# Business Technologies Panel

*NSRP PP27 BT Panel Project Pitches*

NATIONAL SHIPBUILDING RESEARCH PROGRAM™
Taking Shipbuilding and Repair to the Next Level

# Additive Manufacturing for Shock Optimization

**Project Lead Organization:** Austal USA
**Project Team Members:** Altair, ShipConstructor USA, Austal Advance Technologies, HII-Ingalls

## Concept/Idea

**Issue:** Shock qualified components are often heavy and require multiple components for mounting

**Proposed Solution(s):** Verify COT optimization software can design to minimize weight and ensure shock qualification for DfAM systems.

## Benefits/Justification

**Benefits of the Project:**

- Showcase the power of COTs Optimization software to support DfAM components that are shock qualified optimized for minimal weight
- Using a common 4x4 electrical box will allow scaling to large enclosures. The ability to reduce system weight is beneficial to all classes of vessels
- Developing a DfAM system that include integral mounts saves warehousing cost for one part vice many. There is also an installation cost savings due to not having to assembly a legacy system.

## Project Approach

**High Level Statement of Work:**

1) Using COTS optimization software, develop weight optimized shock qualified systems. Compare weight of the DfAM system to legacy component
2) Print system and shock test along side a legacy component
3) SSI able to systematically backfit the 3D model with an optimized DfAM system for a legacy system consisting of multiple parts

**Metric(s) of Success:**

1) DfAM system is lighter and satisfies shock requirements.
2) COTS optimization software shock analysis equals physical light weight shock test

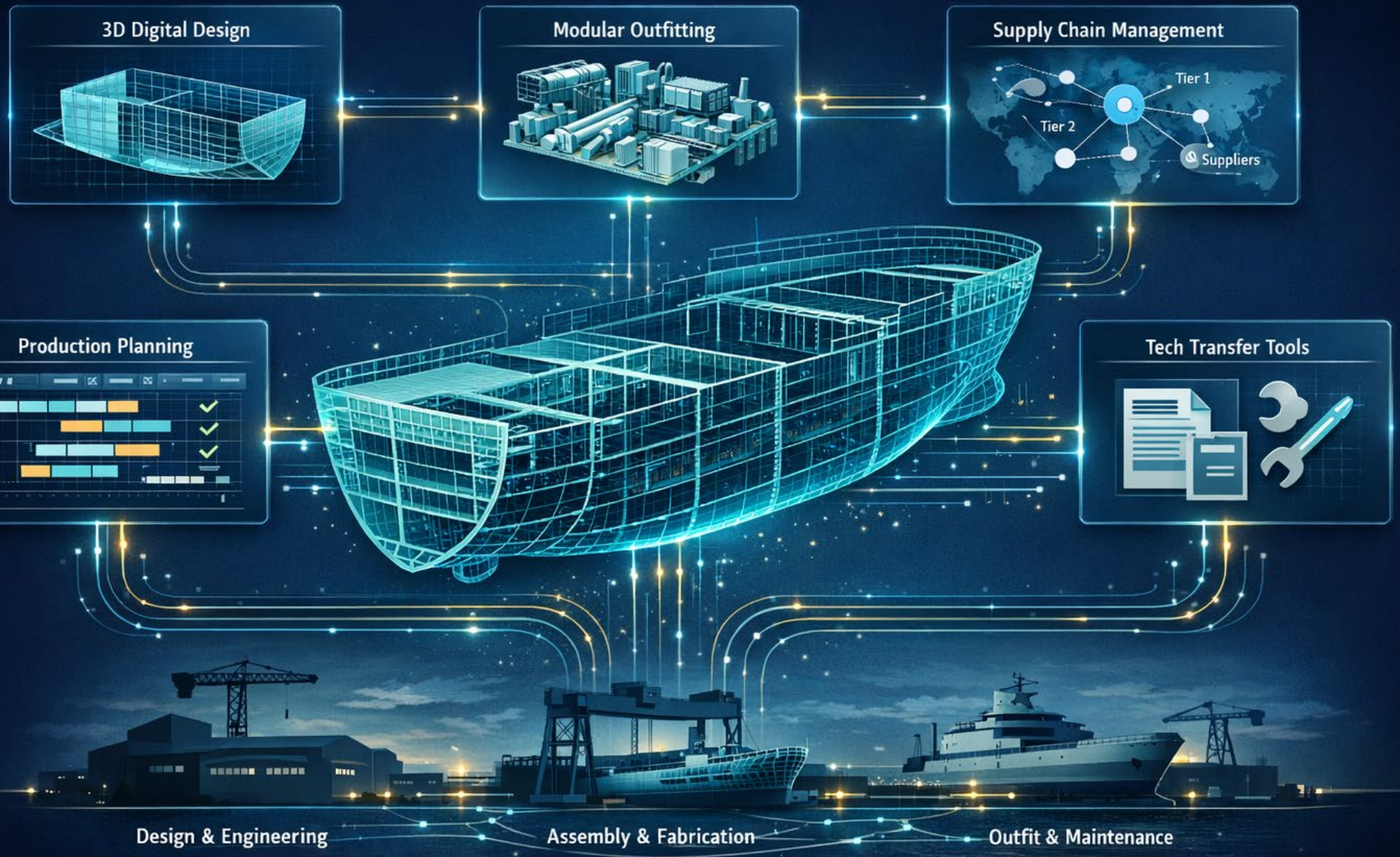
## Cost/Images/Relevant Information

**Project Estimated Cost:**

$200,000

Panel Project

# SMART SHIPYARD DIGITAL TRANSFORMATION

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# ABS 3D Model-Based Class Approval (3DMBA) Process

**Project Lead Organization:** American Bureau of Shipping (ABS) **Project Team Members:** ABS, NAPA, USCG SFLC, General Dynamics NASSCO, Fincantieri Marinette Marine, Austal USA

## Concept / Idea

**Issue:**

- 2D-based class approval drives long review cycles and misaligned stakeholder expectations
- Package preparation and class review consume significant manhours
- Disconnected numerical models across design cycles cause rework when specs or reviews result in change

**Proposed Solution(s):**

- Streamline ABS Class approval through a native 3D Model-Based Approval (3DMBA) process
- Consolidate Naval Architecture calculations and Structural Design in one model using a proven and trusted ship design platform (NAPA) to expedite the review process

## Benefits / Justification

**Benefits of the Project:**

- Fewer manhours for class package preparation and review
- Faster ABS preliminary design approvals
- Greater vessel owner oversight / transparency via native 3D model viewing
- Standardized expectations and requirements across stakeholders.
- Final deliverable doubles as a digital twin; 2D drawings exported on demand
- 3D Model from preliminary approval exports to production software (Ship Constructor, CADMATIC, Aveva Marine, CATIA, etc.) for an end-to-end digital workflow.

## Project Approach

- Map current ABS approval process to a 3D model-based framework using NAPA
- Refine framework with project participants and government stakeholders
- Shipyards estimate time/cost savings vs. current ABS class approval methodology for the final report

## Deliverables

- Final Report summarizing projected time and cost savings
- ABS Guidance Document on the 3DMBA process
- ABS & NAPA webinar for government and industry
- Disseminate via NSRP, ABS publications, conference papers, and outreach
- 2027 RA Proposal for a Proof in Practice Demonstration

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# AI Assisted Visual Import Tool

**Project Lead Organization: SSI**
**Project Team Members:** VizSeek, Shipyard

## Concept/Idea

**Problem Statement:** Engineering drawings, particularly legacy drawings, are difficult to import into modern CAD and PLM systems. Visuals/scans can be stored but the data contained in these drawings must be manually entered to be exploited by other shipyard systems.

**Proposed Solution(s):** Leverage current off-the-shelf visual search technology to parse data/geometry from 2D drawings (3D Models) to be exported to for import into modern CAD/PLM systems. Leveraging Large Language Models (LLMs), VLMs, OCR and other technologies, Vizseek will extract user-defined attributes from the title block and PMI data in the drawing, including GD&T symbols, dimensions, shapes, and other key manufacturing details. Exports will be standard formats to support a variety of downstream processes and systems.

## Benefits/Justification

### Benefits of the project

- Less time manually rekeying data, particularly for legacy ship program engineering data to support additional processes
- Ability to export product manufacturing information (PMI) data to support digital work instructions
- Minimize human errors by consistently extracting data based on predefined standards
- The extracted data can be structured in a way that makes it easier to find. The data can be queried in seconds rather than manually sifting through physical or digital documents.

## Project Approach

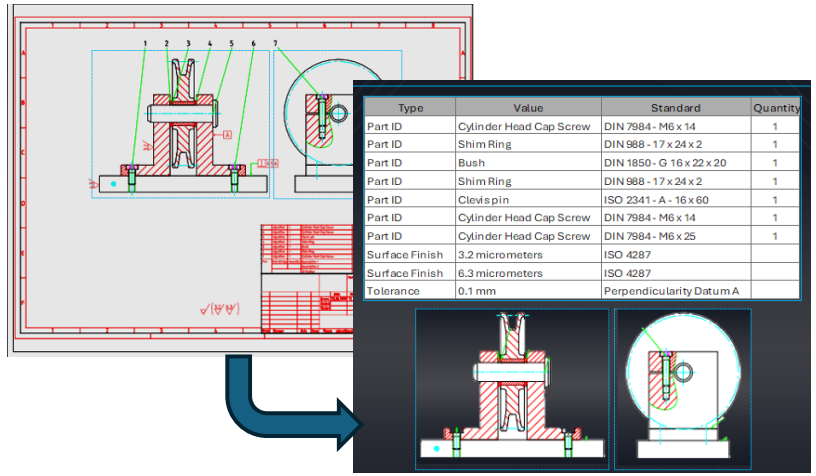
### High level statement of work

- Define an initial dataset including drawings, documents, and images for pilot
- Develop export use cases for other systems
- Define data map for proposed use cases
- Configure pilot system to execute export/import processes
- Test and iterate using AI models to refine process
- Demonstrate configured system and share results

### Metric(s) of Success

- Quality of data exported from pilot data set
- Data exchange back to CAD/PLM to support additional activities

## Cost/Images/Relevant Information




- **Cost**: $200k
- **Cost Share**: $50k
- **Duration**: 12 months

# (MBSCV) Model-Based Ship Check Validation through 3D Scanning

**Project Lead Organization: SSI**

**Team members: DotProduct/Austal USA/USCG/SFLC/ABS**

## Problem Statement/Concept

**Problem Statement:** U.S. shipyards currently perform ship checks and compartment closeouts through manual processes. Inspectors rely on physical walkthroughs, paper checklists, photographs, and visual comparisons to 2D drawings or on-screen views of the 3D model.

This creates:

- Labor-intensive inspections and documentation
- High risk of human error and inconsistencies between as-built conditions and the digital model
- Limited traceability, auditability, and version control of closeout records
- Delays in compartment certification and ship delivery

## Proposed Solution/Project Approach

**Proposed Solution:** Develop a direct integration that enables 3D scanning of the physical environment during ship checks and compartment closeouts, with automatic comparison of scan data to the mature model. The full workflow for compartment closeout and ship checks is managed directly within ShipbuildingPLM.

**Project Approach:** Builds directly on the success of the prior "Equipment Validation through Scanning" project.

DOT Product leads scanning technology and data capture.

SSI provides ShipbuildingPLM integration, workflow management, and automated comparison tools.

Utilizes:• DOT Product scanning APIs and capture workflows• ShipbuildingPLM APIs for model comparison and workflow orchestration

Architecture designed to be reusable across shipyards and maintainable long-term.

## Expected Benefits

**Improved Efficiency:** Automated scan-to-model comparison reduces manual inspection time.

**Reduced Errors & Risk:** Higher confidence that as-built conditions match the model during closeout.

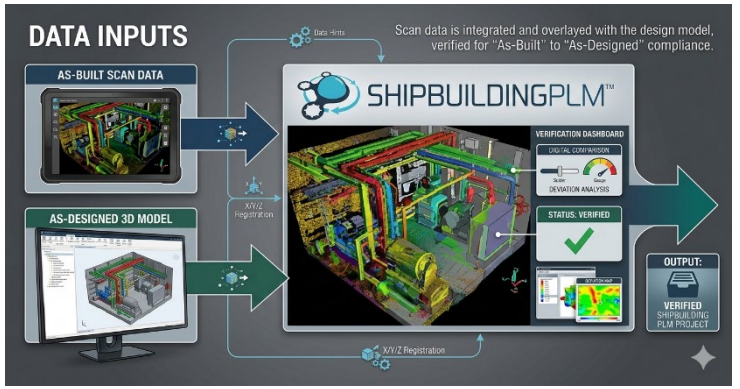
**Enhanced Digital Continuity:** Strengthens the digital thread from design through production and delivery.

**Lower Operational Costs:** Minimizes rework and manual ship-check processes.

**Scalable & Reusable:** Single pre-competitive solution for shipyards, programs, and vessel types.

**Government Alignment:** Supports Navy and Coast Guard model-based shipbuilding and digital thread goals.

## Cost/Images/Relevant Information




- **Cost:** $200k
- **Cost Share:** $50k
- **Duration:** 12 months

# (DCC) Digital Continuity Connector for NAPA–ShipConstructor

**Project Lead Organization: NAPA Design Solutions** **Project Team members: NAPA/SSI/FMM/Austal USA/ABS/**

## Problem Statement/Concept

**Problem Statement:** U.S. shipyards and government programs rely on NAPA for structural/early-stage design and ShipConstructor as the production system of record.

Transferring models between these tools requires third-party translators, which create:

- Additional cost and licensing overhead
- Data degradation and manual rework
- Fragile, project-specific workflows
- Reduced confidence in design-to-production continuity

These limitations block efficient transition of approved designs into production-ready models and slow adoption of model-based shipbuilding and digital thread objectives.

## Proposed Solution/Project Approach

### Proposed Solution

Develop (DCC), a direct, API-based Digital Continuity Connector that enables reliable transfer of structural data from NAPA to ShipConstructor, eliminating the need for mandatory third-party intermediaries.

**Project Approach**

NAPA leads development and ownership of the direct connector.

**Connector utilizes:**

- NAPA APIs for structural design data extraction
- ShipConstructor Genesis API for production model creation

**SSI provides technical enablement:**

- Genesis API guidance and reference implementations
- Targeted utilities / API extensions (e.g., curved plates, cutouts, geometry alignment)

**Architecture designed to be**:

- Reusable across shipyards
- Maintainable long-term

## Expected Benefits

**Improved Production Readiness:** Reliable, repeatable NAPA-to-ShipConstructor model transfer reduces transition time and errors

**Reduced Rework & Risk:** Minimizes manual cleanup and geometry corrections, increasing design-to-production confidence

**Lower Integration Costs:** Eliminates ongoing dependency on costly third-party translation tools and licensing

**Scalable & Reusable:** Single solution applicable across shipyards, programs, and vessel types (pre-competitive)

**Government Alignment:** Directly supports Navy and Coast Guard goals for digital continuity and Model-Based Engineering (MBE)

## Cost/Images/Relevant Information


- **Cost:** $200k
- **Cost Share:** $50k
- **Duration:** 12 months

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