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Medical Situational Awareness in the Theater (MSAT)



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1	Executive Summary	1
2	Introduction.....	2
2.1	Background	2
3	MSAT Joint Program Office (JPO)	3
3.1	Management Plan Development.....	3
3.2	Integrated Management Group (IMG).....	3
3.2.1	IMG Off-Site Meetings and Conferences	3
3.2.1.1	MSAT ACTD Initial Planning Conference	3
3.2.1.2	MSAT Operational Requirements Conference.....	4
3.2.1.3	Pre-Solicitation Planning Conference	4
3.2.1.4	Pre-Solicitation Conference	4
3.2.1.5	MSAT Pre-Solicitation Conference Hot Wash.....	5
3.2.1.6	MSAT Modeling and Simulation (M&S) Conference	5
3.2.1.7	MSAT Early Prototype Assessment Planning Meeting.....	5
3.2.1.8	MSAT Relationship Proposal Meeting with DISA GCCS-J.....	5
3.2.1.9	MSAT Summit	6
3.3	MSAT Demonstration Activities	6
3.3.1	MSAT Early Prototype Assessment	6
3.3.2	Exercise Cobra Gold 06 (CG06)	7
3.4	MSAT Admin Support	8
3.4.1	MSAT Program Document Management.....	8
3.4.2	Collaboration Site	8
3.4.3	IMG Teleconferences.....	8
3.4.4	Audio Bridge Support.....	8
3.4.5	Video Teleconferencing (VTC) Support	8
3.4.6	Web Conferencing Support	9
3.5	JPO Meeting Support.....	9
3.5.1	“Government Only” Meetings.....	9
3.5.2	Oversight Group Meetings.....	9
3.5.2.1	December 2005 Oversight Group Meeting	9
3.5.2.2	July 06 Oversight Group Meeting	9
3.5.2.3	October 06 Oversight Group Meeting	9
3.6	Marketing and Communications.....	10
3.6.1	On-Line Publications	10
3.6.1.1	Military Medical Technology.....	10
3.6.1.2	Force Health Protection and Readiness Magazine	10
3.6.1.3	Defense AT&L Magazine	10
3.6.2	MSAT Newsletters	10
3.6.3	MSAT Original Marketing Plan.....	11
3.6.4	Strategic Communications Plan	11
3.6.5	MSAT Brochures	11
3.6.6	Poster Presentations.....	11
3.6.7	MSAT Public Website	11
3.7	MSAT Business Office Operations.....	11
3.7.1	JPO Support.....	11
3.7.1.1	Funding Profile.....	11

3.7.1.2	Contracts.....	12
3.7.1.2.1	General Purpose.....	12
3.7.1.2.2	Business Operations.....	13
3.7.1.3	Other Finance Mechanisms	13
3.7.2	MSAT Development.....	13
3.7.3	Transition Activity Funding.....	14
4	Technical Management	14
4.1	Technical Evaluation and Procurement	14
4.1.1	Request for Information (RFI) and Pre-Solicitation Activities	14
4.1.2	Technical Evaluation Demonstration Preparation Activities	14
4.1.2.1	Early Prototype Assessment.....	14
4.1.2.2	MSE Development Activities Leading-Up to Field Trial #1	15
4.1.2.2.1	Medical Situational Awareness Lab (MSAL).....	15
4.1.2.2.2	Funding Plan Revision.....	15
4.1.2.3	Execution of Field Trial # 1 at CG06	15
4.1.3	Ongoing Assessments and Evaluations	16
4.1.3.1	Potential ACTD Partners.....	16
4.1.3.1.1	Epidemic Outbreak Surveillance (EOS).....	16
4.1.3.1.2	Actionable Situational Awareness Pull (ASAP)	16
4.1.3.1.3	Advanced Battlefield Awareness (ABA)	16
4.1.3.1.4	Joint Blue Force Situational Awareness (JBFSa)	16
4.1.3.1.5	Coalition Secure Management and Operations System (COSMOS).....	17
4.1.3.2	Potential Government Partners.....	17
4.1.3.2.1	Joint Program Executive Office for Chemical and Biological Defense, Joint Program Manager, Information Systems (JPM-IS):.....	17
4.1.3.2.2	Armed Forces Medical Intelligence Center (AFMIC).....	17
4.1.3.2.3	PEO Command, Control, Communications-Tactical (PEO C3T)	17
4.1.3.2.4	Telemedicine and Advanced Technology Research Center (TATRC)	18
4.1.3.2.5	US Army Center for Health Promotion and Preventive Medicine (CHPPM)	18
4.1.3.3	Applications & Hardware Reviewed.....	18
4.1.3.3.1	CBRN Capabilities.....	18
4.1.3.3.2	Data Mining Tools.....	19
4.1.3.3.3	Handheld Devices.....	20
4.1.3.3.4	Command and Control Capabilities	20
4.1.3.3.5	Collaboration Tools	22
4.1.3.3.6	Logistics Tools	23
4.1.3.3.7	Intelligence Tools	23
4.2	Technical Development Activities	24
4.2.1	Highlights of Development.....	24
4.2.2	Early Prototype Selection.....	24
4.2.3	Standards Based Design	25
4.2.4	Use of Commercial/Government Off-the-Shelf Technologies.....	25

4.2.5	Spatial Decision Support (DS) Development.....	26
4.3	Plan of Action for USAMRMC Technical Close-Out Activities.....	26
4.3.1	Transfer Baseline to a Designated POR.....	26
4.3.2	Transfer Residuals to DHSD	27
4.4	Other Technical Manager Activities	28
4.4.1	Oversight Responsibilities	28
4.4.1.1	System Development and Integration Integrated Product Team... ..	28
4.4.1.2	Naval Health Research Center (NHRC) Lead Investigator.....	28
4.4.2	Briefings, Meetings, and Conferences	28
4.4.2.1	TRICARE Conference 05.....	28
4.4.2.2	DUSD AS&C Staff Brief	28
4.4.2.3	Deputy Assistant Secretary of the Army Brief (ESOH)	29
4.4.2.4	Future Ground Forces Conference	29
4.4.2.5	PEO Command, Control, Communications-Tactical (C3T).....	29
4.4.2.6	8 th Force Health Protection (FHP) Conference.....	29
4.4.2.7	ACTD Manager's Conference	29
4.4.2.8	COCOM Surgeons' Conference 05	29
4.4.2.9	Joint Staff COP Working Group.....	29
4.4.2.10	Briefing to the Air Force Surgeon General	30
4.4.2.11	Intelligence Functional Work Group	30
4.4.2.12	Marine Forces Pacific (MARFORPAC) Brief	30
4.4.2.13	COCOM Surgeons' Conference 06	30
4.4.2.14	9 th Force Health Protection (FHP) Conference.....	30
4.4.2.15	USNORTHCOM/FHP-Medical Homeland Defense WG.....	30
5	MSAT TM Transition/Close-out Activities	30
6	References.....	33
6.1	MSAT Implementation Directive, January 05.....	33
6.2	MSAT Management Plan, September 05	33
6.3	USAMEDDBD System Assessment Report, 18 July 06.....	33
6.4	Interim Military Utility Assessment, 30 September 06	33
6.5	NHRC Lead Investigator Annual Report, September 06	33
6.6	Grid Requirements	33
6.7	Requirements Conference Report	33
7	Acronyms and Abbreviations	35
	Figure 1: Fiscal Performance Profile.....	12
	Figure 2: Executing Activity Support Contracts	12
	Figure 3: Non-Labor & Operational Travel	13
	Figure 4: MSAT Development Expenses	14

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1 Executive Summary

This report documents the successful execution of the United States Army Medical Research and Materiel Command (USAMRMC) responsibilities as Executing Activity for the Medical Situational Awareness in the Theater (MSAT) Advanced Concept Technology Demonstration (ACTD). The MSAT Implementation Directive (ID) (January 05) directed, “...*The Commanding General, United States Army Medical Research and Materiel Command (USAMRMC) will be the Executing Agent and will appoint and provide oversight to the Technical Manager (TM). USAMRMC will establish a Joint Program Office (JPO) to manage and administer the accountabilities of this ACTD...*” Under USAMRMC leadership, the JPO and TM responsibilities have been executed to the standards of Department of Defense (DOD) acquisition and ethical regulations and guidance. This report includes all USAMRMC actions through 31 December 06 and serves as a close-out document of the Command’s TM responsibilities. In response to a decrement in funding, the MSAT Oversight Group (OSG) in October 06 assigned TM responsibilities to the Theater Medical Information Program (TMIP) and JPO management to the MSAT Operational Manager (OM). While no longer providing technical management, USAMRMC will continue to support the effort by managing a portion of project funds and contract support.

Under USAMRMC leadership, the first MSAT developmental spiral produced a highly successful prototype that was evaluated during the United States Pacific Command (USPACOM) Exercise Cobra Gold 06 (CG06). The US I Corps Surgeon, acting as the CG06 Combined Joint Task Force (CJTF) Deputy Surgeon, stated, “...*For a first fielding of this emerging technology, MSAT was a home run...*” Additionally, as noted in the Interim Military Utility Assessment (IMUA) conducted by USPACOM, “...*MSAT has the potential to provide the combatant commander, JTF surgeons, and other operational headquarters with a medical COP that is not available to the domains used by the warfighting counterparts. As such, MSAT has a high degree of military utility.*”

The JPO and TM contributed to this success by managing numerous activities including the following:

- The JPO led a public Request for Information (RFI) for candidate technologies providing data analysis, knowledge management, and innovative graphical user interfaces (GUIs) in support of MSAT. Information gathered during the RFI process and a subsequent Pre-Solicitation Conference was used to identify potential capabilities and contract developers for further assessment.
- The JPO led the identification of technical requirements.
- The TM prepared the MSAT system architecture to guide the integrator and application developers while providing engineering oversight for the total effort.
- The JPO developed a comprehensive Actionable Knowledge Medical Situational Awareness Concept document to help define the goals and objectives of the ACTD.
- The TM delivered the MSAT software baseline and documentation to the Program of Record (TMIP), and installed a working MSAT prototype in the Deployment Health Support Directorate (DHSD) Sensitive Compartmented Information Facility (SCIF).

2 Introduction

The 5 January 05 Medical Situational Awareness in the Theater (MSAT) Advanced Concept Technology Demonstration (ACTD) Implementation Directive (ID) (reference 6.1), provided the following guidance: *The Commanding General, United States Army Medical Research and Materiel Command (USAMRMC) will be the Executing Agent and will appoint and provide oversight to the Technical Manager (TM). USAMRMC will establish a Joint Program Office (JPO) to manage and administer the accountabilities of this ACTD.* In response to this guidance, USAMRMC assigned a TM and established a JPO at Fort Detrick, Maryland. The TM assumed fiduciary and technical responsibility for the program and immediately began concept development activities. A contracting and execution strategy was then defined leading to system development activities for the first spiral prototype. An Operational Test and Evaluation (OT&E) System Assessment including a passive assessment of the system security posture (reference 6.3), and an Interim Military Utility Assessment (IMUA) (reference 6.4) followed the initial development activities. All three activities validated the TM's approach to the design and execution of the first spiral.

After the completion of spiral #1 activities, major changes were made to the program. Based on verbal direction from the MSAT Oversight Group (OSG) on 26 October 06, the Program Manager (PM) of the Theater Medical Information Program (TMIP) will be assuming the TM role for the MSAT ACTD. This report details the activities completed by USAMRMC as the Executing Activity. It also acts as a close-out report detailing the successful completion of TM responsibilities through 31 December 06. It describes the activities performed by the JPO and the TM that led to a successful demonstration of the first prototype of a Medical Situational Enhancement (MSE) capability. Prototype #1 has set the stage for future success. The final task completed by the JPO was the successful delivery and installation of a working prototype in the Deployment Health Support Directorate (DHSD) [Office of the Deputy Assistant Secretary of Defense (DASD) for Force Health Protection and Readiness (FHP&R)] Sensitive Compartmented Information Facility (SCIF) in December 06. The user evaluations, demonstrations, feedback from field units, the IMUA, and the successful transition of the MSE to DHSD indicate that USAMRMC has fulfilled its responsibilities as described in the ID.

2.1 Background

MSAT was not conceived as a traditional medical system. It was developed as more of a Command and Control (C2) function to link the medical domain with other external communities of interest (COI). As such, the MSAT JPO chose to develop the tool as an approved pathway to the Global Combat Support System (GCSS), Global Command and Control System-Joint (GCCS-J), and to the emerging Net-Enabled Command Capability (NECC). This methodology allowed for available medically relevant information to be accessed and displayed on the C2 decision maker's platform on demand.

The MSAT ACTD was also designed to create capability that would not duplicate existing or developing electronic systems or applications. Instead, it obtained data from authoritative sources, fused the data, applied advanced analytics/decision support tools to the data, and displayed the results using a Geographic Information System (GIS) display. This approach has been particularly challenging since few medical systems and

applications relevant to this capability were available for use in a theater environment. In fact, most required MSAT data elements, such as detailed information on a deployed Population at Risk (PAR), are not captured electronically. Lacking reliable data sources, MSAT was nevertheless able to display the potential of its design. Theater business practices and technologies must mature to exploit the full range of MSAT capabilities. In spite of this limitation, the MSAT project has managed to succeed and stimulate exciting changes in theater level business processes. Using the limited existing data sources and capabilities, in less than nine months the TM guided the design and fielding of a prototype to a successful operational test in Exercise Cobra Gold 06 (CG06). Initial feedback from operational users and observers (e.g., I Corps Surgeon; J3 MARFORPAC; 30th Medical Brigade, Multi National Corps-Iraq (MNC-Iraq) was positive. The concept has been so well received, other stakeholders, including industry, the Joint Staff (J4), and the Defense Information Systems Agency (DISA), have joined the MSAT ACTD effort.

3 MSAT Joint Program Office (JPO)

The MSAT JPO was chartered under the authority of the Executing Activity in accordance with the MSAT ID. It was created to plan and execute the day-to-day activities of the MSAT ACTD. The TM was responsible for the JPO. The JPO was responsible for ensuring all MSAT objectives were met within cost, schedule, and performance parameters associated with the ACTD.

3.1 Management Plan Development

The MSAT ID mandated the development of a MSAT Management Plan (MP) within 120 days. The MP (reference 6.2) was tailored to meet the needs of the ACTD at the executive level and was considered the principal management tool for the program. It provided sufficient detailed objectives, approach, critical events, participants, schedule, funding, and transition objectives to achieve understanding and agreement by all relevant parties. The JPO developed and released the MP for staffing before the deadline, a critical milestone for assuring continued funding support for the ACTD.

3.2 Integrated Management Group (IMG)

The Integrated Management Group (IMG) was created to fulfill the role of an Integrating Integrated Product Team (IIPT) mandated by the ID. The TM as the JPO Manager led the IMG to develop strategies for acquisition and contracts, cost estimates, training, evaluation of alternatives, logistics management, cost-performance trade-offs, etc. The IMG included the government leaders for each of the offices identified in the MP. Representatives from the Deputy Under Secretary of Defense (DUSD) for Advanced Systems & Concepts (AS&C), DASD (FHP&R), Joint Information Operations Center (JIOC), and other agencies were also included as appropriate to facilitate the work of the IMG.

3.2.1 IMG Off-Site Meetings and Conferences

3.2.1.1 MSAT ACTD Initial Planning Conference

On 1-2 February 05, the MSAT ACTD JPO Initial Planning Conference was held at the Naval Base Point Loma, Sub Base Combined Bachelor Housing Facility. The conference focused on the following activities:

- Determine roles and missions of the JPO
- Establish requirements for the US Pacific Command (USPACOM) ACTD conference in March 05
- Develop the MSAT Acquisition Strategy
- Review and discuss the Implementation Directive
- Assign JPO responsibilities for developing the MSAT MP to satisfy the 120 day requirement

3.2.1.2 MSAT Operational Requirements Conference

On 15-17 March 05, USPACOM (J07) hosted an MSAT Operational Requirements Conference at the Navy Lodge on Ford Island, Pearl Harbor, Hawaii. The conference was designed as a facilitated workgroup. Representatives from the potential user community were invited to participate in mission analysis and the requirements generation process. To support the effort, the IMG developed a preliminary set of missions from the MSAT ID and other baseline documents. These missions were used to represent the critical functions of the MSAT decision support tool. Using each mission as a starting point, the IMG conducted an analysis that expanded each mission into functional requirements (also referred to as measures of effectiveness [MOEs]) and technical requirements (also referred to as measures of performance [MOPs]). The conference concluded with a briefing to the DASD (FHP&R) and the USPACOM Surgeon. The four missions revised by the work groups were reviewed along with two new ones. The work groups identified 26 functional requirements and 170 technical requirements.

3.2.1.3 Pre-Solicitation Planning Conference

The MSAT ACTD JPO/IMG Pre-Solicitation Planning Conference was held in San Diego, California on 12-13 April 05. Day 1 was held at the Space and Naval Warfare (SPAWAR) Systems Center San Diego, Building 33 where the MSAT JPO received a series of briefings from Government Systems/Applications representatives. The briefings were designed to provide members of the JPO an awareness of Government-owned systems/applications considered as potential candidates for inclusion in the MSAT ACTD. Day 2 meetings were held at the Humphrey's Half Moon Inn and Suites in San Diego and focused on preparations for the Pre-Solicitation Conference and additional development of the MSAT acquisition strategy.

3.2.1.4 Pre-Solicitation Conference

A Request for Information (RFI) on technologies and approaches relevant to MSAT was published through SPAWAR e-Commerce on 1 April 05. Twenty-nine (29) entities submitted written responses to the RFI. A Pre-Solicitation Conference was convened at the Office of the Deputy Assistant Secretary of Defense (ODASD) FHP&R in Falls Church, VA 14 -16 June 05. The conference included a presentation from each respondent consisting of a 15 minute brief with a ten minute question and answer period. Six government MSAT representatives reviewed the written submittals and attended the presentations. After the conference, all submissions were grouped into one of the

following categories: 1) Integrator only, 2) Integrator/vendor with product(s), 3) Vendor with product(s).

3.2.1.5 MSAT Pre-Solicitation Conference Hot Wash

As a follow-up to the Pre-Solicitation Conference, the MSAT Lead Investigator (LI) hosted a “hot wash” workshop in San Diego 21-22 June 05 to analyze all the information submitted and to prepare for potential solicitation. During this conference, JIOC staff assessed the systems vulnerability included in each submission. IMG Lead participants rated each of the 29 submissions on a scale of 1->7 (Poorest->Best) and a mean (average) score for each submission calculated. Eleven submissions scored an average of 5 (“good”) or higher. Eleven others scored less than 3 and the remaining seven averaged between three and five. High-ranking submissions included four graphical user interfaces (GUIs), five data analysis /knowledge management applications, three decision support tools, and three “others.” Pre-solicitation activities allowed the TM to identify existing applications and systems to include in immediate development of the prototype #1 application. After the final evaluation, the IMG determined that all technology required for the first MSAT prototype was available through Government sources. The RFI process was closed and vendors were notified that no government Request for Proposal (RFP) would be needed.

3.2.1.6 MSAT Modeling and Simulation (M&S) Conference

On 19-21 July 05, MSAT held a Modeling and Simulation (M&S) Conference hosted by the LI at the Naval Health Research Center (NHRC), San Diego. The conference provided a forum to review a variety of M&S tools/capabilities that might benefit MSAT for exercise development and test and evaluation purposes. Three tools were scheduled for presentation and consideration: Joint Medical Semi-Automated Forces (JMEDSAF), Joint Deployment Logistics Model (JDLM), and the Altarum Casualty Prediction Model (CPM). There was also a demonstration of NHRC technologies such as the Navy/Marine Corps Combat Trauma Registry. This conference led to the selection of JMEDSAF and CPM as M&S tools to be used for Prototype #1 evaluation purposes.

3.2.1.7 MSAT Early Prototype Assessment Planning Meeting

An MSAT ACTD IMG meeting was held on 27 thru 29 September 05. The meeting was sponsored by the LI and took place in conference facilities at the Combined Bachelor Housing facility at the Naval Submarine Base at Point Loma. The IMG met to prepare for the first ACTD demonstration scheduled for the week of 14 November 05 in Hawaii. There were four objectives for this meeting:

- Address a “go/no-go” decision for the November demonstration.
- Develop a detailed demonstration schedule and Concept of Operations (CONOPS).
- Develop a task list and milestones for activities leading up to the demonstration.
- Develop a description of the MSAT “tool” and a general roadmap ahead, to include an evaluation during CG06.

3.2.1.8 MSAT Relationship Proposal Meeting with DISA GCCS-J

On 22 December 05, the TM met with representatives from DISA GCCS, DISA GCSS, and the Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics (AT&L) to discuss establishing a relationship with GCCS-J. The TM provided an MSAT capabilities brief and outlined the potential synergy between MSAT and the GCCS family of systems. The following feedback was provided by the group:

- The GCCS-J Office was no longer accepting new ACTDs for transition into GCCS.
- The GCCS program was to end around Fiscal Year (FY) 08 or FY09. Joint Command and Control (JC2) (now NECC) will transition from GCCS.
- MSAT should immediately begin to develop to JC2 (NECC) standards.

The group also discussed the advantages and disadvantages of “thick” vs. “thin” client. Although the original MSAT architecture took advantage of the existing thick client capabilities found in the GCCS environment, a thin client approach was recommended by the group for the first field trial. In retrospect, observations from the first field trial confirmed the TM’s original plan to adhere to the current standards and to gradually mature with the entire enterprise was a good decision. During Field Trial #1 (Cobra Gold), the GCCS 4.x thin client capability lacked much of the desirable “look and feel” of its thick client predecessor. The thin client configuration also lacked some important functions, especially in the limited mapping capabilities present in the Commercial/Joint Mapping Toolkit (C/JMTK).

3.2.1.9 MSAT Summit

On 18-20 September 06, the MSAT IMG sponsored a summit to re-focus the project as a result of a severe decrement in funding support and changes in oversight participants. The summit was held to achieve stakeholder consensus on a new MSAT vision, focused requirements, and an action plan. Thirty-four participants attended, representing DISA, GCSS, Joint Staff J4, USPACOM, USAMRMC, ODASD (FHP&R), DUSD (AS&C), Defense Threat Reduction Agency (DTRA), TMIP, Program Executive Office (PEO)-Joint Medical Information Systems, the US Army Medical Department Board (USAMEDDBD), the Joint Medical Logistics Functional Development Center (JMLFDC), Armed Forces Medical Intelligence Center (AFMIC), and the Offices of the Army and Air Force Surgeons General. Key leaders provided guidance, and briefings on GCSS, Joint Medical Work Station (JMeWS), Theater Medical Data Store (TMDS), the Joint Medical Asset Repository (JMAR), the Joint Patient Tracking Application (JPTA), and AFMIC. USPACOM, as the MSAT operational sponsor, led a discussion of focused requirements for the re-scoped project in the context of a vignette requiring contingency planning during execution of a humanitarian assistance mission.

3.3 MSAT Demonstration Activities

3.3.1 MSAT Early Prototype Assessment

On 16 November 05, an early prototype demonstration was presented in conjunction with the USPACOM sponsored Pandemic Influenza (PI) Tabletop Exercise on Ford Island, Pearl Harbor, HI. An assessment of the demonstration documented feedback from Subject Matter Experts on current capabilities provided by the MSE application. A chemical, biological, radiological, and nuclear (CBRN) warning capability was also

demonstrated during the assessment. The warning consisted of a Joint Warning and Reporting Network (JWARN) alert with the MSE showing the track of a plume on a map.

On 17 November 05, the DASD FHP&R and the USPACOM Surgeon met with members of the IMG and other interested parties to provide feedback on the demonstration. This forum was also used to help answer questions and to determine the way ahead for MSAT leading up to the first field trial.

3.3.2 Exercise Cobra Gold 06 (CG06)

MSAT provided medical situational awareness support to the Combined Joint Task Force (CJTF) for the CG06 Command Post Exercise (CPX) in Thailand, 17-24 May 06. The exercise served as the first operational test of the ACTD's prototype MSE geospatial medical display and was considered to be Field Trial #1. Headquarters (HQ), US I Corps, Fort Lewis, WA, served as the US CJTF component. The CPX scenario included peace enforcement operations (PEO) in the simulated oceanic continent of "Pacifica." The PEO preceded a consequence management operation featuring an influenza outbreak among displaced persons and coalition forces. MSAT supported the CJTF staff in accomplishing at least 33 discrete tasks from the CPX Master Scenario Event List (MSEL). These tasks included identification, geolocation, and description of coalition medical capabilities and readiness in the context of the exercise common operating picture; assessment of relevant environmental health threats and medical intelligence; assessment of disease and injury trends among coalition forces and displaced persons; and monitoring individual patients as they were moved through the simulated coalition health service support system.

Medical situational awareness was provided remotely to forces in Thailand via the USPACOM Coalition Wide-Area Network (COWAN) operating from the USPACOM Gaming and Simulation Facility, Camp Smith, Oahu, HI. Technical support for the MSE included casualty and medical facility statuses provided in a web-services relationship with JMeWS which received data generated by the JMEDSAF simulator. Other data sources used by the MSE included operational track data from the Joint Theater Level Simulation (JTLS), C/JMTK, meteorological forecast information from GCCS-Maritime, and unclassified medical intelligence products from AFMIC via a Non-Secure Internet Protocol Router Network (NIPRNET) Web-services interface. Additional decision support tools provided by the MSE included the Centers for Disease Control and Prevention (CDC) FluSurge logistics model and a rudimentary clinical algorithm to assess indications for human-to-human transmission of avian influenza. A System Assessment Report (reference 6.3) of the MSE prototype was prepared by the USAMEDDBD as the operational test agency and reflected a generally positive user response to the MSE application. Additionally, at the end of the exercise the I Corps Surgeon provided a very positive assessment of the MSAT support for the CPX. Results from this event and from the November Early Prototype Assessment were used by the Operational Manager (OM) to develop an IMUA.

The original plan for supporting this exercise called for participation in the CPX and the Field Training Exercise (FTX). Severe funding shortfalls leading up to the exercise forced the JPO to withdraw plans to support the FTX as planned. Instead, MSAT

provided a NIPRNET link to the AFMIC website to allow the FTX user to access medical intelligence products.

3.4 MSAT Admin Support

3.4.1 MSAT Program Document Management

Early in the planning of the ACTD, the JPO recognized the need for complete documentation of all JPO activities. In many cases, the JPO documented non-JPO functions as well to ensure that important milestones, conferences, and activities were recorded. JPO support included the following:

- Prepared and delivered periodic reports to the OSG and other reviewing authorities
- Maintained MSAT historical documentation
- Documented several meetings with DISA, Joint Staff, and other external organizations
- Developed and updated MSAT program documents (e.g., Management plan, Integrated Master Schedule, graphical CONOPS, and the Actionable Knowledge Medical Situational Awareness Concept document)
- Reviewed and commented on all documents pertaining to MSAT prior to final release
- Prepared USAMRMC Annual Report submissions
- Reviewed and commented on various proposals, CONOPS, and Initial/Joint Capabilities Documents
- Maintained funds control documentation and provided monthly status reports

3.4.2 Collaboration Site

The JPO established an MSAT Collaboration Site through which IMG members could share documents and other information. The site is hosted by DHSD, but maintained by the MSAT JPO. All approved documents generated in support of the MSAT ACTD are included. The password protected site is <https://fhp.osd.mil/msat/external/login.jsp> and can be accessed with proper authorization from the IMG.

3.4.3 IMG Teleconferences

The IMG established a weekly teleconference (TELCON) as the primary means of communication and collaboration in the program. The JPO was responsible for the management and execution of these weekly meetings. An agenda was released in advance of each TELCON. Minutes were compiled and when approved, they were converted to Adobe PDF. They were then uploaded to the MSAT Collaboration Site. A list of all tasks identified during the meetings was also created and maintained on the collaboration site. Through 31 December 06, the JPO led and documented twenty-six TELCONS in 2005 and thirty-one in 2006.

3.4.4 Audio Bridge Support

The JPO also provided support on demand in establishing routine and un-planned TELCON support.

3.4.5 Video Teleconferencing (VTC) Support

VTC conferencing capabilities were managed by the JPO as required.

3.4.6 Web Conferencing Support

The JPO used the online conferencing capabilities of WebEx™ for working with developers, IMG members, and external customers. Web conferences were established by the JPO as required. The JPO used this method of communication to save travel costs and time during development.

3.5 JPO Meeting Support

3.5.1 “Government Only” Meetings

In addition to IMG TELCONS and other group meetings, the JPO was also responsible for coordinating a number of “government only” meetings.

3.5.2 Oversight Group Meetings

3.5.2.1 December 2005 Oversight Group Meeting

OASD Health Affairs (HA) hosted the first OSG meeting at DHSD in Falls Church, VA on 14 December 05. The purpose of this meeting was to identify and resolve management issues and provide overall direction to the project. The group discussed the progress of acquisition activities, requirements refinement, concept of operations development, and the plan to transition MSAT to a program of record.

3.5.2.2 July 06 Oversight Group Meeting

A special OSG meeting was held on 31 July 06 to present a plan to re-scope the MSAT ACTD in response to loss of programmed funding. The Deputy Director for Strategic Logistics, Joint Staff, J4 presented a decision brief to the Joint Staff Surgeon and to Dr. Charles Perkins, DUDSD AS&C. He recommended continuation of the MSAT project as an element of GCSS. The proposal significantly decreased the programmed level of effort and changed the management structure by:

- Transferring Lead Agent responsibilities to DISA
- Adding DISA as co-TM with lead development responsibilities
- Moving LI responsibilities to the JPO and deleting the LI
- Adding the Joint Staff J4 as co-sponsor
- Installing the Joint Interoperability Test Command (JITC) as the Operational Test Agency (OTA) lead, with USAMEDDBD providing support
- Adding DISA as co-Transition Manager (XM).
- Establishing PM, GCSS as the Program of Record (POR).

After the brief, there were several unanswered questions which precluded a final decision. The OSG directed these issues be resolved and discussed at a subsequent meeting.

3.5.2.3 October 06 Oversight Group Meeting

The OSG met for the third time on 26 October 06. Many of the issues discussed in July remained unresolved. Mr. Chuck Riechers, Chief of Operations/Technical Advisor,

OUSD (AT&L) represented AS&C. At the July meeting, a co-TM relationship (between DISA and USAMRMC) had been briefed. Mr. Riechers felt that AS&C would not support a co-TM relationship. Based on that guidance and the overall plan for DISA to assume technical development, it was clear that the USAMRMC role as TM was no longer required. The group agreed DISA would assume responsibility for future MSAT technical development as the TM. Others tasks included:

- OM to identify three candidate data sources for additional evaluation and to establish a workgroup(s) to work on functional requirements.
- Mr. Goodell to update the ID. The new ID should include a clause that stipulates termination of the project if expected congressional funding is not provided (e.g., if the congressional funding is not available as planned for FY08, the ACTD will wrap-up/conclude in FY07).
- Joint Staff (J4) to provide the Assistant Deputy Under Secretary of Defense (ADUSD) AS&C ACTD Resource Manager (Mr. Trey Carson) with specific FY07 congressional funding language.
- Determine a better cost estimate for up to two additional developmental spirals by reducing the gap between high and low estimations. Need more specifics tied to the costs.

Note: Since the October 06 OSG meeting, the PM, TMIP has been designated as the TM for future MSAT development.

3.6 Marketing and Communications

The JPO actively pursued a marketing and communications campaign to promote awareness of the MSAT project and its goals and objectives. The campaign was designed to enhance relations with a broad array of potential MSAT stakeholders and used a variety of formats and media.

3.6.1 On-Line Publications

3.6.1.1 Military Medical Technology

The TM published an article titled *Actionable Medical Knowledge* in the 11 Dec 05 issue (Volume: 9 Issue: 8).

3.6.1.2 Force Health Protection and Readiness Magazine

The DHSD-designated MSAT JPO Public Affairs representative published an article titled *MSAT Will Help Commanders See Epidemics Coming* in the Fall 06, Vol.1, No. 1 issue.

3.6.1.3 Defense AT&L Magazine

In coordination with the DHSD-designated MSAT JPO Public Affairs representative, the May – June 06 issue included an article titled *Medical Situational Awareness Advanced Concept Technology Demonstration Leading the Acquisition Culture Change*.

3.6.2 MSAT Newsletters

The JPO developed a series of three Newsletters for general distribution. These publications were made to provide timely MSAT ACTD updates.

3.6.3 MSAT Original Marketing Plan

The JPO released a baseline communications plan on 2 May 05. The plan was targeted at defining the goals, strategies, and key messages to deliver to multiple audiences.

3.6.4 Strategic Communications Plan

The Strategic Communications Plan was developed as a blueprint to reach out to target audiences for information and collaborative opportunities. It was meant to proactively communicate the purpose, goals, and progress of the MSAT development in order to educate and influence the targeted audience.

3.6.5 MSAT Brochures

The JPO has used brochures and Tri-fold pamphlets as a means to provide focused information about the program. These items have been distributed in multiple venues to help create an awareness of the program.

3.6.6 Poster Presentations

The JPO utilized a variety of visual communication displays as a means to educate the public. These posters were used during demonstrations, briefings, and as static displays.

3.6.7 MSAT Public Website

In coordination with DHSD, the JPO established a public web presence to provide interested parties with information about the project. The site is available at <https://fhp.osd.mil/msat/index.jsp>.

3.7 MSAT Business Office Operations

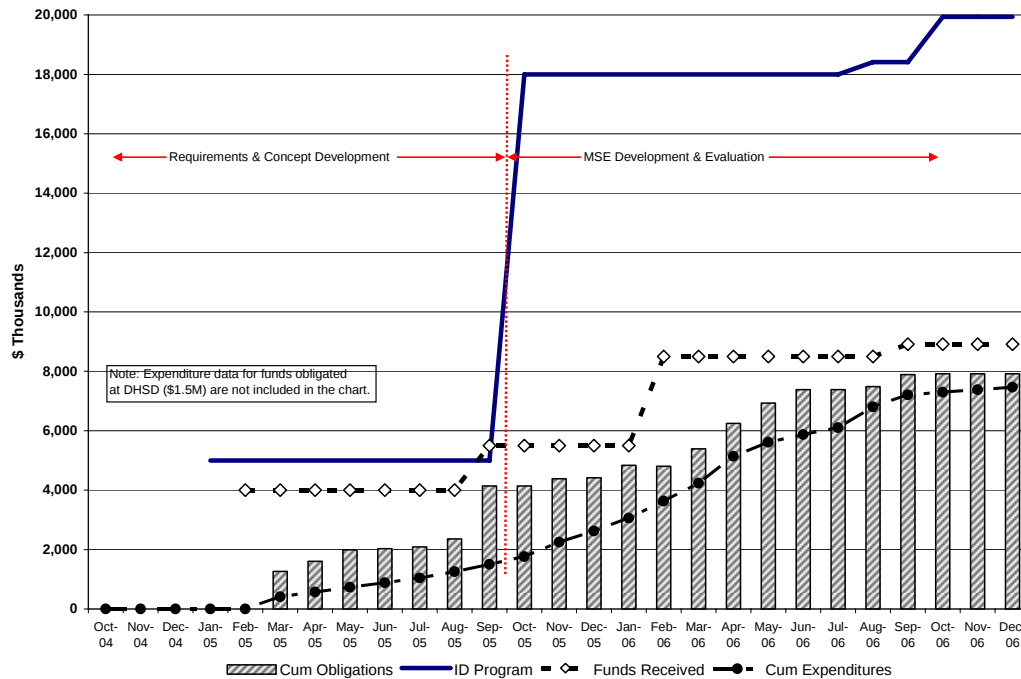
3.7.1 JPO Support

Beginning in June 04 the USAMRMC directed efforts toward establishing a JPO to provide support staff for each of the MSAT major participants. The Principal Assistant for Acquisition, USAMRMC developed draft statements of work (SOW) for two contract efforts (see figure 2). The larger of the two was envisioned as a general purpose workforce to support Technical Manager planning and execution functions. These functions included transition management activities as well as providing support for the Operational Manager's performance and requirements development functions, including operational testing and evaluation. A smaller effort was created to provide business operations support independent of the major support contractor. Both SOWs were awarded as competitive actions by the U.S. Army Medical Research Acquisition Activity (USAMRAA) at Fort Detrick, MD.

3.7.1.1 Funding Profile

Figure 1 illustrates the fiscal performance profile of the project. Project funds were received in the 4th or 5th month of each FY. In FY06, only \$3M of the \$13M originally programmed for MSAT were received. Subsequently, as indicated by the difference between funds received and funds obligated, the TM elected to conserve program dollars to retain the ability to swiftly react to new opportunities.

Figure 1: Fiscal Performance Profile



Expenditures tracked closely to obligations. The small rise in funds received at the end of FY05 reflected an Executive Agent (EA) action using unprogrammed, “end of year” O&M funds to prepare the EA’s computing facility for anticipated MSAT products.

3.7.1.2 Contracts

The JPO was responsible for two support contracts as shown in figure 2.

	<i>FY05</i>	<i>FY06</i>
<i>Akimeka</i>	\$1,482,060	\$954,300
<i>Anteon</i>	\$326,612	\$345,947

Figure 2: Executing Activity Support Contract Obligations

3.7.1.2.1 General Purpose

The general purpose effort, titled the MSAT Support Contract, was awarded to Akimeka, LLC, in December 04, effective 1 January 05. The contract, valued at \$7,813,258, was a base year valued at \$1,370,061, with 4 option years valued at \$1,641,784, \$1,707,455, \$1,695,406, and 1,006,052, respectively for a total of 33.83 full time equivalents.

Functions included in the award were systems engineering, operations manager support, technical manager support, and information operations support, test and evaluation

support, occupational/environmental health systems subject matter expertise, and transition manager support at Camp H.M. Smith, HI, Fort Detrick, MD, and Fort Sam Houston, TX. Akimeka also sub-contracted with the Altarum Institute to modify and deliver an infectious disease model to be used with simulation software in the MSE Early Prototype Assessment during the USPACOM November Tabletop (section 3.3.1).

3.7.1.2.2 Business Operations

A business operations effort, titled the MSAT JPO Support Contract, was awarded to the Anteon Corporation in March 05, effective 14 March 05. The contract, valued at \$1,760,211, was a base year valued at \$326,856, with 4 option years valued at \$386,720, \$401,389, \$409,634 and \$236,613, respectively. Functions included in the award were business operations, logistics management, and administrative. The contract was modified in September 05 to replace the logistics support function with a requirement for systems architecture/engineering function, with an increase in total value of \$205,661. This contract was also used to support the MSAT Summit held 18-20 September 06 in Frederick, MD as described in section 3.2.1.9. The cost for the summit was \$15,107.

3.7.1.3 Other Finance Mechanisms

Figure 3 displays non-labor and government travel operational support for the OM functions at USPACOM. This includes execution of the Requirements Conference, the MSE Early Prototype Assessment and OTA functions at the USAMEDDBD which were all provided thru Military Interdepartmental Purchase Requests (MIPR). Computer and communications support for OM operations at Camp H. M. Smith were provided through a MIPR issued to the Navy Marine Corps Intranet (NMCI) Field Support Activity. NHRC performed as the LI. They were responsible for developing technology concept papers and investigating novel technologies for demonstration in the MSE. This effort was funded by MIPR issued by the JPO. Functions included in the LI performance were engineering, technical liaison, and administrative.

	<i>FY05</i>	<i>FY06</i>
<i>USPACOM</i>	\$41,100	\$9,500
<i>USAMEDDBD</i>	\$14,430	
<i>NMCI</i>	\$14,853	\$8,940
<i>NHRC</i>	\$557,000	

Figure 3: Non-Labor & Operational Travel

3.7.2 MSAT Development

Development of the MSE was accomplished through a MIPR to an existing contract awarded by Naval Undersea Warfare Center (NUWC) - Newport to Anteon Corporation. The contract provided for the development, testing and demonstration of medical situational awareness capabilities derived from the Navy Integrated Tactical Environmental Subsystem (NITES) (PMW 180) capabilities. The JPO also issued a

MIPR to SPAWAR to modify existing JMEDSAF simulation software to support exercise and evaluation of the MSE capabilities. Finally, a separate MIPR was issued to PMW 180 to provide space and support in the Fleet Meteorological Advanced Concepts Laboratory (FMACL) for operation of the MSE servers during demonstrations. See figure 4 for a break-down of costs associated with each of the efforts.

	<i>FY05</i>	<i>FY06</i>
<i>NUWC</i>	\$904,451	\$768,167
<i>SPAWAR (JMEDSAF)</i>	\$137,752	\$69,999
<i>SPAWAR (FMACL)</i>	\$25,000	

Figure 4: MSAT Development Expenses

3.7.3 Transition Activity Funding

In November 06, the JPO provided \$470,000 to the Defense Intelligence Agency for application to a contract on behalf of the Director, DHSD to support close-out activities associated with installation of the MSAT MSE in the DHSD facility. Specific activities included in the SOW are identified in paragraph 4.3.2.

4 Technical Management

4.1 Technical Evaluation and Procurement

4.1.1 Request for Information (RFI) and Pre-Solicitation Activities

ACTDs emphasize integration of mature or emerging technology(s) into fieldable prototypes. The MSAT ID and MP reflected this concept by mandating the evaluation and use of existing technologies. The TM was responsible for identifying mature and/or emerging technologies for integration into the overall system design. An evaluation process was developed early in the program to evaluate commercial “off the shelf” (COTS) and government “off the shelf” (GOTS) products. An RFI was generated to find competitive and innovative contractors with experience in the development, maintenance, integration, test & evaluation, training and exercise support of large-scale Department of Defense (DOD) C2 and medical informatics programs. The plan was to use this information to refine the acquisition strategy for the program. The RFI launched the pre-solicitation process to determine candidate systems and vendors for inclusion in the ACTD. The evaluation process succeeded in identifying several existing technologies available to MSAT through the use of current DOD contracts, which reduced costs and shortened the time required for development of a fieldable MSAT prototype. Section 3.2.1.4 provides more detail on the RFI and pre-solicitation activities.

4.1.2 Technical Evaluation Demonstration Preparation Activities

4.1.2.1 Early Prototype Assessment

As discussed in section 3.3.1, an early prototype assessment was conducted in conjunction with the USPACOM PI Tabletop Exercise. This demonstration provided the TM with valuable feedback from potential user stakeholders that helped refine the scope

of future development. The TM worked closely with the IMG, senior leadership, and the contract developer to prepare for this event. Although the TM recognized the eventual need to develop thin client architecture, for this event the existing GCCS thick client architecture was used to expedite the demonstration. This early prototype was developed in compliance with GCCS 3.x standards that allowed access to GCCS-Maritime meteorological and oceanographic (METOC) data, WEBCOP, and the Joint Mapping Toolkit. Using the current GCCS configuration as the standard for MSAT mitigated risk for the project. Cost, schedule, and performance was thus optimized and the JPO was able to demonstrate capability for user input during the PI Tabletop exercise. Subsequent development utilized GCCS 4.x thin client architecture.

4.1.2.2 MSE Development Activities Leading-Up to Field Trial #1

4.1.2.2.1 Medical Situational Awareness Lab (MSAL)

The JPO recognized the need to establish a functioning instance of the MSE for development, evaluation, training and demonstration purposes. As described in 3.7.2 the FMACL at the Naval Air Station (NAS) North Island, San Diego, CA was selected to host the MSAL. Several alternatives were evaluated, but the capabilities of the FMACL, including access to Secret Internet Protocol Router Network (SIPRNET) to assess operational needs, and excellent on-site staff support, favored its use. Cost, schedule, and performance benefits were quickly realized by using this facility. This capability was instrumental in the preparation activities leading up to the successful demonstration during CG06.

4.1.2.2.2 Funding Plan Revision

The development strategy through Field Trial #1 was executed despite significant challenges. In both FYs no funding was available until middle of the 2nd quarter, and only 23% of programmed FY06 funding was provided. In response to funding constraints in FY06, on 16 March 06 a revised MSAT execution plan was launched. With concurrence of USPACOM, ODUSD (AS&C) and ODASD (FHP&R):

- All work supporting exploration, analysis, and development of MSAT capabilities beyond spiral #1 (CG06 support) was suspended.
- MSAT support for the CG06 FTX was curtailed.
- Contractor support for CG06 CPX was reduced.
- The contractor was funded to complete development and deliver MSE spiral #1 as a prototype to the Government by July 06.

Beginning 1 April 06 the JPO began to reduce staffing, curtail travel, and cease some spiral #1 support activities.

4.1.2.3 Execution of Field Trial # 1 at CG06

Field Trial #1 integrated MSAT technologies into a full capabilities package for military operations. The CG06 CPX (see section 3.3.2) took place 17 – 24 May 06 and provided realistic USPACOM contingency scenarios for peace enforcement operations and consequence management. This provided the CJTF Surgeon with a near real-time view of the medical operational environment and a much needed decision support capability.

It also provided the Surgeon with the ability to participate in the CPX, along with his combat and combat support counterparts.

4.1.3 Ongoing Assessments and Evaluations

Since MSAT was being developed in spirals, the TM was responsible for continuing to pursue potential partners, applications, and data sources. The TM and JPO representatives evaluated multiple technical proposals and a variety of other potential communities of interest and ACTD partners after the initial pre-solicitation process. The following is a partial list of evaluations performed by the Technical Management team.

4.1.3.1 Potential ACTD Partners

The JPO recognized the challenges of establishing a relationship with other ongoing research and development efforts. Because of limited time allotted to development in any ACTD, it was difficult to find another ACTD of sufficient maturity to support a productive partnership. The TM evaluation of each potential ACTD partner included a rapid assessment of the program's technical and schedule maturity as well as an evaluation of its chances to transition successfully into a POR. The ACTDs listed below were assessed by the JPO with input from the IMG.

4.1.3.1.1 Epidemic Outbreak Surveillance (EOS)

EOS is a FY05 ACTD designed to rapidly detect and identify a wide range of pathogens, whether naturally occurring or the result of hostile action. JPO staff attended several meetings and briefings about this ACTD and supported a review of the EOS CONOPS. Based on discussions by the IMG, clinical diagnosis information produced through EOS may be of use to MSAT.

4.1.3.1.2 Actionable Situational Awareness Pull (ASAP)

ASAP is a FY05 ACTD. It is an intelligence situational awareness program designed to develop, integrate, demonstrate and transition software that provides a "Smart Pull" capability to the tactical, operational and / or strategic user on the Global Information Grid (GIG) for accessing critical situation awareness information resident on distributed databases. ASAP is still under development and was determined to be a potential partner in a later spiral or after transition to a POR.

4.1.3.1.3 Advanced Battlefield Awareness (ABA)

ABA was a FY01 ACTD to demonstrate the potential of the GCCS Common Operational Picture (COP) to provide relevant information to support Combatant Command (COCOM); Joint Task Force (JTF); and Component-level situational awareness, decision making, execution, and planning for future military operations. The JPO conferred with the DISA ABA representative who stated that all fielded ABA capabilities would be available through GCCS. The DISA representative urged MSAT to present the medical GCCS requirements to the Joint COP Working Group.

4.1.3.1.4 Joint Blue Force Situational Awareness (JBFSa)

Joint Blue Force Situational Awareness (JBFSa) is a continuation of a FY03 ACTD developed to provide software interfaces and connectivity, which enable integration of existing and emerging Blue Force Tracking (BFT) Systems via the GCCS COP. JBFSa

was designed to provide improved situational awareness, tracking, tagging, locating, and logistics and asset management information to the Joint Force Commander's COP. The JPO determined that the MSAT focus on BFT through GCCS was sufficient for early development activities. As JBFSA is included in the GCCS Family-of-System, MSAT should benefit from its capabilities.

4.1.3.1.5 Coalition Secure Management and Operations System (COSMOS)

The FY05 COSMOS ACTD was evaluated at the request of the Operational Manager to determine its potential value to MSAT. COSMOS uses the International C2 & Modeling and Simulation architecture. It is compliant with GCCS and ultimately NECC. The JPO had identified COSMOS as a system of particular interest because of the MSAT requirement to provide support in a coalition environment. The COSMOS data model was also valued. The Command and Control Information Exchange Data Model (C2IEDM) is the product of 15 years of NATO effort to define a common data model to exchange information specifically for land warfare. It was designed to provide a common lexicon/taxonomy so that each data element or word conveys the same meaning to all countries and systems that subscribe to the model. This standardization will be critically important for eventual deployment of MSAT in a coalition environment.

4.1.3.2 Potential Government Partners

4.1.3.2.1 Joint Program Executive Office for Chemical and Biological Defense, Joint Program Manager, Information Systems (JPM-IS):

The CBRN information system programs have an interoperability requirement to work with the Medical Community of Interest. JPM-IS is responsible for the CBRN systems mentioned below (JWARN, JOEF, and JEM). The JPO determined JPM-IS was an important partner for future refinements of the MSAT prototype. However, several unresolved issues precluded MSAT involvement. The Medical and CBRN domains must develop mutual Information Exchange Requirements and achieve a greater degree of technical standardization between domains (e.g., data models and schemas).

4.1.3.2.2 Armed Forces Medical Intelligence Center (AFMIC)

AFMIC is one of the primary sources for military medical intelligence data. Data "products" are typically provided as Extensible Markup Language (XML) or Portable Document Format (PDF) documents. In support of CG06 the MSE provided a simple keyword search capability and an accompanying user interface to allow users to query locally stored AFMIC product metadata. Using the Uniform Resource Locators (URLs) returned in the search results, the MSE then retrieved the AFMIC article products in the form of Hypertext Markup Language (HTML) pages and stored them locally for faster future retrieval.

After CG06, the MSAT JPO anticipated additional collaboration to leverage AFMIC's plan to implement a map-based "search & retrieve" capability for published analysis products on the SIPRNET.

4.1.3.2.3 PEO Command, Control, Communications-Tactical (PEO C3T)

The Army PEO for Command, Control, and Communications-Tactical (PEO C3T) mission is to rapidly develop, field, and support leading edge, survivable, secure and

interoperable tactical, theater and strategic command and control and communications systems. PEO C3T was determined to be of value as a data source for MSAT at the tactical level. Because initial (spiral #1) MSAT efforts focused at the Joint Task Force level or higher, collaboration with this program was deferred.

4.1.3.2.4 Telemedicine and Advanced Technology Research Center (TATRC)

TATRC (USAMRMC) manages Congressional Special Interest extramural research programs encompassing technology research areas. In a typical year, TATRC manages approximately 25 programs totaling over \$100 million in appropriations. The programs are awarded via extramural contracts and cooperative agreements. Several of the ongoing programs are of potential interest to the MSAT JPO.

4.1.3.2.5 US Army Center for Health Promotion and Preventive Medicine (CHPPM)

CHPPM was determined to have the potential to provide the MSE with a number of services and applications that could be delivered via a web interface. This interface with CHPPM was mature and ready to technically interface with the spiral #1 MSE; however, there was no functional requirement for CHPPM data into the CG06 CPX exercise play. Additionally, limitations with the COWAN rendered the interface with CHPPM irrelevant to CG06. The JPO determined the interface with CHPPM was a parallel spiral to be reviewed by the System Design and Integration Integrated Product Team (SDIPT) (see 4.4.1.1. below) for later fielding, but the work was discontinued when project funding was curtailed.

4.1.3.3 Applications & Hardware Reviewed

4.1.3.3.1 CBRN Capabilities

- **Argus:** Managed by the Imaging Science and Information System (ISIS) Center, Georgetown University. It integrates multiple disparate unclassified data sources for the development of a unique early warning system for foreign biological catastrophic events that threaten homeland security. The JPO determined that ARGUS merited additional investigation as an enhancement to prototype #1.
- **Intelesense:** TATRC is working in conjunction with Intelesense Technologies on a project involving a dedicated data acquisition platform, forming a real-time distributed mesh network, connecting through the Internet to a server where many other data sources are integrated and analyzed. The product of this analysis is then viewable from anywhere via a secure GIS-based 3D visualizer/website. Intelesense is currently involved in projects that range from environmental monitoring, to the tracking of infectious diseases, to bringing wireless communication to remote areas. This technology is deployed on three continents and several Pacific islands. Since the MSAT ID and MP call for the evaluation and exploitation of sensor and point-of-use data capture technologies, the Intelesense capability was considered a potential data source for MSAT.
- **Joint Warning and Reporting Network (JWARN):** Provides the operational capability to employ CBRN warning technology (by monitoring the information flow of all networked CBRN sensors within the designated joint operations area to collect, report, identify, locate, and disseminate information on CBRN, environmental, and

toxic industrial materials (TIM) hazards. JWARN was identified as a MSAT area of interest and was scheduled to be evaluated during spiral #2.

- **Joint Operational Effects Federation (JOEF):** Provides automated decision support tools to enable the Joint Force Commander to more effectively and efficiently assess risk and allocate scarce resources in preparation for and during current operations involving CBRN and TIM hazards. From an MSAT perspective, JOEF would feed JWARN and JWARN would be the data source of interest.
- **Joint Effects Model (JEM):** Provides plume data through JWARN. The plume data is of interest to MSAT. It could be plotted on the MSAT geo-spatial medical display and used to determine potential exposures. This would provide a medical view of the operational situation. The actual data feed required would most likely be JWARN as the feeder system for MSAT. More research with the CBRN community is necessary to determine if data sharing directly with JEM is required.
- **NBC Casualty and Resource Estimation Support Tool (NBC CREST):** NBC CREST is a medical NBC casualty and resource estimation support tool. It provides military and civilian medical planners with information that estimates time-phased casualties resulting from a Weapons of Mass Destruction (WMD) attack. The software application determines day-to-day medical resources required to treat the resulting patient stream and evaluates the capacity of medical treatment facilities. The software also analyzes Courses of Action (COAs) to optimize mission readiness. The JPO reviewed this application and determined that the tool was a viable candidate for further evaluation.
- **DOD Global Emerging Infections Surveillance & Response System (GEIS):** GEIS is a collection of links to surveillance activities and articles on infectious diseases. No dynamic interchange of data could be performed that would fit the MSAT schedule. Based on the limited value of linking to activities and articles, The JPO determined GEIS was not a viable data source. The follow-on to MSAT may need to re-evaluate GEIS if their capabilities mature sufficiently.

4.1.3.3.2 Data Mining Tools

- **VisuaLinks:** A platform-independent, graphical analysis tool used to discover patterns, trends, associations and hidden networks in any number and type of data sources. It presents data graphically uncovering underlying relationships and patterns. The SDIIPT evaluated this product and determined that it would not meet evolving MSAT architectural standards since it is based on a client-server architecture.
- **Web-enabled Temporal Analysis System (WebTAS):** A generic software toolset that supports fusion of large amounts of disparate data sets, visualization, project organization and management, pattern analysis and activity prediction, and various presentation aids. The WebTAS program is managed by the Air Force Research Lab in Rome, NY. The SDIIPT evaluated WebTAS and determined that the flexible architecture exploits multiple data sources and provides data mining tools that facilitate trend and pattern analysis. This type of capability fits within the MSAT concept. However, further evaluation was postponed due to a lack of funding.

4.1.3.3.3 Handheld Devices

- **Field Medical Companion (FMC):** The FMC was evaluated as a data entry tool for MSAT use during CG06. When the MSAT portion of the FTX was cancelled, all evaluation of data entry tools ceased.
- **Battlefield Medical Information System-Joint (BMIS-J):** BMIS-J is a TMIP product and was originally evaluated as a point-of-care device in support of MSAT data collection for the FTX planned for CG06. The FTX included a Humanitarian Assistance operation which was to use the BMIS-J capabilities to provide patient encounter data for use by the MSE. This option was not pursued further since lack of funding prevented MSAT from participating in the FTX.
- **Battlefield Medical Information System-Telemedicine (BMIS-T):** BMIS handheld capabilities were reviewed again after the September 06 MSAT Summit. On this occasion the JPO evaluated the TATRC BMIS-T product which was considered a research and development effort. The JPO reviewed this product in the process of exploring new capabilities for improved situational awareness (SA). BMIS-T potential utility included:
 - The demonstration of military utility of Global Positioning System (GPS) technologies in support of medical operations. Initial focus was on Environmental Hazards and Medical Civic Action Program (MEDCAP) reports.
 - Enhanced Disease Control Mapping & Analysis
 - Disease Surveillance Prediction and Alerts
- **Trimble GeoXH:** The GeoXH is a GIS data collection handheld unit that was compatible with BMIS-T software. It was evaluated as a potential new capability for improved SA as mentioned above.
- **IKE 304:** This is a ruggedized, hand-held device for collecting geospatial data with digital instrumentation. It was designed to seamlessly integrate and synchronize a GPS, laser distance meter, digital camera, compass, inclinometer, GIS, and personal digital assistant (PDA) computer. The IKE 304 was another tool evaluated as a potential new capability.

4.1.3.3.4 Command and Control Capabilities

4.1.3.3.4.1 Blue Force Tracking Capabilities

- **Force XXI Battle Command, Brigade and Below System (FBCB2):** FBCB2 is a digital, Battle Command Information system that provides on-the-move, real-time and near-real-time battle command information to tactical combat, combat support and combat service support leaders and soldiers. It is a PEO C3T program. The JPO determined that in the future, this information should be accessible through GCSS. Because of this and because MSAT is currently focused on levels at the JTF and above, additional collaboration with FBCB2 was deferred.
- **Talon Reach:** Talon Reach is an umbrella project to exploit Iridium Satellite LLC unique global 24/7 capabilities for tactical use. It is a tracking device attached to surface logistics movements to provide real time location and cargo manifest data.

Talon Reach is one of several mechanisms used by GCCS to ingest BFT data. Talon Reach was evaluated for MSAT use during the FTX at CG06. The evaluation ended when funding constraints curtailed MSAT participation in the FTX.

- **GCCS-J 4.0.2 Track Management:** GCCS-J will ultimately receive all BFT data in a theater of operations. For MSAT prototype purposes, the JPO decided to concentrate on the track data provided by GCCS. During CG06, the MSE GCCS Track Management Server received operational track data from JTLS to simulate a feed from GCCS. This approach allowed MSAT to demonstrate the first time use of medically relevant BFT.

4.1.3.3.4.2 Geospatial/Mapping Toolkits

- **Joint Mapping Toolkit (JMTK):** JMTK was developed by the National Geospatial-Intelligence Agency (NGA) to satisfy the Services' common Mapping, Charting, Geodesy, and Imagery requirements. JMTK was used in early versions of GCCS and was developed as a thick client application. The MSE used the GCCS thick client environment/products (including JMTK) for the November 05 MSAT demonstration then rapidly transitioned to a GCCS 4.x thin client environment for CG06.
- **Commercial/Joint Mapping Toolkit (C/JMTK):** C/JMTK is a standardized, commercial, comprehensive toolkit of software components for the management, analysis, and visualization of map and map-related information. C/JMTK is based on a single scalable open architecture with open development environments that incorporates industry standards. It is a thin client application that replaced JMTK. It includes the following Environmental Systems Research Institute (ESRI) products:
 - ArcGIS Engine – Provides a standard framework for developing standalone GIS applications.
 - ArcSDE - Stores NGA map products in a relational database (ORACLE 10G).
 - ArcIMS - A map server that serves map products from ArcSDE

The MSE used C/JMTK in Prototype #1 as part of the transition to a thin client environment. Lessons learned from the IMUA at CG06 indicated that the new thin client C/JMTK was not as robust as its thick client counterpart (JMTK). The users described a loss of features as the main reason for their dissatisfaction. For instance, the capability to display a plume as demonstrated during the early prototype assessment was lost. This loss did not affect the MSAT assessment during CG06 since CBRN was not included in the exercise scenario. The limitations of C/JMTK should be resolved as it matures as a part of GCCS.

4.1.3.3.4.3 Geographic Information Systems (GIS)

- **ArcGIS:** ArcGIS is an ESRI product and is included in C/JMTK. It is an integrated collection of GIS software products for building a complete GIS. ArcGIS enables users to deploy GIS functionality wherever it is needed—in desktops, servers, or custom applications; over the Web; or in the field. MSAT chose to use ArcGIS for Prototype #1 because it is included in C/JMTK which is the current standard for DOD. MSAT compatibility with ESRI GIS is important since these capabilities are integral to GCCS for theater applications.

- **World Wind:** Among MSAT requirements is the ability to interface with non-DOD entities in certain circumstances. For instance, to support United States Northern Command (USNORTHCOM) missions during a domestic crisis, the MSE would have to be accessible to authorized personnel outside the Defense Information Systems Network. The MSE would also require data from authoritative non-DOD sources. Besides these communications-related challenges, maps currently available through GCCS have limited capabilities. GCCS focuses on theater operations and is not well suited for USNORTHCOM settings and scenarios. World Wind is an open source 3D interactive world viewer. It was created by NASA's Learning Technologies project. It is now developed by NASA staff and open source community developers. This product permits “zoom” capabilities from satellite altitude to surface level. It leverages Landsat satellite imagery and Shuttle Radar Topography Mission data.

4.1.3.3.5 Collaboration Tools

The OM/User Sponsor identified a number of collaboration tool requirements for MSAT to support. Several products (listed below) were evaluated. Based on evaluations of many existing products and in compliance with DOD standardization mandates, the JPO determined that there was no valid requirement to procure or develop a MSAT- or medical-specific collaboration tool. MSAT should be able to use whatever standardized collaboration tools are selected by DOD. Future MSAT development efforts should look towards using the collaboration tools provided as a core service of Net-Centric Enterprise Services (NCES).

- **Lightweight Collaborative Whiteboard (LCW):** During the evaluation period, LCW was being used in the ABA ACTD. United States European Command (USEUCOM) endorsed this Mitre-developed capability and it was presented as a candidate for inclusion as part of GCCS. The evaluation showed LCW has the capability to transition from GCCS to JC2 and will most likely be compatible with NECC. LCW displays dynamic geospatial information and the common operational picture in the USEUCOM Collaborative Information Environment. It is Web Services enabled.
- **Info Work Station (IWS):** IWS is a USPACOM initiative that is already underway. It has been extended to other COCOMs as part of an on-going evaluation.
- **Defense Collaboration Tool Suite (DCTS)** – DCTS is a flexible, integrated set of applications providing interoperable, synchronous and asynchronous collaboration capability to DOD agencies, Combatant Commands, and military services. The DCTS program identifies, fields, and sustains a dynamic set of evolving standard collaboration tools that bridge between DOD and the Intelligence Community. The JPO evaluation concluded DCTS can be bandwidth intensive and the tools are not all interoperable “out of the box.” DCTS is already available in USPACOM today as are other competing collaboration capabilities. If DCTS becomes a standard tool for DOD, MSAT could then look at leveraging its capabilities within the MSE.
- **Groove Workspace:** Included in a DOD GEIS-sponsored proposal for FY05 to address the collaborative communication needs of the DOD Preventive Medicine Community. Groove includes, but is not limited to, public and private chat areas,

discussion groups, file cabinets for document storage, collaborative document editing (including Word and PowerPoint), structured meeting management, and customizable forms with database integration (such as would be useful for outbreak investigation surveys).

- **Turbo Planner:** Provides a web-browser-based tool planners use to collaboratively develop adaptive plans and their prerequisite documents; e.g. COCOM's Strategic Concept, Identification of Force Requirements, Planning Directives, Time-Phased Force Deployment Data (TPFDD) Letters of Instruction, etc. The documents that are prerequisites for the plan are also prerequisites for developing the TPFDD. The JPO met with Turbo Planner representatives (DISA and developer) to determine the maturity and potential for use in developing a solution to the crisis planning requirement identified by USPACOM. However, Turbo Planner does not link to the Joint Operation Planning and Execution System (JOPES) planning tools found in GCCS. Turbo Planner does extract some JOPES text which reduces time and effort in plan coordination, but it doesn't get information from the Global Status of Resources and Training System (GSORTS), the Geographic Location (GEOLOC) file, the Type Unit Characteristics File (TUCHA) file or the Type Unit Equipment Detail (TUDET) file.
- **Virtual Agility Work Center:** An on-line demo was presented to the MSAT IMG. Work Center is an enterprise focused, COTS based, Java 2 Platform Enterprise Edition (J2EE) open standard residing on a LINUX operating system.
 - Designed to pull existing tools and applications into a common workspace for collaborative business process development. As such those tools must be in place throughout the enterprise.

4.1.3.3.6 Logistics Tools

- **Joint Medical Asset Repository (JMAR):** JMAR was evaluated by the JPO as a potential data source for logistics since it is the single source system for providing medical total asset visibility under the Joint Total Asset Visibility (JTAV) Program. At the time of review, there were very limited capabilities available for theater. The JMAR Program Manager indicated JMAR would not be ready for collaboration with MSAT in time for CG06, so potential collaboration with MSAT was deferred. Since the Integrated Data Environment-Asset Visibility (IDE-AV) will replace JTAV, JMAR may also change; however a mature IDE-AV may become the authoritative medical logistics data source.

4.1.3.3.7 Intelligence Tools

- **All Source Analysis System (ASAS)-Light:** Members of the JPO met with the Product Director, Systems Product Manager (PdM) Intelligence Fusion and received a brief on the ASAS-Light capability. ASAS-Light is an Army program to automate the processing and analysis of intelligence data from all sources. The JPO evaluated the product as part of an effort to understand the potential commonalities between MSAT and the Army PEO C3T. Discussions with ASAS led to the evaluation of VisuaLinks as a possible data mining tool.

- **Analysis and Control Element (ACE):** Block II ACE is the primary Intelligence and Electronic Warfare (IEW) processing, analysis, and dissemination system at its respective echelon and acts as the focal point for all IEW activities. ACE is a capability found within ASAS. Block II Ace is a robust tool but it requires dedicated hardware and the intelligence collected will not meet MSAT requirements.
- **Global Disease Sentinel Network (GDSN):** This network is a proof-of-concept to provide intelligence analysts rapid alerting of breaking news (currently open source) regarding illness clusters and other noteworthy events. The TM contacted GDSN to learn more about the capability. The initial assessment indicated the output of GDSN as one of the data sources used by AFMIC (and other intelligence analysts), which then would make the INTEL product available to many communities, including MSAT. It did not appear that the JTF and COCOM staff would be direct consumers of GDSN output. Additional evaluation of the underlying technologies within GDSN may have been warranted but were precluded by funding constraints and changes to the scope of the ACTD.

4.2 Technical Development Activities

4.2.1 Highlights of Development

- Designed as a Service Oriented Architecture, MSAT can ingest any web service compliant data and make these data available to itself and external users/partners.
- MSAT can display information on a Joint Web Cop-compliant display where reports and individual data elements take on visual meaning.
- MSAT can map selected information to its physical geolocation
- MSAT demonstrated the first time use of BFT in a medical environment.
- Thin client application meets DOD mandates and will limit the cost of fielding new hardware and software through existing Service infrastructure programs as the concept of net-centricity matures.
- Use of NCES paves the way for using the nine core enterprise services included in the NCES environment. Upon maturity, collaboration; storage services; discovery services; Enterprise System Management; Information Assurance/Security; etc will be available through the GIG Enterprise Services.

4.2.2 Early Prototype Selection

The system design leveraged existing initiatives to ensure MSAT was interoperable across multiple domains. In collaboration with the Naval Sea Systems Command PEO-Integrated Warfare Systems (Code 5A4), MSAT was initially identified to provide medical SA based on NITES technology. NITES is the meteorological and oceanographic planning and SA capability supporting GCCS-Maritime and GCCS-J. The prototype decision support tool is called the MSAT MSE and was developed to provide medical capability to and through GCCS and GCSS.

The MSAT MSE initially used the NITES architecture to provide information graphically, textually, and logically for medical support to operational decision-making. The use of NITES was meant as the beginning of a process to identify and refine user

needs. Further refinement of the MSAT concept led to changes in the original NITES architecture. Specifically, NITES was designed as a thick client to comply with existing DOD standards. Utilizing the NITES thick client architecture for proof of concept proved to be a good first step in MSAT development. As a member of the GCCS family of systems, NITES provided a pathway through which the MSAT MSE was able to provide medical information into and from the GCCS-J environment.

4.2.3 Standards Based Design

The JPO set out to develop a standards-based multi-tiered, service-oriented architecture that was compliant with NCES and the Defense Information Standards Repository (DISR). The DISR is the replacement for the Joint Technical Architecture (JTA) which was used in the development of many of the legacy systems with which MSAT would interact. The MSAT design also required flexibility to comply with legacy requirements such as the Common Operating Environment (COE). The COE is being subsumed within the construct of NCES but MSAT had to maintain compliance since the COE is an integral part of the GCCS-J and the GCSS families of systems. GCSS complements GCCS by being fielded as a GCCS mission application. However, neither GCCS-J nor GCSS are fully net-centric. As GCCS is replaced by NECC the focus will be on NCES and other emerging standards. MSAT is advanced in its design and is constrained mostly by a lack of authoritative data sources. These challenges are not surprising for a prototype of this kind and would have been addressed as MSAT and other systems and applications matured.

MSAT was developed to comply with a variety of over arching standards and requirements such as DOD Directive 8320.2, *Data Sharing in a Net-Centric Department of Defense*, 2 December 04, DOD Instruction 5000.2, *Operation of the Defense Acquisition System*, 12 May 03, CJCS Instruction 6212.01, *Interoperability and Supportability of Information Technology (IT) and National Security Systems*, November 20, 2003, and the *Defense Acquisition Guidebook*. Since Net-Centric transformation has been mandated, success in the development of any new capability is to align program objectives with those required by higher authority. Failure to do so guarantees obsolescence over time, while reinforcing a mentality of information “stovepipes”. Programs of Record share the mandate to comply with the standards and guidance required for all DOD systems operating on the GIG. Most of the Military Health System (MHS) infrastructure, applications, and computer systems have not reached maturity. However, MSAT will be ideally positioned to work with these data partners and data sources as they become available in a net-centric environment.

4.2.4 Use of Commercial/Government Off-the-Shelf Technologies

MSAT successfully leveraged existing COTS and GOTS technologies to cut cost, save time and development, and to comply with DOD policy.

The following are examples of this strategy:

- Reuse of existing code, algorithms, and other applications allowed the TM to reduce redundancy and enhance integrity, thereby cutting the time and cost of development.
- MSAT invested in accelerating the JMeWS web services capabilities that were scheduled for future release.

- MSAT work in evaluating JPTA stimulated the movement of JPTA into an approved program of record relationship within the MHS.
- Electronic Surveillance System for the Early Notification of Community-based Epidemics (ESSENCE) algorithms are being leveraged within JMeWS and externally to provide a more robust capability.

MSAT planned a modest investment of \$850K for developing AFMIC SIPRNET web services capabilities so that AFMIC intelligence products could be made available to the MSE user.

4.2.5 Spatial Decision Support (DS) Development

The JPO recognized that the future of decision support would be closely tied to decision-makers' ability to integrate and relate any data with a spatial component, regardless of the source of that data. This led to a focus on combining a GIS with fused data from other systems. This approach was used in the development of Prototype #1. The results of the CG06 assessment verified the approach but also identified a few shortfalls relating to the concept. The GIS approach supports the management of data to include retrieval and display. However, fusing and combining the data as performed for CG06 presented limited modeling and analysis capabilities. Decision-makers faced with a variety of spatial problems require spatial modeling and analysis techniques for developing and analyzing courses of action. A logical next step for MSAT was the refinement of the current approach to create a Spatial Decision Support System (SDSS). An SDSS integrates comprehensive spatial modeling and analysis with the capabilities currently provided by a GIS. Additionally, an SDSS provides support in semi-structured decision-making environments where:

- There are multiple conflicting objectives
- Important elements of the problem cannot be captured in a mathematical formulation
- A process of generating and evaluating alternative solutions is appropriate.

An SDSS provides a framework for integrating:

1. Analytical modeling capabilities
2. Database management systems
3. Graphical display capabilities
4. Tabular reporting capabilities
5. The decision-maker's expert knowledge

A GIS normally provides 2, 3 and 4. The addition of 1 and 5 creates an SDSS.

4.3 Plan of Action for USAMRMC Technical Close-Out Activities

In response to the OSG guidance to transition MSAT to a new TM, the JPO developed a transition plan that included the following activities:

4.3.1 Transfer Baseline to a Designated POR

The completed prototype used in CG06 was to be secured for further Government evaluation and use. PM, TMIP agreed to accept the software and system documentation.

Anteon (developer under contract to NUWC-Newport) delivered the baseline software to TMIP Configuration Management on 20 October 06 along with the following system documentation:

- Requirements Document (RTM)
- Database Design Document (DBDD)
- Schema documentation
- Software Test Description (STD)
- CONOPS/Capabilities Mapping
- Software User Manual (UM)
- System/Subsystem Design Document (SSDD)
- Software Version Description (SVD)
- MSAT MOEs/MOPs to Use Case Mappings Document
- MSAT Project Tracking Report (PTR)

4.3.2 Transfer Residuals to DHSD

The MSAT prototype hardware and software located at the MSAL in San Diego, CA was considered to be the first MSAT residual capability. This capability was transferred to DHSD on 18 December 06 where it resides as the MSAT prototype baseline. DHSD is hosting the prototype since it hosts other applications (e.g., JMeWS, JMAR and JPTA) that are potential MSAT data sources. Additionally, as a member of the MSAT strategic user community, DHSD plays an important role in refining future MSAT requirements. The JPO proposed a three phased approach for close-out activities at DHSD:

- Implement and sustain the MSE residual capability configuration items.
- Establish a PTR process and maintain configured and installed-on hardware.
- Implement web services with BFT Management Server External data sources, JMEWS Training Server, AFMIC Unclassified Products (catalog and query), ESSENCE IV, or other systems directed for medical situational awareness.
- Stabilize and optimize administrative services (roles and permissions) required for MSE to work with “live” data.
- Prepare for Defense Information Technology Security Certification and Accreditation Process (DITSCAP) accreditation for MSE as directed by the DHSD designated approving authority.
- Enhance MSE installation at DHSD by connectivity with additional systems such as ARGUS (overlay with JMEWS data), CHPPM (classified or unclassified), AFMIC (classified), and other medically relevant systems directed for force health protection.
- Integrate GPS hand held devices supporting environmental and health data collection.
- Support “sandbox” and test environment for MSE to provide an interim operating capability prior to POR product releases.

- Reconfigure web services with JMEWS Alert tables to reduce bandwidth needs.
- Assist with technical refinement of Force Health Protection requirements and the development of technical supporting business processes for the proposed Armed Forces Health Surveillance Center.
- Assist the assigned POR with determining priorities for future investment and transition into a POR.
- Support MSE operations at DHSD to evaluate benefits as an ongoing assessment of military utility.
- Provide Tier I, II, and III help desk support directly or by sub-contract with MSE development support software services.

4.4 Other Technical Manager Activities

4.4.1 Oversight Responsibilities

4.4.1.1 System Development and Integration Integrated Product Team (SDIIPT)

The SDIIPT was established on 27 December 05 by the TM. Meetings were held semi-weekly through 3 March 06. A tracking log was used to complement summary minutes. As directed by the December 05 OSG meeting, the scope of the SDIIPT was focused on simultaneous spiral development to ensure integration with concurrent engineering activities and integration of future opportunities. An additional system design effort was dedicated to the construction of a data repository at DHSD. Reduced funding narrowed the focus of the engineering effort to CG06 preparation and the SDIIPT suspended meeting. Subtask monitoring of system engineering of the MSE replaced the SDIIPT activities during March and April 06.

4.4.1.2 Naval Health Research Center (NHRC) Lead Investigator

The Lead Investigator worked for the TM and provided a variety of support, primarily to seek innovative and promising technologies and to assess them for suitability for integration into MSAT. NHRC also assisted with the coordination and management of MSAT-related contracting activities as identified in section 3.7.2. The LI was also involved in the preparation activities leading to the RFI and the Pre-Solicitation Conference, and hosted several very productive MSAT IMG meetings (section 3.2.1).

4.4.2 Briefings, Meetings, and Conferences

The TM played a key role in publicizing the MSAT ACTD in a variety of forums. Major briefings, meetings, and conferences are highlighted below.

4.4.2.1 TRICARE Conference 05

The 2005 TRICARE Conference was held at the Marriott Wardman Park Hotel – Washington, D.C. on 24-27 January 05. The MSAT TM attended and provided an MSAT information brief.

4.4.2.2 DUSD AS&C Staff Brief

On 2 March 05, the TM and MSAT JPO staff met with Mr. Larry Goodell, Mr. Mo Shriber, and COL Barbosa at the AS&C offices in the Pentagon. Mr. Shriber was acting AS&C Focused Logistics Lead and COL Barbosa was the Oversight Executive for

Focused Logistics ACTDs. The TM answered questions and provided an MSAT informational brief.

4.4.2.3 Deputy Assistant Secretary of the Army Brief (ESOH)

On 23 May 05, the TM provided an informational briefing to the Deputy Assistant Secretary of the Army, for Environment, Safety, and Occupational Health (ESOH). Mr. Hew Wolfe and MAJ Steve Spellman also attended the brief.

4.4.2.4 Future Ground Forces Conference

The Institute for Defense & Government Advancement sponsored the 28-29 June 05 Future Ground Forces Conference at the Sheraton Crystal City, Arlington, VA. The MSAT TM attended and provided an MSAT information brief.

4.4.2.5 PEO Command, Control, Communications-Tactical (C3T)

On 12 July 05, COL Vallory Lowman, Office of the Chief Engineer; PEO C3T hosted the MSAT JPO and the Army Medical Department (AMEDD) Program Manager for Information Technology/Information Management for a series of introductory briefings to relevant products within the C3T domain. The following products were briefed: Global Command and Control System-Army (GCCS-A), Joint Tactical COP Workstation (JTCW), FBCB2/Blue Force Tracking, and Battle Command Sustainment Support System (BCS3).

4.4.2.6 8th Force Health Protection (FHP) Conference

On 9-10 August 05, the TM attended the 8th Annual Force Health Protection (FHP) Conference in Louisville, KY and made MSAT brochures available at the DHSD and USAMRMC exhibit booths. On 10 August 05, the TM provided an MSAT information brief to conference participants.

4.4.2.7 ACTD Manager's Conference

The TM attended the ACTD Manager's Conference from 12-15 September 06 and participated on a TM "Lessons Learned" Panel and provided a briefing on lessons learned from the MSAT first year perspective.

4.4.2.8 COCOM Surgeons' Conference 05

On 20 December 05, the TM provided a briefing at the COCOM Surgeons' Conference. The audience included the COCOM Surgeons and/or their reps. General Officers and Flag Officers present included the Navy and Air Force Surgeons General, RADM Woofter, Maj. Gen. Joseph Kelley (Joint Staff Surgeon, Chair), Maj. Gen. Bruce Green, RMDL Timberlake (United States Joint Forces Command [USJFCOM]), and RADM Burkhard (USPACOM).

4.4.2.9 Joint Staff COP Working Group

The TM provided the technical input and acted as a primary briefer in preparation for the Joint Staff COP Working Group held at USPACOM on 19-20 January 06. The Operational Manager and the TM participated in the working group. The MSAT goal was to provide an overview of proposed MSAT GCCS-J requirements to improve medical planning and operations support to the warfighter and to provide a brief

overview of the MSAT ACTD. In preparation for this event, the TM pre-briefed the Joint Staff J3 Command Systems Operations Division (CSOD) to refine and clarify the eight proposed GCCS medical requirements. The CSOD is responsible for the Joint Staff COP Working Group and according to the CSOD Division Chief, the requirements presented by MSAT were "...the best prepared of any I have worked with." All eight requirements were accepted by the working group. This was a tremendous success for MSAT since up to this point no medical requirements have been validated or approved by the Command and Control community.

4.4.2.10 Briefing to the Air Force Surgeon General

On 27 January 06, the TM provided an MSAT information brief to members of the Air Force Surgeon General's office, including the Deputy Assistant Air Force Surgeon General for Modernization.

4.4.2.11 Intelligence Functional Work Group

On 6 April 06, the TM briefed the GCCS-J Intelligence Functional Work Group (WG) at their scheduled meeting hosted by HQ, JFCOM at the HQ in Suffolk, VA. The purpose of the brief was to request validation of the Medical Intelligence GRID requirement for the COP. This was one of eight medical COP requirements briefed to the J3 COP WG at their meeting at Hickam Air Force Base in January. Since GCCS-J Intelligence requirements are the purview of this WG, a specific briefing was requested. Following the briefing and a short discussion, the WG voted overwhelmingly that the requirement was, in fact a valid COP requirement.

4.4.2.12 Marine Forces Pacific (MARFORPAC) Brief

On 04 May 06, the TM provided an information brief to members of MARFORPAC. The MARFORPAC participants met with the MSAT OM in the MAFORPAC conference room at Camp Smith, HI and received the TM brief by WebEx™. Feedback from the OM and comments from the participants indicated the audience was extremely interested in the potential benefits of the MSE.

4.4.2.13 COCOM Surgeons' Conference 06

On 13 June 06, the TM shared time with the USPACOM Surgeon at the COCOM Surgeons' Conference and provided a briefing that focused on highlights from MSAT's participation in CG06. The presentation was well received. USPACOM, USNORTHCOM, and the Joint Staff indicated their support and continued interest.

4.4.2.14 9th Force Health Protection (FHP) Conference

On 7-10 August 06, the TM attended the 9th Annual FHP Conference in Albuquerque, NM. On 10 August, the TM provided an information brief that explained the results of Field Trial #1 and the MSAT re-scoping effort.

4.4.2.15 USNORTHCOM/FHP-Medical Homeland Defense WG

On 25 October 06, the TM attended the USNORTHCOM/NORAD FHP-Medical Homeland Defense Working Group meeting and provided an information brief on MSAT.

5 MSAT TM Transition/Close-out Activities

As discussed in the introduction and in section 3.5.2.3, the OSG guidance was initially for DISA, then PM, TMIP to assume the role of MSAT TM. USAMRMC is no longer considered the TM but continues to support the ACTD by providing some funds management support and hosting some support personnel. The MSE Prototype #1 has been transferred from the contract development laboratory (MSAL) and installed as an ACTD residual capability at the DHSD SCIF in Falls Church, VA. Support for obtaining military utility from the Prototype MSE has been provided by transferring residual funds saved during execution of prior year funds. Capabilities include visualization of medical operations and epidemiologic information from JMEWS, Friendly Force map locations (BFT), environmental threats (AFMIC NIPRNET query), and web services for connectivity with additional systems as required. Transfer and installation of the MSE Prototype #1 was completed on 18 December 06.

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6 References

6.1 MSAT Implementation Directive, January 05

6.2 MSAT Management Plan, September 05

6.3 USAMEDDBD System Assessment Report, 18 July 06

6.4 Interim Military Utility Assessment, 30 September 06

6.5 NHRC Lead Investigator Annual Report, September 06

6.6 Grid Requirements

6.7 Requirements Conference Report

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7 Acronyms and Abbreviations

ABA	Advanced Battlefield Awareness
ACE	Analysis and Control Element
ACTD	Advanced Concept Technology Demonstration
AFMIC	Armed Forces Medical Intelligence Center
AMEDD	Army Medical Department
ASAP	Actionable Situational Awareness Pull
ASAS	All Source Analysis System
BFT	Blue Force Tracks/Tracking
BMIS	Battlefield Medical Information System
BMIS-T	Battlefield Medical Information System (Tactical)
C2	Command and Control
C2IEDM	Command and Control Information Exchange Data Model
C3T	Command, Control, Communications - Tactical
CBRN	Chemical, Biological, Radiological, and Nuclear
CDC	Centers for Disease Control and Prevention
CG06	Cobra Gold 2006
CHPPM	US Army Center for Health Promotion and Preventive Medicine
C/JMTK	Commercial Joint Mapping Tool Kit
CJTF	Combined Joint Task Force
COA	Course of Action
COCOM	Combatant Command
COI	Communities of Interest
CONOPS	Concept of Operations
COE	Common Operating Environment
COP	Common Operational Picture
COSMOS	Coalition Management and Operations System
COWAN	Coalition Wide Area Network
COTS	Commercial Off The Shelf
CPM	Casualty Prediction Model
CPX	Command Post Exercise
CSOD	Command Systems Operations Division
DASD	Deputy Assistant Secretary of Defense
DBDD	Database Design Document
DCTS	Defense Collaboration Tool Suite
DHS	Deployment Health Support
DISA	Defense Information Systems Agency
DISR	Defense Information Standards Registry
DITSCAP	Defense Information Technology Security Classification and Accreditation Process
DOD	Department of Defense
DTRA	Defense Threat Reduction Agency

DUSD (AS&C)	Deputy Under Secretary of Defense for Advanced Systems and Concepts
EA	Executive Agent
EOS	Epidemic Outbreak Surveillance
ESOH	Environment, Safety, and Occupational Health
ESRI	Environmental Systems Research Institute
ESSENCE	Electronic Surveillance System for the Early Notification of Community-based Epidemics
FBCB2	Force XXI Battle Command, Brigade and Below
FHP	Force Health Protection
FHP&R	Force Health Protection and Readiness
FMACL	Fleet METOC Advanced Concepts Laboratory
FMC	Field Medical Companion
FTX	Field Training Exercise
FY	Fiscal Year
GCCS-J	Global Command and Control System - Joint
GCSS	Global Combat Support System
GDSN	Global Disease Sentinel Network
GEIS	Global Emerging Infections Surveillance and Response System
GEOLOC	Geographic Location
GIG	Global Information Grid
GIS	Geographic Information System
GOTS	Government Off The Shelf
GPS	Global Positioning System
GSORTS	Global Status of Resources and Training System
GUI	Graphical User Interface
HQ	Headquarters
HTML	Hypertext Markup Language
ID	Implementation Directive
IDE-AV	Integrated Data Environment-Asset Visibility
IEW	Intelligence and Electronic Warfare
IIPT	Integrating Integrated Product Team
IMUA	Interim Military Utility Assessment
IMG	Integrated Management Group
IPT	Integrated Process Team
ISIS	Imaging Science and Information System
IT	Information Technology
IWS	Info Work Station
J2EE	Java 2 Platform Enterprise Edition
JBFS	Joint Blue Force Situational Awareness

JC2	Joint Command and Control
JDLM	Joint Deployment Logistics Model
JEM	Joint Effects Model
JIOC	Joint Information Operations Center
JITC	Joint Interoperability Test Command
JMAR	Joint Medical Asset Repository
JMEDSAF	Joint Medical Semiautomated Forces
JMeWS	Joint Medical Workstation
JMLFDC	Joint Medical Logistics Functional Development Center
JMTK	Joint Mapping Toolkit
JOEF	Joint Operational Effects Model
JOPEs	Joint Operation Planning and Execution System
JPM-IS	Joint Program Manager, Information Systems
JPO	Joint Program Office
JPTA	Joint Patient Tracking Application
JTA	Joint Technical Architecture
JTAV	Joint Total Asset Visibility
JTCW	Joint Tactical COP Workstation
JTF	Joint Task Force
JTLS	Joint Theater Level Simulation
JWARN	Joint Warning and Reporting Network
LCW	Lightweight Collaborative Whiteboard
LI	Lead Investigator
M&S	Modeling and Simulation
MARFORPAC	Marine Forces Pacific
MEDCAP	Medical Civic Action Program
METOC	Meteorology and Oceanographic
MHS	Military Health System
MIPR	Military Interdepartmental Purchase Request
MNC	Multi National Corps
MOE	Measure of Effectiveness
MOP	Measure of Performance
MP	Management Plan
MSAL	Medical Situational Awareness Lab
MSAT	Medical Situational Awareness in the Theater
MSE	Medical Situational Enhancement
MSEL	Master Scenario Event List
MUA	Military Utility Assessment
NCES	Net-Centric Enterprise Services
NECC	Net-Enabled Command Capability
NGA	National Geospatial-Intelligence Agency
NHRC	Naval Health Research Center
NIPRNET	Non-Secure Internet Protocol Router Network

NITES	Navy Integrated Tactical Environmental Subsystem
NMCI	Navy Marine Corps Intranet
NUWC	Naval Undersea Warfare Center
OASD	Office of the Assistant Secretary of Defense
ODASD	Office of the Deputy Assistant Secretary of Defense
OM	Operational Manager
OSG	Oversight Group
OT&E	Operational Test and Evaluation
OTA	Operational Test Agency
OUSD	Office of the Under Secretary of Defense
PAR	Population at Risk
PDA	Personal Digital Assistant
PDF	Portable Document Format
PEO	Peace Enforcement Operations or Program Executive Office
PI	Pandemic Influenza
PM	Program Manager
PMW 180	Intelligence, Surveillance, Reconnaissance; and Information Operations Functional Program Office (SPAWAR)
POR	Program of Record
PTR	Project Tracking Report
RFI	Request for Information
RFP	Request for Proposal
RTM	Requirements Document (requirements traceability matrix)
SA	Situational Awareness
SCIF	Sensitive Compartmented Information Facility
SDIIP	System Design and Integration Integrated Product Team
SDSS	Spatial Decision Support System
SIPRNET	Secret Internet Protocol Router Network
SVD	Software Version Description
SOW	Statement of Work
SPAWAR	Space and Naval Warfare Systems Command
STD	Software Test Description
SSDD	System/Subsystem Design Document
TATRC	Telemedicine and Advanced Technology Research Center
TELCON	teleconference
TIM	Toxic Industrial Materials
TM	Technical Manager
TMDS	Theater Medical Data Store
TMIP	Theater Medical Information Program
TPFDD	Time-Phased Force Deployment Data
TUCHA	Type Unit Characteristics File

TUDET	Type Unit Equipment Detail
UM	User Manual
URL	Uniform Resource Locator
USAMEDDBD	United States Army Medical Department Board
USAMRAA	United States Army Medical Research Acquisition Activity
USAMRMC	United States Army Medical Research and Materiel Command
USEUCOM	United States European Command
USJFCOM	United States Joint Forces Command
USNORTHCOM	United States Northern Command
USPACOM	United States Pacific Command
VTC	Video Teleconferencing
WEBCOP	Web-based Common Operational Picture
WG	Work Group
WMD	Weapons of Mass Destruction
XM	Transition Manager
XML	Extensible Markup Language



REPLY TO
ATTENTION
OF:

DEPARTMENT OF THE ARMY
US ARMY MEDICAL RESEARCH AND MATERIEL COMMAND
504 SCOTT STREET
FORT DETRICK, MARYLAND 21702-5000

30 Jul 2007

From: Debra Coffman, Chief of Security, Deputy Operations Officer, USAMRMC
To: Security Manager, DTIC-OQ

Subj: Distribution and Classification Determination on USAMRMC Annual Reports on "Medical Situational Awareness in the Theater (MSAT) Advanced Concept Technology Demonstration (ACTD) Executing Activity"

Ref: (a) Memorandum for Deputy Under Secretary of Defense for Advanced Systems and Concepts (from William H. Howell, Director, USAMRMC) of 3 Apr 2007

1. As per reference (a), the Director of the US Army Medical Research and Materiel Command has determined the classification and distribution of the following report to be UNCLASSIFIED Releasable to the Public:

AD Number: ADB326264

2. Questions on this matter may be directed to this office 301-619-3334.


Debra Coffman
Chief of Security

Deputy Operations Officer

USAMRMC