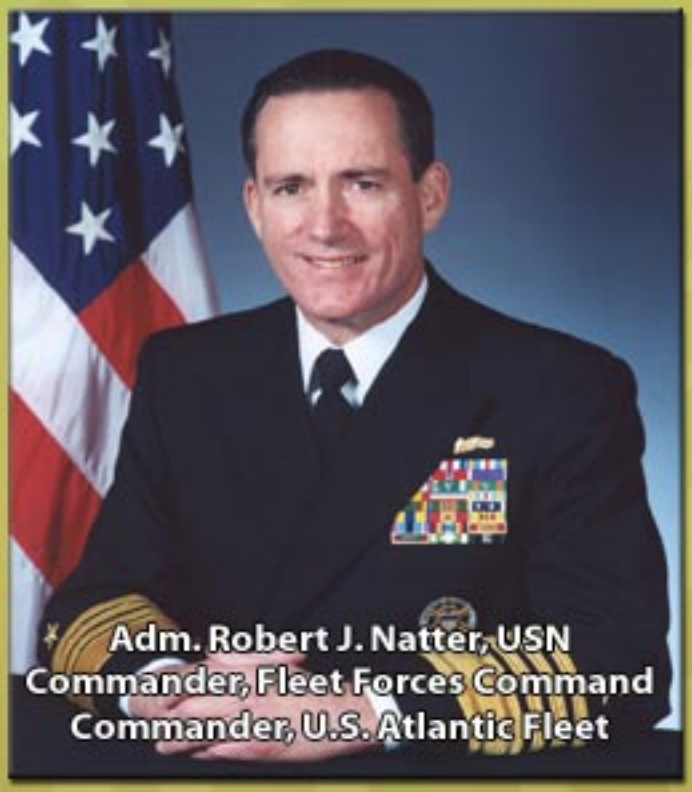
CHIPS magazine

Spring 2003

Susan Morrisey Livingstone
Former Under Secretary of the Navy



Adm. Robert J. Natter, USN
Commander, Fleet Forces Command
Commander, U.S. Atlantic Fleet

Adm. Thomas B. Fargo, USN
Commander, U.S. Pacific Command

Vice Adm. Richard W. Mayo, USN
Commander, Naval Network Warfare Command

Dedicated to Sharing Information - Technology - Experience

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"We must never forget that the men and women in uniform who we serve are, and will always remain the highest and best technological and transformational marvel any of us can ever envision."

Susan Morrisey Livingstone
Former Under Secretary of the Navy

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"... Navy is very actively engaged today helping develop Information Operations as a warfare area."

Vice Adm. Richard W. Mayo, USN
Commander, Naval Network Warfare Command

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"Not only is your Navy ready, but most of it is underway today, ready to answer all bells."

Adm. Robert J. Natter, USN
Commander, Fleet Forces Command
Commander, U.S. Atlantic Fleet

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"Warfighters and planners are successfully and dramatically employing the available information technology to thwart terrorism at each turn."

Adm. Thomas B. Fargo, USN
Commander, U.S. Pacific Command

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"Today the Department of Defense (DoD) uses supercomputers and advanced computational methods to conduct basic research, develop and test precision weapons, and investigate new warfighting capabilities."

Henry Cray, Director, HPCMP

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At sea aboard USS Winston S. Churchill (DDG 81) Mar. 23, 2003 - A Tomahawk Land Attack Missile (TLAM) is launched from the guided missile destoyer USS Winston S. Churchill operating in the eastern Mediterranean Sea conducting missions in support of Operation Iraqi Freedom. Operation Iraqi Freedom is the multi-national coalition effort to liberate the Iraqi people, eliminate Iraq's weapons of mass destruction, and end the regime of Saddam Hussein. U.S. Navy photo by FC2 David Foley, USN.

Editor's Notebook

Words are inadequate to express my admiration and awe for those forward deployed in defense of freedom. Each news photo we see or news item we read is a deeply poignant reminder of our active duty and mobilized reserve personnel — and coalition partners serving with honor and valor far from home.

Former Under Secretary of the Navy Susan Morrisey Livingstone cautions us in her article, that *"there is a fundamental reality all must face and what those in uniform face every day...and this is however wonderous and clever we may be in terms of technological innovation, a large number of our men and women in uniform will never experience it ... Finally, we must never forget that war is nasty, brutish, and remains in many areas of warfare still very basic."*

Chilling words from Ms. Livingstone, and words that have become burned into our consciousness as we have witnessed the strength, courage and sacrifice of those who protect and defend our freedom.

CHIPS sponsors and publisher join me in expressing our sadness and deepest sympathy to the family and friends of those who have made the ultimate sacrifice. While we grieve for those who have been lost and pray for the safe return for those who have been captured, we are intensely proud of our U.S. Forces for their determination, patriotism and bravery.

As I write to you, troop morale remains high and we know that our U.S. Forces will be victorious, but we in the information technology fields must remember what we are working to achieve, as Ms. Livingstone says, *"future technologies ... are for one and sole purpose and that is to protect, help and defend our men and women in uniform ... as they protect, help and defend us."*

God Bless our U.S. Forces and Coalition Partners and God Bless America.

Sharon Anderson

At right: "Our objectives are clear," said Gen. Tommy R. Franks, Commander in Chief of U.S. Central Command in a message to his troops, Mar. 20, 2003 at Camp As Sayliyah, Qatar (NNS). Gen. Franks said to his troops, "We will liberate the Iraqi people from a dictator who uses torture, murder, hunger and terror as tools of oppression. We will bring food, medicines, and other humanitarian assistance to Iraqis in need." U.S. Navy photo of Gen. Franks aboard USS Oak Hill (LSD 51) June 2002.

At left: U.S. Marines from the 2nd Battalion, 1st Marine Regiment assist a captured enemy prisoner of war in the desert of Iraq on Mar. 21, 2003. DoD photo by Lance Cpl. Brian L. Wickliffe, USMC.

Department of the Navy, Chief Information Officer, Dave Wennergren

The DON IM/IT Virtual Community

People are the heart and soul of an organization. They define its culture, drive its performance and represent its knowledge base. Consequently, we must continually seek out the best ways to develop our people and help them to grow, both personally and professionally — providing them with opportunities to develop professionally and have fulfilling careers.

As Information Management/Information Technology (IM/IT) professionals, we are faced with many challenges. We work in a fast-paced environment in which change is the norm. Information Technology is the driver in changing warfare concepts, changing business processes and changing organizational structures. This puts great stress on the IM/IT workforce to stay current professionally, to be responsive and flexible to emerging trends, and still have personal stability in career progression. The IM/IT workforce is at the leading edge of changes in the workforce, and it is a time that demands agility and ingenuity.

We at DON CIO are actively pursuing ways to provide the support programs and tools to ensure our workforce can meet these challenges. We recognize that there is a need for more responsive personnel management that will help us define, retain, recruit and develop the next generation workforce. We must find ways to help the DON adapt quickly to a changing environment and groundbreaking technology.

To this end, we have been engaged in developing tools and programs that will help each of us meet our broad goals by providing specific focus on individual development. For example, we have defined the competencies we believe are key to our future, and we have developed tools to help individuals define career steps that will help them meet personal goals. We have also developed guidance to assist our workforce in identifying and pursuing learning opportunities throughout their careers. These resources are available at http://www.don-imit.navy.mil/workforce.

All of our activities are consistent with the Department's overall approach to strategic human resource management. We are committed to investing in our workforce and aggressively partnering at all levels of the government and within the Department to bring guidance and tools to our IM/IT professionals. The creation of the DON IM/IT Virtual Community is a key component to enable us to link to each other, access relevant resources and collaborate across the DON. I encourage you to get connected (https://donimitcommunity.spawar.navy.mil) and let your voice be heard.

This is truly a time of change, but it is also a time that is full of exciting opportunities. As we continue to work together through the pressures of reduced resources, I urge each of you to take advantage of the available tools and developmental opportunities, and reach out to connect to each other as we leverage the power of our community.

"Putting Information to Work for Our People."

The Pointy End of the Spear

"We must never forget that the men and women in uniform who we serve are, and will always remain the highest and best technological and transformational marvel any of us can ever envision."

By Susan Morrisey Livingstone
Former Under Secretary of the Navy

Ms. Livingstone stepped down as Under Secretary Feb. 27, 2003. Excerpts from Ms. Livingstone's address at AFCEA West were taken for this article.

I'd like to share some thoughts on three topics: the first is on the importance of people in this era of transformational change, then a bit on the Naval vision of the future ... and finally, I would like to address Naval space (and by that I do not mean Pentagon office space, but rather the space that occurs "up there").

First and most appropriately, let's talk about people, our men and women in uniform and their critical importance to transformational change. You have heard so many times that "our people are our most important asset." But let's put that in further perspective: our Soldiers, Sailors, Marines and Airmen are our **only** asset ... for without them, their training, and their motivation, and (what one Army general called) their "situational curiosity," even the highest tech platform or capability has no value. It is critically important as we move forward through this new century and this information age ... that we understand and never forget that.

We talk about future capabilities, future platforms, future technologies and what it will take to move "from change to transformation." But as important as planning is never forget that what we provide ... how and when we provide it ... how we propose to use it, sustain it, and maintain it ... how we envision its place in the theory of war or in operational concepts ... and how we cost it ... are for one and sole purpose — and that is to protect, help, and defend our men and women in uniform ... as they protect, help, and defend us. We must never forget that each of our decisions in each of these areas will significantly impact our men and women in uniform in very personal, fundamental and enduring ways.

We also must never forget that the men and women in uniform who we serve are, and will always remain the highest and best technological and transformational marvel any of us can ever envision. Our warfighters — our 19 year-olds doing flight ops on carrier decks on the most dangerous territory on earth ... pilots fighting the physical limitations of the human body ... ground troops facing dangers no technology can ever address — are not mere users of systems — they are the system ... indeed they are the mother of all systems. We need to understand and never forget that.

We must also never forget that while new technological capabilities are great, in the endgame, they are just tools and gadgets to those who must employ them, and should never be allowed to assume any more lofty position than just that. Unless our warfighters can use these tools in a user-friendly way and in a way that makes a true difference for them — such tools and gadgets are nothing more than burdens and are meaningless.

Finally, we must never forget that war is nasty, brutish, and remains in many areas of warfare still very basic. As we think of grand new technologies, our Seabees today still work with 1950s equipment ... friendly fire is still an issue for our ground troops ... pilots face the reality of their human brain and their human body confronting the limitless boundary of technology ... logisticians still fight for respect and resources with just-in-time and total asset visibility not yet a reality — and C4ISR (even with the wonders of today's technology) is still limited and undercut by organization, bureaucracy, and computer bleeps and blips — and can suffer from information overload.

Most of us are involved in the business of war rather than the warfighting — the tip of the spear. We know our military services are challenged and stressed as never before and are called upon to be ready for virtually anything. They can be called upon to fight conflicts ranging from major theater wars to a global war against terrorism-to battling fanatics in caves. They face a spectrum of threats from weapons of mass destruction to the individual shoe bomber. They have volunteered to perform the most dangerous and most difficult missions that have ever been required of mankind ... for the most important values ever envisioned by mankind ... our shared human values of peace and freedom. And they do so with a courage, dedication, and professionalism that is humbling.

Most of us will not serve directly on the battlefield with these incredible young men and women. But each of us whether we work in the defense industry or as military or civilian personnel working on the business end of the pointy spear are all — still in the war fight.

For we serve as the business warriors for our fighting warriors and our job as their business warriors is to ensure that every dollar we spend and everything we do for our warfighters reflects their needs, the realities they face at the lowest tactical levels, and fulfills their expectations. We owe them nothing less ... and they deserve nothing less.

Since the first shot was fired by Naval forces in Operation Enduring Freedom (OEF), we have been justifiably proud of the enormous capabilities demonstrated by our sensors, radars, missiles, command and control, aviation, sea, and ground assets. But it is also useful to pause and put this justifiable pride in perspective in view of some very basic daily realities faced by our young Soldiers, Sailors, Marines, and Air-

Cmdr. Kevin Bedell, SPAWAR OT (right) briefs the Under Secretary of the Navy Susan Morrisey Livingstone at AFCEA West 2003.

men in the fight today. Let me give you just two examples ... because it is realities such as these that we also must address as we pursue technology and transformation.

Example 1. While we in the Pentagon and those in the Defense press tend to focus on the incredible technological successes of Operation Enduring Freedom, and there are successes, particularly in terms of comparison to Desert Storm (12 years ago) ... successes in terms of targeting, reach, precision, persistence, and interoperability, but in the early days of OEF, the Marines faced a very different basic reality.

Recall Camp Rhino, an expeditionary dirt airstrip where massive dust clouds made every take off and landing a crash waiting to happen. Of course, we had the technology of matting, but we couldn't get the matting to the Marines because of insufficient airlift. A long three weeks later, another potential technology solution in terms of a dust palliative arrived — elegantly called gorilla snot or rhino snot. But rhino snot took water to work and there wasn't enough. So we had to fly in water ... just good old basic water.

High-tech problem? No. Real problem? Yes. Lessons learned: don't forget the basics ... sweat the small stuff as wars may be won or lost on realities such as this ... and people (not technology) made the difference in success.

Example 2. There is a fundamental reality all must face and what those in uniform face every day ... and that is however wondrous and clever we may be in terms of technological innovation, a large number of our men and women in uniform will never experience it.

Take the example of the carrier Constellation now fighting for us in the Persian Gulf. The "Connie" started life in 1961. Perhaps this will be her last fight. As she fights and as we look to the wonders of future platforms, Lt. j.g. Ortega, born decades after the Connie was commissioned, lights her boilers with a $9 Zippo lighter. Without that Zippo lighter (and it has to be a Zippo or a wick because butane would explode in the hellish heat), the Connie doesn't move, doesn't have water to drink, and doesn't launch aircraft.

Lessons learned: Technology is great ... transformational platforms are great ... but only if you have them. The simple fact is that we will never have all our Soldiers, Sailors, Marines and Airmen in the same technological loop at the same time. In one carrier battle group alone, Sailors and Marines will be working with widely differing capabilities separated by decades of technologies. To add to this difficulty and complexity, think of the technological and capabilities gaps that exist with our valued allied and coalition partners. This is a very real and human challenge faced by our men and women in uniform every day and by the more than 90 other countries that have joined us in the war against terrorism. The challenge is how can we maximize the sum of the parts when our men and women in uniform will never all fight with even odds and even capabilities.

There are many more such examples, but these two underscore that the hard task of the 21st century will not be to just find wondrous new technologies and capabilities that enhance our ability to fight and win. Perhaps that's the relatively easy part. Rather the real challenge will be to keep those technologies and capabilities in human perspective and people centric — and this is where transformation comes in.

Transformation is far, far more than technology. Transformation is not just gaining new advantages but how we use them, how we link them all together ... and how we sustain them. As Art Cebrowski keeps trying to tell us in the hope that it will eventually take, true transformation entails the co-evolution of technology, organizations and concepts. Occasionally, that co-evolution of technology, organizations and concepts can lead to such a breakthrough as to produce an emerging new theory of war — that is the difference between mere change and transformation.

Change is just a different way ... albeit hopefully a more efficient and effective way ... to do something. Transformation, on the other hand, is taking that change and adding the human factor of concepts to maximize its power, changing human organizations to maximize its use and rising above the "hardening of the categories" of our own brains to think in wholly new ways.

To move from change to transformation and to sustain that transformation requires one critical ingredient ... and that is very, very smart people. To ensure that we have very, very smart people, we need to value and grow courageous, beyond-the-box thinkers and bold and innovative leaders. We need to keep them on their jobs long enough so they learn them and can make a difference.

We need to <u>value and grow people</u> who have the vision to jointly connect technology, organizational change, process change, and changes in training and operational concepts, and have the ability to continually make the numerous, small (but critical) steps that sustain the environment for transformation. (As current examples, think of Task Force Excel, or the standardization and integration of the Fleets, or the current Sea Trial experimentation with crewing or with UUVs for minehunting.)

We also need to <u>value and grow people</u> able to go even further ... people who can explore and expand the boundaries of doctrine, systems and science, and the way we do business to produce those medium steps that are the beginning of something bigger. (The Navy-Marine Corps TACAIR integration is an example of this.)

We also need to <u>grow and value people</u> who are also able to achieve and recognize such major shifts in capabilities, organizations and concepts that when they actually occur, we actually redefine the entire theory of the war fight. (An historical example is the Naval work that led to the Global Positioning System. Future examples are network-centric warfare or perhaps Directed Energy Weapons.)

Finally, we need to value and grow leaders who can see the needs of our warfighters and meet their expectations whether their platforms are the latest and greatest or the oldest of the legacies ... and whether their job is the complexity of countering mobile missiles or suicide swarms ... or simply hauling water to Camp Rhino to meet a critical mission requirement.

That brings me to my second topic: Naval Power 21 ... the people centric vision of the Naval services for the 21st century. I will be brief as you can read all about Sea Power 21 [in the Winter 2003 issue of CHIPS at www.chips.navy.mil/archives/03_Winter/Winter2003WithTags.pdf], if you haven't already done so.

What I want to emphasize about Naval Power 21 is that this vision has as its foundation one of the most important people centric transformations taking place today in the evolution of the most incredible fighting force partnership ever formed ... the partnership of the Navy and Marine Corps.

The evolution of this powerful partnership has been 227 years in the making. I suggest to you that the partnership of the Naval forces ... in this year and at this time ... is reaching a profound, historic, and absolutely transformational level. What we are seeing today in the integration of the fighting, doctrinal, and organizational capabilities of our Naval forces is — history in the making.

I would be remiss if I did not recognize the terrific leadership of CNO, Adm. Vern Clark and CMC, Gen. Jim Jones [former Commandant of the Marine Corps] ... who never saw a rice bowl that was not worth examining and who had the vision to think new thoughts and the courage to break a few bowls.

Due to their leadership and that of [former] Secretary of the Navy Gordon England, for the first time ever, there is a joint Naval vision (Naval Power 21, which is a marriage of Sea Power 21 and Marine Corps Strategy 21). For the first time ever, there is a joint transformational roadmap ... for the first time ever, there is a joint Naval operational concept in development. Navy and Marine Corps tactical aviation is being integrated ... Amphibious Ready Groups/Marine Expeditionary Units (ARG/MEUs) are being enhanced into new expeditionary strike groups (an enormous cultural change as "amphibious" goes out and "expeditionary" comes in). Also for the first time ever a Marine is a carrier air group commander and a Marine is Commandant of Midshipmen at the Naval Academy. For the first time ever, all of the requirements and combat capabilities that form the transformation roadmap for the Naval forces of the future ... to include ForceNet that underpins the concepts of Sea Basing, Sea Strike, and Sea Shield ... are being developed in total Marine Corps and Navy partnership.

The critical enabler of this Naval vision and partnership is ForceNet, the Navy-Marine Corps term for netted shore, sea, peacetime and joint warfare operations. But just as ForceNet is the critical enabler for Naval Power 21, space is the critical enabler for ForceNet ... and for the Naval Services transformation to the network-centric operations of the future.

And that brings me to the third and final topic — space and the Naval services. As the largest and most dependent of the Services on space, the Naval Services have a long and proud history in space. Historically, from the first Sailor who looked to the stars for navigation, Naval space engineers, acquisition specialists, and operators have been in the forefront of making space operationally relevant. Since the early 1980s the Naval Postgraduate School has had a record of excellence producing space-smart graduates for all the Services. The Naval Services built and operated the world's first ELINT satellite — the first space-based navigation system, and also developed the technology that underlies today's Global Positioning System.

But for some reason (and that reason is usually resources and the loss of champions), as the Naval Services enter the 21st century, we have lessened our leadership role in space. The recommendation of the Space Commission to make the Air Force Executive Agent for National Security Space further caused some to speculate whether the Naval forces should now just be relegated to "user" or "customer" status, and no longer play a strong leadership and partnership role in space development. In recent Naval POM exercises, space has been treated more like a platform, rather than a critical warfare enabler for the Naval Services, competing unfavorably with new ships, planes, and other science and technology (S&T) and research and development (R&D) priorities.

I commissioned a panel to review the role of Naval space under the chairmanship of retired Adm. Bill Smith. The panel's report came out last year and strongly recommended reinvigorating the Naval Services' leadership role in both designing and delivering space capabilities to the combat force, revitalizing and strengthening development, and articulating Naval space requirements.

Since then we have made some progress. NETWARCOM has been stood up under the leadership of Vice Adm. Dick Mayo, who also leads Naval Network and Space Operations Command. A new Naval space policy, updating the 1993 version, is in the works reemphasizing that space be integrated into all Naval operations from the strategic to the lowest tactical level. Rear Adm. Tom Zelibor and Marine Maj. Gen. Kevin Kuklock are the centralized leads for Naval space in the Pentagon. The CNO has reinforced that we must sustain a strong cadre of trained Naval space personnel and a strong Naval space acquisition base. We are working to staff positions across the board at the National Security Space Architect organization (NSSA) and at the National Reconnaissance Office (NRO).

But we still have a way to go before the Naval Services fully step up to a full partnership in National Security Space and leverage, resource, and regain the talent, position and expertise which brought the successes of the past. In my mind, we really have no choice. For Naval transformation will not succeed without space and we cannot expect to just throw our requirements over the transom and expect to get the capabilities we need 8 or 10 years later. Space is the penultimate enabler of joint operations, and if we don't play heavily, our joint warfighting contributions and potentials could very well become marginalized.

In closing, I want to thank you for recognizing how key our young Americans in uniform are to the transformation of the future ... for when all is said and done, they are the ones ... as President Bush has said ... who write history with the "bold strokes of their courage." And thank you for your selfless service and sacrifice, and for your enduring patriotism.

Editor's Note: As we go to press, the Honorable Hansford T. Johnson is Acting Secretary of the Navy and the Office of the Under Secretary of the Navy is vacant.

Interview with Vice Admiral Richard W. Mayo, USN Commander, Naval Network Warfare Command

"Our combination of Defense in Depth, Information Operations, and a coherent network will be the threat to them [network intruders] — they are the ones who better worry."

CHIPS: NETWARCOM was established with the realignment of the operational functional areas of space, information warfare, and command and control in day-to-day network management to a fleet operational command. It has been a short time since stand up in July 2002, but has the transition from N6 been successful in terms of what you had hoped to accomplish by the realignment of resources and responsibilities?

Vice Adm. Mayo: I think we have been successful. It is hard to imagine how something will develop that has never been done before. We were working on this proposal for almost two years before we actually established NETWARCOM on July 11, 2002 — seven months ago. One of the first things we did was to identify short-term goals for the first six months and then long-term goals. We just completed our first six months and we met every one of our short-term goals in the areas of networks, information operations and space. And what is good about that is that these are tangible, concrete, discrete things that we accomplished and can show to the fleet and to the Navy as a result of the establishment of NETWARCOM.

Because NETWARCOM is a fleet organization, acting as the Type Commander for networks and network operations we were able to accomplish these things. For example, in the network area we have clearly improved our information assurance posture. We have completed a good review of Navy Web sites and their registration within DoD. We have improved our awareness of information conditions, what we call "INFOCONs" and how we would execute them. In the information operations area we started to develop an IO architecture. We have become very closely aligned with the new U.S. Strategic Command, which has responsibility for information operations in the joint world. I think STRATCOM sees NETWARCOM as a model for how a Service should establish itself as a network and IO functional Service component.

In the space area, we are looking to firm up the Navy's role in space after the issuance of the Rumsfeld Report [Feb. 16, 2001] designating the Air Force as the Executive Agent for Space. We also have been able to build and deploy an offensive-counter space capability, of which I am proud because that represents real operations capability. So these were among our first six-month short-term goals and I feel very good about achieving them.

CHIPS: I heard [former] Under Secretary of the Navy, Susan Morrisey Livingstone speak about the Navy's reenergized focus on space as a key enabler for joint operations, she said that the stand up of NETWARCOM with you also as head of the Naval Network and Space Operations Command (NNSOC) are important beginnings for the Navy to participate as leaders in space development.

Vice Adm. Mayo: With the establishment of NETWARCOM the former Naval Space Command in Dahlgren, Va., was renamed Naval Network and Space Operations Command under Rear Adm. [John P.] Cryer. We have aligned NNSOC under NETWARCOM, which is part of our functional component strategy. On the joint side, the former U.S. Space Command in Colorado Springs merged with STRATCOM [Oct. 1, 2002]. So just as space has been operationalized on the joint side, so has space been operationalized in the Navy as well — and that is important.

In the aftermath of the Rumsfeld Report when we briefed the Chief of Naval Operations (CNO) on what would be the Navy's future role in space, Adm. [Vern] Clark directed that we concentrate on the operational applications of space to enhance the Navy's mission and combat effectiveness. So NNSOC is clearly focused on those things, which will help us operationalize the products that we get from space to help us do our combat missions even better. For example, effectively using such things as the TENCAP Program [Navy Tactical Exploitation of National Capabilities] products; improving Time Critical Strike through space communications links; the Global Positioning System; precise positioning information and more.

The purpose of the TENCAP Program is to exploit the current and future tactical potential of national space systems and to integrate these capabilities into the Navy's tactical decision-making process as rapidly as possible. Among other things, this will give us quicker turnaround on intelligence data from overhead sensors. The TENCAP program provides the commander immediate access to national assets and the information they provide. We are focusing on how we may operationalize these capabilities in support of the combat mission.

CHIPS: Prior to stand up the plan was that the NNSOC would perform about 75 percent of the network operational functions with NETWARCOM providing the long-range planning for Information Assurance/Information Operations (IA/IO)?

Vice Adm. Mayo: That is the way the division of responsibilities has unfolded. At NETWARCOM our focus with respect to networks has really been on the information side with computer network defense, making sure that we improve our network readiness especially in terms of security. The day-to-day, 24 x 7 operational running and management of the network is accomplished by NNSOC.

CHIPS: What has been apparent to me is the heightened security on our ashore networks and Web sites directed by NETWARCOM. Are the security measures a result of the war on terrorism or were these controls in the planning as part of the NETWARCOM mission?

Vice Adm. Mayo: We discovered that we

had a high number of official Navy Web sites that were not officially registered with the DoD GILS — the Government Information Locator Service. This discovery led NETWARCOM to direct a review of all Navy Web sites — forcing all commands to review their Web sites for both need and content, and subsequently to register their sites to ensure we had an accurate listing. We have been extremely successful in getting over 2,500 Navy Web sites registered. Now we are 100 percent complete. Because of my uncertainty, I was concerned about an intrusion or a misuse of official government information so we cleaned it up. And yes, I was concerned because of the events of 9-11.

CHIPS: I've heard you describe our network-centric warfare capabilities at sea as "fragile." And I've heard you say that the CNO's vision for Sea Power 21 is a transformation solution in many areas. But have there been improvements in capabilities since NETWARCOM stood up that Combatant Commanders and the warfighter can use right now in the war on terrorism?

Vice Adm. Mayo: When I talk about the fragility of network-centric warfare, I generally am talking about redundancy in our communications paths especially in the tactical world — and we also have a few more single points of failure than I would like to have. What we have done at NETWARCOM in the last seven months is to start work on a comprehensive ashore and afloat architecture so we can plan to eliminate single points of failure and build in redundancy and combat survivability.

We put in place a configuration management process so that changes can't be made to our network afloat and ashore without my approval. Therefore, a program management office that is dealing with new capabilities for our networks has to convince me that adequate end-to-end testing has been performed so that when a new system is put on the network there will be no degradation to the network — there will be no failure. Unfortunately in the past we have experienced failures because of incomplete testing. So I think the introduction of a configuration management process has helped greatly.

CHIPS: Part of the DoD transformation plan is bandwidth expansion. DoD is working to bring that expansion to the tactical level. Do you foresee a time when the warfighter and Combatant Commander will have what he needs in terms of sufficient bandwidth?

Vice Adm. Mayo: I see a time when we are going to have more bandwidth than we have now. We are soon going to experiment with an accelerator, which will increase bandwidth to a unit ship. We have recently increased the throughput of our Challenge Athena C/Ku wideband terminals from a T-1, which is a dedicated connection supporting data rates of 1.5 Mbits per second to an E-1, which is a European digital transmission format, supporting 2.0488 Mbits per second. We are also going to introduce new modems and routers to our ship and shore stations, which will dramatically increase the throughput to our large deck ships, command ships and cruisers in the 2004 - 2005 time frame. This will help us to position to take advantage of the new DoD satellite system, the wideband Gapfiller system. So there are some significant bandwidth improvements that are going to happen in the next two years.

But to go back to your question, no, I don't think ships at sea will ever have "enough" bandwidth, but they are certainly going to have more than they do now. And if we could make some progress on information management techniques and knowledge management schemes, I think we will be pretty well off, but we will always need to manage the use of available bandwidth!!!

CHIPS: In an interview with Diann McCoy, DISA Principal Director for Applications Engineering we discussed the worst case scenario, the possibility of a terrorist/criminal threat, which could bring down the DoD architecture. She said chances were very slim due to the Defense in Depth measures in practice. She said that we may have isolated incidents, but ultimately the DISN — and DoD and DON security would save the day. Is this something that concerns you?

Vice Adm. Mayo: I think we could do a better job in preventing attacks. Let me say I am concerned regularly, but that concern is that we stay ahead of both the day-to-day pests and the deliberate state or non-state sponsored intruder intending us harm. I know the Navy Marine Corps Intranet is going to help significantly in this regard because we are going to have much better visibility of all the users who are on the net. We will have a lock down ability to lock a user out if we see suspicious ac-

Vice Admiral Richard W. Mayo, USN
Commander, Naval Network Warfare Command

Vice Adm. Richard W. Mayo was raised in Falls Church, Virginia. Graduating from Brown University under the NROTC Program, he was commissioned an Ensign in June 1968.

Vice Adm. Mayo's sea service included USS Fox (CG 33); Operations Officer, USS Charles F. Adams (DDG 2); Executive Officer, USS Edward O. McDonnell (FF 1043); Chief Staff Officer, COMDESRON FOURTEEN and Commanding Officer, USS Nicholas (FFG 47).

Shore assignments included Aide and Flag Lieutenant, COMNINE, Great Lakes, Illinois; Defense Satellite Communications Project Management Office, Defense Communications Agency, Washington, D.C.; Command, Control and Space Directorate (OP 94D) in the Office of the Chief of Naval Operations; U.S. European Command C3 Directorate Staff in Stuttgart, Germany; Commanding Officer, Naval Computer and Telecommunications Area Master Station, Eastern Pacific in Wahiawa, Hawaii; Assistant Deputy Director for Defense-Wide C4 Support in the Command, Control, Communications and Computer Systems Directorate, the Joint Chiefs of Staff, Washington, D.C.; Commander, U.S. Naval Forces Korea; Director, Fleet and Allied Requirements Division (N60) in the Director, Space, Information Warfare, Command and Control (N6) Directorate; followed by Deputy Director and Fleet Liaison (N6B) and then Director, Space, Information Warfare, Command and Control (N6). He is the Navy's first Commander, Naval Network Warfare Command.

Vice Admiral Mayo is a distinguished graduate from the U.S. Naval War College, College of Naval Warfare and he attended the U.S. Naval Postgraduate School in Monterey, Calif., graduating with highest honors. He holds a Masters Degree in Telecommunications Management.

His personal awards include the Distinguished Service Medal, Defense Superior Service Medal (with Oak Leaf Cluster), Legion of Merit (with Gold Star), Defense Meritorious Service Medal, Meritorious Service Medal (with two Gold Stars) and the Navy Commendation Medal (with Gold Star). He was also awarded the Order of National Security Merit Cheonsu Medal by the Republic of Korea in December 1997.

Vice Admiral Richard W. Mayo, Commander, Naval Network Warfare Command, in his office Feb. 26, 2003.

tivity from their machine or from their local area network. We will have significantly improved configuration control through NMCI. We will have the capability to deny users the ability to load any kind of software that they might bring from home that might have malicious code.

So NMCI is really going to help us in this regard. We need to rethink how we protect our networks and assure our information. Defense in Depth also has to be defense in new and better ways, which we are indeed working into our system. Our Navy's strategy is Sea Power 21, which includes the ultimate answer in ForceNet but also in Sea Shield — which correlates to our network defense — our defense will not be crouched down and waiting for the next casual or determined potential adversary to effect our operations. Our combination of Defense in Depth, Information Operations, and a coherent network will be a threat to them — they are the ones who better worry.

CHIPS: Can you explain what you mean by "INFOCONs?"

Vice Adm. Mayo: You can compare INFOCONs to raising or lowering the physical security conditions on the base. During different levels of threat conditions, we take additional security precautions for access to our base and we force vehicles to drive through a serpentine path through the gate. We do the same thing on our networks through what we call INFOCONs or information conditions. We have a rising level of information conditions: A, B, C and D and various measures within them. At different levels use of the Internet, certain Web sites, e-mail, networks and various other communications is restricted. At the same time INFOCONs could also deny interaction between Naval and non-Naval personnel. For example, Naval personnel may be restricted from using the Internet under certain conditions. We can ratchet up our use of INFOCONs and therefore reduce our exposure to our adversaries.

CHIPS: These are defensive measures, but do you see the Navy taking a more offensive approach, engaging in information warfare on those who would do us harm?

Vice Adm. Mayo: It is clearly a Naval warfare mission area. In fact, NETWARCOM has been given the mission of helping to develop IO — information operations, as a Naval warfare area. We have done things in support of joint force commanders with ongoing activity to support IO. Information operations involve much more than just computer network defense; operations include electronic warfare, military deception, operational security and computer network attack. The actions that we took with the Navy Web sites that I mentioned earlier relate to improving our OPSEC. The U.S. Navy helped our Combatant Commander in Southwest Asia drop leaflets over Iraq. In this case Navy planes dropped leaflets, which warned the Iraqi people not to take up arms against U.S. servicemembers. This is clearly psychological operations, what we call PSYOPS, another of our five areas of mission operations. So Navy is very actively engaged today helping develop IO as a warfare area.

"... Navy is very actively engaged today helping develop Information Operations as a warfare area."

CHIPS: In your remarks at NETWARCOM's stand up, you said that headquarters would be lean with 60 personnel when fully stood up, but that you would be leveraging the talent of the subordinate and affiliated commands which comprise NETWARCOM.

Vice Adm. Mayo: We initially planned about 60, but other billets were identified as supporting functions assigned to NETWARCOM headquarters and transferred to us. Currently we have 63 people on board at NETWARCOM headquarters, 26 at our Nebraska Avenue Complex in Washington, D.C., and 8 in Dahlgren, Va. We really do use our subordinate commands: the Fleet Information Warfare Command, Naval Component Task Force for Computer Network Defense and the Naval Network and Space Operations Command. Then we have affiliations with the Space and Naval Warfare Systems Command, SPAWAR, and the Naval Security Group. We use these connections, and gain some assets and resources to work problems and issues.

CHIPS: Is NETWARCOM still growing?

Vice Adm. Mayo: For today we are not getting bigger — we are just achieving our authorized manning level, however, as our roles and missions evolve, Navy will continually realign to best meet fleet requirements.

CHIPS: The new officer community of Information Professional started on October 1, 2001. What will be the scope of their work? Did you participate in the planning of the initial requirements for this new community? Will these officers spend time in the NMCI NOCs (Network Operations Center) or will they work strictly with the fleet?

Vice Adm. Mayo: Yes, I was part of the planning when I was N6 on the Chief of Naval Operations Staff, as the Director for Space, Information Warfare and Command and Control. The community stood up about 17 months ago. We have had one re-designation board where former fleet support community officers were re-designated into the Information Professional (IP) community and transferred about 330 officers. And from that time we have had three additional lateral transfer boards. We have about 370 officers in the IP community. One of the near-term six-month goals we were successful in accomplishing was to increase the number of sea billets for these officers from 40 to 120. This is a significant increase which means that one third of these officers are ultimately going to be stationed at sea. That is important because the fleet really values these officers' skills and wants them at sea. So this is really a success story. They will continue to have network kinds of jobs both afloat and ashore. They are a restricted

line community, which means they are the network experts. In fact, the mission statement for the Information Professional community states that — IPs own the network. This means they are responsible for running it and when required fixing it or making sure it gets fixed. Everybody looks to the IPs to make sure that the network is running properly. And yes, some of them could very well spend time in NMCI NOCs.

CHIPS: The CNO's vision for the Navy's Revolution in Training, includes, among other initiatives, the encouragement of enlisted personnel to obtain degrees in two- and four-year programs.

Vice Adm. Mayo: Let me go back to the IP community for a moment, one of the hallmarks of the IP community will be continuing education. We will provide opportunities for distance learning, a master's degree, or an additional certification if needed. On the enlisted side, I have an advocacy role for the Information Systems Technicians — our ITs. There are 11,000 ITs in the Navy. We have paid a lot of attention to the IT rating over the last couple of years with the CNO's Revolution in Training. We have laid out a career path for our ITs — from apprentices, to journeymen to masters. Clearly one of the steps that we will be taking in the future is to send more ITs to master's level educational programs. We have identified nine billets where an IT with a master's degree in information systems security will be required. These will primarily be at the fleet level.

Now we are in the process of canvassing for specific IT personnel who could be sent to the Naval Postgraduate School. The Superintendent of the Naval Postgraduate School loves it. Our ITs are going to love it. I'm going to like it a lot because it just speaks to the professionalism and brilliance of our ITs, and how good they are. We need to obtain legislative authority to do this, but that is in the works and then we are going to do it.

But this is great; because as we improve the professionalism of our 11,000 enlisted Information Systems Technicians it is going to help our IPs accomplish their goals and their missions. Then as we improve the professionalism of our IPs they are going to be able to provide better leadership to our enlisted personnel. So I see a convergence of professional missions. I see a dependence and mutual benefit between the enlisted ITs and the officer IPs because they are specialists making sure that the network runs and provides critical information to our ships and command centers. I can foresee this partnership becoming almost like the nuclear Navy where you have both enlisted personnel and officers trained in nuclear engineering to operate the reactors on our nuclear powered ships. I think over time we are going to see the same kind of expertise with ITs and IPs running and operating our networks, and I think it is going to be a wonderful development.

CHIPS: What is on your IT wish list for the Navy?

Vice Adm. Mayo: If I had a Christmas list of the things I would like to get under the tree and share with everybody in the Navy ... I wish we had twice as many IP officers. I think this will be a growing community and it needs to grow fast. These officers are in high demand and will continue to be in high demand. I wish I could provide more bandwidth to ships at sea because they need it and we are moving fast in that regard. I mentioned some efforts that will increase bandwidth within the next two years, but getting increased bandwidth now for our ships at sea is on my wish list. Then slam-dunk, airtight network security where we can know what is going on in every machine connected to the network — and we are working toward that with NMCI. ... Less complex and more user-friendly information systems, which would encourage the spread of using network and information technology even further to provide more capability than we have today ... And Web-enabled services throughout the Navy.

"The building of ForceNet is going to require a lot more time of NETWARCOM as we work to make sure that the fleet requirements for ForceNet will fit and be interoperable with joint forces."

CHIPS: Will ForceNet help provide the items on your wish list?

Vice Adm. Mayo: In the CNO's Sea Power 21 vision, ForceNet is the glue that really brings the operational pillars of Sea Strike, Sea Shield and Sea Basing together. It is more than just connectivity. It is about an information architecture that will continue to evolve to allow more capabilities from a network and IT standpoint, but more importantly from an operational standpoint. We will come together linked through situational awareness and our ability to act quickly with precision worldwide to deliver lethal effects when required either kinetic or non-kinetic. ForceNet is going to be absolutely key to Sea Power 21. The building of ForceNet is going to require a lot more time of NETWARCOM as we work to make sure that the fleet requirements for ForceNet will fit and be interoperable with joint forces. ForceNet is one of my three primary goals for the next year. My other two goals are information assurance — improving our network security, and information operations — continuing to develop IO as a warfare area.

CHIPS: Can you talk about joint, allied and coalition interoperability?

Vice Adm. Mayo: The Navy has made great strides over the last year to field the capability afloat whereby we can exchange information with allied and coalition ships at sea. This is happening today in the Arabian Gulf and we are utilizing the capabilities very well. We can exchange e-mail with attachments between allied and coalition ships. We can share Web pages and Web-based information, and we can do chat to some degree. So we have made great strides in allied and coalition interoperability and will continue to do so in the future. We must continue because that is how we perform Naval operations — jointly with other countries. We conduct exercises and are always at sea with allied and coalition navies.

"NETWARCOM is a joint component ..."

NETWARCOM is a joint component — the functional component commander to U.S. Strategic Command for networks and information operations. That is an operational hat that I wear and it just shows the important linkage between the Naval Service and the joint world as the mission areas of networks and information operations continue to develop. They really are joint and global in scope, and they need to come together to get the visibility at the joint level. We take our role as the Navy functional component commander to STRATCOM very seriously.

YOUR NAVY IS READY

"Not only is your Navy ready, but most of it is underway today, ready to answer all bells."

By Admiral Robert J. Natter, USN
Commander, U.S. Fleet Forces Command
Commander, U. S. Atlantic Fleet

... As you might guess, I'm a big fan of change — as long as it produces better warfighters, and as long as we are spending our time and money creating change that is worthy of the investment. I'll talk more about that in a minute.

...Our Navy's partnership with industry has delivered the best and most capable Navy in the world. We should all be proud of our exceptionally capable ships and aircraft, with the world's most advanced systems, including GPS and satellite communications, the F/A-18 E/F Super Hornet, cooperative engagement capability, precision guided munitions, and the best C4I networks in the world. Given the tremendous pace of technology advancements today, it is a partnership more important than ever for supporting our Sailors and Marines in combat.

As good as that partnership has been, I think we can do better — because the reality is that advances in technology are outpacing our military's ability to choose, develop, and field those technologies. If it makes sense from the fleet's operational perspective, and makes sense from the standpoint of being fiscally responsible, whenever possible we should accelerate delivery of new capabilities to the fleet — which must be ready to go to war today, next week, and next month, not just in the outyears of the FYDP [Future Years Defense Program].

...I want to talk a bit about some of the changes in our Navy that have set us on a course to be transformed, to be better prepared in today's world of distributed threats. I'd like to address this in three ways: first, how the Navy has transformed organizationally; second, how the Navy has transformed operationally; and third, I want to talk about, perhaps, the most concrete and impressive near-term product of our Navy's transformation — the "surgeability" of our Fleet Forces today — how we have streamlined and accelerated the process of getting more Sea-Power deployed forward faster.

Organizational Transformation

Shortly after taking over as CNO, Adm. Vern Clark laid out a vision for our Navy that was truly transformational, well before that term was in vogue. In addition to his emphasis on leadership and retention of our great Sailors, he restored the Navy's focus on the fleet. He recognized that in order to improve and sustain current readiness, as well as develop the Navy that the next generation of Sailors will inherit, we needed to restructure and streamline our chains of command so that we all had a clearer fleet focus.

Adm. Natter addresses Sailors assigned to Helicopter Mine Countermeasures Squadron 15, based at NAS Corpus Christi. The admiral spoke with Sailors and answered their questions about operational issues and quality of life initiatives. U.S. Navy Photo by PH1(AW) Whorton.

The first step was the establishment of the Fleet Type Commanders. Initiated in 2000, the benefits gained were immediate and included: organizational alignment and streamlining of the Type Commanders; eliminating differences and redundancies between coasts; and having commanders speak with one voice when addressing requirements and investment priorities.

These are organizational changes that have placed greater emphasis on the fleet's responsibility to identify requirements, influence resourcing decisions, and be involved directly with experimentation. As a result, our Navy's future capabilities will have a firmer basis in operational realities in how the fleet intends to fight — using promising technology and systems that the acquisition community and industry are developing. In support of this effort, Commander Fleet Forces Command (CFFC) was designated as lead agent for Sea Trial. We develop and formalize experimentation in the fleet and transition successful experiments to fleet capabilities. Furthermore, we aligned Naval Warfare Development Center (NWDC) under CFFC to clearly delineate responsibility for developing doctrine — and to integrate that doctrine into our experimentation. Finally we established Naval Network Warfare Command with a three-star admiral [Vice Adm. Richard W. Mayo] working for CFFC and the fleet, to act as executor for information technology, information operations and space warfare.

Operational Transformation

Given the CNO's organizational charter, CFFC's new operational responsibility included the requirement to more clearly define the Navy's warfighting vision, to develop the supporting concepts of operations, and finally, to leverage and inject new technology into the process when appropriate. Fiscal reality and plain smart business sense make it imperative that we determine early on which changes, technologies, and improvements are worth investing in and which ones are not. Because trying to champion all potential concepts results in actually championing none.

The first step in any approach to operational transformation ought to be focused on the end product — the concept of operations

At sea with USS Florida (SSBN 728) Jan. 16, 2003 — USS Florida launches a Tomahawk cruise missile during Giant Shadow in the waters off the coast of the Bahamas. Giant Shadow is a Naval Sea Systems Command (NAVSEA)/Naval Submarine Forces experiment to test the capabilities of the Navy's future guided missile submarines. Florida is one of four Ohio-class ballistic missile submarines (SSBN) being converted to guided missile submarines (SSGN).

Giant Shadow is the first experiment under the "Sea Trial" initiative of the Chief of Naval Operations' Sea Power 21 vision and the first in a series of experiments before converting and overhauling the four SSBNs to SSGNs. The SSGNs will have the capability to support and launch up to 154 Tomahawk missiles, a significant increase in capacity as compared to other platforms. U.S. Navy photo.

that helps us answer a couple of fundamental questions: *Where do we need to take a specific warfare mission, and what technologies can we field to help us get there?*

Last year's Mine Warfare Study, [See CHIPS Winter 2003 at www.chips.navy.mil] prepared by CFFC with input from the fleet and NWDC, is an example. It serves as the foundation for our way ahead in combating the mine threat in the near-, mid- and long-term, including more extensive use of unmanned vehicles, and experimentation with alternatives to Inchon, the old Mine Countermeasures Support Ship. For example, this past fall USS Kearsarge very successfully joined mine countermeasures assets as the command and control ship during a ten-day squadron exercise in the Gulf of Mexico. We also to need to field the right technologies to improve our current capabilities in this important mission area.

The Atlantic Fleet's Training Resource Strategy (TRS) is another example of keeping an operational focus in developing fleet requirements. It is a training strategy that accounts for today's threats and weapons, and takes advantage of new opportunities available to us through emerging technologies. We are working closely with the Air Force and communities supporting DoD ranges throughout the East Coast and the Gulf of Mexico in this endeavor.

The TRS will support more effective training in precision munitions, increasingly the weapon of choice in combat operations; it will allow us better utilization of existing CONUS ranges, reducing the transit and TAD costs associated with training out of CONUS; and will provide greater flexibility to our training venues through more extensive use of at-sea ranges and simulation, such as what is being done with precision scoring systems like the Virtual At-Sea Trainer (VAST).

Most importantly, we are evaluating and choosing the technologies and combat capabilities that best support our concept of operations — rather than the other way around. For example, in December 2002 we gathered over 40 representatives from throughout the fleet, the Marine Corps and the R&D community to consider the way ahead for the fleet's use of High Speed Vessels. Taking the experiences gained to date with HSV-X1, we developed a clear set of operational objectives and technologies for the follow-on HSV-X2 that will be tested over the months ahead. Many of the capabilities that we are looking at for HSV, especially in the areas of Mine Warfare, Special Operations, and command and control, will help us better define the requirements appropriate for the Littoral Combat Ship.

Another example is our first fully developed Sea Trial experiment, Exercise Giant Shadow, conducted this month [January 2003]. The USS Florida and a number of other sea- and land-based assets will help us investigate some of the great warfighting potential that we are planning for our new SSGNs. The SSGN program of record will deliver a ship capable of launching 154 Tomahawks and conducting campaign-level Navy Special Operations missions. It is a ship that will bring an awesome capability to the fight, and we've only begun to scratch the surface of its many potential capabilities.

Surge Capability

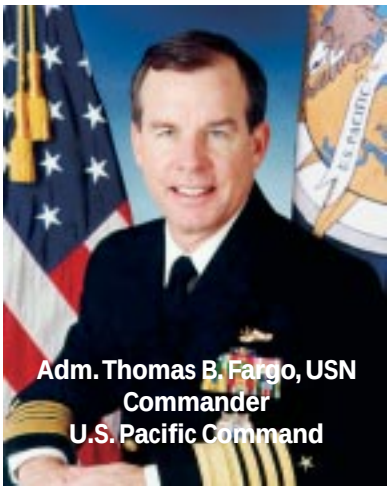
All of what we do and attempt to do boils down to one thing — combat capability. Is the fleet ready today, and will it be ready tomorrow — ready to deploy to sea and answer the nation's call against any and all threats to this great country of ours? The answer had better be YES! Today, our nation's vitality — our economy, the security of our citizens — is challenged directly and indirectly with the threat of weapons of mass destruction in Iraq and North Korea, ... terrorist violence in Indonesia, Bosnia, Somalia, and the scourge of terrorism on our own shores.

To answer these threats your Navy is ready — really ready. We have seven Carrier Battle Groups, six Amphibious Ready Groups, over 100,000 Sailors and Marines either forward deployed and ready for combat, or able to rapidly surge to support combat operations ... our best combat readiness in years.

It is great to be part of the Navy in 2003. Our ships and our aircraft are ready ... well-maintained, well-manned, and well-stocked with weapons. Our people are ready. We have the best retention in more than a decade and the most motivated force I have ever seen. Morale is high, and we have great Sailors and Marines, prepared to do the job for which they are trained.

On September 20, 2001, in a speech by the President to the nation, our Commander in Chief gave his military leaders very clear direction: *"Be ready."* I am proud to report on behalf of all our Navy's men and women: Not only is your Navy ready, but most of it is underway today, ready to answer all bells.

Edited from Adm. Natter's remarks at AFCEA West, Jan. 15, 2003.



Adm. Thomas B. Fargo, USN
Commander
U.S. Pacific Command

The Pacific Theater ...

Where the Rubber Meets the Road

Admiral Thomas Boulton Fargo assumed duties as Commander U.S. Pacific Command, at Camp H.M. Smith, Hawaii, on May 2, 2002. He is the twentieth officer to hold the position. As the senior U.S. military commander in the Pacific and Indian Ocean areas, he leads the largest of the unified commands and directs Army, Navy, Marine Corps and Air Force operations across more than 100 million square miles. He is responsible to the President and the Secretary of Defense through the Chairman, Joint Chiefs of Staff and is the U.S. military representative for collective defense arrangements in the Pacific.

"Warfighters and planners are successfully and dramatically employing the available information technology to thwart terrorism at each turn."

...Two years ago, from the Pacific Fleet vantage point, I talked to you about our strategic plan called PACFLT 2000. I highlighted a number of our goals including "knowledge superiority," and detailed how you might help us achieve it. And I know that (Admiral) Denny Blair over the past two years, provided an update on several programs to include the Pacific Command's C2 architecture, exercise requirements, Joint Mission Force and enhanced Allied Interoperability employing COWAN, APAN, and MPAT, among others. Those are all alive and in fact doing very well.

So, I thought rather than cover similar ground, I might be able to best set the stage ... by talking about some of the larger issues of how we see today's security concerns in the Pacific and the priorities we have set to deal with the fundamental change that is evident in our lives since 9/11.

...I am often asked what worries me? There are a number of concerns and they're reflected very clearly in the national military strategy. That strategy directs us to assure our allies and friends, deter aggression, dissuade competition, and if necessary, fight and win our nation's wars. So, first and foremost, we worry about the potential for conflict on the Korean Peninsula. After all, this is where the stakes are very high even though the likelihood of conflict is low. Second, we worry about a miscalculation between strategic rivals (and here I'm talking about China-Taiwan or India-Pakistan). Next, transnational threats like terrorism demand our attention. We're also concerned about the potential for instability caused by a failing nation-state and the resulting humanitarian crises that could flow from that instability. Finally, and certainly in my case, we have the need to keep U.S. forces trained and ready now and in the future to handle the full spectrum of security concerns.

At Pacific Command, our priorities flow from these concerns. The first two are "sustaining and supporting the global war on terrorism" (and it's no coincidence that I list this one first), and "improving the readiness and joint warfighting capability of the forces." The third priority, which deals with our focus on the "quality of service of our men and women in uniform," has been fundamental to our success. But for now, I will talk about the last two priorities in some detail: "Reinforcing what I call the 'constants' in the Pacific Region" (to include bilateral relationships, and the commitment of forward-deployed forces) and, finally, "promoting change and improving our Asia-Pacific defense posture for the future..."

So let me start with constants. I thought it important people understand from the outset of my tour, that the foundation of the U.S. security equation in Asia and the Pacific has been — and will continue to be — our long-standing bilateral alliances. We currently maintain five treaties. They are with Japan, South Korea, Australia, the Republic of the Philippines and Thailand. We have good friends in places like Singapore and Malaysia and we're developing new relationships with India and other countries. We also recognize that much of what we do will necessarily be multinational in character (such as addressing transnational threats). All of these relationships, whether bilateral or multilateral, support our mutual or shared interests. And it is the forward presence of U.S. forces and their combat capability that underpins this security arrangement.

The center of gravity in Asia-Pacific remains Northeast Asia. This is where the important dynamic of Korea, Japan, China and Russia and the influence of the United States come together. Our alliance with Japan is the most important one in the Pacific and has been fundamental to regional stability and security for almost 60 years. Despite current economic concerns, the United States and Japan together account for almost 40 percent of the world's economy, comprising a huge percentage, with immense stability and security implications. A strong partner in the region's security, Japan is home to the U.S. Seventh Fleet, acting as both a gracious host and crucial ally.

In the wake of September 11, the Japanese Diet acted with speed to pass antiterrorism legislation, enabling historic changes in the employment of the Japanese Maritime Self Defense Force and facilitating crucial airlift and replenishment operations in the CENTCOM AOR. Japan has a very capable and professional military, and continues to move toward a normal security architecture. From a strategic context, we are not looking to reduce any combat capability forward, but we're always looking to eliminate any unnecessary footprint. That is where you come in and we'll talk to it more, shortly. All in all — in my opinion — our relationship with Japan has never been stronger; it is as good as I have seen it.

Korea. I have to say this is where the rubber meets the road or where the stakes are the highest for the entire theater. This relationship has been a keystone for security for 50 years, and it is my strong belief that our continued partnership and presence will transcend any future reconciliation in that subregion.

But there is still plenty here to worry about. North Korea's forward-deployed army is a formidable force and immediate threat, and recent admissions of a nuclear weapons program bear out our long-held concerns. Certainly, as we work through these concerns peacefully, keep in mind that we won't reward unacceptable behavior. Meanwhile, we are ever mindful of the fact that we are guests in South Korea, and are working hard to minimize the adverse impact of our presence on our hosts there. The Land Partnership Program, for example, which was just ratified in the Republic of Korea is just one initiative to further this cause. The Republic of Korea's support for the Global War on Terrorism has been simply outstanding — in the form of medical and sealift support, airlift and replenishment operations, and extensive financial and humanitarian aid. Their actions serve well to reinforce the strength of our alliance.

It is clear to me that China seeks to be the dominant influence in the region — and to pursue this goal diplomatically, economically and militarily. Their economy is growing at a rate of nearly 10 percent per year. Diplomatically, they are reaching out throughout the theater, increasing their influence. Militarily, we've noted a few key developments. We see increased amphibious training in the last few years (with an exercise currently ongoing), the determined development and deployment of short-range ballistic missiles, and an acquisition of third and fourth generation military capabilities (like the KILO SSK, Su30's and the Sovremenny). And we have concerns about China's seeming reluctance to abide by norms of international law for international air, sea and space access. On the other hand, we are encouraged by China's announcement of regulations for controlling missile technology exports and by their support for the Global War on Terrorism.

The obvious sticking point in our relationship is China's unwillingness to renounce its use-of-force option against Taiwan. The Taiwan Relations Act and nearby shipping lanes make Taiwan militarily significant to Pacific Command. Any effort to determine the future of Taiwan by other than peaceful means — including boycotts or embargoes — is a threat to the peace and stability of the Asia-Pacific region. At the same time, these two nations have an interesting symbiosis. China is a burgeoning job market for Taiwan, and Taiwan is a capitalist democracy and trading partner 100 miles away. With both countries in the World Trade Organization, the economic relationship may well lead to improved relations and reduced tension. China is not our enemy. We desire a constructive relationship, including military-to-military ties. We will move ahead, providing this relationship features reciprocity, consistency and transparency...

Singapore and Malaysia have been tremendous partners in the Global War on Terrorism. Singapore has long been a strong partner to us in the region, and our relationship with them is only getting stronger. Demonstrations of their support abound. First, they've played a very noteworthy role in the Global War on Terrorism, discovering and interrupting a number of terrorist attacks. Second, they are the first Asian nation to join the Container Security Initiative, which pre-screens some of the six million shipping containers that enter U.S. ports every year. And if you don't think our sea lines of communication are important, consider the recent impact of the West Coast dockworkers' strike to our economy. And they are great supporters of U.S. presence in the region, hosting a modest logistics presence. (As you know, they have a magnificent port at Changi, designed — and willing — to accommodate our most capable aircraft carriers.) Lastly, Singapore recently hosted the Chiefs of Defense Conference and did a marvelous job. It was the first-ever conducted outside of Hawaii.

Feb. 24, 2003, Adm. Thomas B. Fargo (right), Commander U.S. Pacific Command, welcomes Republic of the Philippines Secretary of Defense Angelo Reyes, at the U.S. Pacific Command Headquarters. Reyes met with Fargo to discuss issues of mutual interest including counterterrorism. (Photo by U.S. Navy Petty Officer 1st Class Clint Beaird.)

Meanwhile Malaysia has arrested dozens (at least 62) of terrorists, mostly from the Jemaah Islamiyah, the Al Qaeda surrogate operating in Southeast Asia. Malaysia also provides exchange of military intelligence and approval of overflights for the air bridge to Southwest Asia. Other encouraging Malaysian initiatives include the prospect of a Counterterrorism Training Center in Kuala Lumpur and the recent trilateral agreement between the Philippines, Malaysia, and Indonesia on counterterrorism.

I traveled to Indonesia in August (2002) and consider it a very important place. I don't know if you realize, their democracy is both new and very large — the second largest democracy in the world. They have the world's largest Muslim population inhabiting over 17,000 islands with several thousand miles of coastline. Currently, Indonesia is wrestling with a huge range of issues. Their recent historic Fourth Amendment legislation provided some crucial improvements, including the elimination of the Indonesia National Military (TNI) influence in the legislature by 2004. These efforts make me hopeful that their governmental reform and our growing appreciation of Indonesia's critical role in regional security will build momentum for peaceful Indonesian democratic development. At the same time, their Chief of Defense, General Sutarto's open audit of some of the TNI-owned businesses is also a step in the right direction.

But, we remain concerned about the presence of terrorist forces in Indonesia, most graphically illustrated by the recent bombing

in Bali. Bali has had a profound impact on the region, producing a heightened sense of vulnerability as well as significant economic impact. As a result, Indonesia is taking on the important task of rooting out, investigating and punishing suspected terrorists.

The Republic of the Philippines serves as a great illustration for both bilateral and multilateral cooperation. It's an important front on the Global War on Terrorism due to both its location and population, and because of their vulnerability to Al Qaeda and similar groups' sponsorship of the Philippines' domestic terrorists. Last year, the Republic of the Philippines invited us in to assist them in developing a framework for building their counterterrorism capabilities. We found that comprehensive and realistic training fundamentally improved both planning and execution. As a result, the Abu Sayyaf Group was dramatically reduced, with many of ASG's leadership eliminated or captured. Their operations have been drastically disrupted, and their funds and sponsors have been drying up. The operation served as a great template for successful training and execution, and provided the lesson that military force has to be matched with civil action to address the root causes that give rise to terrorism in the first place.

Having said all this, you have all heard about the recent bombings to include one that killed an American soldier in Zamboanga City. With Abu Sayyaf leadership (Khaddafy Janjalani) calling on all followers to "strike its enemies," we're probably witnessing a significant development that will undoubtedly alter our future plans and operations in the Philippines.

Australia remains one of our oldest allies and a special partner in the Pacific. We've worked hard to eliminate the technology barriers between our forces with the intention of strengthening our combined capabilities. Australia demonstrated their leadership in taking a lead role in East Timor's security. They continue to demonstrate regional leadership and to make significant contributions as a partner in the Global War on Terror. For that matter, they've contributed to every significant military effort in my memory, regarding the security and democratic development of nations in the South Pacific. And like the United States, they have tragically suffered at the hands of terrorists, most recently in Bali. I met with Prime Minister Howard recently and it is clear this despicable act served only to strengthen our combined resolve to counter this threat. In my opinion, our relationship with Australia is as strong, if not stronger, than it has ever been.

We are also encouraged by new, burgeoning relationships. India has been an essential partner in the Global War on Terrorism — most notably in their provision of shipping escorts in the Malacca Strait shortly after 9-11. We are also engaging in bilateral component commander level discussions, and I plan to visit India next month.

Now I have walked you through our region to illustrate the specific, but varying importance and concerns each element presents. Ironically, it is not the "parts" perhaps, as much as the sum of the whole, that most challenges us. That brings me to our fifth priority, "promoting change and improving our Asia-Pacific Defense posture for the future." Our security challenges — and those regional conditions to which we must be especially attuned — dictate the capabilities we need both now and in the future. In his book, "The Lexus and the Olive Tree," Tom Friedman tries to capture the incredible effects of post-Cold War globalization. And I think we recognize globalization's profound impact on political, economic, social and military change both domestically and internationally. Most of this change is certainly for the good, but there is a downside. The ill effects include the broader impact of crises (across borders) combined with a shorter time to respond. We know too, that the information technology that powers the global economy can also serve as a conduit for destructive agendas. All of this means that our economic interests and our security interests are linked like never before. The instantaneous character of the global economy and the global information network mean that all of us will prosper — or suffer — quickly and collectively. And just as the war on terror is a "global war," so too are our other security interests interrelated. As we think about security transformation — and there's a reason I didn't say "military transformation" — we grapple with a number of issues, as do you. At Pacific Command, we animate, or what I call "operationalize" the strategic guidance we have received in order to meet the security imperatives we face in this theater.

...We're looking at building on our Command and Control arrangements, broader access, sustained forward Force Posture, updating our Plans in a significant manner, dramatically improving our Capabilities, and developing New Operating Patterns and Constructs. At PACOM, our C4I objectives include an information grid that is seamless, secure, and interoperable, that leverages commercial technology advances, and accommodates evolution. As you move forward with your own set of initiatives, I want to ask you to address some of the IT issues and imperatives that follow.

First, I think, is architecture. One of the primary tasks of the Combatant Commanders is to define those capabilities we need to execute our duties while meeting the existing and projected threats to our national security. Currently, there is not a clear blueprint for us to bring together the myriad system solutions into an end-to-end decision making capability. Each system is developed independently requiring the Joint Task Force or Combatant Commander to do much of the integration needed to bring all required information sources together. Addressing this challenge involves multiple stakeholders including system developers, our military and policy makers, all working toward a common set of requirements with a common view of the information infrastructure — not a Navy view, Air Force view, or Army view — it must be a *Joint and Combined* view.

In all fairness to you, we in defense leadership positions, OSD, Joint Staff and Combatant Commanders, need to get together and provide a comprehensive framework that will enable you to provide the solutions that we need to maximize operational effectiveness and combat power. The Global Information Grid, or GIG, is a great start, but it needs more rigor to enable the integration of service-developed solutions into the coherent information infrastructure that we need to support Network Centric Operations. At PACOM, we have developed an information capabilities framework that maps solutions onto the GIG, and are currently in the process of aligning our systems to this framework through the Joint Information Capabilities Enhancement Environment, or "JICEE." We are piloting this effort in the implementation of current and future C4I systems into our new headquarters building. You should come and see it.

Joint Forces Command, through SECDEF's Battle Management

Command and Control initiative, will be pivotal in fleshing out the GIG. We expect this to become the comprehensive system implementation environment that will get new technology into the hands of our warfighters sooner, more effectively, and we hope, more efficiently. That brings me to my next challenge ...

Efficiency. In my opinion, only half of the promise of IT transformation is being met. We have challenged you with providing two broad improvements: much greater Capability and some modicum of Efficiency. Capability and our capacity continue to improve (although our appetite for capacity may never be satisfied), but clearly, efficiency lags. Supporting infrastructure is not being reorganized to my expectations. OM&N costs for IT continue to rise, the amount of space in the new headquarters that is dedicated to servers and supporting IT infrastructure is astonishing, and we are struggling to effectively assess progress on IT initiatives such as NMCI. We have more people than ever working IT issues. It's important, but we need to streamline our IT forces. In effect, we need to do a better job of measuring our progress by determining our information technology return on investment.

Reachback is next. One of my primary transformation concerns is to reduce our forward footprint while maintaining and even increasing forward combat power. A primary method of footprint reduction is the consolidation or elimination of unnecessary forward infrastructure, especially through the use of reachback capabilities. One of my favorite examples is meteorology support. We have METOC — weather stations throughout the world, occupying buildings and land — requiring people who could be put to other uses. METOC information should be widely available via the network — a desktop icon — sensed and analyzed remotely rather than forward in theater.

Reachback is going to be a big part of our future construct. As we develop smaller, more mobile headquarters, information technology must provide us the means for achieving "expertise" forward. Reachback will serve as a critical link between the forward located Joint Task Force Headquarters and the information provider — whether PACOM, JICPAC, or the Air Operations Center at Hickam AFB to name a few. As such, we must continue to pursue initiatives like dynamic bandwidth management. One answer to our growing hunger for increased capacity is to ensure we minimize or eliminate channelized bandwidth — bandwidth which lies idle, fenced off for a specific purpose. I realize security concerns frequently drive this design feature, but it's wasteful and deserves your continued attention as you progress toward a more Network Centric Operational capability.

Assuring our Allies and Friends — not a new topic. I also mentioned that we are updating our plans to accommodate the new security context. One of our primary efforts here is to ensure our allies — our partners in Asia-Pacific security — join us on this transformation journey. Our aim is to improve their capabilities and relevance in future conflicts so that they can assume a greater share of the burden for their own security — not less. This will not happen if the IT improvements we effect do not consider both joint and coalition interoperability concerns. We are making great progress in this arena through both the APAN and our COWAN initiatives. Again, there are significant and multilevel security considerations for this effort, but inclusion of our friends and allies is indeed an IT imperative.

Feb 25., 2003, the USS Carl Vinson (CVN 70) prepares to tie up at Kilo Wharf in Apra Harbor during its first port call to Guam. The Carl Vinson Battle Group is conducting routine operations in the Western Pacific as part of America's commitment to our friends and allies in the region. U.S. Navy Photo.

Last, is Information Assurance. Tom Friedman's "dark side" of globalization applies not just in the marketplace, but in the C4I world as well. Protecting information and the infrastructure where it is gathered, delivered and stored is a necessity. This protection must be engineered from the outset, not added as an afterthought. Having said that, the security measures we engineer into our systems must not reduce our information sharing agility, reducing the lethality of our forces when they need it. In fact, we need to improve our information agility without compromising our security. Managing the delicate balance between "protection" and "sharing" shows up on my scope more and more frequently.

I hope this survey of our security issues in the region provides an adequate backdrop for other discussions, including the huge contributions of our component commanders.

There is no question that we all have a big job ahead of us. The Global War on Terrorism is challenging us in new and difficult ways. The enemy's tenacity and disregard for life itself, is reflected today in their persistent and vicious activity. But this war provides us with an insight too.

Warfighters and planners are successfully and dramatically employing the available information technology to thwart terrorism at each turn. The intelligence we gather has identified personnel, logistics bases, transport, and equipment to capture and eliminate enemy combatants, while often protecting innocents. By aggressively working electronic signals, databases, and banking transactions, we have stalled the operations of many terrorist cells and helped to reveal terrorist plots before their execution. Information technology — both its capabilities and its hardware — is fundamentally helping to win this war.

A man named A. Lou Vickery said, "Nothing average ever stood as a monument to progress." The task at hand will require our very best efforts, and I know you are up to the challenge.

Edited from Adm. Fargo's remarks at AFCEA Asia Pacific TechNet (Nov. 19, 2002). Special thanks to Maj. Becky Rouse, USA, USPACOM Speechwriter, who provided the text from Adm. Fargo's brief.

The High Performance Computing Modernization Program

By Henry Cray, Susan Pfeiffer-Vega and Bill Gabor

Introduction

Since the introduction of the ENIAC in 1945, high performance computing has played a major role in the development of new technologies. Today the Department of Defense (DoD) uses supercomputers and advanced computational methods to conduct basic research, develop and test precision weapons, and investigate new warfighting capabilities. Central to this activity is a partnership among the defense laboratories, test centers and the High Performance Computing Modernization Program (HPCMP). The HPCMP formally started in 1993 (see Figure 1) in response to Congressional and senior DoD leadership direction. The program grew from a collection of small high performance computing departments, each with a rich history of supercomputing experience, which independently evolved within the Army, Air Force and Navy laboratories and test centers.

The HPCMP provides the supercomputer services, high-speed network communications and computational science expertise that enables defense scientists and engineers to conduct a wide-range of focused research, development and test activities. This partnership puts advanced technology in the hands of U.S. forces more quickly, less expensively, and with greater certainty of success. HPC resources play a critical role in Homeland Security, such as, countermeasures to anthrax and DoD counterterrorism technology. HPC techniques were used to analyze and evaluate the Pentagon's structure in the Pentagon Retrofit Project, which will improve structural design to minimize damage and save lives in the event of attack.

Today, the HPCMP fields a unified set of supercomputing services to the DoD science, engineering, test and evaluation communities that includes some of the world's most powerful high performance computing systems, and a premier wide-area network, supporting a significant portion of the nation's top scientists and engineers with high performance computing software development and application assistance.

The HPCMP scope is bounded both in terms of the user community it serves and the technological capability that it delivers. By concentrating the majority of resources at a small number of HPC centers, the program provides computing capabilities that otherwise could not have efficiently been obtained and sustained by the individual Services or federal agencies. This sharing of resources reduces overall acquisition and sustainment costs, and fosters collaboration and cooperation across the DoD science and technology (S&T), and test and evaluation (T&E) communities.

Program Components

The program is organized into three components: HPCMP HPC Centers, Networking, and Software Applications Support. Each component focuses on the most efficient means of supporting the S&T and T&E communities' requirements.

HPCMP HPC Centers

The HPCMP operates four large Major Shared Resource Centers (MSRCs) that enable DoD S&T and T&E communities to effectively use the full range of HPC resources. Each MSRC includes a robust complement of high-end, high performance computing and communications systems that support a wide range of projects. The

Figure 1. HPCMP Expansion

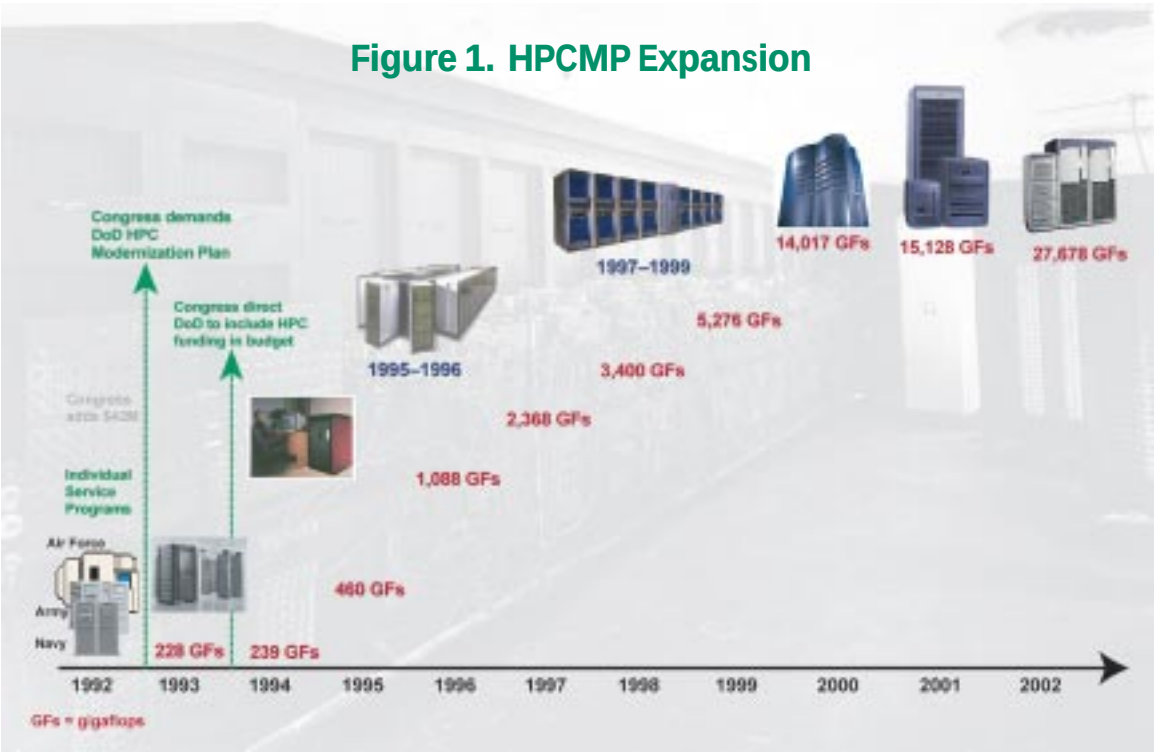


Figure 2. Defense Research and Engineering Network (DREN)

Distributed Centers (DCs) provide HPC capacity and capability to a specified local and remote portion of the program's community. Modest-sized systems are deployed to DCs where there is a significant advantage to having a local HPC system, and where there is potential for advancing DoD applications using investments in HPC capabilities and resources.

Networking

The Defense Research and Engineering Network (DREN, shown in Figure 2) is DoD's recognized research and engineering network. The DREN is a robust, high-speed network that provides connectivity between the HPCMP's geographically dispersed user sites and HPC centers. Since users and resources are scattered throughout the United States, strong interconnectivity with other major networks and high performance test beds at key exchange points are critical for optimal use of high performance computers.

Software Application Support

"Software Applications Support" is a new terminology that captures the evolutionary nature of the program's efforts to *"Acquire and develop joint HPC application software tools, and programming environments,"* and *"Educate and train DoD's scientists and engineers to effectively use advanced computational environments."* There are two major components to software application support: Common High Performance Computing Software Support Initiative (CHSSI) and Programming Environment and Training (PET).

CHSSI provides DoD scientists and engineers efficient, scalable, portable software codes, algorithms, tools, models and simulations that run on a variety of HPC platforms. CHSSI, which is organized around 10 computational technology areas, involves several hundred scientists and engineers working in close collaboration across government, industry and academia. The PET component enables the Defense HPC user community to make the best use of the computing capacity the HPCMP provides and extends the range of DoD technical problems that can be solved on HPC systems. PET enhances the total capability and productivity of users through training, collaboration, tool development, software development support, technology tracking, technology transfer and outreach.

DoD Challenge Projects

Approximately 25 percent of the program's total resources are dedicated each year to a set of DoD HPC Challenge Projects. These computational intensive, high-priority projects are selected annually through a rigorous technical and mission relevance evaluation. The Services and other federal agencies allocate the remaining resources through their unique evaluation processes.

Challenge Project efforts produce and support key enabling technologies, capabilities, and demonstrations expressed by the Defense Technology Objectives (DTOs). These enabling DTOs, support Joint Vision 2020 and the 13 Joint Warfighting Capability Objectives (JWCOs) promulgated by the Joint Requirements Oversight Council of the Joint Chiefs of Staff. While not all inclusive, JWCOs provide focus, priority, and a common reference point for much of the DoD's research, test and evaluation efforts. Below are just a few examples of the 39 Challenge Projects currently in the program.

Coupled Environmental Model Prediction (CEMP)

Wieslaw Maslowski, Julie McClean, Albert Semtner, Robin Tokmakian, Yuxia Zhang, Ruth Preller and Steve Piacsek, Naval Postgraduate

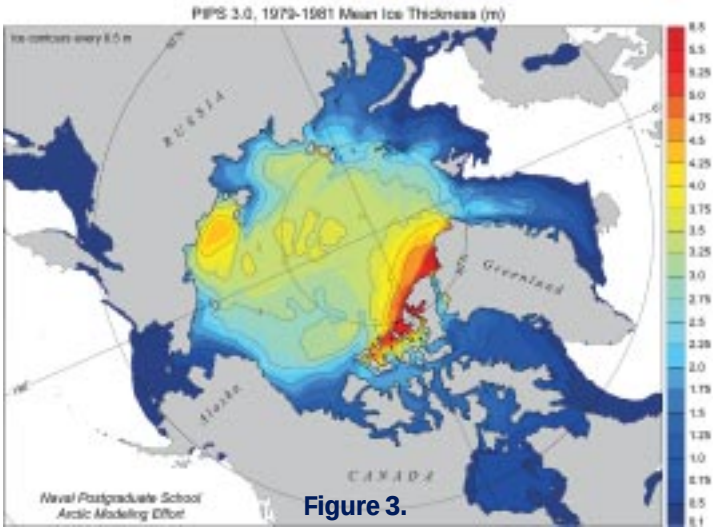


Figure 3.

School, Monterey, Calif., and Naval Research Laboratory, Stennis Space Center, Miss.

The purpose of the CEMP project is to develop coupled air/ocean/ice prediction models to provide short- to long-term forecasts in the battlespace environment and to deliver a state-of-the-art coupled pan-Arctic ice-ocean model to improve the Navy's operational forecasts for sea ice and ocean conditions. The realistic simulation of the present day sea ice thickness distribution is critical to predicting the possibility of partial/seasonal or full removal of permanent sea ice cover in the Arctic Ocean during the next century. An illustration of ice thickness is shown in Figure 3.

3-D Bomb Effects Simulations for Obstacle Clearance

A. Landsberg, Naval Surface Warfare Center (NSWC), Indian Head, Md.

This project will provide a system capable of simultaneously breaching obstacles and clearing mines during an amphibious assault. The goal is to study, identify, and verify the damage mechanisms of obstacles, both on land and in water, subjected to multiple bomb detonations. The rapid creation of transit lanes through shoreline defenses is necessary to enable landing craft to deposit troops and equipment directly onto and beyond the beaches.

Submerged Wakes in Littoral Regions

P. Purtell, Office of Naval Research (ONR), Arlington, Va.; W.R. Briley, Mississippi State University, Starkville, Miss.; J. Gorski, NSWC, Carderock, Md.; and D. Dommermuth, SAIC, San Diego, Calif.

This project provides the first-ever simulations of submerged propelled vehicles undergoing complex maneuvers induced by moving control surfaces. Simulations (Figure 4) of the flowfield itself, including the effects of stratification and trailing vortices are also being conducted. Together, these simulations will supply valuable knowledge of maneuvering characteristics and their effect on the flowfield including the complex characteristics of the littorals: stratification, shear, shallow water and wave motion. This will provide the means to improve platform design and operations and enhance the advantage in undersea warfare.

Chemical Warfare Agents with Acetylcholinesterase (AChE)

M. Hurley, J. Wright, A. Balboa, W. White, and J. Morrill, Army Research Laboratory (ARL), Aberdeen Proving Ground, Md.; G. Lushington, University of Kansas, Lawrence, Kan.; and W. Yang, Duke University.

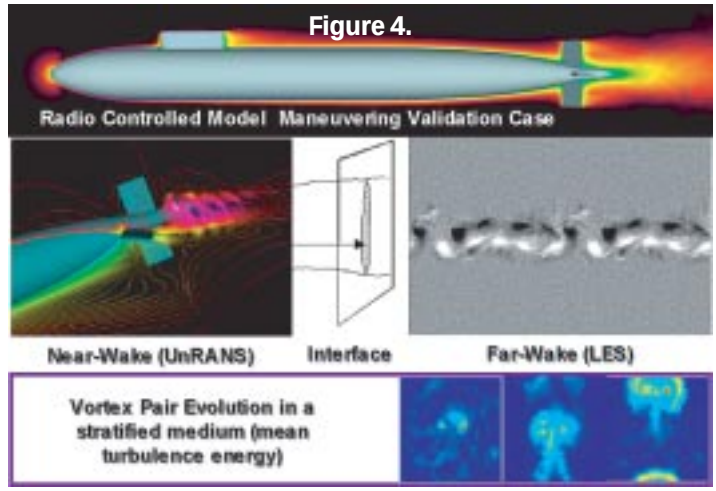


Figure 4.

The purpose of this project is to calculate accurate energetic pathways of reversible and irreversible binding of agents in enzymes and to develop novel absorbents for filtering and deactivating toxic substances. This work will impact the design of therapeutic and prophylactic treatments for nerve agent exposure by devising nerve agent defensive mechanisms.

Multiscale Simulations of Nanotubes and Quantum Structures

J. Bernholc, North Carolina State University, Raleigh, N.C.

The focus of this work is to investigate and predict properties of advanced new materials and technologies critical to DoD's needs as well as to predict properties and technological applications of carbon nanotubes and wide gap semiconductors. Nanotubes are prime candidates for novel electron emitters, to be used in ultra-high resolution flat panel displays and cold-cathode-based microwave amplifiers. The hundredfold increase in the emission current density would obviously have a major effect on the utilization and efficiency of electron emitters in the battlefield and in support systems.

CFD for Aircraft-Store Compatibility and Weapons Integration

J. Martel, Air Force SEEK EAGLE Office (AFSEO), Eglin AFB, Fla.

The goal of this project is to perform engineering analysis, develop flight test profiles, and direct real-time flight tests in support of the aircraft and store certification process. By supplementing inexpensive lower order methods and costly, sub-scale testing, computational fluid dynamics (CFD), shown in Figure 5, has been used to reduce the certification costs, increase flight test safety margins, and develop more confidence in the numerical predictions that lead to the determination of flight test requirements.

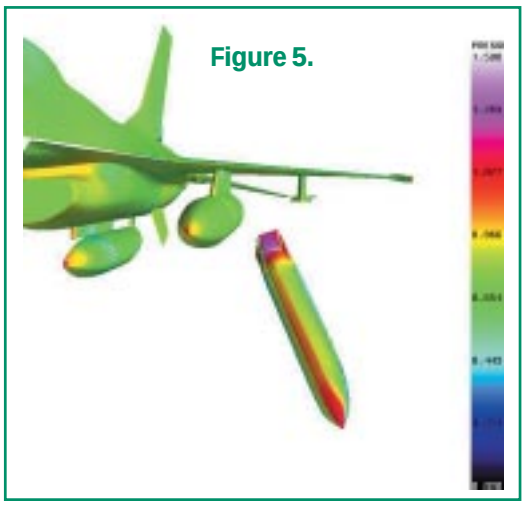


Figure 5.

Homeland Security

The tragic events of September 11, 2001, brought a new focus on the security of our nation. The attacks on the World Trade Center Towers and the Pentagon, and the ensuing anthrax threat have triggered research and development in areas not previously explored. The HPCMP has played a significant role in some areas of homeland security. The following projects used HPCMP HPC resources to solve some of the most demanding problems.

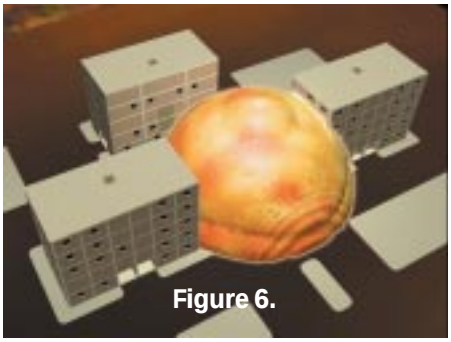


Figure 6.

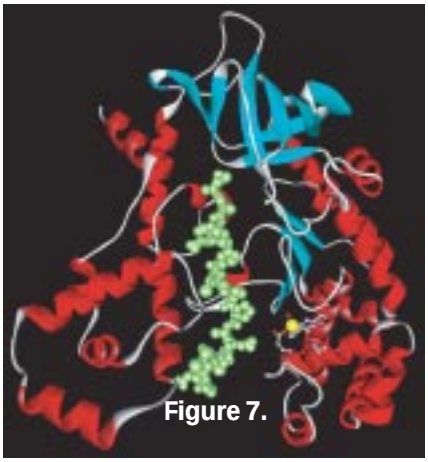


Figure 7.

Blast Response of the Pentagon

Tommy L. Bevins, Byron J. Armstrong, James T. Baylot, and James L. O'Daniel, U.S. Army Engineer Research and Development Center (ERDC), Vicksburg, Miss.

The DoD placed a high priority on the rapid repair of the Pentagon. The U.S. Army Corps of Engineers quickly responded to their tasking to provide possible retrofit designs to improve the Pentagon's structural response to a range of terrorist threats. Because of the objective to speedily repair the damage, the Corps of Engineers' recommendations for improvements had to be finalized and presented to the Pentagon Renovation Office (PenRen) within eight weeks. This effort involved determining the loads on the components of the Pentagon and the response of these components to the loads. It also involved developing, analyzing and evaluating retrofit concepts to improve employee safety. This research is important to DoD not only to improve the survivability of the Pentagon and its occupants, but it also decreases costs by helping to determine the critical vulnerable areas of the Pentagon so that resources are expended in those locations where they are most needed.

Blast Protection in Urban Terrain

J. Baylot, T. Bevins, and J. O'Daniel, ERDC, Vickburg, Miss.; Y. Sohn, Defense Threat Reduction Agency (DTRA), Alexandria, Va; D. Littlefield, University of Texas, Austin, Texas; and C. Eamon, Mississippi State University, Mississippi State, Miss.

An Anti-Terrorism (AT) Planner software tool was developed to rapidly evaluate the safety of structures. This tool is a fast and accurate method of predicting loads on a structure (Figure 6) when a terrorist weapon is detonated between groups of structures (urban terrain). Improved methods of predicting response of conventional structures and developing retrofits for these structures will result from these predictions. This research will provide the DoD community with an improved methodology for evaluating the safety of U.S. forces from terrorist attack and for designing retrofits to improve safety.

Countermeasures to Anthrax

Yuan-Ping Pang, Mayo Foundation and Mayo Medical School.

Inhalation anthrax is often fatal because early diagnosis is very difficult. Early symptoms of inhaled anthrax resemble the common cold or flu. One effective way to counteract anthrax is to use therapeutic agents that specifically block the catalytic activity of the anthrax lethal factor. This approach is supported by the fact that certain metalloprotease inhibitors block the effects of the toxin in vitro. Dr. Y.P. Pang of the Mayo Clinic working with Maj. Charles Millard and Dr. Rekha Panchal began a yearlong effort to develop an effective inhibitor. Using HPC resources, they screened 2.5 million chemical structures using a specially designed algorithm. They identified 20 high potential inhibitors of Botulinum toxin serotype A. They have since synthesized three of these materials (Figure 7) in wet laboratories and initial tests indicate that all three are effective inhibitors.

DoD Counter Terrorism Technology

Charles Needham, John Perry, Terry Caipen and Joe Crepeua, Applied Research Associates, Inc. (ARA), Albuquerque N.M.

Developing explosives designed to produce better results against hardened and/or deeply buried targets has been an ongoing effort for many years. In December 2001, a 2000-pound weapon casing known as the BLU-109 was filled with a new non-ideal explosive called PBX-IH-135. The new weapon was designated the BLU-118 and delivered to Afghanistan for use in the war on terrorism. ARA conducted three-dimensional HPC calculations of the new weapon's performance both inside and outside of tunnel structures in support of live fire testing in Nevada. The decision to send the weapon to Afghanistan was based on the observed performance test data.

The Future of HPC

The DoD HPCMP exists to enable over 4,000 scientists and engineers to address engineering challenges of the S&T and T&E communities linking users at over 100 DoD laboratories, test centers, universities, and industrial sites.

In the future, HPC will continue to take advantage of the best commercially available hardware and software to enable users to standardize where it makes sense to do so, and to make access and use of our capabilities as easy as possible. The rapid evolution of high performance computing requires that the program focus on delivering improved capability early in a weapon systems life cycle. This allows the DoD to maintain the technological edge required to analyze, design, produce, and deploy advanced weapons systems and capabilities to the warfighter — before similar computational capabilities are available to our adversaries.

For more information on the High Performance Computing Modernization Program, please visit our Web site at www.hpcmo.hpc.mil.

Henry Cray is the Director of the DoD High Performance Computing Modernization Program (HPCMP). He oversees the operations of the HPC centers and wide-area network services, in addition to leading acquisition planning for HPCMP capital investments. Susan Pfeiffer-Vega is the HPCMP Outreach Coordinator. Bill Gabor is a Technical Writer/Editor in the HPCMP Office.

NOWS IMPROVES READINESS AND QUALITY OF LIFE

By JO1(AW) John J. Joyce, USN

Web browser, mouse, printer ... and the New Order Writing System (NOWS). Naval reservist MA2 Antonio Cuin used these 21st-century tools from the comfort of his Brooklyn, N.Y., home and was prepared to deploy at a speed made famous by the Minutemen of 1775.

"I'm ready to get on the plane," said the New York City Corrections captain after he logged on to the NOWS Select Reservist (SELRES) and Commanding Officer/Training Officer (CO/TO) Web application site and printed official Active Duty for Training (ADT) orders, and a travel itinerary that would take him over 2,000 miles away from home.

Naval Reservists GM3 Harold Gonzalez and MA3 Javier Valentin maintain a topside watch aboard the USS San Francisco (SSN 711) during its transit through the Panama Canal. Photo by MA2 Antonio Cuin.

In Panama City, Panama, Cuin rendezvoused with 15 Naval reservists from New York and Maryland who also used their home computers and NOWS to apply for the Commander, Submarine Group TEN (SUBGRU 10) force protection mission. They independently tracked the approval process of their requests online until Commander, U.S. Atlantic Fleet gave final approval for the official ADT orders that included a commercial travel itinerary.

"The NOWS application and approval process is a timesaver that helps reservists effectively balance family, civilian careers and military deployments," said Cuin. "If your page two is current and you're good to go, you don't have to travel to base at all. Unit members — some from upstate New York — have saved a day off from work without pay and a long trip to our reserve center in Amityville, Long Island."

The 16 SUBGRU 10 force protection reservists are among thousands of citizen-Sailors who have used NOWS since it went live on August 15, 2002, to apply, track and print their orders for domestic and international Annual Training (AT), and ADT and Inactive Duty Training Travel (IDTT) assignments. By the end of FY 03, an estimated 80,000 reservists will have logged on to the SELRES and unit CO/TO NOWS Web site at https://nows.cnrf.navy.mil to initiate reserve assignments with laptops and personal computers at homes, libraries, schools, and cyber cafes across the nation.

"The ability to print orders and electronic airline tickets on the Web has taken away a lot of leg work that was required under the old system," said TMC(SS) Christopher Crakow, Training Officer of SUBGRU 10's New York Detachment. "We were dependent on Amityville, but NOWS has given our unit control and a flexibility that we've never had. Every unit member now has the ability to see what is happening at every stage in the approval process from application, CO/TO, 'hard holds,' travel and final approval of orders. What's more, we can do it all from home and that's the biggest advantage." But the SUBGRU 10 nuclear submarine force protection team could do it all from home because they were mobilization ready. All hard holds for all team members were current.

AT, ADT and IDTT applications with hard holds that are not current (physical or dental exams; an HIV test; required immunizations; end of service (EOS); or a security clearance) will be disapproved by a Naval Reserve Activity (NRA) Order Specialist. The disapproved application will not proceed to the next NOWS routing stage until the reservist personally visits medical, dental and the reserve center to resolve the matter.

"Electronic applications submitted via NOWS enables the 2,800 reservists we service to avoid physically coming to the center if they are mobilization ready — if there are no hard holds," said Capt. John Landon, Commanding Officer of Navy Marine Corps Reserve Center (NMCRC) San Diego. "Our drilling reservists like the ease of NOWS and the quick turnaround in the receipt of orders and travel itinerary. From a customer service standpoint, this is a tremendous improvement over the old system. The customer service provided by the NOWS help desk to reservists and our staff is outstanding."

Manned by eight civilians and five active duty Navy service members, the NOWS help desk in New Orleans fields an average of 400 calls a day. Questions posed by AT, ADT and IDTT applicants, reserve liaison officers (RLOs), NRA order specialists, fund approvers, and gaining commands worldwide are answered by help desk personnel 24 x 7. "We work around the clock to help customers with NOWS questions," said NOWS help desk supervisor ENC (SW) Phillip Rogers, after getting off the telephone with a satisfied customer at a European gaining command. "Reservists and NRA staff are faced with a learning curve and there are some glitches in the system, but we have a team of software developers constantly working to improve NOWS. We have a help desk team standing by with the answers. If we don't have an immediate answer, we'll figure out how to get the right answer for the customer as soon as possible." Customers can also find answers at the NOWS SELRES and unit CO/TO Web site. The Web interface features online help screens that demonstrate the keyboard actions required to enter and approve orders.

The official NOWS Web site — www.navres.navy.mil/navresfor/now — contains links to helpful sites that include frequently asked questions (FAQs), Commander Naval Reserve Force NOWS policy and a Commander, Naval Personnel Command message authorizing the NOWS watermark and liquidation of travel at a more convenient personnel support detachment (PSD). Prior to final

Silhouette of the USS Florida (SSGN 728) transiting the Panama Canal with the Submarine Group TEN Force Protection Team on deck. Photo by MA2 Antonio G. Cuin, Jr.

approval, reservists can print orders with a watermark in the background reading "DRAFT" that can be provided to employers or other organizations. When the orders have received final approval and are ready to be executed, the watermark will read "ORIGINAL."

"These innovative features in NOWS are what reservists asked for," said Rogers. "Research and development were based on the input of NRA staff and drilling reservists. Applicants initiating their own orders are getting more and more excited about training since NOWS was released. The Naval Reserve Force is enjoying it."

Like the Revolutionary War Minutemen before them who devised a system of horseback rider alerts to assemble quickly, today's Naval reservists have found a way to mobilize quickly and spend more quality time with family in spite of the increasing demands placed on them by the Global War on Terror.

"My wife and children are glad that I've got at least one less trip," said EN2 Kevin Wright, a Naval reservist from Indian Head, Md., who deployed on the SUBGRU 10 Submarine Force Protection ADT with Crakow and Cuin. "Any time there is an issue with submarines, we have to be there," said Wright who works for the Treasury Department at the Bureau of Engraving and Printing. "I've deployed five times in the past five months and one or two trips to Reserve Center Adelphi became normal with each mission. NOWS has streamlined the checkout process to the point where we just print our orders and go. NOWS is fast. It's user friendly. Even better ... it's family friendly."

Visit the official NOWS Web site at: www.navres.navy.mil/navresfor/now.

JO1(AW) John J. Joyce is a Select Reservist in the Naval Reserve Naval Media Center Fleet Support Detachment Norfolk. The author served on active duty as the NOWS Fund Manager and Fund Approver for Commander, U.S. Atlantic Fleet Reserve Office when this story was written.

Editor's Note: As of March 26, 2003, and as we go to press, the total number of reserve personnel on active duty as reported by DoD is: Army National Guard and Army Reserve - 150,071; Naval Reserve - 9,494; Air National Guard and Air Force Reserve - 33,365; Marine Corps Reserve - 20,089; and the Coast Guard Reserve - 3,792. This brings the total Reserve and National Guard on active duty to 216,811 including both units and individual augmentees. At any given time, Services may mobilize some units and individual augmentees.

The list of mobilized personnel is an honor roll of dedication to duty and courage. I want to pay tribute to this brave group of men and women for answering the call of duty, and I want to thank the Naval Reservists of Submarine Group TEN for giving me a glimpse into their heroic lives.

"Over the last week the world has witnessed the skill and honor and resolve of our military in the course of battle. We have seen the character of this new generation of American Armed Forces. We've seen their daring against ruthless enemies and their decency to an oppressed people. Millions of Americans are proud of our military and so am I."

- President Bush, Mar. 26, 2003
MacDill Air Force Base

Talking with Retired Lt. Kevin Shaeffer, USN and Lt. Blanca Shaeffer, USN

The story of Navy Lt. Kevin Shaeffer is one of courage, bravery and incredible determination. Shaeffer sustained serious injury when the Navy Command Center where he worked exploded in a ball of fire after terrorists flew a hijacked airliner into the southwestern wedge of the Pentagon. Shaeffer was the only one of 30 people in his immediate vicinity to survive the 9-11 attacks.

In the CHIPS Winter 2003 issue, I introduced you to an amazing individual, retired Lt. Kevin Shaeffer, who sustained serious burns on 42 percent of his body when hijacked Flight 77 crashed into the Navy Command Center in the Pentagon on 9-11. To my distress I found I had misspelled Shaeffer's name. Our sincerest apologies to both Lt. Blanca Shaeffer and Lt. Kevin Shaeffer — and our thanks for their graciousness and understanding. Above from left to right: Lt. Blanca Shaeffer, CNO Adm. Vern Clark and retired Lt. Kevin Shaeffer, Oct. 2002.

Lt. Shaeffer's injuries were among the worst of the 140 people wounded in the Pentagon attack. He suffered severe burns on 42 percent of his body, lost most of the skin on his arms, hands and back, and inhaled jet fuel, which damaged his lungs. His heart stopped twice on October 4, 2001. Upon escaping the Navy Command Center, Lt. Shaeffer was assisted by Army Sgt. First Class Steve Workman, who received the Soldier's Medal for his heroism in finding Lt. Shaeffer and transferring him to medical personnel. The Chief of Naval Operations Adm. Vern Clark presented the Purple Heart to Lt. Shaeffer for the injuries he sustained during the Pentagon attack. Lt. Shaeffer has undergone 17 surgeries and plans to return to work soon.

The Pentagon's Navy Command Center is manned 24 x 7 with 40 to 50 personnel. One of the missions of the Command Center is to monitor news events around the world. Lt. Shaeffer said, "We quickly knew what was going on in New York City after the first plane hit the first tower. We were watching big-screen TVs and stood up a watch to start logging events and tracking things for the Navy. And then we saw the second plane hit and knew it wasn't an accident."

CHIPS: What is the mission of the Navy Command Center?

Lt. Kevin Shaeffer: Basically, the Center's mission is to constantly monitor global events while keeping up with the latest status of all U.S. Naval assets operating worldwide. The men and women who work there are charged with keeping our Navy leadership updated with exactly what's happening in the world, as it directly relates to Navy operations and other geo-political security and military issues.

CHIPS: What was your job in the Command Center?

Lt. Kevin Shaeffer: I was an Action Officer who worked in the N513 Branch, Navy Strategies and Concepts. Though the 8 to 10 of us in the Branch were physically located there, we didn't have direct responsibilities with the watch functions of the Command Center. We did, however, frequently work with the personnel of the Command Center in completing many taskings.

CHIPS: I read where the Center's watch immediately began tracking the terrorist attacks. What other kinds of support could the Command Center have provided had it not been hit?

Lt. Kevin Shaeffer: Had the Command Center not been destroyed it surely would have been able to provide the highest levels of our Navy leadership with updates as to exactly what was occurring. One of my last mental "snapshots" of the space just prior to the impact of Flight 77 was of the watch section and watch leaders actively engaged in logging and recording the events in New York City. I remember seeing the watch captain and my supervisor, Capt. Bob Dolan, discussing the situation and recall admiring how professionally they were handling things. Of course events were happening so quickly that no formal tasking on exactly what to do came down, but they all responded in exactly the way they were trained.

CHIPS: I have read that you are interested in working in the public service sector, especially in the area of Homeland Security. So many areas of Homeland Security involve increasingly sophisticated and complex IT — do you have a special focus area?

Lt. Kevin Shaeffer: You're exactly right, the Secretary of Homeland Security has recently stressed the role that technological advances will play in contributing to the success of preventing future terrorist attacks. However, at this time I'm focused on possibly contributing my skills and my experiences in a broader manner. I feel uniquely blessed with the ability to forcefully convey the importance of the many facets of Homeland Security. I'm looking to play an active role as an advocate for ensuring that we continue to do everything that is necessary to protect our security.

CHIPS: I've read and heard the courageous history of your long and painful recovery, but the most humbling statement I heard you make is when you told Adm. Clark, that you were a survivor not a hero, that the military personnel serving in defense of

freedom were the real heroes. What message do you have for our warfighters?

Lt. Kevin Shaeffer: We are so indebted to the courage and sacrifice of those in uniform. I want each and every one of them to know that I, as one of the first casualties of this war on terrorism, am honored by their commitment to protect this great country of ours.

CHIPS: Blanca, what was your job at the Naval Surface Warfare Center?

Lt. Blanca Shaeffer: At NSWC Dahlgren, Va., I was the Strategic Systems Programs (SSP) Project Officer. I'm an Engineering Duty Officer (EDO) who works in SSP on the Trident Missile Program and on the new SSGN program. *[Four Ohio-class ballistic missile submarines (SSBN) are being converted to guided missile submarines (SSGN).]*

CHIPS: I've read where your husband said, "I thought that [Navy Command Center] was the safest place in the world ... even as we were watching what was unfolding up in New York City, we never thought that we were in any kind of danger, at any kind of risk... What were you doing and where were you on 9-11?

Lt. Blanca Shaeffer: I was on travel for work in Pittsfield, Mass. I had flown there on September 10, and was supposed to fly back on September 12. When I found out that Kevin was in the hospital, several co-workers and I rented a large SUV to drive back. We drove through the night, arriving at Washington Hospital Center at 3 a.m.

CHIPS: Your bravery and courage have been equal to Kevin's during these difficult months. I've read where both you and your husband have said how supportive "the Navy family" has been. I also read where one of the Pentagon survivors said he felt sorry for the survivors and families of the victims from the World Trade Towers tragedy because they didn't have the support system the Navy has provided.

Lt. Blanca Shaeffer: The Navy offered support in ways that were beyond what I expected. They did things like organize a list of people who brought food to me and to Kevin's family while we were at the hospital day and night, they started prayer chains (some of which still continue today!), and spent hours by our sides to make sure we had everything we needed, including emotional support.

CHIPS: Do you think the Navy and other Services are better prepared to deal with disaster preparedness and response than civil organizations because the military are better trained to deal with life and death situations?

Lt. Blanca Shaeffer: Yes, I do believe the Services are better trained to deal with these sorts of situations. It's not just dealing with life and death situations though. It's also being accustomed to supporting each other through any sort of crisis that might come up. We're accustomed to our friends deploying and leaving their families at home. Sometimes those families at home rely on their Navy family for their support system.

CHIPS: Do you think this ordeal has made you a better Naval officer? What message or advice do you have for our Navy family of military members, civilian employees and contractors as we face the continuing war on terrorism?

Lt. Blanca Shaeffer: It's made me more aware of the kinds of things that a Naval officer needs to think about when someone in their unit needs the support that Kevin and I did during his months in the hospital. The message that I'd like to pass on to the military overseas during these times is that those of us back home are praying for their safety and success. We never forget the sacrifices they are making for the rest of us back home.

CHIPS: Kevin, what do you think others could learn from your experience?

Lt. Kevin Shaeffer: If years from now, people remember anything about me and my story, I'd like them to remember a simple phrase — "Never give up, Never forget. Never give up when things get tough. Never forget what it felt like on that day in September."

To Connecting Technology Attendees and Supporters:

Thank you for your past participation and support of Connecting Technology Symposiums. Your interest and contributions have been – and continue to be greatly appreciated. New challenges face the staffs of Connecting Technology and the DON IT Umbrella Program as we continue to provide total support for our warfighters. Therefore, it is with deep regret that we must announce that Connecting Technology Spring 2003 is cancelled.

The importance of your continued support for the DON IT Umbrella Program in purchasing from pre-competed contracts and Blanket Purchasing Agreements remains a key focus for us and provides cost savings for you, which can be used for the Navy's warfighting mission.

We strive to provide the highest quality IT products and services at the best value to our customers – many are priced lower than the GSA Schedule.

Please visit the DON IT Umbrella Program and CHIPS Magazine Web sites. Purchasing information and points of contact can be found at www.it-umbrella.navy.mil/, www.don-imit.navy.mil/esi and www.itec-direct.navy.mil.

Sincerely,
The Connecting Technology and DON IT Umbrella Program Staffs

N@VY
KNOWLEDGE ONLINE

NAVIGATING THE FUTURE

By JO1 Jd Walter, USN
Naval Personnel Development Command Public Affairs Office

For Sailors, managing their careers is now as easy as point, click, and grow, thanks to Navy Knowledge Online (NKO). The flagship of the Navy's Revolution in Training, NKO is the portal through which Sailors will access vital career information, educational and training requirements, college programs, and other professional and personal development opportunities.

Launched in September 2002 as the vehicle for the Chief of Naval Operations Adm. Vern Clark's initiative to enhance operational readiness and increase mission effectiveness by revolutionizing the Navy's training and education structure, NKO has evolved into a major component of the Navy's integrated delivery system for lifelong learning initiatives, personal development, and knowledge management.

The Department of the Navy (DON) is setting the pace for success with NKO, a dynamic, broad-based online system, designed to be accessible to all Sailors, active duty, reserve and retired, and DON civilians and contractors, whether on the job, on the road or at home. Using NKO gives Sailors the opportunity to not only manage their careers in a more efficient manner, but it also enables them to engage with mentors, subject matter experts and managers concerning all facets of their careers. *"This is going to allow Sailors to access what is most important to them; the information required to excel, both professionally and personally,"* said Commander, Naval Personnel Development Command (NPDC), Rear Adm. Kevin Moran. *"It is going to allow Sailors to take maximum advantage of the tools and opportunities available to them, no matter where they are stationed or deployed."*

While NPDC's knowledge management team is responsible for the overall management of NKO, each of the Navy's new Learning Centers is tasked with developing, populating, and subsequently managing their own NKO interests via their center pages. Here, Sailors will find all the information that is relevant to a given occupational cluster, specific job task or mission area. This approach to centralizing all the tools and opportunities might include the posting of technical manuals and schematics, reference materials for courses, links to training and educational sites, and other career management tools. It also enables the creation of chat rooms and message boards, moderated by subject matter experts focused on systems, equipment, and programs taught by the individual center. NKO's management teams will also be able to utilize this captured content as reusable knowledge to enhance the Navy's training and knowledge transfer. *"The idea of having the individual centers manage their own content is consistent with the Revolution in Training's goal of distribution of professional and personal growth tools to the Fleet,"* said Lt. Eric Morris, NKO Operations. One of the most important tasks facing the centers is the conversion of valuable knowledge captured through the chat rooms, message boards and polls, into a distributable commodity for community-wide use. This information may take the form of frequently asked questions (FAQs), white papers and best practice documentation, which will help formalize the vast amounts of knowledge gained from experience into a format that is readily available to all Sailors.

In Norfolk, Va., users log on to NKO after working hours at Wind and Sea, the base Internet Cafe. Official U.S. Navy photo by JO1 Jd Walter.

Instant messaging (IM) is also available on NKO for one-to-one communication and mentoring. The IM feature and the capacity for chat rooms were given major consideration during the initial design phase. Both features allow for maximum connectivity between deckplate Sailors and subject matter experts. When navigating the portal, a user need only "mouse over" any document posted to view the author's contact information. This feature also alerts the user as to whether the author is online at the time, providing the user immediate access to the author through the IM function. Possibly the best aspect of IM is its multi-tasking ability, conducting multiple chats or IMs at once. *"We want to connect people and ideas,"* said Morris. *"NKO puts frontline Sailors in instant contact with the appropriate subject matter experts so they can do their job better, increasing both their professional proficiency and efficiency."*

The system supports temporary and permanent chat rooms designed for discussions and collaboration within the various Revolution in Training working groups. The chat feature allows community managers to identify user groups based on specific attributes, such as occupational field or mission area, rank or platform so they can send notifications alerting them of an upcoming chat. Transcripts of the chats can be saved to FAQ files for reuse or distribution. This not only increases the realm of impact for a particular chat session, but also creates a retrievable document containing valuable knowledge often lost during physical meetings.

Both IM and chat rooms provide Sailors with a service that is rapidly growing in popularity both inside the military and within the civilian sector because it provides instant communications without additional system or software requirements. It also eliminates the need for time-consuming downloads and since the communications are run through the browser, both methods are secure.

To begin using IM, which is auto-launched, click on "Add Contact" to add a user or to see who is online. To chat, scroll through the list of chat rooms to find those that are active and click to gain entrance. Users can also create their own chat rooms and maintain access control once the chat is initiated.

Another prominent feature of NKO will be the posting of Sailor Continuums (5 Vector Models) for every occupational field within the Navy as they are developed by the Learning Centers. These will be the roadmaps that Sailors will use to navigate their careers. Interactive in nature, the continuums will highlight milestones Sailors must reach to be eligible for promotion. These milestones will not only detail what is expected, but they will also be linked to corresponding training or educational requirements. Sailors will be able to connect to a virtual course, request approval and register for a residence course, and access online reference study materials.

These continuums will provide Sailors with real-time assessments of their progress along each vector (professional, personal, leadership, certifications and qualifications, and performance), expert advice on professional growth and development, and upward mobility, as well as direct access to courses, career information, and other information to ensure career progress. The continuums contain all the relevant and important information organized by occupational field, knowledge, skills and abilities, and will serve as the core knowledge integration and distribution channel for Sailors throughout their Navy careers by combining unique personalization, robust search capabilities, and collaborative tools in a dynamically integrated environment.

"This is where NKO pays off," said Moran. *"By bringing together all the resources related to a given career path or mission area, the Navy will streamline the process of identifying goals, granting immediate access to the tools required to successfully meet that goal, providing a virtual support network of technical experts and community leaders to work with the Sailors to ensure their success."*

Through NKO's collaboration feature, Sailors will have access to what is, in essence, a portable hard drive, on which is stored all the relevant information pertaining to their careers. This feature allows Sailors to post up to 50 megabytes of data and then, if they choose, securely share that information with their shipmates. This Enterprise Collaboration Center (ECC) organizes files into knowledge centers. The knowledge centers have either Navy community, personal or team files. Communities are arranged around function or mission area and are managed by community administrators. These files contain documents that subscribers need to do their jobs. Personal and team files can be created by anyone to share knowledge securely. Most users will only create and utilize folders within the personal and team knowledge centers, but they will be able to request and be granted access to other areas within communities. Upon registration, every Sailor will have a private knowledge center created for them, but may choose to add additional folders. The centers section of NKO links users to the homepages of the different Learning Centers and Training Support Centers, and includes information pertaining to that center, such as announcements from center leaders, community managers, detailers, administrative notes, calendars, news, document centers and additional career management links.

NKO leverages the success of Army Knowledge Online (AKO), the Army's enterprise portal with 1.2 million users. Both portals utilize software from the Appian Corporation, the developer for both NKO and AKO. For external content integration, NKO and AKO use Web services and XML. NKO currently has 45,000 users and is scalable for the entire Navy enterprise.

Currently, NKO is accessible from anywhere via the Internet. A SIPRNET (NKO-S) version for classified information is in development and is expected to be operational by midyear. A shipboard version is also under development. Over the course of the next several months, NKO will also see improvements to its message boards, collaboration and IM features.

New users should log on to NKO at www.nko.navy.mil and then click the "I'm a New User" button and follow the step-by-step registration process. Upon completion of the registration process, the new user completes a profile form and selects one of the Learning Centers based on his community of occupational fields. Users can learn more about NKO's functionality by clicking on the NKO Primer button on the homepage. Detailed instructions and a user guide are accessible via the "User Guide" button on the top right portion of the homepage.

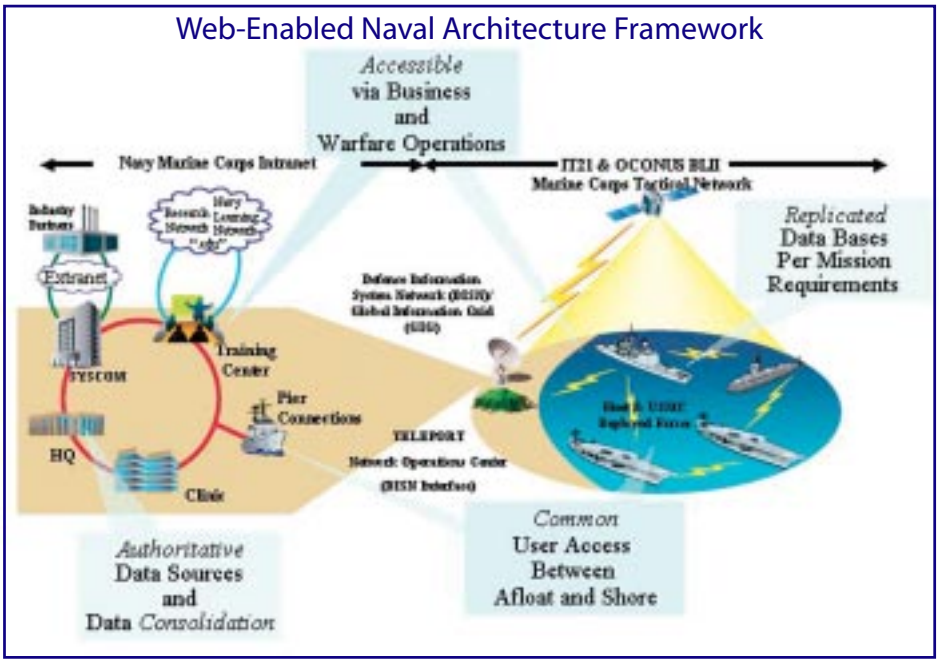
"NKO is a great example of what the Navy's Revolution in Training is doing for our Sailors," said Master Chief Petty Officer of the Navy MCPON(SS/AW) Terry Scott. *"This will give Sailors a single access point to all their professional and personal development milestones, and the training and educational resources that support their success. I strongly encourage Sailors to log on to this site, become familiar with it and use it to manage their careers."*

NKO is 128-bit encrypted via a Secure Socket Layer. To access NKO log on to www.nko.navy.mil and click on the "I'm a New User" button. From there, you will be asked to provide personal information that will be validated against DEERS (Defense Enrollment Eligibility Reporting System) to ensure consistency and user privacy. Users will create their unique password during the initial log in session. Once the DEERS validation process is successfully completed, the user will receive an e-mail confirming access that will include instructions for retrieving forgotten or lost login information. Users will also be given several options depending on which Learning Center they are affiliated with, their rank, occupational field or mission area, NECs (Navy Enlisted Classifications), duty stations, time in service, as well as other data fields contained in the NTMPS (Navy Training Management and Planning System) database.

The core services of NKO are accessed through the tool bar located on the left of the screen. In addition to buttons for Learning Centers, Training Support Centers, Naval Missions and Communities, users will find NKO Search, a robust Verity K2 engine, and the NKO White Pages. The White Pages contain information on every registered NKO user. Users can search and filter based on attributes such as name, pay grade, center affiliation and NKO account type. Once a search is returned results can be sorted by telephone number, e-mail address, first, middle or last name, rate or community. The results also provide hot e-mail addresses that automatically launch e-mail to the selected NKO user. It also reflects the user's online status and allows one to add new people to IM contact lists.

Transforming the Navy with Web Technology

By Cmdr. Tina Swallow, USN (OP 09WN3) and Lt. Cmdr. Danelle Barrett, USN (OP 09WN3B)



The Chief of Naval Operations stated his vision for transforming the Navy in Sea Power 21, describing how Sea Shield, Sea Strike and Sea Basing will transform operations — and how ForceNet, will enable that vision. ForceNet is the operational construct and architectural framework for Naval warfare in the information age. Stated more simply, ForceNet is the keel upon which Sea Shield, Sea Basing and Sea Strike will be built. A critical element in the development of ForceNet is the implementation of the *Web-Enabled Navy*. The full exploitation of Web technology is a critical element in the realization of the Sea Power vision.

Task Force Web (TFW) was established in April 2001 by Adm. Fallon, Vice Chief of Naval Operations, as the lead governance body for implementation of a standards-based Web-enabled framework for the Navy. A Web services architecture based on industry best practices allows the Navy to leverage powerful new technology to move and share data more quickly, securely, and reliably. Many challenges exist in implementing a true enterprise Web solution across the three main Navy enclaves: Navy Marine Corps Intranet (NMCI) within the continental United States (CONUS), IT-21, and the Base Level Information Infrastructure (BLII) for networks outside the continental United States (OCONUS), but the benefits to the end user far outweigh any challenges encountered along the way. Fundamental to this effort is the identification of authoritative data sources, establishment of data standards, elimination of duplicative infrastructure, and provision for a common user interface.

The complexity of the Navy's total communications operating environment was the overriding consideration in the development of the Web-Enabled Naval architecture from the beginning. To meet the unique challenges of the afloat environment and the three major enclaves, Web enablement is intertwined with the communications operating environment. Very often, "enterprise" solutions are developed without proper planning for the overall complexity of the communications context in which they will operate. Task Force Web engineers understand the challenges of implementing a solution between enclaves of vastly differing communications infrastructures and factored in critical required elements for an effective enterprise solution from the beginning. These elements included bandwidth limitations, synchronization, replication, configuration management and security. In taking this approach, the Navy created a context for Web enablement that guarantees success for Web service developers.

The Navy developed the Navy Enterprise Portal (NEP) to provide the enterprise infrastructure for accessing Web services through a common user interface. The user experience is an important element of the infrastructure, providing a common "look and feel" for the user. Users are given many options for customizing the information they want to see and the collaborative tools they wish to use. The NEP is the gateway to these capabilities and information.

The Web-Enabled Navy enterprise architecture is based on an n-tier solution, which results in cost savings, data sharing and reuse, and a more efficient infusion of technology upgrades. Separation of the presentation layer, application and data layers is the important first step toward achieving a Web services architecture. All Navy applications and databases, operational and administrative, are being recoded as Web services that will be available through the NEP. There are commercial products currently available that will assist developers in the rapid Web enablement of existing applications and databases without the high cost and lengthy period for professional service-based contracts. Misconceptions about the level of difficulty and expense for conversion are quickly dispelled with the use of these innovative tools. Industry continues to build newer products for converting legacy applications and databases into Web services, which can make the conversion process extremely efficient and economical. Cost savings under this architecture include significantly reducing redundant databases. The assignment of functional owners of data sources and data elements will provide improved data reliability and accessibility throughout the Navy. Also, the speed for updates is a dramatic improvement over the traditional client-server configuration — time is reduced from months to days.

"Web Services" is a term often used in Web technology discussions yet it is seldom understood. An example of Web services in the travel industry is Expedia.com. When a customer wants to travel from Los Angeles to New York and find the cheapest fare, he enters a few bits of information (i.e., departure city and date, return city and date) and requests feedback. Web services, using industry standards for describing (Extensible Markup Language

or XML) and moving (Simple Object Access Protocol or SOAP) data do the rest. Web services query the authoritative data sources maintained by the airlines and present the information to the traveler in one Web frame with a common look and feel. No longer do travelers need to query Web pages from each airline for a comparative analysis. The Navy is developing the infrastructure to support this same type of powerful capability for all Department of the Navy (DON) business and operational applications.

The vision for the NEP includes many instances of the same portal afloat and ashore configured to share information and replicate data such as portal profiles. The ultimate objective is that a Sailor traveling from a ship to the Pentagon would be able to log in and have the same pre-configured workspaces appear. Portals aboard each ship with replicated content, enable afloat users access to information during periods of disruptions in radio frequency data links and minimize bandwidth requirements.

The NEP is currently available both afloat and ashore to all Navy personnel. This ubiquitous access provides visibility to Web services, which was not possible in the old client-server or Web-based programs. Users can now easily discover Web services through the NEP and reuse data or services to fulfill their information requirements. In the past, new databases or applications were created because well meaning developers weren't aware that a comparable service already existed. With the NEP, the traditional approach of building and maintaining an application and backend database for every function can be eliminated, resulting in huge savings for the Navy in infrastructure, manpower and funding. The NEP also reduces shipboard server equipment. This is critical in reducing the burden on the ship's electrical load, heat generation, space, and systems administrator requirements.

Using nonproprietary products and an open-standards approach allows everyone to bring their content into a shared environment. The Navy's approach for an enterprise portal solution is one of standards compliance, not product or vendor dependence. By adding a layer of abstraction, the Navy is able to realize the benefits of portal technology with the advantage of not being tied to specific portal product vendors. This layer of abstraction is the Portal Connector, which is essentially an interface between the applications, the portal and the backend data source. Unlike today's commercial portal environment where all Web services are directly coded to a specific proprietary portal product, Navy developers code to the Portal Connector interface and portal engineers code once from the interface to the portal. Application and data owners develop their Web services based on standards issued in the Navy Enterprise Application Developers Guide and bind their Web services to the Portal Connector.

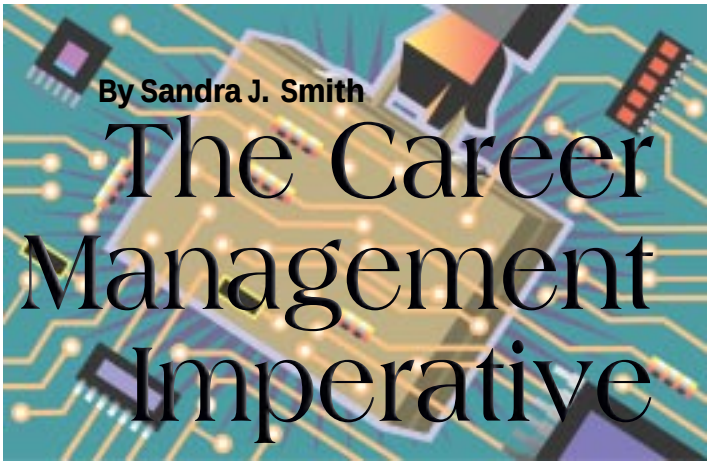
As the portal market matures, should the Navy decide to switch to a newer product, the only recoding necessary would be for the piece between the portal and the interface itself, thus removing the costly and time-consuming coding burden on thousands of Navy developers. By using this component approach, the Navy can more quickly and economically continue to improve the enterprise Web architecture. Since no comparable interface is currently available in industry, the Portal Connector was developed by government programmers. However, there are industry standards beginning to gather momentum in this area, such as Web Service for Remote Portals by the OASIS standards body and JSR 168 by the J2EE standards body. TFW architects have envisioned that as these mature standards are ratified by the standards bodies and are approved and accepted by vendors, and the open source community, the Navy will replace their homegrown interface solution with a commercial or open source solution.

There are several other bleeding edge technologies that TFW is implementing which will significantly improve the Navy's Web environment for users. These include Single Sign On (SSO), Universal Description, Discovery and Integration (UDDI), enterprise-wide portal user profile replication, improved taxonomy management, and workplace management configuration. Many of these solutions include significant challenges, such as ensuring interdomain SSO and an enterprise replication and synchronization model for portal profiles and content. TFW works aggressively to ensure that solutions implemented align with the overall objective of an open standards-based enterprise.

TFW has made significant progress in the development and implementation of the NEP over the past year. These initiatives include:

♦Deploying the only enterprise portal solution in the Navy that operates in both the afloat and ashore environments. ♦Integration of the NEP into the technical requirements for all three Navy enclaves. All baseline networks in each of these enclaves now include NEP. ♦In conjunction with NMCI and the Program Executive Office for Information Technology (PEO-IT), TFW provided the first-ever single guidance document for developers to build enterprise Web services from their legacy applications. The Navy Enterprise Application Developers Guide is a living document, continually updated to reflect industry Web technology advancements. ♦NEP was installed in seven ships from the USS Theodore Roosevelt Battle Group in less than two months. ♦Over 100 Web services have passed the TFW testing labs for integration into the portal and thousands more are in development by commands throughout the Navy. This effort is in support of the VCNO's April 2004 deadline for Web enablement of all Navy applications and databases. ♦NEP is playing a major role afloat in the upcoming ForceNet exercise this year. ♦NEP has been installed on COMSECONDFLT and is being used by the staff to improve knowledge management in conjunction with an ebusiness grant from the Navy. ♦Portals are planned for installation in Hawaii and Naples in March and April 2003 to provide ashore commanders quicker access to enterprise Web-enabled services and for hosting locally developed Web services. ♦TFW is working with OPNAV N7/N61 on implementation of the Navy Global Directory Services, which is a critical component to inter-enclave replication of user profiles and directories. ♦TFW sponsored a proposal to the Joint Staff for development of a Joint UDDI for Web services interoperability. The proposal was accepted by the Military Communications and Electronics Board fall 2002 and is scheduled for implementation in summer 2003.

The Navy is using innovative new technologies to achieve the CNO's objectives for Sea Power 21. These are exciting times for the Navy. As Information Professional Officers it has been exhilarating for us to see the power of technology and be able to quickly get it into the hands of Navy personnel. The Sea Power 21 vision becomes reality through the concentrated efforts of Navy leadership and commands — all committed to leveraging key Web technologies to improve our warfighting processes.



By Sandra J. Smith

The Career Management Imperative

In this time of fierce competition and fast moving technology, now more than ever, each of us must take responsibility for our career to guide it through a path that aligns to our personal goals and supports our organization's mission.

Ensuring Your Competitive Advantage

"If you don't know where you are going, any road will do."
- Chinese Proverb

Taking responsibility for our own learning and competency development is absolutely essential to ensure that our skills remain current and relevant. This is fundamental in assisting us reach personal fulfillment through the enrichment of continuous learning. No longer can companies or even the public sector guarantee lifelong employment or a predictable career path. Gone are the days of thinking that we can rely on our manager to look out for our career progression. We are in an environment where seniority plays a lesser role in aiding us move up the career ladder. Knowledge and competency development are essential for career advancement. Developing a well-thought out career progression plan serves a critical role in achieving our professional goals. The acquisition of the right skill sets can only come through personal vigilance and a proactive approach.

Predicting Future Skill Requirements

"If we did all the things we were capable of doing, we would literally astound ourselves."
- Thomas Edison

No one knows better than you, your manager or your mentor what your learning needs are and how that learning can be applied to current and future job requirements. Getting involved in professional associations, communities of practice, and keeping up with your professional reading are all ways to identify potential competency areas that need to be developed or strengthened. After establishing your career goal, conducting a competency gap assessment is a key step in developing a sound career progression plan.

Identifying Competency Gaps

Conducting a competency assessment is not an easy undertaking, particularly for civilians. In fact, it can be very difficult, not only must you identify required skill sets and associated competencies, but also a means to rate the actual gap, and a mitigation strategy to eliminate or reduce the gap. For the Department of the Navy IM/IT community, there are tools to assist you. For most military personnel, a career path is defined and supported throughout the individual's career. All IM/IT workforce personnel can gain career planning assistance through the DON Civilian Career Path Guide and the Civilian Career Planning Tool. Both the document and the Access database file are available at **www.don-imit.navy.mil/workforce**. For Federal civilian personnel in the GS-2210 series, the Federal IT Roadmap is being developed and integrated into the Federal eTraining initiative at **www.golearn.gov**. Access **www.cio.gov** for the latest status and link to the Web-enabled IT Roadmap career planning tool. In addition to these career planning tools, there are some outstanding IM/IT certificate programs available — many at no cost.

Building Your Credentials

"If you believe you can or if you believe you can't, you will be right."
- Henry Ford

The Information Resources Management College (IRMC) of the National Defense University provides the majority of certificate and scholarship programs for the DoD IM/IT workforce. The Information Assurance Scholarship Program (IASP) provides degree completion opportunities for all military and civilian personnel. In addition to IRMC and the IASP, the Federal CIO Council has established a Virtual CIO University consisting of a consortium of universities that offer graduate-level programs that directly address executive core CIO competencies. A synopsis of programs is provided below with detailed information for IRMC programs available at **www.ndu.edu/irmc/programs**.

CIO Certificate Program

The CIO Certificate Program is an up-to-date source of graduate education for federal CIOs. The program responds to Clinger-Cohen Act requirements to recognize that an individual has received education in the federal CIO competencies. The program is organized around 11 subject areas that relate to CIO competencies. Each area is addressed through one or more courses that are designed as primary or enrichment courses. Courses are designed as 5 days in residence or 10 to 12 weeks in a distributed learning format. The CIO Certificate Program curriculum framework is shown below in Figure 1.

Advanced Management Program

The 14-week graduate level Advanced Management Program (AMP) (curriculum shown in Figure 2) provides both functional and technical information resource managers with an integrated understanding of the Clinger-Cohen Act and other policies, regu-

Figure 1.

Figure 2. Advanced Management Program Curriculum (14 weeks)

lations, imperatives, and ethical standards to allocate and apply information resources to mission requirements. The major focus of the curriculum is the key competency areas required of CIOs and other IRM officials. In addition to the AMP diploma, students also have the opportunity to qualify for the CIO Certificate. Depending on which electives or specialty tracks are selected, graduates may need to earn additional credits after graduation to complete the CIO certificate.

Information Assurance Certification Program

The curriculum for the Information Assurance Certification Program has been certified by the Committee on National Security Systems (CNSS) as being compliant with the NSTISSI No. 4011 Standard for Information Systems Security Professionals. The program entails four intensive courses: *Assuring the Information Infrastructure, Global Enterprise Networking and Communications, Managing Information Security in a Networked Environment, and Developing Enterprise Security Strategies, Guidelines and Policies.*

eGovernment Certificate Program

The eGovernment Leadership Certificate Program..."Facilitating Cross-Boundary Leadership" is designed to facilitate the development of new knowledge, skills, and abilities needed by leaders in the eGovernment and eMilitary arenas. The eGovernment Leadership Certificate Program seeks to develop cross-boundary leadership to achieve the vision and goals of transformation in eGovernment for citizen interaction and customer satisfaction.

The eGovernment Leadership Competencies are shown in Figure 3. The certificate requires completion of eight courses. The curriculum focuses on cross-boundary leadership, communication, best practices, global perspectives, systems thinking, collaboration, technologies and execution.

Information Assurance Scholarship Program (IASP)

DoD civilian employees, military officers and enlisted members may apply for IA Scholarships through their service community managers through the DON CIO. There are three DoD Centers of Academic Excellence that sponsor graduate programs in information assurance under the IA Scholarship Program. Detailed information is available at **www.c3i.osd.mil/iasp.** These three institutions are the Information Resources Management College (IRMC) of the National Defense University (NDU), the Naval Postgraduate School (NPS), and the Air Force Institute of Technology (AFIT). Typically, new students attend IRMC at NDU prior to attending a Partner University to complete remaining degree requirements or they are directly admitted to NPS or AFIT.

Students who previously completed IRMC requirements may be directly admitted to a Partner University if they meet the admission criteria. A Partner University is a designated IASP Center of Academic Excellence that has agreed to award graduate credits from the IRMC CIO Certificate Program (with NSTISSI 4011 Certification). Partner Universities continue to grow as the program matures. The IASP Web site **www.c3i.osd.mil/iasp**, is the best source for the most current information.

Virtual CIO University

The Federal CIO University is a virtual consortium of universities that offer graduate-level programs that directly address execu-

Figure 3. The eGovernment Leadership Competencies

Setting New Directions
- Understanding the environment, principles, policies and foundations of eGovernment
- Applying systems thinking to complex eGovernment challenges
- Planning and organizing strategically for eGovernment
- Transforming organizations and cultures to sustain eGovernment

Transforming Processes and Resource Use
- Collaborating across boundaries to achieve eGovernment goals
- Understanding and applying effective architecture and systems for eGovernment
- Using new models to extend human capital for eGovernment
- Planning and managing funds and resources strategically for eGovernment projects and programs
- Managing performance-based eGovernment programs and projects
- Moving from concept to reality

Using Information Strategically
- Providing the right information and knowledge at the right time within and across boundaries
- Balancing security, privacy, access issues and protection of information for eGovernment
- Understanding strategic uses of information through the use of technologies

tive core CIO competencies. The consortium of universities currently includes George Washington, George Mason, Carnegie Mellon, Syracuse and the University of Maryland University College. There are three types of programs. The first is completion of a certificate program, which requires an individual to attend courses in all the Clinger-Cohen areas following the usual requirements for graduate credit. A second format offers an overview of the competencies at a higher level for an executive who needs to understand the broad sweep of the IT functions, but not at the level of detail required of someone working in a CIO organization. Finally, the third option permits individuals to take select courses to focus on specific areas that they need for remediation or update. This is especially valuable for individuals who arrive at the CIO position from other than an IT background. Detailed information is available at **www.ciouniversity.cio.gov**.

Your Career Progression Plan

Identifying your required competency needs and whether any of the above programs are right for you is a task best completed with the support of your manager or your mentor. At a minimum, your Career Progression Plan should include your goal, prioritized competency needs, developmental options (both formal and informal), desired dates, and estimated costs. Many managers like to also see your past education, training and developmental assignments documented in your plan. All core IM/IT professionals should include in their plans 80 hours of continuous learning as provided in the DON CIO guidance published July 11, 2000.

In this time of exceptional change and reduced resources, the DON workforce must not only be skilled, but also adaptable and flexible in meeting evolving mission demands. Strengthen your competitive advantage by taking charge of your career today, ensuring your skill sets are current and relevant.

"ACTION without vision — is a random activity. VISION without action — is a hallucination."
- Anonymous

Sandra J. Smith is the DON CIO Competency Management Team Leader.

DEPARTMENT OF THE NAVY SIGNS XML POLICY

The Department of the Navy's (DON) continuing efforts to transform its information technology and information management solutions suite took a major step forward with the signing of the DON Extensible Markup Language (XML) policy by DON Chief Information Officer Dave Wennergren on December 13, 2002.

The policy, which replaces an interim policy issued in fall 2001, sets parameters for how the DON will use XML — the technology that facilitates information exchange and interoperability by allowing programmers to assign information tags and attributes to data and documents. It is the first-ever formal XML policy issued by a United States military department.

"Interoperability is a cornerstone of DON efforts to strengthen its interdependent operations and, subsequently, improve the warfighter's ability to find, retrieve, process, and exchange information," said Wennergren in the December policy memorandum. "The Department, like many government and private sector organizations, has increasingly looked to XML technology for its data sharing needs."

In addition to outlining how the Department will use XML to better find, retrieve, process, and exchange data, the policy provides direction to help DON officials manage areas critical to successful XML implementation. These areas include XML technical specifications usage, XML standard components selection, adherence to business standards that define specific XML data vocabularies, and participation in XML-related technical and business standards bodies.

The policy also directs the DONXML Work Group and Functional Area Managers to formally establish XML Functional Namespace Coordinators (FNCs) for the Department's 23 functional areas established in November 2001. As XML vocabulary monitors, FNCs will be responsible for helping to develop, manage, and coordinate DON XML vocabularies, or "namespaces," within their functional areas and across the DON enterprise.

Namespace coordination is vital to XML's success. Inconsistency and a lack of uniformity in XML vocabularies will prevent systems and applications from easily exchanging information and degrade, rather than enhance, interoperability.

"Successful XML implementation requires a firm commitment to coordination," said Wennegren. "I strongly encourage [commanders] to review and adhere to this policy, which is a crucial part of our work to foster XML coordination among DON programs and commands."

The XML policy is part of a comprehensive Department-wide XML implementation strategy. In 2001, the DON Chief Information Officer created the DONXML Work Group to provide leadership and guidance to the Department's XML efforts through focused action teams.

In addition to the DON XML policy, which names the DONXML Work Group as the Department's interim XML governance structure, other Work Group products have included a vision document outlining the Department's objectives for successful XML implementation across the DON (March 2002) and the XML Developer's Guide, Version 1.1 (May 2002). The XML Developers Guide provides DON developers with important information about XML specifications, component selection/creation, schema design, and component naming conventions.

These and other XML-related documents are available at the Work Group Web site at **https://quickplace.hq.navy.mil/navyxml**.

Go to https://quickplace.hq.navy.mil/navyxml for more XML information.

The DONXML Work Group Chairperson is Michael Jacobs.

SPAWAR Shore Installations Focus

By Capt. Mickey V. Ross, USN

Background

Modern warfare is conducted at longer ranges and with greater precision than ever before. Overall mission effectiveness increasingly depends on systems and services external to weapons systems. At the heart of the U.S. warfighting doctrine are the systems of Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance (C4ISR). The purpose of C4ISR, and the mission of the Space and Naval Warfare Systems Command (SPAWAR), are to provide the battle force commander with knowledge superiority — the means to see the battlefield, understand its related ongoing activities, formulate effective courses of action, and transmit orders for action.

More than moving information, the real key to knowledge superiority is providing the right tools to warfighters — tools that will allow the warfighter to translate information, analyze it, then synthesize that information into decisive, actionable knowledge, and all in near real-time. SPAWAR is organized to deliver an integrated end-to-end capability. The entry point into SPAWAR is through a single financial office (Code 01), then to a central engineering and design code responsible for the creation and evolution of the capabilities (Codes 05 and 07). These capabilities are then delineated into core competency areas and sent to program offices for development and acquisition. At the production end another code combines these capabilities to form a single, integrated afloat and ashore interface for installation and life-cycle support (Code 04.)

The Importance of Ashore Communications

There are many lessons to be learned from the attacks of September 11, and one of them is the importance of the shore infrastructure. Once you have a sound architecture in place you can build the networks, systems and all the collaborative communication systems the warfighter needs. In essence this is my message: gone are the days when afloat installations took precedence over shore installations — now we all know that in order for essential fleet C4ISR systems to be successful we must pay equal attention to shore C4ISR systems. The Shore Installations Office (04N) of the SPAWAR Installations and Logistics Directorate (SPAWAR-04), San Diego, Calif., manages over $200 million of integrated capabilities and installations for our customers worldwide. Our expertise and technical competence have become the model for many Navy and joint commands to follow.

Our approach is designed around leveraging lessons learned and best practices while incorporating the adaptability to tailor capabilities, which create the best value for our customers. Rear Adm. David Antanitus, Director, SPAWAR-04, (Rear Adm. Antanitus is now SPAWAR 05, Chief Engineer) has implemented a program that relies heavily on metrics to measure customer satisfaction, logistic parameters, emergent upgrades and new installations capabilities — as well as their impact on existing systems. *We want to know if the install went as planned? Did it increase fleet capability? Have the customer's requirements changed after the installation?* We track CASREPS and pay careful attention to customer feedback. If a customer has a question we can't answer we consult our colleagues at SPAWAR. Our scrutiny of all aspects of the installations is what makes us so responsive.

We use the "IOC-30 process" (Initial Operational Capability), a flexible 30-month planning tool for design and installation integration reviews, and the SPAWAR 04N Shore Installation Process. An important tool is the SPAWAR Shore Installation Process Handbook. Since its inception in September 1999, this handbook has been instrumental in standardizing the installation procedures utilized by the SPAWAR field activities and headquarters organizations. This handbook has resulted in improved customer satisfaction and has been embraced by our customers who now know what to expect from a SPAWAR installation team. A recent handbook update further improves the process documentation and incorporates lessons learned over the past three years. Some of our best work includes:

♦Consolidated C4I Installations at San Diego and Norfolk Fleet Training Centers. The Shore team's dedication, planning and execution of these unique installations had two very important results. The installations were professionally and quickly accomplished resulting in high customer satisfaction. And the installations proved the consolidated installation concept complements the new and streamlined training process giving the fleet better trained Sailors in the very latest C4I systems.

♦Defense Messaging System Sectera Modem Installations 3.0. DMS is a dynamic program continually evolving to meet emergent engineering requirements. To correct a design deficiency, the SPAWAR team was given less than a month to develop plans, process funding and train installers for the new Sectera modems at 22 DMS Service Providers (DSP) sites to replace the legacy STU-III, a part of the original system design. We employed the unique "Battle Cell" approach, which enabled the SPAWAR Shore team to successfully accomplish the task.

♦Bahrain Communications Upgrades. As preparations in the Persian Gulf began to accelerate, COMUSNAVCENT (Commander, U.S. Naval Forces Central Command) identified communications capacity and performance capabilities that needed to be addressed.

CHIPS: What role does the Shore Installation Process Handbook play?

Capt. Ross: The handbook is a customer tool that serves as an agreement between the customer and SPAWAR. It tells the customer what to expect of us, what we will use, what impact the install will have on existing legacy systems, how it will increase capabilities, and how much it will cost. It details the scope of the work, installation performance testing and system turnover. This gives the customer the opportunity to participate and understand what we are doing. It is a work plan for both of us to follow. After the installation is completed, we test the system with our customer right there by our side. Regional Shore Installations Managers (RSIMs) are located in the Installation Management Offices (IMOs) in the SPAWAR Systems Centers (SSCs), and are specifically dedicated to shore installations. They have project engineers who work very closely with them to ensure installations exceed our customer's expectations of excellence.

CHIPS: When I think of SPAWAR customers, I think of fleet customers.

Capt. Ross: Shore commands are my focus: the NCTAMS (Naval Computer and Telecommunications Area Master Stations) and Telecommunications Stations (NCTS), Fleet Training Centers (FTCs), and Command Centers for major Naval and joint commands. We perform new military construction (MILCON) installations, for example, at the USPACOM Nimitz-MacArthur Pacific Command Center (HQ-21). SPAWAR 04N developed the operating model for Corporate Command Centers, which incorporated the initiatives of the SSCs. The 04N team merged SPAWAR corporate processes with new procedures to set the path for the Command Center Design and Installations. This effort is resulting in a cohesive set of practices, which will be used for the Nimitz-MacArthur Pacific Command Center (HQ-21), COMUSNAVCENT OPCON/COMM Center (P903/904) and other command centers.

We perform the integration of over 100 critical C4ISR systems in support of emerging operational requirements for Operation Enduring Freedom. We also facilitated the COMPACFLT upgrade for the Fleet Command Center to better support the new mission requirements of the Joint Forces Command (JFC), C4I Headquarters. The original multi-year goal was to convert a briefing theater into an operational command center and more fully integrate existing systems to improve the evaluation capability of watchstanders. These long-term objectives were elevated significantly following the 9/11 terrorist attacks. To meet critical operational requirements, the first phase conversion effort was compressed from four months to four weeks.

CHIPS: How is it possible to compress four months of work into four weeks?

Capt. Ross: We can do this because we have a proven process. It is an in-depth process that takes careful planning and coordination. However, it has increased our efficiency and level of performance. When you have a well-trained team, with a strategic plan to follow and they collaborate with all the stakeholders of the project you can accomplish what may seem at first to be impossible. I have an excellent team of leaders directing the work: Bob Ireland, Command Centers; John Walker, Pacific; Milton Martinez, Atlantic; and Dick Majer, Eurcent. The SPAWAR Shore process, in my opinion, should be a Navy-wide process. I've discussed this with Capt. Jim Adams, deputy to Ms. Monica Shephard (Commander, Task Force Web and Director, C4 Systems, U.S. Atlantic Fleet), who agreed changes to the current installations policy should definitely include shore processes.

CHIPS: You said that ashore communications are just as important as fleet communications. Is this a new way of thinking?

Capt. Ross: The thinking has been there, but now there is a new emphasis. We all learned a lot from the events of 9/11. For example, what we do for the NCTAMS and their stations is centered on their 24 x 7 operation — they can't miss a beat. Their systems are "hot" and have to be at top performance at all times. Capt. Betsy Hight, Commanding Officer of NCTAMS LANT, has a tremendous responsibility to make sure communications capabilities stay online and operate to demand requirements. Her ship-to-shore capability is vital to the units afloat while at the same time her speed and capacity demands are ever increasing.

When important dignitaries visit a Naval base, they are usually also taken to commercial shipyards to see the incredible power of aircraft carriers and other Naval ships. Rear Adm. Antanitus visits the shipyards — and shore installation sites. I strongly recommend to any leader — go to the C4ISR shore sites. They are awesome feats of capability and engineering excellence. The new command center being built at PACOM is 274,000 square feet of integrated C4ISR systems. We installed these systems throughout the building. It typically takes five years to build a command center of this magnitude — an aircraft carrier takes eight years. The construction of a large deck ship is impressive, but the effort and level of complexity of constructing a C4ISR structure with a command center rival the engineering of a large deck ship — it is a massive undertaking.

CHIPS: What are the "100 critical C4ISR systems" that the Shore Installations Office installs?

Capt. Ross: I'll tell you in terms of capabilities. We install the capabilities for Telecommunications (Telecom), Technical Audio and Video Control, Radio Frequency Satellite Communications (RF/SATCOM), Special Intelligence Communications (SPINTCOMM), Joint Operational Capability (JOC), Brief and Display Video Architecture (BDVA) and Networks. To install these capabilities we collaborate with many acquisition program offices such as those within PEO C4I and DISA. We collaborate with many major commands within the Navy and joint commands prior to and during installations.

CHIPS: What is the "Battle Cell" approach?

Capt. Ross: There are emergent situations when our normal procedures and approaches are not sufficient to deal with the magnitude and urgency required. It is during these times that we empower a dedicated team of experts and senior managers to focus on and resolve the issues, real and political, to complete the effort. The first time we used this concept, we had been asked to do a very large number of installations in a seemingly impossible time frame. We succeeded, and the Battle Cell approach was born.

Capt. Ross is in the Navy's elite Engineering Duty Officer community. Under his leadership, the Shore Installations team has won three SPAWAR Lightning Bolt Awards over the past year, which is the highest level of team recognition at SPAWAR. He was a leader in the restoration of the Navy Command Center in the Pentagon and in the establishment of pier connectivity for the USNS Comfort, which was used as the alternate command post for the mayor of New York City after the 9/11 terrorist attacks. He was recently selected to attend the Maxwell School at Syracuse University for National Security Management (related to Homeland Security). A talented innovator and motivator, he has worked to consolidate shore installs, and reduce costs using earned value management to measure performance. Capt. Ross is a distinguished technical leader committed to enhancing opportunities for minority men and women in SPAWAR and the San Diego community. Capt. Ross was recognized as a Modern Day Technology Leader at the Black Engineer of the Year Awards Conference 2003.

The Project Management Discipline: Achieving the Five Project Success Factors

By Eric Verzuh, PMP

Most of us at one time or another will be responsible for the successful completion of a project. From a simple LAN expansion to a major systems upgrade aboard an aircraft carrier we know that the U.S. Navy relies on the successful completion of many projects to achieve mission readiness.

This article will explore the challenges of managing projects as well as provide a systematic approach for improving the success rate of all projects. As an example, we'll examine one specific project management technique you can apply to any project.

Few projects are easy. Even when the technology is proven, the requirements are clear, and the budget is sufficient we can still stumble — turning what ought to be a routine deployment or upgrade into a nail-biting nightmare. What makes delivering projects so challenging? The answer is found in the definition of project: work that is temporary and produces a unique product or service.[1] There are a number of challenges associated with managing work that is both temporary and unique:

•**Staffing**. As the project has a start and a finish, so does the project team. The more unique the project, the greater the difficulty in assembling a team with the appropriate skill mix.

•**Budgeting**. Most budget cycles are set to reflect accounting cycles. But projects are driven by other factors, and often can't wait for the next budgeting cycle. After September 11, many projects were initiated, cancelled or re-prioritized — totally out of alignment with the annual budget.

•**Authority**. When politics interferes with project progress, we usually mean that the organization's authority structures aren't supporting the project. That's not surprising, given that projects often require cooperation and participation across the normal functional boundaries within the firm.

•**Estimating**. We estimate new deadlines and budgets before a project can be approved. But given that estimating requires forecasting the future, these cost and schedule goals are often built on more assumptions than facts. The project team is being asked to create something unique; that means it will solve new problems and encounter unexpected obstacles. Even projects that are similar to previous efforts can be difficult to forecast because most projects contain so many variables.

•**Communication**. If people are the engine of accomplishing work, communication is the heart of true productivity. Projects that require cooperative, concerted effort from temporary, cross-functional project teams, require teams to re-create basic communication channels on every project.

As challenging as it can be to manage a project, the problem is magnified for a project-based organization such as the Space and Naval Warfare Systems Command (SPAWAR) that has hundreds of projects. Each project has its own risks, stakeholders, communication channels and resource requirements.

The good news is that the project management discipline has evolved to address the challenges of individual projects, and continues to evolve to address the problems faced by project-based organizations. This is the first article in a four-part series that will present proven techniques to increase your project's probability of success. In this article we'll examine the five project success factors and identify specific techniques to help you build them into every project.

A Vision of Success

Before reading further take this test: visualize the best project you have worked on. Best project usually means that it was successful in terms of cost and schedule goals — and the customer found the outcome useful. On top of that, it was an experience you would gladly repeat. With this best project clearly in mind, write down the factors that made it so good — what was happening on the project that made it so successful? Have you got your list? Now read on!

I've given this test to literally thousands of professionals who work on projects in industries from aerospace to information technology to healthcare. Of the hundreds of factors they've identified, five factors crop up with overwhelming regularity:[2] (1) Agreement on the goals of the project. The customer, management, team and project manager had a clear understanding of what they wanted to accomplish and why; (2) A plan that will be used to measure progress during the project. This plan is both a cohesive description of an overall strategy and detailed enough to show clear responsibilities and specific accomplishments; (3) Constant, effective communication among everyone involved in the project. Probably the single most cited cause of project failure is "poor communication." Effective communication means putting the channels in place that keep all the right people informed at the right time, enabling coordinated action even as the project encounters unexpected challenges; (4) A controlled scope. Project scope is all the work required to complete the project's objectives. Scope is controlled by ensuring there are clear agreements on requirements, specifications and objectives before any work begins. Any proposed changes are carefully evaluated for their impact on cost and schedule, and all changes must be approved before we start to work on them. This seemingly bureaucratic restriction maintains a consistent focus on the cost-schedule-quality balance; (5) Management support. Timely decisions and sufficient resources are the two most cited examples of management support. Project teams and project managers don't have

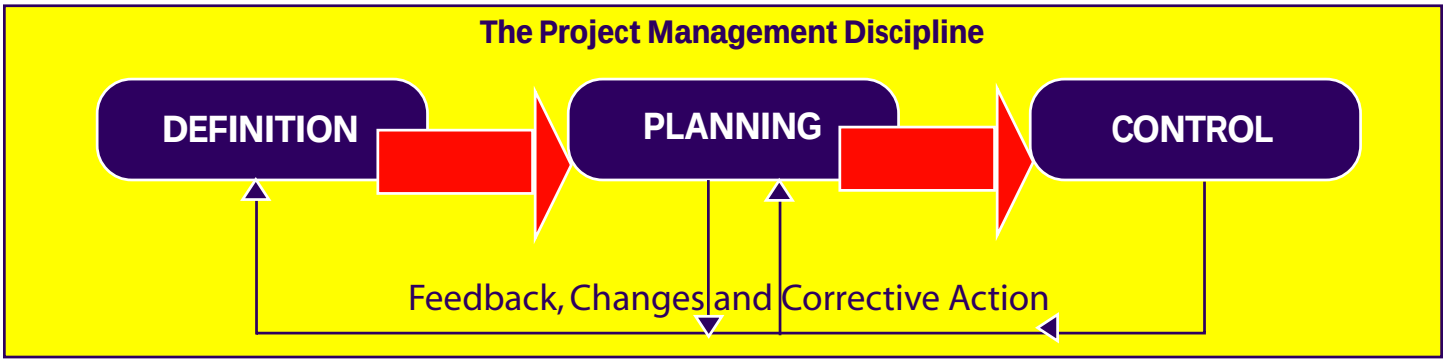


Figure 1.

enough authority to make all the decisions they need to get the project accomplished. They need cooperative, involved management. *Did you identify any or all of these factors for yourself? More importantly, do you have them on every project?* The project management discipline provides a systematic approach that every project team can follow to achieve these five success factors.

A Systematic Approach

The Quality Management discipline has taught us that consistent processes produce consistent results. Figure 1 illustrates a project management process that can be applied to any project. As we examine each of the functions within the process, we'll also understand how each function contributes to the five project success factors. Fundamental to understanding the diagram in Figure 1 is recognizing that it is a management process, and therefore each of the functions takes place repeatedly, throughout the life of the project. It is true that definition will precede planning, and planning will precede control, but it is also true that the outcome of planning may cause the project manager to revisit certain definition activities and that monitoring and controlling a project will lead to updates in the plan. This cycle should become more apparent as we examine the model in greater detail.

Definition. Once a project is selected, a project manager is assigned and goes to work building the foundation for the project's success. Project definition activities include the following:

• Identify all stakeholders on the project and document their goals and involvement. Stakeholders include customers, vendors, core team members and supporting management within the firm. •Develop a relationship with the project sponsor. A sponsor is an executive within the organization who is responsible for the success of the project. While the project manager performs the day-to-day oversight of the project, the sponsor provides the executive authority necessary to overcome organizational obstacles. •Record the goals and constraints of the project using a statement of work or similar document. Goals and constraints can include the scope, budget, key schedule milestones, authority structure for the project, measures of success, communication standards, and other facts or assumptions that will affect the project. This document establishes a baseline agreement that is signed by the project stakeholders.

Project definition is the foundation for success because it establishes a common understanding of the goals and constraints of the project. Without it, the project team is shooting at a moving target. Through the activities of project definition we begin to build all five of the project success factors.

Planning. With a clear goal in place the project manager builds the action plan that describes the who, what, and when of accomplishing the project. Figure 2 represents a common planning graphic that includes all of this information. Planning typically includes the following activities:

•Develop a detailed description of the work on the project using a work breakdown structure (WBS). The WBS breaks the overall work of the project into small, individual tasks, much the same way an organization chart for a company breaks down authority. We will examine this technique in greater detail later. •Analyze the sequence of the tasks. For all the tasks on the WBS, understand which tasks have to be performed before others. The classic diagram for this analysis is called a "network diagram." (Both PERT and Critical Path charts are forms of network diagrams.) •Estimate the tasks to determine the required skills, effort, equipment and materials. Even though the business case provided a high level cost estimate, it is necessary to have detailed estimates in order to assign resources to accomplish tasks. •Establish detailed project schedules documenting specific start and finish dates, responsibilities and completion criteria for each task. •Determine the number of people on the team and what skills are necessary. For part-time team members, identify the dates their skills and effort are required. Staffing the project team often requires negotiating with other project managers or functional managers. •Prepare contracts for vendors who are participating on the project.

The old saying is that "the devil is in the details." Clearly, building a plan provides the details for assigning clear responsibility and monitoring progress. But does project planning affect all five project success factors? Yes. Planning clarifies goals because it breaks high-level goals into detailed actions. The detailed plan becomes the basis for communicating with the team, management and customer. Scope is easier to control because it has been so completely defined. All together these elements make it easier to positively engage management and to get their support.

Control. The control function can be compared to driving a car: the driver monitors his vehicle and the environment, intentionally steering toward his destination, taking corrective action as obstacles or unexpected events arise. Driving the project includes:

•Monitor the progress of the project against the plan. Projects are typically too large for subjective assessments of progress to be valuable. Instead, we need specific measurements, such as the percent of the budget consumed to date. The detailed nature of the project plan allows for detailed measurements of cost and

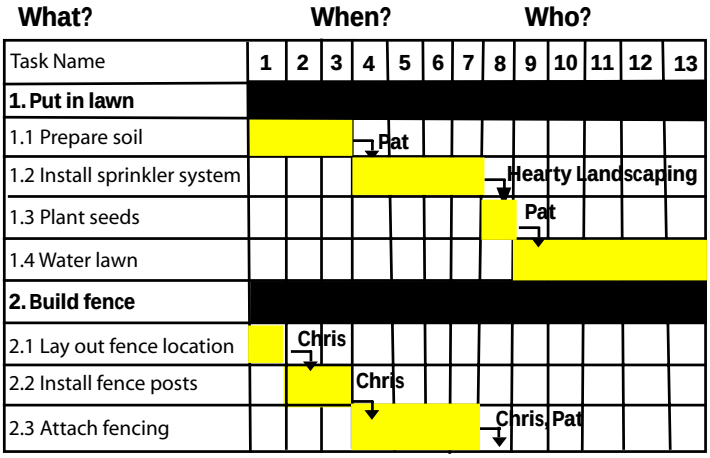


Figure 2.

schedule. We can see which tasks are late, which are early and which are consuming more or less effort than was estimated. •Communicate with the project team and stakeholders. Since life and projects rarely go as planned, continuous, purposeful communication is necessary to keep all project participants informed and working together in harmony. •Form the project team and attend to its health. Forming the team means assembling a disparate group of people into a team with a shared goal. Consciously build and maintain trusting relationships within the team. •Maintain the cost-schedule-quality equilibrium. Be vigilant about potential changes to requirements or project scope and ensure all changes are approved before they are acted upon. •Take corrective action to keep the project on track.

The five success factors permeate project control: manage from the plan, communicate, control changes, re-plan — and always keep an eye on the goal. Our original premise is that SPAWAR's mission accomplishment relies heavily on successful projects. But SPAWAR does not exist to perfect project management processes. Its goal is to deliver successful projects. The key is that project managers with a disciplined, systematic approach to managing their projects consistently produce better results.

The Foundation of Planning and Control

This Define-Plan-Control model makes sense at the high level, but project teams get it done one day at a time. The foundation of successful planning and project control is a clear understanding of what should be happening on a day-to-day basis. We gain this understanding using a work breakdown structure or WBS. The WBS is simple, yet extremely powerful. Its importance derives from the inherent challenge of projects: since each project is unique, there will always be a unique set of tasks to plan and perform. The WBS breaks down a project from one large, unique, bundle of work into many discrete, manageable tasks. It sounds simple and it is, yet following a few straightforward rules provides a firm grasp of the project's details and a cohesive understanding of the big picture.

Rule One: Break it down one level at a time. Start at the highest level. Break the overall project into the big pieces. There is more than one way to break down a project. Some people prefer to focus on the big "pieces" they will deliver, such as hardware, software and documentation. Others will break the high-level view along the lines of the major phases of the project, such as requirements, design, construct, test, etc. No matter how you tailor your approach, just be sure that the first tier of your WBS is a complete, high-level description of the project before you start breaking it down further. Once satisfied with the first tier, you can begin to break down each major task. The key is that you are breaking this task down into smaller tasks. Again, once you've decomposed a first tier task into several smaller tasks, review them to make sure you have identified every step necessary to produce the outcome described by the tier one task. Figure 2 provides an example of this concept: when we have accomplished tasks 1.1, 1.2, 1.3 and 1.4, we have also accomplished task 1.

Rule Two: Clearly describe each detailed task. The lowest level tasks form the basis for estimating the project, assigning responsibilities and measuring progress. That means that the more clearly we can define each task the better grasp we have of the overall project. To clearly define a task, give it a strong, descriptive name and completion criteria.

When building a WBS there is a temptation to use jargon and short, mnemonic tasks names — but don't do it. Abbreviated names such as "database" and "requirements" lead to misunderstandings because each of us will interpret the task in a different way. A strong task name describes what work will be performed and what result will be produced, for example, "design the database" and "produce a data model of the requirements." Every task needs completion criteria, which answers the question, "What does it mean to be done with this task?" If the output from the task must compile, pass a test, or be signed off, then clearly state that condition. The clearer your completion criteria, the easier it will be to estimate, assign and track the task.

Rule Three: Make it a team event. The surest way to build a detailed plan that has no connection to reality is to build it alone. Don't do it. Instead, get the team involved to make sure you have identified all the necessary tasks and you have the correct completion criteria. Involving the team increases their ownership, which leads to increased commitment.

Rule Four: Leverage past projects. Every project may be unique, but many are similar. If you are building a plan today, chances are good that another team has done something similar. Get their list of tasks and let that be a starting point. Then commit to updating your plan as you go, so that when your project is complete you have the new "best WBS" for that type of project. Soon you'll have developed a library of WBS templates that represent best practices for all kinds of projects.

The WBS Improves Your Odds

A solid WBS is just one of the many tools and techniques in the project management discipline, yet this one technique influences all five of the project success factors:

•Clear goals. Sometimes everyone thinks they agree on the big-picture goals, but when reality hits we hear, *"I didn't realize the project would entail all this work!"* The WBS transforms the goals into manageable actions and provides a stronger basis for making commitments. •A detailed plan. The WBS is the foundation of the action plan. •Constant, effective communication. •Clear, descriptive tasks make assigning work and reporting progress more meaningful. •A controlled scope. The WBS is the definitive description of project scope. The stronger the initial understanding of project scope, the easier it is to manage changes. •Manage-

ment support. The top-down nature of the WBS makes it meaningful to both management and team members.

A good WBS won't guarantee success. The five success factors won't guarantee success. But they do turn the odds in your favor. Given the challenging nature of projects — that is an edge you can't afford to ignore.

Summary

In this article we've recognized that the nature of projects *(temporary and unique)* poses challenges that are addressed by the discipline of project management. With a systematic approach to clarifying the goals and constraints of a project, creating a detailed plan, and managing from that plan, we improve communication, management support and ultimately the chance for project success.

The WBS is just one of many proven project management techniques you can easily learn and apply to your project or to a piece of a larger project. It provides a framework for breaking down a large, complex, unique chunk of work (a project) into small, manageable tasks and enables you to keep an eye on both the details and the big picture.

In the next article in this series we'll switch perspectives and focus on the human element — how to build a cohesive, high performing team. Throughout all these articles, you will see that project management is a collection of skills and techniques that you can learn and apply to achieve results.

Sources:

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2. Verzuh, Eric, The Fast Forward MBA in Project Management, New York, John Wiley & Sons, 1999, p. 7-8.

Eric Verzuh, a Project Management Professional, is President of The Versatile Company, a project management training firm. He is the author of the best selling book, "The Fast Forward MBA in Project Management." His latest work, "The Portable MBA in Project Management," is due out in May 2003. His firm has delivered project management courses to over two hundred SPAWAR personnel in Norfolk, Va., and Charleston, S.C., since 2001.

NAVAIR Continues Joint Testing on Upgraded E-6B

By Renee Hatcher, Public Affairs Office

An E-6B Mercury, modified with a new cockpit and an advanced communications package arrived at Naval Air Station Patuxent River in January, where joint testing by VX-20 and Boeing E-6 test teams is continuing. The E-6 is a communications relay and strategic airborne command post (ABNCP) aircraft.

VX-20 is an Air Test and Evaluation Squadron providing *"Full Spectrum Flight Test for the Fleet."* The squadron consists of more than 400 talented test pilots, aircrew, engineers and support personnel who are committed to delivering efficient, comprehensive safe flight testing and engineering services. These services are delivered with a sophisticated fleet of approximately 30 current production and legacy aircraft.

"It's a great situational awareness enhancer," said Lt. Bob Strahm, project test pilot. "These improvements will do great things for the TACAMO community."

TACAMO refers to the Navy's *"Take Charge and Move Out"* mission. It is a Navy Air Wing fully integrated on an Air Force base, carrying out a Navy mission in joint operations. Commander, Strategic Communications Wing One provides operational control and administrative support for Fleet Air Reconnaissance Squadrons Three, Four, Seven and various training units. The Navy's TACAMO community provides a survivable communications link between national decision makers and the country's arsenal of strategic nuclear weapons. The E-6B Mercury aircraft enables the President of the United States and the Secretary of Defense to directly contact submarines, bombers, and missile silos protecting national security through nuclear deterrence.

The E-6 is a long-range, air refuelable aircraft equipped with four CFM-56-2A-2 high bypass ratio fan/jet engines with thrust reversers. The weapon system is electromagnetic pulse hardened. The has an endurance of more than 15 hours without refueling and a maximum endurance of 72 hours with in-flight refueling. Mission range is over 6,000 Nautical Miles (NM). It carries a crew of five officers, nine enlisted aircrewmen and up to four trainees for TACAMO missions. For ABNCP missions it carries five Naval officers, nine Naval enlisted aircrewmen and an eight person battle staff as determined by the United States Strategic Command (J36).

E-6B is a dual-mission aircraft capable of fulfilling either the E-6A mission (communications relay for fleet ballistic missile submarines) or the airborne strategic command post mission, and it is equipped with an airborne launch control system (ALCS). The ALCS is capable of launching U.S. land-based intercontinental ballistic missiles.

The mission system and cockpit display upgrades will improve mission avionics, provide additional data processing capabilities, and increase reliability and maintainability for the Mercury. The upgrades also provide Automated Data Processing, Demand Assigned Multiple Access (DAMA) and Weight Savings (ADWS). Wide bandwidth data capability is also included through integration of a phased array antenna system. The improvements include SIPRNET and NIPRNET functions. Highlights of these functions include two separate onboard servers (classified and unclassified), access to servers on the ground via command managed local area network communication links, airborne user interface via laptop computers, and Ku band (high-speed) uplink and DAMA or Northstar Network (up to 16Kbps) downlink.

The upgraded cockpit is equipped with the Multifunction Display System (MDS) that is based on the Boeing Commercial 777 and 737-700 next generation avionics technology. The MDS will provide the fleet with state-of-the-art communications, navigation and surveillance capabilities in order to address emerging Global Air Traffic Management (GATM) requirements.

Capt. William G. Okoniewski manages NAVAIR's E-6 Program Office (PMA-271).

SMART ERP Introduces Navy Business Changes

By Bob Ahern, Dan Olson and Gina Napoli, SMART ERP Project Team

On January 3, 2003, the Supply Maintenance Aviation Reengineering Team (SMART) Enterprise Resource Planning (ERP) program went live. The single software and process solution for E-2C Hawkeye aircraft and LM-2500 marine gas turbine engines combine maintenance, supply and financial operations into one seamless system.

SMART ERP is a pilot program that replaces legacy supply, maintenance and financial management systems with a modern, responsive, accurate and integrated system. SMART ERP improves parts management, provides total asset visibility, increases inventory modeling capability and facilitates data sharing.

AK1 Christian holds the first successful transaction using the SMART ERP system.

Background

The ERP initiative began with a top-down approach. Sponsored by the Chairman of the Joint Chiefs of Staff, Joint Vision 2010 (now 2020) created a vision for revolutionizing, modernizing and streamlining business processes. This call for management and technological innovation was designed to achieve improved levels of effectiveness in joint warfighting. In response, the Revolution in Business Affairs (RBA), sponsored by the Secretary of the Navy, Commandant of the Marine Corps, and Chief of Naval Operations created a complementary business vision calling for the Navy to become more combat-efficient by improving the design of acquisition and support processes. Following extensive research, the Commercial Best Practices Executive Steering Group (ESG) determined in November 1998 that Navy could best reach these new visions by implementing ERP.

The Naval Supply Systems Command (NAVSUP) and the Naval Air Systems Command (NAVAIR) partnered to reengineer supply, maintenance and financial processes through implementation of an ERP system. This project replaces 1960s financial and maintenance legacy systems (Uniform Inventory Control Point (UICP), U2, and NALCOMIS (Naval Aviation Logistics Command Management Information System)) at Norfolk, San Diego and the Naval Inventory Control Point (NAVICP) with a single integrated system using SAP-based methodology. The NAVICP manages the two systems, Norfolk operates and maintains E-2C aircraft and Fleet and Industrial Supply Center (FISC) San Diego provides supply support for depot repair for both the E-2C and the LM-2500. Initial pilot participants include approximately 400 users at the NAVICP Mechanicsburg and Philadelphia, Pa., FISC San Diego, and the Aircraft Aviation Intermediate Maintenance Detachment and Regional Support Office (RSO) Norfolk. Teams in San Diego, Norfolk, Philadelphia and Mechanicsburg worked tirelessly to resolve transition and legacy data issues common to the implementation of new information technology systems.

Under direction of Vice Adm. John A. Lockard, Commander, NAVAIR, the ESG directed formation of four ERP pilots: SIGMA, CABRILLO, NEMAIS and SMART. The NAVAIR SIGMA pilot focuses on program management, including financial, asset, acquisition and human resources data. The Space and Naval Warfare Systems (SPAWAR) CABRILLO pilot focuses on Navy Working Capital Fund (NWCF) financial management. Led by the Naval Sea Systems Command (NAVSEA), the NEMAIS pilot focuses on project management and planning, system design and development, and deployment and operational support for maintenance activities.

The Need

In addition to top Navy leadership's vision for business processes transformation, quite simply, the legacy applications and processes supporting Navy business transactions were long overdue for overhaul. Originally created in the 1960s, the legacy systems had undergone countless enhancements and upgrades, and many of the experienced software maintenance professionals who worked on the systems were no longer with the Navy.

But more importantly, the infrastructure of the legacy systems is cumbersome and very expensive to maintain. Annual operating and maintenance costs of legacy systems at NAVSUP alone are estimated to reach $55 million by 2005. With ERP systems, the Navy can expect to save $40 million of this cost. The Navy will also realize savings through reduced cycle times, improved visibility of inventory and avoidance of redundant data entry. When fully implemented SMART ERP could reduce inventory costs and lower inventory management-related infrastructure expenses by $100 million annually. These significant savings can be used to directly support the Navy's warfighting mission.

In the area of financial management, one of the biggest impediments in obtaining a "clean audit opinion" on Navy financial statements has been the inability of legacy systems to report historical costs of inventory because DoD legacy logistics systems were designed to report inventory value at standard selling price rather than historical cost. In order to obtain historical costs, the Defense Finance Accounting Service (DFAS) Cleveland had to approximate historical cost using a Cost of Goods Sold (COGS) model. Unfortunately, the COGS model is not endorsed by the audit community as an acceptable way to approximate inventory cost. In contrast, ERP systems are designed to record historical inventory costs with each transaction. Navy inventories managed by ERP will be recorded at Moving Average Cost (MAC), meeting requirements for a clean audit opinion by the audit community.

The Solution

Originally started in fall 1999 as the Aviation Supply Chain Man-

agement/Maintenance Management (AvSCM/MM) ERP Project, SMART completed Phase I less than a year later with the development of Concept of Operations, areas of opportunities, lean maps quantifying process complexity, a Business Case Analysis (BAC), and software selection. SAP (Systems, Applications and Products in Data Processing) was selected for ERP backbone software, and Manugistics was selected for Advanced Planning and Scheduling (APS) software. The Navy selected SAP software after careful analysis. The Defense Logistics Agency (DLA) and U.S. Army also selected SAP. SAP software comprises a complete business system with one single database at its core controlled by a series of tables. SAP is composed of different application modules, each handling specific business processes feeding into the central database. SMART modules include: Sales and Distribution, Materials Management, Production Planning, Plant Maintenance, and Financial Accounting and Controlling. The modules function interdependently so that one module can affect related processes in another. A single database maintains data integrity and allows different views of the business. Functional costs can be identified, including costs relating to discrete weapons systems, costs of each maintenance level and operating costs by activity. The SAP core financial system is Joint Financial Management Improvement Program (JFMIP) certified, and it meets the requirements of the Chief Financial Officer Act of 1990.

In conjunction with SAP, APS provides algorithms and computations necessary to analyze data for demand planning, forecasting and budgeting. APS also includes modules for supply planning and transportation.

Funds Management (FM) Area: USN1

Company Code:		Fund Center Hierarchy Variant: CNO Fund Centers (Partial List):	
1200	NAVAIR NWCF (DMAG)	0105	NAVAIR
		AH0000	NADEP-N
3200	NAVSUP NWCF (SMAG)	0102	NAVSUP
		010204	NAVICP
"Book of Record"		CB0200	FISC-NV
Funds Management		CA0100	ASD Norfolk
		CB0500	FISC-SD
		CF0800	NADEP-NI
4000	CLF GF	0101	CLF
		D00000	VAW-120
		D00000	VAW-121
		D00000	VAW-123
		D00000	AIMD Norfolk
5000	CPF GF	0199	CPF
		E00000	AIMD Point Mugu

Funds (Partial List):

NA2	NWCF (DMAG) – NADEPs
NC1A28	NWCF (SMAG) – DLA-managed Consumables
NC1A34	NWCF (SMAG) – Aviation Consumables
NC1A81	NWCF (SMAG) – Maritime DLRs
NC1A85	NWCF (SMAG) – Aviation DLRs
1506_2002	Aircraft Procurement, Navy – FY02
1506_2003	Aircraft Procurement, Navy – FY03
1804_2002	Operations & Maintenance, Navy – FY02
1804_2003	Operations & Maintenance, Navy – FY03

SAP Funds Management

Going Live with the Phase 2.0 Pilot

Early morning January 3, 2003, aviation storekeepers from Helicopter Combat Squadron 8 (HC-8) placed the first two orders into the SMART Phase 2.0 live system, ordering four shear bolts from RSO Norfolk. Within minutes of the order being initiated by the squadron, the SMART ERP system responded, the location of parts was identified, a picking ticket was printed, and the proper financial and inventory transactions were performed in real-time — and all within a single integrated system. Moreover, the HC-8 technicians received the bolts within 30 minutes.

This very ordinary transaction in the Navy supply system marks the genesis of a very extraordinary change in the Navy's business methods. The importance of this event is that this transaction was conducted within an ERP software solution that will eventually enable the Navy to conduct all of its business in a single, fully-integrated environment, capturing business events in real-time — providing reliable, timely and complete inventory information.

Financial Solution

The SMART ERP design will replace legacy supply and financial system applications for Navy Working Capital Fund /Supply Management Activity Group (NWCF/SMAG) retail (BP28) inventories supporting Naval Air Depot (NADEP) North Island and Naval Air Station Norfolk, as well as NWCF/SMAG wholesale (BP34/81/85) inventories supporting two in-scope weapons systems. SAP will immediately become "book of record" for in-scope retail inventory. Inventory accounting and billing book of record for in-scope wholesale inventory will use SAP while funds management book of record will remain in the legacy wholesale system finance application until SAP's procurement module is upgraded for Defense Acquisition Regulations Supplement (DFARS) compliancy. All in-scope NWCF/SMAG inventories will be recorded and reported at Moving Average Cost (MAC) in SAP, meeting requirements for a clean audit opinion on inventory valuation.

From the fleet perspective, one of the most important accomplishments of SMART is the ability to perform "exchange price billing" for Aviation Depot Level Repairables (AvDLRs). The SMART project built a sophisticated extension to SAP software, allowing fleet customers to pay net price for AvDLR repairs when they turn in carcasses. This has long been one of Navy's best business practices, possible in legacy systems only because they were not integrated. The design team had a formidable challenge in configuring the fully integrated SAP system to perform this accounting properly. The financial book of record supporting customers at SMART pilot sites remains in legacy systems: STARS-FL (Standard Accounting and Financial System-Field Level) for Norfolk fleet customers and DIFMS (Defense Industrial Funds Management System) for NADEP North Island. SMART built two interfaces to STARS-FL supporting station-use accounting in Norfolk.

Another financial interface SMART built accommodates the Daily Expenditure File (DEF) from Defense Cash Accountability System (DCAS) operated by DFAS. The DEF provides seven different registers from the U.S. Treasury, which update SAP financial ledgers. This interface automatically posts public vouchers, expenditures for interdepartmental material purchases, reimbursements for interdepartmental material sales, unfunded reimbursements, audited cross-disbursing, refunds (reversals) and adjustments/corrections.

While financial reporting requirements will continue to be accomplished through legacy financial systems for SMART Phase 2.0 customers, SAP now does departmental reporting requirements for in-scope NWCF inventory. SMART reached a significant milestone January 31, 2003, when it successfully closed its books at its first month-end and provided an automated and balanced datastream to the DFAS Cleveland Central Data Base (CDB).

DFAS Partnership

A primary reason for SMART Phase 2.0 success is the close partnership between DFAS and NAVSUP financial subject matter experts. Nine DFAS Norfolk employees were trained on SAP to support month- and year-end reporting, and vendor invoice and accounts receivable processing. DFAS Cleveland assigned very experienced reporting and financial systems experts to SMART for full design, configuration and testing cycles for the Phase 2.0 pilot. As a result, the SMART interface with DFAS systems for departmental reporting and cash management worked flawlessly. In addition, SMART built a design that is not only interoperable with today's financial management enterprise architecture, but also flexible enough to support an ERP solution across the entire Navy, if not the entire DoD.

Designing and implementing ERP did not happen overnight. The SMART team has been making every effort to track and quickly resolve issues reported by pilot sites. The team has been tracking crucial Key Performance Indicators, conducting daily teleconferences with all four sites, and working through numerous calls to the Help Desk. The SMART ERP team and site representatives are dedicated to achieving the pilot's success. There is still room for improvement, but the process changes have been largely successful and show the Navy's resolve to improve business processes.

Future and Convergence

One point is very clear for the future of SMART. SMART will not be going it alone. August 2, 2002, the Assistant Secretary of the Navy for Research, Development and Acquisition (ASN(RD&A)) directed a single convergence of Navy ERP pilots. In response Navy ERP teams developed convergence and implementation timeline plans. Begun earlier this year, the full normalization effort focuses on common, centrally developed solutions managed to drive process and data standardization. Replacing the former ESG for Navy ERP pilots, the newly established Executive Committee (EXCOMM), will be responsible for leading the convergence effort. Led by ASN (RD&A), EXCOMM has representation from the SYSCOMs, OPNAV and the fleet.

The Navy awarded a BPA to SAP Public Sector and Education, Inc. for Enterprise Resource Planning software, maintenance, services and training. SAP BPA N00104-02-A-ZE77 is open to all DoD.

Go to page 48 for a list of other IT solutions under the DON IT Umbrella Program.

Visit the DON IT Umbrella Web site: www.it-umbrella.navy.mil.

To bolster force protection, the general public is urged not to send unsolicited mail, care packages or donations to servicemembers forward deployed unless you are a family member, loved one or personal friend.

On Oct. 30, 2002, the Department of Defense (DoD) suspended the "Operation Dear Abby" and "Any Servicemember" mail programs due to force protection concerns. Although these programs provide an excellent means of support to friends and loved ones stationed overseas, they also provide an avenue to introduce hazardous substances or materials into the mail system from unknown sources. Unsolicited mail, packages and donations from organizations and individuals also compete for limited airlift space used to transport supplies, warfighting materiel, and mail from family and loved ones.

Recently, DoD has become aware of organizations and individuals who continue to support some form of the Any Servicemember program by using the names and addresses of individual servicemembers and unit addresses. These programs are usually supported by well-intentioned, thoughtful and patriotic groups who are simply unaware of the new risks facing deployed military forces. Some individuals and groups publicize the names and addresses of servicemembers, ships or units on Web sites, with good intentions. The result, however, is a potential danger to the troops they wish to support.

DoD cannot support creative and well-intentioned efforts that defeat force protection measures, but can instead recommend alternatives to mail and donation programs.

To show support to troops overseas, the following are recommended:

Log on to the following Web sites to show support, to include greeting cards, virtual Thank You cards and calling card donations to help troops stay in contact with loved ones:

www.defendamerica.mil/support_troops.html

www.usocares.org/home.htm

www.army.mil/operations/iraq/faq.html

Visit Department of Veterans Affairs hospitals and nursing homes, and volunteer your services to honor veterans who served in past conflicts.

A Brief History of Personal Computing, Part IV:

"How the Web Was Won"

By Retired Major Dale J. Long, USAF

This is the final installment in the "History" series. In the first two installments we looked at the development of personal computing hardware and software. In the last issue we retraced the development of the Internet. In this issue we will close by tackling the World Wide Web (WWW), the graphical overlay of the Internet that represents the current state-of-the-art for collaborative personal computing. The WWW has become a ubiquitous part of the computing landscape in an amazingly short time. It has only been 10 years since Marc Andreessen and others at the University of Illinois National Center for Supercomputing Applications (NCSA) released the first alpha version of "Mosaic for X" in February 1993. Mosaic was a Unix application with a graphical browser. This is most people's earliest memory of the WWW. It was not, however, the beginning of the Web.

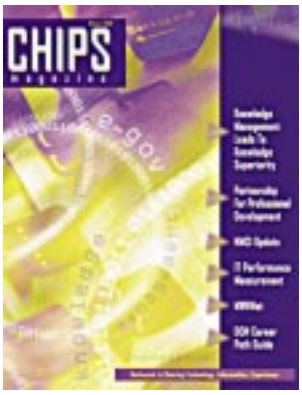
Before we launch this discussion we should review two things: first, what is the basic difference between the Internet and the World Wide Web? The Internet is a backbone system. It connects us, and our computers at several basic levels (physical, data, application, transport, etc.), but it does not normally operate at higher levels of information cognizance. The Internet, at its core, is still a hardware-intensive, hierarchical, text-based environment. The WWW, on the other hand, was developed as a way to connect pieces of information using the Internet as a transport medium. It has added functionality to the Internet by enabling and expanding non-hierarchical functions like indexing, cross-referencing and complex page design through the use of graphical browsers and related development tools.

For the most part it is a symbiotic relationship. The WWW could not have come into being without the Internet; the Internet would never have achieved its current level of explosive growth without the WWW. While some may argue that this growth has been more intrusive than useful, the fact remains that the WWW has become a dominant force across the planet in far less time than any other major technological innovation since cavemen discovered that fire was hot and wheels roll.

Our second review includes the three basic ways by which humans navigate through information: hierarchy, index and cross-reference. If we think of this as a "city" metaphor (and we will look at a virtual implementation of this later in the article), information pathways become like the streets of a large city. Finding things by following a hierarchy (e.g., table of contents) is like knowing the city's streets well enough to navigate by memory. Finding things by knowing an address within a grid coordinate and zeroing directly on your destination is akin to using an index. And arriving at a location that presents you with choices of other interesting places to go resembles cross-indexing. This last method covers both preset links that page authors include and lists of items generated by search engines.

As we found with the first three History topics, the roots of the Web run much deeper than just the release of a single application like Mosaic, which was only made possible by technologies, concepts and standards that took many years of development. Also, as with the other articles, we will spend more time on roots and causes than on modern issues that have been talked to death in recent news. So once again let's wind up the Way Back Machine for a trip back to the 19th century to retrace the steps that brought us to today's hyperlinked Web.

Hypertext in the Paper Age



We start in the mid-1880s, where we find an ancient (by technology standards) device known as the telautograph. After Alexander Graham Bell patented the technology for transmitting voice over the telephone, inventors became interested in the idea of transmitting handwriting by wire. The telautograph reproduced handwriting and drawings by transmitting the movements of an electromagnetically-controlled pen along a line to a similar pen at the receiving end. Elisha Gray, the man who lost the telephone patent to Bell, was the first to develop and patent a practical version of a telegraphic writing machine, and it was Gray who coined the term telautograph. Telegraphic writing was allegedly quite a sensation at the 1893 World's Fair in Chicago, and two years later an improved version of the machine transmitted handwriting a stunning 431 miles from Cleveland to Chicago.

Using a telautograph, it was technically possible for one person writing from a single location to replicate his output simultaneously at any number of receiving points, limited only by how many connections were available. This is the earliest known practical implementation of a function we now see daily in Web-based chat rooms. The telautograph managed to find a niche next to the rapidly expanding telegraph and telephone industry, mainly in areas where high noise levels made using a telegraph or telephone impractical. For example, telautographs were often used in railroad stations to keep baggage and mail handlers informed of train movements.

The telautograph also had military applications. An early high point was its selection by the U.S. Army in the late 1890s for fire-control communication in America's coastal defense system. Before the advent of air power and submarines, the main defenses America relied upon to protect against enemy attack were the coastal artillery batteries. The guns were aimed on the basis of

data received from observers stationed some distance away, so the Army needed a reliable method to transmit the data. However, the noise in the gun pits was, as you may expect, quite deafening when the batteries were firing. Using a telephone or telegraph under these conditions was not practical. So, telautographs were installed in most important American coastal forts on both coasts. The military version of the telautograph was designed for ruggedness and reliability. The receivers were enclosed in heavy brass, waterproof cases suspended on shockproof mounts. Messages appeared behind a plate glass window, allowing the operator to read the messages without opening the case. An electric bulb inside the case allowed night reading. However, none of these coastal guns were ever fired at an enemy, so this first implementation of hypertext was never tested in battle.

OK, you're probably thinking, "That's an interesting bit of trivia, but what does it have to do with watching QuickTime movies of Super Bowl commercials on my Web browser?" While the telautograph may not be the epitome of graphical systems, it was the first. And it did produce some ripples in the technology pond decades later during World War II.

Hypertext in the Pre-Internet Age

The basic concepts of what we now consider hypertext were first formally proposed during World War II, long before computers were an integral part of our landscape. In an article entitled, "*As We May Think*," in the July 1945 issue of *Atlantic Monthly*, Dr. Vannevar Bush (http://www.iath.virginia.edu/elab/hfl0034.html), outlined his ideas for a machine that would be capable of storing information in a way so that any piece of information could be linked to any other piece. Bush, who was serving at the time as President Roosevelt's science adviser, called his system "Memex." His plan included references to associative indexing, which he defined as a process, "whereby any item may be caused at will to select immediately and automatically another." He also wanted the ability to create a trail of traveled links that a user could later retrieve, much like today's browser history files.

What sparked Bush's ruminations on linking information? One of his inspirations was apparently the telautograph machine. Bush believed that some future version of the telautograph would allow people to comment and make notes on documents without regard to distance. Perhaps he had a vision of the modern whiteboards used today for virtual two-way collaboration, even though the technology was not available at the time. However, though Bush did outline the important concepts, he did not specifically use the term hypertext. Theodor "Ted" Nelson, first coined the terms "hypertext" and "hypermedia" in a paper for the 1965 Association of Computing Machinery National Conference. In later writing, Nelson explained: "*By 'hypertext' I mean non-sequential writing — text that branches and allows choice to the reader, best read at an interactive screen.*"

Nelson later went on to found the Xanadu project, a wonderful idea about building a "*magic place of literary memory where nothing is forgotten.*" It was supposed to become a universal, public, hypertext library that would spur the next phase of human evolution. Unfortunately, it became a 30-year vaporware project that never quite lived up to its lofty ideals. Xanadu was the great hacker dream to provide a universal library and collaborative editing with the ability to trace the changes in documents through successive versions. It was to have a means to track and credit authorship, a royalty system and non-sequential writing. Some of these capabilities exist in some form in other systems today, but the combined capability of the original plan has never been achieved completely by any single system. However, like climbing Mt. Everest or flying to the moon, Xanadu gave people a goal to shoot for, as we will see later.

In 1967, IBM sponsored development of the first actual hypertext-based system at Brown University. A team of researchers led by Dr. Andries van Dam developed the Hypertext Editing System, which ran on an IBM/360 mainframe. IBM later sold the system to the Manned Spacecraft Center in Houston, which reportedly used it for the Apollo space program documentation.

The next significant advance came in 1972, when researchers at Carnegie Mellon University developed ZOG. ZOG, by the way, is not an acronym and I did not find any specific references for why the name was used. The only historical reference I could find that might have inspired the name was: Ahmet Zogu, Zog I, King of the Albanians prior to Albania's subjugation by Italy during WW II. It's a long shot, though.

ZOG, the system, was a large database designed for a multi-user environment. It was a text-based system that used a basic, frame-based style sheet format that included a title, a description, a line with standard ZOG commands, and a set of menu items (called selections) leading to other frames. ZOG was a collaborative work tool that allowed users to modify the contents of a frame and make the changes visible immediately to other users through dynamically updated links. The U.S. Navy deployed ZOG in 1982 on the nuclear-powered aircraft carrier USS Carl Vinson (using PERQ workstations) to help automate certain management functions on the ship.

The epitome of pre-WWW hypertext applications was Apple Computer's HyperCard released in 1987. Arguably the most popular desktop hypertext application of all time, HyperCard was bundled free with all Macintosh computers. It was the first truly popular hypertext application to find a home on personal computers and contributed a great deal to the popularization of the hypertext model just in time to get people ready for the World Wide Web.

Spinning the Web

As with many great advancements in human history, the World Wide Web was created because of a desire for convenience. Tim Berners-Lee is credited by almost everyone as the Father of the World Wide Web. Trained in physics at Oxford, Berners-Lee was working at the Swiss-based European Particle Physics Laboratory (CERN - "*Conseil Europeen pour la Recherche Nucleaire*") in 1980 when he began a nine-year journey toward the specifications for a "global hypermedia system." His vision started out modestly enough: make his daily schedule planner, list of telephone numbers and documents all available through a single interface. At the time, CERN used a variety of platform dependent and proprietary information storage and retrieval methods. In addition, there were "in-house" systems that

were unique to CERN. As with most other organizations of that time, data was stored and manipulated in isolated machines with no real direct interaction or connectivity.

Berners-Lee's data was scattered over several such systems. What he wanted was a system that could store random associations between pieces of information based on his perceptions of their actual working relationship to each other. For example, he wanted to be able to pull mailing addresses out of his address list directly into letters on his word processor. We take mail merge for granted today, but Berners-Lee had to launch an entire technological revolution to get it. However, CERN didn't have Internet connectivity in 1980, so Berners-Lee's first attempt at connecting data was simply an attempt to unify personal data on the CERN systems. His initial system, developed around 1980, was called "Enquire." The name was allegedly based on an 1856 Victorian-era *how-to* book titled, "*Enquire Within Upon Everything*." Enquire met the modest functional goals he set for it, but when Berners-Lee left CERN shortly after building the system, it fell into disuse — one more homegrown system that died without its champion.

While Berners-Lee was elsewhere musing about data linkage and Ted Nelson's Xanadu project, CERN embraced TCP/IP (Transmission Control Protocol/Internet Protocol) and connected to the Internet in 1984. By 1989, when Berners-Lee returned, CERN was the largest Internet site in Europe and was heavily invested in both distributed and object-oriented computing. In short, they had finally caught up to where Berners-Lee had been seven years earlier.

It was at this point that Berners-Lee developed his concept of a "World Wide Web" (he coined the term in 1990) that would allow far-flung researchers (he saw this as a boon to scientists, not Web advertisers) to collaborate on large problems. The result of his work brought Vannevar Bush's ideas for Memex to life and fulfilled much of what Ted Nelson tried to achieve with Xanadu. In March of 1989, Berners-Lee submitted his first paper outlining his strategy for a global information system to his bosses at CERN titled: "*Information Management: A Proposal*." A later paper, titled "*World Wide Web: An Information Infrastructure for High-Energy Physics*," is even more specific about his intentions and motivations. Note that the title indicated his belief that the endeavor of building the Web was primarily in support of scientific study.

Berners-Lee believed that the motivation for this system arose "*from the geographical dispersion of large collaborations, and the fast turnover of fellows, students, and visiting scientists.*" He wanted to create an information environment where these transient people could use the Web to quickly integrate into projects and make lasting contributions by contributing to the assembled knowledge. In his original "*Information Management: A Proposal*," Berners-Lee described the deficiencies of the hierarchical information delivery systems in use at the time and argued the advantages of hypertext-based systems. He proposed that CERN incorporate several different servers of machine-stored information and a distributed hypertext system to provide "*a single user interface for many large classes of stored information such as reports, notes, databases, computer documentation and online systems help.*"

The key capabilities of his system would include a protocol for requesting readable information stored in remote systems. This was fulfilled by the development of Hypertext Transfer Protocol (HTTP). The Web also needed a common format for information exchange between information suppliers and consumers, and some method for reading text and graphics at the same time. The solution for this was Hypertext Markup Language (HTML), developed as a subset of Standard Generalized Markup Language (SGML). SGML was a well-developed publishing standard already in existence, but it was originally considered too complex for the Web.

Shared document libraries were also a key part of the plan, and Berners-Lee expressly wanted users to be able to add to individual libraries, as well as their own. Tying all the collected knowledge together would be links between documents (or even from within documents) in one library to documents in any other connected library. The enabler for this was the Uniform Resource Locator (URL). A URL syntax explicitly describes the unique location of every site, library, document and element of information with an independent existence on the Web. Finally, having all that information available would be fruitless without some ability to find what you wanted. URLs may describe everything, but unless you already know how to navigate hierarchically to the exact street you want, navigating the Web without an index would be like navigating an unfamiliar city without a map.

Berners-Lee envisioned the ability to index all documents in all libraries for retrieval by keyword search. Inverse indexing, essentially the ability to find and record the location and frequency of every word in any document, evolved rapidly on the Web as search engines like Lycos and WebCrawler provided new Web users with quick ways to find and retrieve information. The initial development of the Web was a two-phase project. In the first phase, CERN made use of existing software and hardware as well as implementing simple browsers for the user's workstations.

However, there wasn't this type of software already in common use, or was there? Most people remember NeXT Software, Inc. as what Steve Jobs did while he was waiting for Pixar to become a leading computer animation company so he could regain the reins of Apple Computer. Jobs, the creative force behind the Macintosh computer, founded NeXT (after being ousted from Apple) to bring object-oriented, high-end computing to the masses. The masses, and even most computer professionals, weren't ready for it and the NeXT brand became one more failed system that was too far ahead of its time.

However, NeXT survived on the Web. CERN developed the first hypertext graphical browser in November 1990 using NeXT's object-oriented technology. In addition to viewing HTML instances, it was also a "*what you see is what you get*" Web document editing application. The first WWW server was also developed and implemented on a NextStep computer. Web software was ported to other platforms in 1991 and released to the public. Berners-Lee and CERN changed the face of the Internet with their server, browser, HTTP, HTML and URLs.

The Birth of the Browser

Once CERN placed the WWW concepts and the protocols in the public domain, programmers and software developers worldwide began making their own contributions. Marc Andreessen was one of them. Andreessen was a graduate student at the University of Illinois National Center for Supercomputing Applications (NCSA). Andreessen led a team of graduate students who released the alpha version of Mosaic for X in February 1993. As I mentioned at the beginning of the article, Mosaic was originally a "point-and-click" graphical Web browser that ran on Unix. What really helped open the floodgates, however, was six months later in August 1993 when Andreessen and his team released free versions of Mosaic for both the Macintosh and Windows operating systems. This was a milestone in Web development. It was the first time a WWW client with a relatively consistent and easy to use point-and-click graphical user interface (GUI) was implemented on the three most popular operating systems available at the time.

Andreessen later helped found the Mosaic Communications Corporation which eventually became known as Netscape. By May 1994, practically all the members of the original Mosaic development team at NCSA had joined Netscape. There, the team decided to completely rewrite the underlying code of the Mosaic system, creating an entirely new browser that quickly became the most popular Web application in the world. The Microsoft Internet Explorer (IE) Browser later supplanted Netscape as the No. 1 browser on the Web. Ironically, the core code for IE was from Andreessen's original NCSA Mosaic project, purchased from NCSA by Microsoft.

The main remaining barrier to Internet entry fell when America Online, the most popular single online service in history, included a Web browser with their service. Swarms of "newbies," their modems plugged into RJ-11 outlets, mice in hand and armed with GUI browsers, rapidly entered this strange and wonderful new world. Much like the Old West, once the pioneers paved the way, civilization invaded and the Internet changed forever as the Web blanketed it like kudzu. Given the success of the Web, it was only a matter of time before it grew to a size that warranted some form of management thus the World Wide Web Consortium (W3C) was formed in December 1994. W3C's main objective is "*to promote standards for the evolution of the Web and interoperability between WWW products by producing specifications and reference software.*"

The Web Today

The issues facing the World Wide Web today are surprisingly similar to the ones that spawned its creation. Ideally, it is an interface that will unify all our data, information, and knowledge sources on desktops without regard to what type of computer, software or operating system you use. Of course, there are many companies that do care quite a bit about what type of computer, software, or operating system you use — preferably theirs. Unless you've been living in a hermitage, you have read or heard about things like the browser war between Netscape and Microsoft, the competition for dominance between Java and ActiveX, what's happening with Extensible Markup Language (XML), and whether the Web will remain in the public information space or become a commercial entity.

Unfortunately, I'm about out of space here, so we'll have to wait until some later date to move on to a "*Future of the Web*" article. If you want more information about the current state of the Web, I recommend you visit the W3C Web site at http://www.w3.org/.

Final Thoughts

In 1900, the military transmitted firing coordinates to gunners using telautographs sending electronic handwriting. Today, the crew on the destroyer USS McFaul uses PDAs (personal digital assistants) continuing the military revolution in hypertext started in those gun pits 100 years ago. If you are lucky enough to be part of the McFaul project, take a moment to consider how those turn-of-the-century troops in their gun pits felt when the quartermaster delivered those thick brass telautograph cases with wires sticking out one end and a newfangled light bulb illuminating the interior. It may have been the same feeling we get when someone hands us a PDA, the screen flickers on, and we realize that we are now connected to something a lot bigger than we are. That's what the leading edge feels like. Get used to it, because at the rate networking and the Web are evolving we will be riding on the edge for the foreseeable future.

Finally, I find it fascinating that the birth of the Web was simply a side effect of the elite culture that developed over four decades ago at CERN because of a desire for a better way to do particle physics research. There was nothing in the plan about most of what we use the Web for today — and they had no intention to profit monetarily from their innovations. It was science for science's sake — altruism at its finest. While the rest of us may never achieve the level of intellectual acumen of a nuclear research facility, we have managed to do some pretty useful and interesting things with Web technology. I just wish, however, I could get the image out of my mind of prehistoric monkeys staring at the big, rectangular monolith from "*2001: A Space Odyssey*."

Oh well, it's time for this monkey to go Web surf for some more movie trailers.

Happy Networking!

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To become a CHIPS subscriber log on to the CHIPS Web site at www.chips.navy.mil or e-mail us at chips@spawar.navy.mil.

Significant Savings Under the Umbrella

The Department of the Navy (DON) Information Technology (IT) Umbrella Program provides easy to use, pre-competed acquisition vehicles that give you better life-cycle prices, higher quality, timely delivery and guaranteed integration and interoperability with the standards-based technology you currently have in place. Contracts on the program are continually being revised to bring you the latest technology products and services at prices significantly discounted below market values with guaranteed compliance to industry standards — and many are priced substantially lower than GSA Schedule discounts. In these days of austere budgets the Umbrella Program can help you buy the technology refreshes you need, but thought you couldn't afford. Most importantly, savings can be used for the warfighting mission of the Department of Defense and DON.

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The Umbrella Program employs a staff of technology experts who can assist you in an efficient, simplified acquisition process for Commercial-Off-the-Shelf (COTS) defined service solutions or Government defined capability (Statement of Work (SOW)). Buyers have access to multiple schedule holders and schedule categories. In addition, there is a five-year Blanket Purchasing Agreement (BPA) term, with no order limit. All prices are considered "not-to-exceed" and customers are encouraged to negotiate further discounts based on volume and current market conditions. In fact, we are pleased to help you negotiate additional discounts.

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Local contracting offices can initiate proposal requests and place orders. The ordering office will provide guidance, access and support. We can also assist with contracting support if you need a contracting officer.

We have done all the work — all you have to do is call us for the easiest acquisition solution and best savings available — anywhere.

Program Features:

- Pricing substantially below retail and GSA Schedule prices
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- Easy online ordering with the Government Purchase Card
- Easy access to customer support for large and small purchases
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- DoD realizes Total Cost of Ownership (TCO) savings
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- Improves tracking of IT purchases and life-cycle management
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- Meets the Clinger-Cohen Act for IT Management Reform
- Continuous competition for customer purchases among leading companies

Web Sites

The DON IT Umbrella Program Web site is the preferred source for contract information, order status, downloadable copies of contract text and modifications. Visit us at **www.it-umbrella.navy.mil.**

Other sites offering assistance can be found at:
www.itec-direct.navy.mil
www.don-imit.navy.mil/esi

Who Can Order?

Authorized users include all DoD and generally DoD is defined as: all DoD Components and their employees, including Reserve Component (Guard and Reserve) and the U.S. Coast Guard mobilized or attached to DoD; other government employees assigned to and working with DoD; non-appropriated funds instrumentalities such as NAFI employees; Intelligence Community (IC) covered organizations to include all DoD Intel System member organizations and employees, but not the CIA nor other IC employees unless they are assigned to and working with DoD organizations; DoD contractors authorized in accordance with the FAR; and authorized Foreign Military Sales. Please check with a DON IT Umbrella Program customer service representative to verify eligibility.

Please go to page 48 for a list of DON IT Umbrella Program contracts and BPAs.

ViViD Contracts
N68939-97-D-0040
Contractor: Avaya Incorporated

N68939-97-D-0041
Contractor: General Dynamics

ViViD provides digital switching systems, cable plant components, communications and telecommunications equipment and services required to engineer, maintain, operate and modernize base level and ships afloat information infrastructure. This includes pier side connectivity and afloat infrastructure with purchase, lease and lease-to-own options. Outsourcing is also available. Awarded to:

Avaya Incorporated (N68939-97-D-0040); (888) VIVID4U or (888) 848-4348. Avaya also provides local access and local usage services.

General Dynamics (N68939-97-D-0041); (888) 483-8831

Modifications

Latest contract modifications are available at http://www.it-umbrella.navy.mil

Ordering Information

Ordering Expires:
26 Jul 05 for all CLINs/SLINs
26 Jul 07 for Support Services and Spare Parts

Authorized users: DoD and U.S. Coast Guard

Warranty: Four years after government acceptance. Exceptions are original equipment manufacturer (OEM) warranties on catalog items.

Acquisition, Contracting & Technical Fee: Included in all CLINs/SCLINs

Direct Ordering to Contractor

Web Link

http://www.it-umbrella.navy.mil/contract/vivid/vivid.html

TAC Solutions BPAs
Listed Below

TAC Solutions BPAs provide PCs, notebooks, workstations, servers, networking equipment, and all related equipment and services necessary to provide a completely integrated solution. BPAs have been awarded to the following:

Compaq Federal, LLC (N68939-96-A-0005); (800) 727-5472

Control Concepts (N68939-97-A-0001); (800) 922-9259

Dell (N68939-97-A-0011); (800) 727-1100, ext. 61973

GTSI (N68939-96-A-0006); (800) 999-4874, ext. 2104

Hewlett-Packard (N68939-97-A-0006); (800) 222-5547

McBride and Associates, Inc. (N68939-96-A-0007); (800) 829-9409, ext. 7580

SUN (N68939-97-A-0005); (800) 786-0404

Ordering Expires: Indefinite with annual review for all BPAs.

Authorized Users: DON, U.S. Coast Guard, DoD, and other federal agencies with prior approval.

Warranty: IAW GSA Schedule. Additional warranty options available.

Web Link

http://www.it-umbrella.navy.mil/contract/tac-solutions/tac-sol.html

Enterprise Software Agreements
Listed Below

The Enterprise Software Initiative (ESI) is a Department of Defense (DoD) initiative to streamline the acquisition process and provide best-priced, standards-compliant information technology (IT). The ESI is a business discipline used to coordinate multiple IT investments and leverage the buying power of the government for commercial IT products and services. By consolidating IT requirements and negotiating Enterprise Agreements with software vendors, the DoD realizes significant Total Cost of Ownership (TCO) savings in IT acquisition and maintenance. The goal is to develop and implement a process to identify, acquire, distribute, and manage IT from the enterprise level.

In September 2001, the ESI was approved as a "quick hit" initiative under the DoD Business Initiative Council (BIC). Under the BIC, the ESI will become the benchmark acquisition strategy for the licensing of commercial software and will extend a Software Asset Management Framework across the DoD. Additionally, the ESI was incorporated into the Defense Federal Acquisition Regulation Supplement (DFARS) Section 208.74 on October 25, 2002.

Authorized ESI users include all Defense components, U.S. Coast Guard, Intelligence Community, and Defense contractors when authorized by their contracting officer. For more information on the ESI or to obtain product information, visit the ESI Web site at http://www.don-imit.navy.mil/esi.

ASAP (N00039-98-A-9002) for Novell products; and (N00104-02-A-ZE78) for Microsoft products; Small Business; (800) 883-7413 for Novell products and (800) 248-2727, ext. 5303 for Microsoft products

CDW-G (N00104-02-A-ZE85) for Microsoft products; (703) 726-5011

COMPAQ (N00104-02-A-ZE80) for Microsoft products; (800) 535-2563 pin 6246 or (317) 228-3424 (OCONUS)

CorpSoft, Inc. (N00104-01-A-Q506) for Adobe products; and (N00104-02-A-ZE82) for Microsoft products; Call (800) 862-8758 or (509) 742-2308 (OCONUS)

Crunchy Technologies, Inc. (N00104-01-A-Q446) for PageScreamer Software (Section 508 Tool), Crunchy Professional Services and Training; Small Business Disadvantaged; (877) 379-9185

Datakey, Inc. (N00104-02-D-Q666) IDIQ Contract for CAC Middleware products; (301) 261-9150

DELL (N00104-02-A-ZE83) for Microsoft products; (512) 723-7010

GTSI (N00104-02-A-ZE79) for Microsoft products; Small Business; (800) 999-GTSI

HiSoftware, DLT Solutions, Inc. (N00104-01-A-Q570) for HiSoftware (Section 508 Tools); Small Business; (888) 223-7083 or (703) 708-9658

Northrop Grumman (N00104-03-A-ZE78) for Merant PVCS products; Large Business; (703) 312-2543

SAP Public Sector and Education, Inc. (N00104-02-ZE77) for SAP software, installation, implementation technical support, maintenance and training services; (202) 312-3640

Schlumberger (N00104-02-D-Q668) IDIQ Contract for CAC Middleware products; (410) 723-2428

Softchoice (Beyond.com) (N00104-02-A-ZE81) for Microsoft products; Small Business; (877) 804-4995, ext. 305

Softmart (N00104-02-A-ZE84) for Microsoft products; (610) 518-4000, ext. 6492

Software House International (N00104-02-A-ZE86) for Microsoft products; Small Business Disadvantaged; (301) 294-9439

Spyrus, Inc. (N00104-02-D-Q669) IDIQ Contract for CAC Middleware products; (408) 953-0700, ext. 155

SSP-Litronic, Inc. (N00104-02-D-Q667) IDIQ Contract for CAC Middleware products; (703) 905-9700

Ordering Information

Ordering Expires:

Adobe products: 14 Aug 03
CAC Middleware products: 06 Aug 05
Crunchy products: 04 Jun 04
HiSoftware products: 16 Aug 04
Merant products: Jan 06
Microsoft products: 26 Jun 03
Novell products: 31 Mar 07
SAP products: Upon expiration of the GSA Schedule

Authorized Users: Adobe products, CAC Middleware, Merant products, Microsoft products, SAP products and Section 508 Tools: All DoD. For purposes of this agreement, DoD is defined as: all DoD Components and their employees, including Reserve Component (Guard and Reserve) and the U.S. Coast Guard mobilized or attached to DoD; other government employees assigned to and working with DoD; non-appropriated funds instrumentalities such as NAFI employees; Intelligence Community (IC) covered organizations to include all DoD Intel System member organizations and employees, but not the CIA nor other IC employees unless they are assigned to and working with DoD organizations; DoD contractors authorized in accordance with the FAR; and authorized Foreign Military Sales.

Warranty: IAW GSA Schedule. Additional warranty and maintenance options available. Acquisition, Contracting and Technical fee included in all BLINS.

Web Links

ASAP Software Express
http://www.it-umbrella.navy.mil/contract/enterprise/microsoft/asap/asap2.html

CorpSoft, Inc.
http://www.it-umbrella.navy.mil/contract/adobe/adobe.html

Crunchy Technologies, Inc.
http://www.it-umbrella.navy.mil/contract/508/crunchy/crunchy.html

Datakey, Inc.
http://www.it-umbrella.navy.mil/contract/middleware-esa/datakey/index.html

Government Technology Services, Inc. (GTSI)
http://www.it-umbrella.navy.mil/contract/enterprise/microsoft/gtsi/gtsi.html

HiSoftware, DLT Solutions, Inc.
http://www.it-umbrella.navy.mil/contract/508/dlt/dlt.html

Microsoft Products
http://www.it-umbrella.navy.mil/contract/enterprise/microsoft/ms-ela.html

Northrop Grumman
http://www.feddata.com/schedules/navy.merant.asp

SAP
http://www.it-umbrella.navy.mil/contract/enterprise/sap/sap.html

Schlumberger
http://www.it-umbrella.navy.mil/contract/middleware-esa/Schlumberger/index.html

Spyrus, Inc.
http://www.it-umbrella.navy.mil/contract/middleware-esa/spyrus/index.html

SSP-Litronic, Inc.
http://www.it-umbrella.navy.mil/contract/middleware-esa/litronic/index.html

Navy Contract: N68939-97-A-0008

Department of the Navy Enterprise Solutions BPA

The Department of the Navy Enterprise Solutions (DON ES) BPA provides a wide range of technical services, specially structured to meet tactical requirements, including worldwide logistical support, integration and engineering services (including rugged solutions), hardware, software and network communications solutions. DON ES has one BPA.

Computer Sciences Corporation (CSC) (N68939-97-A-0008); (619) 225-2412; Awarded 07 May 97; Ordering expires 31 Mar 06, with two one-year options

Authorized Users: All DoD.

Web Link

http://www.it-umbrella.navy.mil/contract/tac-don-es/csc/csc.html

Information Technology Support Services BPAs Listed Below

The Information Technology Support Services (ITSS) BPAs provide a wide range of IT support services such as networks, Web development, communications, training, systems engineering, integration, consultant services, programming, analysis and planning. ITSS has five BPAs. They have been awarded to:

Booz Allen Hamilton Inc. (N68939-97-A-0014); (415) 281-4942; Awarded 02 Jul 97; Ordering expires 31 Mar 04

Lockheed Martin (N68939-97-A-0017); (240) 725-5950; Awarded 01 Jul 97; Ordering expires 30 Jun 05, with two one-year options

Northrop Grumman Information Technology (N68939-97-A-0018); (703) 413-1084; Awarded 01 Jul 97; Ordering expires 12 Feb 05, with two one-year options

SAIC (N68939-97-A-0020); (703) 676-5096; Awarded 01 Jul 97; Ordering expires 30 Jun 05, with two one-year options

TDS (Sm Business) (N00039-98-A-3008); (619) 224-1100; Awarded 15 Jul 98; Ordering expires 15 Jul 05, with two one-year options

Authorized Users: All DoD, federal agencies and U.S. Coast Guard.

Web Link

http://www.it-umbrella.navy.mil/contract/itss/itss.html

Research and Advisory BPAs Listed Below

Research and Advisory Services BPAs provide unlimited access to telephone inquiry support, access to research via Web sites and analyst support for the number of users registered. In addition, the services provide independent advice on tactical and strategic IT decisions. Advisory services provide expert advice on a broad range of technical topics and specifically focus on industry and market trends. BPAs listed below.

Gartner Group (N00104-03-A-ZE77); (703) 226-4815; Awarded Nov 02; one-year base period with three one-year options.

Acquisition Solutions (N00104-00-A-Q150); (703) 378-3226; Awarded 14 Jan 00; one-year base period with three one-year options.

Ordering Expires:

Gartner Group: Nov 06
Acquisition Solutions: Jan 04

Authorized Users:

Gartner Group: This Navy BPA is open for ordering by all of the DoD components and their employees, including Reserve Components (Guard and Reserve); the U.S. Coast Guard; other government employees assigned to and working with DoD; non-appropriated funds instrumentalities of the DoD; DoD contractors authorized in accordance with the FAR and authorized Foreign Military Sales (FMS).

Acquisition Solutions: All DoD. For purposes of this agreement, DoD is defined as: all DoD Components and their employees, including Reserve Component (Guard and Reserve) and the U.S.Coast Guard mobilized or attached to DoD; other government employees assigned to and working with DoD; non-appropriated funds instrumentalities such as NAFI employees; Intelligence Community (IC) covered organizations to include all DoD Intel System member organizations and employees, but not the CIA nor other IC employees unless they are assigned to and working with DoD organizations; DoD contractors authorized in accordance with the FAR; and authorized Foreign Military Sales.

Web Links

From the DON IT Umbrella Program Web Site:

Gartner Group
http://www.it-umbrella.navy.mil/contract/r&a/gartner/gartner2.html

Acquisition Solutions
http://www.it-umbrella.navy.mil/contract/r&a/acq-sol/acq-sol.html

SEWP III
Listed Below

NASA's Scientific and Engineering Workstation Procurement III government-wide contracts provide Class 10 Computer Support Devices and Class 12 Security Systems and Tools. SEWP III is an indefinite delivery, indefinite quantity (IDIQ) type contract. Contracts have been awarded to the following:

Hewlett-Packard (NAS5-01133); (781) 505-7676

GTSI/SUN (NAS5-01134); (703) 502-2172

IBM (NAS5-01135); (800) 426-2255

Silicon Graphics Federal, Inc. (NAS5-01136) and (NAS5-01140); (301) 572-1980

GMR/Cray (NAS5-01138); (703) 330-1199

Compaq Federal, LLC (NAS5-01139); (301) 918-5360

GTSI (NAS5-01142) and (NAS5-01146); (703) 502-2172

Northrop Grumman IT (NAS5-01143) and (NAS5-01147); (301) 446-3100

UNISYS Corporation (NAS5-01144); (800) 398-8090

Government Micro Resources (NAS5-01145); (703) 330-1199

Ordering Expires: 30 Jul 06 (Contracts awarded for five years starting 30 Jul 01.)

Authorized Users: DON, U.S. Coast Guard, DoD and other federal agencies.

Warranty: 36-month extended warranty available.

Web Link

http://www.it-umbrella.navy.mil/contract/sewp3/sewp3.htm

The U.S. Army Small Computer Program (ASCP) Maxi-Mini and Database (MMAD) Program
Listed Below

The Maxi-Mini And Database (MMAD) Program is supported by two fully competed Indefinite Delivery/Indefinite Quantity (ID/IQ) contracts with IBM Global Services and GTSI Corporation. The MMAD Program is intended to be DoD's follow-on to the Navy administered Supermini Program in fulfilling high and medium level IT product and service requirements. Like its predecessor, MMAD provides items to modernize, upgrade, refresh and consolidate current systems, as well as to establish new ones. Products and manufacturers include:

	IBM Global Services	GTSI
Servers (64-bit & Itanium)	IBM, HP, Sun	Compaq, HP
Workstations	HP, Sun	Compaq, HP
Storage Systems	IBM, Sun, EMC, McData, System Upgrade	HP, Compaq, EMC, RMSI, Dot Hill
Networking	Cisco	Cisco, 3COM

Ancillaries include network hardware items, upgrades, peripherals and software.

Services are geared toward providing solutions needed to effectively manage and support the complexities of agency or program system environments, to include: consultants, analysts, engineers, programmers, trainers and administrators.

MMAD is designed to ensure the latest products and services are available in a flexible manner to meet the various requirements identified by DoD and other agencies. This flexibility includes special solution CLINs, technology insertion provisions, ODC (Other Direct Cost) provisions for ordering related non-contract items, and no dollar/ratio limitation for ordering services and hardware.

Latest product additions include Sun products, HP storage and Remedy software. Awarded to:

GTSI Corporation (DAAB07-00-D-H251); (800) 999-GTSI

IBM Global Services-Federal (DAAB07-00-D-H252); CONUS: (866) IBM-MMAD (1-866-426-6623) OCONUS: (703) 724-3660 (Collect)

Ordering Information

Ordering: Decentralized. Any federal contracting officer may issue delivery orders directly to the contractor.

Ordering Expires:
GTSI: 25 May 06 (includes three option periods)
IBM: 19 Feb 06 (includes three option periods)

Authorized Users: DoD and other federal agencies including FMS

Warranty: 5 years or OEM options

Delivery: 35 days from date of order (50 days during surge period, August and September)

No separate acquisition, contracting and technical fees.

Web Links

GTSI
http://pmscp.monmouth.army.mil/contracts/mmad_gtsi/mmad_gtsi.asp

IBM
http://pmscp.monmouth.army.mil/contracts/mmad_ibm/mmad_ibm.asp

The U.S. Army Enterprise Software Initiative BPA DAAB15-99-A-1002 (Oracle)

As of February, 28, 2002, the Navy holds inventory of Oracle Database Enterprise Edition (9i and 9ias) perpetual licenses (either named-user, multi-server or processor), and additional options and tools (i.e., security options, partitioning, spatial, clustering, diagnostics management packs, Tuning Management Pack, Change Management Pack, Internet Application Server Enterprise, Internet Developer Suite, and Balanced Scorecard). Initial orders will include a warranty period of March 1 through May 31, 2002, and software support for the period June 1 through May 31, 2003. Placing orders early will result in the best deal for end users. Four (4) additional out years of Silver Technical Support and product update support have also been negotiated.

The initial purchase price for end users is an average of a 64 percent discount off GSA prices and total package discounts (including out year technical support) average a 70 percent discount off GSA prices. Customers with small requirements can benefit from discounts normally reserved for customers with orders over $10 million. These licenses can be distributed throughout the Navy. In accordance with the Federal Acquisition Regulations (FAR) and DoD policy, Navy customers who have selected Oracle to satisfy new requirements must purchase the "new" Oracle licenses from the inventory.

This virtual inventory was established through the Department of the Navy Chief Information Officer (DON CIO) Enterprise Licensing Team and the Department of Defense Enterprise Software Initiative (DoD ESI). The DoD ESI is a joint initiative, which has been approved by the DoD Business Initiative Council (BIC). This inventory will be managed by the Department of the Navy Information Technology (DON IT) Umbrella Program Office at SPAWAR Systems Center, San Diego.

The U.S. Army Enterprise Software Initiative BPA DAAB15-99-A-1003 (Sybase)

Through the contract, Sybase offers a full suite of software solutions designed to assist customers in achieving Information Liquidity. These solutions are focused on data management and integration, application integration, anywhere integration, and vertical process integration, development and management. Specific products include but are not limited to Sybase's Enterprise Application Server, Mobile and Embedded databases, m-Business Studio, HIPAA (Health Insurance Portability and Accountability Act) and Patriot Act Compliance, PowerBuilder and a wide range of application adaptors. In addition, a Golden Disk for the Adaptive Server Enterprise (ASE) product is part of the agreement. The Enterprise portion of the BPA offers NT servers, NT seats, Unix servers, Unix seats, Linux servers and Linux seats. Software purchased under this BPA has a perpetual software license. The BPA also has exceptional pricing for other Sybase options. The savings to the Government is 64 percent off GSA prices.

Ordering Expires: 15 Jan 08

Authorized Users: Authorized users include personnel and employees of the DoD, Reserve components (Guard and Reserve), U.S. Coast Guard when mobilized with, or attached to the DoD and non-appropriated funds instrumentalities. Also included are Intelligence Communities, including all DoD Intel Information Systems (DoDIIS) member organizations and employees. Contractors of the DoD may use this agreement to license software for performance of work on DoD projects.

The U.S. Army BPWin/ERWin (Computer Associates) DAAB15-01-A-0001

This Enterprise agreement provides Computer Associates Enterprise Modeling tools including the products, upgrades and warranty. ERwin is a data modeling solution, that creates and maintains databases, data warehouses and enterprise data resource models. BPwin is a modeling tool used to analyze, document and improve complex business processes. The contract also includes warranties for these two products and upgrades for older versions of the products. In addition, there are other optional products, services and training available.

Ordering Expires: 30 Mar 06

Authorized Users: DoD and DoD contractors.

For complete contract information go to the DON IT Umbrella Program Web site at: www.it-umbrella.navy.mil

DON IT Umbrella Program

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