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
1. Defending the homeland, paced to the growing multi-domain threat posed by the People’s Republic of China (PRC)

2. Deterring strategic attacks against the United States, Allies, and partners

3. Deterring aggression, while being prepared to prevail in conflict when necessary, prioritizing the PRC challenge in the Indo-Pacific, then the Russia challenge in Europe

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, critical readiness infrastructure, 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.

Combat Climate Change. 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 will invest meaningfully, thoughtfully and creatively 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
“Flood Hazard Management for DOD Installations” and Unified Facilities 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.
• 100 yr flood level plus 2 ft
Shipyard Legacy
Naval Shipyard Legacy – Norfolk (1767), Portsmouth (1800), Puget Sound (1891), Pearl Harbor (1908)
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

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

Navy Waterfront Facility Inventory, 2022

<table>
<thead>
<tr>
<th>Facility</th>
<th>Number</th>
<th>Avg Age (yrs)</th>
<th>Avg Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piers</td>
<td>194</td>
<td>57</td>
<td>70 (Poor)</td>
</tr>
<tr>
<td>Wharves</td>
<td>199</td>
<td>83</td>
<td>70 (Poor)</td>
</tr>
<tr>
<td>Dry Docks</td>
<td>39</td>
<td>98</td>
<td>81 (Fair)</td>
</tr>
</tbody>
</table>
“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

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

$4B Earthquake Damage
China Lake, CA

USGS
science for a changing world

Highest hazard

Lowest hazard
Resilience and Climate Change Risks

$13.2B PRV facilities in flood prone areas, mostly East Coast, Hawaii, Guam, SoCAL
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

DoD Facilities Criteria Strategy

**QUALITY**
System material, Performance
Level

**FUNCTION**
Intended use of the facility

**ENHANCED Legislation & Policy**
ATCP, Accessibility/Energy/HP3B

**BASIC SAFETY & PERFORMANCE**
Consensus Codes IBC, IMC, IPC, NFPA, ASHRAE, NEC Minimum Level of Safety and Performance

**UNIFIED FACILITIES CRITERIA (UFC)**

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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)

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

- Military Construction
- Facility Sustainment Restoration & Modernization
- Capital Equipment

Puget Sound Naval Shipyard & Intermediate Maintenance Facility (PSNS&IMF)
Bremerton, WA
- DD1
- DD4
- DD2
- DD5
- DD3
- DD6

Portsmouth Naval Shipyard (PMSY)
Portsmouth, NH / Kittery, ME
- DD1
- DD2
- DD3

Pearl Harbor Naval Shipyard & Intermediate Maintenance Facility (PHNSY&IMF)
Pearl Harbor, HI
- DD1
- DD3
- DD2
- DD4
- Fwd/Aft

Norfolk Naval Shipyard (NNSY)
Portsmouth, VA
- DD2
- DD3
- DD4
- DD8
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

Source: U.S. Navy
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

Source: U.S. Navy
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

Source: U.S. Navy
Portsmouth Naval Shipyard (PNSY) Dry Docks
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
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
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
Waterfront Inspections

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

• Dry Dock Certification Program
  – Who: NAVFAC and NAVSEA
  – What (Duties):
    o Support NAVSEA 04X Dry Dock Safety Certification Program
    o Material Condition Rating (CR) and Facility Condition Index (FCI)
    o Required for operation of Dry docks
  – When:
    o Audits every 3 years
    o Control Inspections annually
  – Where:
    o 26 Navy dry docks
    o 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 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
Resilience and Climate Change Projects

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

Flood Wall
Norfolk Naval Shipyard

Flooding
Naval Academy, MD
Ocean Facilities

Port Security Barriers

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.” – President Theodore Roosevelt

• “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!