



Panel Project – Modern Shipbuilding Design Courses 3 – Final Report

AGREEMENT #2019-483-007
SHIPCONSTRUCTOR SOFTWARE INC. (SSI)

OCTOBER 20TH, 2023

NSRP

National Shipbuilding Research Program

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PANEL PROJECT FINAL REPORT
MODERN SHIPBUILDING DESIGN COURSES 3
AGREEMENT #2019-483-007

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Project Overview:

Background and Summary

This project will update the original Marine Design coursework, providing an implementation path and resources to be offered at a local level with the end goal of training and preparing a capable marine design workforce for the modern shipbuilding industry. This project will also provide a fully documented website and course materials to be used by educators to provide this coursework to students. The intention is to start offering the newly updated marine design courses as early as possible.

Qualified coursework for marine design-specific education is lacking across the industry. Previous NSRP efforts produced marine design courses that were taught at local universities (University of Wisconsin Marinette and University of South Alabama) but have since stopped being offered and have not been updated to include modern advances in design software. This has not helped with the shortage of qualified marine designers across the industry.

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When shipyards need to increase manpower to accommodate a new contract or program, there is always a need for qualified marine designers. When there are other shipyards in the area, they are often competing for the same designer resources, and often find the market lacking in available capable qualified designers. Knowledge of basic CAD tools is not enough for a shipyard marine designer to be productive. Details of how modern shipbuilding design is conducted, processes, terminology, and the understanding of general and specific shipyard workflows all help to make a designer both valuable and highly productive.

The original NSRP RA project, Modern Shipbuilding Design Courses (2018-399), provided a wealth of information for educators in conducting and evaluating a design course for teaching newcomers about the intricacies of modern shipbuilding design. The coursework has not been updated in quite some time and this project will focus on reviewing and updating all the course materials to include advancements made in the industry in the last twelve years as well as to update the material to use new software and features that have since become available.

This project will also investigate the possibility of a fully documented website and course materials to be used by educators and implementors in providing this coursework to students. The intention is to start offering the marine design courses as early as possible.

At the same time, recent advances in internet-enabled learning platforms may be beneficial in offering this coursework in a remote fashion. These will be investigated and if found appropriate and capable, the coursework can be adapted to support Online Training Centers, furthering the appeal and accessibility of the courses to students regardless of where they may be located.

Project Results

This project intended to deliver the following:

- Updated Marine Design Course for new approaches and using the latest software versions.
- Implementation plan for anyone to establish and teach the new coursework.
- A potential for a project website to contain the coursework material as well as the implementation plan details.

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Deliverable's #2, #3 and #4:

- *Deliverable #2 – Acquire and review original course material deliverables*
- *Deliverable #3 – Identify and note areas for updates/revisions, reflecting a change in processes or procedures*
- *Deliverable #4 – Make the appropriate updates/revisions to the curriculum as required*

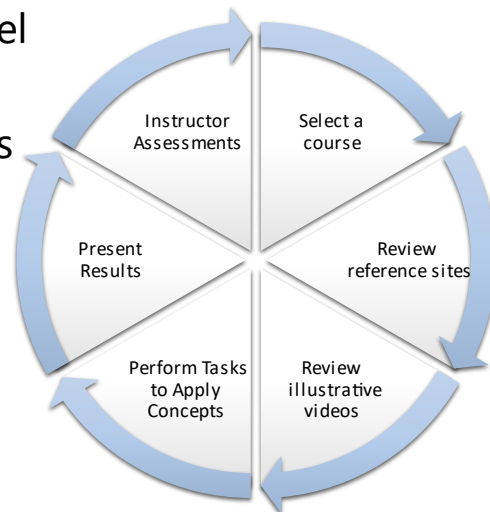
Course Overview

- Purpose
 - Provide appropriate context related to marine design: concepts, processes, and terminology
 - Communicate the information need to develop marine designers quickly to support industry resource needs



Course Design

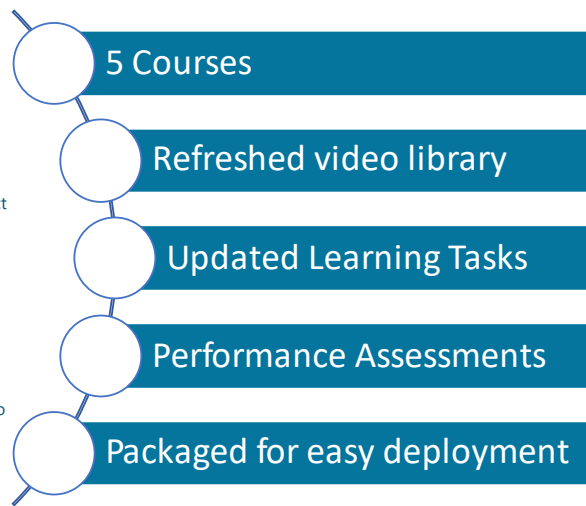
- Performance based learning model
- Instructor-Led
- Students consume basic principles
- Apply knowledge for real-world scenarios
- Instructor Performance Assessments



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Work Performed

- Five Courses
 - Basics of Structural Modeling
 - Basics of Pipe Modeling
 - Basics of HVAC Modeling
 - Basics of Electrical Design
 - Introduction to Design for Production
- Extensive Refreshed Reference Learning library
 - Over 100 originalswf(flash) videos converted to playable format
 - Extracted and updated narration scripts
 - Remade illustrative videos using SSI 2024 and SSI Training Project
 - Reviewed and updated external references (URLs)
- Updated Learning Tasks
 - Reviewed and updated instructional exercise pages for students and instructors
- Updated Performance Assessments
 - Reviewed and updated for each course
 - Converted to fillable .pdfs to accommodate digital file handling
- Redesigned website and Zipped packaging
 - Completely redesigned reference document and illustrative video library
 - Easily downloadable and deployable just download and unzip
 - Web server not required!



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Enhancements Added to the Project

- Completely recreated videos using ShipConstructor 2024 and SSI Training Project
- Redesigned pages, file structure, and document libraries
- Updated external reference links
- Clashes have replaced Interferences
- Hull overview videos added, with the addition of a 'ground up modeling' tutorial

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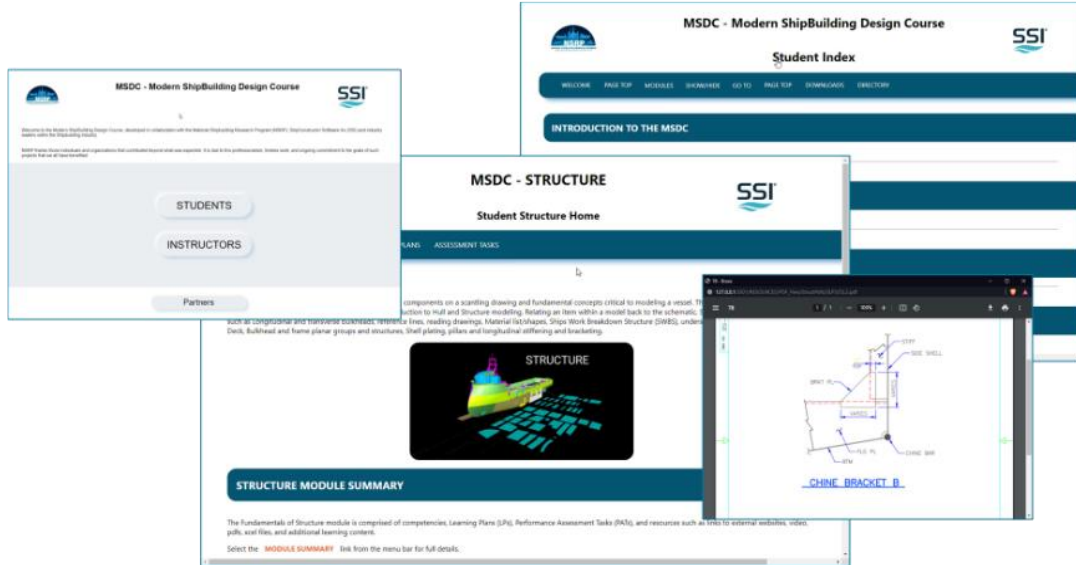
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Deliverable #5:

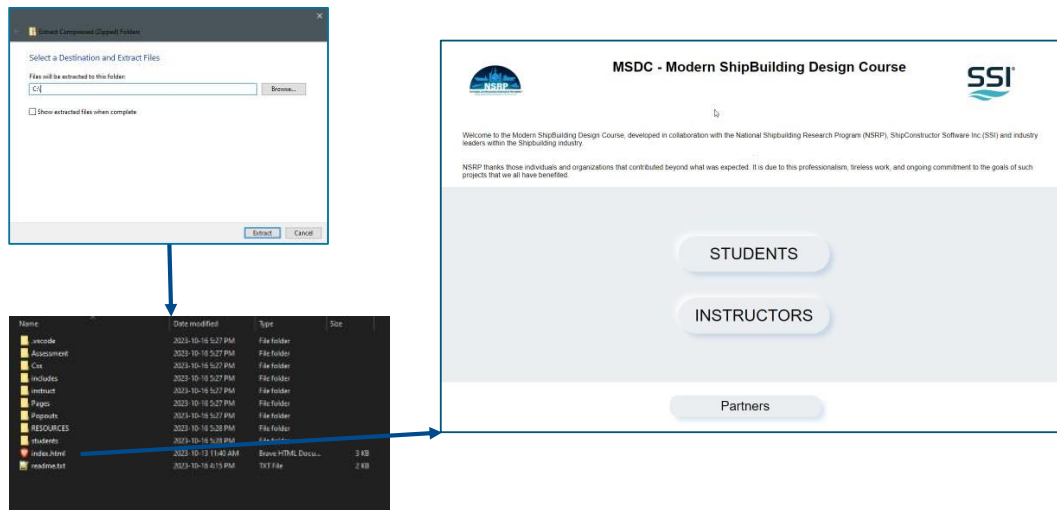
- *Deliverable #5: Investigate a website for Technology Transfer for project visibility*

MSDC Site Overview



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Deployment



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2009 Landing Page

Original Site Landing page

The screenshot shows the original landing page for the Modern Shipbuilding Design Courses. It features a header with the NSRP logo, a central banner with the text 'WELCOME to the MODERN SHIPBUILDING DESIGN COURSES', and a list of course topics: 'BASICS of STRUCTURAL MODELING', 'BASICS of PIPE MODELING', 'BASICS of ELECTRICAL DESIGN', 'INTRODUCTION to BASICS of PRODUCTION', and 'BASICS of HVAC MODELING'. The page also includes a sidebar with navigation links like 'STRUCTURE', 'PIPE', 'ELECTRICAL', 'HVAC', and 'DFF'. A footer section contains a thank-you message from NSRP to the course developers.

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2023 Student Index

Updated Site Landing page

The screenshot shows the updated landing page for the Modern Shipbuilding Design Course (MSDC) Student Index. It features a header with the NSRP logo, the title 'MSDC - Modern ShipBuilding Design Course', and the SSI logo. A navigation menu includes 'WELCOME', 'PAGE TOP', 'MODULES', 'SHOW/HIDE', 'GO TO', 'PAGE TOP', 'DOWNLOADS', and 'DIRECTORY'. A dropdown menu is open under 'MODULES', showing options for 'STRUCTURE', 'PIPE', 'HVAC', 'DFF', and 'ELECTRICAL'. The main content area includes a welcome message and a detailed description of the course, its modules, and the competencies students will gain.

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Site Enhancements

- Restructured Directory, file organization structure
- Easier Navigation
- Modern look and feel (UI/UX)
- Student Assessments and Instructor-specific site pages
- Optional .dwg viewing with Autodesk Drive
- Optional Checkbox Progress Tracking
- Desktop/Mobile/Tablet compatibility
- Popout Viewer Window
- Simplified HTML/CSS/JS format allows for seamless customization, future updates

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Technology Transfer and Implementation

This project was briefed at the Workforce & Compliance Panel Meeting (apart of the 2023 NSRP All Panel Meeting) on Thursday, March 30th, 2023 in Charleston, SC. The meeting was held at the North Charleston Convention Center located at 5001 Coliseum Dr, North Charleston, SC 29418. SSI's Darren Guillory presented this project to the panel on Day 3 of this event.

Time	Presentation	Speaker
8:00 am	Convene Meeting	
8:00 am	Introduction / Panel Chair Welcome / Chair Report	Maurissa D'Angelo
8:10 am	NSRP Update	Maurissa D'Angelo
8:30 am	Panel Project Call Highlights Discussion	Maurissa D'Angelo
8:40 am	Panel and RAP Project Updates	Multiple
	Shipbuilding Apprenticeship: A Qualitative Analysis	
	Feasibility of Standardized OSHA Maritime Management Safety Training	
	Pending – High Productivity Reduced Emissions Arc Gouging Process	
	Pending – Modern Shipbuilding Design Courses 3	
	Pending – Implementation of Press Connect Fittings in Construction of US Navy Ships	
9:30am	When Bad Data Meets Good Intentions: Impact of Poor Data Quality on Welding Emission Factors	Giobbi
10:00 am	SIP/TIP Update	Crowell
10:45	Break	
11:00	Supporting Workforce Through Training	Witt
11:30	Electric Transportation and the Environment	Tallarico
12:00	Panel Project Discussion	All
12:30 pm	Review Action Items / Closing Remarks	Maurissa D'Angelo

A link to the NSRP website's "Event Page" for the [2023 NSRP All Panel Meeting – Charleston, SC](#) is provided here.

The Modern Shipbuilding Design Courses 3 presentation included the following:

- Project Overview
- Introduction of the Project Team
- Explanation of the Project Problem Target
- Outline of the Project Goals
- Description of the Major Tasks
- Review of Original Course Material
- Updated Course Curriculum
- Questions

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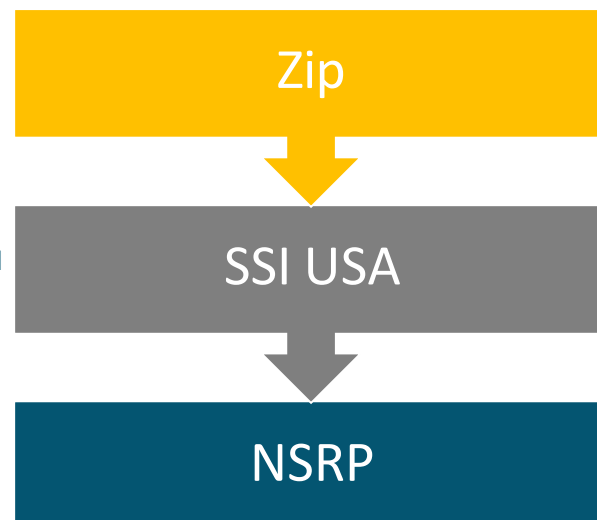
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Additional discussions around this project were conducted at the Workforce Development Panel Meeting in Baltimore August 1 – 2, 2023. A final demonstration was hosted on October 17, 2023. This was a widely attended meeting including all project participants and other industry participants. The project team demonstrated the website and discussed the findings from the project and next steps including plans for content delivery/deployment of the content :

- The new course material can be accessed by downloading the zipped project folder. This zipped folder is included in the Final Demonstration presentation as well as instructions on how to download the folder and navigate through the content.
- SSI will be providing the new course material to all project participants and NSRP.
- SSI will host the content on its Nexus site which is available to all global SSI customers.
- The Modern Shipbuilding Design course compliments SSI existing training modules and will now become part of SSI's training curriculum which will be updated with future releases of the software.

Content Delivery

- Course pages, video library, and assessments delivered as .zip file to support local deploy or web deployment
- SSIUSA will provide Zip and upgrades to NSRP directly (if bug fixes needed)
- SSI Nexus
 - Users will need to access Nexus to download ShipConstructor
 - ShipConstructor training project does not require a license
 - May deploy video library to SSI Learning
 - May make zipped package available to download from Nexus SSI Learning
- Potentially have NSRP host the website



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Conclusion and Recommendations

The Modern Shipbuilding Design course fills a critical gap in the need to onboard new designers to the shipbuilding industry. The original investment by NSRP was in need of an upgrade to deal with changes in technology as well as ship design processes. With collaboration of the broader team, SSI was able to deliver an updated instructor-led course that is now in a position to be maintained by SSI for the benefit of the marine industry. The following bullets summarize the results of this effort:

- Course explains the theory behind Marine Design, compliments SSI certified training.
- Organization of original content was difficult to follow and needed to be restructured.
- Took a long time to update the content but future efforts should update the theory (i.e., create a hull section).
- Timeline was difficult to manage (more work than the time and funding allowed).
- It was important to stay organized and focused on content creation to complete the project.
- Evaluated integration with Learning Management Systems
 - Interesting but not the value we thought it might provide
 - Future efforts would apply the SCORM model to provide more opportunity for self-directed training and potentially LMS integration
 - Website is SCORM compatible and could be implemented in the future
- Future opportunity for self-paced, online training but not enough time to execute during this project.
- Content drives the training and updating the content was deemed most important for this effort.