



Presentation for:

“Pilot Results and Assessment”

Life Cycle Integrated Data Environment

NSRP Advanced Shipbuilding Enterprise Research Announcement
Submitted by: Huntington Ingalls Industries, Newport News Shipbuilding

A Collaborative Proposal on behalf of:

Huntington Ingalls Industries,
Newport News Shipbuilding

SIEMENS Product Lifecycle
Management Software

SIEMENS

Life Cycle Integrated Data Environment Pilot Results and Assessment Agenda:

- Project Goals and Objectives
- Requirements Addressed by Project
- Pilot Results
- Demonstration
- Pilot Assessment
- Production Implementation Considerations

The goal of this project is to build a shipbuilding data environment in order to improve customer access to OEM technical data needed to support Service Lifecycle Management (SLM). This project also further enables the Navy in its efforts to move from a drawing centric to a data centric environment with the ultimate goal of reducing ship total ownership costs (TOC).

The Project Team will leverage and integrate with the ongoing Newport News Shipbuilding (NNS) PLM NeXt 3D product model development activities. This project will be devoted to the more efficient creation and management of life cycle work by:

- Development of a common Graphical User Interface (GUI) for all stakeholders.
- Providing a user friendly portal for Navy and other stakeholder access.
- Providing an IDE with single source for accessing ship OEM technical data.
- Provide a framework for security access and configuration control of selected ship data.

Benefits of the project:

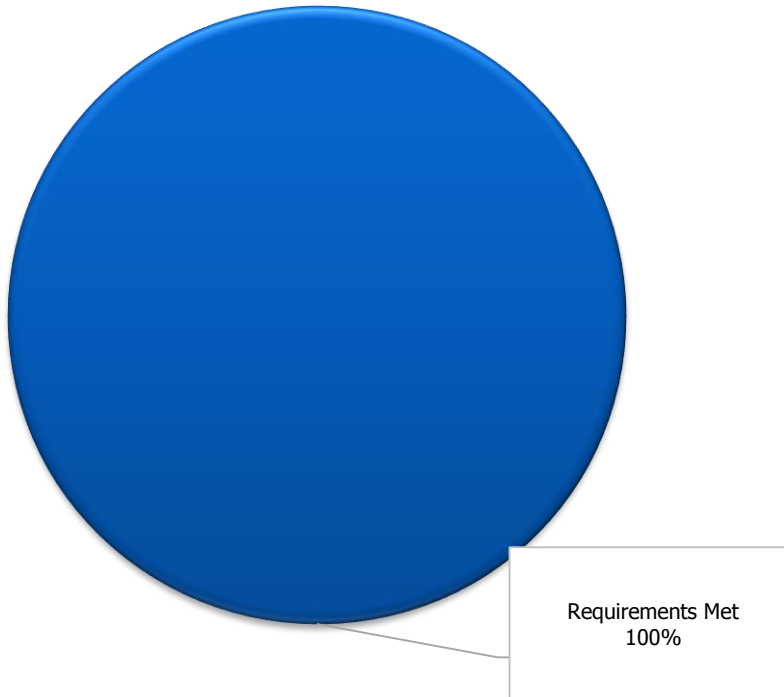
- Development of a standard reduces time for stakeholders to access and exchange data.
- Reduces time to access information for problem resolution.
- Provision of light 3D product model views in addition to 2D drawings.
- Effort supports the concept of drawing elimination.
- Provide OEM data from user desktop.

COMPLETED – In Scope Project Requirements

- Development of a common Graphical User Interface (GUI) for all stakeholders.
- Providing a user friendly portal for Navy and other stakeholder access.
- Providing an IDE with single source for accessing ship OEM technical data.
- Provide a framework for security access and configuration control of selected ship data.

Active Workspace is a zero install web client that brings Teamcenter functionality to a wide range of browsers and mobile devices

In Scope Project Requirements



Ship Class: CVN78

Product Model:
Forward Pump Room
No 2

Test Scripts: 64 Total
in scope requirements
tested

Success Rate: 100%
of the in scope
requirements were met.

Life Cycle Integrated Data Environment

Additional Project Scope

- Develop Siemens COTS software, configurable to individual shipyard business and manufacturing processes
- Utilize the geometry and metadata for analysis and work package creation purposes
- Pilot shipyard specific TC/NX configurations and processes to simulate an abbreviated carrier maintenance availability. The intent of this simulation is to test abilities and limitations of the Siemens SLM module with NNS data aligned with Naval Shipyard methodologies.
- Within the Scope of this project, NNS alignment with Naval Shipyard methodology is interpreted as NNS workflows, processes, and performance metrics as aligned with the Naval Shipyards workflows, processes, and performance metrics to permit interchangeability of design information, work instructions and production labor, and associated data as much as practical

Additional Requirements COMPLETED – End-to-End Ship Availability Requirements

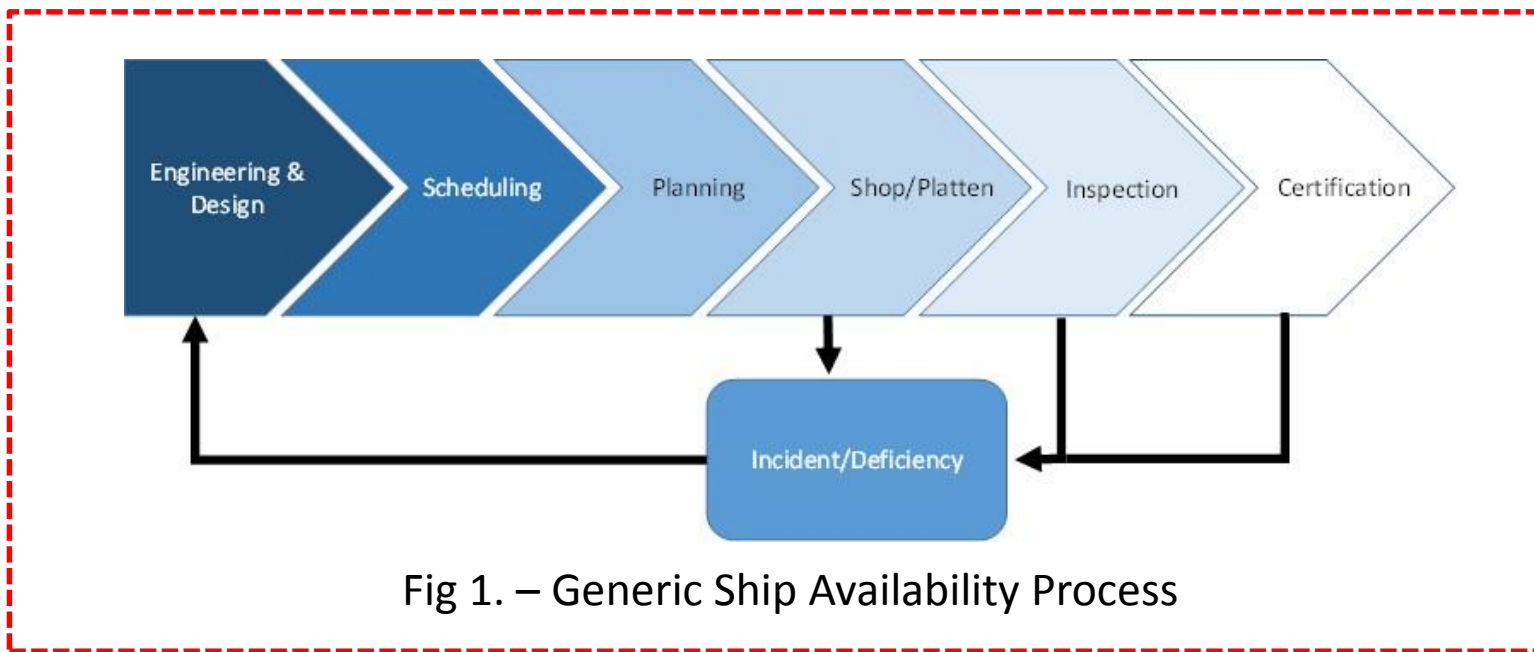
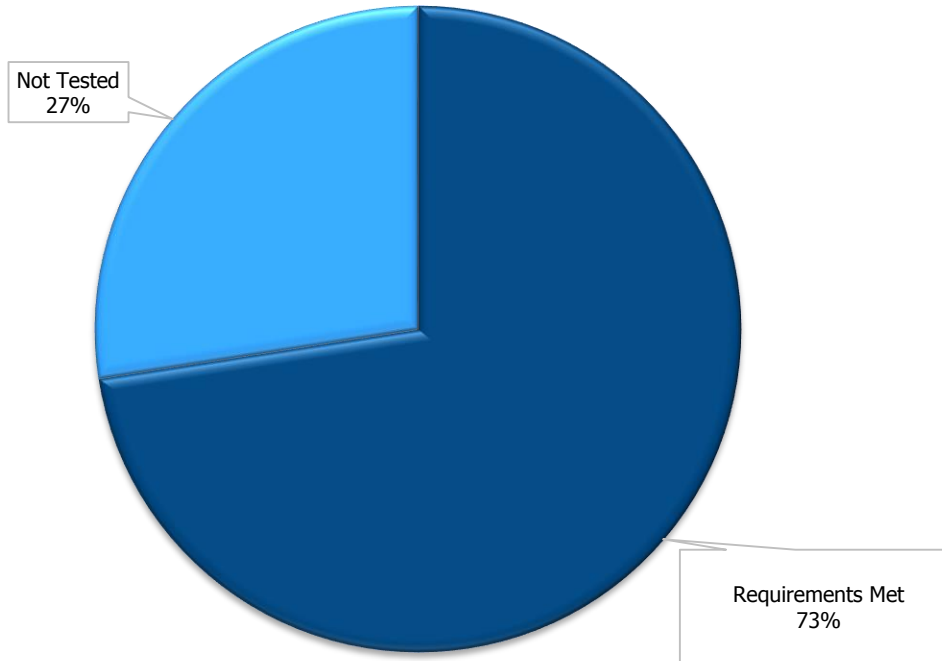


Fig 1. – Generic Ship Availability Process

End-to-end Ship Availability Requirements



Ship Class: CVN78

Product Model: Forward Pump Room No 2

Test Scripts: 1,425 additional “End-to-End” Ship Availability requirements identified

Success Rate: 73% (1,034) of these requirements were also met. 391 could not be tested.



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REQUIREMENT CATEGORY	NOT TESTED	%	TESTED	%
Approvals	1	13%	7	88%
Authoring Tool	6	15%	34	85%
Engineering & Design	14	28%	36	72%
Configuration Management	1	7%	14	93%
Data Management	6	50%	6	50%
Execution	20	36%	36	64%
Inspection/Certification	7	10%	61	90%
Performance	6	43%	8	57%
Planning	13	25%	40	75%
Reporting	2	10%	19	90%
Security & Role Definition	5	16%	26	84%
Scheduling	23	47%	26	53%
Usability	1	3%	34	97%
Work Package	274	30%	653	70%
Work Flows	12	26%	34	74%
TOTAL	391	27%	1034	73%

	PASSED	FAILED/NOT TESTED				TOTAL
		SEV-1	SEV-2	SEV-3	SEV-4	
TESTED:	1,034					1,034
REASON NOT TESTED:						
Drawing requirement			7	19	1	27
Production Implementation			58	74		132
ERP Integration			19	19		38
Lifting and Handling			8	11		19
Material Location			9			9
Job Location			12	3		15
Shipyards specific requirement			10	11		21
Performance		3	1	2		6
Training					3	3
Specific paper form/record				65		65
Preheat / Interpass temperature				33		33
CCPM Integration			10	13		23
TOTAL	1,034	3	134	250	4	1,425

SEVERITY LEVEL DEFINITIONS

- SEV-1 Critical Defect affects critical functionality or critical data. No workaround available
- SEV-2 Major Defect affects major functionality or major data. Workaround is difficult
- SEV-3 Minor Defect affects minor functionality or non-critical data. Easy workaround
- SEV-4 Trivial Defect does not affect functionality or data. No workaround required

LCIDE Objectives - (CVN78 Pilot)

Development of a common Graphical User Interface (GUI) for all Navy and other external stakeholders	F (Fully Achieved)
Provide an IDE with a single source for accessing ship OEM technical data	L (Largely Achieved)
Distributed collaborative Engineering and Planning	L (Largely Achieved)
Enhance process and tool efficiency	L (Largely Achieved)
Interoperability	L (Largely Achieved)
Paperless distribution and tasking workflow	L (Largely Achieved)
Increased Technology Readiness Level (TRL) - Pilot will increase TRL from 4 to 6	F (Fully Achieved)
Increased Manufacturing Readiness Level (MRL) - Pilot will create an MRL from 4 to 5	F (Fully Achieved)



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LCIDE NSRP Focus Areas - (CVN78 Pilot)

<p>a. Increased application of digital technologies</p>	<ul style="list-style-type: none"> * Innovative application of collected/stored data to shipyard business processes * Increased paperless workflow * Increased real-time digital communication and configuration management * Increased application of modern communications and information technologies 	<p>F (Fully Achieved)</p>
<p>b. Reducing Total Ownership Costs</p>	<ul style="list-style-type: none"> * Reduced time spent by External Stakeholders to search for Yard Issued Drawings and supplemental documents (Electronic Inspection Reports, previous drawing revisions, etc.) * Reduced time spent by shipyards to provide data * <i>Reduced time spent by External Stakeholders locating data</i> 	<p>L (Largely Achieved)</p>
<p>c. Improving Processes</p>	<ul style="list-style-type: none"> * Optimized sequencing of work * Optimized processes for shipyard interoperability * Streamlining data collaboration efforts 	<p>F (Fully Achieved)</p>
<p>d. Improving Data Exchange</p>	<ul style="list-style-type: none"> * Reducing time spent from providing data through different medims * <i>Integrating external systems (Navy & PLM Tools)</i> 	<p>L (Largely Achieved)</p>

* Achieved

* *Not achieved*

Metric	"As is" Baseline	Project Goal	Pilot Assessment
Improve Data Access	Current Process	30% reduction	✓ Achieved
Reduce Data Exchange Time	Current Process	40% reduction	✓ Achieved
Technology Readiness Level (TRL)	4 - Component validation in laboratory environment	6 - System prototype demonstrated in a relevant environment	✓ 6 - System prototype demonstrated in a relevant environment
Manufacturing Readiness Level (MRL)	4 - Capability to produce the technology in a laboratory environment	5 - Capability to produce prototype components in a production relevant environment	✓ 5 - Capability to produce prototype components in a production relevant environment



- System performance at the scale of the planned operational system (5,000 users) is unknown.
- Investment in a secure wireless network infrastructure would need to be made in order to provide connectivity throughout the shipyard.