NAVSEA
WARFARE CENTERS
CRANE

NSWC CRANE DIVISION

COMMAND INTEGRATED STRATEGY

2023

"**STRATEGY** without **TACTICS** is the **slowest route to victory**. **TACTICS** without **STRATEGY** is the **noise before defeat.**" *-Sun Tzu*

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Message from Leadership

This document is the culmination of collaborative efforts across the organization. Our cohesive strategy enables the appraisal of current and future threats to our National Security, acknowledgment of the changing requirements for our products, expertise, and services, and assessment of our need to continue to transform how we conduct business.

***NSWC Crane is responsible for critical technical capabilities and strategic mission areas**. When our Nation and global interests are threatened, then the demand for our products, expertise, and services escalate. We continue to address increased global challenges that are shaping a more complex and volatile security environment than ever before.*

In our current state, we need to operate with a sense of urgency and unity across the Command. Each of us must prioritize what is most important to our ability to field lethal, resilient, and rapidly adapting operational capabilities to the Joint Force. Successful execution of our Command Integrated Strategy requires seamless integration across the organization. We must seize opportunities, challenge ourselves to innovate for the future, and maintain disciplined execution of our mission.

CAPT Rex A. Boonyobhas
COMMANDING OFFICER

Dr. Angela Lewis, SES
TECHNICAL DIRECTOR

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Table of Contents

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NSWC Crane Mission & Vision

WHAT WE DO

Deliver innovative solutions and readiness to the NATION and its WARFIGHTERS.

HOW WE DO IT

Advance all-domain system of systems within the Mission Areas of:

STRATEGIC MISSIONS

ELECTROMAGNETIC WARFARE

EXPEDITIONARY WARFARE

Conduct science and technology, research, development, test and evaluation, acquisition and in-service engineering.

Vision

Combating our nation's greatest threats, NSWC Crane is the indispensable mission expert, leveraging our deep technical heritage to deliver solutions through innovation and strategic partnerships.

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NSWC Crane Foundational Principles

Workforce & Leadership Development

NSWC Crane fosters a diverse and inclusive work environment to support an empowered workforce. We focus on collaboration for rapid solutions, advancing workforce skill sets with continuous learning, talent attraction, competitive incentives to inspire employees to the next step, and enable growth to meet the Mission demand.

The Command Integrated Strategy for our workload is to transform leaders, digitize efforts, and own the life cycle for critical capabilities and systems.

Technical & Business Excellence

NSWC Crane brings high technical value and solutions to the Nation. Our technical capabilities are areas we invest in personnel, infrastructure, capital, and partnerships. We are national technical leaders in our mission areas, which are expertly integrated with our business departments to ensure mission success.

Technical Capabilities

- CR04 Electronic Warfare Systems RDT&E
- CR10 Infrared Countermeasures and Pyrotechnic RDT&E and Life Cycle Support
- CR15 Strategic Systems Hardware
- CR16 Expeditionary Warfare and Systems
- CR18 Advanced Electronics RDT&E
- CR19 Sensors and Surveillance Systems Engineering, Integration, RDT&E Acquisition & Life Cycle Support
- CR20 Hypersonic Weapon Systems RDT&E
- CR21 Power and Energy Systems
- CR22 Electro-Optic and Infrared Technology
- CR23 Force Level Electromagnetic Warfare Mission Analysis, Advanced Concepts and Technologies

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NSWC Crane Foundational Principles

Business Capabilities

- BC00 Command
- BC01 Comptroller
- BC02 Contracts
- BC10 Corporate Operations

Strategy

Combating our Nation's greatest threats, NSWC Crane is the indispensable mission expert, leveraging our deep technical heritage to deliver solutions through innovation and strategic partnerships. We are vital to our nation's defense, and make it a point to remain aware of strategic trends and the latest threats.

Culture

NSWC Crane values honesty, integrity, service, unity, empowerment, and solutions. NSWC Crane works to foster an inclusive and diverse environment where each employee reaches their full potential, able to contribute their best and brightest ideas in support of innovative solutions for the Warfighter.

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NSWC Crane Foundational Principles

Innovation Ecosystem Engagement

NSWC Crane incorporates the innovation ecosystem to leverage collaborative partnerships that address critical challenges that impact our Nation. We view the innovation ecosystem as critical to accelerating the development and transition of technology to the warfighter. Over the next decade, Crane intends to continue to expand the ecosystem of networked partners, both regionally and nationally, in order to maximize the impact it has on delivering critical capabilities in support of the Nation's defense.

"**EFFORTS** and **COURAGE**
are not enough without purpose and direction." *-John F. Kennedy*

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Command Strategic Intent

Relevance through national leadership:
mission - technical - economic

Rapidly providing capability to Warfighters

Complete life-cycle expertise and engagement

National leadership displayed through our innovation ecosystem

Business excellence and best value

Indiana's premier employer

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Environmental Scan Themes & Trends

Global Summary

The People's Republic of China (PRC)

China is the most consequential strategic competitor for the coming decades. The PRC is "the only country with both the intent to reshape the international order, and, increasingly, the economic, diplomatic, military, and technological power to do so." The PRC has expanded its conventional forces and modernized nearly every aspect of the People's Liberation Army through rapidly advancing and integrating its space, counter-space, and cyber, electronic, and information warfare capabilities. In parallel, the PRC is accelerating the modernization and expansion of its nuclear capabilities.

Russia

Recent events underscore the acute threat posed by Russia. Its extensive track record of territorial aggression includes the escalation of its brutal and unprovoked war against Ukraine. Russia presents serious and continuing risks in key areas. These include nuclear threats to the homeland and U.S. Allies and partners; long-range cruise missile threats; cyber and information operations; counter-space threats; chemical and biological weapons; undersea warfare; and extensive gray zone campaigns targeted against democracies in particular.

Threats to the U.S. Homeland

Although diverging interests and historical mistrust may limit the depth of their political and military cooperation, the PRC and Russia relationship continues to increase in breadth. This relationship could prove problematic as either state could interfere with the U.S.'s ability to respond to a crisis involving either nation. China and Russia now pose more dangerous challenges to safety and security at home, even as terrorist threats persist. The U.S. has experience with how Russia fights, the same cannot be said for the PRC.

Other Persistent Threats

North Korea continues to expand its nuclear and missile capability to threaten the U.S. homeland, our allies, and interests. Iran is taking actions to improve its ability to produce a nuclear weapon while building and exporting extensive missile forces, uncrewed aircraft systems, and advanced maritime capabilities. Iran further undermines Middle East stability by supporting terrorist groups and military proxies, employing its own paramilitary forces, and conducting malicious cyber and information operations. Additionally, global terrorist groups, including al-Qa'ida, have had their capabilities degraded, but may be able to reconstitute them in short order.

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Environmental Scan Themes & Trends

Department of Defense (DoD) Summary

The 2022 National Defense Strategy (NDS) identifies four top-level defense priorities:

- *Defend the homeland*
- *Deter strategic attacks against the U.S., our Allies, and our partners*
- *Deter aggression and be prepared to prevail in conflict when necessary*
- *Build a resilient Joint Force and defense ecosystem*

The NDS was released in conjunction with the Nuclear Posture Review and Missile Defense Review to solidify the integrated deterrence concept and logics of deterrence by denial, deterrence by resilience, deterrence by direct cost imposition, and deterrence through imposing costs on adversaries collectively with Allies and partners.

The Army, Air Force, Marine Corps, and Special Operations Command are embarking on a decade of major transformation and modernization. The overarching goal is to develop, design, and manage forces, writing new operational concepts and capabilities to achieve strategic objectives. The requirement is a Joint Force that is lethal, resilient, sustainable, survivable, agile, and responsive. The Department of the Navy is still assessing three separate alternatives for the 30 year ship build program with a total requirement ranging from 398 to 512 total crewed and uncrewed surface and subsurface platforms.

To sustain our military advantage over China, the FY 2024 budget request makes major investments in integrated air and missile defenses and operational energy efficiency, as well as in air dominance, maritime dominance, and in munitions, including hypersonics.

The FY 2024 budget request, if enacted, would set several historical budget record highs:

- ***Total Base Budget of $842B. Increase of $26B or 3.2%***
- ***RDT&E budget of $145B. Increase of $5.6B or 4.0%***
- ***Procurement budget of $170B. Increase of $6.3B or 3.8%***
- ***Operations and Maintenance budget of $330B. Increase of $9.2B or 2.9%***

FY 2024 budget requests for programs NSWC Crane is heavily involved with:

- ***$37.7B for Nuclear Enterprise Modernization***
- ***$11.0B to deliver a mix of hypersonic and long-range subsonic missiles***
- ***$2.6B for Microelectronics industrial base***

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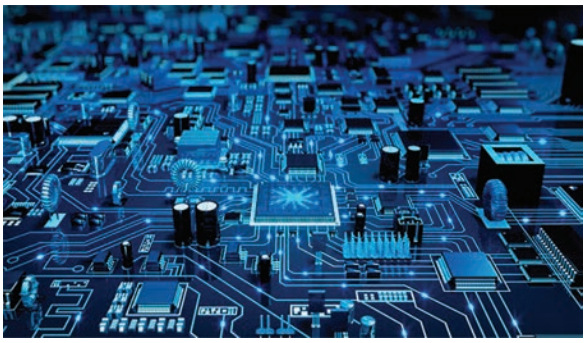
Command Positioning Strategies

Trusted Microelectronics: Trusted Microelectronics are foundational to the Strategic Missions deterrent capability and nuclear modernization efforts. NSWC Crane will continue to provide Trusted Microelectronics leadership as an independent agent to verify the proper operation of microelectronics over the entire strategic weapons system life-cycle. Crane provides key technical and programmatic leadership to multiple OSD Trusted Microelectronics programs to ensure that access to critical microelectronics technology is realized. The Trusted and Assured Microelectronics (T&AM) Program and the newly-established Microelectronics COMMONS program are examples where Crane's technical and programmatic leadership will be essential in ensuring access critical microelectronic technologies, including radiation-hardened microelectronics which are essential components of the strategic weapon system. NSWC Crane will continue to provide National Leadership expertise in microelectronics engineering and sustainment to ensure the availability of high-reliability and trusted state-of-the-art (SOTA) microelectronics for mission-critical Navy and DoD systems and sub-systems. As such, access to Trusted Microelectronics and critical microelectronic technologies in the future will be a key to fielding effective Strategic, Expeditionary and Electromagnetic Warfare systems.



Widespread usage in nearly all military systems

NSWC Crane strategically plans to increase our radiation-hardened and T&AM value proposition to DoD and the Navy by:

- *Scaling T&AM and Rad-Hard technical capacity by augmenting both government and contractor workforce numbers and skills.*
- *Maintaining key leadership positions in OUSD affiliated with T&AM and radiation hardened microelectronics by engaging in proactive workforce development and succession planning for key positions.*
- *Establish an enduring National Leadership by actively contributing to professional publications and forums for related fields.*
- *Key Elements: T&AM –Rapid Assured Microelectronics Prototypes (RAMP C); COMMONS Mission Employment (ME); Industrial Base Analysis and Sustainment (IBAS) ME including Reshore Ecosystem for Secure Heterogeneous Advanced Packaging Electronics (RESHAPE); transition paths to Program of Record (POR) meet near term threats; budget pressures Joint Federated Assurance Center (JFAC); West Gate/Industry Engagement; RAD/LE2 and Nuclear Modernization; ties to Hypersonics.*

Hypersonics: Strategic Missions leadership in Hypersonics technology development and deployment will provide a capable warfighting deterrent against aggression and attacks against the U.S. and its allies. NSWC Crane is leading efforts on several Hypersonics activities including development of an Under Water Launch Test capability. NSWC Crane is also leading the Government Model-Based Systems Engineering (MBSE) efforts on Hypersonics through the development of novel techniques and applications for reviewing descriptive models. NSWC Crane will continue leadership of Configuration Management for the Hardware-In-The-Loop

Enables missile targets anywhere within a short amount of time

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Command Positioning Strategies

(HWIL) for the HWIL national team, and provide Systems Engineering expertise in the areas of block upgrades, information management, and digital infrastructure in support of the Joint Hypersonics Transition Office Systems Engineering Field Activity (JHTO SEFA).

NSWC Crane is focused on the following efforts:

- *Becoming a principal contributor in DoD and service hypersonic and strategic weapons development, research and test*
- *Creating a cadre of weapon system engineers able to support all levels of weapon systems development*
- *Creating and sustaining key leadership positions in OUSD programs affiliated with Hypersonic and Strategic Weapons Development, Test and Operations.*
- *Creating a Strategic Systems Applied Research Group that will integrate research activities in key technical areas, integrate with regional and national research partners to deliver game changing technologies and value to our customers.*

Mission Integration for Distributed Operations (MIDO):

MIDO represents an emerging defense area of opportunity for the U.S. Department of Defense (DoD), the state of Indiana, and NSWC Crane. MIDO is an overarching strategic concept designed to effectively respond to the evolving need for mission integration in an environment where joint forces are dispersed, both geographically and across domains, from physical domains across the sea bed up all the way to space, and within the cyberspace domain.

MIDO emphasizes the seamless coordination and synchronization of distributed military activities to achieve mission objectives and ensure effectiveness. NSWC Crane's profound capabilities related to electromagnetic spectrum modeling and simulation, autonomous unmanned effects, and operational testing and assessment within a realistic environment serve as key tenets for our MIDO approach.

NSWC Crane's strategic approach to MIDO will focus on three key enablers including:

- *Integration and interoperability*
- *Realistic, mission-level assessment*
- *Proactive, rapid fielding of capabilities*

Combined field capabilities giving service members in harm's way the capabilities to execute their mission

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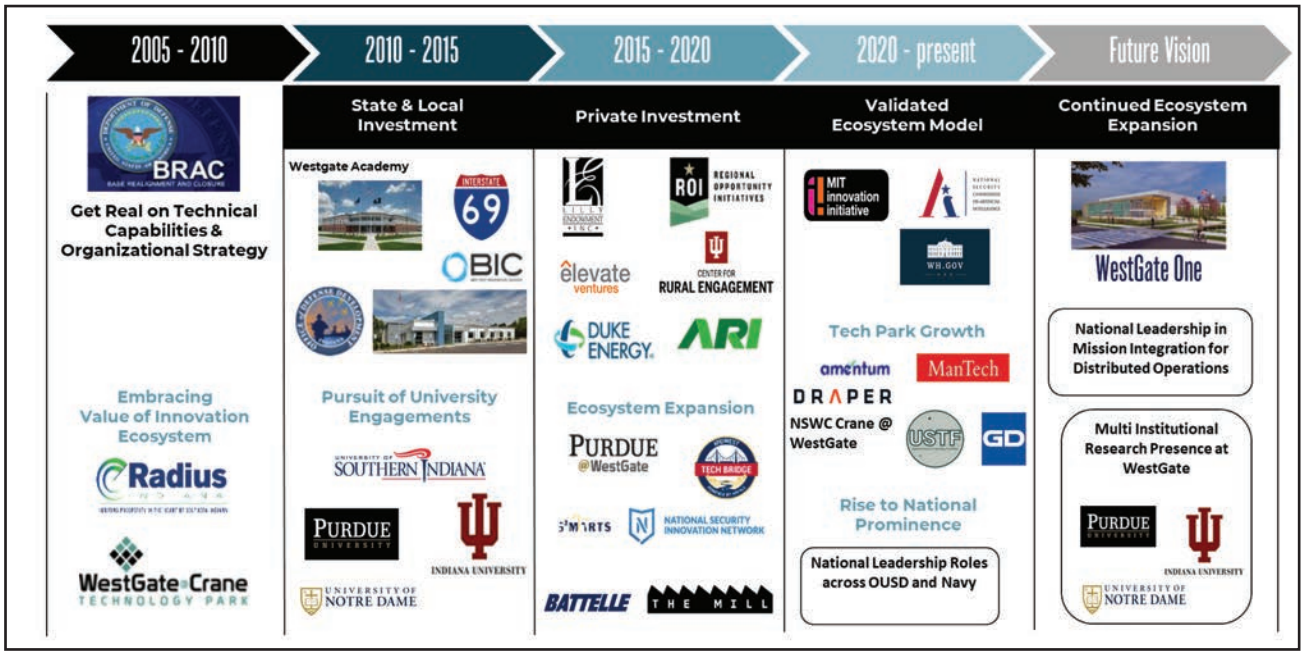
Innovation Ecosystem Engagement

NSWC Crane is more valued and relevant than at any time in its history and is positioned for an abundance of growth opportunities in emerging technology areas central to its areas of National Technical Leadership. In a time when demand for NSWC Crane's expertise exceeds workforce capacity and when the challenges that face our nation are so complex, Crane recognizes the critical importance of creating partnerships in order to meet the needs of the Navy and the nation today and tomorrow.

NSWC Crane is committed to bringing the best resources to bear on the critical challenges that face our Nation through a continued practice of engaging with partners throughout the ecosystem.

NSWC Crane views the innovation ecosystem as critical to accelerating the development and transition of technology to the warfighter. Over the next decade, Crane intends to continue to expand the ecosystem of networked partners, both regionally and nationally, in order to maximize the impact it has on delivering critical capabilities in support of the Nation's defense.



The Office of Engagement is responsible for fostering the innovation ecosystem and conducting outreach and advocacy to create partnerships that leverage the equities of mutually aligned stakeholders in order to:

- *Accelerate the development and transition of technology to the Warfighter*
- *Best position the organization to meet the current and future needs of DoD and the Navy*

Throughout its history, NSWC Crane has been intentional to cultivate and embrace strategic partnerships.

WestGate One will be the first of several anticipated microelectronics facilities located at the adjacent WestGate Technology Park. This microelectronics facility will consist of multiple industry and academic partners and will establish critical government and commercial capabilities to meet the nation's microelectronics needs, as well as conduct research critical to the future of the industry. Hundreds of millions of dollars is anticipated in private investment, as well as over 1000 high tech jobs.

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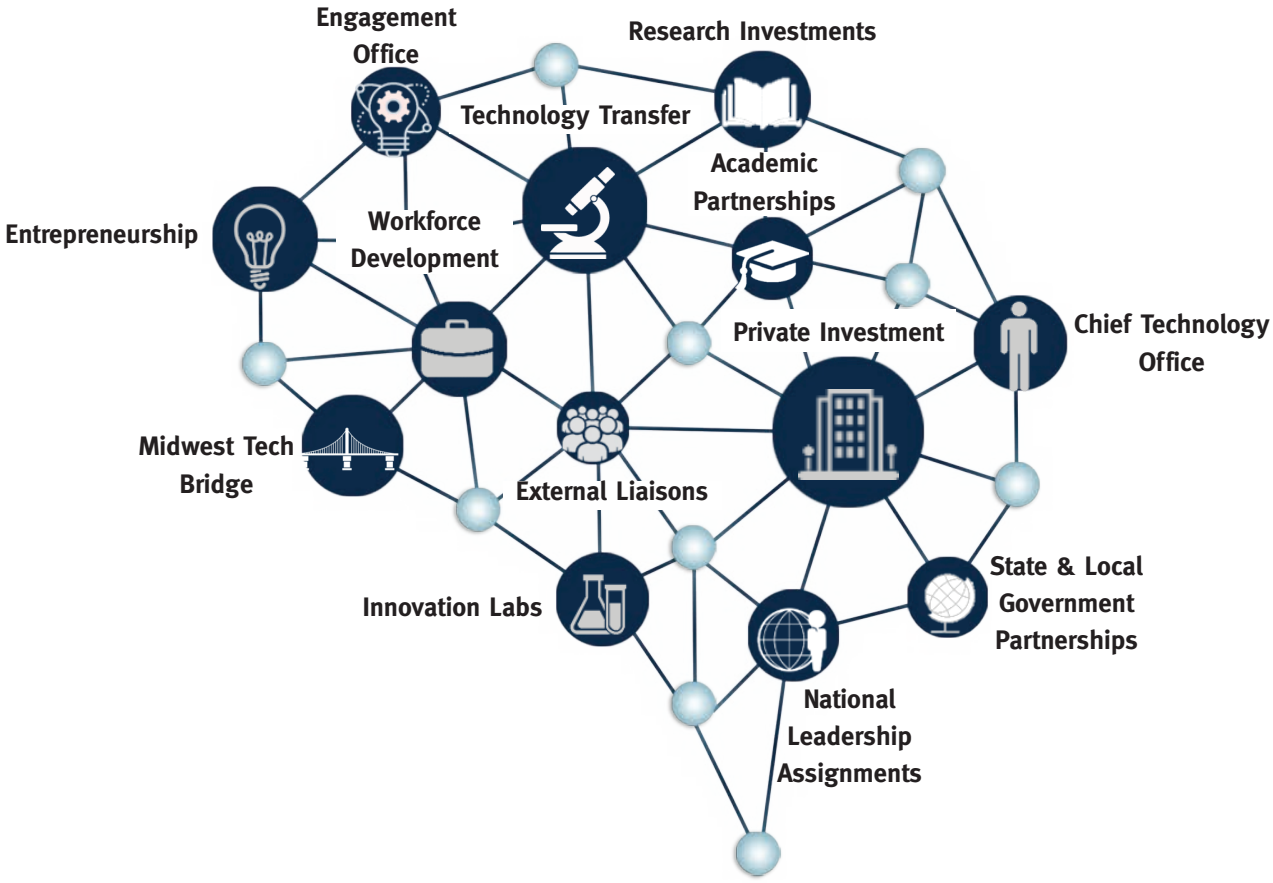
Innovation Ecosystem Engagement

MIDO superiority is an imperative for the Nation's forces as we look forward to the next fight. Crane will lead by combining its expertise to ensure integrated deterrence needed for the Nation's toughest challenges.

NSWC Crane and its regional partners continue to pursue completion of key opportunities associated with the Uplands Regional Defense Strategy. A major component of the strategy is a multi-institutional research capability with the WestGate Technology Park. Such capability would not only stimulate economic activity within the Tech Park, but enable better access to academic partners and foster technology innovation that enables Crane to deliver rapid capabilities to its customers.

NSWC Crane will continue to leverage partnerships across the ecosystem, both regionally and nationally. Critical partnerships include capabilities from the Office of the Secretary of Defense such as Defense Innovation Unit (DIU). Its partnership with DIU enables Crane and the defense industrial base to provided critical capability to the Navy and DoD. DIU's mission is to accelerate the adoption of commercial and dual use technologies so solve tough technical challenges. DIU's programming engages labs like NSWC Crane to source problems, provide workforce pipelines, and direct small business and other industrial base partners to critical capital needed to adopt and transition technology. NSWC Crane has a strong relationship with DIU and its programming, through dedicated liaisons who work both internally and externally to create meaningful and impactful partnerships within the ecosystem. This is accomplished through partnerships with a variety of internal and external stakeholders.



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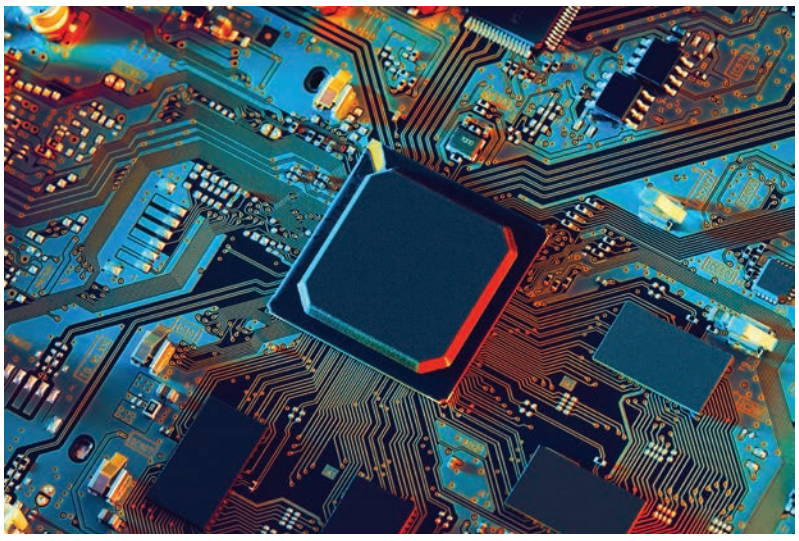
Strategic Missions

Strategic Missions Vision

As the Navy's primary organic field activity for full life cycle management including hardware, ordnance and power systems, NSWC Crane applies the distinct capabilities inherent in its people and facilities to assure 100% operational readiness of strategic missile systems. Modernization and sustainment of our Nation's strategic deterrent is a top priority of the Navy and DoD. It requires collaboration between the Navy, Air Force, and Missile Defense Agency to align appropriate requirements, technology development, production, sustainment efforts, and protection activities of ballistic missile systems to enable affordability, advance technology, and reduce program risks to modernize the nuclear enterprise to defeat emerging threats worldwide.

The 2022 NDS prioritizes **"Integrated Deterrence"**, which entails developing and combining our strengths to maximum effect, by working seamlessly across warfighting domains, theaters, the spectrum of conflict, other instruments of U.S. national power, and our unmatched network of Alliances and partnerships. Integrated deterrence is enabled by combat-credible forces, backstopped by a safe, secure, and effective nuclear deterrent. NSWC Crane will continue to provide critical national-level leadership and technical expertise across the Navy's Trident Life Extension 2 (LE2) program, the Air Force's ground-based Sentinel, Minuteman III, and Air-Launched Cruise Missile (ALCM) programs. This also includes support for the Missile Defense Agency's Ground and Sea-based programs, including the next generation interceptor program.

Trusted Microelectronics: Microelectronics are foundational to ensuring mission resilience through a measurably secure supply chain for Navy systems and capabilities. The Navy must be proactive in identifying and addressing challenges and vulnerabilities to its combat readiness, which is especially vital for its most critical microelectronics-based systems.



The 2022 Chief of Naval Operations (CNO) Navigation Plan stated that readiness remains the Navy's top priority. However, the DoN ability to maintain combat readiness and technology leadership is predicated upon our reliance on foreign microelectronics products, a lack of understanding of the components within our systems, and limited influence on a diminishing domestic microelectronics production base. This results in critical sourcing and sustainment challenges which present both national economic and security issues.

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Strategic Missions

Efforts to address these risks are occurring at all levels of the U.S. Government. Congress has taken steps through numerous initiatives, including the appropriation of $52.7 billion in support of the Creating Helpful Incentives for the Production of Semiconductors and Science Act. Further, Congress has requested an assessment of energy storage and electronic components needed to support DoD readiness **"for not less than one year against the pacing threat identified in the National Defense Strategy"**, which emphasizes the long-term competition with China. Within the DoD, the Deputy Secretary of Defense (DSD)-empowered Defense Microelectronics Cross-Functional Team (DMCFT) is developing a holistic DoD strategy that addresses challenges in supply and demand, industrial base capabilities, knowledge centralization, and technology transition.

Microelectronics enable all DoN platforms, weapons, sensors, and networks and are foundational to the Department's modernization efforts. The 2022 CNO Navigation Plan explicitly states that the DoN must **"build, maintain, train, and equip a combat- credible, dominant naval force to keep the sea lanes open and free, deter conflict, and when called upon, decisively win our Nation's wars."** The Navy must be proactive in identifying and addressing challenges and vulnerabilities to its combat readiness, especially vital for its most critical microelectronics-based systems. Therefore, in parallel with the broader DoD and U.S. Government (USG) efforts, the DoN is ensuring a path for its programs by establishing Strategic Objectives that will inform the development of a DoN Microelectronics Strategy and Implementation Plan.

The NSWC Crane Microelectronics Strategy will align with the Secretary of the Navy's three enduring priorities: capabilities, processes, and people. Those priorities will work in consonance with a concurrent effort to develop an agile, innovative, and inclusive ecosystem to leverage commercial industry, academic partners, and other government entities to identify trends, and promote rapid and innovative responses to community needs.

Nuclear Modernization:

With a strong heritage that includes more than 60 years with Strategic Systems Programs (SSP), more than 40 years with the Air Force and a vital role with nuclear modernization programs, NSWC Crane is indispensable to the Nuclear Triad. The Global Deterrence and Defense Department supports Strategic Missions which encompasses the full range of DoD activities that alter an adversary's will and ability to attack the U.S. and its interests which is in direct correlation to our continued support to the mission of the U.S. Strategic Command (USSTRATCOM) to deter strategic attack and employ forces, as directed, to guarantee the security of our Nation and our Allies.

The CNO Navigation Plan states as a primary objective that **"the Navy must defend the Homeland with an assured nuclear deterrent from beneath the sea to deter nuclear and non-nuclear strategic attacks"**. The Plan also forecasts the future fleet to consist of Columbia-class ballistic missile submarines to provide America with an assured deterrent to any strategic attack on the Homeland. NSWC Crane will lead efforts to accomplish these objectives by providing technical and programmatic leadership for the Navy LE2 Strategic Systems program while modernizing the internal infrastructure to facilitate execution of key Navy and DoD Strategic programs.

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Strategic Missions

Hypersonics: Hypersonic systems are among the highest priorities in the Defense Department's modernization strategy to ensure continued U.S. battlefield dominance, according to the principal director for hypersonics in the Office of the Undersecretary of Defense for Research and Engineering. China and Russia have fielded high-end, integrated air-missile defense systems to challenge our aircraft out hundreds of miles. Their anti-satellite systems aim to degrade our capabilities in space and on land, and their attack cruise, ballistic and hypersonic missiles put our troops, ports and airfields at risk. Adversaries have increasingly focused on systems that dramatically compress the timelines and the timescale of a tactical battlefield. These systems — including ballistic missiles, ballistic missiles with maneuvering reentry vehicles, and vehicles that are increasingly hypersonic in nature — give adversaries the ability to hold our forces at risk from hundreds, even thousands, of miles away, with flight times that are measured in minutes.

Another top objective of the CNO's Navigation Plan is to achieve accomplished Conventional Prompt Strike CPS testing and technology development, including milestones in rocket motor testing. NSWC Crane will provide leadership toward this objective by ensuring the transition of technical capabilities and by providing programmatic leadership for the Navy CPS program. This will require an understanding of the Systems Engineering and Systems Integration challenges for the Navy Conventional Prompt Strike program, as well as leveraging capabilities such as the Multi-Service Advanced Capability Hypersonic Test Bed (MACH-TB) while building on established innovative programs and leveraging efforts within the Joint Hypersonics Transition Office Systems Engineering Field Activity.

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Expeditionary Warfare

Strategic Relevance

Guided by the NDS, we recognize the priorities of conflict and threats shifted to the Pacific. Our efforts must be able to counter the multi-domain threats and deter aggression posed from the Indo-Pacific region. More than ever, this reinforces the need of a Joint Force that is even more lethal, resilient, agile and responsive. Services and agencies must become more integrated to meet these challenges. The Expeditionary force is critical and integral to success as an integrated Joint Force and therefore to the deterrence of threats across the globe. Expeditionary Warfare Department's heritage has been and continues to focus on rapid prototyping and proven solutions supporting the evolving needs of the Expeditionary force.

Big Picture

The CNO's Navigation Plan, and the Commandant's Planning Guidance, lays out the need for the Navy and Marine Corps to innovate and accelerate delivery of credible and reliable unmanned systems in conjunction with increasingly capable manned platforms into the fleet. Based on the Unmanned Campaign Framework, the Unmanned Systems (UxS) shift is from a platform centric approach to a capability approach, delivered and updated through a modular and open system environment. From a Counter Unmanned Systems (CUxS) perspective, just as we deploy UxS assets, our adversaries are doing the same.

With the shift in priorities and as the force becomes more integrated, battlespace management is of utmost importance to the Expeditionary force, specifically managing our own signature and deception to protect and thwart offensive measures against us. The goal is to reduce our signature to ensure less vulnerable while also developing deception capabilities so adversaries so they cannot predict or disrupt our Command and Control (C2), communications or movement in the battlespace.

The Expeditionary Force must also have C2 capabilities capable of executing a joint/naval campaign and contributing to the joint force's ability to sense and make sense of the operational environment and, when necessary, enabling and contributing to joint kill webs per the Commandant's Force Design 2030. According to the JADC2 Strategy, the Joint All-Domain Operations concept is focused on providing command access to **"information to allow for simultaneous and sequential operations using surprise and the rapid and continuous integration of capabilities across all domains to try to gain physical and psychological advantages and influence and control over the operational environment"**, directly supporting the goals and priorities of the NDS integrated deterrence across domains and campaigning.

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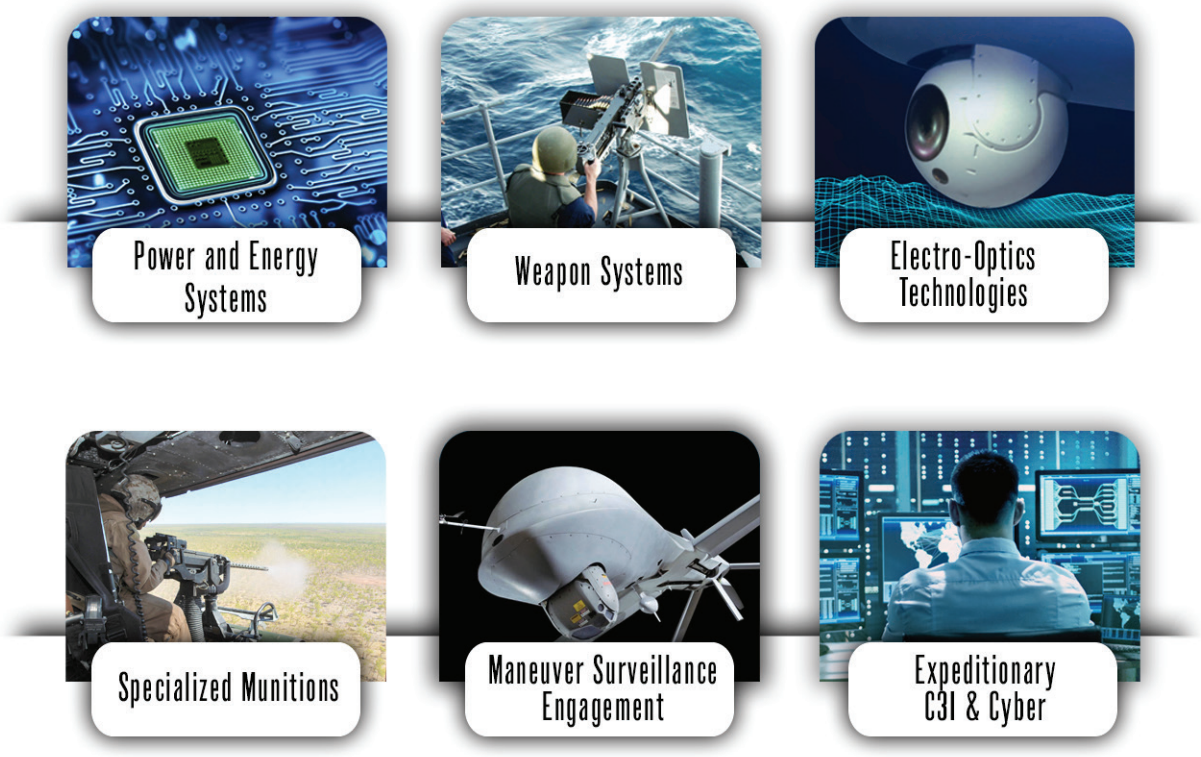
Expeditionary Warfare

Why Crane?

NSWC Crane is actively supporting this integration and interoperability through the technical leadership and expertise focused on systems solutions for all domains that enhance detection, decision-making, maneuver, and kinetic and non-kinetic engagement capabilities for the Expeditionary warfighter built upon our rapid response culture, core capabilities and unique infrastructure.

We have a reputation of providing solutions that do not sacrifice safety or risk. Our technical expertise and National Leadership in areas such as sensor integration, EW, EO, SpM, weapons, C2, and Radar all in one location enables rapid specialization to the ever changing threat. Our culture and strategic mantra of the last several decades, **"rapid response, proven solutions"** is a foundational strength that we need to bring to the fight more than ever.

Core Capabilities



Strategic Way Forward

With the need to focus on systems solutions for all domains that enhance detection, decision-making, maneuver, and kinetic/ non-kinetic engagement capabilities for the Expeditionary warfighter, we focused our efforts on three primary strategic thrust areas.

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Expeditionary Warfare

Unmanned System-Counter Unmanned Systems

GOAL: Have the premier organic capability for rapid development, integration, experimentation, assessment for sensor and effector systems of unmanned solutions.

Rapid Development And Integration: Our proven capability to respond to rapid needs/problems/requirements in a condensed timeframe with a proven unmanned solution with acceptable risk. This includes our local test and experimentation infrastructure and expertise to rapidly proof the solution and further develop.

Sensor And Effector System Integration: Our expertise and growing capability in sensor fusion with growing emphasis on the identification, integration and development of best of breed sensor and effectors for layered CUxS solutions for the warfighter with integration focus of systems for whole situation. We continue strategically pushing the edge.

Autonomy And Counter: We are growing the organic baseline knowledge and expertise in these areas and working with existing and new partners to further autonomy capability solutions.

Experiments And Assessments: With the rapid evolution of the threat, the DoD needs the ability to figure out what isn't known, to anticipate those changes and how to help direct tech in this area. Our Rapid Integration and Mission Experimentation Center (RIMEC) efforts will continue to lead and adapt the capability for experimentation at the component, subsystem system level for CUxS to rapidly develop solutions. This includes evaluation of current and emerging technology insertion and evaluation of techniques.

Integrated Battle-Space Management

GOAL: Have the premier organic capability to manage the integration and interoperability of our sensor systems and deception.

Deception: Protect and thwart offensive measures against us. Reduce our signature to ensure less vulnerability within the EMS developing capabilities so adversaries cannot predict or disrupt our C2, communications or movement within the battlespace.

Further The EMS Superiority Strategy: Prioritize the need for Electromagnetic Battle Management capabilities across the spectrum.

Naval Integration Joint C2

GOAL: Integrate expeditionary C2 systems into JADC2 infrastructure.

Enterprise Level Information Sharing Capability: Building upon our proven software integration capability with our USMC and Navy Common Air C2 (CAC2S) system solution, we will continue to invest in supporting cross service solutions focused on connecting existing systems to talk, supporting and developing solutions such as CAC2S Afloat and Composite Tracking Network we have been supporting for years.

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Expeditionary Warfare

Implement Layered Security Features In C2 Systems: We have proven our ability to provide cross domain solutions and our Universal C2 solution exhibited at Purple Guardian, built upon our organic Enhanced Battlespace Reconnaissance, Intelligence, and Surveillance Software (EBRISS Core (ECORE)) capability to integrate more systems across multiple services. We have integrated a Cross Domain Solution in support of Universal C2 and will continue.

Special Warfare and Expeditionary Systems Department (SWESD) continues to align our strategic thrust areas to the command positioning strategies. Our integration and interoperability efforts centered around our core capabilities strongly align to the MIDO positioning strategy while also supporting some niche linkages to Hypersonic and Microelectronics.

OUR DNA

- RAPID RESPONSE
  ...culture
- CRITICAL INFRASTRUCTURE
  ...capability
- NATIONAL LEADERSHIP
  ...credentials

brings solutions...

- INTEGRATED AUTOMOUS SYSTEMS
  ...UxS / CUxS
- NAVAL INTEGRATION
  ...joint C2
- BATTLESPACE MANAGEMENT
  ...maneuverability

TO THE FIGHT

Special Warfare and Expeditionary Systems Department is committed to providing **critical infrastructure (capability), national leadership (credibility) and rapid experimentation (culture)** for NSWC Crane and our nation. These are the three foundations of our monument and something that cannot be replaced.

WE understand the MISSION - URGENCY - and are able to deliver in an expedited timeframe!

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Electromagnetic Warfare

Vision

Over the past decade the threat to the nation has rapidly evolved, specifically within the electromagnetic spectrum (EMS), these challenges are driving the U.S. to begin developing innovative approaches to maintain the strategic electromagnetic advantage. Our peer and near peer adversaries are finding new and novel ways to leverage the EMS forcing it to become increasingly congested, contested, and constrained. These challenges are driving the DoN and DoD to accelerate the pace at which technical capabilities are fielded to the fleet. NSWC Crane's Spectrum Warfare Department (SWD) is ready to embrace these challenges by developing superior EMS capabilities to support strategic and operational objectives.

The Joint Chiefs of Staff (JCS) have released several publications and doctrine designed to guide the Joint Electromagnetic Spectrum Operations (JEMSO) community of interest, and NSWC Crane SWD has adapted quickly to those guiding documents. These documents are confirming that the SWD is consistent with JCS guidance to ensure we continue to lead as the Electromagnetic Warfare (EW) Center of excellence. In the Spectrum Superiority Strategy, Objective 1.1 states **"The Department's emphasis should be on revolutionary leap-ahead technology and capabilities."** Similar prescriptions for the Naval EMS capabilities have been requested in the NDS, DoD EW Strategy, Distributed Maritime Operations, Design for Maintaining Maritime Superiority, the USMC Commandants Guidance. The aforementioned documents all call for a need for distributed, integrated **FORCE LEVEL EW** capabilities as stated within the Joint Publication (JPUB) 3-85 "Joint Electromagnetic Spectrum Operations."

"Instead of these mission areas being planned and executed in a minimally coordinated and stovepiped fashion, JEMSO guidance and processes prioritize, integrate, synchronize, and deconflict all joint force operations in the EMOE, enhancing unity of effort. The result is a fully integrated scheme of maneuver in the Electromagnetic Operating Environment (EMOE) to achieve EMS superiority and Joint Force Commander (JFC) objectives."

Since NSWC Crane's SWD is the largest concentration of EW experts in the DoD, it is vital that our department is providing innovative EMSO technical capabilities that are being delivered to services, however, we must ensure that the systems currently fielded are sustained and maintained to the highest caliber of excellence. We will continue to leverage our expertise to ensure NSWC Crane's SWD is embracing systems across the entire lifecycle and ensure the advanced technology developed across the Naval Research & Development Establishment (NRDE) is being transitioned to today's naval systems, while we are designing and implementing tomorrow's integrated naval EMSO systems.

At NSWC Crane, we provide Non-Kinetic Expertise and Electromagnetic Spectrum Dominance to all the services through a variety of manners. We seek to support multi-domain (i.e. land, air, sea, space) integrated solutions through multispectral capabilities (i.e. RF, EO, IR, digital) and multi-service (i.e. Navy, Marine Corps, Air Force, and Army) through strategic joint service EW partnerships (i.e. WPAFB/AFRL and Army EW/C5ISR Center). Specifically, the Spectrum Warfare Department is leading the DoD in cognitive and distributed non-kinetic systems of systems solutions; offensive and disruptive concepts and technologies across the entire lifecycle.

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Electromagnetic Warfare

Thrust Areas

The Spectrum Warfare Systems department revolves around four fundamental pillars; Mission Engineering (ME), Apps for EW, Advanced Electromagnetic Spectrum Capabilities, and EMSO Threat Intelligence & Exploitation. These pillars are focused on leveraging our EMSO Expertise to ensure our employees understand the values and mission around our core thrust areas. These pillars serve as the foundation to ensure we continue to be leaders in Innovation and Sustainment for Force Level EW mission, continue developing our workforce to nationally lead in EW, and transforming our workforce to support the agile nature of EMSO to leapfrog Peer and Near-Peer Capabilities.

Mission Engineering: Mission Engineering is defined by OSD R&E MCTO as **"The deliberate planning, analyzing, organizing, and integrating of current and emerging operational and system capabilities to achieve desired warfighting mission effects"**. Within Spectrum Warfare we are specifically looking at leveraging our EMSO capabilities for Mission engineering, Mission analytics, and Mission integration for Non-Kinetic capabilities. All of these competencies aligned with verbiage in the EMS Superiority Strategy that states the, **"DoD must evaluate campaign-level and operational scenarios through modeling, simulation, and testing in representative environments to prescribe appropriate levels of performance and be willing to embrace leap-ahead technology rather than evolutionary acquisition paths".**

As the DoD pushes for more Test and Evaluation (T&E), Mission Engineering offers several advantages to both reduce the cost and mitigate risks of failure at test events. This approach (i.e. ME/T&E) is backed by the 2022 NDS Strategy which calls for, **"Greater flexibility and mobility; increased operational tempo; and seamless, cyber- and electromagnetic spectrum-survivable integration of multiple platforms, weapons, and systems to achieve multi-domain superiority".** Within the EW Mission Area we are pushing for advanced Model and Simulation of EMSO capabilities in the Campaign/Theater, Mission/Battle, Engagement, Engineering and Physics levels. This helps us expedite the pace of concept development to experimentation and reduce the cost of capabilities within Digital environment. This directly aligns to the NDS, EMS Superiority Strategy, and other doctrine such as the Navy and Marine Crops Digital Systems Engineering Transformation Strategy, which focuses on **"activities to provide a standard of practice that delivers affordable, lethal capabilities to the warfighter at the speed of relevance".** These environments and methodologies can help develop capabilities quicker by showing the gains made from integrating EMSO Capabilities into a proper force level Electromagnetic Warfare capability in support of all Warfighting mission areas (Strike Warfare, Air Warfare, Surface Warfare, etc).

NSWC Crane Spectrum Warfare Department has partnered with U.S. Strategic Command (USSTRATCOM), who currently is assigned Joint EMS Operations under the Unified Command Plan. NSWC Crane is working with the STRATCOM Joint EMSO Center (JEC) in the planning, organization, and execution of the NSWC Crane Joint EMS Warfare Integration Center (JEMSWIC) which leverages our Technical Capability of Force Level Electromagnetic Warfare to facilitate the integration of EMSO Non-Kinetic effects faster into our naval EMSO capabilities.

Apps For EW: The value of software defined radio in military application has proven itself many times over in the past decade. In that prior time period, our Electromagnetic Warfare systems were primarily hardware based, meaning that any new capability required fielding of newly developed hardware to enable new capabilities which in turn required long stretches of time between upgrades to systems, and leaving our naval systems with large capability gaps.

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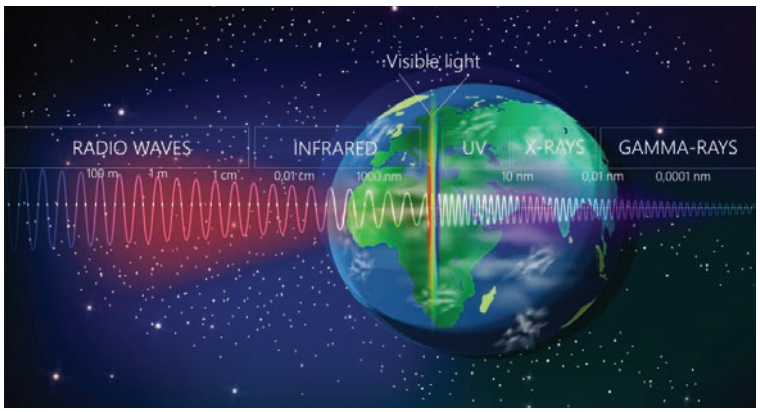
Electromagnetic Warfare

Specifically over the past decade, having software defined radios, and in a broader sense software defined capabilities, new capabilities can be fielded with software upgrades and more recently they can be updated mid-mission if need be.

Spectrum Warfare Department also is actively engaging in open systems architecture, Government off the Shelf architectures, and open standards boards to allow us to leverage the same waveform threats across all of the systems we support. This allows us to leverage Countermeasures or techniques developed on one platform to be leveraged across all the platforms SWD and the broader EW Mission Area supports. Additionally, the EW Mission Area continues to pursue innovative radio frequency (RF) machine learning (ML) and artificial intelligence (AI) for electromagnetic spectrum systems applications. This thrust area is a critical enabler for providing the military with real time mission adaptability at the tactical edge.

Advanced EMSO Capabilities: Over the course of a couple decades, SWD has continually innovated ways in that EMSO systems can be used in novel ways, and find creative solutions to employ our systems. Through internal intentional investments we have found ways to do this, and have transitioned those capabilities to the fleet and to the greater DoD Research construct (Office of Naval Research (ONR), and Defense Advanced Research Project Agency (DARPA), among others).



Only through intentional pushes to implement State of the Art (SOTA) research, can we ensure our technical advantage in the EMS is maintained. Specific strides in specific AI/ML, Quantum sciences, advanced engineered materials (EnMats), 5G and beyond technologies must be leveraged and implemented in our EMSO systems.

EMSO Threat Intelligence And Exploitation: Through our support of EMSO systems, Spectrum Warfare Department has formed partnerships with relevant Intelligence Agencies to understand emergent threats from our adversaries. Through our direct fleet support of naval Electromagnetic Warfare systems and countermeasures, we often times are called upon to understand our systems capability and how it can be used as to counteract the new capabilities that the warfighters observe from the adversaries, and begin developing ways that our systems can be used to bridge the gaps in those capabilities, and working with the Intelligence Community to fully understand the adversaries capabilities. The key enabler for this thrust area will be conducting a net assessment of peer and near-peer military capabilities and technology investments to identify threat based trends. Based on the net assessment, NSWC Crane in turn will utilize those results to drive research and development of leap ahead EMSO capabilities.

The EW Mission Area is forging new approaches to EMSO and leading development in Disruptive and Non-Traditional ways that the EMS can be used for warfighting advantage. The DoD and specifically the Navy has acknowledged that Military Deception is an underutilized capability. In the EMS, Electromagnetic Warfare systems, and those Tactics, Techniques and Procedures can be readily leveraged to enhance and facilitate the capabilities the fleet and the Joint Force requires. Through our in-depth understanding of EW systems, we can better develop and transition EMSO systems that deliver significant capability to the fleet in a cost effective and timely manner.

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Comptroller

Strategic Objective

To employ and empower a premiere, highly skilled and motivated financial management workforce to ensure the Command has strong financial integrity, accurate financial information for real-time decision making, and agility to adapt to all situations while ensuring compliance and effective controls.

Strategic Goals (2023-2026)

WORKFORCE: Build and maintain a premiere workforce by cultivating collaborative knowledge through a shared vision and extensive understanding of financial management practices.

EFFICIENCIES: Expand our data analytics and gain efficiencies through digital transformation.

PROCESSES: Utilize continuous improvement to ensure processes are most effective and efficient.

PARTNERSHIPS: Improve partnership and alignment to create a climate of mutual trust, collaboration, and innovation to deliver top-rate financial management and customer service.

Mission

Guided by an unwavering commitment to the Warfighter, we inspire trust by delivering world-class financial services and fostering fiscal responsibility to enhance mission success.

Vision

Fostering innovation and continuous improvement with agility at the core, we empower our workforce and cultivate collaborative relationships, propelling the Comptroller Department to be a recognized force in financial excellence.

Priorities

WORKFORCE: Our workforce is imperative to the Command's success in financial management. To ensure a top-notch workforce, we must focus on the individual through intentional connection, training, and collaboration. Our individual and collective behavior ensures inclusiveness and mutual respect.

ENVIRONMENT: The current environment requires strong financial integrity and rapid data delivery for real-time decision making. Our continued focus on digital transformation will improve our processes, services, and products we offer to the Command and will promote our willingness to be adaptable and agile to future needs while ensuring compliance in an audit readiness culture.

CONTINUOUS IMPROVEMENT: Continuous improvement is instilled in our culture. We will ensure the continuous improvement process remains strong, seeking out efficiencies as we review and update processes and internal controls.

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Contracts

Strategic Objective

The current national security environment features a strategic competition spanning multi-domains, authorities, and regions. Global adversaries have accelerated military modernization programs, investments in advance capabilities, and quickly acquired technologies that exploit our vulnerabilities. To prevail in this environment, our acquisition process must keep pace and deliver capability to the fleet at the speed of relevancy. (partially sourced from: ASN RDA Strategic Guidance 2022)

Strategic Goals (2023-2026)

TRANSFORMATION: Move into the future without compromising the quality, excellence, and gold standard reputation our historical methods have afforded us.

Measurement method: Procurement Surveillance Program and annual climate survey

ALIGNMENT: Combine our strong acquisition competence with innovative methods to deliver contracting solutions that differentiate NSWC Crane, accelerates unique DoD capability, and engages top-level advocacy.

Measurement method: Customer feedback and annual climate survey

LEADERSHIP DEVELOPMENT: Invest in our current and emerging leaders in way that cultivates a leadership competency that adheres to the Contracts Department values and successfully executes our strategic objectives.

Measurement method: Track employee participation in formal leadership courses and employees receiving awards/ recognition for leadership attributes, DEOCS survey

PARTNERSHIPS: Create and maintain a climate of mutual trust, collaboration, & common purpose.

Measurement method: Annual climate survey

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Contracts

Mission

Provide timely, effective, and efficient acquisitions to enable the U.S. Navy to maintain its technological edge in the Maritime domain. Deliver innovative, cost-effective, and reliable capability to our warfighters while upholding the highest standards of integrity, professionalism, and ethical conduct. We aim to build and maintain strong relationships with our business and industry partners, and to continuously improve our processes and capabilities to meet the evolving needs of the Navy and the Nation.

Vision

To be an agile, world-class, center of excellence in acquisition and contracting. By hiring and cultivating top talent, we ensure NSWC Crane's mission areas equip the U.S. Navy, joint services, and coalition partners for continued dominance. In this new era, we will courageously embrace new flexibilities, maintain high standards, and deliver impactful products and services.

Guiding Principles and Values

As trusted business advisors, strategic planning partners, and key enablers, we provide exceptional customer support by cultivating relationships that are grounded in alignment toward a common purpose: combatting our nation's threats.

GP = GUIDING PRINCIPLES

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Contracts

Priorities

PEOPLE: Our work is relational. Connectedness matters. Our behaviors create and uphold a culture of diversity and inclusion, continuous learning, and mutual respect. We maintain trustworthiness by demonstrating honesty, fairness, reliability, and empathy.

AGILITY: It is imperative that we adapt and pivot with emerging technologies, authorities, and methods relevant to acquisition. To become more agile we will train, equip, and empower our workforce for nimble execution.

TECHNOLOGY: Our willingness to embrace innovative tools and game-changing technologies enhances our output, and, distinguishes us as premiere solution providers. To maximize effective utilization, we actively participate in knowledge sharing across multiple competencies.

BALANCE: We will maintain the public trust by conducting our business with integrity & accountability and exercising sound business judgement, which includes taking appropriate risk.

Key Tactics

Develop Action Plans for Contracts Divisions that specify:

Assignment of Duties – what each Division needs to do to bring the Contracts Department strategy to life

Time Bound Milestones – key deliverables & dates demonstrating incremental success

Assign Accountability – maximize empowerment, recognize interdependency, stay firm on expectations

Mutual Key Performance Indicators – metrics that gauge whether or the team is staying on the strategic path

Leverage the distinct skills and responsibilities of Department Deputy and Technical Deputy:

Department Deputy – mentoring & coaching, recruiting & retaining top talent, strategizing professional development objectives, holding supervisors accountable, maintaining a culture of fair and equitable treatment.

Technical Deputy – create summary report illustrating contract spend across the command (inclusive of external contract vehicles), establish decision criteria and guidance for the use of various acquisition pathways and stackable solutions, assist in enhancing the use of flexible acquisition authorities, reduce perceived cultural barriers between technical line codes and contracts department that prevent optimal collaborative performance.

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Corporate Operations

As a testament to our people-centered culture, our Workforce has emerged from the pandemic with greater flexibility and a renewed passion to bring the full force of technology to the Nation's next fight. The Corporate Operations Team is at the heart and soul of every plan, capability, and decision our Command makes. We are a group of trusted professionals, committed to providing world-class talent, infrastructure, and business intelligence to our Strategic Missions, Expeditionary Warfare, and Electromagnetic Warfare Mission Areas. Everything we do is in pursuit of innovative solutions to meet our mission.

The mission of Corporate Operations is to partner with all NSWC Crane Divisions through a diverse and multidisciplinary support structure to provide a variety of resources to meet our collective mission.

Corporate Operations strives to lead NSWC Crane Division to:

- *Advance National Technical Leadership in Strategic Missions, Expeditionary Warfare, and Electromagnetic Warfare*
- *Become a recognized innovation leader*
- *Develop and broaden technical collaboration through regional, industrial, and academic agreements*
- *Create criticality of mass for our Command and Mission Areas*

Vision & Strategic Focus

The Corporate Operations Team brings indispensable business expertise while leveraging every resource available to bring capability, capacity, and the latest innovative solutions to our Command and Mission Areas. Our team is in constant pursuit of innovation solutions to achieve business excellence.

*The **MISSION** of the **Corporate Operations Team** is to deliver the*

***BEST CAPABILITIES** to our **Mission Areas** **WITHOUT FAIL**!*

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Corporate Operations

HUMAN RESOURCES

Committed to hiring, retaining, and developing first class engineering, scientific, technical, and business talent. Our people are the "FORCE BEHIND THE FLEET;" driving innovation and emerging technologies that will be critical for future challenges and opportunities.

INFRASTRUCTURE

Focused on maximizing existing footprint via Sustainment, Restoration, and Modernization (SRM), Improving Data Analytics, creating new footprint, and leveraging available authorities to complete facilities projects.

CORPORATE COMMUNICATIONS

Serves as the principal advisor to NSWC Crane Leadership for policy decisions, courses of action, and ramifications related to internal and external communication. Corporate Communications Division currently has three primary focuses: Planning and Protocol, Visual Information, and Communications.

INFORMATION TECHNOLOGY

Optimizes NSWC Crane's IT service portfolio through strengthening and expanding the existing people, processes, and IT capabilities. Ensures the appropriate modernization, upgrades, and new investments occur. Provides technology guidance, support, and consulting by building trust through transparency and accountability, confirming expectations, and delivering on commitments.

SECURITY

Committed to providing a safe and secure environment, that reduces the security risk, builds trust, and enhances the quality of life for our workforce. Security supports our mission with a high standard of customer service in an effective, responsive, and professional manner.

CORPORATE BUSINESS OFFICE

Provides the command with business information and visualizations, the management of critical "Headquarters" level programs, and operations support for essential processes. Analytics cell that leverages new technologies and incorporates enterprise level resources. The future data repository and advanced data analysis that will deliver rapid and accurate information for decision makers.

PROPERTY MANAGEMENT

Committed to providing innovative solutions for the oversight, administration, execution, acquisition and disposition of government property. Strategically targeted to improve operational readiness through the implementation of solutions that provide users with quicker access and greater visibility of material and equipment.

EQUAL OPPORTUNITY EMPLOYMENT

Makes sure everyone in the organization is seen and heard. Focusing on Special Emphasis Programs, Equal Employment Opportunity counseling, Diversity and Inclusion, Reasonable Accommodation, and Alternative Dispute Resolution.

BUSINESS & FINANCIAL MANAGEMENT

Provides responsive, balanced, and innovative solutions that enable immediate visibility into NSWC Crane's financial performance. Focuses on the business and financial management needs of its customers through analytical services. Provides insight into the customer's organizational and operational effectiveness and assist in the management of capital assets.

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NSWC Crane Summary

Over a decade ago, NSWC Crane established a well-defined strategy focused on modernization and the three specific Mission Areas of Strategic Missions, Expeditionary Warfare, and Electromagnetic Warfare. Focusing on the work our Mission Areas support. Crane leadership carefully developed strategic measures and targets that prioritized and aligned our workforce and workload efforts leading to deliberate growth in targeted areas. Crane continues to adapt through careful analysis, intentional positioning, and dedicated measures and targets to achieve strategic goals.

Workload

In 2022 RDT&E total expensed dollars surpassed both operations & maintenance and procurement, while nearly doubling RDT&E work years over the past several years. This increase in RDT&E workload is also directly related to NSWC Crane's strategic alignment with the DoD Critical Technology Areas including hypersonics, FutureG (5G), Trusted AI and Autonomy, Microelectronics, and many others. Finally, Crane has grown deliberate strategic partnerships and workload, both in total funding and work years.

Workforce

NSWC Crane achieved year over year improvements to our workforce's education level. These changes are a direct result of the strategic objective to increase the credentials of the workforce. From 2016 to 2022 NSWC Crane achieved a 29% increase in bachelor degrees, 30% increase in master degrees, and more than 100% increase in doctoral degrees.

Our workforce and workload efforts have resulted in NSWC Crane's participation in the In-house Laboratory Independent Research (ILIR) Program and as a Federal Laboratory. NSWC Crane continues to prove that careful strategic planning, and effective continuous assessment enables the Warfare Center to successfully adapt, learn, and innovate through the most challenging times.

Bottom Line

NSWC Crane will sustain the readiness of fielded combat capabilities, acquire products and services for future requirements, and will innovate and develop the solutions required to make the next generational leaps in technology and capability for our three Mission Areas.

"**STRATEGY** equals **EXECUTION**.

All the great ideas and visions in the world are worthless if they can' t be implemented rapidly and efficiently." *-Colin Powell*

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Acronyms & Abbreviations

AI/ML	Artificial Intelligence/Machine Learning
ALCM	Air-Launched Cruise Missile
APPS	Applications
C2	Command and Control
C5ISR	Command, Control, Computers, Communications, Cyber, Intelligence, Surveillance, and Reconnaissance
C2 (CAC2S)	Navy Common Air C2
CNO	Chief of Naval Operations
COMMONS ME	OSD Microelectronics Commons Program
CPS	Conventional Prompt Strike
DARPA	Defense Advanced Research Projects Agency
DEOCS	Defense Organizational Climate Survey
DIU	Defense Innovation Unit
DMCFT	Defense Microelectronics Cross-Functional Team
DoD	Department of Defense
DoN	Department of Navy
DSD	Defense Secretary of Defense
(EBRISS) Core (ECORE)	Enhanced Battlespace Reconnaissance, Intelligence, and Surveillance Software
EMOE	Electromagnetic Operating Environment
EMSO	Electromagnetic Spectrum Operations
EO	Electro-Optics
EW	Electromagnetic Warfare
FY	Fiscal Year
HWIL	Hardware-in-the-Loop
IBAS	Industrial Base Analysis and Sustainment
IBAS Microelectronics OSD	Industrial Base Analysis & Sustainment Program for Microelectronics
IBAS RESHAPE	Reshore Ecosystem for Secure Heterogeneous Advanced Packaging Electronics
IFAC	Industry Functional Advisory Committee
JAD C2	Joint All Domain Command and Control
JCS	Joint Chiefs of Staff
JHTO SEFA	Joint Hypersonics Transition Office Systems Engineering Field Activity
JFAC	Joint Federated Assurance Center
LE2	TRIDENT D5 Missile Life Extension 2 Program
MACH-TB	Multi-Service Advanced Capability Hypersonic Test Bed
MCTO	Mission Capabilities Technology Office
ME	Mission Engineering
MIDO	Mission Integration Distributed Operations
MILCON	Military Construction

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Acronyms & Abbreviations

NAVSEA	Naval Sea Systems Command
NDS	National Defense Strategy
NRDE	Naval Research & Development Establishment
NSS	National Security Strategy
NSWC	Naval Surface Warfare Center
OSD	Office of Secretary of Defense
OUSD	Office of the Under Secretary of Defense
POR	Programs of Record
PRC	People's Republic of China
RAMP-C	Rapid Assured Microelectronics Prototypes – Commercial Project
RDT&E	Research Development Test and Evaluation
RH MICROELECTRONICS	Radiation-Hardened Microelectronics
RIMEC	Rapid Integration and Mission Experimentation Center
SOTA	State-of-the-Art
SpM	Specialized Munitions
SSP	Strategic Systems Programs
SWESD	Special Warfare and Expeditionary Systems Department
SWD	Spectrum Warfare Department
T&E	Test and Evaluation
T&AM RAMP-C	Trusted & Assured Microelectronics Rapid Assured Microelectronics Prototypes-Commercial Program
USG	United States Government
USSTRATCOM	United States Strategic Command
UXS-CUXS	Unmanned Systems – Counter-Unmanned Systems
WPAFB/AFRL	Wright-Patterson Air Force Base / Air Force Research Laboratory

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