

Sea Power 21

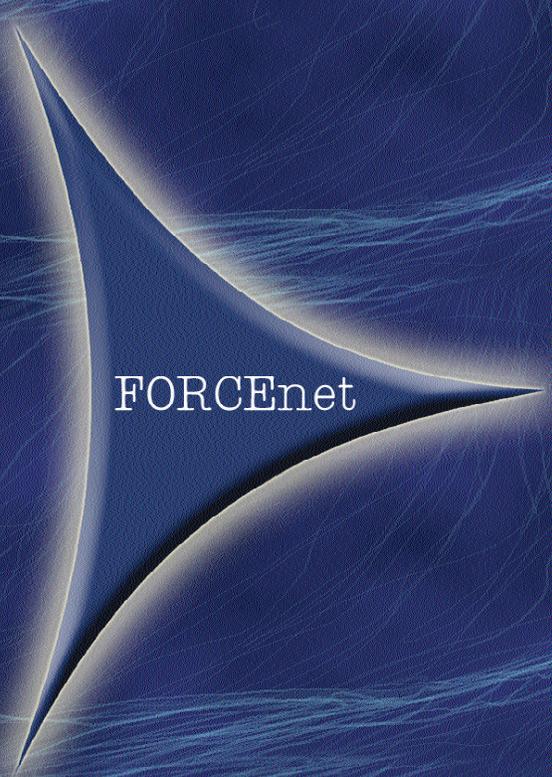
Projecting Decisive Joint Capabilities

Sea Shield

FORCEnet

Sea Strike

Sea Basing



How the U.S. Navy of the 21st century will or



organize, integrate, and transform.



“Sea Power 21” is our vision of tomorrow’s Navy: a globally distributed force that leverages revolutionary information superiority and networked capabilities to deliver unprecedented offensive power, defensive assurance, and operational independence to joint force commanders.

This vision commits us to change. It begins the process of translating theory into practice for a wide range of advanced concepts and technologies that will increase warfighting effectiveness and strengthen the joint team as we operate across a unified battle space of sea, air, land, space, and cyberspace.

The decisive capabilities of “Sea Power 21” will continue the journey that has brought us from the blue-water focus of the Maritime Strategy (1986), through the littoral emphasis of “...From the Sea” (1992) and “Forward...from the Sea” (1994), to a broadened strategy in which naval forces are fully integrated into global joint operations against regional and transnational enemies. By doing so, “Sea Power 21” will provide greater power and protection to our nation—projecting enhanced security into the dangerous decades ahead.

Vern Clark
Chief of Naval Operations

Sea Power 21

Projecting Decisive Joint Capabilities

Sea-based operations use revolutionary information superiority and dispersed, networked force capabilities to deliver unprecedented offensive power, defensive assurance, and operational independence to Joint Force Commanders.

By Admiral Vern Clark, U.S. Navy

The 21st century sets the stage for tremendous increases in naval precision, reach, and connectivity, ushering in a new era of joint operational effectiveness. Innovative concepts and technologies will integrate sea, land, air, space, and cyberspace to a greater extent than ever before. In this unified battlespace, the sea will provide a vast maneuver area from which to project direct and decisive power around the globe.

Future naval operations will use revolutionary information superiority and dispersed, networked force capabilities to deliver unprecedented offensive power, defensive assurance, and operational independence to Joint Force Commanders. Our Navy and its partners will dominate the continuum of warfare from the maritime domain—deterring forward in peacetime, responding to crises, and fighting and winning wars.

By doing so, we will continue the evolution of U.S. naval power from the blue-water, war-at-sea focus of the “Maritime Strategy” (1986), through the littoral emphasis of “. . . From the Sea” (1992) and “Forward . . . from the Sea” (1994), to a broadened strategy in which naval forces are fully integrated into global joint operations against regional and transnational dangers.

To realize the opportunities and navigate the challenges ahead, we must have a clear vision of how our Navy will organize, integrate, and transform. “Sea Power 21” is that vision. It will align our efforts, accelerate our progress, and realize the potential of our people. “Sea Power 21” will guide our Navy as we defend our nation and defeat our enemies in the uncertain century before us.

Transformation for a Violent Era

The events of 11 September 2001 tragically illustrated that the promise of peace and security in the new century is fraught with profound dangers: nations poised for conflict in key regions, widely dispersed and well-funded terrorist and criminal organizations, and failed states that deliver only despair to their people.

These dangers will produce frequent crises, often with little warning of timing, size, location, or intensity. Associated threats will be varied and deadly, including weapons of mass destruction, conventional warfare, and widespread terrorism. Future enemies will attempt to deny us access to critical areas of the world, threaten vital friends and interests overseas, and even try to conduct further attacks against the American homeland. These threats will pose increasingly complex challenges to national security and future warfighting.

Previous strategies addressed regional challenges. Today, we must think more broadly. Enhancing security in this dynamic environment requires us to expand our strategic focus to include both evolving regional challenges and transnational threats. This combination of traditional and emerging dangers means increased risk to our nation. To counter that risk, our Navy must expand its striking power, achieve information dominance, and develop transformational ways of fulfilling our enduring missions of sea control, power projection, strategic deterrence, strategic sealift, and forward presence.

Three fundamental concepts lie at the heart of the Navy’s continued operational effectiveness: Sea Strike, Sea Shield, and Sea Basing. Sea Strike is the ability to project precise and persistent offensive power from the sea; Sea Shield extends defensive assurance throughout the world; and



- **Sea Strike**—Projecting Precise and Persistent Offensive Power
- **Sea Shield**—Projecting Global Defensive Assurance
- **Sea Basing**—Projecting Joint Operational Independence

SEA STRIKE IMPACT

- Amplified, effects-based striking power
- Increased precision attack and information operations
- Enhanced warfighting contribution of Marines and Special Forces
- “24 / 7” offensive operations
- Seamless integration with joint strike packages

SEA STRIKE CAPABILITIES

- Persistent intelligence, surveillance, and reconnaissance
- Time-sensitive strike
- Electronic warfare / information operations
- Ship-to-objective maneuver
- Covert strike

FUTURE SEA STRIKE TECHNOLOGIES

- Autonomous, organic, long-dwell sensors
- Integrated national, theater, and force sensors
- Knowledge-enhancement systems
- Unmanned combat vehicles
- Hypersonic missiles
- Electro-magnetic rail guns
- Hyper-spectral imaging

SEA STRIKE: ACTION STEPS

- Accelerate information dominance via ForceNet
- Develop, acquire, and integrate systems to increase combat reach, stealth, and lethality
- Distribute offensive striking capability throughout the entire force
- Deploy sea-based, long-dwell, manned and unmanned sensors
- Develop information operations as a major warfare area
- Synergize with Marine Corps transformation efforts
- Partner with the other services to accelerate Navy transformation

Sea Basing enhances operational independence and support for the joint force. These concepts build upon the solid foundation of the Navy-Marine Corps team, leverage U.S. asymmetric advantages, and strengthen joint combat effectiveness.

We often cite asymmetric challenges when referring to enemy threats, virtually assuming such advantages belong only to our adversaries. “Sea Power 21” is built on a foundation of American asymmetric strengths that are powerful and uniquely ours. Among others, these include the expanding power of computing, systems integration, a thriving industrial base, and the extraordinary capabilities of our people, whose innovative nature and desire to excel give us our greatest competitive advantage.

Sea Strike, Sea Shield, and Sea Basing will be enabled by ForceNet, an overarching effort to integrate warriors, sensors, networks, command and control, platforms, and weapons into a fully netted, combat force. We have been talking about network-centric warfare for a decade, and ForceNet will be the Navy’s plan to make it an operational reality. Supported by ForceNet, Sea Strike, Sea Shield, and Sea Basing capabilities will be deployed by way of a Global Concept of Operations that widely distributes the firepower of the fleet, strengthens deterrence, improves crisis response, and positions us to win decisively in war.

Sea Strike: Projecting Precise and Persistent Offensive Power

Projecting decisive combat power has been critical to every commander who ever went into battle, and this will remain true in decades ahead. Sea Strike operations are how the 21st-century Navy will exert direct, decisive, and sustained influence in joint campaigns. They will involve the dynamic application of persistent intelligence, surveillance, and reconnaissance; time-sensitive strike; ship-to-objective maneuver; information operations; and covert strike to deliver devastating power and accuracy in future campaigns.

Information gathering and management are at the heart of this revolution in striking power. Networked, long-dwell naval sensors will be integrated with national and joint systems to penetrate all types of cover and weather, assembling vast amounts of information. Data provided by Navy assets—manned and unmanned—will be vital to establishing a comprehensive understanding of enemy military, economic, and political vulnerabilities. Rapid planning processes will then use this knowledge to tailor joint strike packages that deliver calibrated effects at precise times and places.

Knowledge dominance provided by persistent intelligence, surveillance, and reconnaissance will be converted into action by a full array of Sea Strike options—next-generation missiles capable of in-flight targeting, aircraft with stand-off precision weapons, extended-range naval gunfire, information operations, stealthy submarines, unmanned combat vehicles, and Marines and SEALs on the ground. Sovereign naval forces will exploit their strategic flexibility, operational independence, and speed of command to conduct sustained operations 24 hours per day, 7 days per week, 365 days per year.

Information superiority and flexible strike options will result in time-sensitive targeting with far greater speed and accuracy. Military operations will become more complicated as advanced intelligence, surveillance, and reconnaissance products proliferate. Expanded situational awareness will put massed forces at risk, for both friends and adversaries. This will compress timelines and prompt greater use of dispersed, low-visibility forces. Countering such forces will demand speed, agility, and streamlined

information processing tied to precision attack. Sea Strike will meet that challenge.

The importance of information operations will grow in the years ahead as high-technology weapons and systems become more widely available. Information operations will mature into a major warfare area, to include electronic warfare, psychological operations, computer network attack, computer network defense, operations security, and military deception. Information operations will play a key role in controlling crisis escalation and preparing the battlefield for subsequent attack. This U.S. asymmetry will be a critical part of Sea Strike.

When we cannot achieve operational objectives from over the horizon, our Navy-Marine Corps team moves ashore. Using advanced vertical and horizontal envelopment techniques, fully netted ground forces will maneuver throughout the battlespace, employing speed and precision to generate combat power. Supported by sea bases, we will exploit superior situational awareness and coordinated fires to create shock, confusion, and chaos in enemy ranks. Information superiority and networking will act as force multipliers, allowing agile ground units to produce the warfighting impact traditionally provided by far heavier forces, bringing expeditionary warfare to a new level of lethality and combat effectiveness.

Sea Strike capabilities will provide Joint Force Commanders with a potent mix of weapons, ranging from long-range precision strike, to covert land-attack in anti-access environments, to the swift insertion of ground forces. Information superiority will empower us to dominate timelines, foreclose adversary options, and deny enemy sanctuary. Sea Strike operations will be fully integrated into joint campaigns, adding the unique independence, responsiveness, and on-scene endurance of naval forces to joint strike efforts. Combined sea-based and land-based striking power will produce devastating effects against enemy strategic, operational, and tactical pressure points—resulting in rapid, decisive operations and the early termination of conflict.

Sea Shield: Projecting Global Defensive Assurance

Traditionally, naval defense has protected the unit, the fleet, and the sea lines of communication. Tomorrow's Navy will do much more. Sea Shield takes us beyond unit and task-force defense to provide the nation with sea-based theater and strategic defense.

Sea Shield will protect our national interests with layered global defensive power based on control of the seas, forward presence, and networked intelligence. It will use these strengths to enhance homeland defense, assure access to contested littorals, and project defensive power deep inland. As with Sea Strike, the foundation of these integrated operations will be information superiority, total force networking, and an agile and flexible sea-based force.

Homeland defense will be accomplished by a national effort that integrates forward-deployed naval forces with the other military services, civil authorities, and intelligence and law-enforcement agencies. Working with the newly established Northern Command, we will identify, track, and intercept dangers long before they threaten our homeland. These operations will extend the security of the United States far seaward, taking advantage of the time and space afforded by naval forces to shield our nation from impending threats.

Maritime patrol aircraft, ships, submarines, and unmanned vehicles will provide comprehensive situational awareness to cue intercepting units. When sent to investigate a suspicious vessel, boarding parties will use advanced equipment to detect the presence of contraband by visual, chem-

SEA SHIELD IMPACT

- Projected defense for joint forces and allies ashore
- Sustained access for maritime trade, coalition building, and military operations
- Extended homeland defense via forward presence and networked intelligence
- Enhanced international stability, security, and engagement

SEA SHIELD CAPABILITIES

- Homeland defense
- Sea / littoral superiority
- Theater air missile defense
- Force entry enabling

FUTURE SEA SHIELD TECHNOLOGIES

- Interagency intelligence and communications reach-back systems
- Organic mine countermeasures
- Multi-sensor cargo inspection equipment
- Advanced hull forms and modular mission payloads
- Directed-energy weapons
- Autonomous unmanned vehicles
- Common undersea picture
- Single integrated air picture
- Distributed weapons coordination
- Theater missile defense

SEA SHIELD: ACTION STEPS

- Expand combat reach
- Deploy theater missile defense as soon as possible
- Create common operational pictures for air, surface, and subsurface forces
- Accelerate the development of sea-based unmanned vehicles to operate in every environment
- Invest in self-defense capabilities to ensure sea superiority

SEA BASING IMPACT

- Pre-positioned warfighting capabilities for immediate employment
- Enhanced joint support from a fully netted, dispersed naval force
- Strengthened international coalition building
- Increased joint force security and operational agility
- Minimized operational reliance on shore infrastructure

SEA BASING CAPABILITIES

- Enhanced afloat positioning of joint assets
 - Offensive and defensive power projection
 - Command and control
 - Integrated joint logistics
- Accelerated deployment and employment timelines

FUTURE SEA BASING TECHNOLOGIES

- Enhanced sea-based joint command and control
- Heavy equipment transfer capabilities
- Intra-theater high-speed sealift
- Improved vertical delivery methods
- Integrated joint logistics
- Rotational crewing infrastructure
- International data-sharing networks

SEA BASING: ACTION STEPS

- Exploit the advantages of sea-based forces wherever possible
- Develop technologies to enhance on-station time and minimize maintenance requirements
- Experiment with innovative employment concepts and platforms
- Challenge every assumption that results in shore basing of Navy capabilities

ical, and radiological methods. Forward-deployed naval forces will also protect the homeland by engaging inbound ballistic missiles in the boost or mid-course phase, when they are most vulnerable to interception. In addition, our nuclear-armed Trident ballistic missile submarine force will remain on silent patrol around the world, providing the ultimate measure of strategic deterrence. These highly survivable submarines are uniquely powerful assets for deterring aggressors who would contemplate using weapons of mass destruction.

Achieving battle-space superiority in forward theaters is central to the Sea Shield concept, especially as enemy area-denial efforts become more capable. In times of rising tension, pre-positioned naval units will sustain access for friendly forces and maritime trade by employing evolving expeditionary sensor grids and advanced deployable systems to locate and track enemy threats. Speed will be an ally as linked sensors, high-speed platforms, and improved kill vehicles consolidate area control, including the location and neutralization of mines via state-of-the-art technology on dedicated mine warfare platforms and battle group combatants. Mission-reconfigurable Littoral Combat Ships, manned and unmanned aviation assets, and submarines with unmanned underwater vehicles will gain and maintain the operational advantage, while sea-based aircraft and missiles deliver air dominance. The result will be combat-ready forces that are prepared to “climb into the ring” to achieve and sustain access before and during crises.

Perhaps the most dramatic advancement promised by Sea Shield will be the ability of naval forces to project defensive power deep overland, assuring friends and allies while protecting joint forces ashore. A next-generation long-range surface-to-air Standard Missile, modernized E-2 Hawkeye radar, and Cooperative Engagement Capability will combine to extend sea-based cruise missile defense far inland. This will reinforce the impact of sea-based ballistic missile defense and greatly expand the coverage of naval area defense. These capabilities represent a broadened mission for our Navy that will lessen the defensive burden on land forces and increase sea-based influence over operations ashore.

The importance of Sea Shield to our nation has never been greater, as the proliferation of advanced weapons and asymmetric attack techniques places an increasing premium on the value of deterrence and battlespace dominance. Sea Shield capabilities, deployed forward, will help dissuade aggressors before the onset of conflict. In addition, Sea Shield will complement Sea Strike efforts by freeing aviation forces previously devoted to force defense, allowing them to concentrate on strike missions and generate far greater offensive firepower from the fleet. In sum, Sea Shield will enhance crisis control, protect allies and joint forces ashore, and set the stage for combat victory—providing a powerful new tool for joint combatant commanders in this dangerous age.

Sea Basing: Projecting Joint Operational Independence

Operational maneuver is now, and always has been, fundamental to military success. As we look to the future, the extended reach of networked weapons and sensors will tremendously increase the impact of naval forces in joint campaigns. We will do this by exploiting the largest maneuver area on the face of the earth: the sea.

Sea Basing serves as the foundation from which offensive and defensive fires are projected—making Sea Strike and Sea Shield realities. As enemy access to weapons of mass destruction grows, and the availability of overseas bases declines, it is compelling both militarily and politically to reduce the vulnerability of U.S. forces through expanded use of secure,

mobile, networked sea bases. Sea Basing capabilities will include providing Joint Force Commanders with global command and control and extending integrated logistical support to other services. Afloat positioning of these capabilities strengthens force protection and frees airlift-sealift to support missions ashore.

Netted and dispersed sea bases will consist of numerous platforms, including nuclear-powered aircraft carriers, multi-mission destroyers, submarines with Special Forces, and maritime pre-positioned ships, providing greatly expanded power to joint operations. Sea-based platforms will also enhance coalition-building efforts, sharing their information and combat effectiveness with other nations in times of crisis.

Sea Basing accelerates expeditionary deployment and employment timelines by pre-positioning vital equipment and supplies in-theater, preparing the United States to take swift and decisive action during crises. We intend to develop these capabilities to the fullest extent. Strategic sealift will be central to this effort. It remains a primary mission of the U.S. Navy and will be critical during any large conflict fought ashore. Moreover, we will build pre-positioned ships with at-sea-accessible cargo, awaiting closure of troops by way of high-speed sealift and airlift. Joint operational flexibility will be greatly enhanced by employing pre-positioned shipping that does not have to enter port to offload.

Twenty-first-century operations will require greater efficiencies through the development of joint logistical support. This will include the provisioning of joint supplies and common ammunition, and the completion of critical repairs from afloat platforms. Providing these capabilities to on-scene commanders will significantly increase operational effectiveness and constitute a valuable addition to strategic basing support provided by friends and allies around the world.

Beyond its operational impact, the Sea Basing concept provides a valuable tool for prioritizing naval programs. Sea-based forces enjoy advantages of security, immediate employability, and operational independence. All naval programs should foster these attributes to the greatest extent feasible. This means transforming shore-based capabilities to sea-based systems whenever practical, and improving the reach, persistence, and sustainability of systems that are already afloat.

ForceNet: Enabling 21st Century Warfare

ForceNet is the “glue” that binds together Sea Strike, Sea Shield, and Sea Basing. It is the operational construct and architectural framework for naval warfare in the information age, integrating warriors, sensors, command and control, platforms, and weapons into a networked, distributed combat force.

ForceNet will provide the architecture to increase substantially combat capabilities through aligned and integrated systems, functions, and missions. It will transform situational awareness, accelerate speed of decision, and allow us to greatly distribute combat power. ForceNet will harness information for knowledge-based combat operations and increase force survivability. It will also provide real-time enhanced collaborative planning among joint and coalition partners.

Using a total system approach, ForceNet will shape the development of integrated capabilities. These include maritime information processing and command and control components that are fully interoperable with joint systems; intelligence, surveillance, and reconnaissance fusion capabilities to support rapid targeting and maneuver; open systems architecture for broad and affordable interoperability; and safeguards to ensure networks are reliable and survivable. ForceNet also emphasizes the human factor in

FORCENET IMPACT

- Connected warriors, sensors, networks, command and control, platforms, and weapons
- Accelerated speed and accuracy of decision
- Integrated knowledge to dominate the battlespace

FORCENET CAPABILITIES

- Expeditionary, multi-tiered, sensor and weapons grids
- Distributed, collaborative command and control
- Dynamic, multi-path and survivable networks
- Adaptive / automated decision aids
- Human-centric integration

IMPACT OF GLOBAL CONCEPT OF OPERATIONS

- Widely distributed, fully netted striking power to support joint operations
- Increased presence, enhanced flexibility, and improved responsiveness
- Task-organized to deter forward, respond to crises, and win decisively

the development of advanced technologies. This philosophy acknowledges that the warrior is a premier element of all operational systems.

Today, ForceNet is moving from concept to reality. Initial efforts will focus on integrating existing networks, sensors, and command and control systems. In the years ahead, it will enable the naval service to employ a fully netted force, engage with distributed combat power, and command with increased awareness and speed as an integral part of the joint team.

Global Concept of Operations

“Sea Power 21” will be implemented by a Global Concept of Operations that will provide our nation with widely dispersed combat power from platforms possessing unprecedented warfighting capabilities. The global environment and our defense strategy call for a military with the ability to respond swiftly to a broad range of scenarios and defend the vital interests of the United States. We must dissuade, deter, and defeat both regional adversaries and transnational threats.

The Global Concept of Operations will disperse combat striking power by creating additional independent operational groups capable of responding simultaneously around the world. This increase of combat power is possible because technological advancements are dramatically transforming the capability of our ships, submarines, and aircraft to act as power projection forces, netted together for expanded warfighting effect.

The results will be profound. Naval capability packages will be readily assembled from forward-deployed forces. These forces will be tailored to meet the mission needs of the Joint Force Commander, complementing other available joint assets. They will be sized to the magnitude of the task at hand. As a result, our Navy will be able to respond simultaneously to a broad continuum of contingencies and conflict, anywhere around the world. The Global Concept of Operations will employ a flexible force structure that includes:

% Carrier Strike Groups that provide the full range of operational capabilities. Carrier Strike Groups will remain the core of our Navy’s warfighting strength. No other force package will come close to matching their sustained power projection ability, extended situational awareness, and combat survivability.

% Expeditionary Strike Groups consisting of amphibious ready groups augmented with strike-capable surface warships and submarines. These groups will prosecute Sea Strike missions in lesser-threat environments. As our operational concepts evolve, and new systems like Joint Strike Fighter deliver to the fleet, it will be advantageous to maximize this increased aviation capability. New platforms being developed for Expeditionary Strike Groups should be designed to realize this warfighting potential.

% Missile-defense Surface Action Groups will increase international stability by providing security to allies and joint forces ashore.

% Specially modified Trident submarines will provide covert striking power from cruise missiles and the insertion of Special Operations Forces.

% A modern, enhanced-capability Combat Logistics Force will sustain the widely dispersed fleet.

The Global Concept of Operations requires a fleet of approximately 375 ships that will increase our striking power from today’s 12 carrier battle groups, to 12 Carrier Strike Groups, 12 Expeditionary Strike Groups, and multiple missile-defense Surface Action Groups and guided-missile submarines. These groups will operate independently around the world to counter transnational threats and they will join together to form Expedi-

tionary Strike Forces—the “gold standard” of naval power—when engaged in regional conflict.

This dispersed, netted, and operationally agile fleet, as part of the joint force, will deliver the combat power needed to sustain homeland defense, provide forward deterrence in four theaters, swiftly defeat two aggressors at the same time, and deliver decisive victory in one of those conflicts. Employment of sovereign sea-based forces projecting offensive and defensive power across a unified battlespace will be central to every war plan. Equally important, this 21st-century fleet will be positioned to immediately counter unexpected threats arising from any corner of the world.

The Global Concept of Operations will increase striking power, enhance flexibility, and improve responsiveness. It will fulfill our broadened strategy by sustaining the on-scene capabilities needed to fight and win.

Achieving Our Vision

We are developing Sea Strike, Sea Shield, and Sea Basing through a supporting triad of organizational processes: Sea Trial, Sea Warrior, and Sea Enterprise—initiatives that will align and accelerate the development of enhanced warfighting capabilities for the fleet.

Sea Trial: The Process of Innovation

Our enemies are dedicated to finding new and effective methods of attacking us. They will not stand still. To outpace our adversaries, we must implement a continual process of rapid concept and technology development that will deliver enhanced capabilities to our Sailors as swiftly as possible.

The Navy starts with the fleet, and Sea Trial will be fleet-led. The Commander, U.S. Fleet Forces Command, will serve as Executive Agent for Sea Trial, with Second and Third Fleet commanders sponsoring the development of Sea Strike, Sea Shield, and Sea Basing capabilities. These commanders will reach throughout the military and beyond to coordinate concept and technology development in support of future warfighting effectiveness. The Systems Commands and Program Executive Offices will be integral partners in this effort, bringing concepts to reality through technology innovation and the application of sound business principles.

The Navy Warfare Development Command, reporting directly to the Commander, U.S. Fleet Forces Command, will coordinate Sea Trial. Working closely with the fleets, technology development centers, and academic resources, the Navy Warfare Development Command will integrate wargaming, experimentation, and exercises to speed development of new concepts and technologies. They will do this by identifying candidates with the greatest potential to provide dramatic increases in warfighting capability. Embracing spiral development, these technologies and concepts will then be matured through targeted investment and guided through a process of rapid prototyping and fleet experimentation.

The Sea Trial process will develop enhanced warfighting capabilities for the fleet by more effectively integrating the thousands of talented and energetic experts, military and civilian, who serve throughout our Navy. Working together, we will fulfill the promise of “Sea Power 21.”

Sea Warrior: Investing in Sailors

The Sea Warrior program implements our Navy’s commitment to the growth and development of our people. It will serve as the foundation of

SEA TRIAL IMPACT

- Fleet-led, enduring process of innovation
- Accelerated concept and technology development
- Enhanced headquarters / fleet alignment

SEA WARRIOR IMPACT

- Continual professional growth and development
- Improved selection and classification
- Interactive, web-based, incentivized detailing
- Networked, high-impact training

SEA ENTERPRISE IMPACT

- Greater process efficiencies
- Divestment of non-core functions
- Organizational streamlining
- Enhanced investment in warfighting capability



warfighting effectiveness by ensuring the right skills are in the right place at the right time. Led by the Chief of Naval Personnel and Commander, Naval Education and Training Command, Sea Warrior will develop naval professionals who are highly skilled, powerfully motivated, and optimally employed for mission success.

Traditionally, our ships have relied on large crews to accomplish their missions. Today, our all-volunteer service is developing new combat capabilities and platforms that feature dramatic advancements in technology and reductions in crew size. The crews of modern warships are streamlined teams of operational, engineering, and information technology experts who collectively operate some of the most complex systems in the world. As optimal manning policies and new platforms reduce crew size further, we will increasingly need Sailors who are highly educated and expertly trained.

Introducing our people to a life-long continuum of learning is key to achieving our vision. In July 2001, we established Task Force EXCEL (Excellence through our Commitment to Education and Learning) to begin a revolution in training that complements the revolution in technologies, systems, and platforms for tomorrow's fleet. We are dedicated to improving our Sailors' professional and personal development, leadership, military education, and performance. Task Force EXCEL will apply information-age methods to accelerate learning and improve proficiency, including advanced trainers and simulators, tailored skills training programs, improved mentoring techniques, and more effective performance measurement and counseling tools. This growth and development focus will revolutionize the way we train.

Another initiative central to Sea Warrior is Project SAIL (Sailor Advocacy through Interactive Leadership). Project SAIL is moving the Navy toward an interactive and incentivized distribution system that includes guaranteed schools for high-performing non-rated personnel, team detailing, Internet job listings, an information call center, and expanded detailer outreach. These actions will put choice in the process for both gaining commands and Sailors, and it will empower our people to make more informed career decisions.

Our goal is to create a Navy in which all Sailors—active and reserve, afloat and ashore—are optimally assessed, trained, and assigned so that they can contribute their fullest to mission accomplishment.

Sea Enterprise: *Resourcing Tomorrow's Fleet*

Among the critical challenges that we face today are finding and allocating resources to recapitalize the Navy. We must replace Cold War-era systems with significantly more capable sensors, networks, weapons, and platforms if we are to increase our ability to deter and defeat enemies.

Sea Enterprise, led by the Vice Chief of Naval Operations, is key to this effort. Involving the Navy Headquarters, the Systems Commands, and the Fleet, it seeks to improve organizational alignment, refine requirements, and reinvest savings to buy the platforms and systems needed to transform our Navy. Drawing on lessons from the business revolution, Sea Enterprise will reduce overhead, streamline processes, substitute technology for manpower, and create incentives for positive change. Legacy systems and platforms no longer integral to mission accomplishment will be retired, and we will make our Navy's business processes more efficient to achieve enhanced warfighting effectiveness in the most cost-effective manner.

Our Navy values operational excellence as its highest priority, and the vast majority of our training is devoted to sharpening tactical skills. However, it is also important that our leaders understand sound business prac-



FROM TOP: U.S. NAVY / U.S. NAVY (DCN SMITH) / DOD; REYNALD RAMON / U.S. NAVY (CASEY R. HUTCHENS)

tices so that we can provide the greatest return on the taxpayer's investment. To meet this need, we are creating educational opportunities to teach our leaders about executive business management, finance, and information technology. For example, the Center for Executive Education at the Naval Postgraduate School brings together rising flag officers and private industry decision-makers to discuss emerging business practices. We must also extend this understanding to the deckplates, so that our future leaders gain experience in a culture of strengthened productivity and continually measured effectiveness.

Increased inter-service integration also holds great promise for achieving efficiencies. For example, the Navy and Marine Corps tactical aviation integration plan will save billions of dollars for both services, enhance our interoperability, and more fully integrate our people. Whether it is the U.S. Coast Guard's Deepwater Integrated Systems Program, new munitions being developed with the U.S. Air Force, joint experiments with the U.S. Army on high-speed vessels, or a new combined intelligence structure with the U.S. Marine Corps, we will share technologies and systems whenever possible. Such efforts must not just continue; they must expand. Savings captured by Sea Enterprise will play a critical role in the Navy's transformation into a 21st-century force that delivers what truly matters: increased combat capability.

Our Way Ahead

The 21st century is clearly characterized by dangerous uncertainty and conflict. In this unpredictable environment, military forces will be required to defeat a growing range of conventional and asymmetric threats.

"Sea Power 21" is our vision to align, organize, integrate, and transform our Navy to meet the challenges that lie ahead. It requires us to continually and aggressively reach. It is global in scope, fully joint in execution, and dedicated to transformation. It reinforces and expands concepts being pursued by the other services—long-range strike; global intelligence, surveillance, and reconnaissance; expeditionary maneuver warfare; and light, agile ground forces—to generate maximum combat power from the joint team.

"Sea Power 21" will employ current capabilities in new ways, introduce innovative capabilities as quickly as possible, and achieve unprecedented maritime power. Decisive warfighting capabilities from the sea will be built around:

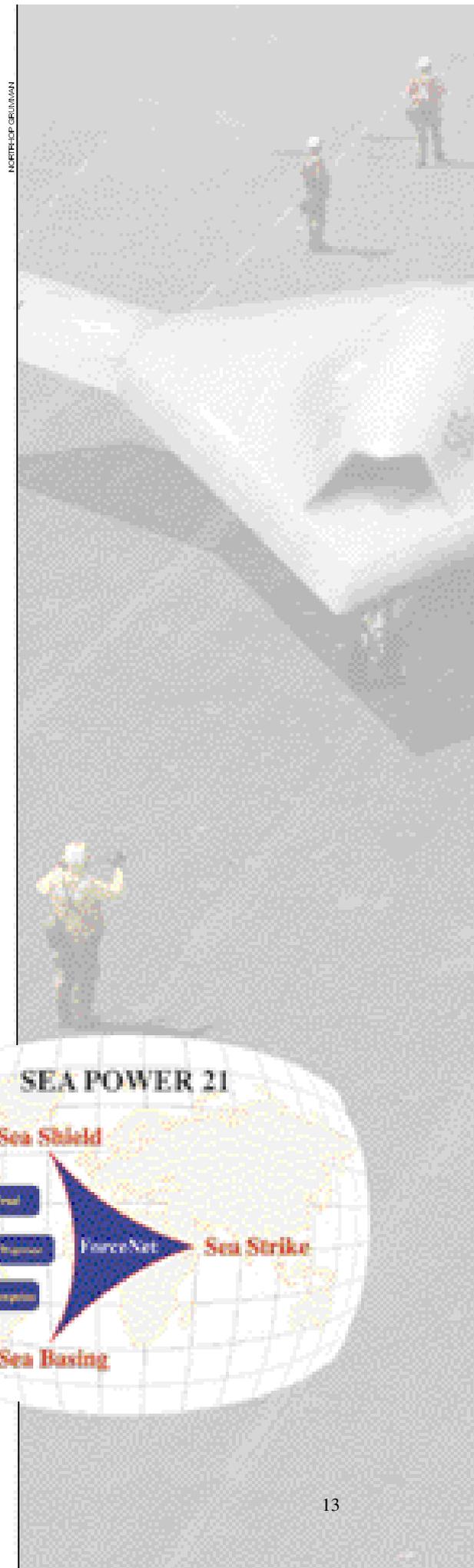
% Sea Strike—expanded power projection that employs networked sensors, combat systems, and warriors to amplify the offensive impact of sea-based forces;

% Sea Shield—global defensive assurance produced by extended homeland defense, sustained access to littorals, and the projection of defensive power deep overland;

% Sea Basing—enhanced operational independence and support for joint forces provided by networked, mobile, and secure sovereign platforms operating in the maritime domain.

The powerful warfighting capabilities of "Sea Power 21" will ensure our joint force dominates the unified battlespace of the 21st century, strengthening America's ability to assure friends, deter adversaries, and triumph over enemies—anywhere, anytime.

Admiral Clark is the Chief of Naval Operations.



Sea Shield

Projecting Global Defensive Assurance

By Vice Admiral Mike Bucchi, U.S. Navy, and Vice Admiral Mike Mullen, U.S. Navy

Sea Shield will project defense beyond what any navy has been able to accomplish—i.e., deep inland against cruise and ballistic missiles. This Standard Missile III fired from the USS *Lake Erie* (CG-70) successfully intercepted an Aries ballistic missile target earlier this year.



In his October 2002 *Proceedings* article “Sea Power 21,” the Chief of Naval Operations prescribes a broadened naval strategy that will fully integrate U.S. naval forces into joint operations against regional and transnational dangers. He rededicates the Navy to a global focus that will dissuade, deter, and defeat a growing array of potential threats, including weapons of mass destruction, conventional warfare, and widely dispersed and well-funded terrorism.

Three interwoven operational concepts lie at the heart of his vision: Sea Strike, Sea Shield, and Sea Basing. Sea Strike, the projection of precise and persistent offensive power, will punish aggressors swiftly and decisively. Sea Shield will provide a layered defense to protect the homeland, sustain access to contested littorals, and project a defensive umbrella over coalition partners and joint forces ashore in distant theaters. Sea Basing of joint warfighting capabilities by way of a widely distributed and netted fleet will increase the operational independence of U.S. forces and serve as the foundation for the projection of offensive and defensive fires—making Sea Strike and Sea Shield a reality.

Sea Shield embraces emerging technologies and concepts that for the first time have the potential to extend naval defensive firepower beyond the task force. Sea Shield encompasses some things great navies always have tried to do—sea control off hostile coasts and maritime defense of the homeland, for example—and some that no navy has ever done, such as projecting defense deep inland against cruise and ballistic missiles. But whether new missions or traditional ones done in new ways, these enhanced warfighting capabilities will play an increasingly central role in U.S. national security in the decades ahead.

U.S. national strategy is founded on our advantages of forward-deployed forces, sea and air supremacy, and information superiority, allowing us to fight and win thousands of miles from our shores. Our enemies know this, and they are working to circumvent our strengths by denying our forces access to their regions and by developing asymmetric strategies to conduct attacks on our soil.

Future adversaries will strive to hold our deployments at risk by interdicting air and sea lines of communication, rendering debarkation points unusable, and delaying or denying political access. By projecting defensive power, Sea Shield will defeat these efforts and enable the U.S. Navy to “climb into the ring” to conduct Sea Strike and Sea Basing in forward theaters of operation, setting the stage for combat victory.

% Theater Air and Missile Defense. Effective theater air and missile defense is critical to achieving the vision for Sea Shield. This is a challenging task, as countering emerging cruise and ballistic missiles will require advanced network-centric operations and high levels of weapon-system technology, seamlessly fused to produce a single integrated air picture available to all elements of the force. Air defense in the 21st century will require missiles that reach ranges, altitudes, and speeds never before seen. Networks will pass vast volumes of precise data to achieve near-instantaneous speed of command, ensuring targets are destroyed in the fleeting moments when successful engagements are possible.

Experts in Navy laboratories and private industry are hard at work on the next generation of theater air and missile defense. Sensors will include upgrades to the Aegis weapon system and the DD(X) destroyer’s volume search radar; the Radar Modernization Program (RMP) for the E-2C Hawkeye aircraft; and the advanced electronically scanned array (AESA) radar for the F/A-18E/F and Joint Strike Fighter. Networks will encompass the cooperative engagement capability (CEC) and Link-16 systems. And weapons will be the extended range, over-the-horizon, and ballistic missile defense versions of the Standard missile, and new models of the advanced medium-range air-to-air missile (AMRAAM).

Capability advances in these programs are impressive. The AESA radar, for example, will extend air detection ranges by a factor of two to three over current fighter radars. When employed together, these transformational capabilities will produce a system referred to as Navy Integrated Fire Control-Counterair (NIFC-CA). It will emerge over the next decade as each component is developed, and it will deliver fully networked, distributed, long-range defensive firepower to keep our Navy well ahead of anticipated aerospace threats. It will ensure future battlespace dominance, allowing aircraft to shift from defensive combat air patrols to attack missions, amplifying the striking power of the fleet.

Our Navy already is fielding CEC on deploying battle groups, and it is working well. CEC integrates the radar sensor data of ships and E-2C aircraft into a real-time, fire-control quality composite track picture that is distributed to each participating unit. This allows target engagement well beyond a ship’s radar horizon, enabling carrier strike groups to act as integrated and distributed combat systems in countering ballistic missiles, cruise missiles, and stealthy aircraft. It also enables smaller ships operating in the littorals to share the sensing capacity of an entire group rather than relying solely on organic sensors. CEC and Link-16 are critical first steps in the development of a joint single integrated air picture that will lead to profound advances in joint force decision making, speed, and engagement lethality.

With arrival of the E-2C Radar Modernization Program in 2011, the Navy will deploy an unprecedented capacity to conduct defensive air warfare deep inland against cruise missiles and aircraft. The range and overland detection capabilities achieved through RMP, combined with the networking of CEC, will expand significantly our ability to defend critical ports, airfields, and joint forces ashore—initially with F/A-18E/Fs using AESA radar and AMRAAMs, and ultimately with a next-generation over-the-horizon ship-launched Standard missile. Naval forces then will be capable of projecting wide-area defense, more effectively assuring

“Sea Shield is about projecting defensive power from the sea. It is key to protecting our nation at home, assuring allies overseas, and dissuading and deterring potential adversaries in multiple theaters.”

—Admiral Vern Clark

allies and protecting the deployment of U.S. forces into forward theaters.

Ballistic missile defense is yet another potential breakthrough on the horizon. Over the next decade, we will use our Navy's globally deployed, mobile infrastructure of sea-based radars and missile launchers to field ballistic missile defense, both for forward theaters and the U.S. homeland. Linked to a network of space and airborne sensors, and directed by highly responsive command-and-control systems, a family of sea-based interceptor missiles will provide options for boost phase, mid-course, and terminal defense as part of an overall joint force ballistic missile defense system. Tests of this capability are ongoing, and recent successes indicate that sea-based missile defense will strengthen U.S. security in the years ahead.

Sea and Littoral Control. Battlespace control near land is essential to ensure prompt access and freedom of maneuver for joint forces moving from the sea to objectives deep inland. Surface and subsurface threats include small, fast surface combatants, modern ultraquiet submarines, and an array of floating, moored, and buried mines.

To detect and defeat these threats, force sensors and weapons will be integrated to produce battlespace dominance on, above, and below the sea. This is a challenging goal because sensors and weapons in the littoral environment have limited ranges as a result of environmental conditions and the clutter of maritime traffic. The most effective approach to countering these limitations is to network large numbers of distributed sensors and weapons. The Navy is pursuing this approach through programs such as the expeditionary sensor grid, the Advanced Deployable System for the detection of submarines and mine-laying activities, and the development of a family of unmanned underwater vehicles (UUVs). In addition, the new MH-60 helicopters, which will carry reconfigurable sensors and weapons customized for the littoral environment, will link their data to the force as they perform antimine, antisubmarine, and antisurface sea control missions.

Stealthy and lethal Littoral Combat Ships (LCSs) will add new dimensions to our ability to counter enemy submarines, small craft, and mines. Designed to be smaller and far faster than any current U.S. warship, they will have the maneuverability and signature reduction to take the fight to the enemy. They also will have reconfigurable mission payloads, including unmanned vehicles, to win in this challenging arena. In an environment where numbers matter and distributed capability has special value, LCSs will complement our larger, multimission ships by providing both. Our fleet will gain more combat effectiveness from LCS units operating forward for extended periods, experimenting with innovative crewing methods, and swiftly reconfiguring to obtain required mission capabilities.

The key to future effectiveness against modern, quiet diesel submarines in shallow waters once again will be the application of advanced sensor and networking technologies. These will contribute to building a common undersea picture that fuses the information from dis-

tributed sensors, platforms, and command elements to permit collaborative mission planning and tactical decision making. New, longer-range individual sensors such as the low-frequency active ship-mounted sonar, the advanced low-frequency sonar (ALFS) for the MH-60R helicopter, and new acoustic processors on nuclear submarines will complement the distributed sensors of the expeditionary sensor grid, Advanced Deployable System, and UUVs. ALFS, for example, will increase area search rates by three to five times that of current helicopterborne sonars. In addition, multistatic and advanced signal processing technologies will extract every possible element of information from the surrounding environment, making the water column increasingly transparent. None of these approaches will make antisubmarine warfare easy, but in the aggregate, these technologies, combined with well-trained sailors using realistic simulators to refine their skills, can sustain assured access for U.S. forces in the face of diesel submarine threats.

Mine warfare is on the verge of a revolution in the U.S. Navy. This decade will see the progressive fielding of new systems that will make mine countermeasure (MCM) capabilities integral to forward-deployed strike groups. While dedicated MCM forces will remain vital to keeping open the sea lines of communication, surface and subsurface combatants will detect and avoid mines on their own, sustaining the critical tempo of operations early in crises. Both dedicated and organic MCM forces will use new generations of sophisticated UUVs—eventually to be joined by unmanned air and surface vehicles—to detect, avoid, and neutralize mines at all depths.

Small, fast enemy surface combatants represent another threat to operations in geographically confined areas, where their size and the surrounding clutter of geography and traffic make long-range detection difficult. While destroying these craft in port or at long range is the preferred solution, a dispersed force of smaller platforms such as the LCS and the MH-60, networked with distributed, unmanned sensors, offers promising response capabilities once enemy vessels are under way. In addition, the highly effective Close-In Weapon System Block 1B antisurface-capable gun, rapidly entering the fleet, provides a lethal inner layer of defense against these craft. Revolutionary new technologies, such as directed-energy weapons, also offer promise as the next generation of systems for precise close-in defense against both combatant craft at sea and waterborne threats to ships pierside.

Extended Homeland Defense. Homeland defense relies on many of the elements that will make Sea Shield effective in a forward battlefield environment, such as expanded sensor coverage, increased situational awareness by networking, and rapidly deployable defensive assets and weapon systems. Sharing information with other services and agencies will extend the security boundaries of the United States far seaward, using the time and space afforded by naval forces to shield our nation from impending threats.

In close coordination with Northern Command, naval forces will establish comprehensive maritime domain awareness, to include the tracking of surface vessels, aircraft, and sub-surface units approaching the United States. Interagency communication reach-back systems will send the latest intelligence to and from naval assets. This will integrate afloat forces into joint, interagency, and civil efforts to a far greater degree than today, providing the situational awareness, agility, and timeliness so vital to countering terrorist threats.

As suspect vessels close our coasts, naval defense in depth will allow boarding, inspection, and neutralization of dangers. To coordinate this task, the Navy has assigned 300 sailors to the National Maritime Intelligence Center, working alongside U.S. Coast Guard personnel, to track and identify potential threats on the high seas. In addition, more than 10,000 antiterrorism and force protection professionals afloat and ashore protect today's fleet. The Navy also has numerous qualified personnel capable of assisting civil authorities during emergencies, such as those assigned to the Marine Corps' Chemical Biological Incident Response Force and Radiological Emergency Response Teams on Navy shore installations and tenders.

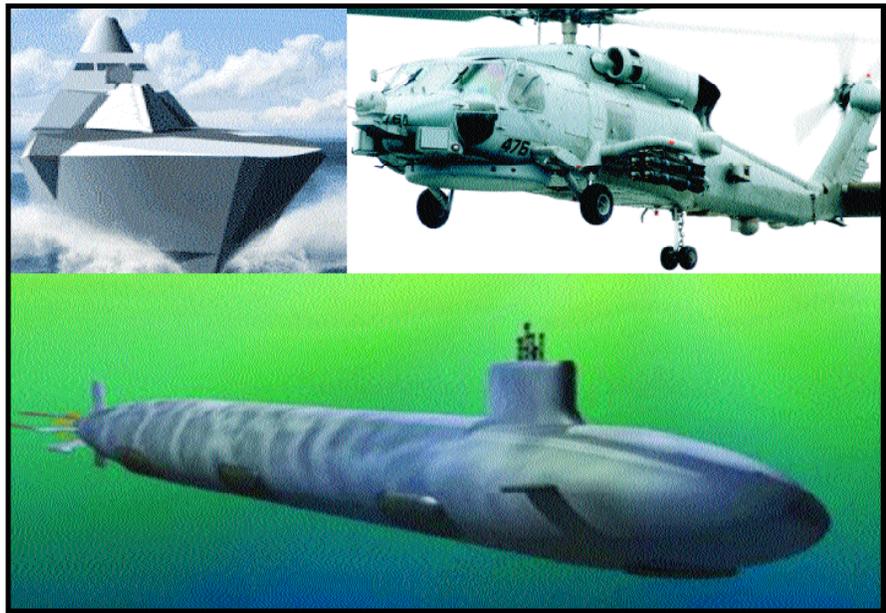
Key homeland defense assets in years ahead will include ballistic missile defense ships, U.S. Coast Guard Deepwater units, the new Multi-Mission Aircraft, and the Broad Area Maritime Surveillance UAV that will provide long-dwell coverage of very large areas of the ocean because of its high-resolution sensors and unprecedented flight endurance.

Fleet Leadership in Concept Development

Aggressive fleet leadership will be critical to realizing the full capabilities of Sea Shield. To provide such leadership, the Chief of Naval Operations has tasked Commander, Third Fleet, to work in concert with Commander, Seventh Fleet, to accelerate the development of all facets of Sea Shield. Third Fleet is an ideal venue for advancing such capabilities, because the innovation command ship USS *Coronado* (AGF-11) already hosts the U.S. Pacific Command's Joint Task Force for Experimentation and the Navy's Sea-Based Battle Lab.

To accelerate the delivery of Sea Shield capabilities, Third Fleet will address the CNO Action Steps specified in "Sea Power 21." These include:

- % Expand combat reach.
- % Deploy theater missile defense as soon as possible.
- % Create common operational pictures for air, surface, and subsurface forces.



U.S. NAVY / U.S. NAVY / GENERAL DYNAMICS

The Littoral Combat Ship, the new MH-60 helicopter, and the Virginia-class submarine (SSN-774) will ensure prompt access for joint forces moving from sea to objectives deep inland.

% Accelerate development of sea-based unmanned vehicles to operate in every environment.

% Invest in naval self-defense capabilities to ensure sea superiority.

Deployment and validation of Sea Shield capabilities will require strong partnerships with Commander, Fleet Forces Command, Navy Warfare Development Command, the Office of Naval Research, Navy Headquarters, the system commands, counterpart organizations in other services, and key allies. Such efforts will build on recent events including Millennium Challenge 2002, Fleet Battle Experiment Juliet, and successful ballistic missile defense test firings from the USS *Lake Erie* (CG-70).

Enhanced Security, Stability, and Engagement

Yesterday's Navy defended itself and the sea lines of communication. Tomorrow's Navy will do much more. It will provide assured access for joint power projection forces in an environment where threats increasingly hold land bases at risk. It will protect friends and partners from enemies armed with an array of advanced and deadly weapons. And it will provide the first, critical layer of defense against asymmetric threats to the U.S. homeland.

Sea Shield will extend homeland defense, sustain access to contested littorals, and project security deep inland. In short, Sea Shield will provide the capabilities needed for the United States to deter, dissuade, and decisively defeat adversaries in the decades ahead, providing stability and security in an uncertain century.

Admiral Bucchi is Commander, Third Fleet.

Admiral Mullen is Deputy CNO for Resources, Requirements, and Assessments.

Sea Strike

Projecting Persistent, Responsive, and Precise Power

By Vice Admiral Cutler Dawson, U.S. Navy, and Vice Admiral John Nathman, U.S. Navy

Sea Strike focuses on the *offensive*. It uses both lethal and non-lethal effects to attack key enemy targets. It involves not only strike aircraft (here, the Joint Strike Fighter) and cruise missiles, but also Marines, information operations, Special Operations Forces, and the joint strike capabilities of the Army and Air Force—as well as the offensive punch of our allies, coalition partners, and friends.



Sea Strike is a vision of what we will become as well as the focus of our capability today. It is about far more than putting bombs on target, although the delivery of ordnance remains a critical function. At its heart, Sea Strike is a broad concept for naval power projection that leverages C²ISR (command, control, communications, computers, combat systems, intelligence, surveillance, and reconnaissance), precision, stealth, information, and joint strike together. It amplifies effects-based striking power through enhanced operational tempo and distant reach. It takes U.S. power to the enemy 24 hours a day, 7 days a week, creating shock and awe both immediately and persistently. Sea Strike is what it takes to win in the 21st century.

Current and Future Capabilities

Sea Strike will permit the United States to execute true time-sensitive strike—i.e., sensor-to-shooter closure will be measured in seconds, instead of hours or minutes. In a world of fleeting targets, potentially tipped with weapons of mass destruction, speed becomes a dominant principle of war. We must therefore become capable of achieving dominance over the enemy through information gathered by long-dwell sensors, leading to a comprehensive understanding of the

enemy's critical military, political, economic, and sustainment nodes. Above all, Sea Strike will put us well inside the enemy's decision loop. The new strike planning challenge will not be adapting to weapons or systems limitations, but instead coordinating and controlling the pace and effects of complex simultaneous events. Synergism rather than individual actions will dominate the strike battlefield. Time-sensitive targets, hardened encasements, rugged terrain, rural camouflage, urban canyons, heavily defended complexes—all elements of the modern strike warfare environment—will be integrated into the target matrix and subjected to relentless effects-based operations that will employ the full range of joint warfighting capabilities.

Information operations will be a backbone and force multiplier to our combat operations and a fundamental part of Sea Strike. The designation of information operations as a primary warfare area is the underpinning for the employment of a wide range of agile and effects-based strike operations that will exploit, deceive, deter, and disrupt our enemies. Working in a joint and combined environment, we will manipulate the fog of war with cutting-edge information systems and persistent intelligence, surveillance, and reconnaissance (ISR). Leveraging technology in the areas of offensive computer network operations and precise electronic strike, covert nonkinetic actions will help control crisis escalation and shape the battlefield prior to initiation of hostilities. Computer network surveillance and attack—from the sea—will become central to crisis response and the support of strike operations. In a parallel effort, support for active psychological operations will further the effectiveness of tactical operations.

Upgraded or entirely new sensors and systems are in development that will provide critical situational awareness—on the bridges of our ships, in the cockpits of our aircraft, and for our troops ashore. A comprehensive sensing program will connect hundreds of varied and dispersed sensor nodes—including advanced radars such as that in the E-2C radar modernization program, hyperspectral sensors in multimission maritime aircraft and eventually unmanned vehicles and unattended sensors—into an expeditionary sensor grid that delivers unprecedented clarity throughout the battlespace. New high-bandwidth networking systems—such as the Advanced Tactical Data Link, Joint Tactical Information Distribution System, Cooperative Engagement Capability, and upgraded EHF satellite communications—will flow precise targeting data and intelligence to every level of command. Finally, powerful new data processing and decision enhancement tools—such as the Joint Service Imagery Processing System, Global Command and Control System-Maritime, and Naval Mission Planning System—will ensure that the accelerating flow of data is translated into decisive action and battlespace dominance. These efforts will provide a clear and dramatic improvement in the sensor-to-decision maker-to-shooter process that is at the heart of Sea Strike.

The F/A-18E/F Super Hornet and F-35 Joint Strike Fighter will increase strike fighter lethality dramatically, providing stealth and expanded sensing capabilities with the active electronically scanned array (AESA) radar. The AESA radar allows multiple sensor usage simultaneously, expands detection ranges two to three times beyond current radars, generates positive identification of ground targets, and immediately mensurates targeting data for precision weapons. These capabilities enable one platform to close the sensor-to-shooter cycle in real time and defeat even the most fleeting time-sensitive targets. Armed with this powerful sensor suite and an arsenal of advanced weapons, F/A-18E/F and JSF aircraft will dominate offensive and defensive air-to-air and air-to-surface missions with seamless transition between the two. These advanced strike aircraft will provide the Navy and Marine Corps team with survivable, accurate strike capability that is able to fill the roles of both sensor and shooter.

Improvements to unmanned air, surface, and undersea vehicles will provide long surveillance dwell times and expanded warfare options while minimizing risks to the war fighter. Unmanned vehicles under, on, and above the sea will provide low-risk, high-payoff augmentation to every aspect of strike and strike support in mis-

“Sea Strike is what we are all about. It is first and most importantly about being on the offense. It is the ultimate reason we remain forward deployed: to impose the will of our nation on our enemies when all else has failed.”

—Admiral Vern Clark



U.S. NAVY / U.S. NAVY / U.S. NAVY (KEN KOELBL)

Special operations forces will find and fix fleeting targets deep behind enemy lines, while time-sensitive, precise, and persistent striking power is delivered from the air and from below the sea.

sion areas ranging from surveillance and sensing, to shooting, electronic attack, and poststrike analysis. Similar ISR systems and products will become increasingly available to potential adversaries, however. Only by fielding and protecting a vastly superior ISR network will we maintain our situational awareness advantage in the battlespace.

A new generation of naval weapons will help bring the Sea Strike vision to fruition. Tactical Tomahawk offers a quantum leap in deep strike warfare by adding the ability to loiter over the battlefield and be retargeted to attack time-sensitive targets as they emerge. The Advanced Gun System will provide a tenfold increase in range compared to current naval guns, extending the precision strike revolution to naval surface fire support by providing a responsive, flexible, and cost-effective means to support ground troops. New technologies being developed for precision-guided munitions will make these weapons lethal, affordable, available, and effective. These new capabilities will enhance our ability to attack targets ranging from hardened or deeply buried objectives to those vulnerable to smaller munitions delivered with pinpoint accuracy.

Naval air wings benefit from similar advances in striking power. Since Desert Storm, precision-guided munitions have increased the number of aim points we can strike from dozens to hundreds per day. In the future, the Joint Air-to-Surface Standoff Missile will provide greater standoff range while an improved Joint Direct Attack Mu-



niton will significantly enhance our ability to destroy mobile targets, with both weapons being launched from strikefighters that will fly 800 miles without refueling.

Beyond this increase in strike capacity, we are witnessing the beginning of a technology explosion that will deliver new flexibility and crisis control to the combat commander. Nonlethal weapons in early development—such as sound and energy bursts—will give us the ability to match the appropriate weapon and desired effect with geopolitical circumstances and rules of engagement. Deployed, recoverable unmanned combat air vehicles, electromagnetic rail guns that fire hypersonic projectiles, high-energy/free-electron lasers, and microwave pulse weapons no longer are in the realm of science fiction but exist as naval science and technology initiatives that are achievable in the near to mid-term.

The ships, submarines, and aircraft that form the backbone of the naval striking force also are undergoing a revolution in capability. The conversion of four *Ohio* (SSBN-726)-class ballistic missile submarines into cruise missile submarines (SSGNs) begins in 2003. Each of these sub-

marines will be able to launch a salvo of as many as 154 cruise missiles in minutes, as well as support enhanced intelligence-gathering and joint special operations.

The CVN(X) nuclear-powered aircraft carriers will have three times the electrical generation capacity of current carriers to drive future systems and sensors. They also will have more flexible flight decks from which to launch sorties more quickly, surging increased numbers of aircraft to meet the warfare mission requirements of the strike force. The DD(X) multimission destroyers will provide precision surface fires against ground and air targets by way of the Advanced Gun System and an advanced vertical launching system for Tactical Tomahawk and other next-generation missiles. In addition, Marines will expand ship-to-objective maneuver by exploiting the vast maritime maneuver space made possible with the V-22 tilt-rotor assault aircraft, increasing the reach of sea-based forces five times beyond that provided by current helicopters.

Looking further into the future, a key aspect to Sea Strike will be the ability to strike hundreds—eventually thousands—of targets simultaneously. This will require immediate targeting underwritten by ForceNet. By linking massive databases with autonomous organic, long-dwell sensors and emerging knowledge-enhancement systems, we will use a combination of electromagnetic rail guns, hypersonic missiles, aircraft, information effects, and Marine units to unleash effects-based attacks against every target of value within incredibly short time periods.

Picture a small number of Marines and Special Operations Forces inserted as advance strike coordinators into a theater of operations. Using ForceNet, they identify and link to the shooters more than a thousand targets that are attacked simultaneously by a combination of information operations, direct-strike unmanned air vehicles, manned strike-fighters and bombers, hypersonic missiles, and offshore rail guns. All of this fits seamlessly into a joint and combined strike campaign.

At the same time, we must pursue expanded targeting devices, which are weapons that detect, sense, and attack targets based on transmissions other than those found in the typical visual and electromagnetic range. For example, we need the ability to attack based on magnetic fields, data transmissions, and biologic cues.

At the heart of our longer-range approach to Sea Strike is *fusion*. We must be able to fuse multiple sensors automatically to build a single strike picture. This will be particularly effective if we can put multiple sensors into individual combat units. Think of a single tactical aircraft operating from the sea—perhaps even a submarine-launched unmanned air vehicle—capable of downloading information from national sensors, fusing it with organic sensor inputs, putting ordnance on targets, and conducting its own battle damage assessment.

Key advantages for the United States will continue to be our massive databases and the ability to link information into coherent patterns. We need to leverage such advantages in executing Sea Strike operations, and we are

doing so through ForceNet, Information Technology 21, the Navy and Marine Corps Intranet, and other initiatives.

Action Steps

We must bring Sea Strike on line quickly. Our enemies are working to develop systems and techniques to overcome our advantages, and we need to stay well ahead of them. To accomplish this, the Chief of Naval Operations has tasked Commander, Second Fleet, and Commander, Fifth Fleet, to make Sea Strike a reality. Second Fleet's long history of international cooperation and exercises and the real-world crucible of Fifth Fleet operations make these fleets the ideal proving grounds for Navy offensive systems. They will begin Sea Strike development by implementing the action steps listed in "Sea Power 21."

% Accelerate information dominance through ForceNet. ForceNet provides the integrated information critical to Sea Strike. Building and effectively employing ForceNet, however, will be challenging because it requires fusion of disparate series of systems. Artificial intelligence has a role to play here, but it remains a future contributor. Our urgent task is to develop, acquire, and integrate systems to increase combat reach, stealth, and lethality now—all tied together by ForceNet. We will begin this today.

% Develop new combat structures to distribute offensive striking capability throughout the force. The nature and scope of national security challenges and rapid insertion of new technologies demand that the Navy-Marine Corps team change the way it is organized and deployed. Countering 21st-century threats requires a doctrine and force structure that can respond immediately with a wide array of capabilities. We must be able to tailor the size and composition of the force to meet any threat.

We will do this by implementing the expeditionary strike force concept. Made up of carrier strike groups and expeditionary strike groups—augmented by strike surface action groups and SSGNs—these forces will be crucial to striking from the sea. Sea Strike forces will enable naval assets, working with the other U.S. armed services, allies, and coalition partners, to meet the challenge of distributed strike efficiently, effectively, and decisively. By taking a modular approach to combatant force composition and employment, these flexible and scaleable force combinations will capitalize on the synergies generated by their complementary capabilities. Lethality will be increased and greater efficiencies achieved. In addition, these combinations of submarines, ships, aircraft, and ground forces with embedded information operations capabilities, specifically tailored to various threats and missions, give the combatant commanders greater on-station options across the theater.

These forces will answer the challenge of our nation's "4-2-1" military strategy: Deployed carrier strike groups, expeditionary strike groups, surface action groups, and submarines will provide persistent deterrence forward in four critical regions; these same forces will flex to defeat

two adversaries swiftly with minimal reinforcements; and they will be at the center of joint forces that win one major war decisively.

Experimental strike groups will deploy in 2003. On the East Coast, the *Enterprise* (CVN-65) Carrier Strike Group will pair with the *Saipan* (LHA-2) Expeditionary Strike Group. On the West Coast, the *Carl Vinson* (CVN-70) Carrier Strike Group will team with the *Peleliu* (LHA-5) Expeditionary Strike Group. Together, the expeditionary strike forces will be the “gold standard” of Sea Strike capability.

¶ *Develop information operations as a major warfare area.* Our intention is to work with the other U.S. armed services and coalition partners to craft a combat approach to the employment of the entire range of information operations—from electronic attack to national-level activity involving enemy computer systems. To move out in this mission, in July 2002 we created the Naval Network Warfare Command in Norfolk, Virginia. The fleets already are working with the Naval Network Warfare Command to ensure information warfare commanders are better trained and resourced to execute this critical warfare area.

¶ *Achieve greater synergy with the Marine Corps, the other U.S. armed services, and our allies.* This will accelerate transformation efforts in all combat operations.

As an example, the *Enterprise-Saipan* Expeditionary Strike Force operating off the Horn of Africa in 2003, with its combined power, could establish a forward striking sea base to conduct independent operations or facilitate the arrival and integration of an Air Force wing and an Army brigade. Working with joint and coalition partners, these forces could conduct hundreds of strikes daily.

As the future unfolds, the speed and scope of offensive operations will only increase, leveraging sea-based precision and persistence to achieve decisive effects. This is the promise of Sea Strike.

The Road Ahead

As Chief of Naval Operations Admiral Vern Clark said shortly after the attacks of 11 September 2001, “Naval missions and capabilities inevitably evolve in response to the wars we fight.”¹ The operational capabilities that define Sea Strike are vital to winning the current war on terror. They also are critical to meeting future threats that will challenge the United States in the 21st century.

Operation Enduring Freedom amply demonstrated the Navy’s ability to take the fight to the enemy, but we must continue to transform our means and methods to maintain our warfighting superiority. “Sea Power 21” is the Navy’s road map for this ongoing transformation. It will guarantee naval forces continue to be first on scene with decisive, multidimensional combat strike power, as well as act as increasingly integral partners with joint, allied, and coalition forces for sustained conflict.

Secretary of Defense Donald Rumsfeld recently said he envisioned a military that is “very rapidly deployable, lethal, [and] involving a relatively small footprint compared to the past.”² That is a perfect description of the course we will sail as we incorporate “Sea Power 21” and Sea Strike into our operational capabilities, providing our nation with what it takes to win in the years ahead.

¹Chief of Naval Operations Admiral Vern Clark, USN. Remarks at the Naval War College Symposium: Setting our Course in the Terror War, Naval War College, Newport, RI, 29 October 2001.

²Secretary of Defense Donald Rumsfeld. Interview with *Defense Daily*, 21 August 2002.

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Admiral Nathman is Deputy Chief of Naval Operations for Warfare Requirements and Programs, N6/N7.

Sea Basing

Operational Independence for a New Century

By Vice Admiral Charles W. Moore Jr., U.S. Navy, and
Lieutenant General Edward Hanlon Jr., U.S. Marine Corps

The 21st century will witness the advent of unique and powerful capabilities delivered by global sea-based forces. In the decades ahead, the seas will comprise the most independent and secure maneuver space for joint military forces. Weapons, sensors, and communications systems with revolutionary reach and precision will integrate maritime forces into a unified battle space extending across sea, land, air, space, and cyberspace—providing invaluable strategic and operational advantage from the vast international domain of the world's oceans. (Here, an F-14 Tomcat launches from the *Harry S. Truman* [CVN-75] during replenishment operations with the USNS *Arctic* [T-AOE-8] and *Mount Baker* [T-AE-34] in support of Iraqi Freedom.)



U.S. NAVY (JOHN BEEMAN)

Sea Basing is the core of “Sea Power 21.” It is about placing at sea—to a greater extent than ever before—capabilities critical to joint and coalition operational success: offensive and defensive firepower, maneuver forces, command and control, and logistics. By doing so, it minimizes the need to build up forces and supplies ashore, reduces their vulnerability, and enhances operational mobility. It leverages advanced sensor and communications systems, precision ordnance, and weapons reach while prepositioning joint capabilities where they are immediately employable and most decisive. It exploits the operational shift in warfare from mass to precision and information, employing the 70% of the earth’s surface that is covered with water as a vast maneuver area in support of the joint force.

Sea Basing will be increasingly central to joint military planning because the traditional *advantages* enjoyed by afloat forces—such as independence, mobility, and security—are becoming ever more important to military affairs, while traditional *limitations* of sea-based forces—including operational reach and connectivity—have been largely overcome by new technologies and concepts of operations. These advances in sea-based capabilities could not come at a more critical time, as political and military barriers to access ashore are growing worldwide. Because of these changes, the value of Sea Basing in an increasingly interdependent world will continue to rise—providing operational freedom for joint and coalition forces, compressing deployment timelines, strengthening deterrence, and projecting dominant and decisive combat power from the sea.

In a world of hidden and fleeting enemies, Sea Basing provides the joint force commander with dispersed, netted, and sovereign platforms that are ready to re-

“In the future, we will use the extended reach of naval weapons and sensors to provide unprecedented power, protection, and freedom to joint campaigns. We will do this by exploiting the largest maneuver area on the face of the earth: the sea.”

—Admiral Vern Clark

“Sea-based operations maximize naval power projection and enhance the deployment and employment of naval expeditionary forces by Joint Force Commanders.”

—General James L. Jones

strengthen deterrence and war fighting. Sea-based offensive and defensive power assures friends and allies, enhances coalition building, and guards against international coercion; missions that will grow in importance as advanced warfighting technologies proliferate.

Sea-based forces are projecting power over longer distances and with far greater precision than in the past. For example, the F/A-18 C/D, the current workhorse of the fleet, has an unrefueled operational mission radius of approximately 500 miles. The F/A-18 E/F Super Hornet, which already has flown combat missions in the war on terrorism, extends that range to more than 650 miles. The Joint Strike Fighter, which will enter the fleet in the next decade, will have a combat radius of 800 miles. The MV-22 tilt-rotor aircraft will have five times the range of current helicopters and the Advanced Gun System will support maneuver forces by extending precision gunfire from 10 miles to 100 miles, vastly increasing the target set vulnerable to sea-based gunfire. At the same time, the Advanced Assault Amphibious Vehicle will provide the Marine Corps much needed over the horizon mobility and remarkably improved firepower.

Increased range is augmented with increased precision. Over the past ten years, precision weapons with extended standoff capability have advanced from a niche capability to an operational requirement. During Operation Desert Storm in 1991, precision weapons represented only 10% of munitions expended. In 2001, during the initial phases of Operation Enduring Freedom in Afghanistan, precision

spond. To accomplish this mission, the sea base is comprised of distributed forces of many types, including carrier strike groups, expeditionary strike groups, combat logistics force ships, maritime prepositioning force platforms, and, in the year’s ahead, high-speed support vessels. Working together, these forces mass effects rather than platforms, increasing sensor coverage and force protection while focusing offensive and defensive firepower throughout the battlespace. This increase in operational effectiveness is possible because naval capabilities are evolving in important ways.

%Precise and Persistent Firepower. Sea Basing is the foundation for Sea Strike and Sea Shield, complementary capabilities that

weapons accounted for more than 90% of weapons employed. This ability to effectively target and engage with pinpoint accuracy gives our forces the scaleable combat power necessary to dominate today’s military environment. In addition, efficiencies inherent in precision strike radiate from the battlefield to the factory, requiring fewer weapons to be produced, shipped, stored, and employed. This movement from mass to precision greatly enhances the effectiveness of Sea Basing.

The sliding scale between mass and precision is equally evident in maneuver. In step with the improvements achieved in precision weaponry is a complementary shift toward precision maneuver. Netted intelligence, surveillance, and reconnaissance with increased speed of seaborne and airborne platforms permit the discernment and rapid maneuver against and exploitation of gaps in an adversary’s defenses. Precision navigation systems allow forces to move through cleared lanes created in obstacle belts and minefields, eliminating the need to clear entire shorelines. Sea Basing also improves the speed by which maneuver forces operate by retaining command and control, fire support, and logistics functions at sea. Precision maneuver capitalizes on the improved accuracy of fire support systems and munitions to enable a tempo of operations the adversary cannot match.

%Operational Maneuver at and from the Sea. The essence of Sea Basing is the exploitation of the sea, an obstacle for those who cannot control it, as maneuver space for friendly forces. By controlling the sea, the U.S. Navy creates a sanctuary for joint forces. Using the sea as maneuver space, afloat forces are capable of presenting an adversary with a mobile and multidimensional threat that overextends his capabilities and generates exploitable gaps and vulnerabilities. The inherent operational mobility of the sea base enables naval forces to place enemy forces and critical infrastructure at risk across the length of his coastline. The significantly expanded operational reach enabled by sea-based fires and maneuver capabilities will further increase an adversary’s vulnerabilities deep inland. This power projection capability can be exploited for forcible entry, enabling the establishment ashore of follow-on land based joint forces. Subsequently, the maneuver capabilities of the sea base will allow naval forces to operate opportunistically off an adversary’s coast, striking from the sea with fire and maneuver as vulnerabilities are discerned or created.

The economy and benefits of sea-based maneuver are best appreciated from the perspective of the enemy, who faced with a combined arms sea-based threat is placed on the horns of a dilemma. He can dissipate his force along the length of his coast or concentrate forces at strategic points, in either case naval and joint forces will maneuver throughout the battle space to defeat local forces in detail while striking critical nodes. By placing the enemy in a no-win situation, sea-based forces contribute greatly to the joint campaign and fully exploit the advantages of sea control.



COURTESY BELL BOEING

Global Connectivity. Tremendous advances in afloat connectivity over the past decade have knitted sea-based forces into the larger world around us. Situational awareness is shared real-time across all forces and with theater and national decision-makers. Support data have increased dramatically, providing greater efficiency, higher readiness, and access to expertise and information through reach-back systems. Collaborative planning and training systems, including video teleconferencing from sea, allow forces to arrive on scene with the latest information, ready for immediate employment. This web of connectivity turns individual ships into elements of a dispersed but integrated force—a sea base—from which commanders exercise control in secure and mobile facilities, accelerating the speed and accuracy of assessment, decision, and action at every level of command.

Responsive Logistics. Twenty-first century operational logistics increasingly will leverage information to achieve efficiencies and provide support at the time and place of greatest impact. This shift toward anticipatory, responsive logistics—which is just beginning—will make Sea Basing of integrated joint logistics support increasingly possible, minimizing dependence on large and vulnerable bases ashore.

In pursuit of this goal, sea-based logistics are building upon a rich tradition that includes the legendary World War II fleet train of support ships that operated just behind the battle fleets. Today's Military Sealift Command (MSC) has inherited this role. Comprised of 119 fully op-

The MV-22 tilt-rotor Osprey gives the joint force commander the capability to project ground forces five times farther than he could with current helicopters.

erational ships—72% of which are deployed at any time—and another 96 surge ships, MSC supports fleet operations with oilers, stores ships, ammunition ships, ocean-going tugs, hospital ships, and other vessels. In addition, MSC has maintained prepositioned support forces in the Mediterranean Sea, Indian Ocean, and Western Pacific since the early 1980s. These assets are truly joint, including 40 ships to supply the Marine Corps, Army, Navy, and Air Force. By keeping these arsenals of U.S. firepower in theater, MSC provides the nation with decreased deployment and employment timelines, expanded military options, and greater operational responsiveness to the joint force commander.

The Naval Supply Systems Command is another important change agent in enhanced Sea Basing. Its more than 8,000 logistics professionals are striving to achieve one-touch supply on a global scale, providing web-based, single-point-of-entry support to save customer time and increase anticipation of demand. As with the MSC, the Naval Supply Systems Command is expanding its partnership with the other services and the Defense Logistics Agency by leveraging information technologies and expanded communications tools to increase situational awareness and capture joint efficiencies. The result will be improved speed of response and operational agility.

We are only beginning to exploit the full potential of Sea Basing. In support of joint and coalition operations, maritime forces will provide Sea Strike and Sea Shield capabilities of unprecedented range and accuracy, global connectivity of great capacity and survivability, and streamlined logistics to support joint forces throughout the battle space. Sea-based forces will minimize reliance on ashore infrastructure by challenging all assumptions that result in the shore basing of operational capabilities. The reasoning is direct: less reliance on shore basing equals more operational flexibility. This means taking advantage of every opportunity to place enhanced capabilities at sea and improving the reach, persistence, and sustainability of systems that already are based afloat.

Improved Joint Effectiveness. The future is all about jointness, from initial planning through mission completion. Every facet of sea-based operations must focus on the bigger picture. Defensive assurance will be derived from the integration of complementary joint capabilities, and strike options of every type will be planned and executed in a joint context. Afloat operations will be tai-

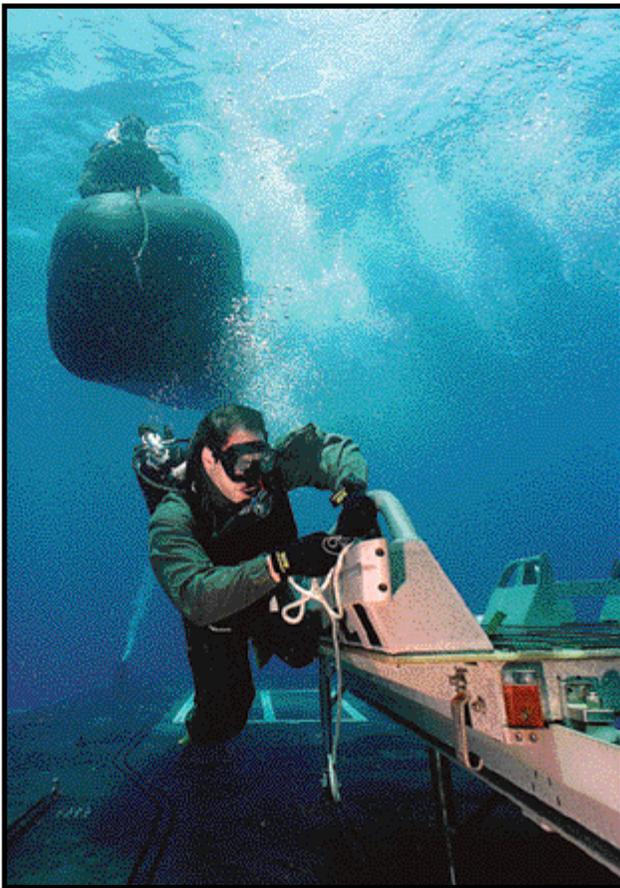
lored and timed so that their impact folds smoothly into joint strategic, operational, and tactical plans. The fully integrated battle space of the future may witness not only Special Operations Forces operating from the maritime domain, but also Air Force unmanned combat vehicles surging to sea bases rather than bedding down ashore. Readily available forward-operating bases will be central to joint operations in the 21st century, and, while not invulnerable, there is no forward-staging area more secure and sovereign than a sea base.

Seamless joint communications lie at the heart of effective Sea Basing. As part of that effort, the Navy is lead agent for developing a new deployable joint command-and-control system to provide a rapidly accessible and flexible common planning tool for all services to share. Such communications must leverage fully the capabilities of joint, theater, and national systems, as well as those of allies, coalition partners, and friends. This web of awareness must reach beyond the military, to include other agencies such as the new Department of Homeland Security, the intelligence organizations, and civilian relief and international aid groups. In an era of preemptive defense, we must shape the strategic and operational environment by engaging as early as possible with every available tool.

Sea Basing is also a catalyst for coalition building, because it is politically and logistically easier for nations to contribute to a sea-based effort than to commit land forces. In future operations, international data-sharing networks will make available local knowledge, regional intelligence, and operational specialties needed for effective campaign planning. This demands the development of communications systems that are accessible to other nations, including the portability and safeguards required to optimize coalition operations.

Increased Reach and Responsiveness. On-scene presence and operational freedom are vital to deterring and defeating current and future threats, ranging from regional adversaries to transnational terrorists and criminal organizations. The Navy-Marine Corps team will meet this challenge by greater integration with each other and with the larger joint force. Naval forces will provide distributed, netted striking power around the world to swiftly attack wherever threats appear.

New and better systems are key to expanded reach. The new CVN(X) nuclear-powered aircraft carrier will be the first major update of the fleet's most powerful weapon system in a quarter century. It will launch very long-range manned and unmanned strike craft, be powered by a new propulsion plant that will include greatly expanded electrical-generating capacity, and have a more flexible flight deck, all operated and supported by a much smaller crew. The new multimission DD(X) destroyer reflects this drive toward longer-range weapons, more efficient crewing, and greater emphasis on electric systems, eventually leading to electric propulsion and weapons. The follow-on CG(X) cruisers will project defensive shields over entire regions, placing a new tool of great value into the hands of deci-



U.S. NAVY (ANDY MCKASKIE)

With Sea Basing, advance parties of Marines and Special Operations forces can deploy clandestinely—here, Navy SEALs prepare to deploy a SEAL delivery vehicle from the dry deck shelter of a submarine—to gather intelligence and prepare the battlefield.

sion makers. Improved amphibious assault ships such as the LHA(R) and LPD-17 will maneuver forward presence forces to shape events in the early stages of conflict. These new expeditionary warfare platforms will provide a limited but responsive forcible entry capability to enable rapid reinforcement by follow-on sea-based forces.

Increased combat power also will rely on an array of advanced weapons and sensors. Long-dwell unmanned sensors will be projected vast distances on, over, and under the sea, providing the persistent intelligence, surveillance, and reconnaissance

critical to 21st century warfighting. Next-generation missiles, aircraft, and unmanned vehicles will provide rich streams of information, to include optical, infrared, audio, seismic, radiological, magnetic, and thermal returns. These sensors will guide very fast, very precise strikes best suited to a rapidly changing battlefield. Information operations will complement strike missions with non-kinetic attack at vital enemy systems. High-speed sealift, tilt-rotor aircraft, and advanced assault amphibious craft will provide more mobility and flexibility in support of power projection forces while also increasing sustained support. In short, sea-based forces will leverage improved intelligence, surveillance, and reconnaissance capabilities, precision fire support, and enhanced mobility to generate combat power on a scale previously provided by far heavier and less agile forces.

New platforms and technologies will be implemented by new concepts of operations. To provide greater striking power and responsiveness, amphibious ready groups are being augmented with dedicated surface combatants and submarines, to produce expeditionary strike groups, thereby distributing the offensive power of the fleet more widely while increasing area control and surveillance capabilities. Expeditionary strike groups will operate independently against transnational threats, and they will combine with carrier strike groups and maritime prepositioning groups to form expeditionary strike forces when countering major adversaries.

To further develop sea-based reach and responsiveness, joint experimentation will be aggressively pursued. Today, the Navy-Marine Corps team and U.S. Joint Forces Command are working together to incorporate naval efforts into joint exercises whenever possible. Concurrent with that effort, the naval services are working with the Army on high-speed vessels, with the Air Force on unmanned



U.S. NAVY (COURTESY INCAT/RICHARD BENNETT PHOTOGRAPHY)

High-speed sealift will provide far more flexible, efficient, and secure support by way of intra- and intertheater sustainment and transportation.

aerial vehicles, and with the Coast Guard on its Deepwater project. The goal is to develop as many common systems as possible, to maximize the utility of joint Sea Basing. In addition, we must define concepts and doctrine that codify how we will work together more effectively in the future as a unified military force.

Enhanced On-Scene Endurance. Being there is what sea-based forces are all about, and the naval services are dedicated to finding innovative ways to increase on-scene endurance. Enhanced on-station presence will compress deployment and employment timelines and increase the operational effectiveness of every Sailor and Marine.

Maritime Prepositioned Force-Future (MPF[F]) ships will be central to this effort. These platforms will sustain in-theater logistics, communications, and medical capabilities, providing joint operational and logistical support while remaining on-station for extended periods. MPF(F) ships will enhance the responsiveness of the joint team by the at-sea assembly of a Marine expeditionary brigade that arrives by high-speed airlift or sealift from the United States or advanced bases. They will off-load forces, weapons, and supplies selectively while remaining far over the horizon and reconstitute ground maneuver forces aboard ship after completing assaults deep inland. The impact of these ships will be significant, because prepositioned support will not be limited to unloading supplies in port after troops have moved ashore. They will sustain the force and allow the joint force commander to rapidly reposition and retask for other operational missions. MPF(F) ships will serve a broader operational function than current prepositioned shipping, creating greatly expanded operational flexibility and effectiveness.

In the near future, on-station time will be enhanced by improved vertical delivery capabilities provided by the MH-60S helicopter and MV-22 tilt-rotor aircraft. High-

speed sealift will provide far more flexible, efficient, and secure support by way of inter- and intra-theater sustainment and transportation. MSC already is sailing the West-Pac Express, a 101-meter vessel that averages 35 knots while transporting nearly 1,000 Marines. This results in more efficient training and lower costs than provided by airlift. Another high-speed vessel, Joint Venture, is being employed on the U.S. East Coast for experimentation with the Army, while a third has been placed on order to work with the Mine Warfare Command in Ingleside, Texas.

The Littoral Combat Ship (LCS) will take the concept of being there to new heights, applying cutting-edge technology and innovative operational concepts to provide increased presence in the littorals. Designed from the keel-up to be very fast and mission flexible, it has the potential to remain forward deployed for extended periods, supporting carrier and expeditionary strike groups while sustaining access to vital waters for trade and military operations. In addition, the Navy is conducting experiments with rotational crewing to enhance on-scene endurance, and optimum manning initiatives are being implemented in fleet units to reduce crew size while increasing sustainability.

More advanced technologies lie further ahead. Future sea bases might include highly capable joint command centers, aircraft operating areas, and sea-to-shore craft of unprecedented speed and lift. Future logistical capabilities include enhanced hull-to-hull transfer systems for heavy cargo, revolutionary crane designs, advanced strike-up/strike-down cargo handling equipment, improved fenders employing electromagnetic technologies, and new fuel transfer systems for greater safety and efficiency. Someday, sea bases may even be supplied by ultra-large airships capable of vertically delivering more than 1,000 tons of cargo after transiting from airstrips in the United States or elsewhere around the world.

Decisive Capabilities for an Uncertain Era

Twenty-first century Sea Basing will result in dramatically expanded use of the seas to directly influence events anywhere. Imagine a major crisis 20 years from now: rogue elements within a failed state seize missiles armed with weapons of mass destruction and threaten to attack a neighboring nation. In response, sea-based forces project a defensive shield over the potential victim. Long-dwell sensors—naval, joint, and national—provide minute-by-minute, comprehensive data to decision-makers. Advance parties of Special Operations Forces and Marines clandestinely deploy from ships and submarines to gather intelligence. Reinforcements flow from outside the theater to afloat forward-staging bases, where they meet with equipment and prepare for the attack. The sea base grows in extent and capability as international forces arrive, bringing additional intelligence and operational skills.

A joint force commander activates an afloat headquarters and begins integrated planning, linking with resources

around the world. Representatives of other governmental agencies and international humanitarian organizations arrive to coordinate post-conflict planning, including the possibility of inserting teams of specialists from the sea base into a contaminated environment ashore. As planning rapidly progresses and refined estimates of weapons usage become available, focused logistics systems push select items forward on high-speed sealift and airlift to sustain the tempo of assault.

While the international community struggles to defuse the crisis, sea-based forces shape the effort: providing enhanced deterrence capabilities, immediately employable strike options, critical intelligence, and coalition connectivity. Should conflict erupt, sea-based forces will be at the leading edge of the attack, maneuvering to exploit the advantages of sea-based power projection. Once tensions are resolved, the sea base will disperse as silently and swiftly as it assembled, melting away into the vast maneuver space of the sea until it is needed again.

Asymmetric Military Advantage

Enhanced and networked Sea Basing will allow us to do more from the sea than ever before, operating as a fully integrated joint force to deliver major increases in operational effectiveness. By doing so, it will extend to the joint force advantages historically enjoyed by naval forces, such as freedom of action, immediate employability, increased security, and sustained access. Sea Basing is transformational, but it is not a panacea. It will remain an operational-level capability that relies on the strategic basing support of overseas friends and allies outside the joint operations area.

In the years ahead, afloat command and control will be seamless, global, and secure. Resupply of joint forces from the sea will be safer, faster, and more efficient. Naval firepower will range across the joint battle space, and sea-based maneuver forces will penetrate deep into enemy territory. Prepositioned assets will remain on station for extended periods. Greater integration with joint and coalition forces will result in increased situational awareness, enhanced regional stability, and—should crises occur—an accelerated flow of combat and support forces throughout the theater of operations.

Twenty-first-century Sea Basing will be our nation's asymmetric military advantage, contributing immeasurably to global peace, international stability, and warfighting effectiveness. It is the key to operational independence in the dangerous decades before us.

Admiral Moore is Deputy Chief of Naval Operations for Fleet Readiness and Logistics (N4). Previously, he was Commander, U.S. Naval Forces Central Command, and Commander, U.S. Fifth Fleet during Operation Enduring Freedom.

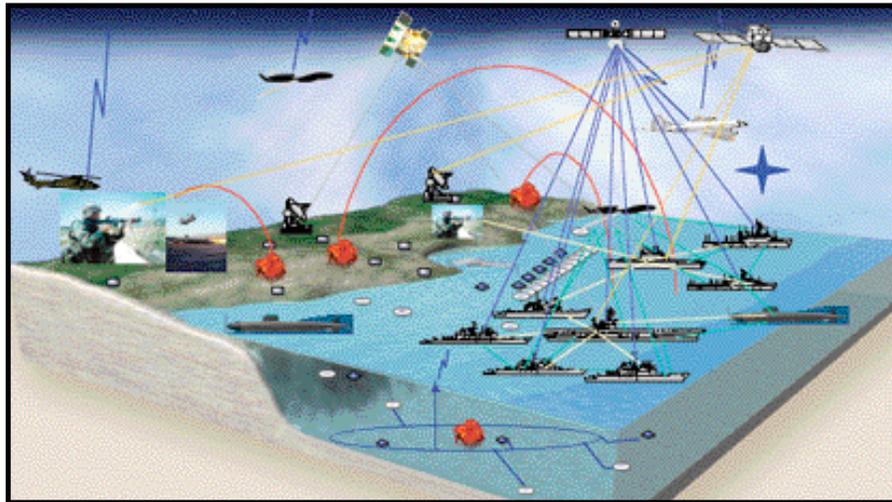
General Hanlon is Commanding General, Marine Corps Combat Development Command. Previously, he was Commanding General, Marine Corps Base Camp Pendleton.

ForceNet

Turning Information into Power

By Vice Admiral Richard W. Mayo, U.S. Navy, and
Vice Admiral John Nathman, U.S. Navy

The information age has increased dramatically U.S. combat effectiveness. New communications links, computer-processing techniques, and miniaturized electronics have given the U.S. armed forces global connectivity, powerful sensors, and weapons with awesome precision and lethality. By more fully integrating these technical capabilities with 21st-century warriors, ForceNet will deliver the full promise of network-centric warfare.



U.S. NAVY

Swift and effective use of information will be central to the success of “Sea Power 21.” Sea Strike will rely on rich situational awareness provided by persistent intelligence, surveillance, and reconnaissance to sense hostile capabilities and trigger rapid and precise attacks. Sea Shield will use integrated information from joint military, interagency, and coalition sources to identify and neutralize threats far from our shores, locate and destroy antiaccess challenges in littoral waters, and intercept missiles deep over land. Sea Basing will draw on comprehensive data to sustain critical functions afloat, such as joint command and logistics, ensuring operational effectiveness and timely support.

Near-instantaneous collection, analysis, and dissemination of information coupled to advanced computer-driven decision aids will unify the battle space of the 21st century, turning the seas into joint maneuver areas. This vital asymmetric advantage of information superiority will increase responsiveness and survivability by allowing our forces to disperse while focusing offensive and defensive firepower over tremendous distances. ForceNet will provide the information that enables knowledge-based operations, delivering greater power, protection, and operational independence than ever before possible to joint force commanders.

Defining ForceNet

ForceNet will enhance dramatically how the Navy acquires, shares, and capitalizes on information superiority to generate transformational combat effectiveness. It has its roots in the visionary work of the Chief of Naval Operations’ Strategic Studies Group (SSG) based in Newport, Rhode Island. After years of research and concept generation, the SSG defined ForceNet as “the operational construct and ar-

chitectural framework for naval warfare in the information age that integrates warriors, sensors, networks, command and control, platforms, and weapons into a networked, distributed combat force that is scalable across all levels of conflict from seabed to space and sea to land.” ForceNet implements the theory of network-centric warfare.

Developing ForceNet will involve designing and implementing a network architecture that includes standard joint protocols, common data packaging, seamless interoperability, and strengthened security. It requires identifying and prioritizing capability investments within and across joint, interagency, and international programs. Most importantly, it will emphasize people as the center of ForceNet development, so that technological advances support increasingly rapid and accurate decision making.

The goal of ForceNet is to arm our forces with superior knowledge, leading to increased combat power. In pursuit of this goal, ForceNet will provide a comprehensive network of sensors, analysis tools, and decision aids to support the full array of naval activities, from combat operations to logistics and personnel development. The focused, timely, and accurate data delivered by ForceNet will help leaders at every level by allowing them to draw on vast amounts of information and share the resultant understanding. This will increase the joint force’s ability to synchronize activities throughout the battle space to achieve the greatest impact.

On the Leading Edge of Change

Today’s military operations exploit our existing information advantages to great effect. During the opening phases of Operation Enduring Freedom in Afghanistan, for example, 80% of the targets destroyed by sea-based aircraft were identified to the pilots after they left the carriers’ decks. This unprecedented tactical flexibility can be attributed to the advent of advanced sensing and targeting systems in the air and on the ground, coupled to precision-guided munitions, and coordinated by secure data links and voice circuits. This new American way of war allowed dispersed ground forces to generate tremendous combat power by drawing on sea-based and air-delivered fire support projected over great distances with punishing precision. U.S. forces leveraged the peerless speed, reach, and accuracy of their strike systems to permeate the battle space, paralyzing and destroying enemy forces.

As with other military “revolutions,” battlefield success in Afghanistan had its roots in decades of careful forethought and investment. In this case, such capabilities included the design and acquisition of joint data links, space-based navigation systems, stand-off and precision weapons, increasingly capable strike-fighter aircraft, and—above all—the superb training of a highly innovative and professional joint military force. Still, as impressive as this achievement was, U.S. capabilities can be strengthened. During Operation Enduring Freedom, our political and cultural understandings of the enemy were incomplete; co-

ordination with non-military assets was ad hoc; integrated coalition operations were limited; and information filtering and decision aids for field commanders were minimal.

As we prepare for the future, we must build on our successes to acquire operational capabilities at the next level of integration and effectiveness. This includes compiling data streams that are shared by all services as the foundation of a common operational picture; sensors that are integrated fully to share critical information; joint, multi-agency, and coalition analysis cells to translate information into knowledge for rapid dissemination; and advanced decision aids to help commanders focus resources and coordinate actions for maximum effect.

Leveraging the Power of Information

By fully leveraging the power of information, U.S. and coalition forces will gain the knowledge needed to dominate the tempo of operations—enhancing deterrence, controlling crises, and sustaining warfighting superiority. To do so, we must more effectively acquire, share, and exploit information in the decades ahead.

% Acquiring Information: The speed, volume, and diversity of knowledge required to effectively operate our forces is accelerating. Not long ago, naval engagements were measured in days and bound by the visible horizon. Today’s engagements are measured in seconds and cover hundreds of miles. Tomorrow’s operations will be broader, taking into account military, political, economic, and cultural variables. To feed this demand for immediate and detailed information, we must move beyond current military sensors. We will develop and deploy next-generation systems and analytical processes that provide broad situational awareness by harnessing the torrent of data flowing through military, interagency, and public channels. Continually processed and shared, this stream of information will provide expansive visibility and understanding, arming the joint force with knowledge dominance.

ForceNet will strive toward comprehensive sensing that integrates sea-based capabilities with highly sophisticated joint and national assets, including ground-based interception stations and aircraft, as well as space-based systems. Naval forces will complement national collection programs with widely dispersed sensing systems that contribute vital data to the planning and execution of trans-global operations. Central to this effort will be extensive sensor coverage provided by manned ships, submarines, and aircraft. In the near future, many of these missions will be accomplished by high-endurance, unmanned vehicles on, over, and under the surface of the ocean, as well as expeditionary sensor grids on land. Launched and maintained from forward-deployed ships and submarines, such sensors—including unmanned aerial vehicles, remote mine-hunting systems, and advanced deployable systems on the ocean’s floor—will provide persistent and responsive networked sensor coverage to increase battlespace transparency, sharpen decision making, and guide operations.

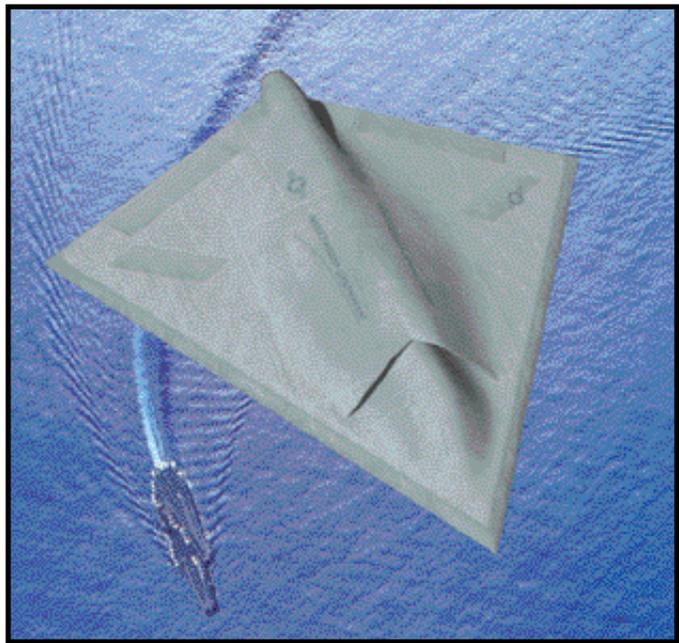
Looking further into the future, such capabilities might someday include the launching of theater space packages from missile-firing submarines, to be controlled by forward commanders. Direct access to the low earth-orbit domain would provide flexible, responsive, and replaceable sensors in situations where national assets are overburdened or degraded. Similarly, establishing and maintaining intratheater communications and sensing capabilities by way of high-endurance unmanned aerial vehicles will expand available bandwidth, increase force protection, and complicate enemy countertargeting efforts, allowing U.S. and coalition forces to maintain the information advantage.

Regardless of their size, launch source, or operating domain, ForceNet sensors will monitor myriad returns with increasing coverage and resolution, to include hyperspectral audio, radiological, seismic, and thermal cues, responding instantly to changing environmental and adversary conditions. Operating forward provides a vital advantage in collecting such information, because there are signal intercept opportunities that only on-scene and often-covert forces can exploit fully. To capture this information, we will develop advanced systems and joint procedures to expand naval capabilities for collecting intelligence and, when need be, conducting information operations.

% Sharing Information: Once information is acquired, it must be shared and processed to achieve knowledge dominance, leading to operational advantage. To meet this challenge, the Navy has been improving data sharing among platforms, including Link 16, the Cooperative Engagement Capability, and the Joint Fires Network. These are important steps in better integrating our forces for network-centric operations, but they represent only a fraction of the ultimate power of ForceNet.

Modern military operations demand more than tracking unit positions and engagement zones. Increasingly, military actions must be informed by political, economic, and cultural understanding. In a world of complex interrelationships, where a single shot can have global ramifications, naval professionals must be armed with the widest possible perspective. To gain this broadened knowledge, joint forces must integrate information, share databases with government agencies and nongovernmental organizations, and develop professionals with the skills and experience to appreciate the importance of such factors.

Effective integration of vast and diverse information will require new models for command, control, and data flow. Our global sensor network must communicate instantaneously to optimize information collection and share critical data, such as missile launch warnings or enemy force movements. Simultaneously, an expansive command-and-control network should provide reach-back and reach-forward capabilities to rapidly disseminate synthesized knowledge for operations. Integral to this effort will be employment of knowledge enhancement centers within which intelligent computer agents help elite analysts search, filter, and classify information to produce a comprehensive understanding of the environment as quickly as pos-



COURTESY OF NORTHROP GRUMMAN

Central to ForceNet is the sensor coverage provided by manned and unmanned platforms.

sible. In the emerging world of covert, dispersed enemy activities executed on compressed timelines, the value of information becomes increasingly perishable. Therefore, rapid information collection, analysis, dissemination, decision making, and execution are critical to winning the life-and-death race for combat effectiveness.

% Exploiting Information: A critical challenge for ForceNet is to develop and deploy powerful decision aids for force commanders, as well as to institute streamlined execution processes to swiftly translate decisions into coordinated actions. This requires enhanced, continual human-centric planning and organizational alignment. Naval professionals are our most valuable assets. It is through their experience, judgment, and ethics that optimal decisions are made. We can maximize the speed and accuracy of their comprehension by employing advanced systems and expert analysts to continuously review and integrate information, while ensuring the resultant knowledge is optimally formatted, displayed, and communicated to decision makers. Thus, ForceNet is ultimately not about providing *more* information; it is about providing the *right* information at the proper time to aid decision making.

Once strategic, operational, or tactical decisions are made, ForceNet systems will be employed to translate them into immediate and effective action by integrating the size, composition, location, and timing of joint effects. Major warfighting gains can be achieved in this area through the application of computer-based technologies. Automated tools will be developed to continuously map and analyze critical variables in the operational environment, adversary forces, and friendly assets. Such tools will keep U.S. and allied commanders updated on the status of increasingly fluid operational environments. Our asymmetric advantages in information collection and processing technologies are ideally suited to such tasks, involv-

ing data-intensive functions for which computer capabilities vastly exceed those of human planners.

Ultimately, the goal of this analysis and display is to predict what will happen next, so that an adversary's actions can be preempted. By drawing on superior information and understanding, ForceNet will allow joint force commanders to foresee potential enemy actions days or weeks in advance. This will empower our commanders to decisively alter conditions and dominate opponents by sustaining the initiative, foreclosing enemy options, and keeping adversaries off balance. By doing so, ForceNet will turn knowledge into action and information into power.

Delivering ForceNet

Bringing ForceNet to reality will require mobilizing a full array of intellectual and financial resources, to include strong leadership from the Director, ForceNet (Deputy Chief of Naval Operations for Warfare Requirements and Programs [N6/7]), the ForceNet warfare sponsor (Director of Space, Information Warfare, Command and Control Division [N61]), the type commander (Naval Network Warfare Command), and its primary systems command (Space and Naval Warfare Systems Command). It also will involve continued intellectual investment by the fleet, the Naval War College, the Navy Warfare Development Command, the other systems commands, and the Office of Naval Research. These organizations will work together to rapidly advance ForceNet-related programs through the acquisition process, fully integrating Sea Strike, Sea Shield, and Sea Basing capabilities within an expanded knowledge-based architecture.

Priority actions to implement ForceNet will include web-enabling the Navy; establishing open architecture systems and standards to allow rapid upgrades and integration; building common data bases to widely share information; implementing standard user interfaces to access information; and establishing portals that allow users to pull data from common servers. These ForceNet initiatives and others will be aligned to advance the following objectives:

- *Enhance sensing, connectivity, and decision making.* This includes surveying existing capabilities to identify “what’s missing,” especially concepts and technologies that would provide: persistent intelligence, surveillance, and reconnaissance over tactically significant areas, with emphasis on rapidly deployable, distributed, and networked unmanned systems; enhanced communications systems to enable secure, multipath, intratheater links that optimize limited bandwidth and satellite resources; command-and-control systems tailored to a distributed and less hierarchical architecture; and network infrastructure that is dynamic and interoperable with joint and coalition forces.

- *Expand joint, interagency, and coalition interoperability.* ForceNet will transcend organizational boundaries. It will integrate the widest possible array of joint and coalition platforms, weapons, systems, and networks, to include sensing, decision making, and action execution

technologies. This effort should encompass all of the services, as well as interagency and international organizations, as appropriate.

- *Invest in intratheater capabilities.* Expanded and redundant sensing and communications paths are vital to achieve the full potential of future unmanned systems. Currently, approximately half of internal battle group communications travels along a circuitous out-of-theater path—from ship to satellite, to network operations center, back to satellite, and to recipient ship. As new, higher capacity systems enter the fleet, this routing path leads to unsustainable demand on limited resources. It also is inconsistent with reducing our dependence on bases ashore. To address this problem, ForceNet must develop high-endurance, organic communication hubs that enhance and extend intratheater networking for joint forces.

- *Focus on the “warrior” in ForceNet development.* While networks, hardware, and software are critical to ForceNet, its real transformational potential results from enhanced warrior performance initiatives that are key to greater situational awareness, self-synchronized execution, and accelerated speed of decision. Developing these capabilities demands that human-system integration efforts be central to ForceNet, ensuring technology is employed to best support our professionals.

- *Experiment, innovate, integrate, and implement.* Aggressive joint experimentation is critical to the success of ForceNet. The Sea Trial process will provide a framework to coordinate efforts and accelerate prototyping, aligning fleet-determined requirements with joint objectives. Sea Trial will advance information-gathering and knowledge-enhancement activities while showcasing the operational potential of promising future technologies and concepts. Pilot projects built around improved joint interoperability, theater-centric capabilities, and warrior innovation will forcefully demonstrate the potential of ForceNet.

Turning Information into Power

ForceNet is the enabler of “Sea Power 21,” turning information into power. Projected operating environments emphasize the decisive advantage conferred by superior information management and knowledge dominance. They will be key to operational success in the decades ahead.

Developing ForceNet will be challenging, requiring a comprehensive joint, multiagency, and international program that integrates systems, processes, and organizations. But the time is right for such an effort. Emergent technologies and concepts offer a rare opportunity to dramatically increase our operational effectiveness. By implementing ForceNet, we will seize this opportunity and leverage the full power of network-centric forces in an information age.

Admiral Mayo is Commander, Naval Network Warfare Command.

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Achieving the Vision!

By Admiral Vern Clark, U.S. Navy

“Sea Power 21” is our vision. It commits the U.S. Navy to becoming fully netted, globally dispersed, and effectively integrated with joint and coalition partners around the world, thereby providing greater power, protection, and operational independence to our nation.



We have entered a new age—a transnational age—that poses highly complex challenges to deterrence and war fighting. Ensuring security in this new era requires fresh thinking and swift action because advanced technologies are proliferating and deadly enemies embrace conflict without limits. As a result, traditional boundaries are fading: between sea and land, home and overseas, and combatant and civilian.

Operating effectively in this new environment will require our Navy to transform as part of the larger joint force. We must embrace innovative operational concepts, new technologies, and organizational change to leverage our information advantage and dominate the full breadth and duration of conflict.

Innovative Operational Concepts

The enhanced capabilities of “Sea Power 21” will result from greater alignment based on a common set of operational constructs: Sea Strike, Sea Shield, and Sea Basing tied together by ForceNet. Sea Strike will move the Navy toward improved joint precision attack, ship-to-objective maneuver, and information operations. Sea Shield will integrate naval forces with homeland defense and intelligence agen-

cies, employ high-speed littoral attack platforms linked to distributed, networked sensors, and project defensive power deep inland. By forward deploying comprehensive area defense capabilities, Sea Shield will strengthen the deterrent power of Sea Strike by increasing the degree of risk involved in aggression. Sea Basing breaks precedent with “. . . From the Sea” by retaining afloat key components of national power.

The result will be a forward-deployed fleet with the multifunction force packaging, information superiority, and combat power needed to dominate war fighting and prevent or preempt adversary actions. Most important, naval, air, and land forces will be integrated like never before, recasting the sea as a vast maneuver area from which to deploy offensive power and defensive protection. Our “Sea Power 21” Navy will become:

Fully Netted. Communications links and computer networks are integrating naval, air, and land forces across a unified battle space, allowing sea-based forces to project offensive and defensive firepower directly ashore with unprecedented reach and precision. The swift collection, sharing, and exploitation of information by way of ForceNet will lie at the heart of our combat power. Integrated data streams, a common operating picture, advanced decision aids, and enhanced knowledge will be critical to completing the precision attacks of Sea Strike; neutralizing threats by way of Sea Shield; and providing focused support from Sea Basing. Quickly turning information into power will be the central element of this transformation.

Globally Dispersed. Future crises will require us to counter regional adversaries armed with antiaccess capabilities, as well as transnational threats such as terrorist and criminal organizations that operate covertly around the world. Key to that effort will be widely distributed forces that preposition persistent and highly responsive warfighting capabilities at the time and place of greatest impact. This is why our Navy is moving toward a global concept of operations that includes carrier strike groups and expeditionary strike groups to amplify the offensive power of the fleet, missile defense surface action groups to push forward the security of the nation, and cruise-missile submarines to forward position striking power without detection. In a world of shadowy enemies, operationally independent, on-scene assets will be central to joint combat effectiveness. The growing reach and precision of sea-based offensive and defensive fires, command and control, and logistics will allow our fleet to concentrate effects rather than massing forces, increasing our strategic agility while enhancing force protection.

Jointly Integrated. The transnational nature of the 21st-century threat and the unified battle space of a global age require the full integration of joint and coalition capabilities. Systems must be interoperable within and between services, agencies, and nations. The “soft power” of intelligence, language skills, and cultural insights must be employed alongside the “hard power” of ships, sub-

marines, and aircraft. Sea bases will be made available to a wide array of joint and coalition assets that are developed from the beginning to be interoperable. In the decades ahead, shared sensors, decision aids, platforms, and weaponry will work together to generate joint combat power of punishing precision and unparalleled effectiveness.

New Technologies

An impressive array of advanced technologies will implement “Sea Power 21.” Tomorrow’s Navy will include unmanned vehicles on, above, and in the sea; long-dwell sensors; hypersonic missiles; electromagnetic rail guns; hyperspectral imaging; knowledge-enhancement computer agents; advanced hull forms; directed-energy weapons; information reach-back networks; a common operating picture; ballistic and cruise missile defense systems; expeditionary sensor grids; heavy cargo at-sea transfer systems; information attack and defense capabilities; international data-sharing systems; and many more changes. Swiftly fielding such technologies will be vital to our national security, for the rate of global change is accelerating and we must develop new capabilities as rapidly as possible to stay ahead of our adversaries.

Organizational Change

To realize the full potential of “Sea Power 21,” we must make our Navy as efficient and effective as possible. That is the goal of Sea Trial, Sea Warrior, and Sea Enterprise.

Sea Trial moves leadership of our Navy’s experimentation effort to the fleet for the first time since the groundbreaking work on carrier aviation, amphibious warfare, and fleet logistics was accomplished in the 1920s and 1930s. It will integrate studies, war games, experiments, and exercises, and will leverage the knowledge and activities of our academic institutions, warfare centers, and systems commands. Commander, Fleet Forces Command, is leading this effort, with the Navy Warfare Development Command acting as the main agent in identifying areas of common interest to serve as catalysts for increased teamwork. The Sea Trial process also empowers the fleet to identify promising initiatives for increased funding and accelerated testing. Electromagnetic rail guns and tactical unmanned aerial vehicles are two projects already earmarked for enhanced organizational support at the fleet’s request. In addition, the Navy Staff’s warfighting analysis effort has been organized into Sea Strike-, Sea Shield-, and Sea Basing-related mission capability packages, to provide stronger resource alignment and support to the fleet. To gather further insights, the Naval War College has shifted from a single annual Global War Game to a series of smaller games focused on developing “Sea Power 21” concepts and capabilities. Finally, the Naval Network Warfare Command was established to speed development of information warfare and ForceNet-related initiatives.

Sea Warrior recognizes that people are capital assets in the information age. In line with this recognition, our Navy will increase investment in the personal and professional development of our sailors. We will provide them with greater information and choice in career decisions to ensure they fill assignments best suited to their skills and needs. Actions to implement these goals are already under way as part of Task Force EXCEL (Excellence through our Commitment to Education and Learning) and Project SAIL (Sailor Advocacy through Interactive Leadership). Sea Warrior initiatives will shape our force to meet the requirements of 21st-century operations, ensuring the right skills are in the right place at the right time. In addition, Sea Warrior's educational focus will reinforce the Sea Trial process by emphasizing study of the military art as central to our profession. Enhanced investment in professional education will be essential to charting our best course into the future.

Sea Enterprise will reconfigure the current support structure, which was designed for cyclic force rotations and tiered readiness, into an information-age organization that provides agile support around the clock, around the world. This will involve increased use of information-sharing technologies, web-enabling the Navy, shifting routine support functions ashore to streamline crews, implementing

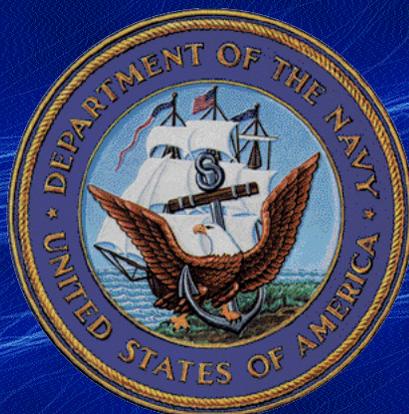
extensive reach-back mechanisms, improving our business practices, and divesting the active force of non-warfighting functions. We also will pursue efforts such as joint weapons acquisition and spiral development to better leverage procurement funds and integrate more fully with the other armed services. Such efforts will enhance our operational effectiveness and free critical resources to recapitalize our fleet.

Projecting 21st-Century Security

The 21st century presents tremendous opportunities to increase naval precision, reach, and connectivity, leading to major advances in the generation of joint combat power. To realize the full promise of such change, "Sea Power 21" commits our Navy to developing innovative concepts, technologies, and organizational initiatives. Together, Sea Strike, Sea Shield, and Sea Basing, enabled by the power of ForceNet, will arm joint and coalition forces with the decisive operational capabilities needed to fight and win. "Sea Power 21" will provide enhanced power, protection, and independence to our nation, projecting greater security into the turbulent decades ahead.

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