

Knowledge Sharing for a Better Tomorrow



180 Years Strong: Building for Our Warfighters to Win

R. David Curfman, P.E., SES, M. ASCE, Chief Engineer

Naval Facilities Engineering Systems Command (NAVFAC)

Distribution Statement A: Approved for Public Release



<u>https://youtu.be/6Q7fxXKpu1E</u>



Agenda "Get Real, Get Better" - CNO

- Risks and Vulnerabilities of Navy Infrastructure
 - DOD and Navy Strategies
 - Shipyard Legacy
 "Sails to Atoms"

 - Age and deteriorated condition
 - Additional risks to waterfront facilities today
 - Seismic issues

 - Resilience and Climate change
 Power requirements and Environmental issues
- Mitigating Risks
 - Unified Facilities Criteria
 - Shipyard Infrastructure Optimization
 New and modernized waterfront facilities

 - Risk Analysis (Seismic, Tsunami, Sea Level Rise)
 - Waterfront inspections
- Ocean Engineering challenges, fleet moorings, water barriers
- Industry Engagements



Navy and Department of Defense Strategy



National Defense Strategy - Priorities (2022)

- 1. <u>Defending</u> the homeland, paced to the growing multi-domain threat posed by the People's Republic of China (PRC)
- 2. <u>Deterring strategic attacks</u> against the United States, Allies, and partners
- 3. <u>Deterring aggression</u>, while being prepared to prevail in conflict when necessary, prioritizing the PRC challenge in the Indo-Pacific, then the Russia challenge in Europe
- 4. <u>Building</u> a resilient Joint Force and defense ecosystem.







SECNAV Strategic Guidance (2021)

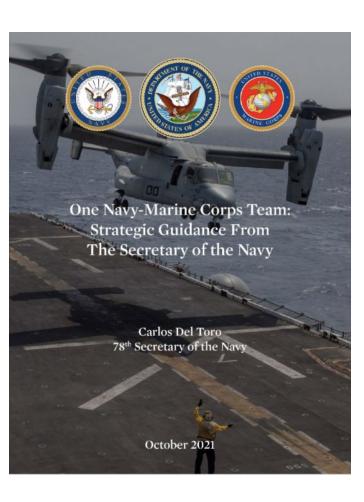
Maintaining Maritime Dominance in Defense of Our Nation

Expand Forward Presence. "We will prioritize strategic competitive advantage over China and Russia by expanding our global posture."

Enhance Warfighting Readiness. "To reduce the time our platforms are offline for maintenance and repairs, we will invest in sustainment, <u>critical readiness infrastructure</u>, and the industrial workforce....We will also enhance the readiness through targeted investments in... ranges and facilities on naval installations."

Innovate and Modernize. We will also affordably invest in the facilities, infrastructure, and systems we need to maintain our critical advantage in supporting and sustaining our combat forces.

<u>Combat Climate Change</u>. It is a national security and warfighting imperative for the Department of the Navy to address the impact of climate change on our readiness, operations, and ability to fight and win...We <u>will invest meaningfully, thoughtfully and</u> <u>creatively</u> in these foundational elements of our force's capability and fortify against the future fight.



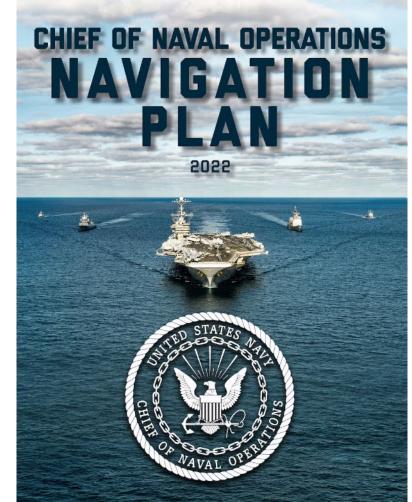




CNO NAVPLAN 2022

Control the Seas and Project Power Ashore

- 1) Achieve alignment to National Defense Strategy
- 2) Account for the progress made implementing the 2021 NAVPLAN Implementation Framework (NIF) in 18 focus areas
- 3) Account for learning and correcting Force Design Imperatives--Distance, Deception, Defense, Distribution, Delivery, and Decision Advantage
- 4) Overarching priorities:
 - Readiness NIF R4: Critical Infrastructure
 - Capabilities
 - Capacity
 - Sailors





Navy Climate Action Plan 2020

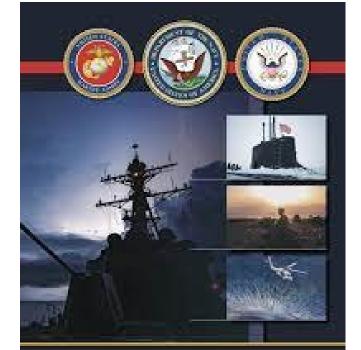
"Climate change is one of the most destabilizing forces of our time, exacerbating other national security concerns and posing serious readiness challenges. Our naval and amphibious forces are in the crosshairs of the climate crisis and this strategy provides the framework to empower us to meaningfully reduce the threat of climate change."

– Honorable Carlos Del Toro, Secretary of the Navy

Defense Technical Memorandum 22-03

<u>"Flood Hazard Management for DOD Installations" and Unified Facilities</u> Criteria 3-201-01

- Flood hazard areas will be delineated for all installations
- DoD Components will, to the maximum extent practicable, avoid development, siting, or leasing of facilities or infrastructure within flood hazard areas.



CLIMATE ACTION 2030 Department of the Navy

• 100 yr flood level plus 2 ft



Shipyard Legacy



Naval Shipyard Legacy – Norfolk (1767), Portsmouth (1800), Puget Sound (1891), Pearl Harbor (1908)



USS DELAWARE

U. S. S. DELAWARE WAS THE FIRST SHIP DRYDOCKED IN THE UNITED STATES. SHE ENTERED DRYDOCK NO. 1 AT THE PORTSMOUTH (GOSPORT) NAVY YARD ON JUNE 17, 1833. DRYDOCK NO. 1 IS STILL IN USE AT THE NAVAL SHIPYARD.









Shipyard Legacy



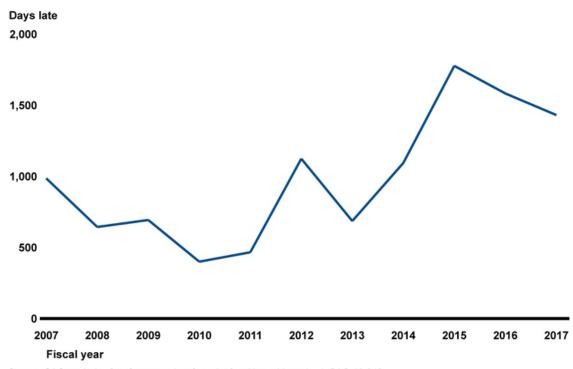


NNSY Dry dock No. 1 - 1833



Impact of facilities on Ship Maintenance

Days of Maintenance Delay at the Four Navy Shipyards, Fiscal Years 2007 – 2017



Navy Waterfront Facility Inventory, 2022

	Number	Avg Age (yrs)	Avg Condition
Piers	194	57	70 (Poor)
Wharves	199	83	70 (Poor)
Dry Docks	39	98	81 (Fair)

Source: GAO analysis of performance data from the four Navy shipyards. | GAO-19-242



"From sails to atoms"



Constitution Class 304 ft (175 WL) x 44 ft



Ford Class 1092 ft x 252 ft



"From sails to atoms"



CSS Hunley 40 ft (8 crew) Virginia Class 377 ft (460 ft Blk V) x 34 ft

Columbia Class 560 ft x 43 ft





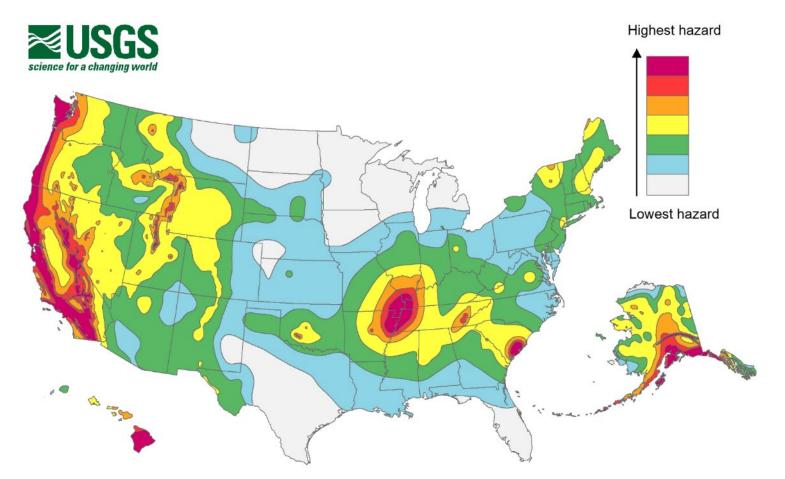




Additional Risks



Seismic Risks





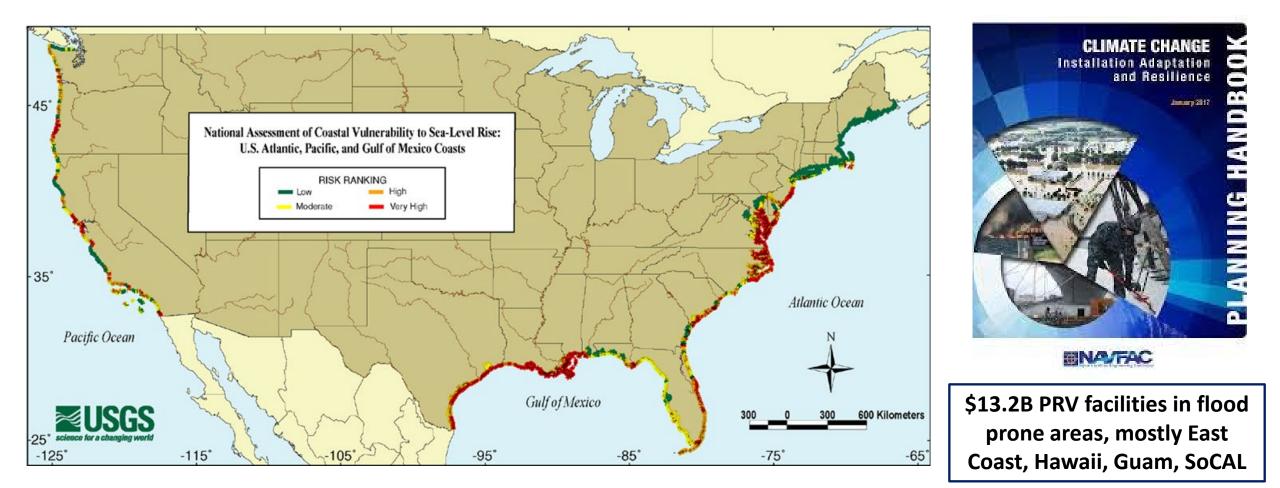
\$4B Earthquake Damage China Lake, CA

Nearly all existing dry docks designed prior to complete understanding of seismic requirements





Resilience and Climate Change Risks





Shore Power and Environmental Risks

- 440V > 4160V > 13.8kVA
- Hazardous Waste All shipyards are NPL sites (some with Munitions of Explosive Concern) at various levels of remediation
- Historic Properties All have districts on NRHP;
 - PHNSY (855 facs),
 - PSNS (113 facs)
 - PNSY (62 facs)
 - NNSY (206 facs)
 - NNSY DD#1 on National Historic Register



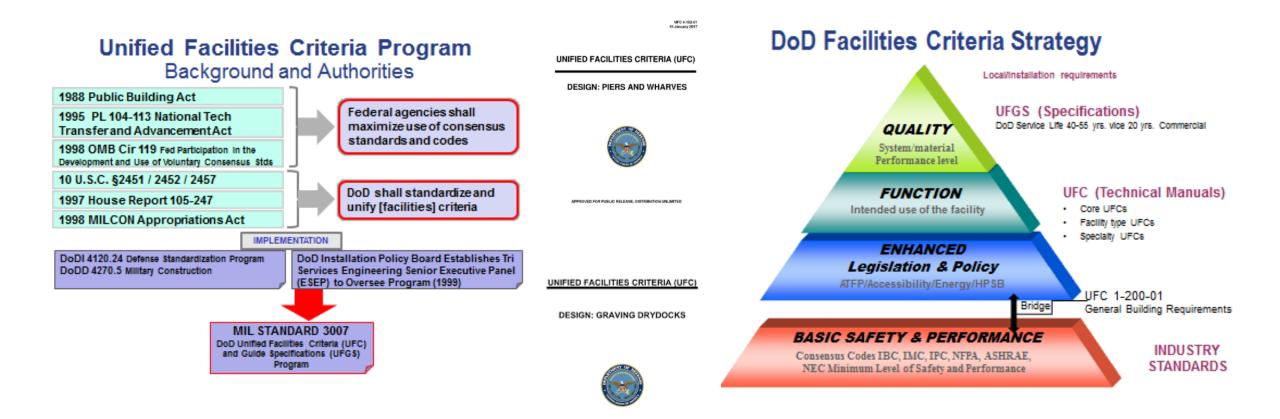




Mitigating Risks *"Get Real, Get Better" - CNO*



Unified Facilities Criteria Program



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US Navy Waterfront Solutions

- SIOP and Dry Docks
- Navy Piers and Wharves
- Seismic Analysis
- Inspection/Certification Programs
- Major Fires Lessons Learned
- Resiliency and Climate and Climate Change
- Ocean Engineering





Shipyard Infrastructure Optimization Program (SIOP) and Navy Dry Docks



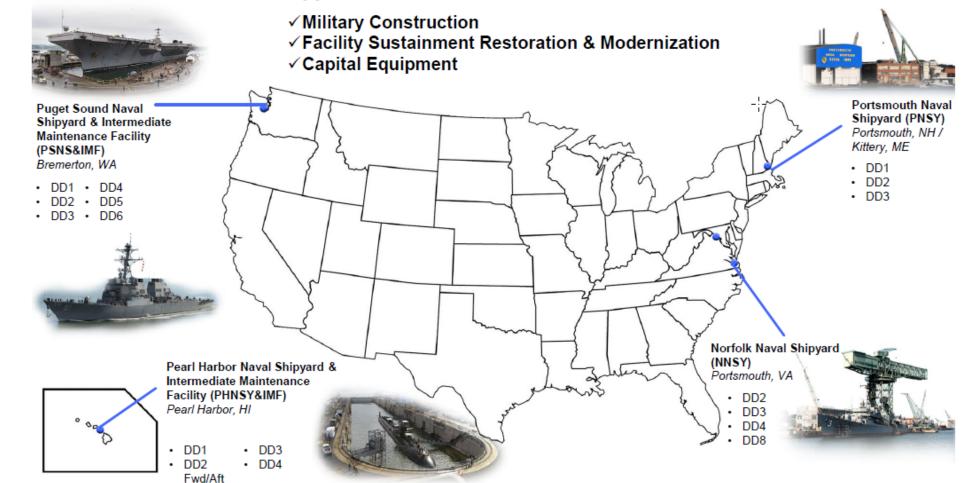


Shipyard Infrastructure Optimization Program (SIOP)

COPRI

D

Comprehensive approach to support the Fleet's maintenance requirements at Navy's four public shipyards



Background: Where are we now?



LOE 1 Dry Docks:

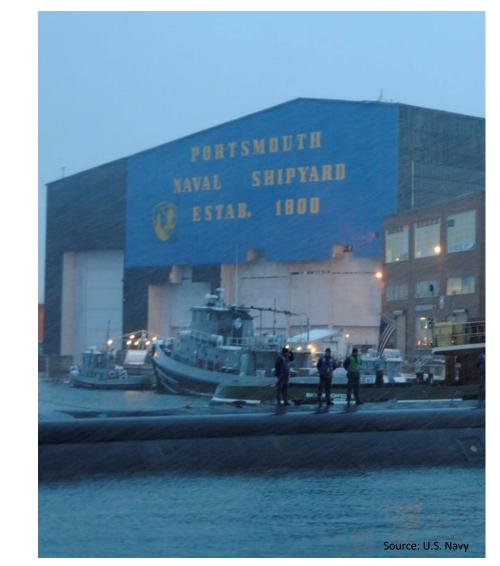
- •Potential increase in the size of submarine and aircraft carrier fleet
- •New ships and submarines
 - –USS GERALD R. FORD Class aircraft carriers
 - –USS VIRGINIA Class submarines including the VIRGINIA Payload Module (VPM) variant
- Investments required at all shipyards to mitigate an estimated 68 deferred major maintenance periods



Background: Where are we now?

LOE 2 Facilities:

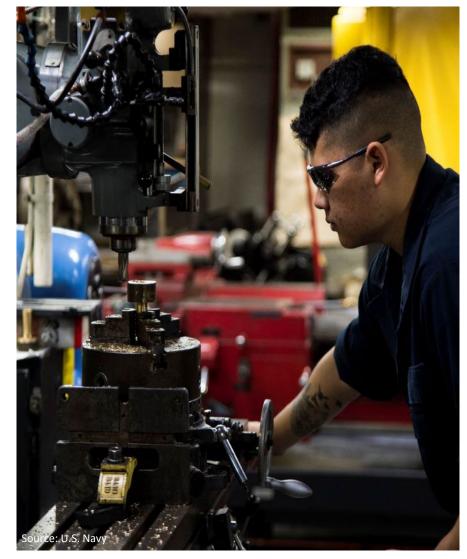
- •Shipyards originally developed to build ships and experienced major construction/expansion, for that purpose, during World War II
- •Current mission is maintenance and modernization on 21st century nuclear powered ships
- Historic ship-building facilities were morphed to meet the new mission with no major recapitalization efforts
- Result is poorly configured, inefficient facilities in deteriorated condition



Background: Where are we now?

LOE 3 Capital Equipment:

- •Average private sector equipment age 7-10 years
- Naval shipyard average
 equipment age is 16 years
- •Many are unsupported by original equipment manufacturers
- •Operational risk factor



COPR D







P-310 & P-381, Multi-Mission DD #1 (PNSY)

- Constructs new multi-mission dry dock (M2D2) and superflood basin to support Virginia Class, Blocks I-IV
- Project under construction
 - Construction Awarded: \$1.7B Aug 2021
 - Contractor: 381 Constructors JV
 - Construction Complete: June 2028
 - Construction Schedule Constraints
 - Outfitting & Certification
 - Flooding the Construction Site Several times during construction for ship movements





Pearl Harbor Naval Shipyard and Intermediate Maintenance Facility Dry Dock



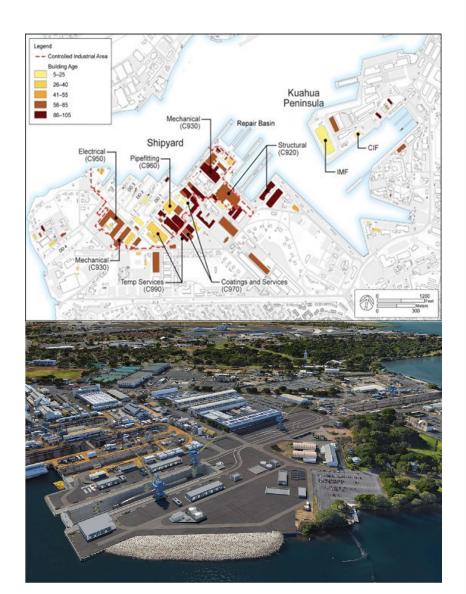
COPRI





P-209, Dry Dock 5 (PHNSY)

- Constructs new gravity dry dock to support depot level maintenance of all current and planned future fast attack submarines
- RFP Issued: 25 Aug 2022
- Construction Award: June Mar 2023 using Early Contractor Involvement on MACC IDIQ
- Project Cost: TBD
- Construction Schedule Constraints:
 - Target Construction Complete by Jan 2028

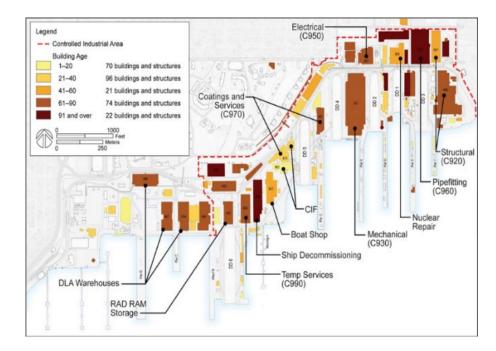


Puget Sound Naval Shipyard and Intermediate Maintenance Facility



P-454, Multi-Mission Dry Dock (PSNSY & IMF)

- Constructs new Multi-Mission Dry Dock (M2D2) to support CVN 78 Class nuclear aircraft carriers and all fleet nuclear submarine classes
- Design Start: FY23
- Construction Award: TBD
- Project Cost: TBD
- Completion: TBD





COPR 2

Navy Piers and Wharves





Double Deck Pier Naval Station Norfolk

SWFPAC, Bangor, WA

RM 18-0486, DD Recapitalization (Kings Bay TRF)

- Major repairs to Kings Bay Dry Dock (DD) that supports Ohio/Columbia Class SSBN/SSGNs at Trident Refit Facility (TRF)
- Project under construction
 - 3 Construction Phases
 - Phase A Temp Facilities, Establish Free Zone and Steel Caisson Repairs
 - Phase B Structural, Electrical, Mechanical and Architectural repairs to the entire dry dock
 - Phase C Repairs to ancillary dry dock support facilities and demobilization
 - Project Schedule
 - Phase B 15 months (July 2021 Oct 2022)
 - \$40M Award Fee to incentivize early to on time completion
 - Award: March 2020 ; Project Cost: \$613M

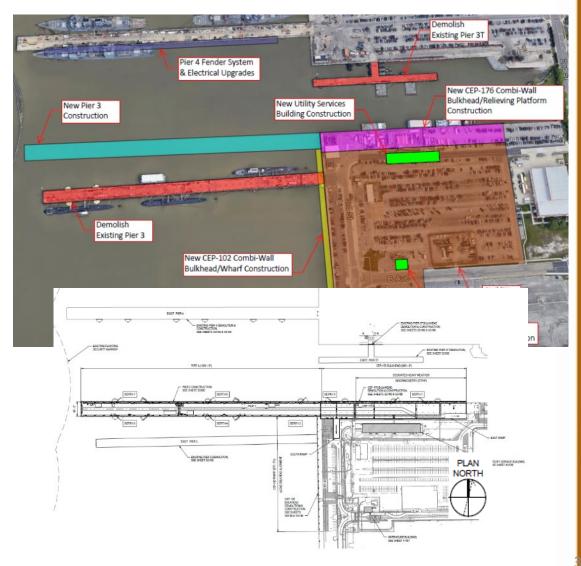






P-095, Pier 3 Replacement (NS Norfolk)

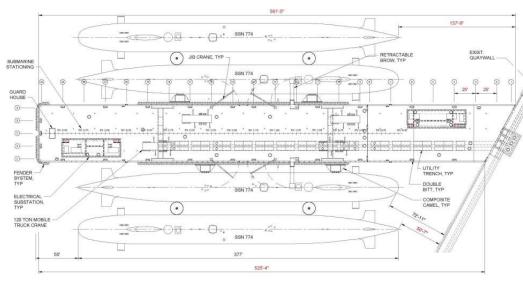
- Constructs new Pier 3 and wharf to support berthing all classes of current and future SSNs
 - Single deck, 1330 x 85 ft pier, 800 x 100 ft wharf, new relieving platform, new Utility Service Building (USB), and construct AT/FP security enclave
 - Demolishes inadequate existing piers
 - Phased construction, outfit Pier 4 south for temporary berthing SSNs
 - New Pier 3 is 'ideal submarine pier', but not standard
- Award: May 2022
- Project Cost: \$300M
- Completion: Feb 2027





P-898, Pier 32 Replacement (NSB New London)

- Constructs new submarine berthing pier for Los Angeles (LA) and Virginia (VA) class SSN submarines, demolishes obsolete/inadequate existing Pier 32, and dredging
- Award: Sept 2020, Weeks Marine
- Project Cost: \$67.3M
- Completion: Dec 2022





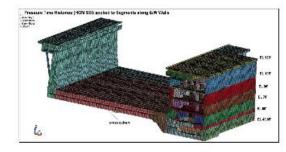
Dry Dock Seismic Analysis

- NAVFAC developed dry dock seismic risk assessment
- Initial study of PSNS DD6 identified seismic risks requiring further investigation, data collection, contingency plans
- All dry docks are planned to be evaluated over next several years prioritized by mission, location, and type of construction
- DD Seismic Virtual Technical Team (VTT) established for review



TECHNICAL REPORT TR-NAVFAC-EXWC-CI-1706 DECEMBER 2016

RECOMMENDED METHODOLOGY FOR DRY DOCK SEISMIC RISK ASSESSMENT



RDT&F Division Capits, Englovements Department NAVEAC Englocering and Experitionary Worfale Center

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Waterfront Inspections

- Waterfront Inspection Program
 - Who: NAVFAC EXWC
 - What (Duties):
 - Determine physical condition, above and below the waterline, and operational restrictions of all CNIC waterfront facilities
 - $\,\circ\,$ Primarily structural inspection with visual utilities assessment
 - $\circ\,$ Provide repair recommendations and budgetary estimates based on condition assessments
 - Types (dependent on material types):
 - $\,\circ\,$ Routine Inspections
 - $\circ\,$ Construction Inspection
 - **o** Design Level Inspection
 - Post Event Inspection
 - Where:
 - \circ All Major waterfront facilities (piers and wharves) world-wide



Dry Dock Certifications

- Dry Dock Certification Program
 - Who: NAVFAC and NAVSEA
 - What (Duties):
 - $\odot\,$ Support NAVSEA 04X Dry Dock Safety Certification Program
 - \circ Material Condition Rating (CR) and Facility Condition Index (FCI)
 - $\,\circ\,$ Required for operation of Dry docks
 - When:
 - $\,\circ\,$ Audits every 3 years
 - $\,\circ\,$ Control Inspections annually
 - Where:
 - \odot 26 Navy dry docks
 - $\,\circ\,$ 6 States and Japan



Major Fires Review

Background

- USS Miami SSN 775 Fire (2012)
- USS Bonhomme Richard LHD 6 Fire (2020)
- Most Consequential Actions related to facilities
 - Perform capacity and capability evaluation of Navy berths to meet repair requirements
 - General Purpose vs. Repair Pier/Berth
 - Update NAVSEA 8010 Manual, Industrial Ship Safety Manual for Fire Prevention and Response
 - Update DOD UFCs







Climate Change



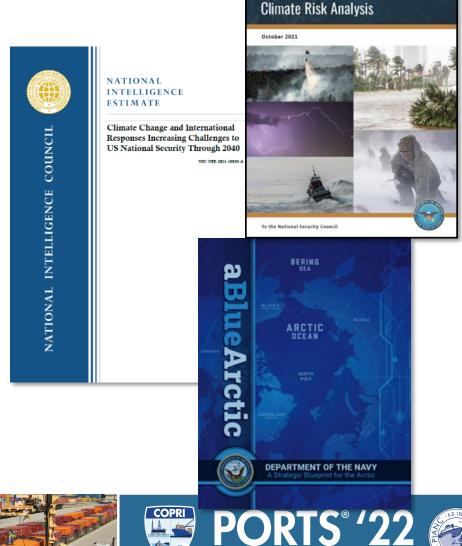
Strategic Drivers

Strategic Imperatives:

- Interim National Security Strategic Guidance (2021)
- National Defense Strategy (28 March 2022)
- National Intelligence Estimate (2021)
- DoD Climate Risk Assessment (2021)
- DoN Blue Arctic Strategic Blueprint (5 Jan 2022)
- DoN Arctic Vision Memorandum (1 Jan 2022)
- DON Climate Action Strategy 2030 (24 May 2022)

Risk Areas:

- Mission Critical Installation & Range Sustainment
- Emerging Operational Domains (e.g. Arctic)
- Increased Humanitarian Assistance Disaster Response (HADR) Support
- Increased competition for key minerals and technologies



Department of Defense

Honolulu, Hawaii September 18-21, 2022



Resilience and Climate Change Projects

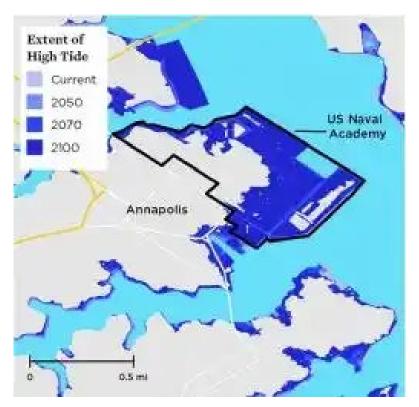


Flood Wall Norfolk Naval Shipyard Performance Goals:

Build a Climate Culture Addresses the DoD climate literacy and climate-informed decision making LOEs

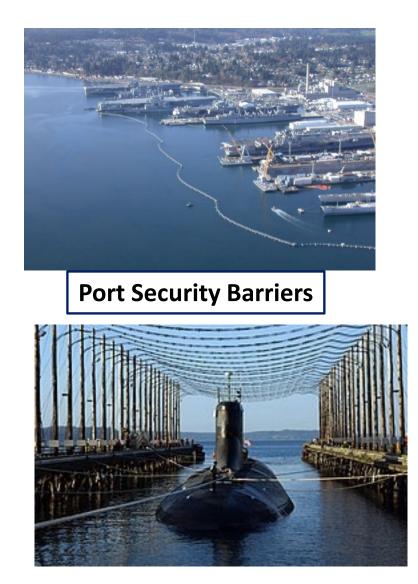
Build a Resilient Force Addresses the DoD test, train and equip, supply chain, and natural and built infrastructure LOEs

Reduce Climate Threat Addresses the performance goals of E.O. 14057 for Net-zero emissions by 2050 through Installation and Operational energy initiatives as well as carbon capture and sequestration



Flooding Naval Academy, MD





Ocean Facilities



Fleet Moorings

Magnetic Silencing Equipment

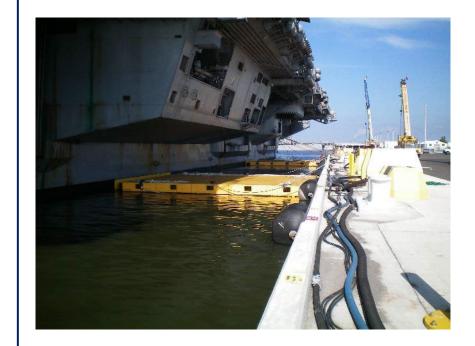


Composite Camels



Industry Engagement

- ASCE/COPRI Ports and Harbors Committees
 - Pier and Wharf Seismic Committee (ASCE 61)
 - Design Standards for Piers and Wharves
 - Dry Dock Committee (Dry Docks O&M Standard)
 - Climate Change Committee
 - Moorings Committee
 - Waterfront Inspection Committee
- SAME, AGC, & ACEC CPARS, Partnering, Workload Projections
- ASTM Committees Waterfront materials
- CMAA Training and certification
- Industry Forums for each major project





We Build so Our Warfighters Will Win

- "It follows then as certain as that night succeeds the day, that without a decisive naval force we can do nothing definitive, and with it, everything honorable and glorious." – President George Washington
- "A good Navy is not a provocation to war. It is the surest guaranty of peace." – <u>President Theodore</u> <u>Roosevelt</u>
- "Control of the sea means security. Control of the seas can mean peace. Control of the seas can mean victory. The United States must control the seas if it is to protect your security" – President John F Kennedy

We need continued partnership with industry organizations, and their membership, like ASCE. Be innovative, cost conscious, design to win!...

Get Real, Get Better!



