NSRP - Combat Systems Standard Foundation Qualification & Optimization July 13, 2023

Harold Howard - Newport News Shipbuilding
Ify Amene - Newport News Shipbuilding
Mackenzie Wilson – Newport News Shipbuilding

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

Combat Systems Standard Foundations Qualification and Optimization

- Integrated Project Team:
  - Lead – Newport News Shipbuilding:
    - Harold Howard
    - Ify Amene
    - Mackenzie Wilson
    - Daniel Kissinger
  - Participants - Ingalls Shipbuilding:
    - John Walks
    - Davida Cunningham
  - NAVSEA O5P1
    - TBD
  - Program Technical Representative
    - Shawn Wilbur – AUSTAL USA

Background

- Combat systems equipment is currently installed utilizing specialized foundations that often require hot work (cutting, grinding, and welding)
- These foundations must often be replaced when equipment is refreshed, and new specialized foundations are designed, produced, and installed for each new piece of equipment
- Given the frequency of combat systems equipment refreshes, this potential results in significant industrial work and rework in adjacent spaces
- To that effect, the NSRP Common Interface Pilot Project (CIPP) was undertaken to streamline the installation process for combat systems equipment onboard Navy platforms

Standard Foundation Project Initiation

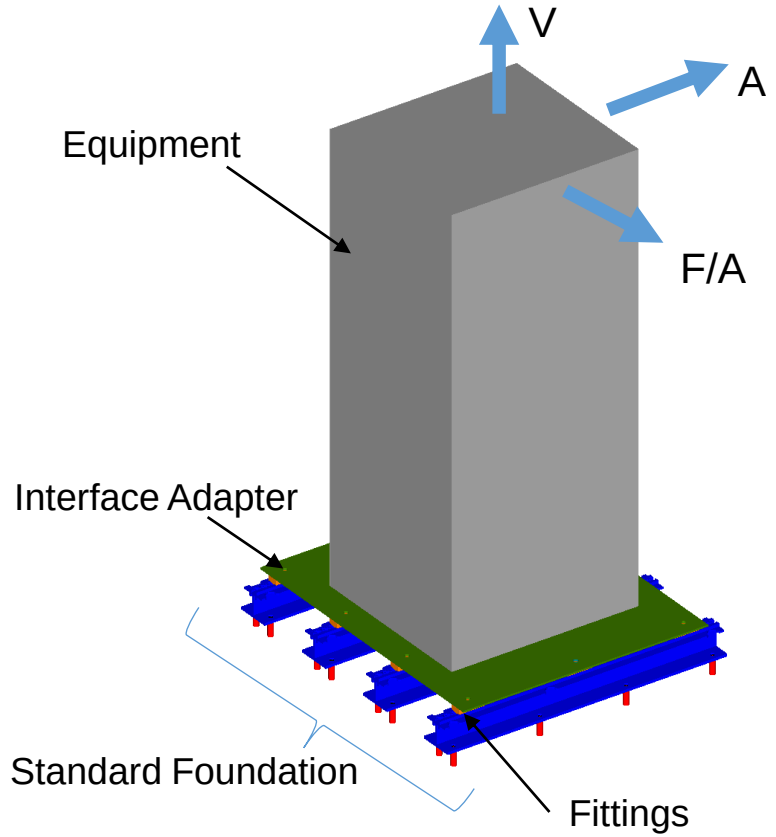
- CIPP Purpose: Development of common interface standards for the integration of combat systems Enterprise Air Surveillance Radar (EASR) on multiple surface ships
- CIPP Investigation: Multiple shipyards surveyed to identify the major cost & schedule drivers in the Combat Systems (CS) equipment installation process:
  - Impact to schedule caused by late/changing GFI
  - Impact to adjacent spaces due to performing work out-of-sequence
  - Achieving required installation tolerance of CS equipment
- The Standard Foundation Project was initiated from the NSRP CIPP and aims to develop flexible, standardized equipment mounting systems that address the identified major cost & schedule drivers

Standard Foundation Project Objective/ Approach

- Reduce schedule pressure created by late technology insertion
- Reduce construction cost associated with technology refresh
- Focus on stud mounted attachments to reduce installation cost & schedule
- Standardize engineering methodology and materials for combat systems equipment installation cross-platform
- Develop a design analysis tool to minimize the engineering effort of design agents

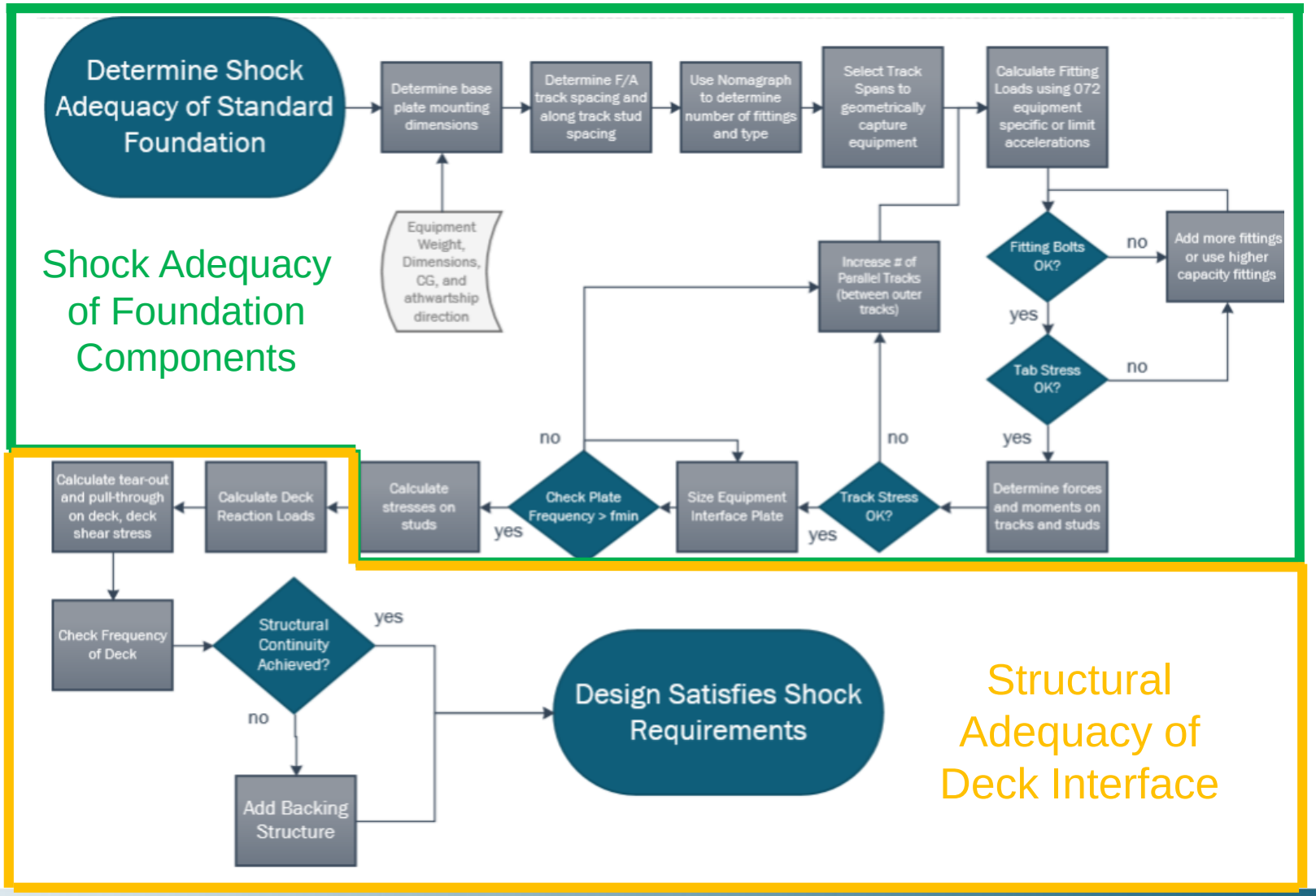
Standard Foundation Concept

- Design to include:
  - Standardized stud spacing
  - Standardized track spacing
  - Method for foundation arrangement
    - Number of tracks, type of fitting, number of fittings, etc.
- Foundation configured for each specific piece of equipment
- Evaluate shock and structural adequacy of design



Standard Foundation - Stud Mounted & Scalable

Proposed Process Flow Chart for Design Evaluation



Standard Foundation Project Tasks

- Conduct structural and shock analyses on various combat systems standard foundation solutions (Complete)
- Down-select a combat systems standard foundation solution based on the analyses results and define its not-to exceed parameters (Complete)
- Collaborate with the Government Technical Community to determine the Objective Quality Evidence (OQE) required for cross-platform approval of the chosen standard foundation solution, and implement this process as part of the design and analysis tool to be developed (In progress)

Standard Foundation Project Tasks (cont'd)

- Develop a user-friendly tool for the Design Agents that defines the optimal standard foundation layout for each piece of equipment and associated materials that meet the applicable shipboard foundation requirements (Upcoming)
- Develop a standard foundation guidance drawing that optimize the materials and details for the chosen standard foundation solution (In Progress)
- Report results to NSRP members (Upcoming)

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