JITC Provides Essential Services to the Fleet

Joint Test Command's relationship with the United States Navy spans nearly three decades

By Chris Watson

For many years, the Joint Interoperability Test Command (JITC) has directly contributed to the success of U.S. Navy fleet operations through the execution of complex test events and on-demand warfighter support efforts. From a technical standpoint, the Navy and other military services view JITC as the preeminent evaluator of systems interoperability. JITC is one of the key organizational elements of the Defense Information Systems Agency (DISA) Interoperability (IN) Directorate and serves as DISA's developmental and operational test organization. As designated by the Joint Chiefs of Staff, JITC is also the authority that certifies that Department of Defense (DoD) Information Technology (IT) and National Security Systems (NSS) meet interoperability requirements for joint military operations.

JITC facilities are strategically located at Fort Huachuca, Ariz., and Indian Head, Md. The diverse capabilities of each location allow the Services to have access to a dynamic environment for laboratory tests and on-site field evaluations. Navy organizations from coast to coast have benefited from JITC's robust test environment and continue to leverage off of their vast resources and technical expertise.

To understand JITC's current relationship with the Navy, one must revisit the history of the organization and recognize how it has evolved over the past three decades. JITC's relationship with the Navy spans back to the 1970s when the Joint Tactical Command, Control, and Communications Agency (JTC3A) Joint Interoperability Test Facility (JITF) established a partnership with the Navy Center for Tactical Systems Interoperability (NCTSI) for the interoperability testing of Tactical Digital Information Links (TADIL). In 1988, the Defense Communications Agency (DCA) absorbed the Tri-Service Tactical Communications (TRI-TAC) Joint Test Element (JTE) and the JTC3A JITF. DCA consolidated these organizations in 1989 to form the "JITC" in Fort Huachuca, Ariz. JITC's primary mission was to provide interoperability compliance testing and certification. As the designated lead for DoD Command, Control, Communications and Intelligence (C3I) support, DCA tasked JITC to perform interoperability tests of various systems including High Frequency (HF) radio systems, Military Satellite Communications (MILSATCOM) systems, and the Worldwide Military Command and Control System (WWMCCS). On June 25, 1991, DCA was renamed "DISA" to reflect its expanded role in managing the Defense Information Infrastructure (DII), now known as the Global Information Grid (GIG). As a result, JITC's responsibilities for ensuring joint interoperability of all military systems began to increase as well, causing the need for growth and expansion within the organization.

In 1993, the Naval Computer and Telecommunications Command (NCTC) proposed an initiative to transfer the functions and resources of the Naval Telecommunications Systems Integration Center (NAVTELSYSIC) to JITC. Since 1976, the NAVTELSYSIC test facility had operated in Cheltenham, Md., and was the primary site for the Quality Assurance (QA) and Functional Certification testing of all Navy-messaging systems. DISA and the Chief of Naval Operations (CNO) agreed that the transfer of NAVTELSYSIC resources to JITC would improve both agencies' ability to enhance operational fleet support. Thus, JITC's East Coast arm, known as the Washington Operations Division, was established. In 1998, the Washington Operations Division moved its facility to the Naval Surface Warfare Center (NWSC) at Indian Head, Md., where they currently reside. Today, JITC's East and West Coast divisions work closely to provide valuable test and exercise support to the Navy and the other Services. The JITC organization is currently divided into eight divisions and a liaison office, each having unique responsibilities, these are shown in the text box on the next page.

JITC's superior test methodologies and extensive expertise are shown by the many success stories reported by various Navy organizations. For example, the JITC JDEP (Joint Distributed Engineering Plant) Division's TADIL Branch at Fort Huachuca continues to work closely with NCTSI detachments in Dahlgren, Va.; Dam Neck, Va.; and San Diego, Calif., for TADIL interoperability assessments and certification. JITC uses the Joint Interoperability Evaluation System (JIES) for TADIL-A/B/J testing and the Joint Operational C4I Assessment Tool (JOCAT) for operational assessment of tactical data links. With JITC's assistance, the Navy has been able to identify and correct deficiencies pertaining to Link 11 (TADIL-A) and Link 16 (TADIL-J) data exchange with AEGIS destroyers and E-2C aircraft. The Navy has also improved interoperability between their embarked forces and key allies, through TADIL tests conducted by JITC.

The JITC Washington Operations Division also continues to be the operational tester of all Navy legacy and transitional messaging systems, both strategic and tactical. JITC has been directly involved in the testing, training, and implementation of Navy shore-based systems such as GateGuard, Personal Computer Message Terminal (PCMT), Manual Relay Center Modernization Program (MARCEMP), Multi-Level Mail Server (MMS),

Above: JITC Headquarters, Fort Huachuca, Ariz. Right: JITC Washington Operations Division, Indian Head, Md.

Nova, and the Message Conversion System (MCS). JITC's consistent performance was demonstrated during the recent implementation of the Fleet Message Exchange/Directory Update & Service Center (FMX/DUSC), the replacement for the Naval Communications Processing and Routing System (NAVCOMPARS). JITC assisted the Space and Naval Warfare Systems Command (SPAWAR) in testing, troubleshooting, and bringing online this very intricate configuration at the three Naval Computer and Telecommunications Area Master Station (NCTAMS) locations under difficult conditions. Navy fleet systems such as the Common User Digital Information Exchange System (CUDIXS), Fleet SIPRNET Messaging (FSM) system, the Naval Modular Automated Communication Systems (NAVMACS - V2, V3, V5A and Version II), the Shipboard AN/SYQ-26 (V) Single Messaging Solution (SMS), and the Submarine AN/SYQ-28 (V) SMS have also gone through rigorous test evolutions at the Indian Head facility.

In the summer of 2002, Rear Adm. Kenneth D. Slaght, Commander SPAWAR, recognized the JITC Washington Operations Division for their outstanding contributions to fleet operations. Several JITC representatives received the SPAWAR "Lightning Bolt Award of Excellence" for their support of various mission-critical systems.

JITC divisions at Indian Head and Fort Huachuca execute the developmental and operational testing of the Defense Message System (DMS) on behalf of the DISA DMS Program Management Office (PMO). The Navy is an important stakeholder in the overall DMS program and JITC works closely with selected Navy DMS operational sites for the successful collection of data during DMS OT events, leading to subsequent DMS fielding decisions. JITC is also responsible for the developmental testing of Navy-developed non-core DMS products such as the Defense Message Dissemination System (DMDS). The SPAWAR developer and PM rely heavily on JITC's test processes and results, which ensure that fully operational DMDS software iterations are distributed to the field. Additionally, JITC validates unique Navy DMS strategic and tactical configurations and provides on-site training to Navy DMS Service Provider (DSP) sites.

In the fall of 2002, the Navy Operational Test and Evaluation Force (OPTEVFOR) will

The JITC Organization

Plans, Policies and Warfighter Support Division (PPWFS) directly supports the Combatant Commanders, Services and Agencies by providing interoperability, operational and technical support during exercises, deployments and contingencies. Lead division for combined warfighting issues. Develops and executes the command's strategic plan and establishes policies for testing and interoperability certification.

Operational Test and Evaluation Division (OT&ED) provides independent operational test and evaluation (OT&E) and assessments of DISA programs to ensure that only operationally effective and suitable NSS/ITS systems are delivered to the warfighter. DISA programs include Global Command and Control System (GCCS), Defense Information System Network (DISN) and Defense Message System (DMS). Also serves as the Operational Test Agent (OTA) for the Defense Logistics Agency (DLA), Defense Finance and Accounting Service (DFAS) and High Performance Computing Modernization Program (HPCMP), among others.

JITC Washington Operations Division (JWOD) provides NSS/ITS interoperability test, evaluation and certification support with a specific focus on Department of Defense Intelligence Information Systems (DODIIS), Navy Programs, DMS, DoD Health Affairs, Logistics, Information Assurance and the Joint Warfighter Interoperability Demonstration (JWID).

Combat Support and Information Systems Division (CSISD) provides developmental and interoperability test, evaluation and certification support with a specific focus on combat support, combat service support and information systems. Conducts standards validation and conformance testing of IT systems.

Networks, Transmission and Intelligence Division (NTID) provides NSS/ITS (National Security Systems/Information Technology Systems) interoperability test, evaluation and certification support to DoD and other federal Agencies. Programs/functional areas supported include the Global Information Grid, information security, networks, transmission systems, switches, radios of all types, wireless systems; and intelligence, surveillance and reconnaissance systems. Conducts and participates in joint and combined exercises such as the DoD Interoperability Communications Exercise (DICE), the Joint User Interoperability Communications Exercise (JUICE), Combined Endeavor and CID (Coalition Interoperability Demonstration) Borealis.

Joint Distributed Engineering Plant Division (JDEPD) leads DoD planning, coordination and engineering teams developing the JDEP. Provides management and oversight of investment, coordination and general support functions. Oversees JDEP software/hardware development and maintenance. Provides JDEP capability repository, network/simulation engineering, configuration management and infrastructure scheduling. Tests, evaluates and certifies command and control, and air and missile defense systems to interoperate with other Joint systems in accordance with tactical data link standards.

Automated Systems and Test Support Division (AS&TSD) provides system engineering support in the design, development, installation, modernization and maintenance of JITC automated test and test support systems, traffic and message loading devices, and strategic and tactical equipment. Manages, operates and maintains JITC test beds, laboratories, test systems, COMSEC account and related equipment in support of NSS/ITS testing. Implements and manages network management programs for JITC. Provides logistics support for JITC.

Resource Management Division prepares and implements business, contract, and personnel policies/guidelines. Manages the command's fiscal and human resource programs.

NCR Liaison Office provides support to JITC customers based in the National Capital Region (NCR). Liaison to DISA PMs and Directorates, Joint Staff, OSD-level boards and committees, Major Range & Test Facility Base (MRTFB) activities, T&E policy working groups, tiger teams, allied interoperability groups, Combatant Command/Service/Agency activities. Represents DISA's Central Test & Evaluation Investment Program (CTEIP) projects to OSD.

JITC Advanced Technology Testbed (ATT) incorporates state-of-the-art technologies such as Video Stream and Voice-over-IP.

conduct an Operational Assessment (OA) of the Navy Marine Corps Intranet (NMCI). In conjunction with this OA, the JITC Combat Services and Information Systems Division will coordinate with OPTEVFOR to assess the joint information flow of selected Critical Joint Applications (CJA) to determine NMCI interoperability. The assessment will take place in an operational NMCI environment using JITC-developed test procedures. JITC will conduct its assessment at: Naval Air Systems Command, NAS Patuxent River, Md.; NAS Lemoore, Calif.; and Naval Air Facility Washington, Andrews Air Force Base, Md. When the assessment is completed, JITC will issue a "Status of Interoperability" letter, which will help the Navy thoroughly review their target NMCI implementation strategy and develop lessons learned.

JITC's Information Assurance (IA) team conducts code vulnerability assessments, penetration tests, commercial product testing, and security tool assessments. Testers also provide assistance during the DoD Information Technology Security Certification and Accreditation Process (DITSCAP), and the National Information Assurance Certification and Accreditation Process (NIACAP). The IA laboratory at the Indian Head facility employs four individual enclaves that are networked over a three-tier architecture. The IA lab can replicate almost any Navy operational environment, thus providing added realism when testing a system's reaction to an unauthorized intrusion. IA assessments of the Common Access Card (CAC) have been conducted relevant to the Navy's implementation of Public Key Infrastructure (PKI) tokens within the NMCI architecture.

The JITC NTID Surveillance & Reconnaissance Branch has begun to work closely with the Navy regarding developmental testing of the Navy's Vertical Takeoff and Landing Tactical Unmanned Aerial Vehicle (VTUAV). JITC became involved with this program early in the acquisition process, which will allow the Navy to mitigate much of the interoperability risks prior to future operational test events. JITC will soon work with the VTUAV Program Office to conduct interoperability assessments of the VTUAV at selected sites such as the Naval Weapons Center Detachment, China Lake, Calif. While conducting these assessments, JITC will determine the VTUAV's ability to interoperate with numerous strategic and tactical C4I systems.

To fulfill its interoperability mission, JITC has established laboratories and network connectivity to key DoD sites and employs state-of-the art technologies to replicate operational nodes. JITC's Risk Mitigation Network employs central connectivity from Fort Huachuca to Navy and other DoD sites, and provides the capability to test systems in a distributed manner with minimal impact to operational networks. The Advanced Technology Testbed (ATT), located at Indian Head, enhances JITC's current testing infrastructure. The ATT has positioned itself at the forefront of communication technology and keeps up with the latest communication innovations so JITC can mitigate the risk of introducing new technology within the DISN. The ATT includes modern communication technologies such as Gigabit Ethernet, Packet Over SONET (POS), Multi-Protocol Label Switching (MPLS), IP Telephony, Dense Wavelength Division Multiplexing and wireless LAN technology.

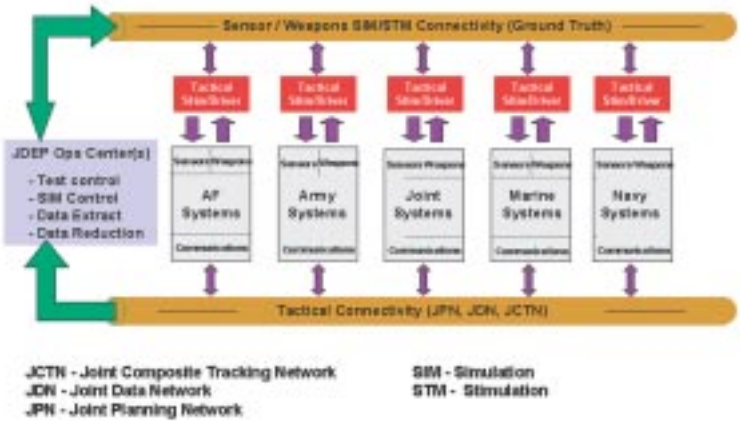
JITC observed a transformation in the IT industry that warrants changes to test methods. Because of spiral development, the timeline for bringing a product to the field has been significantly reduced, which requires the tester to become involved early in the process. This demands a testing environment that can closely emulate a production setting with development features. For these reasons, the ATT employs a multi-vendor/multi-technology layout. Connectivity to the ATT will allow the Navy to take advantage of the lab's many unique test capabilities.

In the near future, the Navy and other services will also establish connectivity via the Joint Distributed Engineering Plant (JDEP) to conduct distributed test events. To a certain extent, the JDEP program (a diagram of the JDEP architecture is shown on the next page) was initiated based on the success of the Navy's DEP. In accordance with Defense Planning Guidance, the JDEP program was established as a DoD-wide effort to link DoD and joint combat system engineering and test sites. It is designed to improve the interoperability of systems through rigorous testing and evaluation in a replicated battlefield environment. The DISA IN Directorate serves as the manager of the JDEP and oversees the execution of the program. The JITC JDEP Division serves as the JDEP Coordinator and is responsible for identifying candidate sites and federations, cataloging system and network capabilities, and defining the overall technical architecture. JDEP baseline sites include Navy activities such as NAVAIR Patuxent River, Md.; Naval Surface Warfare Center (NSWC) Dam Neck, Va.; SPAWARSYSCEN Charleston, S.C.; and SPAWARSYSCEN San Diego, Calif. JITC will work closely with these activities, as well as other DoD sites, during collaborative engineering team meetings and JDEP test events. JDEP strategies coincide with Joint Vision 2010 and 2020 initiatives. JITC is poised to support the collaborative test opportunities and interoperable environment that JDEP offers to joint warfighters.

JITC testers perform analysis of the Submarine AN/SYQ-28(V) Single Messaging Solution (SMS) and other tactical systems.

JITC is well known for the exercise and operational contingency support they provide to Combatant Commanders worldwide. JITC supports seven to nine exercises each year in support of joint and combined interoperability initiatives aug-

JDEP Joint Architecture



menting combatant commander staffs with on-site technical support. JITC has supported exercises such as Combined Endeavor, Unified Endeavor, Foal Eagle and Roving Sands, as well as operational contingencies such as Desert Storm and Operation Enduring Freedom.

The JITC NTID Networks and Integration Branch serves as the coordinator and test lead for the DICE on behalf of the Joint Forces Command (JFCOM). DICE represents a coast-to-coast joint service interoperability test that focuses on warfighting requirements. The DICE network is designed to emulate a Joint Task Force (JTF) architecture. DICE distributed tests are accomplished in phases using JITC laboratory resources, assets from active units, and other DoD test facilities. The overall purpose of DICE is to assess new/improved DoD tactical and strategic switching systems, transmission systems and terminal devices, and certify these systems for joint interoperability. Naval ships such as the USS Mount Whitney, USS George Washington and USS Nassau have been active participants in past DICE events.

The NTID Networks & Integration Branch also supports JUICE on behalf of JFCOM. JUICE allows the Services to evaluate deployable communication configurations and their interfaces to the GIG. Besides providing great training opportunities, this event affords the opportunity for the Navy and other Services to refine operational configurations, monitor the applicability of tool sets, and evaluate reporting procedures. JITC also provides 24-hour hot line support to Combatant Commanders and DoD personnel. For instance, if a Sailor needs technical assistance to restore a circuit, he/she may call **1-800-LET-JITC** to receive troubleshooting information. If the JITC technical expert cannot provide the necessary assistance over the phone, it is likely that he/she will be dispatched to the Sailor's location to resolve the problem.

JITC developed the Joint Interoperability Tool (JIT) to further assist the warfighter. The JIT is a Web-based repository of information that is available via controlled access over the NIPRNET or directly over the SIPRNET. The JIT has a powerful search engine that permits users to access test reports, interoperability certification letters, reference manuals and valuable lessons learned. The JIT is constantly updated with new information, allowing the Services to obtain vital information that is always current.

To ensure that warfighter objectives are satisfied, JITC must view its interaction with DoD services and agencies as a partnership. JITC works in tandem with some organizations by way of unspoken agreements or established written agreements. JITC recognizes the need to initiate "formal" partnerships with key Navy organizations in order to achieve joint interoperability goals.

In May 2002, JITC Commander, Col. Terry Pricer, USAF, signed a Memorandum of Agreement (MOA) with several organizations, making JITC the newest member of the Chesapeake Regional Ranges Cooperative (CRRC). As a member of the CRRC, JITC will assist the Navy and the other Services in providing a streamlined T&E process for program managers and the acquisition community in the Chesapeake region and beyond. JITC will soon collaborate with CRRC partners (NAVAIR Atlantic Test Ranges (ATR), NAVSEA Combat Direction Systems Activity (CDSA), CINCLANTFLT, Aberdeen Test Center (ATC) and Fort A.P. Hill) for cooperative testing, assistance during Joint Task Force Exercises (JTFEX), and support of programs such as the Tactical Tomahawk. This partnership will demonstrate how collaborative testing and resource sharing will enhance military readiness, reduce costs, and support the RDT&E and interoperability requirements of DoD acquisition managers.

In 2001, JITC and the SPAWAR CINC Interoperability Program Office (CIPO) began pursuing activities that would lead to closer relations with other DoD agencies responsible for joint interoperability. Both organizations determined that significant benefits could be gained by having a SPAWAR liaison on-site at JITC headquarters. In order to accomplish this, a JITC/SPAWAR CIPO Memorandum of Agreement (MOA) was staffed and signed in June 2002. It defined organizational responsibilities and established a CIPO liaison at the Fort Huachuca facility. This MOA strengthens the relationship between JITC and the Navy and encourages the sharing of information and resources. It is also seen as a way to enhance exercise coordination, offer SPAWAR direct access to the appropriate offices at JITC, provide an interface between the JITC testing community and SPAWAR Code 053, and enhance systems design prior to programmatic testing and implementation.

JITC Commander Col. Terry Pricer, USAF, (right) Capt. John Melear, USN (center) sign the JITC/SPAWAR CIPO MOA, while JITC Deputy Commander, Mr. Denis Beaugureau looks on.

Through a follow-on Memorandum of Understanding (MOU) signed in September 2002, JITC and SPAWAR officially established a partnership for facilitating DT, OT, and joint interoperability certification of the Navy's IT and NSS infrastructure. Ultimately, JITC will improve its fleet support posture and further cultivate its relationship with the Navy, as the Navy's acquisition, engineering, and operational communities fully understand and institute joint interoperability test processes, procedures and doctrine.

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