NSRP Sustainment Panel Discussion Collaboration Opportunities

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Introduction

- 38 Years at PHNS – “Refreshed” April 2021
- Last 6 Years Prior to Retirement – Senior Executive Service, Nuclear Engineering and Planning Manager
- Focused Priorities:
  - People
  - Process
  - Environment
- Executive Director, Kakou Professional Development
  - Leadership Development
  - Workforce Development Programs
  - Connecting Industry and Academia Opportunities with DOD Needs (Primarily Local Businesses with Navy Ship Building and Maintenance)
  - Supporting Local Small Businesses and our Native Hawaiian Community

Key Take-Aways

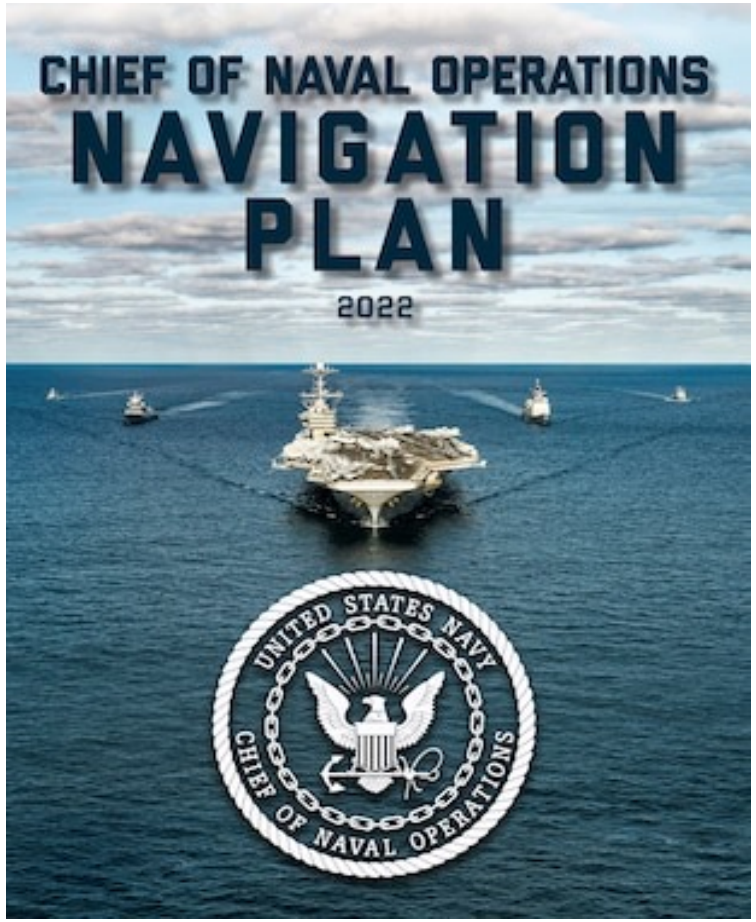
- **Urgency.** Navy Leadership demands exponential improvement in ship building and ship maintenance.

- **Innovation.** If we keep doing the same thing, we will get the same result. Need to work on the ”O” in SIOP.

- **Opportunities.** Significant Opportunities exist to address specific problems and to anticipate future needs for ship building and maintenance.

- **Collaboration.** We need to learn faster, together and establish relationships that essentially supports the fleet.

Urgency – CNO NAVPLAN



CNO NAVPLAN – “What We Learned…”

- Performance-to-Plan (P2P) remains the key driver to Get Real on our baseline readiness performance, identify the most consequential levers that move the needle on outcomes, and communicate performance barriers to accountable supported commanders.
- The Naval Sustainment System (NSS), our Get Better engine, brings world-class solutions and best practices to improve readiness outcomes.

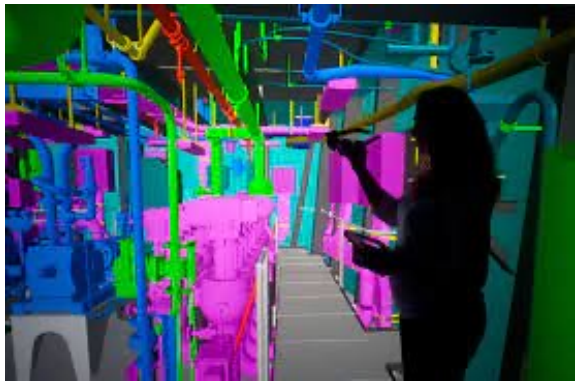
CNO NAVPLAN “What We Learned…”

- Improving on-time completion in our public shipyards remains a challenge. While we have improved our ability to predict repair time for our submarines and aircraft carriers, further progress requires implementing the right shipyard production controls to make the artisan the center of all shipyard efforts.
- We are taking a holistic, analytical approach to our critical shore infrastructure, making necessary once-in-a-century investments to overhaul our Nation’s shipyards through the Shipyard Infrastructure Optimization Plan (SIOP), ensuring our footprint ashore can support fleet operations.

Examples of Challenges

- Rapid IT Solutions – How do we expedite reviews for cybersecurity and ATOs?
- Cost and Funding – What is real ROI?
- Corporate Technical Approval of Processes – How do we align innovation and technology insertion with one aligned technical approach?
- Contracting Processes – How can we contract faster to implement improvements quicker?
- Availability of Material – What are alternate approaches in manufacturing or acquiring and qualifying required material, ahead of time?
- Talent Acquisition and Development – How do we encourage pathways to support ship building and maintenance industries?
- Responsiveness to these Common Problem Areas – how do we find opportunities for common solutions, in our communities, nationwide, and then share learning and efficiencies?

Innovation = Optimization



Sustainment Panel Objectives

- Life-Cycle Design. Incorporate sustainment considerations in the design phase of manned and unmanned vessels and components to support ship maintenance and modernization of hull, mechanical, and electrical as well as mission system infrastructure
- Innovation and Technology Insertion. Develop new inspection and maintenance processes and procedures to support minimal time in availabilities
- Material and Supply Readiness. Develop and implement processes to address supply chain issues
- Work Scope Definition. Develop processes to improve material/early condition assessments and prognostic monitoring tools to support condition based maintenance and structural health
- Total Cost Ownership. Development of life cycle cost model for flexible adaptable manned and unmanned systems as compared to traditional ship building practices

Opportunities

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

Office of Naval Research
USN
ONR
Science & Technology

HEADQUARTERS
TECH BRIDGE
POWERED BY NAVALX

ATDM
ACCELERATED
TRAINING IN DEFENSE
MANUFACTURING

Alignment With NAVSEA (PEO&05 Gaps/NSS-SY)

NAVSEA PEOs/05 provided gaps in areas requiring improvement. (Next step is Shipyards and Ship Builders provide their gaps to success)

Naval Sustainment System – Shipyard (NSS-SY) NAVSEA stood up nine pillars – or focus areas – of naval warship maintenance and modernization. These pillars are led by Flags and SESs accountable for driving change and removing barriers for the mechanic to be more productive at the deck plate.

The Pillars include:

- Engineering
- Planning
- Material
- Fleet Ops
- Waterfront
- Inside Shops
- SY Resourcing
- Infrastructure
- IT

National Shipbuilding Research Program (NSRP)

- The mission of the National Shipbuilding Research Program (NSRP) is to employ a unique collaborative framework to research, develop, mature, and implement industry-relevant shipbuilding and sustainment technologies and processes, improving efficiency across the U.S. shipyard industrial base and meeting future demand.
- The Program accomplishes this mission by providing a collaborative framework to manage, focus, develop, and share research and development and leverage best practices in shipbuilding and ship repair.

NavalX and the Tech Bridge Programs

- ASN RDA's Naval Agility (aka NavalX) initiative serves as the Naval workforce "super-connector," focused on scaling non-traditional agility methods.
- The NavalX Tech Bridge is a network of regional innovation nodes that enhances collaboration between Naval labs / entities, industry, academia, state/local government, and military branches.

Tech Bridge Locations

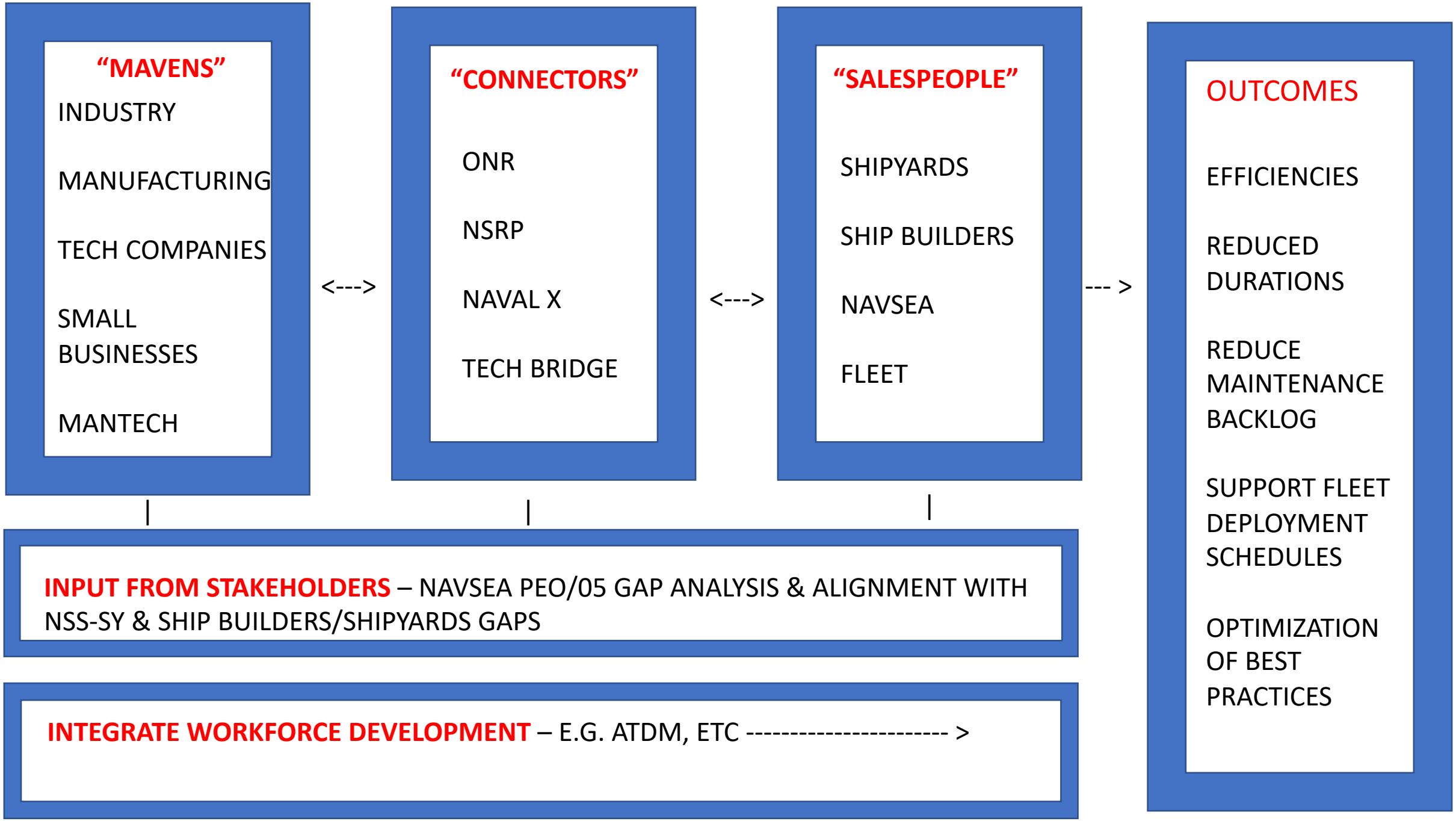
Workforce Development Integration
Accelerated Training in Defense Manufacturing (ATDM)

- The Accelerated Training in Defense Manufacturing (ATDM) Program is specifically designed to help adult learners with varying educational and workplace experiences earn the skills necessary to make an immediate impact in the defense industrial base (DIB). If you are seeking a career change, starting your educational journey for the first time, or looking to become involved in manufacturing, ATDM is a perfect fit. The 16-week curriculum is designed to give you the skills and nationally recognized credentials directly requested by the industry. Our instructors and staff are prepared to give you the tools to be successful.
- You can earn the skills for great paying, in-demand defense industry jobs in these skilled trades:
  - CNC MACHINING
  - QUALITY CONTROL INSPECTION (also known as Metrology)
  - WELDING
  - ADDITIVE MANUFACTURING

Collaboration = Partnerships and Alignment

(From "The Tipping Point")

- **Connectors** tend to be connected to many communities — whether through interests and hobbies, jobs that cause them to work with people in other fields, or other experiences. **Their strength is in occupying many different worlds, and bringing them together.**
- **Mavens** are information specialists; they are endlessly curious and adept at gathering and retaining information on a wide variety of topics. A Maven's influence is in the power of her recommendation. **People know that Mavens are knowledgeable and trustworthy sources of information, so a Maven's word carries a lot of weight.** Mavens also love to share their knowledge with other people.
- **Salespeople** are the people who pitch an idea or message and persuade people to jump on board. They do not merely store and share information; **Salesmen want to *convince* you to follow their advice.** Salesmen have the right words plus an inherent energy, enthusiasm, charm, and likability that makes people want to listen to them.


"MAVENS"
INDUSTRY
MANUFACTURING
TECH COMPANIES
SMALL BUSINESSES
MANTECH
<--->
"CONNECTORS"
ONR
NSRP
NAVAL X
TECH BRIDGE
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"SALESPEOPLE"
SHIPYARDS
SHIP BUILDERS
NAVSEA
FLEET
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OUTCOMES
EFFICIENCIES
REDUCED DURATIONS
REDUCE MAINTENANCE BACKLOG
SUPPORT FLEET DEPLOYMENT SCHEDULES
OPTIMIZATION OF BEST PRACTICES
INPUT FROM STAKEHOLDERS – NAVSEA PEO/05 GAP ANALYSIS & ALIGNMENT WITH NSS-SY & SHIP BUILDERS/SHIPYARDS GAPS
INTEGRATE WORKFORCE DEVELOPMENT – E.G. ATDM, ETC ---------- >

Potential Solutions

- Nationwide expertise and experience solving long standing efficiency problems at shipyards that can be applied across ship building and ship repair facilities. DEFINE FOCUS AREAS
- Visibility of unique and creative potential solutions to problem areas that are not normally visible to all stakeholders. INCREASE VISIBILITY OF POTENTIAL SOLUTIONS
- Potential cost reductions in technology and equipment due to increased options of available manufactures and tech companies. SHARE BEST PRACTICES
- Responsiveness to problems by addressing streamlining contracting and implementation processes. EXPEDITE IMPLEMENTATION
- Increased industry support, both locally and nationally, to address DOD needs. INCREASE AND CULTIVATE PARTNERSHIPS
- Community and Academia support for career pathways to support ship building and ship repair workforce (trades, gas free engineers, engineers, etc.). INTEGRATE WORKFORCE DEVELOPMENT

Questions?

Back-Up Slides

Sustainment Panel Focus Areas

7.3.2.4 Incorporate sustainment considerations in the design phase of manned and unmanned vessels and components to support ship maintenance and modernization of hull, mechanical, and electrical as well as mission system infrastructure

1. Develop improved design tools to standardize shipbuilding design practices across shipyards that facilitate sustainment
2. Develop innovative methods to leverage the use of existing equipment and components in modernization design efforts to minimize cost and in-service availability time
3. Identify and pursue advanced materials (composites) that reduces the burdens associated with cost and longevity
4. Improve accuracy of engineering and design products supporting ship modernization and upgrades
5. Identify/provision existing commercial advanced technologies for shipbuilding, modernization and repair applications
6. Leverage advanced technology to assist remote personnel to accurately determine locations of potential interferences when designing for modernization and ship upgrades.

Sustainment Panel Focus Areas

7.3.2.5 Develop new inspection and maintenance processes and procedures to support minimal time in availabilities

1. Incorporate emerging technologies to advance inspection, sustainment and improved reliability
2. Evaluate digital support tools and processes to reduce time in availability
3. Develop capability to automate detection, non-destructive inspection, and assessment of corrosion and delamination on vessels
4. Mature capabilities for problem identification and rapid repair of critical systems such as propulsion and steering system components
5. Adapt comprehensive production planning systems to develop an integrated plan tailored to short duration availabilities
6. Perform qualification efforts for advanced technologies that will be more reliable and/or require less maintenance than legacy technologies
7. Develop Virtual Reality/Augmented Reality capabilities that can enhance ship check and planning processes.

Sustainment Panel Focus Areas

7.3.2.6 Develop and implement processes to address supply chain issues

1. Investigate alternative additive manufacturing technology and materials to mitigate issues with parts obsolescence and/or long lead times
2. Develop data analytic and predictive modeling methods that support early identification of potential supply chain issues
3. Codify guidelines to assist suppliers in addressing supplier gaps with the execution of Quality Management Systems such as welding, Non-Destructive Testing, shock and vibration

7.3.2.7 Develop processes to improve material/early condition assessments and prognostic monitoring tools to support condition based maintenance and structural health

1. Develop data analytic methods that support early identification of potential system failures
2. Explore robotics or other AI/ML methods to improve condition inspections of hulls, tanks and other systems
3. Explore condition based maintenance and structural health monitoring capabilities from other industries

Sustainment Panel Focus Areas

7.3.2.8 Development of life cycle cost model for flexible adaptable manned and unmanned systems as compared to traditional ship building practices

1. Research and implement efforts to identify life cycle cost models that help with reducing shipbuilding costs
2. Develop a cost model that identifies the differences between flexible, adaptable, manned and unmanned systems from traditionally designed ships
3. Examine how the different phases of new construction and modernization can be more accurately estimated and propose reflective cost model(s) for future acquisitions

Standard Tech Bridge Problem Statement Format

PROBLEM TITLE

BACKGROUND

CHALLENGE

STATUS QUO

WHAT HAVE YOU TRIED

PROPOSED SOLUTIONS

OPERATIONAL CONSTRAINTS

RISKS

PROBLEM SPONSOR

TECHNICAL POC (if different than problem sponsor)

SENIOR LEADER

Tech Bridge Prototype Funnel

Total FY23 Requested Funding XXXX
Project Type: *XX*

FY23 MEGA Project Proposal

Lead Division: National Tech Bridge Team **Lead Div POC:** Mike Lavery/ Telephone 267-990-9195 **ID#:** TBD upon final ED approval

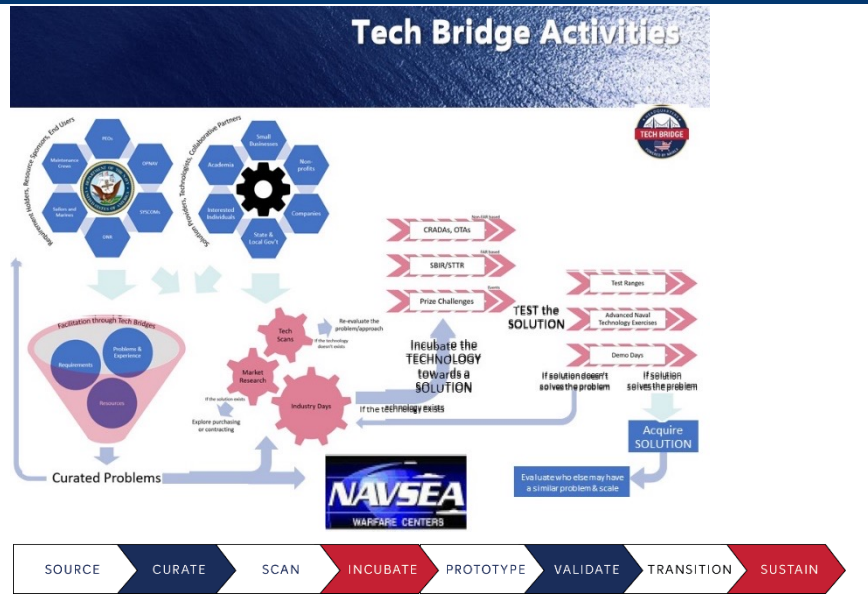
"How might we support a wartime rapid integration team attached to Pacific Fleet?"

Technology Description / Product:

- Create a repeatable process to provide problems to the Tech Bridge Network in order to accelerate the maturation of technology and impact to the fleet with user driven development
- Provide a NSWC engineering team to rapid prototype, test and demonstrate technology in order to better inform requirements owners and increase the delivery to the fleet

Expected Operational Value:

- Release 1 will provide SRF-J Ship Yard with access to CBM+ data to prioritize ship maintenance and increase ship Operational Availability (Ao) and 7th Fleet readiness
- Subsequent Releases would source Naval Fleet, Science Advisors, and Sustainer's challenges to feed the NavalX Innovation Pipeline working to accelerate solution development and transition



Key Partners / Participants:

- NSWC, Japan Tech Bridge, Liberty Tech Bridge (NSWCPD), Inland Tech Bridge (NSWC-Corona), NPS, ONR Global, NAVALX

Key Deliverables:

- Release 1 Shipyard Pilot Prototype Dashboard to inform the ship maintenance schedule for ERM V4+
- Create a Training Team to institutionalize and create organic capabilities at RMC starting in the Pacific Theatre
- Established problem funnel to feed the TBN for solutions

Collaborative Approach:

- Create a forward-deployed rapid experimentation and demonstration team that can curate and prototype solutions for Fleet-validated requirements. The experimentation team would collaborate with the Tech Bridge Network(TBN) to develop a pipeline strategy for the proposed solution. The TBN collaborate, facilitate and navigate the innovation pipeline strategies with executing program manager to ensure delivery at the speed of relevance.

Funding Profile:

Organization	FY23	FY24	FY25	Total
Required Labor Funding (2.5 FTE in FY24 & FY23)	(NISE) $200K	$570K	$570K	1340K
NAVALX				
ONR Global				
NSWC Corona				
NSWC Philadelphia				
NSWC HQ				

Milestones leading to key deliverables:

- Required Phase 1 ERM v4 Completion