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SSC San Diego Command History Calendar Year 2002

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SSC San Diego
San Diego, CA 92152-5001

PREFACE

The Space and Naval Warfare Systems Center, San Diego (SSC San Diego) Command History for calendar year (CY) 2002 is submitted in conformance with OPNAVINST 5750.12H. The history provides a permanent record of CY 2002 activities at SSC San Diego. Although the history covers one calendar year, much of the information was only available on a fiscal year (FY) basis and is so noted in the text.

This Command History is divided into three main sections. The first section is a general introduction to SSC San Diego. The second section describes administrative highlights. The third section documents technical highlights.

Appendices to this document provide supplementary SSC San Diego information. Appendix A lists achievement awards given in CY 2002. Appendix B lists patents awarded in CY 2002. Appendices C and D provide lists of distinguished visitors hosted by SSC San Diego and major conferences and meetings at SSC San Diego, respectively. Appendix E lists acronyms used in the document.

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SECTION 1
INTRODUCTION

INTRODUCTION TO SSC SAN DIEGO

The Space and Naval Warfare Systems Center, San Diego (SSC San Diego) is a full-spectrum research, development, test and evaluation (RDT&E), engineering and fleet support center serving the U.S.Navy, Marine Corps, and other Department of Defense (DoD) and national sponsors within its mission, leadership assignments, and prescribed functions. SSC San Diego reports directly to the Commander, Space and Naval Warfare Systems Command (SPAWAR).

MISSION

SSC San Diego's formal mission is "To be the Navy's full-spectrum research, development, test and evaluation, engineering and fleet support center for command, control and communication systems and ocean surveillance and the integration of those systems which overarch multiplatforms."

LEADERSHIP AND TECHNOLOGY AREAS

Consistent with its mission, eight leadership areas are formally assigned to SSC San Diego. These leadership areas represent SSC San Diego's command, control, communications, computers, intelligence, surveillance, and reconnaissance (C^4ISR) charter and leadership areas outside that scope—ocean engineering and marine mammals. Beyond these areas, SSC San Diego has demonstrated national and international expertise in a broad range of technology areas.

ASSIGNED LEADERSHIP AREAS

- Command, control, and communication (C^3) systems
- Command, control, and communication systems countermeasures
- Ocean surveillance systems
- Command, control, and communication modeling and analysis
- Ocean engineering
- Navigation systems and techniques
- Marine mammals
- Integration of space communication and surveillance systems

TECHNOLOGY AREAS

- Ocean and littoral surveillance
- Microelectronics
- Communications and networking
- Topside design/antennas
- Command systems
- Computer technology
- Navigation and aircraft C^3
- Intelligence/surveillance/reconnaissance sensors
- Atmospheric effects assessment
- Marine mammals
- Environmental quality technology/assessment

VISION

SSC San Diego's vision is "to be the nation's pre-eminent provider of integrated C^4ISR solutions for warrior information dominance." SSC San Diego's vision guides the Center's efforts in defining, developing, integrating, installing, and sustaining C^4ISR systems.

PROGRAMS

SSC San Diego conducts a broad range of programs that focus on integrated C^4ISR. The Center also conducts several unique programs outside its primary C^4ISR focus: Environmental Quality Technology/Assessment, Marine Resources, Marine Mammals, Ocean Engineering, and Robotics and Physical Security. Innovative research is encouraged through the In-House Laboratory Independent Research program.

ORGANIZATION

Figure 1 shows SSC San Diego's organization as of 31 December 2002.

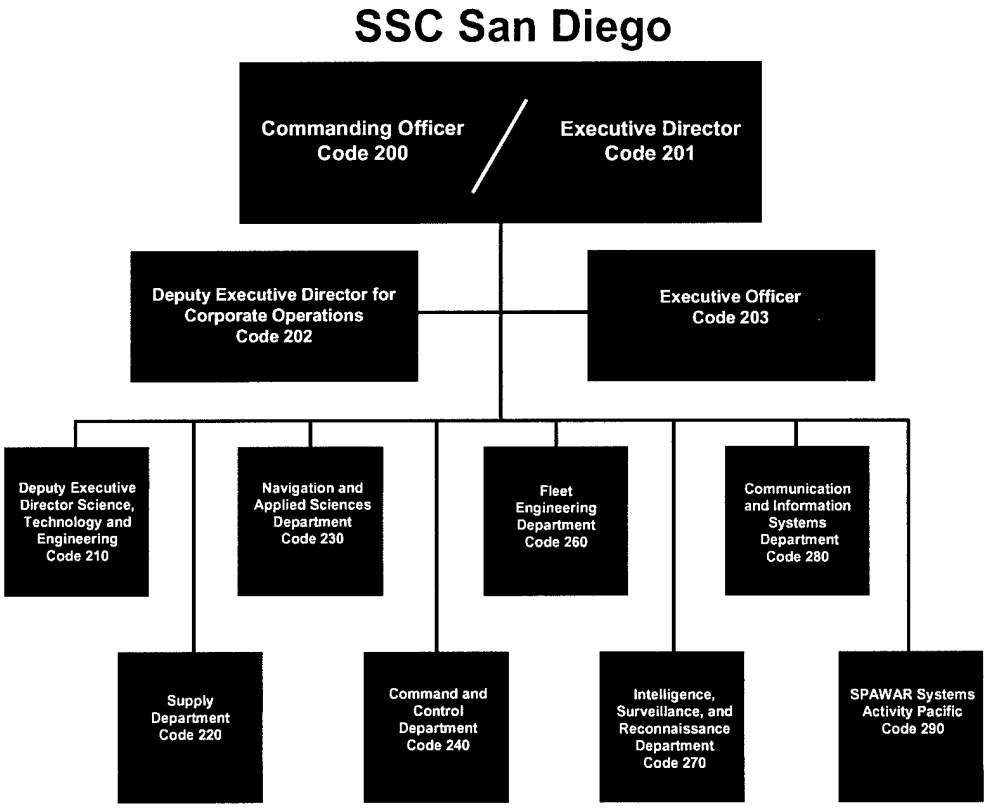

Figure 1. SSC San Diego organization.

SECTION 2
ADMINISTRATIVE HIGHLIGHTS

FUNDING

Total SSC San Diego funding in FY 02 was $1310M. Table 1 shows funding by sponsor. Table 2 shows total funding by type.

Table 1. Funding by sponsor, FY 02.

Sponsor	$M (% of Total)
SPAWAR	439 (33.51)
DARPA	240 (18.32)
Other Navy	204 (15.57)
Other	175 (13.36)
ONR	98 (7.48)
NAVAIR	95 (7.25)
NAVSEA	59 (4.50)
Total	1310

DARPA (Defense Advanced Research Projects Agency)

ONR (Office of Naval Research)

NAVAIR (Naval Air Systems Command)

NAVSEA (Naval Sea Systems Command)

Table 2. Funding by type, FY 02

Type	$M (% of Total)
RDTE	587 (44.81)
OPN	243 (18.55)
OMN	210 (16.03)
Other DoD	216 (16.49)
Other Navy	36 (2.75)
Non-DoD	18 (1.37)
Total	1310

OPN (Other Procurement, Navy)

OMN (Operation and Maintenance, Navy)

PERSONNEL

PERSONNEL ONBOARD

Total personnel onboard as of 31 December 2002 was 3537. Table 3 lists personnel by area.

Table 3. Personnel onboard, 31 December 02.

Scientists and Engineers	1885
Technicians	404
Technical Specialists	469
Administrative	401
Clerical	270
Senior Executive Service	7
Wage Grade	27
Officers	41
Enlisted	
Total	3537

MAJOR PERSONNEL CHANGES

SSC San Diego Change of Command[1]

Capt. Timothy V. Flynn

Capt. Timothy V. Flynn assumed command of SSC San Diego on 2 May 2002. A native of New Orleans, Louisiana, Capt. Flynn received his commission upon graduating from the United States Naval Academy with a Bachelor of Science degree in Marine Engineering in 1979. He completed nuclear propulsion plant operator training in 1980. He was later awarded Master of Science degrees in National Security Affairs (Technical Intelligence) and Mechanical Engineering from the Naval Postgraduate School.

Capt. Flynn's sea assignments include service as Damage Control Assistant on USS *Truxtun* (CGN 35), First Lieutenant and Reactor Training Assistant on USS *Arkansas* (CGN 41), Operations Officer on USS *Paul F. Foster* (DD 964), Chief Engineer on USS *Texas* (CGN 39), and Chief Engineer on USS *Harry S. Truman* (CVN 75). He qualified as a Surface Warfare Officer and was designated as "qualified for command at sea." He became an Engineering Duty Officer in 1992.

His shore assignments include Special Projects Officer at Joint Task Force Five; Assistant Project Officer for New Construction Aircraft Carriers at Supervisor of Shipbuilding, Conversion and Repair, Newport News, Virginia; Assistant Program Manager for In-Service Carriers, including the "Smart Carrier," at Aircraft Carrier Program Office (PMS-312) Naval Sea Systems Command, Washington, DC;

and Director of Shore Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance Installations. His last assignment was as Executive Assistant at Space and Naval Warfare Systems Command.

His decorations include the Meritorious Service Medal (four awards), the Joint Commendation Medal, the Navy Achievement Medal (three awards), and multiple unit commendations.

Capt. Patricia A. Miller[2]

Capt. Patricia A. Miller, who reported as SSC San Diego Executive Officer in July 2001, was appointed as Center Commanding Officer by SPAWAR Commander Rear Adm. Kenneth Slaght on 8 December 2001. As of 2 May 2002, Capt. Miller resumed her former position as SSC San Diego Executive Officer.

SPAWAR SYSTEMS ACTIVITY PACIFIC[3]

SPAWAR Systems Activity Pacific Officer in Charge Cmdr. John Davidson was relieved by Cmdr. Raymond Alfaro at a Change of Charge ceremony in Hawaii on 10 January 2002. Cmdr. Davidson transferred to the Norfolk Naval Shipyard.

CENTER STRATEGIC PLANNING

2002 TECHNICAL BOARD[4]

Center managers, division heads, administrative officers and resource managers met for 3 days in mid-May for the 2002 Technical Board meeting.

Day 1. Discussion focused first on issues impacting the Center's effectiveness, including national security military strategies, technology areas, and FORCEnet[5]). Executive Director Dr. Robert C. Kolb then discussed the plan to establish working teams to address subjects of critical concern to the Center.

Days 2 and 3. A presentation, "Leveraging Technology for the USPACOM Theatre Plan for Transformation," discussed areas essential to United States Pacific Command (USPACOM) vision, including Resource Stewardships, Revolution in Military Affairs, Regional Engagement, and Readiness. The challenge in this transformation process is achieving the right balance among coalition relations, training, and experimentation. The top challenges to USPACOM include C^4I (command, control, communications, computers, and intelligence) equipment and procedures, multilevel security, integrated force protection, and training for complex interoperability issues. Possibilities for future program work for the Center involve this transformation effort.

Attendees formed action teams to address topics in several critical areas. Action teams and highlights of their efforts follow.

Strategic Decision-Making Processes. Topics included current decision-making process and improvements, the Center's Strategic Plan, and the new Balanced Scorecard initiative. Recommendations included:

- Promote Division-level strategic planning; every branch, every unit (micro-business unit) should also do strategic planning.
- Revise the Strategic Plan to reflect DoD strategies; simplify the Strategic Plan to avoid adding unnecessary work to daily routines.
- Eliminate parallel organizations that do not directly support the Strategic Plan; resolve charter overlaps.

Organizational Improvement. Topics included teaming, communication/morale, Center outreach, and support code tasking. Recommendations included:

- Develop a Center-wide, documented, formalized business process for teaming.
- Improve tech code/support code communication to improve morale on both sides.
- Increase positive outreach to the community and to SPAWAR headquarters.
- Perform a functional assessment of support code tasking (overhead support functions were seen as too "lean").

Management and Leadership of Technical Work. Focus was on teaming. Teaming allows quicker and more managed response to emerging project requirements, and reduces competition and duplication of resources. Recommendations included more positive encouragement and rewarding teaming behavior.

ERP—Moving to the Next Level. The team reported that the first year of Enterprise Resource Planning (ERP) operations were focused on gaining Chief Financial Officer compliance, i.e., satisfying legally mandated financial compliance requirements. Topics included the need for better ERP user interfaces and improved report and workflow processes. Recommendations included:

- Form a Tiger Team/project systems forum to identify near-term requirements (top action items).

- Develop a "Project Controller" career path related to ERP.

Internal Business Practices (Procurements). Topics included staffing and qualifications of Technical Assistance Officers (TAOs) and Contracting Officer's Representatives (CORs). Recommendations included:

- Improve communications between requiring and reviewing codes.
- Ensure that CORs are qualified for specific functions.
- Provide templates for requirements documents (to be provided by Contracts Division).

The team also discussed some potential improvements in the simplified acquisition and purchase card processes, sought alternate sources for information technology (IT) acquisitions, and considered a process to send selected purchase backlogs to General Services Administration (GSA). The team expressed concerns about end-of-fiscal-year issues, including carryover, expiring funds, and project execution.

Internal Business Practices (Workforce). Topics included workforce development and shaping. Of particular concern was the length and difficulty of the hiring process. Issues identified for workforce development included awards, promotions, training, career paths, and mentoring. Issues identified for workforce shaping included retention and promotion, retraining, and performance-based adverse actions. Recommendations included:

- Seek new Center-level recruiters for hiring.
- Create a "Project Controller" position/career path.
- Balance New Professional (NP) hiring with mid-career hiring.
- Encourage managers to hire from the unfunded, underemployed ranks at the Center.

De-Stressors/Morale. Topics included internal communications, e-mail volume and quality, and excessive data calls, inadequate recognition, and the promotion "bottleneck" between DP3 and DP4 personnel levels. Recommendations included:

- Provide strong support to Internal Communications Team (ICT) initiatives.
- Develop standard e-mail processes.
- Form "Stressbuster Committee" to implement positive and aggressive initiatives to reduce stress on Center personnel and improve morale. Note: The Stressbuster Committee was formed shortly after the 2 May Tech Board; the *Outlook* chronicles the progress of the Committee's work on a series of 13 specific action items from the Tech Board and other Center issues.[6, 7, 8, 9, 10, 11]

C⁴ISR TECHNOLOGY DEVELOPMENT[12]

Center leaders began designing and gradually implementing a corporate technology development plan to bring more vision-based planning to the Center's technology development efforts. The intent is to better focus the efforts of the Center workforce toward fulfilling the Center's technical vision.

Development of the Center's technical vision began several years ago and was formally approved by the Executive Board in the Spring 2002. Current efforts are underway to integrate the technical vision with the Center's technology development efforts. This process is modeled partly after a successful research and development planning process for submarine technology at the Office of Submarine Technology (SUBTECH, Naval Sea Systems Command).

SSC San Diego representatives have been working at SUBTECH in a 1-year rotational position for the last several years. These representatives are helping to form the technology development planning process at the Center. Teams and groups similar to those that make up the SUBTECH process are already in place at SSC San Diego.

SSC San Diego's Corporate Imperative teams[13] are assisting in the integration of the Center's vision and requirements with strategic thinking on warfighter capability and required technology. Seven cross-department teams were organized to develop leap-ahead capability concepts related to the imperatives and to formulate technology road maps to achieve the capabilities.

For additional background information about the Center's corporate technology development planning, see "Center Seeks to Plot C^{4}ISR Technology Future."[14]

BALANCED SCORECARD[15]

SSC San Diego is committed to pursue higher performance as an organization. Center leaders are working to communicate the Center's vision and align individual and corporate efforts to achieve the vision. Substantial efforts have been made at all levels of SSC San Diego to link performance to that vision. The next major step forward in this effort is a formalized approach called the "Balanced Scorecard."[16]

The SSC San Diego Executive Board, with the essential support of a dedicated team, developed a Balanced Scorecard strategy map (Figure 2) to set the desired objectives of high performance. The map brings together the Center's vision, its "Strategic Themes" and "Strategic Objectives" required to achieve that vision, and the alignment of those objectives into four Balanced Scorecard perspectives (Customer, Buyer and Stakeholder; Financial; Internal; and Learning and Growth).

Strategic Themes

Achieving the vision requires several major thrusts, or Strategic Themes: Innovation, Integrated Products and Services, and Execution Excellence.

Innovation. SSC San Diego will meet customer expectations to achieve integrated solutions by investing in future capacity and creating processes to foster communication, visioning, and innovation across micro businesses.

Integrated Products and Services. SSC San Diego will consistently meet the quality expectations of our sponsors and users of our products and services, and will develop trusted external relationships emphasizing satisfaction, responsiveness, and feedback.

Execution Excellence. SSC San Diego will develop more effective administrative, support, and technical processes to improve customer value.

Strategic Objectives

The Strategic Objectives are a breakdown of the Strategic Themes into specific areas that ultimately can be measured. Twenty Strategic Objectives are positioned under the corresponding Strategic Theme and set in a matrix that aligns with one of four Balanced Scorecard perspectives (customer, financial, internal, and learning).

Through the principles of organizational improvement and the Balanced Scorecard philosophy, the Strategy Map represents the means by which the Center will measure its progress toward achieving the Center's vision and, in the process, attain substantial organizational improvement.

See also: "Balanced Scorecard Mini-Tech Board." [17]

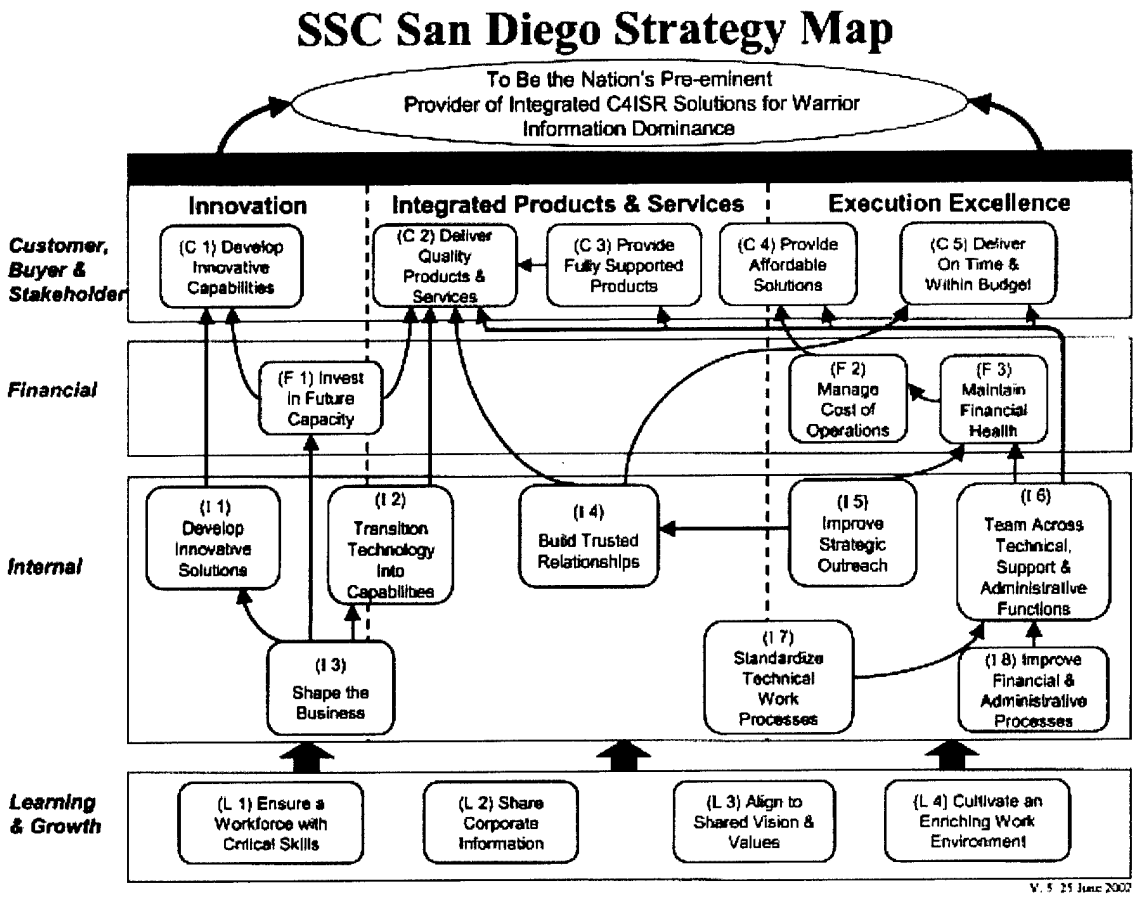

Figure 2. SSC San Diego strategy map.

THIRD HPO CHANGE CONFERENCE[18]

From 28 May through 31 May, six SSC San Diego employees participated in the Third HPO Change Conference held at the Federal Executive Institute in Charlottesville, Virginia. The Commonwealth Center for High Performing Organizations (CCHPO) hosted the conference. Organizations attending the conference indicated that they have found they must use additional developmental strategies to improve performance based on concepts taught in the HPO seminar. The HPO Seminar alone is insufficient to drive change. Supplemental efforts initiated at SSC San Diego include:

- Balanced Scorecard
- Development of internal performance consulting ability (initiated by the Improvement Integration Working Group [IIWG])
- Offering team building and individual development programs supported by the IIWG's Myers Brigg Type Indicator, "Seven Habits of Highly Effective People" workshops, and by the Systems Engineering Process Office's "High Performing Teams" workshop.

Dr. John Pickering, president of CCHPO, publicly commended SSC San Diego's IIWG for finding and beginning to apply the Situational Leadership II skills and practice consistent with a System 3 or 4 Leadership Philosophy.

Presentations made by SSC San Diego included a summary of performance improvement at the Center, and lessons learned from employing the Leadership Philosophy Questionnaire and 360-degree feedback.

CENTER INITIATIVES

PROJECT CABRILLO: ENTERPRISE RESOURCE PLANNING[19]

During 2002, SSC San Diego led the effort to become the first operational Enterprise Resource Planning (ERP) command, allowing the Navy to evaluate this new capability as part of the Navy's operational vision for "Sea Enterprise." For additional information, see "Sources/Notes."[20]

The Enterprise Resource Planning Project Cabrillo Team began the start of Wave 2 with a kickoff meeting on 7 February 2002. (See Center Command Histories for CY 2000 and 2001 for background information.[21]) Project team members were briefed on the overall program schedule, Wave 2 activities, the management approach, technical environment, life-cycle operations, and various procedures.

Wave 2 encompasses the upgrade of the SAP R/3 system from 4.6B to 4.6C. This technical upgrade sets the stage for later improvements. Functional upgrades to the system will be added as time goes on.

SOFTWARE PROCESS IMPROVEMENT INITIATIVE[22]

The SSC San Diego Software Process Improvement (SPI) Initiative resulted in two more projects achieving Level 3 on the Software Capability Maturity Model (SW-CMM): the Control Display Navigation Unit (CDNU) project and the Joint Tactical Information Distribution System (JTIDS).

The CDNU and JTIDS projects were evaluated in July by an internal assessment team. The team conducted interviews and reviewed project processes, procedures, and documentation. The evaluation team then compared the project's practices against the best practices described in the SW-CMM.

CDNU and JTIDS join an elite group of SSC San Diego projects that have achieved SW-CMM Level 3. In October 2001, four other SSC San Diego projects achieved SW-CMM Level 3: the Common Tier 3, Navy Key Management System, Marine Corps Air Traffic Control and Landing System, and Joint Network Design Agent. As the SPI Initiative continues to expand, more projects will achieve this milestone. The SPI Initiative now includes systems engineering and the Capability Maturity Model Integration (CMMI). A Center goal is for projects to achieve CMMI Level 3 as an interim milestone to Level 5.

SUPPLY INVENTORY MANAGEMENT[23]

At the recommendation of the Integrated Process Team for Sponsor-Owned Material (SOM), SSC San Diego began implementing a centralized, Center-wide, material inventory management solution using the Supply Inventory Management System (SIMS). The complexity of this undertaking was compounded by the diverse database products, internal data architecture, and business requirements associated with the existing, stand-alone, material inventory data systems that were integrated into this new centralized product.

The Fleet Engineering Department (Code 260) volunteered to be the first department to convert to SIMS. The SIMS conversion journey started in January 2001 and completed in June 2002. As of November 2002, all of Code 260's 25 data systems had been converted to SIMS.

In September 2001, the SOM inventory was estimated to be approximately 53% undervalued, and erroneously computed and reported. Code 260 has now greatly reduced the undervalued and erroneous reporting of SOM requirements. For total asset visibility (TAV), the majority of the inventory still remains nonstandard stock, although with aggressive technical editing the 10% initial estimate during site survey has been reassessed as better than 40% standard stock.

Visibility of SSC San Diego material was initially available through the Joint Computer-Aided Acquisition and Logistics Support System (JCALS). JCALS provided the capability to point to select data fields within SIMS and view SOM inventory. Because of the visibility of SSC San Diego SOM via JCALS, procurement offsets were forwarded via military standard requisition and issue procedures (MILSTRIP). JCALS capacity allowed only 200 to 300 requirements a day to be processed so Naval Supply searched for an alternative TAV tool. The Real-Time Residual Asset Management (RRAM) program was selected and SSC San Diego was chosen as SPAWAR's pilot site for Virtual SOM implementation in February 2002.

If the pilot proves successful, the accessibility will be expanded to include lateral redistribution, back orders, National Military Command System/Programmable Modular Communication Systems casualty reports from the Fleet, and direct transmission of asset status reporting request transactions for local determination.

ENERGY SAVINGS PROJECTS[24]

The Facilities Management and Operations Office (Code 2036) began two new energy conservation opportunity (ECO) projects to reduce the Center's energy consumption. The basis for the energy savings projects are found in the Federal Energy Management Program, which provides information on financing alternatives, available resources, technical assistance, and projects. The Energy Policy Act of 1992 authorizes and encourages federal agencies to participate in utility programs ranging from rebates on equipment to delivering a complete turnkey project. Executive Order 13123 of 3 June 1999 directs agencies to reduce energy consumption 35% by year 2010, relative to a 1985 base, and a 30% reduction in greenhouse gases by 2010, relative to a 1990 base.

The two SSC San Diego projects are financed and contracted through an energy partnership of San Diego Gas and Electric (SDG&E), Southwest Division of Naval Facilities Engineering Command, and SSC San Diego. This partnership offers a least-cost, best-value solution to meeting the government's total energy needs. For the two projects, SDG&E will provide project management and financing as a customer service to the Center. The cost of the projects will be paid back by a utilities charge, a portion of the savings, over the calculated payback period.

In Bayside Building 1, the ECO project will install new energy efficient pumps, heating coils, and louvers with actuators. At Seaside, a new chiller plant will be built just north of Building 600.

Examples of completed ECO projects initiated and managed by the Center's facilities office include lighting retrofits, high-voltage alternating current retrofit (Buildings 1 and 600), exit signs retrofit, chilled water loop integration (OTC Building 1), and motor generator sets replacement (Seaside).

NAVY/MARINE CORPS INTRANET (NMCI)[25]

The Navy Marine Corps Intranet (NMCI), a Secretary of the Navy initiative, is a long-term arrangement with the commercial sector. It will replace our current conglomeration of individual, shore-based networks with a single, integrated, Department of the Navy-wide Intranet for an estimated 360,000 users. The Information Strike Force (ISF) provides all associated equipment and software improvements necessary to meet security and quality of service requirements, as well as personnel training, maintenance, and operations. ISF is a team of companies led by Electronic Data Systems (EDS).

PURCHASE CARD PROGRAM[26]

In 2000, Congress directed GAO to conduct audits of Purchase Card Programs at two randomly selected Navy organizations that were relatively large users. SSC San Diego was one of the two selected; the Navy

Public Works Center in San Diego was the other. The audit began in August 2000 and continued until May 2001 and included Congressional testimony by the former SSC San Diego Commanding Officer in July 2001. Those findings and testimony caused Congress to ask GAO to return for another 90-day follow-on audit.

The second audit was similar to the first and was conducted between November 2001 and February 2002. The focus of both investigations was to determine if the Center has proper purchase card controls in place and is a good steward of tax dollars. GAO found weaknesses, but also significant improvements, in the Center's program.

Although no fraud was found, GAO determined that the potential for abuse could not be ignored. Potential abuse means lack of tight internal controls. The Center program was suspended for all but 12 cardholders. For the program to be reinstated with a more workable number of cardholders, appropriate training in purchase card documentation procedures was required. The Center initiated a comprehensive review of the program and implemented effective changes to address potential problem areas.

SAFETY INTEGRATION[27]

The Naval Inspector General Oversight Inspection Unit (NOIU) evaluated SSC San Diego's Navy Occupational Safety and Health (NAVOSH) program in January 2002. Six NOIU safety and health specialists conducted the evaluation using a new methodology called the Process Review and Measurement System (PR&MS). The PR&MS measures the integration of safety into the core business of an activity.

The NOIU visit offered a training opportunity. PR&MS subject matter experts briefed the scope and intent of this new methodology to safety and other Center personnel. The visit was an essential step toward implementation of the PR&MS process-related methodology for improving safety performance.

Although SSC San Diego received a baseline score of 53%, the field compliance deficiencies have been abated and a plan of action and milestones has been developed for process-related findings.

SECTION 3
TECHNICAL HIGHLIGHTS

SUMMARY OF CY 2002 ACCOMPLISHMENTS

- **Knowledge Web.** Installed Knowledge Web (K-Web) display technology onboard USS *Carl Vinson* (CVN 70), enabling dynamic control of naval airstrike forces from multiple carriers and a continuous air presence to support ground forces.
- **Global Hawk.** Supported the Global Hawk Unmanned Air Vehicle (UAV), enabling a large-scale flow of data from the UAV to tactical commanders and battle planners in support of Operation Enduring Freedom.
- **Navy Regional Hawaii Command Center.** Developed the Navy Regional Hawaii Command Center to support Homeland Security, Force Protection, and Anti-Terrorism in the Hawaiian Islands.
- **Commander, Pacific Fleet (CINCPACFLT) Command Center**. Developed the CINCPACFLT Command Center, which was used extensively by Commander, Third Fleet (COMTHIRDFLT) during Rim-of-the-Pacific (RIMPAC) 2002. Additional discussion of the RIMPAC 02 is provided later in this Command History.
- **PC-IMAT (Interactive Multisensor Analysis Training, PC) V5.0**. Approved by Commander, Submarine Force, Pacific Fleet, for use on Pacific Fleet submarines. Version 5.0 provides new capabilities and is now one of the primary antisubmarine warfare (ASW) planning tools provided to the Battle Group ASW Commander.
- **Robotics.** Developed and deployed ground robots to support Special Forces in Afghanistan. Robots were effective at searching caves and minimized danger to U.S. ground forces.
- **Cryptoanalysis.** Deployed new classified capability for cryptoanalysis (through Cryptologic Management and Analysis Support System) to forces afloat and ashore in support of Operation Enduring Freedom.
- **Medical Data Surveillance System (MDSS).** Installed and tested the MDSS, a processing/database capability that looks for symptom trends within populations to detect potential use of chem-bio agents, at several field locations, including the 18th Medical Command (MEDCOM) in Korea, Naval Hospitals in San Diego, Camp Pendleton, and Okinawa, and at U.S. Central Command (CENTCOM). Extensive operator training was also provided.
- **Radiation Detection, Indication and Computation (RADIAC)**. Thirty-six RADIAC systems (a unique component of the C^4ISR network of systems, used to locate, classify, and quantify gamma radiation emissions in underwater and air environments) in use by Operational Forces.
- **Intelligence, Surveillance, and Reconnaissance Capability (ISRC).** Transitioned ISRC technology, providing manned and unmanned aircraft video into Global Command and Control Systems-Maritime (GCCS-M), significantly enhancing Situational Awareness.
- **GCCS-M Version 3.1.2.1 Authorized for Fleet Release.** Global Command and Control-Maritime (GCCS-M) version 3.1.2.1 received final fleet release authorization. This release provides significantly enhanced Common Operational Picture (COP) and COP Synchronization Tools (CST) capabilities.

NAVIGATION AND APPLIED SCIENCES

MARINE AIR TRAFFIC CONTROL AND LANDING SYSTEMS (MATCALS)[28]

The Marine Air Control Squadron-2 (MACS-2), located at Marine Corps Air Station Cherry Point, North Carolina, was tasked by the Joint Task Force Olympics (JTFO) to provide a surveillance radar system, the Marine Air Traffic Control And Landing Systems (MATCALS) AN/TPS-73 Air Traffic Control Subsystem (ATCS), for air security during the 2002 Winter Olympic Games at Park City, Utah. A transportable radar was needed to perform a gap filler mission.

MACS-2 contacted the SSC San Diego's Air Command and Control Branch (Code 2336) and requested assistance. The mission required interface to the U.S. Air Force (USAF) Air Security Operations Center (ASOC), at Hill Air Force Base (AFB), and the U.S. Customs Center using Federal Aviation Administration/USAF Common Digitizer-2 (CD-2) formatted messages. A one of a kind unit, the Multiple Radar Tracking System (MRTS) was built for the ATCS in 1995 to support a range control mission at Camp Lejeune, North Carolina, and had been recently turned over to SSC San Diego. It was the only device immediately available to convert the unique ATCS Naval Tactical Data System (NTDS) radar messages into the required CD-2 format.

The ATCS was installed and performance-tested in September 2001. The radar performed well throughout the games. It was manned 24/7 by the MACS-2 Marines and experienced only 1 hour of downtime in its 1000 hours of operation. SSC San Diego continued to provide remote technical and supply support assistance as required.

Potentially, AN/TPS-73 can perform many other homeland security related missions. Procurement of additional CD-2 converter devices has been investigated.

MARINE MAMMAL PROGRAM TARGET MINE SUPPORT[29]

SSC San Diego Biosciences Division (Code 235), is the in-service engineering agent and primary support activity for the Explosive Ordnance Disposal (EOD) units that maintain the Navy's MK-4, MK-5, MK-6, MK-7, and MK-8 Marine Mammal Systems (MMS). In 1994, after several ships struck mines in the Persian Gulf, SSC San Diego was tasked to develop a shallow water and very shallow water (SW/VSW) enhancement capability for the MMS. To develop these enhancements to the MMS capabilities, physically and acoustically valid SW/VSW foreign mine simulators were required for the dolphin-based MMS animal and operator training.

SSC San Diego consulted with the Naval Surface Warfare Center (NSWC), Office of Naval Intelligence (ONI), Naval Undersea Warfare Center (NUWC), Coastal Systems Station (CSS) Panama City, Mobile Mine Assembly Group (MOMAG), and the EOD community to determine the most likely threats to be encountered from off shore into the littoral zones. The mines of interest, constructed of glass-reinforced plastic (GRP) and other non-metallic materials, are difficult to locate with traditional sonar systems because of their low acoustic target strengths. Determining accurate physical and acoustic properties of these targets was especially crucial because of the highly sensitive nature of the Navy's mine-hunting dolphin's echolocation sonar.

To begin training, standard U.S. mine shapes similar to foreign mines were substituted, when available. Most of the SW/VSW mine shapes were very different from the U.S. inventory and required procurement, reverse engineering, and manufacturing. Efforts to locate and procure valid GRP mine simulators met with little success. Some could be purchased from manufacturers, but high cost and difficulty of acquisition made this undesirable. The Navy had no centralized office for developing and procuring the

necessary training mines, so the Center worked with NUWC and the VSW Mine Countermeasures Detachment (VSWMCMDET) to manufacture suitable mine simulators that met the MMS physical and acoustic requirements.

In 1998, the Naval Sea Systems Command (NAVSEA PMS-490) asked the Center to make the VSW/SW Exercise and Training (E&T) mine program available to all fleet mine hunting assets. An E&T mine integrated process team (IPT) was formed and chartered to supply all E&T mine targets for fleet mine hunting training and system assessment.

In addition to developing and validating the acoustic and physical properties involved with manufacturing these simulators, SSC San Diego is developing the capability to recover the mine shapes using the MK-5 MMS. MK-5 employs California sea lions to dive, locate, and attach lifting lines to the deployed targets in depths to 500 feet. Sea lions have been used to recover other test mines and missiles for over 25 years. This method of retrieval is more effective than using divers or remotely operated vehicles yielding high recovery rates and less susceptibility to environmental constraints. The inclusion of MK-5 attachment points to old mine shapes as well as future shapes will allow this option to be available for all E&T mine field recoveries.

In FY 01, Code 2353 wrote contracts to outfit MOMAG with three E&T mine shapes, totaling 150 mines. A contract was also written to supply the VSW Mine Countermeasures Detachment with an assortment of E&T mines. These E&T mines were previously not available to the Fleet. In FY 02, technical data packages for two new E&T mine shapes and MK-5 attachments were written. The contracts for development and manufacturing were prepared for release in late FY 02. In addition, a contract for procurement of 60 E&T mines (two shapes) to further outfit MOMAG was released for open bidding.

COMMAND AND CONTROL

REAL-TIME EXECUTION DECISION SUPPORT (REDS)[30]

The Real-Time Execution Decision Support (REDS) project is developing a collection of object-oriented technologies and enterprise solutions to provide strike warfare information management and decision support. These new technologies are becoming enablers for battle group decision-makers to retarget carrier-based tactical aircraft in flight.

REDS is an outgrowth of the overarching Real-time Targeting and Retargeting (RTR) program for controlling tactical aircraft and Tomahawk missiles in flight. It is sponsored by the Office of Naval Research (ONR) to develop Future Naval Capabilities (FNCs) for time-critical strike and knowledge superiority.

Efforts are being concentrated in three areas: reducing the normal 8- to 10-hour strike mission planning to less than 2 hours, supporting real-time replanning of a mission, and providing decision support tools for the rapid options generation of temporally constrained events. These development areas encompass information management, decision support, and communications management. They are centered on the carrier infrastructure, which supplies the information needed for mission planning.

The Center team relies on the Naval Strike and Air Warfare Center in Fallon, Nevada, for operational guidance. The REDS team observes and gathers data during carrier air wing training evolutions that are mandatory before deployment. Project personnel also work with Naval Air Systems Command, Naval Mission Planning Program Office (PMA-233), for integration of REDS into the Joint Mission Planning System (JMPS).

The team developed the REDS three-tier concept: (1) a shipboard/land based reconfigurable operations center, (2) Spectrum Management for communications, and (3) the Warfighter's Virtual Assistant (WVA) airborne interface that supports information transfer to and from the platforms.

Two new areas of research started in 2002: Airborne Battle Management System (ABMS) and Temporal Evaluation Model for Mobile Profiled Target Sets (TEMMPTS). ABMS will provide technologies to support an emerging concept of operations for the E-2C community called Airborne Command and Control (ABC2). TEMMPTS provides predictive assessments on threats based on weather, geographical, and geopolitical information. The goal is to better understand how and why a particular country deploys its assets, thus predicting with greater accuracy where mobile weapons systems or high-priority targets are located.

AWS LINK-16 SYSTEM[31]

A team from Israel's National Missile Defense Program participated in testing systems developed by the Tactical Systems Integration and Interoperability Division (Code 245) for Israel's Missile Defense System. The Arrow Weapon System (AWS), on which it is based, provides Israel with the ability to produce and field its own national missile defense system using the Arrow-II interceptor. Code 245 is the Navy's source for Link-16 expertise. The AWS Link-16 System (ALS) developed by Code 245 allows the Israeli AWS to exchange real-time missile track data with U.S. tactical systems and link the Arrow-II antiballistic missile to U.S. radar systems via Link-16. The AWS uses a missile launcher, command and control center, and sophisticated radar to track and intercept incoming ballistic missiles. The tests, which took place in SSC San Diego's Systems Integration Facility, were designed to verify the initial integration of the upgraded ALS.

DISTRIBUTED ENGINEERING PLANT[32]

The Navy Distributed Engineering Plant (DEP) team tested the USS *Harry S. Truman* (CVN 75) and USS *Constellation* (CV 64) battle groups during the Battle Force Interoperability Test (BFIT), 15 April through 2 May 2002. The April BFIT was particularly challenging because new combat systems versions for programs such as the Aegis Weapons System, E-2C Hawkeye, and the Combined Data Link Management System were tested.

The Navy uses BFIT to evaluate battle group combat systems configurations and characterize interoperability before deployment. BFIT and various other test events are accomplished through use of the DEP, a high-fidelity, shore-based battle group test bed formed by federating dispersed combat system sites around the U.S. to replicate a Navy battle group.

The DEP uses an asynchronous transfer mode (ATM) network backbone that provides a robust test environment with wide bandwidth. The DEP allows for several unique testing capabilities and functions. The ATM is segregated into virtual local area networks (VLANs) or "pipes." These VLANs allow for Tactical Digital Information Link (TADIL) data to be transmitted on separate pipes for Link-16 and Link-11. Additionally, VLANs exist for a shared simulated radar environment, data analysis file sharing, voice, and video teleconferencing. These network capabilities are designed, operated, and managed by the DEP Network Operations Center located in the Advanced Concepts and Engineering Division (Code 241).

In response to a Chief of Naval Operations directive, a Naval Sea Systems Command (NAVSEA) task force study, and the subsequent formation of the Navy Alliance[33], the Navy DEP team was established in 1998 to address critical fleet interoperability issues. The primary mission of the DEP is the BFIT process whereby the Navy DEP team characterizes the interoperability of each deploying battle group and provides this information to the battle group staff and the acquisition community. DEP testing has been extremely valuable in many ways over the past 3 years. As of the fall of 2001, the DEP had executed nine BFITs covering 14 deployed battle groups, and fleet feedback has been very positive.

The Tactical Systems Integration and Interoperability Division (Code 245) DEP team is unique in the DEP community because its participation spans all areas of planning, test execution, engineering, and analysis. The DEP TADIL lead is responsible for setting TADIL requirements, ensuring TADIL reliability, and planning the introduction of future TADIL enhancements into the DEP. The DEP TADIL lead also oversees test execution, online TADIL analysis, and TADIL support in the TADIL Operations Center (TOC), which is located in the Systems Integration Facility (SIF), Lab 350.

By using the DEP, many more issues can be isolated than during program element testing. The operational battle group environment can be emulated with land-based test sites and the network. Battle group interoperability can be realistically evaluated in a controlled laboratory environment.

A unique aspect of the BFIT is the concept of battle group system integration and debugging. Historically, the first time a battle group came together as a total system was during the battle group system integration test, several months before deployment. The fleet sailors were executing the functions of system integration and system debug instead of their primary training goals. The advent of the DEP tool and the BFIT test process has effectively moved a large portion of the battle group system integration and debug process back ashore where it belongs.

The BFIT testing process follows a graduated concept of interoperability characterization. Combat systems programs are tested in increasingly complex environments starting with single-unit air surveillance tracking, moving to multiple-unit tracking, and then to identification and weapons coordination. Finally, the BFIT team evaluates the battle group with a final exercise used to flex all areas of interoperability. This exercise is called the Battle Force Interoperability Requirements (BFIR) event. In 1999, NAVSEA took on the task of developing battle-group-level metrics and established the BFIR

program. The ability to measure the performance of any system against a yardstick is critical to any systems engineering function as it supports an acquisition program. The metrics provided indicate system capability, functionality, developmental progress, and potential for system improvement and investment.

Currently, the DEP is fully operational for the battle group anti-air warfare mission. The DEP exercises the battle group as a system and tests all components of the battle group in a rigorous, repeatable environment. In addition, as a battle group test bed, the ability of the DEP to support system development programs as well as system acquisition decisions via performance analysis is just being realized. The BFIR program is providing quantitative analysis of battle group performance within the DEP. This information is critical to bounding the performance required of U.S. battle groups by measuring current and future performance of battle groups and battle group system components as they are acquired.

FLEET BATTLE EXPERIMENT JULIET[34]

In close partnership with the Fleet Commanders, the Navy Warfare Development Command (NWDC) designs, plans, and executes the Fleet Battle Experiment (FBE) Program, and then analyzes and disseminates experiment results. Through the FBEs, NWDC examines innovative warfighting concepts in an at-sea, operational environment. Although NWDC has led every FBE, SSC San Diego has been the only organization among U.S. Navy laboratories, industry, and academia to participate in every FBE.

FBE Juliet (J) was the tenth in a series of FBEs and was conducted under the overarching objectives of Millennium Challenge 2002 (MC-02), 24 July through 15 August, throughout the United States. FBE J was hosted by Commander, Third Fleet acting as FBE officer in charge of the experiment.

FBE J involved experimentation across all maritime warfare areas. FBE J was planned to develop and refine command and control processes for future joint maritime forces, including defining functions and planning process for the Joint Forces Maritime Component Commander, improving ship-based command and control, and enhancing the integration between networks and databases serving forward sea-based forces and rear elements. FBE J experimented in Joint Fires and Joint Sensor integration and employment with manned and unmanned distributed sensors over, on, and under the sea, and over and on the land.

The experiment specifically examined mine warfare, antisubmarine warfare, anti-surface ship warfare, and overland strike operations using manned and unmanned platforms. One highlight of the event was further experimentation with the joint high-speed vessel (experimental) Joint Venture (HSV-X1). The potential of fast, shallow draft, open architecture, multi-mission vessels with large payload fractions in the areas of mine warfare, special operations, ship-to-objective maneuver, and medical and noncombatant support operations was evaluated.

Of particular significance to the Center was the information and knowledge advantage initiative, which included:

- *Joint and Maritime Command and Control Joint Forces Maritime Component Commander:* Refine roles, functions, and planning process. Build initial tactics, techniques, and procedures and doctrine.
- *Ship-based Joint C^2:* Refine C^4ISR/manning support for sea-based Joint Force Commander.
- *Netted Force:* Improve coordination between forward sea-based forces and rear elements through enhanced networking. Continue coalition experimentation using software agent-based systems.

Facets of other initiatives related to the Center included:

- *Information Operations:* Integrate kinetic and non-kinetic engagement options. Extend computer network defense work from Fleet Battle Experiment India.

- *High-Speed Vessels:* Evaluate vessel speed, size, range, and endurance; evaluate reconfigurable payload characteristics for assured access missions. Evaluate use of vessels as transport, undersea warfare, fire support, sensor support, C^2 node, and logistics.
- *Unmanned Sensors, Platforms:* Refine concepts of employment and information fusion for distributed, networked, manned and unmanned platforms, and remote sensors for antisubmarine warfare/mine warfare/anti-surface warfare.
- *Theater Air Missile Defense (TBMD):* Examine multi-mission impacts of and joint C^2 for Navy TBMD-capable units.

FLEET ENGINEERING

JOINT WARRIOR INTEROPERABILITY DEMONSTRATION (JWID) 2002[35]

The SPAWAR Chief Technology Office (Code 06), in conjunction with the Fleet Engineering Department (Code 260), hosted the Joint Warrior Interoperability Demonstration (JWID) 2002 in the Advanced Concepts Site (ACS), 13–24 May 2002. The ACS focused on challenges of the Global Information Grid (GIG) support to the warfighter.

JWID is the Chairman of the Joint Chiefs of Staff's annual event that enables the U.S. combatant commands and the international community to investigate command, control, communications, and computers (C^4) solutions that focus on relevant and timely core objectives for enhancing coalition interoperability.

With more than 20 sites around the world participating, JWID '02 provided an opportunity to conduct international command and control interoperability trials, and to assess technology demonstration capabilities at five U.S. sites. Primary coalition participants included representatives from Australia, Canada, New Zealand, United Kingdom, Spain, Germany, and the North Atlantic Treaty Organization (NATO). For the first time, Pacific Rim countries also were represented in JWID.

The Special Projects and Implementation Branch (Code 2644) provided support in systems engineering, network engineering, security accreditation, and planning and execution of JWID '02. The Tactical Network Communications Branch (2631) provided support with the ACS connectivity to the JWID Coalition Wide Area Network (CWAN) via the Joint Integrated Communications Facility (JICF) located at SPAWAR (Old Town Building 2). Twenty-four personnel representing the U.S. Navy, Naval Reserve, Marine Corps, Royal Australian Navy, and the New Zealand Defense Force were brought in to operate and provide assessments of the technologies demonstrated.

The ACS is connected to the JICF through fiber-optic lines enclosed in a protected distribution system (PDS). This PDS provides the ACS with connectivity to a wide variety of satellite communication, terrestrial, and base-band systems. Additionally, Code 2631 maintained the Combined Federated Battle Laboratory Network (CFBLNet) point-of-presence in the JICF, allowing for round-the-clock connectivity to the CFBLNet and the Defense Information Systems Network Leading Edge Services. This support assisted in maintaining a 100% up status of the network connection to the CFBLNet, which was instrumental in the success of this year's JWID.

RIMPAC 02[36]

Rim-of-the-Pacific (RIMPAC) 02, a multi-national, multi-force exercise, was conducted in the waters off Hawaii from 24 June to 22 July. Over 30 ships, 24 aircraft, and 11,000 sailors, airmen, Marines, soldiers, and Coast Guardsmen from eight nations participated in RIMPAC 02 training operations. SPAWAR personnel played a critical role in providing and supporting the extensive command, control, communications, computers, and intelligence (C^4I) architecture needed to safely and successfully conduct this important event.

SPAWAR was an integral part of all phases of C^4I preparation and operation. These include shore site installations at the Commander in Chief, U.S. Pacific Fleet (CINCPACFLT) Command Center (FCC) and the Combined Forces Air Component Commander's Air Operations Center (AOC); shipboard Combined Operations Wide Area Network (COWAN) installations on U.S. Navy and coalition ships; and onsite support and troubleshooting during operations at the FCC, AOC, and at-sea.

With the USS *Coronado* (AGF 11) not available during RIMPAC 02, the staffs of Commander Third Fleet (COMTHIRDFLT) and CINCPACFLT relied on SPAWAR expertise to prepare the FCC and AOC to provide the shore-based command and control infrastructure needed to run such a complex operation. A diverse team of employees from SSC San Diego, SPAWAR Systems Activity Pacific (Code 290), and SSC Charleston came together in late February 2002 to start the process of preparing the FCC and AOC.

To support RIMPAC 02, the FCC required installation of several major C4I systems. The FCC upgrades were spearheaded by the SSC San Diego personnel from C^4I Programs, Hawaii (Code 2424). Code 290 provided the engineering management team for the FCC installations. After the major system installations at the FCC were complete, SPAWAR personnel provided critical around-the-clock operations and technical troubleshooting support.

In addition to preparing the shore sites for RIMPAC 02, SPAWAR claimancy personnel provided vital shipboard installations and at-sea support. Engineers from the Fleet Systems Engineering Team (FSET) conducted installation, testing, and troubleshooting for COWAN equipment on the majority of coalition units, as well as providing underway COWAN and high-frequency connectivity support. FSET engineers also provided ashore support during RIMPAC 02.

SSC San Diego's Installation Management Office (Code 26001) was instrumental in coordinating between SPAWAR Headquarters and the installation team. This coordination resulted in the successful installation of the various systems in the FCC.

INTELLIGENCE, SURVEILLANCE, AND RECONNAISSANCE

VERTICAL LAUNCH ANTI-SUBMARINE ROCKET (VLA)[37]

The Vertical Launch Anti-Submarine Rocket (VLA) program is sponsored by Naval Sea Systems Command Program Manager, Program Executive Officer Submarines. SSC San Diego Undersea Systems Branch (Code 2715) serves primarily as technical direction agent but is also involved in other program functions such as system integration and test and evaluation. Currently, the undersea system's foreign military sales are complete but there continues to be direct commercial sales (DCS). In support of the DCS production, Lockheed Martin has funded Code 2715, via commercial service agreement, to conduct testing of nose cap shells. The VLA weapon is launched from a vertical launch system on U.S. Navy ships, such as *Spruance* and *Arleigh Burke* class destroyers, and *Ticonderoga*-class guided missile cruisers.

The VLA missile consists of a lightweight torpedo coupled to a rocket with an airframe. The forward end of the torpedo has a phenolic (plastic) nose cap installed to protect the transducer elements during several stages of the missile's flight. Because of a recent transfer of intellectual property rights, the phenolic material used to manufacture the nose cap shell is being re-qualified. As part of this effort, SSC San Diego is conducting water entry tests at the SSC San Diego's Transducer Evaluation Center (TRANSDEC).

GROUND AIR PASSIVE SURVEILLANCE ACTD[38]

The Ground Air Passive Surveillance (GAPS) Advanced Concept Technology Demonstration (ACTD) was conducted at the Naval Air Warfare Center-Aircraft Division (NAWC-AD), Patuxent River, Maryland, 30 May to 14 June 2002. This demonstration was the first field demonstration of the Lockheed Martin Mission Systems Silent Sentry 3 (SS3). The Joint and National Systems Division (Code 273) provides the technical management for the GAPS ACTD, which began in FY 00 to assess the military utility of the SS3 passive coherent location (PCL) technology. This technology uses the transmitted signals from commercial FM (frequency modulation) radio and television stations to provide the illumination for the passive radar system.

The tests were highlighted by a demonstration of the system to Deputy Undersecretary of Defense for Advanced Systems and Concepts. The many visitors who observed the demonstration were extremely impressed with this evolution of the SS3 system. The SS3 system software had just become operational on 16 May 2002, so this was an aggressive schedule to demonstrate it so soon after initial operations. Because of the high visibility of SS3 and interest associated with the anticipated delivery of the system, a successful demonstration of the system was required as soon as possible to aid in system transition.

First, the technology was assessed for counter-drug missions by demonstrating PCL as a real-time, mobile, wide-area, passive surveillance system for detection, tracking, and localization of air targets. Second, the PCL system utility was evaluated for blue force military operations in littoral regions. Third, the capability of red forces to exploit this technology was assessed.

Southern Command is the principal user/sponsor for GAPS. The Joint Inter-Agency Task Force East is the operational manager responsible for all planning, coordination, and direction of user activities related to the demonstration project. Finally, the Office of the Chief of Naval Operations is the GAPS service sponsor and provides the ACTD transition manager, who directs transition planning and execution.

COMMUNICATIONS AND INFORMATION SYSTEMS

COMBAT WEAR INTEGRATION (COMWIN) ANTENNA[39]

Advances in testing and development have continued to evolve for the Combat Wear Integration (COMWIN) antenna since the technology was described in the CY 2001 Command History.[40] The COMWIN antenna has been tested under as many realistic conditions as possible to evaluate how well it works when the user is standing up, lying down, or walking.

The goal of the project is to develop a human-carried antenna that can send or receive a signal, at any frequency between 2 and 2,400 MHz, while concealing the identity of the radio operator. The concealment occurs by integrating the antenna into the uniform so that the radio operator looks like every other Marine or soldier. The system has wireless potential using voice activation and does not require use of the hands.

The primary antenna is a vest that is worn under the shirt. The vest antenna covers the frequency range from 30 to 500 MHz. This 13-to-1 frequency range corresponds to ultra broadband. Other components include an antenna conformal to a helmet that covers 500 to 2400 MHz, a whole body antenna that covers 2 to 30 MHz, and a signal distribution system that sends the signal to the appropriate antenna for efficient transmission. Each component has been successfully tested with radio or video signals.

User safety is paramount. To ensure its safety, the antenna has been tested at Brooks Air Force Base to identify hot spots. Research will continue until everyone in the scientific community agrees that the antenna can be safely used by personnel.

Communications capabilities of the COMWIN vest antenna were successfully tested to distances of 7.7 kilometers. Radio transmission for frequencies higher than about 30 MHz cannot go over the horizon and COMWIN has a 12-mile line-of-sight limit for operators at heights less than 100 feet.

The investigators have experimented with the vest antenna at many frequencies between 50 and 450 MHz. The vest antenna part of the COMWIN antenna has very good characteristics at frequencies between 30 and 500 MHz. The government has sold off much of the frequency spectrum that the military previously could use. The COMWIN antenna will provide much greater flexibility in the use of the permissible spectrum. The greater spectrum of frequencies COMWIN could provide for the military has potential applications for civil defense as well.

DOMESTIC EMERGENCY RESPONSE INFORMATION SERVICE (DERIS)[41]

In August 2001, SSC San Diego's Crisis Consequence Management team conducted an urban emergency exercise with local San Diego government agencies. SSC San Diego's experience and success with the exercise, using a Defense Advanced Research Projects Agency-developed system, came to the attention of the Department of Defense Homeland Security Task Force. SSC San Diego was tasked to design a multiple crises scenario in urban environments.

The homeland defense system used in the August demonstration showed the potential of sharing information quickly and easily to improve response and make use of scarce resources in an emergency. It consisted of the Enhanced Consequence Management Planning and Support System (ENCOMPASS), wireless communications provided by the Deployable Communications Support Terminal (developed by SSC San Diego), and the University of California, San Diego, High Performance Wireless Research and Education Network.

The DERIS system demonstration was conducted on 12 March. The experiment linked disaster preparedness components, organized working relationships with emergency management teams at various levels, and worked to stay within existing protocols for dealing with emergencies using proper matches of tactical and command level organizations. The San Diego team designed a complex scenario involving terrorists in San Diego Harbor. In response, various local agencies developed a coordinated effort and the would-be terrorists were apprehended.

SSC San Diego developed the protocols around the scenario and decided who would handle the issues and determine effective communication patterns. With so many agencies involved, the exercise was complex. Participants agreed that more government support is needed to upgrade all capabilities for emergency management, and these must fit the existing methods of operation and protocols.

COMBAT SURVIVOR EVADER LOCATOR (CSEL) BASE STATION[42]

SSC San Diego and SSC Charleston employees completed installation of the ultra high-frequency SATCOM base station (UBS) for the Combat Survivor Evader Locator (CSEL) program at Naval Computers and Telecommunications Station (NTCS) Sigonella, Italy. CSEL is a joint program, with the U.S. Air Force as the lead service. The program is currently in low rate initial production supporting operational testing. Combined developmental/operational testing began in March and will be completed with the formal multi-service operational test and evaluation (MOT&E). Fielding approval is pending successful completion of MOT&E, with the results supporting a May 2003 Milestone III/Full Rate Production Decision. The CSEL UBS at NCTS Sigonella is critical for the completion of MOT&E and the continued success of the program.

CSEL is the tri-service combat search and rescue (CSAR) replacement for the existing survival radios used today by aircrews and special forces. CSEL adds a secure, anti-spoof and jam-resistant military Global Positioning System (GPS) capability. But the major technology leap over today's combat survival radios is the ability to communicate over the horizon via secure SATCOM. The key to the CSEL architecture is the ability of the handheld radios to communicate via SATCOM directly to a rescue coordination center.

CSEL became a priority acquisition effort in 1995 after Air Force Capt. Scott O'Grady was shot down over Bosnia and was lost for 6 days. Congress raised concerns about the primitive technologies employed for localization and communications in the recovery of missing aircrews. Personnel recovery became the Secretary of Defense's highest priority. The Department of Defense designated the Air Force as the lead service, and the Boeing Company was awarded the contract in February 1996.

The Integrated Networks Branch (Code 2824) and the Radio Frequency Communications Systems Division (Code 28405) have been supporting the development of the CSEL system and are responsible for CSEL UBS installations worldwide. The base stations enable the system to communicate over the horizon. Four CSEL base stations will be installed to provide global communications coverage.

APPENDIX A: CY 2002 ACHIEVEMENT AWARDS

DEPARTMENT OF DEFENSE AWARDS

DoD Electromagnetic Environmental Effects (E3) Program Dr. Robert J. Haislmaier Memorial Award

Dr. Shing T. Li, for significant contributions to the Electromagnetic Environmental Effects Community. Dr. Li has been manager of the Electromagnetic Compatibility (EMC) project at the Center since 1984, and is internationally recognized for his contributions in the EMC area.

Defense Advanced Research Projects Agency 2002 Award for Outstanding Performance by a Government Technical Agent

Dr. Cynthia Hanson, for technical expertise across a number of disciplines and timely contractual assistance

Commander-in-Chief, U.S. Pacific Fleet WOW Award

For managing the upgrade to the CINCPACFLT command center, completed a month ahead of schedule. Team converted a briefing facility to a multi-functional command center with 23 workstations, desktop video teleconferencing, satellite communication handsets, and secure communications

Sharon Albus-Kimura
Jay Sakai
Glenn Takahashi
Steve Watkins

Joint Civilian Service Commendation Awards

For efforts on the Coalition Theatre Logistics Advanced Concept Technology Demonstration

Bruce Fink
Dexter Ishii
Bill Steeger

Advanced Concept Technology Demonstration Manager of the Year

Bruce Fink

NAVY AWARDS

Navy Meritorious Civilian Service Award

John Audia for his vision and enthusiasm in organizing and leading a division formed from merger of several groups, initiating new programs and projects within that division

David Chadwick for work on a multi-agency task force of city, state and federal agencies to clean up contaminated sediments in San Diego Bay

Terry Clark for improving branch processes using modern management theory, High Performance Organization and Balanced Scorecard techniques

Jerome Dejaco for developing and managing new business opportunities for upgrading the T-AGOS-19 class of ships with the littoral Low Frequency Active surveillance system

James Dombrowski for leadership of the Advanced Concepts Branch and management of the Fiber Optic Microcable Program and the Hermes and P1 projects

Solomon Fink for supporting unique funding requirements for Department of Defense and non-DoD sponsors

Joseph Fitchek for direction of R&D on advanced hyperspectral capability for detection of submerged objects

Dr. Clarence Fuzak for development of strategic and tactical Navy surveillance systems, and development and assessment of sensor data fusion processing algorithms for precision geolocation information

Gregory Hama for planning and implementation of the Automated Digital Network System at Naval Computer and Telecommunications Area Master Station, Pacific, and at Commander, Submarine Forces Pacific

Dr. Eric Hendricks for his role in creating the Independent Applied Research Program, and for leadership of an action team to identify Center technologies with homeland defense potential after September 11, 2001

Thinh Ho for technical achievement and inventions in antenna design and modeling

Visarath In for research in non-linear dynamics in several important areas, including medical applications (human hearts undergoing fibrillation), wideband antennas and wideband tracking

Barbara Johnson for her involvement with the Department of the Navy Information Technology Umbrella

Dr. Brenda-Lee Karasik for establishment of the Competitive Intelligence Marketing Group to develop business case analyses of new technical areas and the Center for Commercialization of Advanced Technology project to streamline the technology transfer process

Philip Lazar for maintaining and rehosting the Command and Control Processor programs used operationally in 135 U.S. Navy and foreign ships and shore sites

Roy McConnaughey for design efforts on the Theatre Battle Management Core Systems and the Contingency Theatre Air Control System Automated Planning Systems Year 2000 remediation

Linda Modica for development of a wide range of financial, contract, and project management information products

Arthur Nakagawa for leadership of the command, control, communications, computers and intelligence suite project for the new U.S. Commander-in-Chief Pacific headquarters

C.A. Norton for service as Division Chief for Systems Engineering, Joint Warfighting Center, U.S. Joint Forces Command. He expanded the systems engineering team, guiding it in design, implementation and operation of the Joint Training Analysis and Simulation Center, DoD's premier facility in this area.

Edward Peterson for research that contributed to efficiency of ultra high frequency satellite communications channels available to the fleet

Barry Randall for initiative and innovation in dealing with ever changing financial requirements for the Command and Control Department

Peter Shaw for management of the Evolutionary Acquisition Block upgrades for the Navigation Sensor System Interface Display and Control System

Allen Shum for invention of the Stochastic Unified Multiple Access protocol, a simple, robust, efficient, scalable and flexible solution to long-standing, complex Link 16 tactical data link problems

Randall Volker for leadership as program manager for initiation and implementation of the Enterprise Resource Program

Michael Wood for leadership of a national team to develop and verify computer-based simulation models for ionizing radiation effects on microelectronic devices

Dwight Yoshinaga for service as intelligence systems technical adviser for U.S. Special Operations Command Pacific, supporting operational readiness of intelligence information and communications systems

Mark Zabriskie for management of a specialist team to support the Web-Enabled Navy, including development of technical/system architecture

Space and Naval Warfare Systems Command (SPAWAR) Special Act Award

For moving an immature product baseline to one mature and stable enough to support full-scale system integration, certification, operational testing, and fielding

Common Operating Environment Tiger Team

Cathy Croswait	Sharon Roe
Pat Garcia	Gail Rutherford
Randy Garlinghouse	Kim Trieu
Chris Johnson	

SPAWAR "On the Spot" Award

Leslie Davenport, for efforts as a member of a Joint UHF Military Satellite Communications Control System Integrated Logistics Support team

SPAWAR Lightning Bolt Team Excellence Award

For contributions to employee morale

Employees Services Council

Joan Baker	Nancy Hupp
Mary Boner	Althea Kaneaster
Elizabeth Bowen	Erin Lyles
Glorina Carr	Ric Mazzetti
Lisa Collins	Deb McCormick
Betty Croft	JoAnne Newton
Lt. William Deniston	Paula Riddle
Rose Duarte	Mike Sammuli
Mary Elliott	Letty Soto
Dan Garcia	Sherry Wandrack
Edward Gray	

Combined Federal Campaign Bronze Activity Award

SSC San Diego

ORGANIZATIONAL/INDUSTRY AWARDS

Acoustical Society of America R. Bruce Lindsey Award

Dr. James Finneran, for work in bioacoustics, studying hearing capabilities of marine mammals and fish and for efforts on effects of human-generated sound on marine mammal.

Armed Forces Communications and Electronics Association, San Diego Chapter, AFCEAN of the Month

Leif Hendrickson

Human Factors and Ergonomics Society Jerome H. Ely Award

Dr. Michael Cowen, for most outstanding human factors journal article

National Defense Industrial Association Fleet Support Award

Mark Blocksom for supervision of cryptologic surveillance systems installs, particularly for designing and managing installation of joint SPAWAR/SSC San Diego Advanced Concepts Site, a 250-plus node Wide Area Network designed to accommodate coalition partners

CENTER CIVILIAN AWARDS

Lauritsen-Bennett Award

Dr. Glenn Osga for Excellence in Science as a leading Navy research scientist in human-computer interface technology with major program successes with the Navy Advanced Information Management and Evaluation System and the CNO-funded Manning Affordability Initiative/Multi-Modal Watchstation

Robert Wernli for Excellence in Engineering for development of unmanned underwater vehicles. He directed development of one of the Navy's premier undersea test facilities, which supports some of the nation's most important intelligence, surveillance, reconnaissance, and ocean systems fleet applications.

Secretarial Award

Laurie Wilcox

Team Awards

U.S. Central Command Deployable Headquarters team, which teamed with the Joint Precision Strike Office to build a deployable headquarters for the Central Command, including system architecture, shelters, communications, applications, security, system integration and test, and integrated logistics support

Les Anderson	Mark Freedman
Guy Casciola	Pho Le
Jack Chandler	Dennis Magsombol
Victor Chao	Marc Sorensen
Linda Dunham	Thomas Tiernan
William Eichelberger	Lee Zimmerman
Robert Franco	Sean Zion

Combined Operations Wide Area Network (COWAN) team. Funded by Commander-in-Chief, U.S. Forces Pacific, and Commander-in-Chief, U.S. Pacific Fleet, team developed networking services for coalition partners to communicate, collaborate, share data and receive tactical information as they deployed within U.S. Navy carrier battle groups and amphibious ready groups. After September 11, 2001, COWAN's role expanded to include direct support of Operation Enduring Freedom.

Guy Atiburrcio	James Lee
Brad Carter	Keith Monzen
Daryl Ching	Brian Myers
Kenneth Ching	Michael Nockerts
Yi Ping Deng	Roger Ogden
Gregory Hama	Doug Robert
Debora Harlor	Jim Rogers
Robert Ichiyama	Scott Simms
Mark Ignacio	Robert Stephenson
Wing Kaida	

Building 600 restoration team, which reacted quickly to a major water pipe break that flooded labs in the building, destroying power panels and transformers, communications and electrical cabling. The team handled water removal, assessed and minimized potential environmental hazards to personnel, designed and contracted for refurbishment of the spaces with minimal delays.

Sergio Alonzo	Malcolm Johnson
Joel Baumbaugh	Rick Kawachi
John Chess	Karl Maska
Sam Corrao	Tim Mayberry
Gary Curtis	Randy Peacock
Gary Douglass	Peggy Peterson
Michelle Ferro-Czech	Terry Rakestraw
Tom Gaydos	Dana Shaw
Gabe Haduch	Dave Willis
Carol Haney	Rick Wilson

Distributed Engineering Plant Network Operations Center team. Created by the Navy acquisition commands—Naval Air Systems Command, Naval Sea Systems Command, Space and Naval Warfare Systems Command—the team addressed combat and command, control, communications, computers, intelligence, surveillance and reconnaissance (C4ISR) interoperability issues, facilitating delivery of interoperable weapon and C4ISR systems to Navy battle groups and joint operations battle forces.

Kenneth Boyd	Chuck Kilgore
Sheena Brannan	Wayne Nelson
Peter Ngan	Cyril Pedrano
Sissy Gillihan	Peter Pham
Eric Godat	Liz Rothgeb
Joe Hack	Mushir Shinta
Jay Hayser	Viet Tran

Transport Test and Integration Complex Team was formed as a cooperative effort by SPAWAR and SSC San Diego as the Center's distributed engineering plant. Their mission is to use San Diego area technology resources effectively to accomplish end-to-end systems level testing prior to fielding products in the fleet.

Thomas Aird	Todd Landers
Ray Barrera	Joe Mantione
Dale Bryan	Don Milstead
Douglas Bui	Eric Otte
Paul Catano	Jeffery Quy
Steve Chance	Noemi Ramirez
George Evanoff	Margaret Robbie
George Frederick	John Schwetz
Tom Hively	Hoa Vo
Chris Horne	

U.S. Coast Guard Support team, which made major technical contributions to the two largest acquisition projects in Coast Guard history—the National Distress and Response System Modernization Program, a short-range, very high frequency communications system, and the Deepwater Capability Replacement Project, intended to replace an aging aircraft and cutter fleet and provide it an integrated C4ISR capability.

James Allen
Anastasia Dimitriu
Mary Edwards
Bernadette Gallagher
Susan Henry
Judy Huber
Paul Johnson
Bryan Kubishta
Joseph Loughlin
Larry Martin
Galard Mills
David Morin
Michael Reaves
Paul Sheets
James Tomitagawa
Thomas Utschig

Exemplary Achievement Award

Jeanne Abriel
Hana Abusalem
Alvin Agena
Janet Andersen
JoAnne Blodgett
Rolan Bloomfield
Pamela Boss
Beverly Bowen
Ed Budzyna
Rowena Carlson
Robert Castello
Jose Chavez
Daryl Ching
Mark Clawson
Robert Coffman
Eric Coolbaugh
Cathy Croswait
Gerald Cruz
Judy Cruz
James Daly
Melissa Dolan
Patsy Dworshak
Armona Farwell
Timothy Fitzgerald
JoAnn Flavin
Ray Fukumitsu
Joseph Gallagher
Ronald Gardner
Gina Goodman
Callis Goodrich
Richard Griffin
Ronald Hidinger
Justin Hodiak
Eugene Howard
James Hubin
Claudine Huggins
Terri Hupp
Grace Huynh
Susan James
Wayne Johnson
Harold Jones
Phillip Juarez
David Kellmeyer
Tomas Kelly
Aram Kevorkian
Charles Kilgore
Gary King
Jacob Langford
David Lapota
Marilyn Lasniewski
Alfredo Lopez
Mytiec Luc
Martin Machniak
Myron MacNeil
Michele Marshall
John Martin
James McGeary
Paul Meisinger
Granton Merkel
Donna Miller
Karl Moeller
Joseph Morales
Catherine Morse
Robert Mullen
Maureen Myer
James O'Neill
Paul Pakus
Wanda Parise
Jennifer Park
Sylvia Proffit
Michael Putnam
Michael Reaves
Marjorie Rezachek
Paul Rinkleib
Ken Robinson
Carl Rosengrant
Mark Roser
Westel Rowland
Mary Saavedra
Candice Saka
Jay Sakai
Alan Sandlin
Kelly Sobon
Willard Stevenson
Mona Sullivan
Grant Tanaka
Glenn Tolentino
Carol Townsend
Timothy Varhola
Stan Vermeers
Aleta Wallace
Ryan Wark
Jeffry Waters
Todd Webber
Jimmie Williams
Donna Williamson
Dean Willis
Christopher Yerkes

SSC SAN DIEGO PUBLICATION AWARDS

SSC San Diego Publication Awards for 1998-1999 were presented on 7 March 2002.

1998 Publications of the Year Recipients

CATEGORY 1 SSC San Diego Technical Reports

Parvis Soltan, Dr. Mark Lasher, Weldon Dahlke, Malvyn McDonald, Neil Acantilado, TR 1763, Revision 2, "Improved Second-Generation 3-D Volumetric Display System."

CATEGORY 2 SSC San Diego Technical Documents (Technical)

David Sailors, Amalia Barrios, Wayne Patterson, Herb Hitney TD 3033, "Advanced Propagation Model Computer Software Configuration Item Documents."

CATEGORY 5 Articles in the Open Literature

Robb Johnson, Dr. Paul de la Houssaye, Charles Chang, Pin-Fan Chen, Dr. Michael Wood, Dr. Graham Garcia, Dr. Isaac Lagnado, Peter Asbeck "Advanced Thin-Film Silicone-on-Sapphire Technology: Microwave Circuit Applications."

CATEGORY 6 Articles in Conference Proceedings

Dr. Robert Dinger, D. A. Jancic, "Development of a Shipboard High Frequency Surface Wave Radar for Anti-Ship Missile Detection."

1998 Publication Award Recipients

CATEGORY 1 SSC San Diego Technical Reports

Formal Center-approved publications presenting results of an effort taken by the Center toward an objective defined by a sponsor. SSC San Diego's most formal document.

DISTINGUISHED: Randall Brannan, Dr. Dale Barbour, Haw Jye Shyu, TR 1784, "Revised Design and Evaluation of Track-Before-Detect Processing for Acoustic Broadband Data."

EXCELLENCE: Charles Katz, TR 1768, "Seawater Polynuclear Aromatic Hydrocarbons and Copper in San Diego Bay."

MERIT: Ronald Major, Dr. John Rockway, Robert Welch, Peter Donich, TR 1770, "Link Analysis of Shipboard Satellite Communication Phased-Array Antenna."

CATEGORY 2 SSC San Diego Technical Documents (Technical)

Covers all other types of technical material that do not fall under the technical report series.

DISTINGUISHED: Andrew Estabrook, Robert MacDougall, Richard Ludwig, TD 3042, "Unmanned Air Vehicle Impact on CVX (Next Generation Aircraft Carrier) Design."

EXCELLENCE: Dr. George Benthien, Don Barach, TD 2980, "Handbook of Acoustic Projector Technology, Revision 1."

MERIT: Bart Everett, Robin Laird, Gary Gilbreath, Tracy Heath-Pastore, Rebecca Inderieden, K. Grant, D. M. Jaffee, TD 3026, "Multiple Resource Host Architecture for the Mobile Detection Assessment and Response System."

CATEGORY 3 SSC San Diego Technical Documents (Administrative)

Covers all administrative aspects of the Center's technical work.

DISTINGUISHED: Wayne Patterson, TD 3028, "Advanced Refractive Effects Prediction System, Version 1.0 User's Manual."

CATEGORY 4 Special Documents

Posters, brochures, fact sheets, and all other high-level marketing material.

DISTINGUISHED: Dr. Aram Kevorkian, SD 128, Revision 1, "On Point High Performance Computing News from SSC San Diego."

CATEGORY 5 Articles in the Open Literature

Articles appearing in academic or professional journals or scholarly books which the author intends to be an original contribution to science or technology.

DISTINGUISHED: Dr. Mark Shensa, "Quotient Coding for Fading Channels."

EXCELLENCE: J. W. C. Robinson, D. E. Asraf, Dr. Adi Bulsara, Dr. Mario Inchiosa, "Information-Theoretic Distance Measures and a Generalization of Stochastic Resonance."

MERIT: Dr. Roy Axford, Laurence Milstein, Dr. Jim Zeidler, "The Effects of Pseudo Noise Sequences on the Misconvergence of the Constant Modulus Algorithm."

CATEGORY 6 Articles in Conference Proceedings

Articles published that support an oral presentation given at a recognized conference or symposium.

DISTINGUISHED: Dominic Ciccimaro, Bart Everett, Gary Gilbreath, Theresa Tran, "An Automated Security Response Robot."

EXCELLENCE: Joe Rice, M. D. Green, S. Merriam, "Underwater Acoustic Modem Configured for Use in a Local Area Network."

MERIT: Dr. Donald Bamber, "How Probability Theory Can Help Us Design Rule-Based Systems."

1999 Publications of the Year Recipients

CATEGORY 1 SSC San Diego Technical Reports

Thomas Roy, Jill Bekkedahl, M. Hogue, Marlene Mayekawa, Stephen Hobbs, John Herman, Mike Howard, TR 1796, "Signal Processing and Data Fusion for Deployable Autonomous Distributed Systems."

CATEGORY 2 SSC San Diego Technical Documents (Technical)

Tom Tiernan, TD 3091, "Extending the Littoral Battlespace Advanced Concept Technology Demonstration, Major Systems Demonstration Number 1 Assessment Plan."

CATEGORY 5 Articles in the Open Literature

Michael Reuter, Dr. Jim Zeidler, "Nonlinear Effects in Local Monitoring System Adaptive Equalizers."

CATEGORY 6 Articles in Conference Proceedings

Dr. Frank Hanson, Erhard Schimitschek, "Relative Ladar Performance in Littoral Environments, the Case for Mid-Infrared Coherent Laser Radars."

1999 Publication Award Recipients

CATEGORY 1 SSC San Diego Technical Reports

Formal Center-approved publications presenting results of an effort taken by the Center toward an objective defined by a sponsor. This is the Center's most formal document.

DISTINGUISHED: Dr. Richard Adams, Lt. Cmdr. Peter Haglind, Lt. Cmdr. Howard Pace, Jovan Lebaric, Richard Adler, Capt. Thomas Gainor, Ah Tuan Tan, TR 1808, "Fiscal Year 1999 Wideband Antenna Feasibility Study, Man-Carried Ultrawideband Antenna System."

EXCELLENCE: Dr. Thomas E. Jones, Thomas Roy, TR 1776, "Electromagnetic Sensors for Deployable Autonomous Distributed Systems."

MERIT: Dr. Gabriel Lengua, TR 1790, "Bistatic Response of Target Highlights."

CATEGORY 2 SSC San Diego Technical Documents (Technical)

Covers all other types of technical material that do not fall under a technical report series.

DISTINGUISHED: Dr. Thinh Ho, Stephen Hart, Terry Hilsabeck, TD 3067, "Multifunctional Satellite Communications Systems, Antenna Technology Development."

CATEGORY 3 SSC San Diego Technical Documents (Administrative)

Covers all administrative aspects of the Center's technical work.

DISTINGUISHED: Thomas Hepner, TD 3070, "User's Guide for the Naval Communications Assessment Tool Software Version 2.0."

EXCELLENCE: Tom LaPuzza, Lee Hood, TD 3050, "SSC San Diego Command History, Calendar Year 1998."

MERIT: Marion McCord, TD 3075, "Department of the Navy Foreign Disclosure Decisions Data Base Procedural Guide."

CATEGORY 4 Special Documents

Posters, brochures, fact sheets, and all other high-level marketing material.

EXCELLENCE: Karen Thomas, Joyce Hameloth, Ed Alburo, SD 135, "Data Link Test Tools-Joint Interoperability Test and Evaluation."

MERIT: Lee Zimmerman, SD 134, "Information Operations Center of the Future."

CATEGORY 5 Articles in the Open Literature

Articles appearing in academic or professional journals or scholarly books that the author intends to be an original contribution to science or technology.

DISTINGUISHED: Dr. Sivaguru Sritharan, "Deterministic and Stochastic Control of Navier-Stokes Equation with Linear, Monotone, and Hyperviscosities."

EXCELLENCE: Michael Latz, Dr. Jim Rohr, "Luminescent Response of the Red Tide Dinoflagellate Lingulodinium Polyedrum to Laminar and Turbulent Flow."

MERIT: Tim Pattison, Dr. Shih Chou, "Sensitivity Analysis of Dual-Satellite Geolocation."

CATEGORY 6 Articles in Conference Proceedings

Articles published that support an oral presentation given at a recognized conference or symposium.

DISTINGUISHED: Jean-Francios Diouris, Steven McLaughlin, Dr. Jim Zeidler, "Sensitivity Analysis of the Performance of a Diversity Receiver."

EXCELLENCE: Dr. David Stein, Stephen Stewart, Dr. Gary Gilbert, Jon Schoonmaker, "Band Selection for Viewing Underwater Objects Using Hyperspectral Sensors."

MERIT: Dr. Roy Axford, Lt. Cmdr. Kevin Wilson, "Military Use of Commercial Satellite Communications: Benefits, Costs, and Challenges."

CENTER MILITARY AWARDS

Navy-Marine Corps Achievement Medal

Sonar Technician First Class (Submarine Service) Robert Dyar, USN, for service as Project Officer for High-Bandwidth Optical Cable Project

Electronics Technician First Class (Submarine Service) Brian McDonough, USN, for selection as command Sailor of the Year

Sailor of the Half Year

Aerographers Mate First Class (Aviation Antisubmarine Warfare Operator) William Crank, USN

Sailor of the Year

Electronics Technician First Class (Submarine Service) Brian McDonough, USN

Good Conduct Awards

Chief Steelworker (Diver) Michael Cordova, USN (fifth award)

Electronics Warfare Technician First Class (Steelworker) Daniel Meany, USN (fourth award)

Electronics Technician First Class (Submarine Service) Brian McDonough, USN (third award)

APPENDIX B: CY 2002 PATENT AWARDS

Inventor(s)	Title	Patent No.	Date
Ho, Thinh Q. Hart, Stephen M. Adams, Richard C.	Wideband Antenna System	6,342,866	29 Jan 02
Van Orden, Karl F. Makeig, Scott Jung, Tzyy-Ping	Eye Activity Monitor	6,346,887	12 Feb 02
Alsup, James M.	Sonar System and Method Employing a Power-Efficient Triplet-Pair Comb Waveform	6,349,073	19 Feb 02
Shimabukuro, Randy L. Russell, Stephen D. Offord, Bruce W.	Ultra-High Resolution Liquid Crystal Display on Silicon-on-Sapphire	6,365,936	2 Apr 02
Russell, Stephen D. Sexton, Douglas A. Offord, Bruce W. Imthurn, George P.	Self-Aligned MOSFET with Electrically Active Mask	6,372,592	16 Apr 02
Russell, Stephen D. Shimabukuro, Randy L.	Micro-Dynamic Optical Device	6,384,953	7 May 02
Cowen, Steven J. Kagan, Michael A.	Photo-Lithographic Mask Having Total Internal Reflective Surfaces	6,395,435	28 May 02
Cartagena, Eric N.	Complementary Vertical Bipolar Junction Transistors Fabricated of Silicon-on-Sapphire Utilizing Wide Base PNP Transistors	6,404,038	11 Jun 02
Scheps, Richard	Solid State Modulated Ultraviolet Laser	6,404,785	11 Jun 02
Boss, Pamela A. Boss, Roger D. Lieberman, Stephen H.	Metal and Glass Structure for Use in Surface Enhanced Raman Spectroscopy and Method for Fabricating Same	6,406,777	18 Jun 02
Russell, Stephen D. Winton, Michael J.	Method of Making Improved Electrical Contact to Porous Silicon Using Intercalated Conductive Materials	6,404,984	18 Jun 02
Bendall, Charles S.	Automated System for Determining Minimum Resolvable Temperature Differences	6,414,305	2 Jul 02
McKnight, William H. McGinnis, Wayne C.	Energy-Harvesting Device Using Electrostrictive Polymers	6,433,465	13 Aug 02
Scheps, Richard	Laser Communications Link	6,437,890	20 Aug 02
Adams, Richard C. Rast, Howard E.	Method for Secure Communications Using Spiral Antennas	6,448,941	10 Sep 02

Dahlke, Weldon J. Lasher, Markham E.	Sequential Color Scanner	6,456,414	24 Sep 02
Russell, Stephen D.	Acceleration Responsive Switch	6,459,055	1 Oct 02
Moose, Paul H. Geile, Michael J. North, Richard C.	Frequency/Timing Recovery Circuit for Orthogonal Frequency Division Multiplexed Signals	6,459,745	1 Oct 02
Whitesell, Eric James Scheps, Richard	Three Dimensional Volumetric Display	6,466,184	15 Oct 02
Alsup, James. M. Whitehouse, Harper J.	Power-Efficient Sonar System Employing a Waveform and Processing Method for Improved Range Resolution at High Doppler Sensitivity	6,466,515	15 Oct 02
Driggers, Ronald G. Burroughs, Jr., Ellis E. Williams, Donald N. Bendall, Charles S.	Tunable Spectral Source	6,485,150	26 Nov 02
Brock, David W.	Detector of Faulty Radar Transmit Tubes	6,489,919	3 Dec 02
Scheps, Richard Schoonmaker, Jon S.	Acousto-Optic Tunable Filter Hyperspectral Imaging System	6,490,075	3 Dec 02

APPENDIX C: CY 2002 DISTINGUISHED VISITORS

January

23 Dr. Dave Alberts
Director
Research and Strategic Planning
Office of the Assistant Secretary of Defense

30–31 Dr. Hans Binnendijk
Roosevelt Chair
Center for Technology and National Security Policy
National Defense University

February

1 Dr. Steven Mozes
Laboratory Specialist
(Laboratories and Basic Science)
Office of the Secretary of Defense

6 Captain Dan Soper, USN
Assistant Navigator of the Navy
Office of the Chief of Naval Operations

7 Captain Joseph Benkert, USN
Executive Director
CNO Executive Panel
Office of the Chief of Naval Operations

Dr. Alfred Andreassen
CNO Executive Panel Member
Office of the Chief of Naval Operations

13 Brigadier General Kevin T. Campbell, USA
Director of Plans/
Commander
U.S. Army Element
U.S. Space Command

14–15 Ms. Christine Anderson
Program Director
Military Satellite Communications Joint Program Office
Space and Missile Systems Center

19 Ms. Betsy Phillips
Professional Staff Member
Subcommittee on Defense
Committee on Appropriations
U.S. House of Representatives

20 Ms. Letitia Long
Deputy Director of Naval Intelligence
Office of the Chief of Naval Operations

Ms. Priscilla Guthrie
Deputy Chief Information Officer for C3I
Office of the Secretary of Defense

21 Rear Admiral Mark J. Edwards, USN
Commander
Cruiser-Destroyer Group Five

25 Brigadier General Walter Jones, USAF
Director
Command, Control, Communications and Computer Systems/
Chief Information Officer
U.S. Joint Forces Command

26 Brigadier General Doug Langton, USAF
Director General
Air Force Development
Canadian Forces School of Aerospace Studies

28 Rear Admiral William J. Maguire, USN
Vice Commander
Naval Supply Systems Command

March

4	Dr. Alex Levis Chief Scientist U.S. Air Force
	Rear Admiral Hamlin B. Tallent, USN Commander Carrier Group One
11	Commodore Mike Holmes, RN Chief Strategic Systems Executive Ministry of Defence, United Kingdom
13–14	Mr. Ronald L. Haas Director Office of Financial Operations Office of the Assistant Secretary of the Navy (Financial Management and Comptroller)
18	Rear Admiral Mark Edwards, USN Commander Cruiser-Destroyer Group Five
18–19	Dr. Albert E. Brandenstein Director Counterdrug Technology Assessment Center Office of National Drug Control Policy
19	Dr. Stephen Weber President San Diego State University
	Vice Admiral John B. Nathman, USN Commander Naval Air Force, U.S. Pacific Fleet
	Vice Admiral Toney Bucchi, USN Commander U.S. Third Fleet

Vice Admiral Timothy Lafleur, USN
Commander
Naval Surface Force, U.S. Pacific Fleet

Rear Admiral John B. Padgett III, USN
Commander
Submarine Force, U.S. Pacific Fleet

Rear Admiral Thomas J. Wilson III, USN
Deputy Director
Surface Warfare Division
Office of the Chief of Naval Operations

Rear Admiral Michael A. Sharp, USN
Program Executive Officer
Mine and Undersea Warfare
Naval Sea Systems Command

19 Dr. Richard Roca
Director
The Johns Hopkins University Applied Physics Laboratory

Dr. Clark Penrod
Executive Director
Applied Research Laboratory, University of Texas

19–20 Rear Admiral John Butler, USN
Deputy Commander for Undersea Technology
Naval Sea Systems Command/
Commander
Naval Undersea Warfare Center

21 Mr. Thomas Kranz
Principal Deputy General Counsel
Department of the Navy

Rear Admiral Tom S. Fellin, USN
Vice Commander
Space and Naval Warfare Systems Command

April

12 Rear Admiral Tom S. Fellin, USN
Vice Commander
Space and Naval Warfare Systems Command

15 Rear Admiral Jose L. Betancourt, USN
Commander
Navy Region Southwest

17 Honorable John J. Young, Jr.
Assistant Secretary of the Navy (Research, Development and Acquisition)

23–25 Ms. Carol Haave
Deputy Assistant Secretary of Defense
(Security and Information Operations)
Office of the Secretary of Defense

26 Dr. Linton Wells
Principal Deputy Assistant Secretary of Defense
(Command, Control, Communications and Intelligence)
Office of the Assistant Secretary of Defense

29 Rear Admiral Lui Tuck Yew, RSN
Chief of Navy
Republic of Singapore Navy

Rear Admiral Mark Edwards, USN
Commander
Cruiser-Destroyer Group Five

29–30 Dr. Ed Liszka
Chief Scientist/Research and Technology Director
Office of Naval Research

May

5	Ms. Deidre Lee Director Defense Procurement Office of the Secretary of Defense
7	Rear Admiral Tom S. Fellin, USN Vice Commander Space and Naval Warfare Systems Command
16	Dr. Ron Fuchs Panel Chairman, Prediction and Confirmation Tools Panel MR. THOMAS SAUNDERS Panel Chairman, Information Integration Panel U.S. Air Force Scientific Advisory Board
21–23	Rear Admiral Michael A. Sharp, USN Program Executive Officer Mine and Undersea Warfare
24	Lieutenant General Hu Chu-Sheng Commanding General Operations and Doctrine Development Committee Taiwan Army General Headquarters

June

12	Air Marshal Sir Jock Stirrup, RAF Deputy Chief of Defence Staff (Equipment Capability) Ministry of Defence, United Kingdom
12-13	Rear Admiral Uwe Kahre, FRG Assistant Chief of Staff Communications and Information Systems Supreme Allied Commander, Atlantic

July

30 Dr. Charles Holland
Director
Science and Technology
Information Systems
Deputy Under Secretary of Defense (Science and Technology)
Office of the Under Secretary of Defense

August

8 Ms. Mary Ellen Fraser
Senior Counsel
Subcommittee on Readiness
Committee on Armed Services
U.S. House of Representatives

Mr. Jean Reed
Professional Staff Member
U.S. House of Representatives

20 Mr. Bob Lentz
Director
Information Assurance (C^3I)
Office of the Assistant Secretary of Defense

22 Rear Admiral Thomas E. Zelibor, USN
Director
Space, Information Warfare, Command and Control
Office of the Chief of Naval Operations

26 Honorable Donald Rumsfeld
Secretary of Defense

28 Vice Admiral John Laplante, USN (Ret.)
Brigadier General Matt Broderick, USMC (Ret.)
Dr. Bill Greer
Institute for Defense Analyses Study Team

28–29 Mr. Chip Engle
Technical Director and Business Manager
Joint Warfighting Center
U.S. Joint Forces Command

September

5–6 Dr. Paris Genalis
Director
Naval Warfare (Acquisition and Technology)
Office of the Assistant Secretary of Defense

October

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

10 Honorable John J. Young, Jr.
Assistant Secretary of the Navy (Research, Development and Acquisition)

23–24 Dr. Brian Shaw
Deputy National Intelligence Officer for Science and Technology
National Intelligence Council

28 Mr. Bill Natter
Professional Staff Member
Committee on Armed Forces
U.S. House of Representatives

November

4–5 Dr. Lawrence Modisett
Chairman
Warfare Analysis and Research Department
Center for Naval Warfare Studies
U.S. Naval War College

Dr. Thomas Barnett
Professor/Senior Strategic Researcher
Warfare Analysis and Research Department
Center for Naval Warfare Studies
U.S. Naval War College

6 Dr. John Hopps
Deputy Director
Defense Research and Engineering/
Deputy Under Secretary of Defense
(Laboratories and Basic Sciences)
Office of the Deputy Under Secretary of Defense

19 Ms. Nancy Tarrant
Director
Small and Disadvantaged Business Utilization
Office of the Secretary of the Navy

December

3 Rear Admiral Paul Shebalin, USNR
Deputy Commander for Mobilization
Space and Naval Warfare Systems Command/
Deputy Commander for Mobilization
Naval Sea Systems Command

6 Representative George Miller
7th Congressional District of California
U.S. House of Representatives

9 Mr. Don Eddington
Head
Center for Joint Command and Control Capabilities
Defense Information Systems Agency

20 & 23 Rear Admiral Christopher C. Ames, USN
Director
Plans and Policy
U.S. Transportation Command

APPENDIX D: CY 2002 MAJOR CONFERENCES AND MEETINGS

February

25–28	Command Information Superiority Architectures Worldwide Conference

March

4–5	USS Nimitz Battle Group Conference
19–21	National Defense Industrial Association Joint Undersea Warfare Technology Conference
21	Commander Third Fleet Commanders' Conference
28	Counterdrug Intelligence Systems Conference

April

11	OPNET Federal Users Meeting
23–25	Contractor SAP/SAR Security Working Group Meeting
26	Border Research and Technology Center Advisory Council Meeting

May

13–14	U.S. and U.K. Submarine Communications Symposium

June

26	"Been There, Done That"—A Woman–Owned Small Business Contract Knowledge Sharing Event
26–27	U.S. Navy—U.S. Coast Guard Joint Harbor Operations Center Requirements Working Group Meeting

July

17	Naval Postgraduate School Faculty Orientation
31 July–4 Aug.	Fifth Annual International Autonomous Underwater Vehicle Competition

August

13–15	2002 Military Sensing Symposia National Symposium on Sensor and Data Fusion

September

17	Sensor Networks Special Interest Group Meeting

23 Sept.–11 Oct.	Naval Research Advisory Committee Study Panels Meeting
30 Sept.–4 Oct.	The Technical Cooperation Program (TTCP) Unmanned Autonomous Vehicles and Microsats Workshop
	The Technical Cooperation Program (TTCP) Coalition Network Systems Architecture Panel Meeting
	The Technical Cooperation Program (TTCP) Technical Panel 2, Command Information Interfaces Meeting

October

7–11	The Technical Cooperation Program (TTCP) Panel 6, Space and Unmanned Autonomous Vehicles Communications Technology Meeting
	The Technical Cooperation Program (TTCP) Technical Panel 8, Networking and Communications Technology Meeting
	The Technical Cooperation Program (TTCP) Technical Panel 11, Information Assurance and Defensive Information Warfare Meeting
23	Professional Council of Federal Scientists and Engineers Meeting

November

6	Joint Wireless Working Group Meeting
12–13	U.S./U.K. Internet Protocol Working Group Meeting
19–22	Unmanned Aerial Vehicle Communications Conference
20–21	Naval Warfare Systems Symposium

APPENDIX E: ACRONYMS

ABC2	Airborne Command and Control
ABMS	Airborne Battle Management System
ACS	Advanced Concepts Site
ACTD	Advanced Concept Technology Demonstration
AFB	Air Force Base
ALS	AWS Link-16 System
AOC	Air Operations Center
ASOC	Air Security Operations Center
ASW	Antisubmarine Warfare
ATCS	Air Traffic Control Subsystem
AWS	Arrow Weapon System
BFIR	Battle Force Interoperability Requirements
BFIT	Battle Force Interoperability Test
C^2	Command and Control
C^3	Command, Control, and Communications
C^3I	Command, Control, Communications, and Intelligence
C^4I	Command, Control, Communications, Computers, and Intelligence
C^4ISR	Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance
CCHPO	Commonwealth Center for High Performing Organizations
CD-2	Common Digitizer-2
CDNU	Control Display Navigation Unit
CECOM	Communications and Electronics Command
CENTCOM	U.S. Central Command
CFBLNet	Combined Federated Battle Laboratory Network
CIG	Corporate Initiatives Group
CINCPACFLT	Commander, Pacific Fleet
CMMI	Capability Maturity Model Integration
COMTHIRDFLT	Commander, Third Fleet
COMWIN	Combat Wear Integration

COP	Common Operational Picture
COR	Contracting Officer's Representative
COWAN	Combined Operations Wide Area Network
CSAR	Combat Search and Rescue
CSEL	Combat Survivor Evader Locator
CSS	Coastal Systems Station
CST	COP Synchronization Tools
CWAN	Coalition Wide Area Network
DCS	Direct Commercial Sales
DEP	Distributed Engineering Plant
DERIS	Domestic Emergency Response Information Service
DoD	Department of Defense
E&T	Exercise and Training
ECO	Energy Conservation Opportunity
EDS	Electronic Data Systems
ENCOMPASS	Enhanced Consequence Management Planning and Support System
EOD	Explosive Ordnance Disposal
ERP	Enterprise Resource Planning
FBE	Fleet Battle Experiment
FBE J	FBE Juliet
FCC	Fleet Command Center
FNCs	Future Naval Capabilities
FSET	Fleet Systems Engineering Team
GAO	General Accounting Office
GAPS	Ground Air Passive Surveillance
GCCS-M	Global Command and Control Systems-Maritime
GIG	Global Information Grid
GPS	Global Positioning System
GRP	Glass-Reinforced Plastic
GSA	General Services Administration
ICT	Internal Communications Team

IIWG	Improvement Integration Working Group
IT	Information Technology
IPT	Integrated Process Team
ISF	Information Strike Force
ISRC	Intelligence Surveillance and Reconnaissance Capability
JCALS	Joint Computer-Aided Acquisition and Logistics Support System
JICF	Joint Integrated Communications Facility
JMPS	Joint Mission Planning System
JTFO	Joint Task Force Olympics
JTIDS	Joint Tactical Information Distribution System
JWID	Joint Warrior Interoperability Demonstration
K-Web	Knowledge Web
MACS-2	Marine Air Control Squadron-2
MATCALS	Marine Air Traffic Control And Landing Systems
MC-02	Millennium Challenge 2002
MDSS	Medical Data Surveillance System
MEDCOM	U.S. Army Medical Command
MMS	Marine Mammal Systems
MOMAG	Mobile Mine Assembly Group
MRTS	Multiple Radar Tracking System
NAVOSH	Navy Occupational Safety and Health
NAVSEA	Naval Sea Systems Command
NAWC-AD	Naval Air Warfare Center-Aircraft Division
NOIU	Naval Inspector General Oversight Inspection Unit
NP	New Professional
NSWC	Naval Surface Warfare Center
NTCS	Naval Computers and Telecommunications Station
NTDS	Naval Tactical Data System
NUWC	Naval Undersea Warfare Center
NWDC	Navy Warfare Development Command
ONI	Office of Naval Intelligence

OTH	Over-the-Horizon
PC-IMAT	Interactive Multisensor Analysis Training, PC
PCL	Passive Coherent Location
PDS	Protected Distribution System
PR&MS	Process Review and Measurement System
RADIAC	Radiation Detection, Indication and Computation
RDT&E	Research, Development, Test and Evaluation
REDS	Real-Time Execution Decision Support
RIMPAC	Rim-of-the-Pacific
RRAM	Real-Time Residual Asset Management
RTR	Real-time Targeting and Retargeting
SATCOM	Satellite Communication
SATCOM	Satellite Communications
SDG&E	San Diego Gas and Electric
SIF	Systems Integration Facility
SIMS	Supply Inventory Management System
SOM	Sponsor-Owned Material
SPAWAR	Space and Naval Warfare Systems Command
SPI	Software Process Improvement
SS3	Systems Silent Sentry 3
SSC San Diego	Space and Naval Warfare Systems Center, San Diego
SUBTECH	Office of Submarine Technology
SW	Shallow Water
SW-CMM	Software Capability Maturity Model
TADIL	Tactical Digital Information Link
TAO	Technical Assistance Office
TAV	Total Asset Visibility
TEMMPTS	Temporal Evaluation Model for Mobile Profiled Target Sets
TOC	TADIL Operations Center
UAV	Unmanned Air Vehicle
UBS	Ultra High Frequency SATCOM Base Station

USAF	U.S. Air Force
VLA	Vertical Launch Anti-Submarine Rocket
VLANs	Virtual Local Area Networks
VSW	Very Shallow Water
VSWMCMDET	VSW Mine Countermeasures Detachment

SOURCES/NOTES

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[1] *Outlook,* "All hands invited to SSC San Diego Change of Command," 26 April 2002, Volume 25, Number 9. For additional information, see *Outlook,* "Change of Command for SSC San Diego," 10 May 2002, Volume 25, Number 10; *Outlook,* "Capt. Tim Flynn addresses all hands," 10 May 2002, Volume 25, Number 10

[2] SSC San Diego Command History Calendar Year 2001, March 2002, Technical Document 3131. SSC San Diego, CA

[3] *Outlook,* "Cmdr. Raymond Alfaro is new D90 Officer in Charge," 1 February 2002, Volume 25, Number 3

[4] *Outlook,* "2002 Technical Board evaluates Center direction," 7 June 2002, Volume 25, Number 12

[5] "FORCEnet is the operational construct and architectural framework for Naval Warfare in the Information Age which integrates warriors, sensors, networks, command and control, platforms and weapons into a networked, distributed combat system, scalable across the spectrum of conflict from seabed to space and sea to land. From "Transformation: Providing Information Technology to the Fleet," Space and Naval Warfare Systems Command presentation to MILCOM 2002, 9 October 2002

[6] *Outlook,* "Stressbusters Update," 13 September 2002, Volume 25, Number 18

[7] *Outlook,* "Stressbusters Update," 27 September 2002, Volume 25, Number 19

[8] *Outlook,* "Stressbusters Update," 11 October 2002, Volume 25, Number 20

[9] *Outlook,* "Stressbusters Update," 8 November 2002, Volume 25, Number 22

[10] *Outlook,* "Stressbusters Update," 22 November 2002, Volume 25, Number 23

[11] *Outlook,* "Stressbusters Update," 6 December 2002, Volume 25, Number 24

[12] *Outlook,* "Center to plan for C^4ISR technology development," 21 June 2002, Volume 25, Number 13

[13] Imperative teams were first organized at Tech Board in May 2001. The imperatives are a set of C^4ISR warfighting capability constants vital to military forces in achieving battlefield dominance. The seven imperatives, developed by the Corporate Initiatives Group (CIG), are focused sensing and data acquisition, dynamic interoperable connectivity, universal information access, information operations, consistent situation representation, distributed collaboration, and resource planning and management.

[14] Outlook, "Center seeks to plot C^4ISR technology future," 19 July 2002, Volume 25, Number 15

[15] *Outlook,* "Balanced Scorecard translates strategy into operational objectives," 27 September 2002, Volume 25, Number 19

[16] The Balanced Scorecard approach, developed by two business leaders and Harvard professors (Robert S. Kaplin, Professor of Leadership Development at Harvard Business School, and David P. Norton, President of Balanced Scorecard Collaborative, Incorporated) provides the framework for translating the organization's strategy into operational objectives, specifically objectives that can be measured. The Balanced Scorecard's philosophy is that "measurement motivates and communicates." Another major factor in the Balanced Scorecard is recognition of several perspectives in organizational success. Historically, a company's success or failure was seen in the "bottom line": Did we make a lot of profit? Did we make more money this year than we did last year? At SSC San Diego, it has been "How much funding was brought in?" or "How much overhead has been generated or spent?" Under the Balanced Scorecard, the financial perspective is significant but it is only one aspect that is balanced by three others: a customer perspective, an internal perspective, and a learning and growth perspective. An organization that ignores the interests of its customers and the development and appropriate employment of its personnel would not be seen as successful, even though it might reap large profits in the short term.

[17] *Outlook,* "Balanced Scorecard Mini-Tech Board held," 22 November 2002, Volume 25, Number 23

[18] *Outlook,* "Center participates in Third HPO Change Conference," 21 June 2002, Volume 25, Number 13

[19] *Outlook,* "Project Cabrillo kicks off Wave 2," 29 March 2002, Volume 25, Number 7. See also*: Outlook,* "ERP SAP R/3 system upgraded," 24 May 2002, Volume 25, Number 11

[20] *Outlook,* "Stressbusters Update," 13 September 2002, Volume 25, Number 18; *Outlook,* "Stressbusters Update," 27 September 2002, Volume 25, Number 19; also see http://www.nmci.navy.mil/

[21] SSC San Diego Command History Calendar Year 2000, May 2001, Technical Document 3119. SSC San Diego, San Diego, CA; "SSC San Diego Command History Calendar Year 2001," March 2002, Technical Document 3131. SSC San Diego, San Diego, CA

[22]*Outlook,* "More Center projects achieve SW-CMM Level 3," 9 November 2001, Volume 24, Number 23. CDNU is a project in the Global Positioning and Navigation Systems Division (Code 231). The Air Global Positioning Systems Integration Branch (Code 2311) initiated the SPI effort in 1998. The second project, JTIDS, is in the Command and Control Fleet Engineering Division (Code 264).

[23] *Outlook,* "Supply Inventory Management System implemented," 8 November 2002, Volume 25, Number 22

[24] *Outlook,* "Energy savings projects to start at SSC San Diego," 19 July 2002, Volume 25, Number 15

[25] For background, see *Outlook,* "Navy/Marine Corps Intranet is the future of our Navy forces," 12 October 2001, Volume 24, Number 21

[26] *Outlook,* "Capt. Patricia Miller holds meetings with all hands to discuss Purchase Card Program," 12 April 2002, Volume 25, Number 8

[27] *Outlook,* "Inspector General evaluates safety integration," 10 May 2002, Volume 25, Number 10

[28] *Outlook,* "Center provides Olympic gold medal support," 15 March 2002, Volume 25, Number 6

[29] *Outlook,* "Marine Mammal Program provides target mine support," 24 May 2002, Volume 25, Number 11

[30] *Outlook,* "Real-Time Execution Decision Support (REDS) project retargets tactical aircraft in flight," 1 February 2002, Volume 25, Number 3

[31] *Outlook,* "Israeli, SSC San Diego teams test AWS Link-16 system," 29 March 2002, Volume 25, Number 7

[32] *Outlook,* Navy Distributed Engineering Plant team provides fleet answers," 26 April 2002, Volume 25, Number 9

[33] The Navy Alliance is made up of surface, air, subsurface, and command, control, communication, computers, intelligence, and reconnaissance components across all U.S. Navy systems commands. The initial purpose of the Navy Alliance was to develop a proposal for the establishment and implementation of a Navy DEP.

[34] *Outlook,* "SSC San Diego participates in Fleet Battle Experiment Juliet," 21 June 2002, Volume 25, Number 13

[35] *Outlook,* "JWID '02: Harnessing the global information grid," 21 June 2002, Volume 25, Number 13

[36] For more detailed information, see *Outlook,* "SPAWAR claimancy team supports RIMPAC 02," 25 October 2002, Volume 25, Number 21

[37] *Outlook,* "Center conducts testing of VLA nose cap shells," 7 June 2002, Volume 25, Number 12

[38] *Outlook,* "Ground Air Passive Surveillance ACTD conducted," 30 August 2002, Volume 25, Number 17

[39] *Outlook,* "COMWIN project makes technical advances," 1 March 2002," Volume 25, Number 5

[40] SSC San Diego Command History Calendar Year 2001, March 2002, Technical Document 3131. SSC San Diego, San Diego, CA

[41] *Outlook,* "March 12 demonstration improves emergency communications using current technology," 12 April 2002, Volume 25, Number 8

[42] Outlook, "Base station for CSEL program completed in Italy," 2 August 2002, Volume 25, Number 16

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