

# **Advanced Amphibious Assault Vehicle (AAAV)**

**DMSO Conference**

**6/2/99**

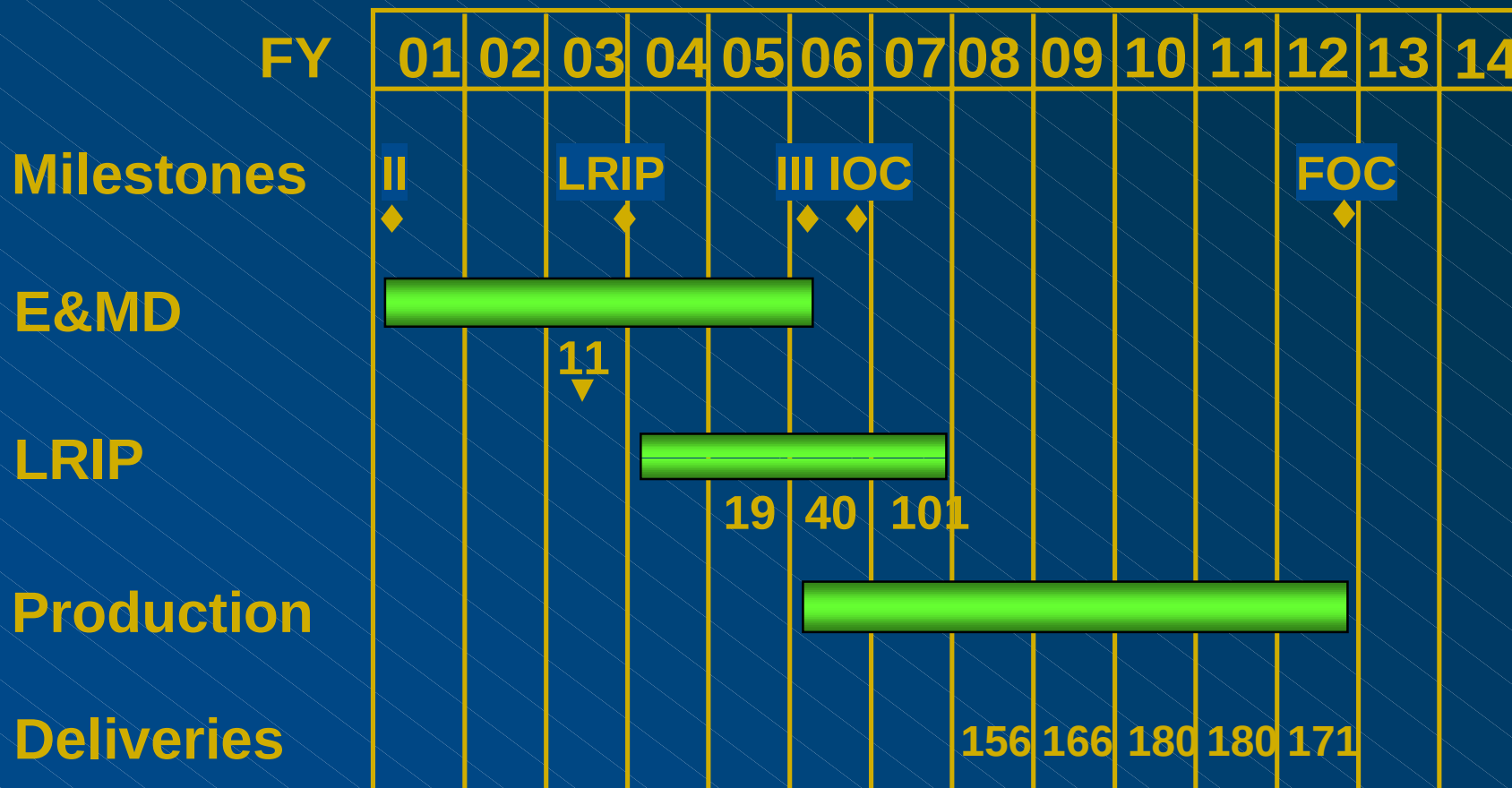
**Panel Discussion**



**Mark Routson/AAAV M&S IPT Lead**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |                               |                           |                                                                                                                  |  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------|--|
| REPORT DOCUMENTATION PAGE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             |                               |                           | Form Approved OMB No.<br>0704-0188                                                                               |  |
| Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Department of Defense, Washington Headquarters Services, Directorate for Information Operations and Reports (0704-0188), 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. PLEASE DO NOT RETURN YOUR FORM TO THE ABOVE ADDRESS. |                             |                               |                           |                                                                                                                  |  |
| 1. REPORT DATE (DD-MM-YYYY)<br>02-06-1999                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                             | 2. REPORT TYPE<br>Briefing    |                           | 3. DATES COVERED (FROM - TO)<br>xx-xx-1999 to xx-xx-1999                                                         |  |
| 4. TITLE AND SUBTITLE<br>Advanced Amphibious Assault Vehicle (AAAV)<br>Unclassified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                               |                           | 5a. CONTRACT NUMBER                                                                                              |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |                               |                           | 5b. GRANT NUMBER                                                                                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |                               |                           | 5c. PROGRAM ELEMENT NUMBER                                                                                       |  |
| 6. AUTHOR(S)<br>Routson, Mark ;                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |                               |                           | 5d. PROJECT NUMBER                                                                                               |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |                               |                           | 5e. TASK NUMBER                                                                                                  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |                               |                           | 5f. WORK UNIT NUMBER                                                                                             |  |
| 7. PERFORMING ORGANIZATION NAME AND ADDRESS<br>General Dynamics<br>xxxxxx, xxxxxxxx                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                               |                           | 8. PERFORMING ORGANIZATION REPORT<br>NUMBER                                                                      |  |
| 9. SPONSORING/MONITORING AGENCY NAME AND ADDRESS<br>United States Department of Defense<br>Defense Modeling and Simulation Office<br>1901 N. Beauregard St., Suite 500<br>Alexandria, VA22311-1705                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                             |                               |                           | 10. SPONSOR/MONITOR'S ACRONYM(S)                                                                                 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |                               |                           | 11. SPONSOR/MONITOR'S REPORT<br>NUMBER(S)                                                                        |  |
| 12. DISTRIBUTION/AVAILABILITY STATEMENT<br>APUBLIC RELEASE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                             |                               |                           |                                                                                                                  |  |
| 13. SUPPLEMENTARY NOTES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                             |                               |                           |                                                                                                                  |  |
| 14. ABSTRACT<br>Advanced Amphibious Assault Vehicle                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                             |                               |                           |                                                                                                                  |  |
| 15. SUBJECT TERMS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                             |                               |                           |                                                                                                                  |  |
| 16. SECURITY CLASSIFICATION OF:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             | 17. LIMITATION<br>OF ABSTRACT | 18.<br>NUMBER<br>OF PAGES | 19. NAME OF RESPONSIBLE PERSON                                                                                   |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             | Public Release                | 12                        | Fenster, Lynn<br>lfenster@dtic.mil                                                                               |  |
| a. REPORT<br>Unclassified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | b. ABSTRACT<br>Unclassified | c. THIS PAGE<br>Unclassified  |                           | 19b. TELEPHONE NUMBER<br>International Area Code<br>Area Code Telephone Number<br>703767-9007<br>DSN<br>427-9007 |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                             |                               |                           | Standard Form 298 (Rev. 8-98)<br>Prescribed by ANSI Std Z39.18                                                   |  |

# AAAV / USMC PROGRAM SCHEDULE



**GENERAL DYNAMICS**  
Amphibious Systems

March 16, 1999

# VIRTUAL INTEGRATION & ASSEMBLY

- SEEKS TO INTEGRATE LIFECYCLE DOCUMENTATION PROCESSES
  - Prototype Assembly Mfg Build, Tech Manuals
- PROVIDES COMMON WEB INTERFACE TO WIDE VARIETY OF DATA SOURCES
  - Useable By Mechanics, Mfg, and Logistics
- ENSURES EFFICIENT DEPLOYMENT OF MULTIPLE DOCUMENTATION SOURCES
  - Removes Reliance On Drawings
  - Simplifies Configuration Management

# INTEGRATED PDRR/EMD/IETM PROCESS DEVELOPMENT

## Standard Method - Independent Management

Assembly Drawings



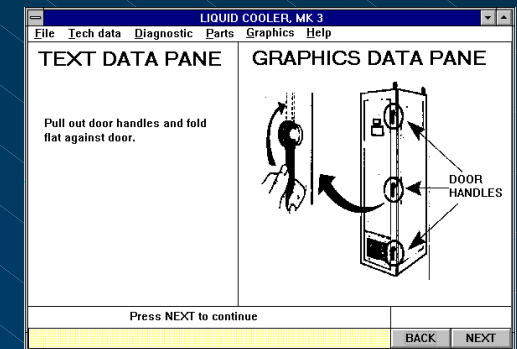
Interface (New Drawings, ...)

Process Sheets



Interface (New Drawings, ...)

Interactive Electronic  
Technical Manual



Prototype

Manufacturing

Fielding

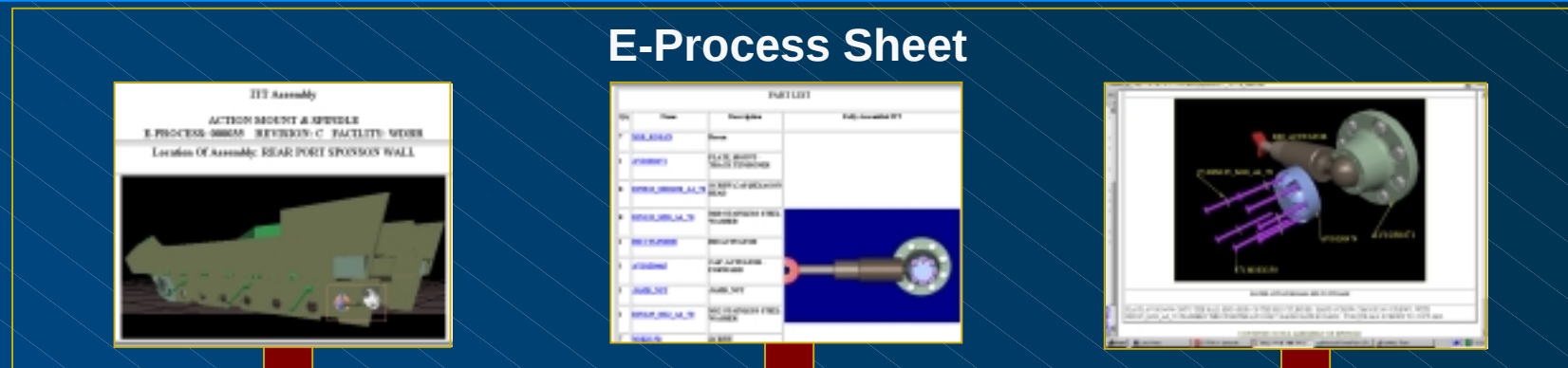
Standard "Stove Pipe" Approach To Development  
Generates Similar Redundant Documents To Support  
Weapon Station Life Cycle. Redundant CM, Development,  
And Inconsistent Data Often Results From This Approach.

**GENERAL DYNAMICS**  
Amphibious Systems

March 16, 1999

# INTEGRATED DEVELOPMENT / MFG / LOGISTIC SUPPORT PROCESS DEVELOPMENT

## Integrated Process Development



**Prototype Build**

**Manufacturing  
Operation  
Sheets**

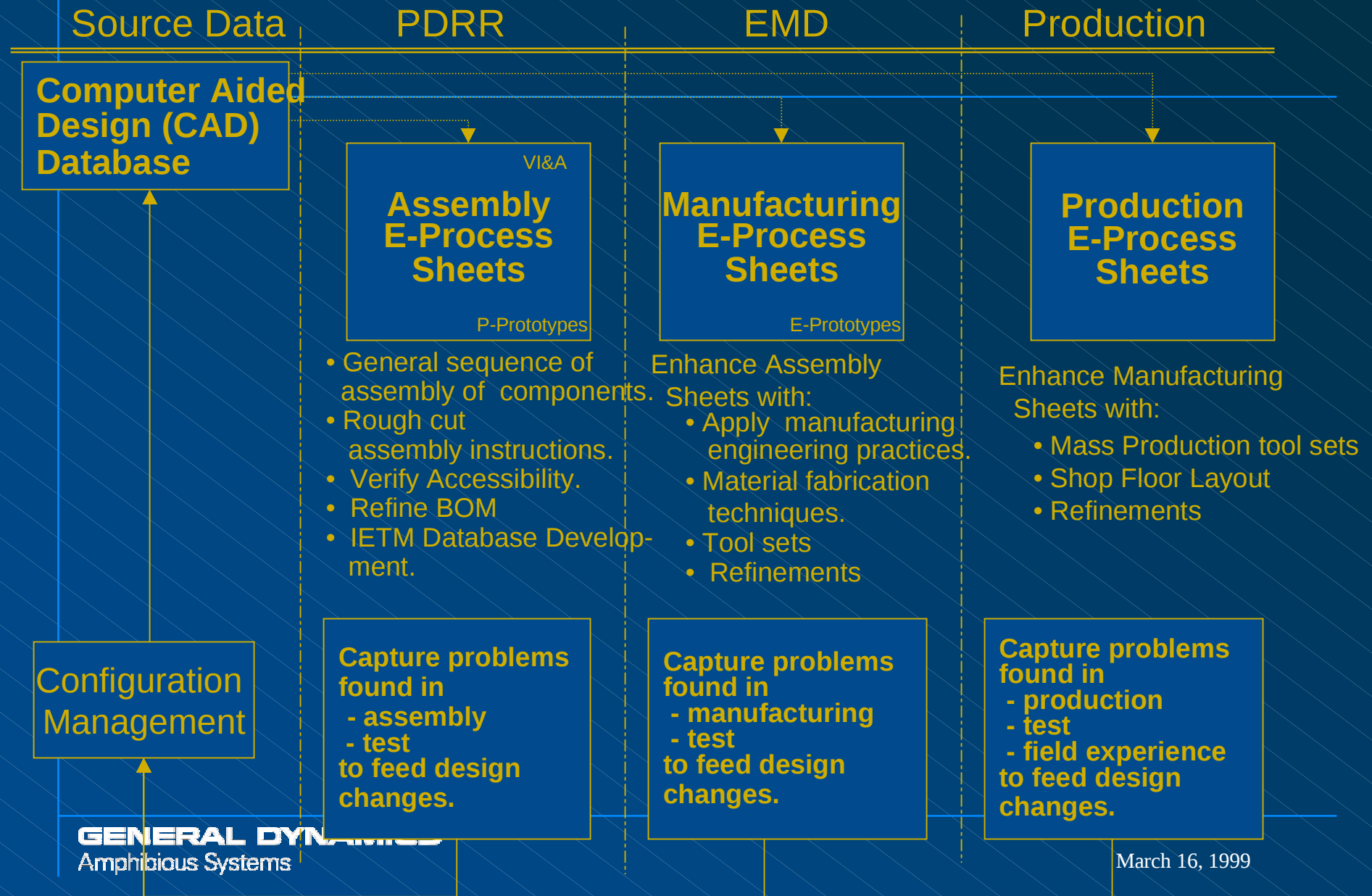
**Fielding  
IETM**

**Integrated Approach Reduces Redundant Documentation Efforts.  
This simplifies CM, Development, and greatly increases data  
consistency (e.g. improves quality) at a reduction of cost.**

**GENERAL DYNAMICS**  
Amphibious Systems

March 16, 1999

# VI&A Tie-in to Production



**GENERAL DYNAMICS**  
Amphibious Systems

March 16, 1999

# VIRTUAL INTEGRATION & ASSEMBLY

Hardware



AAAV Build



LATP Fab



AAAV Test

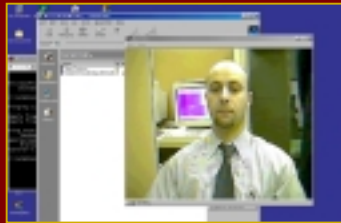


AAAV DRPM

World Wide Web (Hyper-Link, Embedded Functions, Security)

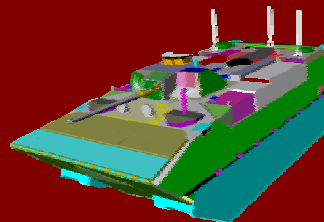
Application(s)

Virtual Collocation

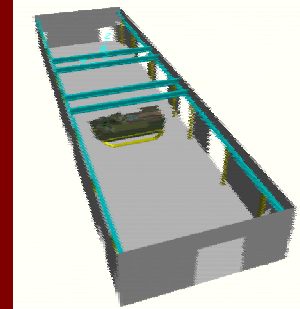


VTC, Whiteboard, App Sharing

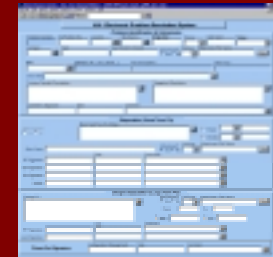
Assembly Data/Notes



Simulation



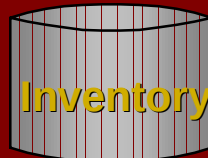
Problem Reporting



Data Sources



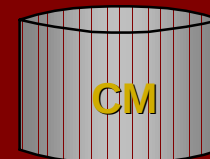
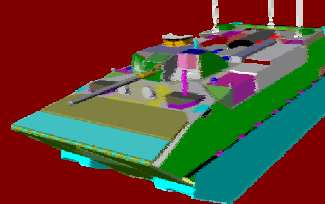
Procure



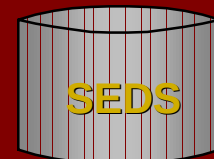
Inventory



Models



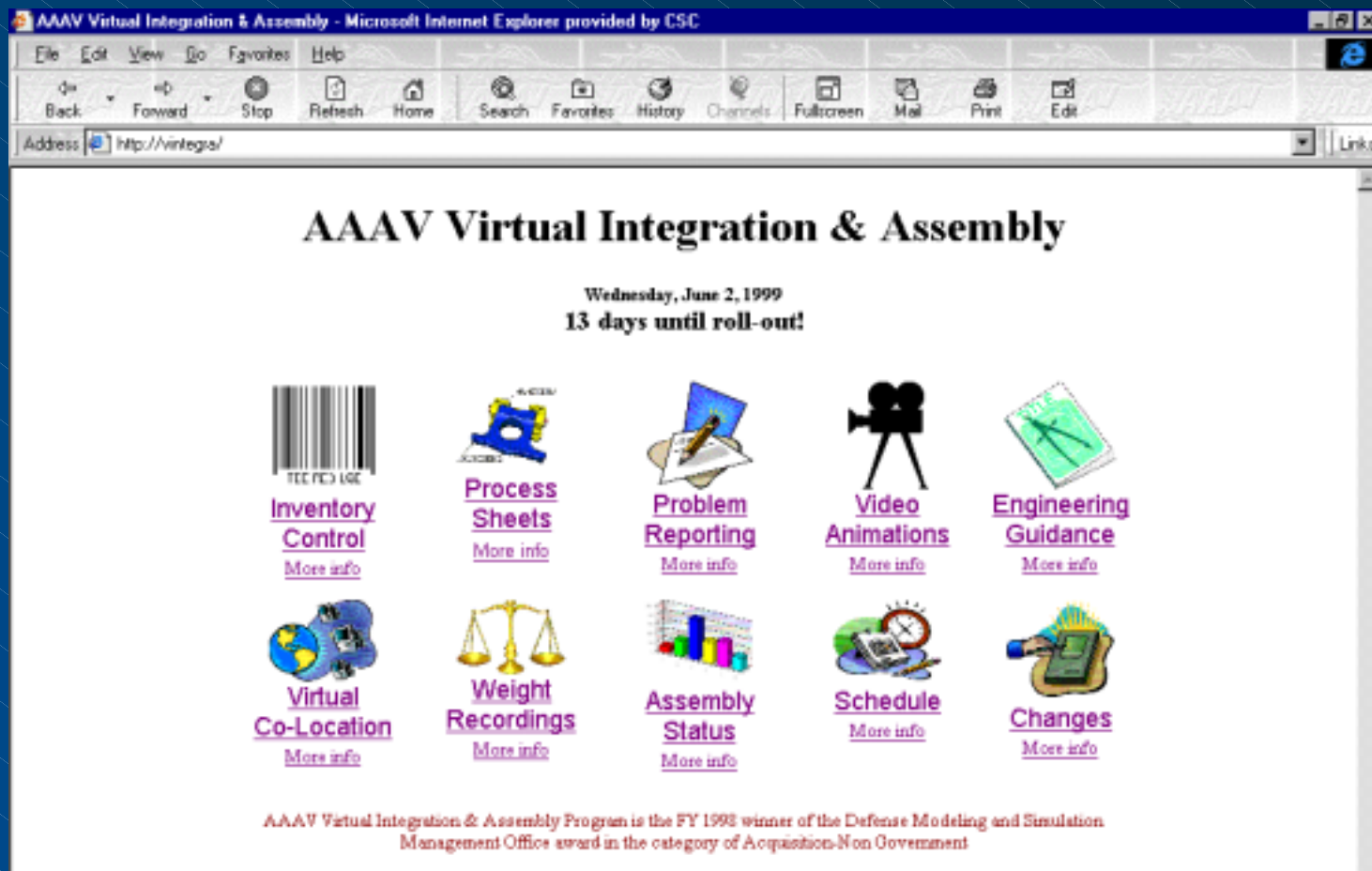
CM



SEDS



# Virtual Integration & Assembly Integrated Manufacturing Knowledge Base



**GENERAL DYNAMICS**  
Amphibious Systems

March 16, 1999

# Integrated Inventory Control

## Mapping Manufacturing Tasks To BOM

**Engine**

**I&A TASK**

| IPT    | Task Code                  | Task Description                | Early Start |
|--------|----------------------------|---------------------------------|-------------|
| Engine | <a href="#">I&amp;A02</a>  | P-1 Install Primary Engine      | 04/26/1999  |
| Engine | <a href="#">I&amp;A06</a>  | P-1 Install APU                 |             |
| Engine | <a href="#">I&amp;A201</a> | P-1 Rework Hull Structure       |             |
| Engine | <a href="#">I&amp;A37</a>  | P-1 Install Fuel System         |             |
| Engine | <a href="#">I&amp;A37A</a> | P-1 Install Fuel System Exter   |             |
| Engine | <a href="#">I&amp;A40</a>  | P-1 Install Engine Cooling Sy   |             |
| Engine | <a href="#">I&amp;A41</a>  | P-1 Install Air Induction Syste |             |
| Engine | <a href="#">I&amp;A42</a>  | P-1 Install Exhaust Systems     |             |

Engine : I&A02 : P-1 Install Primary Engine Vehicle: P1

| Line # | Part# Part              | Alias Part          | Description                     | Part Qty | Inv Qty | Process ID | Comment            |
|--------|-------------------------|---------------------|---------------------------------|----------|---------|------------|--------------------|
| 1      | av040802.asm            |                     | ENGINE                          | 1        |         | PS0405     | In stock           |
| 2      | av040812.prt            |                     | MOUNT                           | 1        | 3       | PS0408     | In stock           |
| 3      | av040811.prt            |                     | STAND                           | 1        |         | PS0408     | gross date 777     |
| 4      | av040812.prt            |                     | PLATE                           | 2        |         | PS0408     | In stock           |
| 5      | av040813.prt            |                     | SWITCH, PRESSURE                | 1        |         | PS0405     | gross date 6/15    |
| 6      | av040814.prt            |                     | SWITCH, PRESSURE                | 2        |         | PS0405     | gross date 6/15    |
| 7      | av040805a.prt           |                     | COVER                           | 1        |         | PS0405     | to be released 6/1 |
| 8      | av040805.prt            |                     | SETScrew, SOCKET                | 8        |         | PS0408     | In stock           |
| 9      | av040810.prt            |                     | MOUNT                           | 1        | 3       | PS0408     | In stock           |
| 10     | av040800.asm            |                     | VALVE, CHECK                    | 2        |         | PS0405     | gross date 6/1     |
| 11     | ole031_m08x08_al_01.prt |                     | SCREW, CAP, SOCKET, CONICAL HEA | 8        |         | PS0408     | In stock           |
| 12     | ole031_m08x08_al_03.prt |                     | SCREW, CAP, HEXAGON HEAD        | 4        |         |            | In stock           |
| 13     | ole031_m12_al_03.prt    |                     | NUT, FLANK, HEXAGON             | 12       |         | PS0408     | In stock           |
| 14     | ole031_m12_al_03.prt    |                     | NUT, FLANK, HEXAGON             | 3        |         | PS0405     | In stock           |
| 15     | av040813.prt            | AV040813.PRT        | ENG SLIDE BACK                  | 1        |         | PS0405     | In stock           |
| 16     |                         | AV040813.prt        | Major Engine Mount              | 8        |         | PS0405     | In stock           |
| 17     |                         | AV040802.prt        | Support Rack                    | 8        |         | PS0405     | In stock           |
| 18     |                         | 040812 MOUNTING AS- |                                 | 8        | 14      | PS0405     | In stock           |

**GENERAL DYNAMICS**  
Amphibious Systems

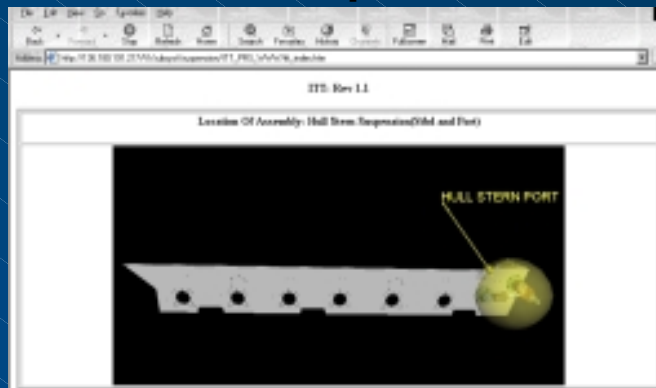
March 16, 1999



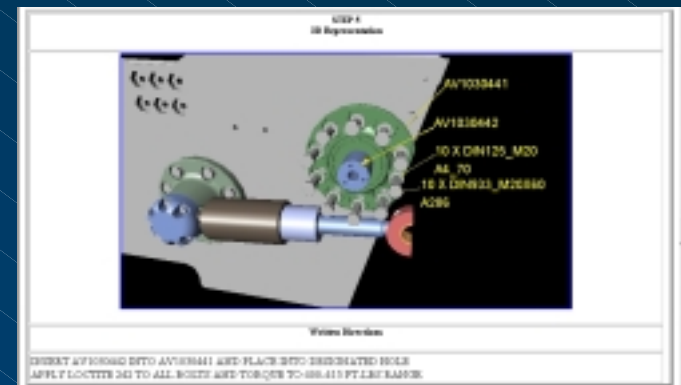
# E-Process Sheet

## Detailed Assembly/Mfg Knowledge

### Location Of Operation



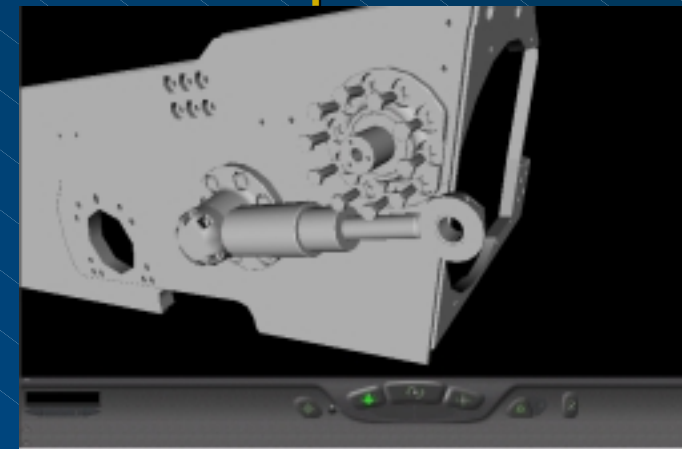
### Step By Step Instructions



### Assembly BOM

| TABLE BOM        |               |                            |      |                            |       |  |
|------------------|---------------|----------------------------|------|----------------------------|-------|--|
| Part No. 1000000 |               |                            |      | PART NAME                  |       |  |
| Qty              | Part No.      | Part Name                  | Unit | DESCRIPTION                | Notes |  |
| 1                | AV1038441     | BUSH                       | 1.00 | BUSH BASE                  |       |  |
| 16               | DIN125_M20    | BOLT                       | 1.25 | BOLT STANDARD STEEL W/SHIM |       |  |
| 16               | DIN933_M20B80 | NUT                        | 1.00 | NUT CAP STANDARD HEAD      |       |  |
| 1                | AV1818442     | BUSH                       | 1.25 | BUSH CAP                   |       |  |
| 2                | AV1038442     | SPRING PLATE, MOUNT, THICK | 1.00 | SPRING PLATE, MOUNT, THICK |       |  |
| 1                | AV1038443     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038444     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038445     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038446     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038447     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038448     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038449     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038450     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038451     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038452     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038453     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038454     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038455     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038456     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038457     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038458     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038459     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038460     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038461     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038462     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038463     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038464     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038465     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038466     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038467     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038468     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038469     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038470     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038471     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038472     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038473     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038474     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038475     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038476     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038477     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038478     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038479     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038480     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038481     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038482     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038483     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038484     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038485     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038486     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038487     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038488     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038489     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038490     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038491     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038492     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038493     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038494     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038495     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038496     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038497     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038498     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |
| 1                | AV1038499     | SPRING PLATE, THIN         | 1.00 | SPRING PLATE, THIN         |       |  |
| 1                | AV1038500     | SPRING PLATE, THICK        | 1.00 | SPRING PLATE, THICK        |       |  |

### VRML Of Step



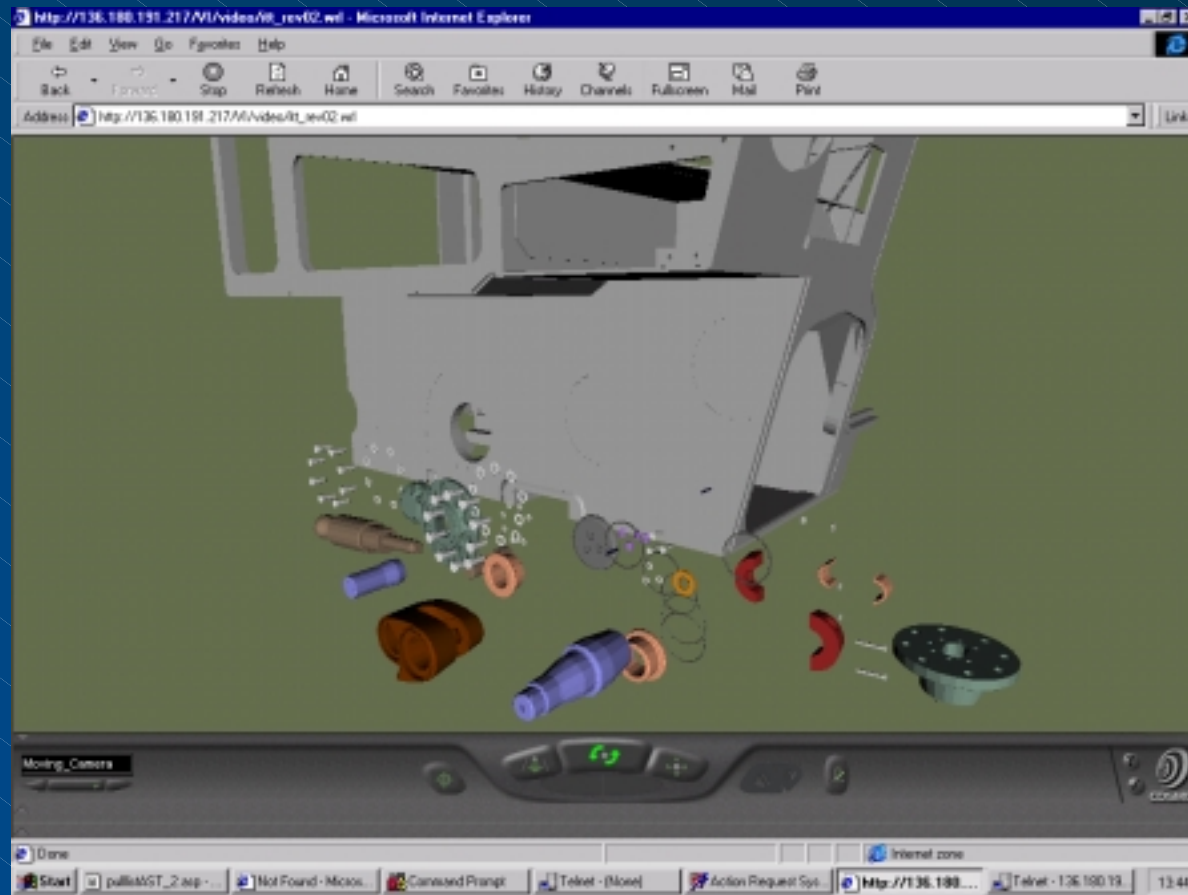
**GENERAL DYNAMICS**  
Amphibious Systems

March 16, 1999

# Produceability Simulation

## Assess Assembly/Mfg Before Build

## Doubles As Mfg/IETM Training



**GENERAL DYNAMICS**  
Amphibious Systems

March 16, 1999