

Shipyard Production Process Technologies

September 30, 2010



2010 SNAME Annual Meeting and Ship Production Symposium

- ▶ Hyatt Regency Bellevue (Bellevue, Washington)
- ▶ November 3rd – 5th
- ▶ SPPT Papers/Presentations/Posters
 - Construction Visualization Modeling
 - RoRo Deck Plating Renewal
 - Implementation of Process Oriented Visual Planning Methods and Techniques
 - Mechanical Bending Process and Application for a Large Curved Shell Plate by Multiple Point Pressing
 - Advanced Mold Design Technology of LCS Waterjet Casting


Panel Project Selection

- ▶ Panel Project White Papers are due to ATI on Friday, October 8, 2010
 - Complete and in correct format
 - Maximum of 3 projects per Panel
- ▶ Will begin the “down select” process today
- ▶ ECB Shipyard Representatives not in attendance will receive all White Paper proposals on Monday, October 4, 2010
- ▶ ECB Panel Project Selection Meeting is scheduled for November 30, 2010 in New Orleans

ECB Shipyard Representatives

Shipyard	SPPT Panel Representative
Austal USA	Shawn Wilbur
BAE Systems Southeast Shipyards	
Bollinger	Barry Matherne
General Dynamics - Bath Iron Works	Tony Clukey
General Dynamics Electric Boat	Ken Fast
General Dynamics - NASSCO	Jeff Schaedig
Marinette Marine Corp	Robert Metzger
NGSB - Gulf Coast (Avondale)	Shawn Wilkerson
NGSB - Gulf Coast (Pascagoula)	Tonya Boney
NGSB - Newport News	Thurston Gore
Todd Pacific Shipyards	
VT Halter Marine	Paul Albert

SPPT White Papers Received

- ▶ Improved Process for Foundry Inspection
 - ▶ Ship Design and Construction Training Module: A Short Course for Ship Design Engineers and Production Crafts in Shipbuilding Distortion Management
 - ▶ Outfit Measurement Requirements
 - ▶ Stability Criteria During Construction and Repair
 - ▶ Development of Course Material for Training Rigging Engineers
 - ▶ Development of Integrated Product and Process Data for Detailed Space Constrained Scheduling
 - ▶ Visual Spatial Planning
- 

Improved Process for Foundry Inspection

- ▶ **Proposer:** David Rice – Northrop Grumman Shipbuilding Newport News
- ▶ **Objective:** To investigate and identify alternative commercial-off-the-shelf (COTS) metrology equipment and software to scan and create 3D models of castings in order to compare the finished part to the designed “finished shape” model
- ▶ **Benefits:**
 - Reduction in Acquisition Costs of Castings
 - Improved Delivery Time of Castings (3D plots will be used to determine if the cast shape meets the acceptance surface tolerances in a timely and cost effective manner without utilizing specialized labor)
- ▶ **Deliverables:** A report containing the analysis and recommendation relative to hardware, software and processes for creating 3D plots of part castings
- ▶ **Funding Requested:** \$95,000

Ship Design and Construction Training Module

- ▶ **Proposers:** T.D. Huang – Northrop Grumman Shipbuilding Gulf Coast
Pingsha Dong – University of New Orleans
- ▶ **Objective:** Develop and deliver a ship design and construction short course module for conducting training to both design and production engineers as well as shop floor craftsmen on practical distortion management and mitigation techniques in shipbuilding to reduce rework and improve quality.
- ▶ **Benefits:**
 - Rework Reduction associated with Thin Steel Distortion
 - Improved Product Quality
- ▶ **Deliverable:** A training course module that will cover and include
 - How residual stress and distortion are generated
 - Sources for residual stress and distortions in lightweight steel structures
 - Principles of distortion mitigation
 - Case studies and recommendations
- ▶ **Funding Requested:** \$99,800

Outfit Measurement Requirements

- ▶ **Proposers:** Ken Fast – General Dynamics Electric Boat
- ▶ **Objective:** Develop a requirements specification document for measurement device(s) that could be used in outfitting to be delivered to the measurement community (vendors, developers, researchers, etc) in an effort to stimulate research and product development for new, more usable equipment
- ▶ **Benefits:**
 - Reduction of time and labor effort associated with shipboard measurement for outfitting while ensuring accuracy
- ▶ **Deliverable:** Outfitting measurement device requirements specification document
- ▶ **Funding Requested:** \$75,000

Stability Criteria During Construction and Repair

- ▶ **Proposers:** Jim Perry – General Dynamics NASSCO
- ▶ **Objective:** Develop a formal methodology and supplementary stability criteria to ensure appropriate levels of safety during ship float out, launch, and dockside repair.
- ▶ **Benefits:**
 - Ability to confirm ship stability and refocus the resources applied to closing and reopening of penetrations that do not pose a demonstrable risk to the ship
 - Improve budget and schedule performance by eliminating the unnecessary closing and reopening of penetrations during launch and float out
 - Method will ensure that complete watertight integrity is provided in regions of anticipated hazard
- ▶ **Deliverables:**
 - Generic stability criteria to verify ship safety at launch and float out
 - Formal Methodology for ensuring vessel stability during launch and float out
 - Report documenting the process by which the criteria and methodology were developed.
- ▶ **Funding Requested:** \$100,000

Development of Course Material for Training Rigging Engineers

- ▶ **Proposers:** Jim Perry – General Dynamics NASSCO
- ▶ **Objective:** Develop a training program with supporting training aids tailored to shipyard rigging design and operation that will provide structural engineers and naval architects with the information required to enable participants to be “qualified persons” as per the American Society of Mechanical Engineers (ASME) B30.20.
- ▶ **Benefits:**
 - Retention and dissemination of shipyard rigging and lifting best practices
 - Improved safety and efficiency
- ▶ **Deliverables:** Training packages containing PowerPoint presentations suitable for classroom instruction, course workbooks, self-learning modules and instructor guides
- ▶ **Funding Requested:** \$100,000

Development of Integrated Product and Process Data for Detailed Space Constrained Scheduling

- ▶ **Proposers:** Patrick Roberts – ShipConstructor USA, Inc.
Vince Stammetti & Chuck Nugent – BAE Systems Southeast Shipyards
Mark Traband & Daniel Finke – ARL Penn State
- ▶ **Objective:** Develop a methodology to integrate product data and scheduling information for use in the 4D Scheduling Tool with the goal to have a fully automated integration between the CAD system and the 4D Scheduling software.
- ▶ **Benefits:**
 - 2-3% Cost Avoidance in Outfitting Labor Hours
- ▶ **Deliverable:** Formal documentation of the translation process (software development plan) and a prototype demonstration of the technology
- ▶ **Funding Requested:** \$100,000

Visual Spatial Planning

- ▶ **Proposers:** Patrick Cahill - Knowledge Based Systems, Inc.
Todd Pacific Shipyards, Inc.
Autodesk, Inc.
- ▶ **Objective:** Develop standards and procedures for using Navisworks® as a Visual Spatial Planning tool for shipbuilding, and prototype the tool at Todd Pacific Shipyards.
- ▶ **Benefits:**
 - Provides shipyard with a comprehensive visual method for integrating facilities planning into ship production
 - Enhances “what-if” analysis during development of build strategies and capacity analysis for potential future new construction programs
 - 20% reduction in man-hours associated with temporary fixtures and services
 - 30-50% reduction in cycle time for evaluating future new construction projects
 - 40% reduction in time required to develop comprehensive build strategies for new construction
- ▶ **Deliverable:** Project Report
- ▶ **Funding Requested:** \$100,000

Next Meeting

- ▶ New Orleans, Louisiana
- ▶ December 7-9, 2010 (tentative)

- ▶ Potential Agenda Items
 - Safe Practice of Common Rigging Equipment (Final Outbrief)
 - Pilot Tool for Linking Ship Design to Shipyard Simulation (Update)
 - Realization Workshop – 3 hour hands on workshop with simulation games and a workbook focused on Critical Chain
 - New Gouging and Weld Removal Processes (Tech-Source Intl)
 - Corzan CPVC Piping: An Alternative to CuNi and Other Metallic Piping Systems (Lubrizon)