER CONDITIONER	143
15 AND 30 KW NOISE KITS (ACOUSTIC SUPPRESSION KITS)	740
COMBAT VEHICLE ENVIRONMENTAL SUPPORT SYSTEM	65
DISTRIBUTION/ILLUMINATION SET, ELECTRICAL	371
FIELD HOSPITAL UNIT SYSTEM	798
HI TECH REVERSE OSMOSIS WATER PURIFICATION UNIT	832
MODULAR BASE PETROLEUM LABORATORY	821
ELECTRIC GUN (PULSE POWER)	793
ENVIRONMENTAL CONTROL/CB PROTECTION	372
M113 ELECTRIC DRIVE PROJECT	159
REGENCY NET POWER UNIT PROGRAM	685
PULSE POWER	29
TOTAL ENVIRONMENTAL CONTROL SYSTEM	531
TRIDENT II BOXCAR	88
UNIT BASIC LOAD - UPLOAD EQUIPMENT	403
UNIVERSAL SELF DEPLOYABLE CARGO HANDLER	722

TABLE 2.
TRADOC PROPONENT DATA BASE ENTRIES

SCHOOL	DATABASE ENTRY
US Army Signal Center and School	ACS
US Army Armor Center and School	ARMC
US Aviation Center and Fort Rucker	AVNC
US Army Aviation Logistics and Transportation School	AVNLOG
US Army Combined Arms Center and Development Activity	CACDA
Customer	CUSTOMER
US Army Engineer School	ENS
US Army Infantry School	IS
US Army Ordnance Missile Munitions Center and School	OMMCS
US Army Quartermaster School	QMS
US Army Training and Doctrine Command	TRADOC
US Army Transportation School	TRANS
US Army Ordnance Center and School	ORDCS

TABLE 3.
PROGRAM TYPE DATA BASE ENTRIES

PROGRAM TYPE	DATABASE ENTRY
Contract Support	CNTR SUP
Customer	CUSTOMER
Engineering Support	ENGR SUP
Nondevelopment Item	NDI
Product Improvement Program	PIP
Production Support	PRODUCTN
Research, Development, Test, and Evaluation	RDTE
Technology Base Research	TECH BSE
Value Engineering	VE

TABLE 4.
PROJECT ENGINEERS IN THE DATA BASE

PROJECT ENGINEER
ADAMS, A.
ANDERSON, J.
ARNOLD J.
BAGWELL, T.
BOYNTON, M.
BROWNE, C.
CERAMI, S. J.
CLARK, H.
COLEMAN, A. J.
COOMBE, H. S.
CZUL, E.
DAVID, B. J.
FAEHN, D.
FAIR, H.
HALL, J.
HENNIGER, R.
KRAWCHUK, D.
LINDLEY, W.
MCKENNA, A.
MOYER, S.
NAWROCKI, S.
NEWMAN, M.
PERDUE, W.
PERKINS, J. T.
POLLOCK, D.
PROPST, P. L.
REASE, H.
RHODES, R.
RUSSELL, E.
SANTIAGO, M.
SGROI, T. J.
SHIVELY, P. D.
SMITH, D. C.
SOUSK, S. F.
STRANDELL, J.
TASCHEK, W.
VAUGHN, D.
WERSHING, J.
WINFREY, E.
WONG, D. Y.

TABLE 5.
TABLES IN THE DATA BASE

FORMS	The table of forms used by the data base.
REPORTS	The table of reports used by the data base.
ASAP	The table containing the description of tasks and milestones used in the standard Army Streamlined Acquisition Process (ASAP) templates.
NDI	The table containing the description of tasks and milestones used in the standard Nondevelopment Item (NDI) templates.
R&D	The table containing the description of tasks and milestones used in the standard Research, Development, Test, and Evaluation (RDTE) templates.
PROGRAMS	The table containing the background data for the programs within the data base.
AMMS-DAT	The table containing the HTPM data for the AMMS and BELVOIR milestones in schedules previously developed by the Project Engineers.
ROADMAPS	The table containing the HTPM data for the tasks and milestones used in the schedules developed by the Project Engineers.
INPUT	The table used for inputting the HTPM schedules when the data is in -DIF format.

TABLE 6.
COLUMN DESCRIPTIONS
ASAP, NDI, AND R&D TABLES

COLUMN NUMBER	NAME	TYPE	DESCRIPTION
1	TASKNAME	TEXT	The name of the node from the standard schedules (i.e., ASAP, NDI, R&D).
2	SCHEDULE	TEXT	The name of the HTPM project schedule that this task belongs.
3	CODE#	TEXT	The code associated with the task or milestone (i.e., AMMS, BELVOIR).
4	RESPONSI	TEXT	The organization/person responsible for the completion of the task or milestone.
5	WORK_DAY	DOUBLE	The planned duration of the task.
6	DESCRPTN	TEXT	Description field from the node in the standard schedule.
7	PROJ-NUM	INTEGER	The level of the schedule within each acquisition type.

TABLE 7.
COLUMN DESCRIPTIONS
PROGRAMS

COLUMN NUMBER	NAME	TYPE	DESCRIPTION
1	ITEM	TEXT	The name of the program.
2	PE	TEXT	The name of the Project Engineer.
3	ACRONYM	TEXT	The program acronym.
4	SCHOOL	TEXT	The proponent School.
5	PMS#	REAL	The unique program identification number.
6	DESCRIPT	TEXT	A brief description of the program.
7	OFF.SYM	TEXT	The office symbol of the Project Engineer.
8	PE.PHONE	INTEGER	The Project Engineer's office phone number.
9	TYPEPROG	TEXT	The type of program (i.e., RDTE, NDI).
10	TYPEFUND	TEXT	The type of funding (i.e., CUSTOMER, OMA)
11	FNDLEVEL	CURRENCY	The level of funding for this project during this fiscal year.
12	MEMO	TEXT	Notes about this program.
13	MS-CHRT	TEXT	Is there a milestone chart, [Y]es or [N]o?
14	UPDATED	DATE	The date when the milestone chart was last updated.
15	IN-DB	TEXT	Is this milestone chart in the data base, [Y]es or [N]o?
16	SCRATCH	TEXT	A scratch field used during queries as a flag.

TABLE 8.
COLUMN DESCRIPTIONS
ROADMAPS

COLUMN NUMBER	NAME	TYPE	DESCRIPTION
1	PMS#	INTEGER	The program identification number.
2	TASKNAME	TEXT	The name of the node from the schedule.
3	DESCRIBE	TEXT	Description field from the node in the schedule.
4	PLAN-DUR	REAL	The planned duration of the task in work days.
5	ACT-ST	DATE	The actual start date of the task, if the task is being performed.
6	ACT-FN	DATE	The actual finish date of the task, if the task has been completed.
7	ACT-DUR	REAL	The actual number of days it took to complete this task.
8	EARLY-ST	DATE	The earliest date that this task can begin.
9	EARLY-FN	DATE	The earliest date that this task can be completed.
10	LATE-ST	DATE	The latest date that this task can begin.
11	LATE-FN	DATE	This is the latest that this task can be completed and maintain the schedule.
12	PLAN-ST	DATE	The date that the Project Engineer plans to start this task.
13	PLAN-FN	DATE	The date that this task will be completed based upon the planned start date and the planned duration.
14	COMPLETE	REAL	The completion percentage.
15	SLACK	REAL	The number of days available before the task becomes critical. (Tasks on the critical path have 0 slack.)
16	CODE#	TEXT	The code associated with the task or milestone (i.e., AMMS, BELVOIR)
17	RESPONSI	TEXT	The organization/person responsible for the completion of the task.
18	SCHEDULE	TEXT	The name of the HTPM project schedule that this task belongs.
19	SCRATCH	TEXT	A scratch field used during queries as a flag.
20	SCRATCH2	TEXT	A scratch field used during queries as a flag.
21	X	REAL	A scratch field used during queries as a computation field.
22	Y	REAL	A scratch field used during queries as a computation field.
23	Z	REAL	A scratch field used during queries as a computation field.

and BELVOIR/Army activities. Provided with this knowledge the PEs will be better able to schedule their programs and positively influence program events.

SECTION VIII: ISSUES

During the development and upgrade of the LSD, ASAP, and PIP templates and the subsequent interviews with many of the PEs, several issues were raised regarding HTPM as a useful acquisition process management tool for the LSD community. This Section of the report summarizes these issues and leads to a discussion of the program feasibility assessment resulting from a series of Government/contractor meetings in June and July 87.

Army regulations and directives that require and define a milestone management system appear to be directed toward major item acquisitions. LSD, with few exceptions, is responsible for non-major acquisitions or developmental programs that are part of larger acquisition projects. Some of LSD's projects are testing protocols rather than acquisition actions. All of LSD's acquisition programs analyzed in this effort are highly tailored to take advantage of specific, approved procurement "short-cuts" designed to significantly reduce development time and costs. No two projects are designed alike in their acquisition strategy. The consensus of the PEs interviewed in this effort is that scheduling with HTPM takes inordinate time and work and it is not always possible to fit the myriad of diverse developmental programs underway at LSD to a rigid standardized format. This effort attempted to reverse the procedure and tailor the templates to the individual projects, hopefully reducing the work and time involved. It was successful to varying degrees depending on the complexity of the project and how far along it was in the acquisition cycle.

The HTPM templates model the acquisition process from the project initiation through the award of the production contract following a MDR III. This lengthy model is appropriate and useful to the PE only as an initial planning step before any attempt is made to tailor the acquisition process. Once the project is underway or the process has been tailored, the

template tends to become less effective and consequently, less useful. In addition, the PE is knowledgeable and fairly certain of events and activities concerning his/her project out to a maximum of 18 months to two years. Beyond that time, activity start dates are often unknown and the PE is forced to resort to estimates or rely on the start dates computed by the standard event duration times developed as part of this analysis.

In addition to being too long, the HTPM schedules are probably too wide in scope. Recognizing that the management philosophy within the LSD community places primary responsibility for project management on the PE, the templates still require data that he/she reasonably could not be expected to provide. Attempts to capture all of the AMMS milestones contained in DA Pamphlet 700-26 are the main cause of this problem. The HTPM templates contain events/activities/milestones that are the responsibility of agencies other than the materiel developer with whom the PE has no direct or indirect communication. Yet the templates tie these into activities for which the PE is responsible such that dependent relationships are formed. The PE thus finds the activities for which he/she is responsible being influenced by actions unrelated to the sphere of his/her daily business.

Rather than completing tasks sequentially or in a logical pattern, PEs tend to accomplish those planning, procurement and testing functions in response to requests or directions from supporting staff agencies. In addition, actions with which the PEs are not familiar are sometimes delayed until the PE learns enough about the action to complete it. One PE, for example, was familiar with an old format for completing an Acquisition Strategy and prepared one accordingly. The document was reviewed by members of a TIWG and received the necessary concurrences. After the project had progressed far down the road to MDR I/III, a BELVOIR staff office requested the document be rewritten in accordance with the new format, adding a section on total life cycle competition strategy. This further reduces the effectiveness of templates that schedule tasks in a logical format.

A working knowledge of the Army's evolving acquisition processes is absolutely necessary if the HTPM templates are to be used and useful as a management tool. The templates only provide a roadmap to follow through the acquisition process. If the PE does not understand the purpose of the activities and milestones within those roadmaps and how to accomplish those activities, the templates will have little meaning to him and, in fact, will tend to overpower him. With few exceptions, the PEs interviewed admitted a lack of understanding of the entire acquisition process as outlined by the templates.

The developmental projects planned and ongoing at LSD are probably atypical of the major acquisitions for which the AMMS milestones contained in DA Pamphlet 700-26 were designed. Many of the AMMS milestones do not seem to apply to the tailored acquisition processes characteristic of LSD projects. For this reason, the application of the HTPM templates to specific LSD projects met with varying degrees of utility as a management tool. A few of the 26 projects, such as CVESS, STAG, GRREG, and Regency Net were so elementary as to have little relationship to the templates. On the other hand, a few of the projects, such as SLEEP, were in the beginning stages of planning and the templates were very useful and applicable.

During the course of this analysis, it was discovered that several agencies/offices had their own milestone management data bases that were used to guide them through their acquisition responsibilities. Systems apparently exist in the ILS Division, the Quality Assurance Division, the Procurement Division and others. Each office relies, in part, on input from the PE to keep these systems current. The PE thus finds himself responding to numerous management information systems, none of which directly serve him, but serve instead, the numerous support divisions in the BELVOIR community. Besides the inefficiencies that result from this type operation, information used in the management of LSD acquisition programs rapidly becomes inconsistent because of differing update times among the offices involved.

The need still exists for a LSD acquisition process management system to assure all required actions are accomplished in a timely manner regardless of the seeming simplicity of the project. Most of the 26 milestone schedules initially developed by the contractor following LSD's direction do not necessarily provide that assurance. The remainder of this report describes the actions that took place after the feasibility assessment in July 1987.

SECTION IX: RESULTS OF THE FEASIBILITY ASSESSMENT

A. General

Based on the conclusion that the templates were of questionable usefulness (except for use in planning the acquisition process for new projects), a modified approach was taken for the remainder of the analysis. Fourteen schedules were requested from Division Chiefs within the Directorate. At least one project submitted by each division was to have multiple tasks and complex interrelationships. There was no format established for the milestone schedules submitted. Some PEs developed them by hand, others used some form of software. Each Division Chief was given a list of tasks and events considered essential for tracking project status by both management and the PEs (Figure 2). A separate list (Figure 3) contained tasks and milestones to be used at the discretion of the PEs. Each schedule contained, as a minimum, those milestones from the lists that were scheduled to occur prior to 1 April 1989. PEs were encouraged to add tasks and milestones they believed would help them properly manage their projects such as Project Management Documentation (PMD).

All schedules submitted were reviewed by the Program Management Division to ensure they complied with the intent of current Army direction and guidance. The contractor then coded the schedules and entered them into the data base developed for that purpose. These schedules and the supporting data base will be used to brief the Directorate's project completion status to the Commander, BELVOIR.

R&D Type Acquisition

Milestone Decision Review I
D&V Contract Award
Technical Test I Start
User Test I Start
Milestone Decision Review II
FSD Contract Award
Technical Test II Start
User Test II Start
Milestone Review Decision III
Production Contract Award
First Article Test
Follow-on Test and Evaluation
FUED

NDI Type Acquisition

Milestone Decision Review I
D&V Contract Award
Feasibility Test
Milestone Decision Review III
Production Contract Award
First Article Test
Follow-on Test and Evaluation
FUED

ASAP Type Acquisition

D&V Contract Award
Unified Test I
Milestone Review Decision I/II
FSD Contract Award
Unified Test II
Milestone Review Decision III
Production Contract Award
First Article Test
Follow-on Test and Evaluation
FUED

NOTE: Milestone Decision Reviews may be combined

FIGURE 2. HTPM ESSENTIAL TASKS/MILESTONES

Contract

Statement of Work Preparation
Daisy Chain
Procurement Administrative Lead Time
Contract Delivery Schedule

Testing

Planning Events
Test Events
Reporting Events

Technical Data Package (TDP)

TDP Availability Date
TDP Draft Preparation Schedule
TDP Planning Schedule (TDPPS)

Program Documentation

Baseline Cost Estimate (BCE)
Acquisition Strategy Preparation, Review, Approval
Market Investigation Activities
MARC/MARB Preparation, Execution
Safety Assessment Events
Transportability Events
BOIP/QQPRI Events
Integrated Logistics Support Events

FIGURE 3. EXAMPLES OF HTPM DISCRETIONARY EVENTS

This new effort is seen as the first step towards the development of a prototype system designed for the planning and management of Directorate programs. If the resulting project management system proves feasible and acceptable, it will be implemented for all projects within a year. Implementation will include monthly updates of each on-going project and six month milestone extensions every six months.

B. Results

It is interesting to note that ten of the 14 schedules submitted in the redirected effort were in HTPM format. (Four PEs used HTPM I: six used HTPM II). Half, or seven, of the schedules were developed for projects included in the initial effort. Thus, a total of 33 schedules were prepared for LSD projects considering both the initial and redirected efforts.

Three of the seven repeat schedules; USDCH, Lightweight Expandable Tophandler, and TRIDENT II Boxcar, were copies of the schedules prepared by the contractor in the initial effort. Assuming that the PEs submitting these schedules found them useful, the percentage supports the results of the interview process associated with the initial effort in which 41% of the PEs involved considered HTPM a useful management tool. The more optimistic measure of utility derived from the total number of PEs in the redirected effort that used HTPM is not supported by those interview results. One possible reason is that many of the PEs submitting HTPM schedules may have been influenced by their supervisors.

Five of the 14 PEs opted to schedule events for the entire range of their project instead of for 18 months in the future as directed. A review of these schedules indicated that perhaps not enough was happening in that short time period to make a schedule meaningful. One to three events was all that could be scheduled. By adding events/tasks leading up to the reported events, meaningful and interesting schedules could be developed.

All 14 schedules were reviewed by personnel from the Program Management Division and the contractor to ensure that tasks listed occurred in a

logical sequence, that critical tasks were not omitted, and that standardized names were used for all tasks and milestones. The schedules at Appendix C reflect the results of that review. These schedules and their accompanying Gantt Charts can serve quite easily as a means of reporting acquisition program progress within LSD.

As mentioned earlier, there was no format established for the milestone schedules submitted. This is a suitable procedure if the scope of the effort were to be limited to a small number of projects. If this management technique is to be extended to all projects within LSD, some standardized means of collecting information needs to be developed. A report form, such as the one contained in Appendix E, allows the preparation of HTPM schedules from data received by the Program Management Division from PEs. As can be seen, the report can be used to provide information on new projects (first time reports), updates on old projects, or cancellation of projects. The report ensures that correct and necessary information is submitted, facilitates the review process and the preparation of HTPM schedules, and enhances coordination among PEs, Division Chiefs, and PMD on matters relating to acquisition program direction and tailoring.

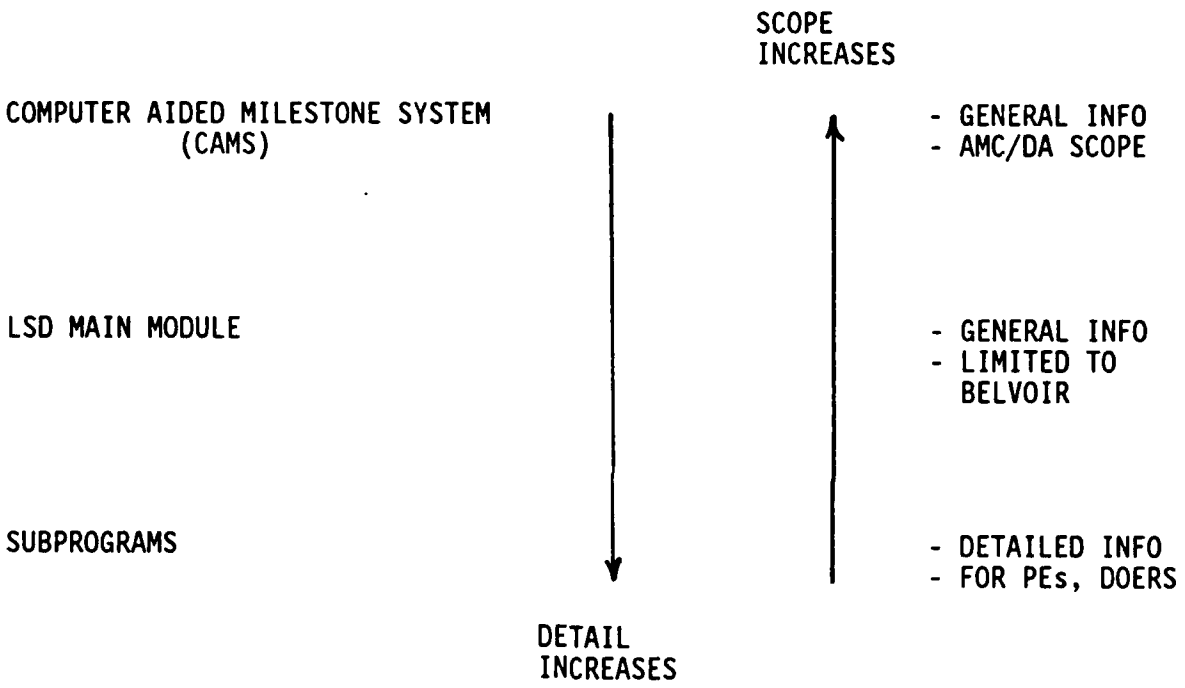
C. The LSD Model

The templates developed initially in this effort were too complex to be used as a management tool by either PEs or management personnel at LSD. Thus, there remains a valid requirement to develop a project management system that would be "used and useful" by all concerned. This portion of the technical report describes the basic concept of such a management system. Approval of this concept by the sponsor should trigger detailed development of the system by either analysts assigned to LSD or a contractor. The system concept to be described takes maximum advantage of the efforts contained in this technical report and the lessons learned discussed earlier.

Figure 4 portrays the LSD Project Management Model (PMM). The model consists of three elements, the Computer Aided Milestone Schedule Model

- SYSTEM HAS THREE ELEMENTS

  - DEGREE OF DETAIL VARIES
  - SCOPE VARIES



THE LSD PROJECT MANAGEMENT MODEL

SYSTEM CONCEPT

FIGURE 4

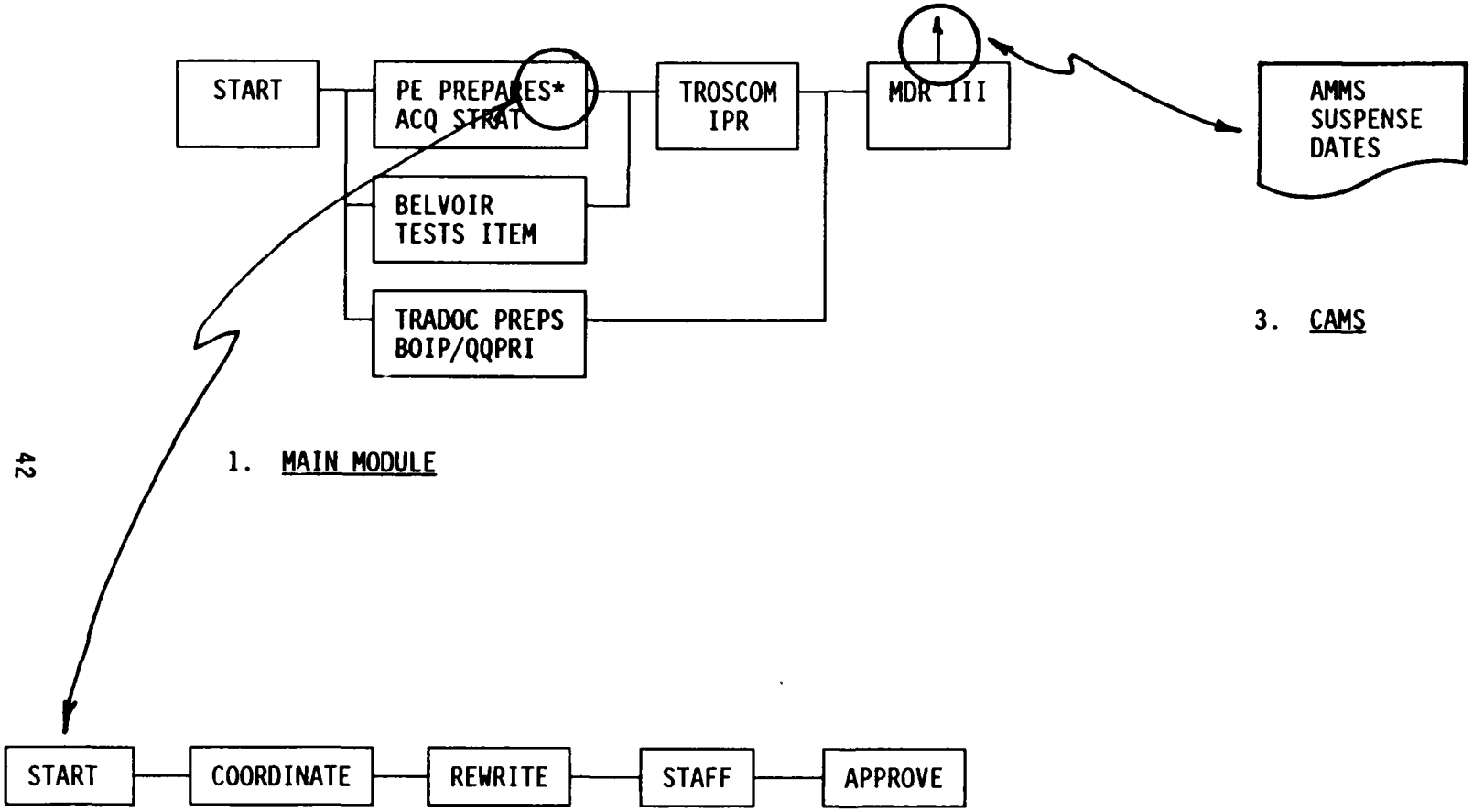
(CAMS), the LSD Main Module, and a set of subprograms. The scope or degree to which all AMMS milestones are included increases as the user moves from subprograms to CAMS. At the same time, the degree of detail tends to range from specific details to information more general in nature. The PMM is simple and requires only limited knowledge of the Army's acquisition processes. It is compatible with HTPM and R:Base System V and is easily updated when necessary. Figure 5 is a graphical representation which shows the interrelationship of the three elements.

The first element, the LSD Main Module, includes all the acquisition, development and test functions performed at BELVOIR or to which LSD contributes. Milestone completion dates entered in this module drive all AMMS suspense dates. This type information would be useful to PEs and others involved in day-to-day activities in the acquisition process. Figures 6,7, and 8 provide simplistic flowchart diagrams of the LSD Main Module. It is envisioned that the PMM would provide, as required, an easy to use roadmap through any acquisition process (the flowcharts depict the events of the ASAP process). The HTPM software package would be useful in automating the flowchart, although other software should be explored in any follow-on effort. PEs and management personnel at Division level or higher could use these flowcharts periodically to check project status as necessary.

The detailed activities comprising each box on the flowchart and the event duration times derived from this present effort could be used to load the R:Base System V data base to provide meaningful and useful management information as required. Alternatively, a PE or management personnel may desire to use the subprograms denoted by an asterisk in many of the blocks of the Main Module.

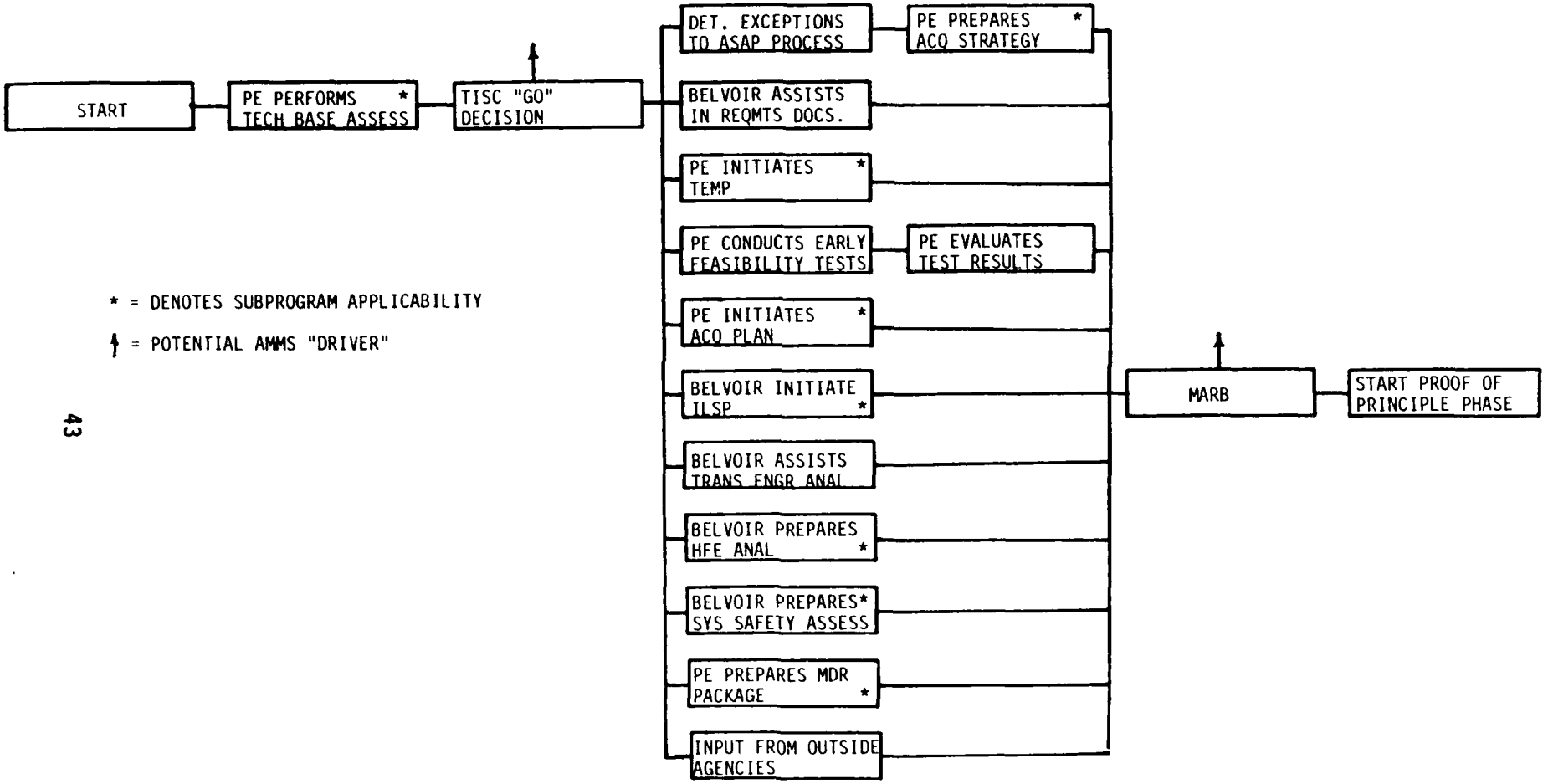
The second element of the PMM is the set of subprograms associated with the Main Module. The subprograms would be designed for use by personnel desiring detailed information regarding specific actions to take, when to take them, who to contact, etc., in order to proceed through the PMM. A flowchart of a typical subprogram is shown in Figure 9. Development of

- SYSTEM HAS THREE ELEMENTS



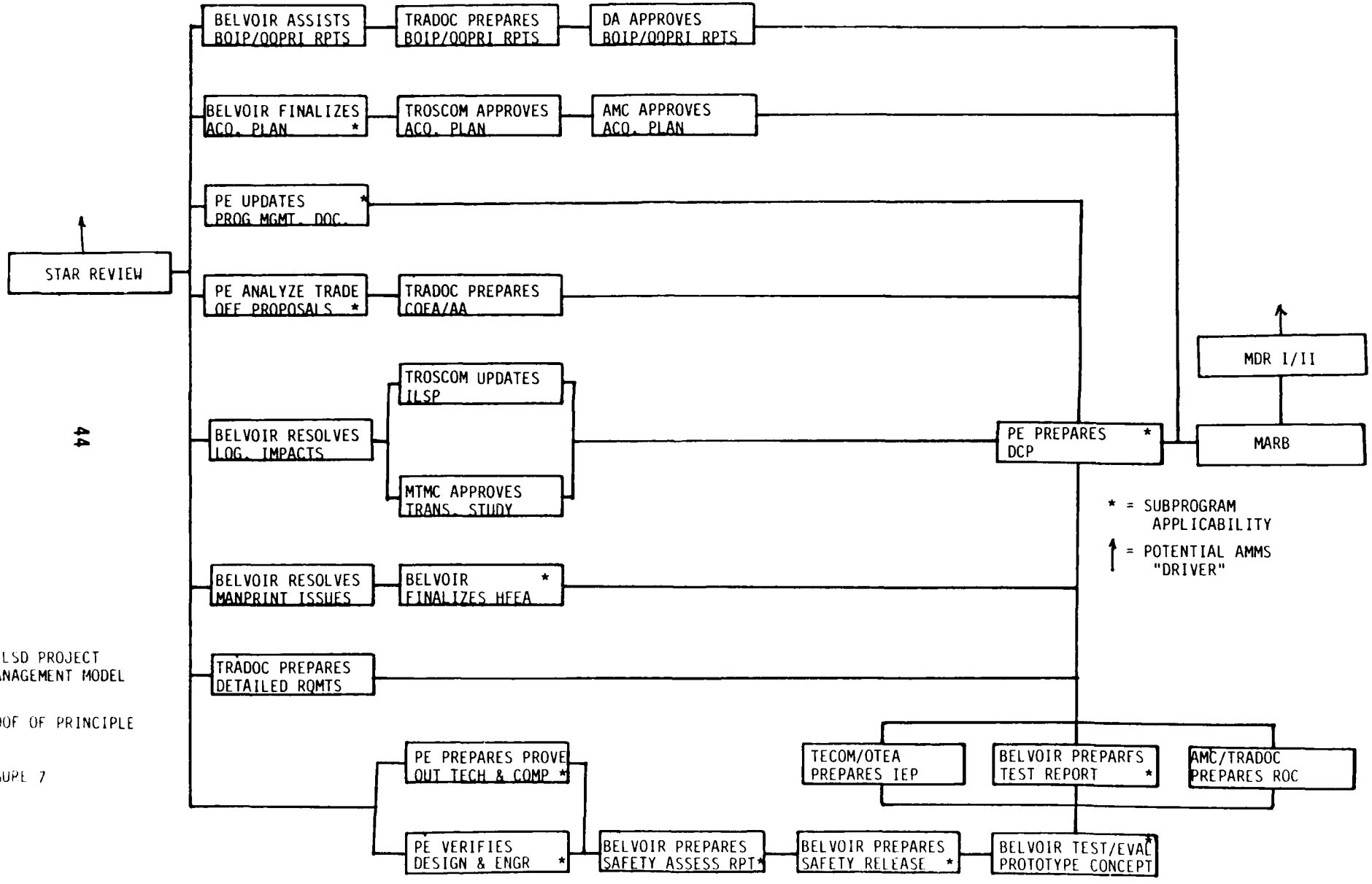
THE LSD PROJECT MANAGEMENT MODEL
GRAPHICAL PORTRAYAL

FIGURE 5



LSD PROJECT MANAGEMENT MODEL
REQUIREMENTS/TECHNOLOGY BASE ACTIVITIES

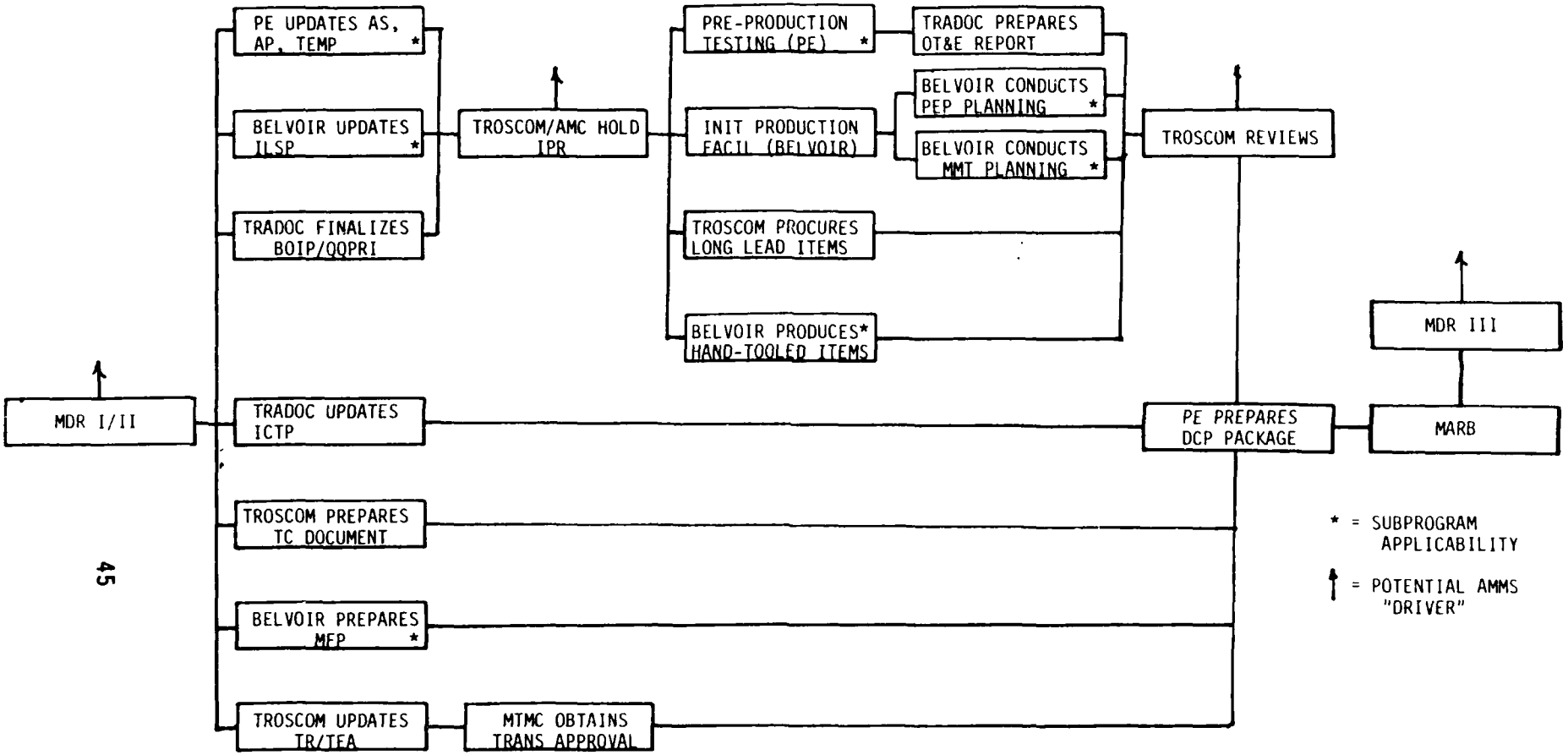
FIGURE 6



LSD PROJECT MANAGEMENT MODEL

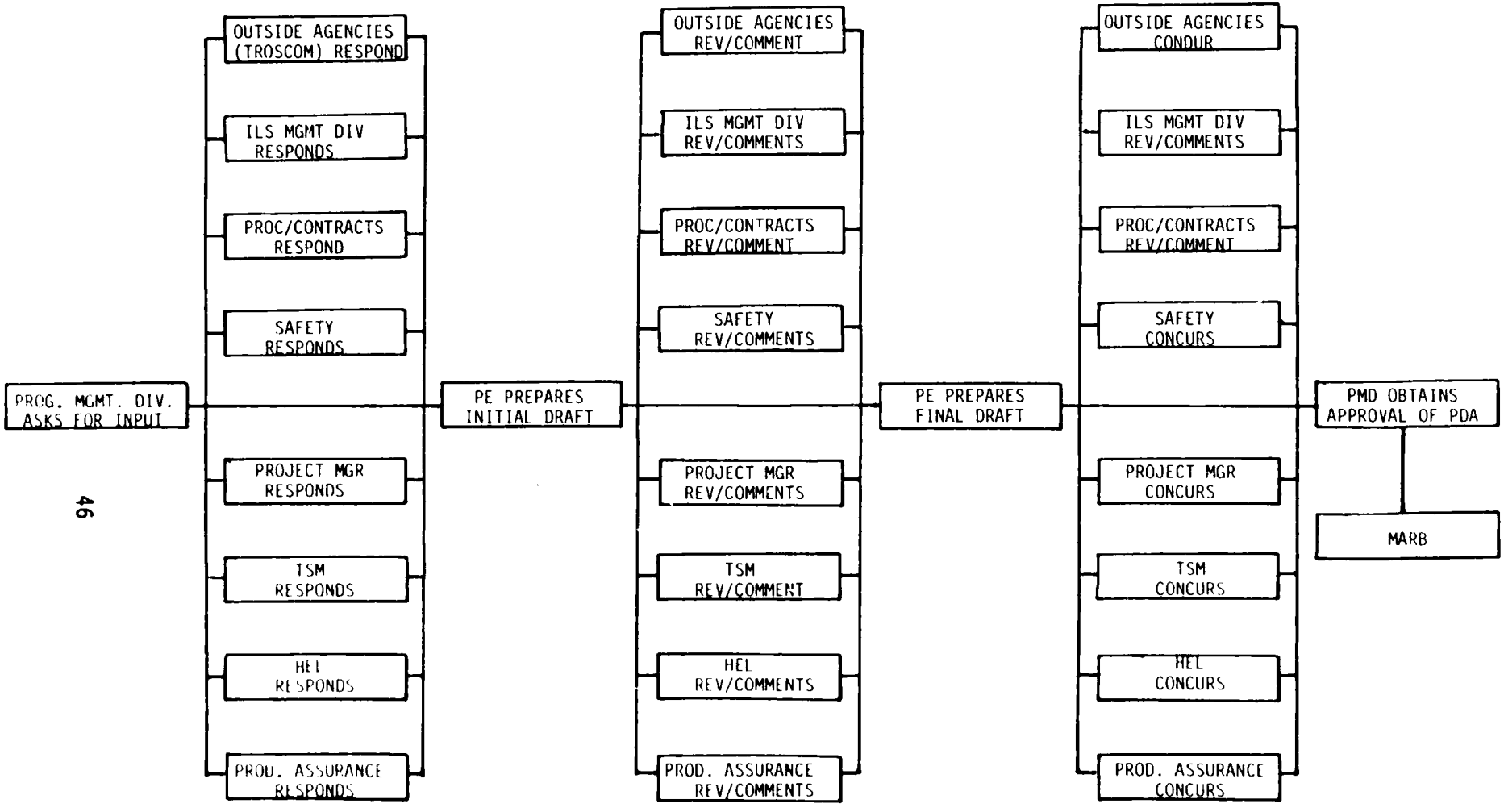
PROOF OF PRINCIPLE

FIGURE 7



LSD PROJECT MANAGEMENT MODEL
DEVELOPMENT/PROVE OUT PHASE

FIGURE 8



TYPICAL SUBPROGRAM FOR DEVELOPMENT OF PROGRAM MANAGEMENT DOCUMENT
FIGURE 9

these subprograms will be facilitated by the work done thus far under this task order.

The third element of the PMM is the Computer Aided Milestone Schedule Model (CAMS) developed by the Materiel Readiness Support Activity at Lexington Army Depot. Potential AMMS "Drivers" are annotated in the Main Module by an event with an arrow projecting from the event block. These events connect the LSD PMM Main Module with the Army acquisition process modeled by CAMS. Dates established for any one of these connector events early in the acquisition process would drive the AMC and DA AMMS suspense dates until such time as the established connector dates changed or new connector events were assigned completion dates. At those times, and only those times, CAMS would require updating and output delivery would probably not be time sensitive. It is anticipated that CAMS updates would not be needed more than monthly - even for fast moving acquisition actions.

The LSD PMM, in concept, is a simple, easy to use management system that directs people with limited knowledge of the Army's acquisition process through that process from start to MDR III. It offers the opportunity of obtaining detailed information when needed, lends itself to data base management, and requires very few updates. Further, the LSD PMM will "drive" AMC and DA AMMS suspense dates through use of the CAMS system.

SECTION X: SUMMARY

Twenty-two PEs managed the 26 development projects for which HTPM schedules were produced in accordance with the original task order. Nine of these PEs or 41% of the total number of PEs interviewed considered HTPM useful and would use or are using it as a scheduling system. Ten PEs or 45% did not consider HTPM useful and would not use it if they had not been directed to do so. Three PEs (14%) were ambivalent toward HTPM. Approximately 75% of the PEs submitting schedules in the redirected effort (10 of 14) used HTPM. Those that were using or planned to use HTPM in the future were those who had taken the time to learn the system, either on their own or by attendance at classes. Most were using schedules they had

personally developed that had little or no resemblance to the templates developed last year. A number of reasons were given for not considering HTPM useful:

- Some PEs are not computer "literate" and do not feel comfortable using a computer to the degree required by HTPM.
- Some projects are so minor that management by HTPM is considered overkill. The time devoted to scheduling becomes too high a percentage of total project time.
- Knowledge of the Army's acquisition process varies throughout the Directorate. Even with a HTPM schedule that someone developed for them, PEs with limited knowledge find difficulty understanding the schedules.
- A few expressed resentment at being directed to use HTPM as a management tool. This resentment may be sincere or may be a front, disguising one or more of the preceding reasons.

In those instances where an acquisition was extended far into the future, PEs and others related to the programs had difficulty in detailed levels of planning for more than one or two years in the future. They were uncertain as to what direction their project would take, or whether it would be funded. Consequently, the requirement imposed on them to estimate planned completion dates for up to 181 milestones not only appeared overwhelming to them, but tended to make the whole effort highly incredible. The completion dates provided by them more often than not resulted in negative slack problems due to the event duration times developed in Task 2 of this task order. The 18 month planning range imposed after the feasibility assessment is much more realistic and "do-able" by the PEs. The LSD PMM (Figure 4) further limits the scope of the scheduling function by restricting HTPM roadmaps and the supporting data base to those events for which LSD is responsible or contributes or which influence the acquisition activities of LSD. At the same time, events common to both the LSD environment and the larger AMMS environment "drive" suspense dates for AMC and DA peculiar milestones.

LSD's PEs are not very well familiar with the Army's evolving acquisition process to manage the projects assigned effectively. This fact,

together with a management philosophy defined in TROSCOM Regulation 10-1, Organization, Mission and Functions, dated October 1986, that spreads responsibility for project management throughout the Directorates, results in an environment where the use of any scheduling tool may not be helpful and advantageous. Concurrent with the establishment of an HTPM/R:Base System V management system, acquisition process training needs to be undertaken. At the same time, a relook at the management philosophy regarding the relationships and responsibilities of the PEs and the supporting staff may prove beneficial.

BELVOIR has evolved to the point were it appears that the organization consists of smaller, semi-independent elements, each with its own information gathering and management system, characterized by very little information sharing. This became apparent when at least three milestone scheduling systems were discovered in use within the BELVOIR community, each monitoring acquisition projects status. The effect on the PE is significant. First, he spends an inordinate amount of time responding to requests to update these systems. More importantly, since updates occur at different times, the resulting management information is often outdated. A definite need exists to develop and use one, standardized information system that contains all the information necessary to satisfy all users of the system. The LSD PMM or any other concept with similar characteristics needs to be further explored with the goal of developing a workable system sensitive to the BELVOIR environment.

The templates developed as part of this task order have utility only as a means of reviewing the tasks and critical milestones of a new project necessary to comply with the myriad of complex reporting requirements relating to the materiel acquisition process. They are of much less use in monitoring the progress of on-going projects that have been extensively tailored to save time, money and other scarce resources involved in the acquisition process. Most of the projects on-going or in the early stages of planning at LSD do not conform to any of the acquisition processes, R&D, NDI, ASAP or PIP, modeled by the templates.

The R:Base System V data base developed under this task order provides managers at any level in the LSD organization the opportunity to review the status of any acquisition project to determine tasks and milestones that have been completed, tasks and AMMS milestones that the PE has decided are not applicable to his/her project, tasks and milestones still to be completed, tasks behind schedule, milestones missed, percent completions, and dates of last update. User queries are possible within the constraints imposed by the information contained in the data base. As a result of the interview process, the perception was formed that project direction and acquisition process tailoring decisions were usually made by the PE and his/her Team Chief and Division Chief, often without complete information. As a consequence, the projects currently being undertaken are unique in their approach and the tasks and milestones planned to successfully complete the project. Projects with planned combined MDR I/III seem particularly popular, probably because of the nature of the projects undertaken by LSD.

SECTION XI: FINDINGS AND CONCLUSIONS

1. The HTPM schedules developed to manage acquisitions from start to MDR III and to account for all AMMS Milestones were acceptable by 41% of the PEs interviewed. (Pages 10-22,39,48)

2. The LSD PMM System designed by this analysis provides an effective management tool for directing, controlling, and monitoring LSD acquisition projects. The system needs to be completely developed before it is implemented. (Pages 40-48)

3. Decisions concerning program direction and acquisition tailoring appear overly decentralized. (Pages 10-22)

4. A need exists to develop and use one, standardized information system that contains all the information necessary to satisfy everyone in the BELVOIR community. (Pages 16, 37-38, 50)

5. LSD personnel need continuous, periodic training in the Army's acquisition process. (Pages 15,20,34,48,49)

SECTION XII: RECOMMENDATIONS

Recommend:

1. That the procedures developed by the Program Management Division as a result of this analysis be briefed to the Commander, BELVOIR, in the near future. The schedules included in Appendix C of this report could be used to support such a briefing.

2. Consideration be given to the development of a project management system based on the concept of the LSD Project Management Model described in this report. This project management system should be institutionalized and implemented for all projects within a year. Implementation should include the establishment of procedures for monthly updates of each on-going project and six month extensions of the 18 month schedule every six months so that schedule projections are available for at least one year in the future at any given time.

3. The establishment of a LSD Board to define early in the acquisition cycle the acquisition direction for each individual project. Consideration should be given to specifying a standard acquisition process for all items (Conditions at LSD suggest either the ASAP or NDI Category B process may be most appropriate. Current Army directives specify ASAP for low risk acquisitions). Exceptions to this process would be approved by the Board before the start of the Proof of Principle Phase or finalization of the Acquisition Strategy.

4. Only one project milestone management system be used by all Directorates within BELVOIR. Responsibility should be assigned to an office within BELVOIR to ensure that information generated and used in this system is consistent with the information used by outside agencies and commands. A

primary goal of this system should be to reduce to an absolute minimum the time required by PE to update the system.

5. Consideration be given to holding periodic training sessions on the Army's acquisition process for all LSD personnel associated with BELVOIR development projects. This training could include instructions on the use of HTPM and R:Base System V for PEs. Being fully familiar with the acquisition process should be a professional development goal of every PE.

DEVELOPMENT OF MILESTONE SCHEDULES
FOR
SELECTED LOGISTICS SUPPORT DIRECTORATE PROGRAMS

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Appendices A, B, C, and D are under separate cover due to their volume. Copies can be obtained from DTIC or the Program Management Division, Logistics Support Directorate, BELVOIR, Fort Belvoir, VA 22060-5606.

APPENDIX E

MANAGEMENT INFORMATION SYSTEM

TABLE OF CONTENTS

APPENDIX E

MANAGEMENT INFORMATION SYSTEM

I. INTRODUCTION

This Appendix contains the essential elements of a management information system (MIS) designed to collect critical data from Project Engineers (PEs) and Division Chiefs assigned to the Logistics Support Directorate (LSD), US Army Belvoir Research, Development, and Engineering Center (BELVOIR) and to transform that data into useful management information. This MIS provides one way to properly use acquisition project management information.

II. OBJECTIVE OF THE MANAGEMENT INFORMATION SYSTEM

The objective of this MIS is to provide useful management information that:

- Is formatted to be acceptable to both LSD management personnel and PEs.
- Ensures all Army Acquisition Management Milestones are met.
- Satisfies the management information needs of LSD and all staff support activities within the BELVOIR community.
- Encourages early coordination between PEs, and LSD management personnel on matters pertaining to project direction (ASAP, NDI, etc.) and tailoring.
- Supports the management philosophy of centralized planning at LSD level and decentralized program execution at Division level and below.
- Minimizes the time required by the PE to report the status of his/her project.

III. DESIGN CRITERIA

The following design criteria led to the system proposed for use by LSD to support the MIS objective stated above:

- o Simplistic. In order to be used and useful to both PEs and LSD management personnel, the system must be easily understood and simple to operate.
- o Systematic. The MIS must be capable of being "proceduralized" in order to ensure consistent results from all users.
- o Useful, Timely Feedback. The PEs send raw data up through the system and must receive timely project management information, if projects are to be executed as planned.
- o Data transformed into information at LSD level. Necessary to support centralized planning, decentralized execution. Administrative time for PEs is optimized.
- o MIS must ensure early agreement between Division Chiefs and Director, LSD, on program direction and tailoring at the earliest possible date.

IV. MANAGEMENT INFORMATION SYSTEM DESCRIPTION

A. Project Management Data Sheet (PMDS). The proposed PMDS at Annex A serves to provide raw data concerning a particular project. The PMDS is completed by a PE and reviewed by a Division Chief when a project is first assigned to LSD (and for all projects when this system is first implemented), and periodically thereafter to report project status, completion, cancellation, or redirection. The PMDS is forwarded through the Division Chief to the Program Management Division (PMD) where the data is used to develop milestone management schedules using the Harvard Total Project Manager (HTPM) software on LSD's microcomputers.

B. HTPM Milestone Schedules. PMD personnel check the data provided by the PEs on the PMDS to ensure the start and finish times are consistent with BELVOIR approved event duration times. Inconsistencies and omissions of critical data are resolved with the appropriate Division Chief at this time. The resultant data are standardized and, using HTPM and either the templates

or the LSD Model developed under this task order, milestone schedules or "roadmaps" are prepared by PMD personnel. These schedules are projected for 18 months in the future and are simple enough to be used and useful by both PEs and LSD management personnel. The Division Chief and Chief, PMD then present the schedule to the Director, LSD, for his approval. This approval results in early agreement on program direction and tailoring as reflected in the data provided in the initial PMDS and reviewed by PMD. Following approval, the PEs, the Division Chief, and heads of all supporting staff activities are given diskettes containing the HTPM milestone schedule to assist in managing the project.

C. R:Base System V Data Base. The HTPM milestone schedules are automatically loaded by PMD personnel into the R:Base System V Data Base developed under this task order. See either Section VII of the Technical Report or Appendix D, User's Manual, to determine the data contained in the data base. Copies of the data base containing information on all projects for which LSD is responsible are provided to all Division Chiefs and heads of supporting staff agencies initially upon implementation of this MIS and periodically thereafter on scheduled updates. LSD management personnel use the data base to monitor the status of all projects, detect performance trends, and evaluate activities within the Directorate. Division Chiefs and PEs do likewise, but also measure their progress against the progress of their peers. Supporting staff activities forecast resource requirements needed to provide timely assistance to their supported PEs.

D. The Computer Aided Milestone System (CAMS). The Director, LSD, with recommendations from PMD, determines one to three most critical milestones for each project for which LSD is responsible and inputs them into the Army Materiel Command's Computer Aided Milestone System at Lexington/Blue Grass Army Depot. Using these critical milestones, CAMS computes all of the Acquisition Management Milestones proscribed by US Army Pamphlet 700-26. PMD personnel compare the CAMS milestones with those generated by the PE via the PMDS and attempt to reconcile differences. Irreconcilable differences are brought to the attention of the Director, LSD, for appropriate action and eventual resolution.

V. SUMMARY

Using the design criteria specified above, a Management Information System has been conceptualized that accomplishes the desired objective:

- The PMDS, once initially completed, is easy to use. PEs can understand completely what data is needed and can provide that data to PMD in an understandable form. Some complexity in the initial submission is acceptable if early coordination between Division Chiefs and PMD on program direction and tailoring results.

- Presentation of the HTPM schedule to the Director, LSD, supports the management philosophy of centralized planning and decentralized execution. This action, in effect, accomplishes the same result as that of the LSD Board as recommended in the Technical Report.

- Delivery of HTPM and R:Base System V diskettes to all Division Chiefs and heads of supporting staff activities will satisfy the needs of all concerned with acquisition project support and management within BELVOIR. Periodic updates will ensure that conflicting information among staff agencies is minimized.

- Accomplishment of the work of transforming data into information by PMD greatly reduces the administrative burden now on the PEs. In addition, the use of only one MIS within LSD negates the multiple updates currently imposed on PEs.

- The input of critical milestone completion date into the CAMS model computes suspense dates for all Acquisition Management Milestones required by Army directives. This provides the means by which management can control all BELVOIR acquisition action suspenses and be responsive to Army requirements.

Implementation procedures have not been addressed. These procedures depend on management philosophies, resources available, integration with other assigned duties of the players involved, timing, and so forth. This analysis is not prepared to address those issues. The analysis has provided, however, a conceptual MIS that can provide timely, usable management information to both PEs and LSD management personnel with minimum effort.

ANNEX A TO APPENDIX E
LOGISTICS SUPPORT DIRECTORATE
PROJECT MANAGEMENT DATA SHEET

GENERAL: The purpose of this document is to obtain data from Logistics Support Directorate (LSD) Division Chiefs and Project Engineers (PEs) concerning new and on-going acquisition projects assigned to LSD. Data provided by this document will be used by Program Management Division (PMD) personnel to develop Harvard Total Project Manager (HTPM) milestone schedules for use by PEs, Division Chiefs, and LSD management personnel. Additionally, the data will be placed in a R:Base System V data base for use by all LSD project management personnel. This data sheet is designed to reduce the administrative burden on Division Chiefs and PEs. The initial completion will require some time, but follow-on updates will require no more than 15 minutes every week or as significant changes occur in a project's status.

SECTION A (General Information)

Program Name_____ PMS#_____ Date_____

Project Engineer_____ Tele #_____
Division Chief _____ Tele #_____

Type Report: New Project_____ (Complete entire report).
Update _____ (Complete only areas that have changed since last report).
Cancel Project___ (No further entries necessary).

Proponent:_____

Program Type:

Contract Support___ PIP___ Customer___ Prod. Support___
Engineer Support___ Tech Base Research___ NDI___ VE ___
RDTE_____ ASAP___ MACI_____

Current FY Funding Level_____ Type of Funding (6.2,6.4,etc)_____

SECTION B (Brief Description of the Project)

_____

_____

_____

_____

SECTION C (Critical Task/Milestone Data)

This section contains critical tasks and milestones necessary for a PE to manage a typical project. Fill in the estimated start and finish dates for each task/milestone listed. Milestone start and finish times will be the same. If a task/milestone is not applicable to the project, enter "NA" and a short explanation for non-applicability. Information regarding event descriptions and duration times are available from PMD, if required.

Type Program	Task/ Milestone	Start Date	Finish Date	Remarks
RDTE	Milestone Rev I			
	D&V Contract Awd			
	TT I			
	UT I			
	Milestone Rev II			
	FSD Contract Awd			
	TT II			
	UT II			
	Milestone Rev III			
	Prod Contract Awd			
	FOT&E			
	FAT			
	FUED			
NDI	Milestone Rev I			
	D&V Contract Awd			
	Feasibility Test			
	Milestone Rev III			
	Prod Contract Awd			
	FOT&E			
	FAT			
	FUED			
ASAP/PIP	D&V Contract Awd			
	UT I			
	Milestone Rev I/II			
	FSD Contract Awd			
	UT II			
	Milestone Rev III			
	Prod Contract Awd			
	FOT&E			
	FAT			
	FUED			

SECTION D (Milestones/Tasks Occurring in the Next 18 Months)

This section contains additional milestones and tasks that occur during the course of an acquisition program. Fill in the estimated start and finish dates for each milestone/task expected to occur in the next 18 months. If a task/milestone would normally be expected to occur, but will not because of tailoring or other reasons, enter "NA" and a short reason for excluding the task/milestone.

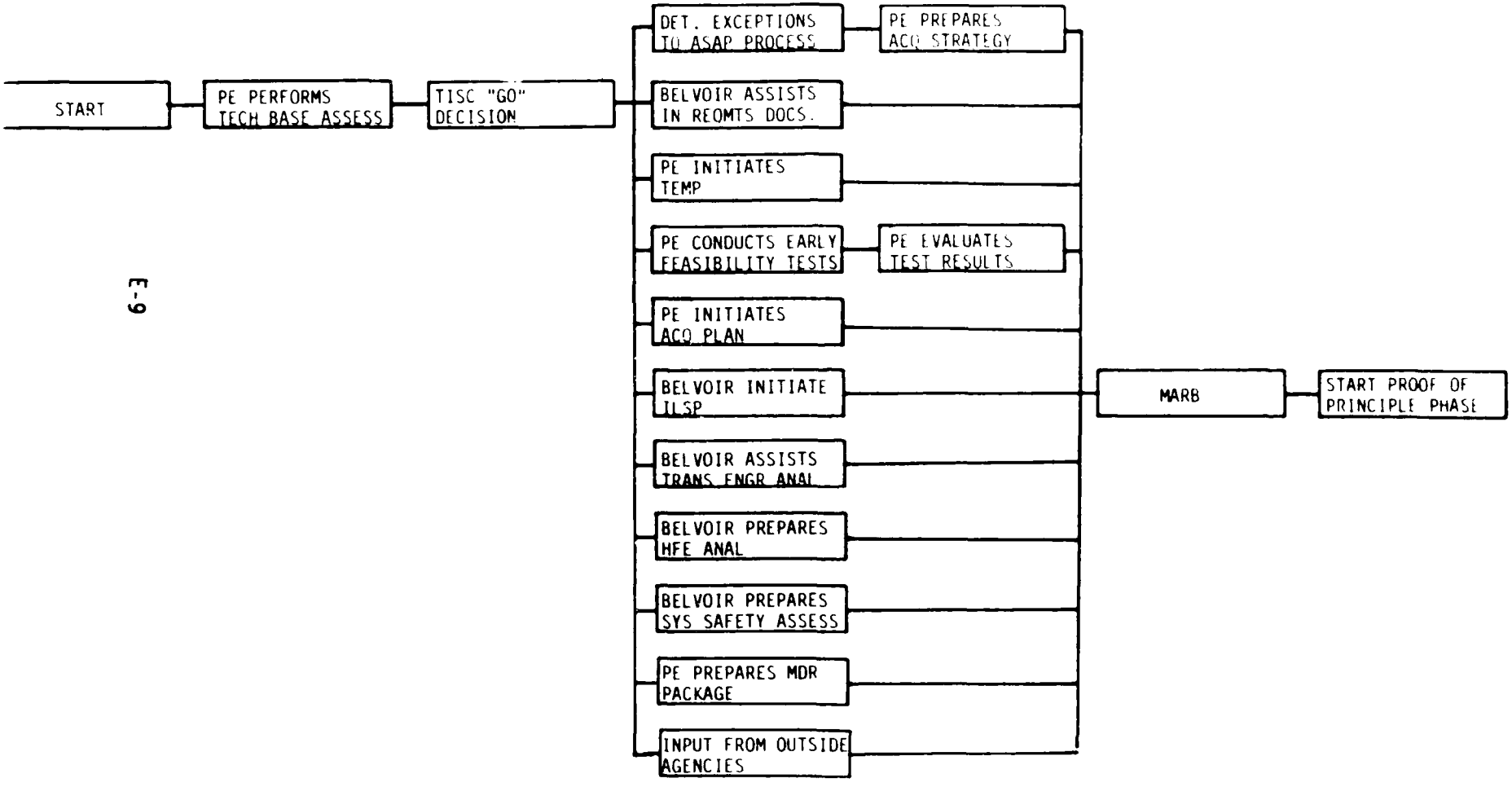
Task/Milestone	Start Date	Finish Date	Remarks
SOW Preparation			
Daisy Chain			
Proc Admin LeadTime			
Contract Deliv Sch			
TDP Avail Date			
TDP Draft Prep			
TDP Plan Sched			
BCE			
AS Prep,Rev,Apprv			
Mkt Investigation			
MARC/MARB Prep			
MARC/MARB Mtgs			
Planning Events			
Test Events			
Reporting Events			
Safety Events			

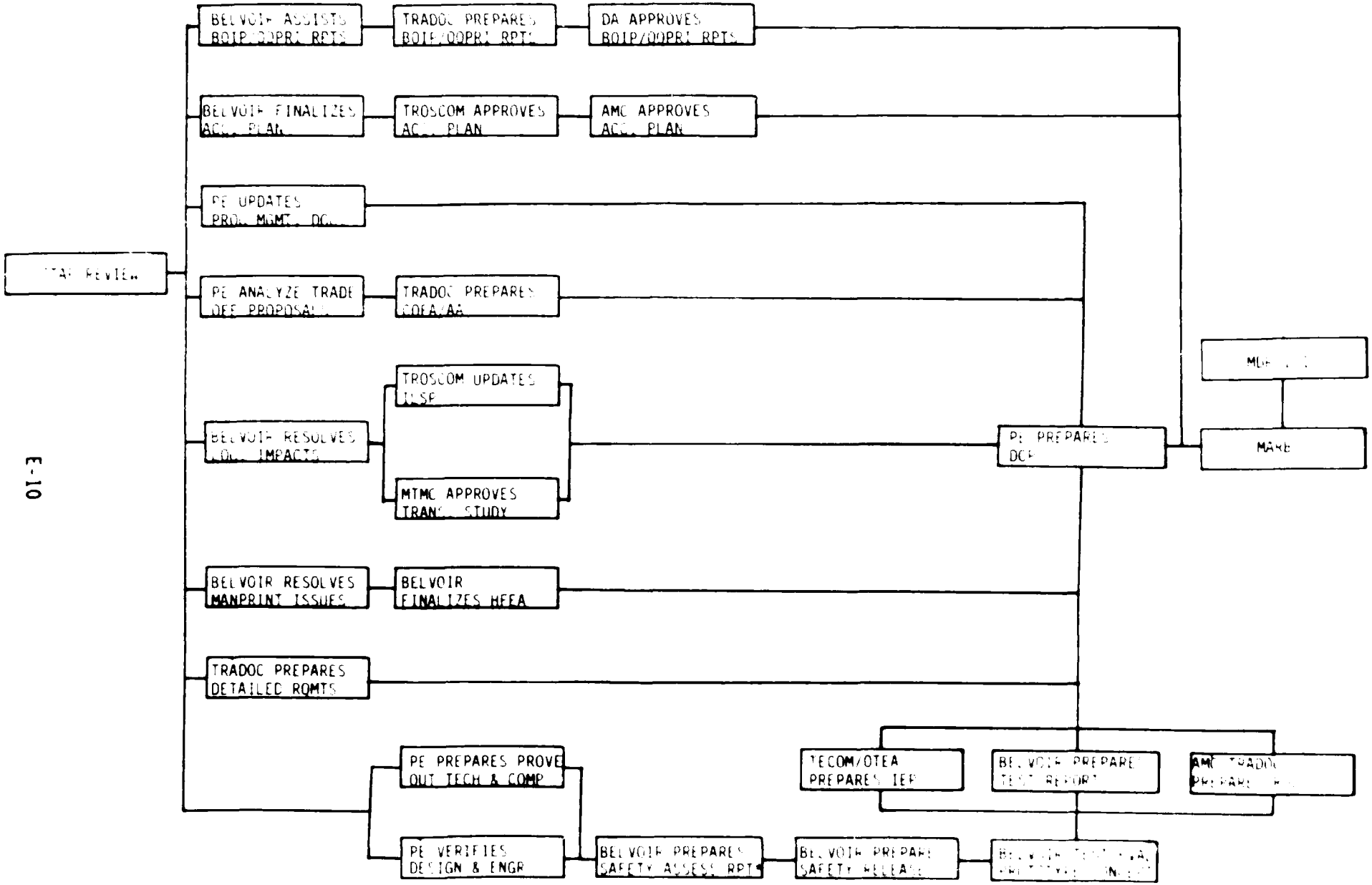
SECTION D (Con't)

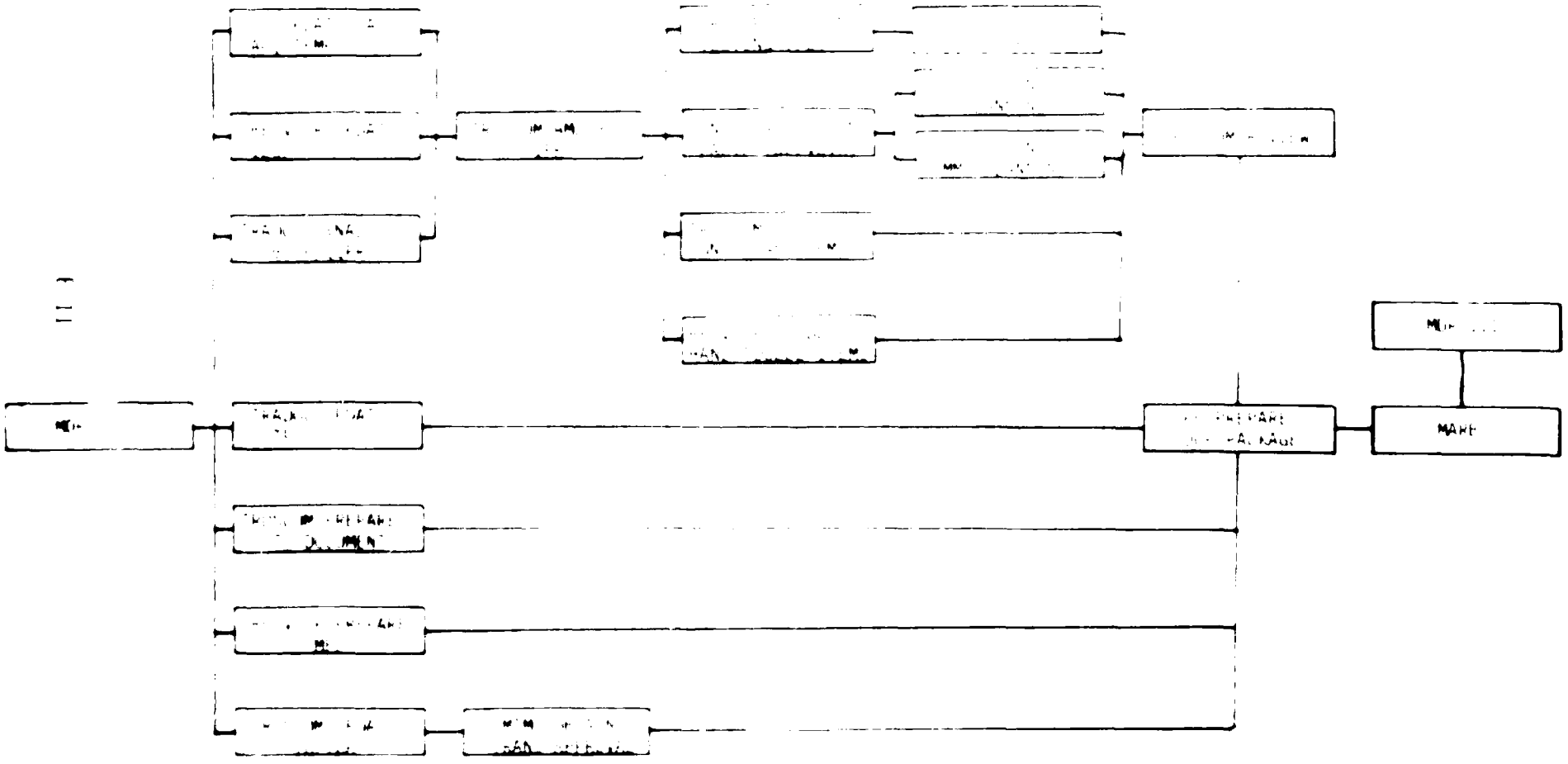
Task/ Milestone	Start Date	Finish Date	Remarks
Transportibility Events			
BOIP/QQPRI Events			
ILS Events			
Other			

SECTION E (General Roadmap Location)

The following three pages provide a generic roadmap of an acquisition project. Use a red pencil and mark approximately where the project is right now and where it is planned to be 18 months from now. Updates to this section will only be required every six months. (Unexpected advances, delays, or project redirections may cause more frequent updates).


START
PE PERFORMS TECH BASE ASSESS
TISC "GO" DECISION
DET. EXCEPTIONS TO ASAP PROCESS
PE PREPARES ACQ STRATEGY
BELVOIR ASSISTS IN REQMTS DOCS.
PE INITIATES TEMP
PE CONDUCTS EARLY FEASIBILITY TESTS
PE EVALUATES TEST RESULTS
PE INITIATES ACQ PLAN
BELVOIR INITIATE ILSP
BELVOIR ASSISTS TRANS ENGR ANAL
BELVOIR PREPARES HFE ANAL
BELVOIR PREPARES SYS SAFETY ASSESS
PE PREPARES MDR PACKAGE
INPUT FROM OUTSIDE AGENCIES
MARB
START PROOF OF PRINCIPLE PHASE


BELVOIR ASSISTS BOIP/DOPRI RPTS
TRADOC PREPARES BOIP/DOPRI RPTS
DA APPROVES BOIP/DOPRI RPTS
BELVOIR FINALIZES ACQ. PLAN
TROSCOM APPROVES ACQ. PLAN
AMC APPROVES ACQ. PLAN
PE UPDATES PROG. MGMT. DC.
PE ANALYZE TRADE OFF PROPOSALS
TRADOC PREPARES COEA/AA
TROSCOM UPDATES ILSP
BELVOIR RESOLVES LOG. IMPACTS
MTMC APPROVES TRANS. STUDY
PE PREPARES DCP
MAR
BELVOIR RESOLVES MANPRINT ISSUES
BELVOIR FINALIZES HFEA
TRADOC PREPARES DETAILED RQMTS
PE PREPARES PROVE OUT TECH & COMP
PE VERIFIES DESIGN & ENGR
BELVOIR PREPARES SAFETY ASSESS RPT
TECOM/OTEA PREPARES IEP
BELVOIR PREPARE TEST REPORT



END

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DTIC