Subj: FY-17 NAVAL KEY STRATEGIC ISSUES LIST

Ref:  
a) SECNAV’s Priorities: People, Platforms, Power and Partnerships, dated January 2016  
b) CNO’s Design for Maintaining Maritime Superiority, dated January 2016  
c) CMC FRAGO: Advance to Contact, dated January 2016

1. Purpose. The Naval Key Strategic Issues List highlights issues for research and study within the Department of Navy and more importantly to partners external to the Department of the Navy. These external partners include academia, industry, and international partners who are interested in studying and solving the current Naval challenges.

2. Organization. The FY-17 Naval Key Strategic Issues List synthesizes the topics into the Secretary of Navy’s four issue areas with the addition of Information as the key enabler:

- People
- Platforms
- Power
- Partnerships
- Information*

*Information is included as its own topic area. Many of the topics regarding information significantly impact multiple topic areas from People and Platforms to Power and Partnerships.

A. Each topic area is further delineated by subtopics to assist researchers in narrowing the focus for their research while maintaining situational awareness for how the study area fits within the broader Department of Navy. For example, the topic area “People” is subdivided into several sub-topics:

- Preparing
- Recruiting
- Training and Education
- Managing Talent
- Retaining
- Transitioning

B. Each sub-topic includes specific questions that delineate the questions of greatest importance to the Department of Navy. For example, Power might be the topic area, with Expeditionary Energy as a key sub-topic. The questions might include the following:
• Develop/Assess a New Paradigm Supercapacitor for Energy Storage
• Develop Educational Programs for Energy Culture Change
• Explore Potential Energy Alternatives Using Simulation and Evolutionary Algorithms
• Develop Novel Solid State Energy Conversion System based on advanced High Efficiency Thermophotovoltaic Devices
• Explore CAD Interoperability for Navy Reuse in Additive Manufacturing (AM), 3D Printing, Maintenance and Training
• Determine Viable Locales for Waste-to-Energy Technology
• Conduct Analysis of Fuel Connector Usage
• Develop/Assess Hi Efficiency Flexible Solar Power System
• Explore Differential Power Processing to Harvest Maximum Power from Solar Panels
• Explore equipment, systems and concepts for the Resupply of Distributed Forces

3. We encourage those who are interested in participating in the research to contact the Research Office at NPS. Our staff can help link external partners with ongoing research and maintain cognizance of those partners who want to ensure their ideas are discoverable by the broader Department of Navy. For questions or feedback on the Naval Key Strategic Issues List please contact the Research Office at the Naval Postgraduate School.
Tab 1. People

1. Preparing
   - Develop and Assess methods for Inspiring Underrepresented Community College Students In STEM Fields

2. Recruiting
   - Analyze Recruiting Market Depth
   - Assess Anticipated Diversity in the Navy and Methods to Impact It
   - Analyze Non-Cognitive Measures for Navy Selection and Classification

3. Training and Education
   - Develop and Assess an Education and Training Continuum for the 21st Century
   - Assess Methods for Developing Leaders in 2025
   - Develop and Assess Intelligent Tutor, Artificial Intelligence and Augmented Reality for Tactical Training Simulators
   - Assess the Role of Navy Processes in Enabling and Constraining the Adoption and Use of Learning Centered Technologies
   - Assess Click to Finish Distance Learning Courseware as to whether it is Legitimate Education & Training vice Simple Completion
   - Assess Sailor Tuition Assistance and Distance Learning
   - Assess the Role of Communication for High Velocity Learning
   - Analyze Blended Learning Models for Application to Graduate Education of Military Officers
   - Analyze Alternatives for a Disconnected Learning Network

4. Managing Talent
   - Assess best methods to Improve Navy Talent Management with Model-driven Big Data
   - Develop Big Data and Deep Learning Approach for Manpower, Personnel, Training and Education (MPTE) Common Operational Picture
   - Analyze Issues in Marine Corps Talent Management
   - Identify Success Criteria Early on in a Marine’s Career
   - Define and Measure Integration of Women and Minority Officers in the Navy
   - Analyze the Truths and Myths of Military Millennials
   - Design Matching and Assignment Process for the DON and Talent Management.
   - National Cultural Considerations and Learning from International Navies: A Tool to Assess Transferability of Women’s Policies

5. Retaining
   - Analyze Sailor Retention and what drives this personal decision
• Analyze Resilience Assessment and Intervention in the Fleet
• Assess how Gender Impacts Attrition, Loss and Promotion
• Analyze the blended retirement plan impact on force structure and conduct cost-benefit analysis
• Assess the role of Naval officers’ college education on retention and performance
  • Assess Retention of Officers with STEM Degrees

6. Transitioning
• Analyze effectiveness of the new Transition Assistance Program (TAP)
• Identify Elder Care Issues, Trends and Needs
Tab 2. Platforms

1. Sub-Surface
   • Develop and Assess Networked Undersea Autonomous Sensing and Tracking
   • Develop and Evaluate Precision Control of Agile Underwater Vehicles

2. Surface
   • Assess the Role of Raw Powder Characteristics in Additive Manufacturing (AM) of Metals and Alloys for Naval Applications
   • Develop and Assess Surface Ship Safety Predictive Analysis
   • Develop and Assess the Surface Ship Port Loading Model
   • Measure The Potential Impact Of Fuel Planner Systems On Surface Fleet Time On Station

3. Air
   • Develop an Automated Unmanned Aerial System
   • Test and Evaluate Autonomous Unmanned Systems

4. Space
   • Develop and Assess Satellite Vulnerability Planning Models

5. Cyber/EW
   • Develop a Cybersecurity Framework for Ship Industrial Control Systems (ICS)
   • Develop and Assess Afloat Network Defense Cyber Operations with CDOSS and MAST
   • Develop tools for Mapping Dark Maritime Networks
   • Identify and Assess Development Test and Evaluation (DT&E) Implications for Cyber

6. Littoral Operations
   • Develop Methods to Determine the Value and Employment of “Brown” and “Green” Water Navy Options
   • Assess the Global Force Management Process and Efficiencies
   • Develop a Cost-Benefit Model for Evaluating Forward Presence
   • Develop Methods to Counter State and Non-State Actors Contesting the Maritime Battlespace and Littorals
   • Investigate Innovation in Military Logistics and Unmanned Cargo Distribution
   • Investigate Innovation in Military Logistics and Remote Monitoring of Heavy Tactical Vehicles
   • Develop Methods to Integrate Robotic Forces
   • Determine Methods to Safeguard the “Global System” and Strategic Commons
   • Determine Concepts for Sea Basing vs. Land Basing Forward Deployed Forces (Comprehensive Logistics Management for the Sea Base)
• Determine How to Tailor the Global Presence Based on Threat and Need (Modeling and Analysis of Surface Navy Availability Maintenance Processes)
• Determine Concepts for Future Options of Forward Basing and Stationing: (GCSS Analytics Suite Prototype)
Tab 3. Power

- Analysis of Fuel Connector Usage
- Optimal Fuel Mix
- Using Differential Power Processing to Harvest Maximum Power from a Solar Panel
- Novel Way to Conduct Resupply of Distributed Forces
- Low power control link scalable mesh for managing tactical nodes energy utilization
- Find Methods to Reduce Ocean Model Dependence on Foreign Environmental Satellites
- New Paradigm Supercapacitor for Energy Storage
- Education for Energy Culture Change
- Exploring Potential Energy Alternatives Using Simulation and Evolutionary Algorithms
- Novel Solid State Energy Conversion System based on advanced Hi Efficiency Thermophotovoltaic Devices
- CAD Interoperability for Navy Reuse in Additive Manufacturing (AM), 3D Printing, Maintenance and Training
- The Money Function—Determining Viable Locales for Waste-to-Energy Technology
- Microstructural Analysis and Comparative Study of Powders Used in 3D Metal Printing
- Investigate Additive Manufacturing: Novel Metal Particle Technology
Tab 4. Partnerships

1. Partners and Policies

- Explore and Assess Methods to Increase Partnerships in Africa
- Explore and Assess Methods to Deepen U.S. Partnerships in the Indian Ocean Region
- Explore and Assess Methods to Increase Partnerships in Middle East
- Explore and Assess Methods to Increase Partnerships in Europe
- Explore and Assess Methods to Increase Partnerships in Latin America
- Explore and Assess Methods to Increase Partnerships in North America
- Explore and Assess Methods to Increase Partnerships in Pacific
- Explore and Assess the Evolving Russian Views on the Utility of Nuclear Weapons and Their Impact on the U.S. Strategic Posture
- Explore and Assess the Strategic Stability in Sino-American Nuclear Relations
- Define China's "New Asian Security Concept" and US Maritime Interests in East Asia
- Explore and Assess Pacific Islands Coastal Marine Spatial Planning
- Assess Security Cooperation Goals and Methods
- Evaluate the Nuclear Taboo and Non-Western Regional Powers
- Determine Geography's Role in Strategic Laydown
1. Command and Control
   - Define Command and Control for the New Normal
   - Determine best practices to Increase Joint Interdependence
   - Ensure effective communications to the tactical edge in challenged, disrupted, and denied environments
   - Develop Battle Management Aids - Integration into Common Tactical Air Picture and IAMD Decision Process
   - Explore and Assess methods to Increase Distributed Lethality: Decentralized C2 in a Centralized World
   - Integrate Trusted Hand Held Security for Digital Interoperability
   - Develop Open-Source Analytics for Indications and Warnings in Complex Human Environments

2. Integrating Cyberspace Operations
   - Develop a Cybersecurity Framework for Ship Industrial Control Systems (ICS)
   - Develop a Cybersecurity Figure of Merit (CFOM) Cyber Readiness Assessment
   - Assess Darknet and DoD Networks: Obfuscation, Spoof Detection, and Elimination
   - Assess Satellite Vulnerability Planning Models
   - Understand Development Test and Evaluation (DT&E) Implications for Cyber
   - Increase Data Compression and Tactical WAN Optimization with XML/EXI

3. Capitalize on Cutting-Edge Modeling, Simulations and Virtual Environments
   - Develop Leadership and Team Skills Using Virtual Gaming
   - Develop 3D Virtual Environments of Naval Installations for Online Web-Based Enterprise Collaboration
   - Assess Trusted Hand Held Security for Digital Interoperability
   - Develop Big Data and Deep Learning Approach for Manpower, Personnel, Training and Education (MPTE) Common Operational Picture
   - Create Financial Model for USN/USMC Amphibious Lift Requirements

4. Managing Data
   - Conduct a Broad Study on Data Exploitation Tools
   - Develop Integrated Big Data Architecture – Integrating Object-Based Production/Activity Based Intelligence and Combat Systems Transient Object Data Models