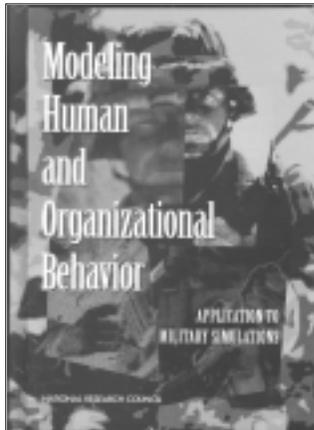


# DMSO NEWS

Volume 3 Number 3

Fall 1998

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## The next phase HLA emphasis shifts to implementation

By Chris Turrell  
DMSO HLA Staff

The Department of Defense (DoD) High Level Architecture (HLA) for simulation enters a new stage this fall, shifting the focus from a technical transition characterized by stabilization of the specification to increased emphasis on HLA implementations.

Just two years ago the DoD adopted the HLA as the technical architecture for simulations. This October signals the start of the HLA Compliance period as existing simulations begin implementation of the HLA. During the intervening 24 months, the HLA specifications have matured and are now well into the industry standardization process.

Supporting software, including full support runtime infrastructure (RTI) software

and user support tools, have been fielded and made freely available across the HLA user community. Commercial tools to meet growing community needs are appearing on the market (see the tools article on page 5). The Defense Modeling and Simulation Office (DMSO) offers free monthly regional training sessions on all aspects of the HLA. Hands-on classes are offered on a continuous basis, also free of charge. Finally, an over-the-internet testing capability is available to simulation and tool developers to test compliance with the HLA. With these capabilities in place, the implementation phase of HLA is beginning in earnest.

"The modeling and simulation (M&S) community at large can take pride in the

*See HLA EMPHASIS, p. 7*

## NATO M&S Master Plan on track for NAC final approval this fall

By Leon Armour  
DMSO International Activities

The North Atlantic Treaty Organization (NATO) Modeling and Simulation Master Plan (NMSMP) has entered the NATO staffing and coordination process and continues to move toward completion and final approval by the North Atlantic Council (NAC) in the fall.

The NMSMP, Version 1.0, was approved by the NATO Steering Group on Modeling and Simulation (SGMS) at its

July 15-16, meeting at NATO Headquarters in Brussels, Belgium.

During the meeting, nation representatives unanimously agreed on Version 1.0 of the Master Plan, then reviewed and approved the amended Final Report of the Steering Group. The Final Report recommends implementation actions, to include the establishment of a NATO Simulation Policy Group (NSPG) reporting to the

*See NATO MSMP, p. 16*



## *Director's Corner*

*Col Crash Konwin, USAF*

*“People – the first of the three important elements of success”*

**New faces in the DoD M&S community**

As summer turns to fall, a lot more has changed in the environment than the foliage. Significant changes in some of the key modeling and simulation (M&S) leadership positions have taken place since the last publication of this newsletter for DMSO Industry Days in June.

A new Director, Defense Research & Engineering, **Dr. Hans Mark**, rejoined government service in July fresh from his previous duty as Professor of Aerospace Engineering and Engineering Mechanics at the University of Texas at Austin where he served from 1988-98. During his previous tour in government service in the late 1970s and early 1980s, Dr. Mark served as Undersecretary and later Secretary of the Air Force, Director of the National Reconnaissance Office (NRO), and Deputy Administrator of the National Aeronautics and Space Administration (NASA). In the management structure for M&S within the DoD, the DDR&E chairs the Executive Council for Modeling and Simulation (EXCIMS).

Assisting Dr. Mark in his oversight role for M&S will be **Dr. Delores M. Etter**, Deputy Director, DDR&E. Dr. Etter became the Principal Deputy to the DDR&E in June 1998. In this role she is responsible for Defense Science and Technology strategic planning, budget allocation, and program execution and evaluation. She also is the Principal U.S. Representative to the North Atlantic Treaty Organization (NATO) Research and Technology Board, a forum that was the sponsor of the first NATO M&S Master Plan development that is nearing completion this year. Dr. Etter joins the Department from her position as Professor of Electrical and Computer Engineering at the University of Colorado, Boulder, where she served in that capacity from 1989-98. She also was a member of the Defense Science Board from 1995-98 and served on several panels that involved the exploitation and development of M&S techniques and technologies.

Both Dr. Mark and Dr. Etter have personally visited the Defense Modeling and Simulation Office and are highly supportive of our collective strategy to develop and exploit modeling and simulation within and across the three functional areas of Training, Analysis, and Acquisition. You can expect to see more active involvement of these professionals in the months that follow supporting all of us in the challenges that lie ahead.

Within the DMSO, we proudly said farewell to **Maj Steve Zeswitz, USMC**, who retired from active duty with a glorious ceremony at the foot of the Lincoln Memorial in July. The ceremony was not only special for his family and friends, but made those of us involved very proud to be Americans. We will miss Steve's contributions and friendship and wish him well in his "next life". We are very fortunate to have filled Steve's position with another outstanding officer and military aviator, **LtCol "Mac" McKeon, USMC**. Mac joins the DMSO after completion of his year's fellowship at the Defense Systems Management College where he and two sister Service colleagues (Lt Col Terry Szanto, USAF, and LTC Mike

See *DIRECTOR'S CORNER*, p. 3

## **DMSO NEWS**

*Director, Defense Research and Engineering*

**Dr. Hans Mark**

*Director, Defense Modeling and Simulation Office*

**Col Kenneth C. Konwin, USAF**

*Deputy Director, DMSO*

**CAPT Stan O'Connor, USN**

*Chief of Staff*

**Mr. Gary Yerace**

*Chief Scientist*

**Dr. Judith Dahmann**

*Chief, Operations Division*

**LTC Harry Thompson, USA**

*Chief, Technology Division*

**LtCol Mark McKeon, USMC**

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You can also view the newsletter at <http://www.dmsomil/docslib/newsltr/dmsomil/>.

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# NRC publishes report on modeling human behavior

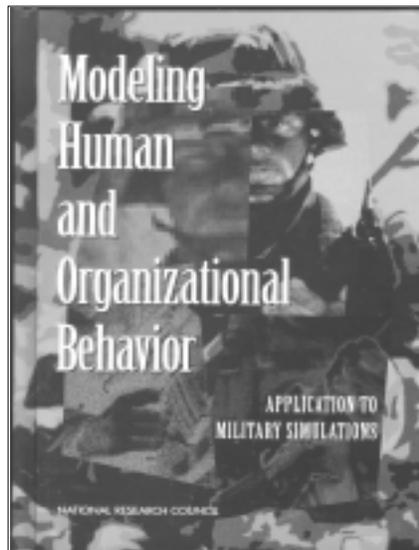
By Ruth P. Willis, PhD  
DMSO Human Behavior Representation Project Manager

This summer the National Academy Press published the DMSO-sponsored report *Modeling Human and Organizational Behavior — Application to Military Simulations*. The report is the work of the National Research Council's *Panel on Modeling Human Behavior and Command Decision Making*.

The panel was charged to review the state of the art for representing human and organizational behavior at the individual, unit and command levels.

The need to represent the behavior of individual combatants, as well as teams and larger organizations, has been expanding as a consequence of the increased use of simulation for training, analysis and acquisition. The behaviors that are important to represent realistically are those that can be observed by the other participants in the simulation, including physical movement and detection and identification of enemy forces. Achieving realism with respect to these observable outcomes requires that the models of human behavior used in the simulation be based on psychological, organizational and sociological theory.

For individual combatants, the Panel felt it important to represent the processes underlying the observable behavior, including attention and multitasking, memory and learning, decision making, perception and situation awareness, and planning. At the unit level, it is important to represent the



command and control structure, as well as the products of that structure. In each of these areas, the report presents the Panel's findings on the current state of knowledge and recommends goals for future understanding, development and implementation.

The Panel's conclusions and recommendations fall into two broad areas:

- a framework for the development of models of human behavior
- infrastructure and information exchange.

For the short term, the Panel recommends the collection of real-world, wargame and laboratory data in support of the development of new models and the development and application of human model accreditation procedures. For the intermediate term, the Panel recommends new task analysis techniques and sustained model development in selected areas. Finally, the Panel advocates theory development and behavioral research leading to future generations of models of human and organizational behavior.

With regard to the need for infrastructure and information exchange, the Panel identified actions to influence and shape modeling priorities within the services. These actions included collaboration, conferences, interservice communication, and education.

The report is available from the National Academy Press at (800) 624-6242, (202) 334-3313 in the Washington Metropolitan area, or online at <http://www.nap.edu/>.

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## Director's Corner

*Continued from p. 2*

Johnson, USA) authored a *Program Manager's Guide to Simulation Based Acquisition*. Besides his acquisition and aviator skills, Mac brings previous experience working with the Naval Air Warfare Center Training Systems Division (NAWC-TSD) on simulators and associated databases.

Last issue I mentioned **CAPT Stan "Steamer" O'Connor, USN**, would be joining the DMSO in July as Deputy Director and how delighted we at Team DMSO are to have Steamer aboard. He has already catapulted into the world of the Training Council, Joint Simulation System (JSIMS) Program Management Reviews, Simulation Based Acquisition, and the M&S support to the Joint Warfighting Program. As a recent graduate of the Industrial College of the Armed Forces, and with previous tours as an Executive Officer (XO) and Commander of an F-14 squadron (VF-21), XO of the Navy's *TOPGUN* program, a pilot in the Air Force's 4477th Tactical Evaluation Squadron, "Red Eagles," and as

an F-14 requirements officer in the Pentagon (N88), he brings a breadth and depth of quality operational and leadership experience that will serve the Department well.

Change is not limited to the M&S management structure within the Office of the Secretary of Defense. Look for future contributions in our community by the new leadership within the Service M&S Management Offices —

**Mr. Vern Bettencourt**, Director, Army M&S Office (AMSO); **COL Steve Collier**, Deputy Director, AMSO; **CAPT Robert S. Chapman**, Director, Navy M&S Office (N6M); and **Dr. Jackie Henningsen**, SES, Air Force Directorate of Command and Control (AF/XOC).

The new team is in place — the challenges are abundant — the resources are scarce — the expectations are high — BUT, as a fighter pilot flight lead outnumbered 50:4 allegedly said: "Outstanding teammates — we're now entering a target rich environment"!!!

Cheers,  
Crash

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# M&S education expands MSSOC marks first year with European course

By Tom Hanton  
MSSOC Instructor

The Department of Defense (DoD) Modeling and Simulation (M&S) Staff Officer (MSSOC) celebrated its one-year anniversary with the first international presentation of the course.

The Warrior Preparation Center in Einsiedlerhof, Germany hosted MSSOC 98-8, August 3-7. Forty students attended the five-day course, including U.S. representatives from a variety of European commands and six representatives from NATO countries.

The MSSOC has educated over 300 students this year in the basics of DoD M&S. Providing entry-level information on M&S to new staff officers, allies, and DoD contractors, the MSSOC will be conducted in Albuquerque, NM in September; Alexandria, VA in October; and Norfolk, VA in December. Fiscal Year 99 promises to be even busier with regional offerings in the Southeast, Midwest, West Coast, Europe, and Pacific, as well as in Washington, DC.

Visit the MSSOC web site at <http://www.dmsomil/SOC/> for class dates and other information. Prospective students can apply on line at the web site.

Given the far-reaching and expanding interest in M&S, and recognizing that the existing knowledge gap calls for both general and specific education, the Defense Modeling and Simulation Office (DMSO) is developing additional M&S educational opportunities for specific focus groups. These include the following.

- The *Executive Level Orientation (ELO)* will provide the senior DoD executive with a broad overview of current DoD M&S policies, organizations and issues. The objective of the ELO is to enhance the senior executive's ability to make decisions involving the use of M&S. Orientations will be tailored to the recipient to better ensure that the provided information is appropriate for his/her area of responsibility. Look for this course to begin this fall.



**British Air Force Wing Commander Steve Oliver (right), U.S. Army Major Tim Drake (center) and U.S. Air Force Major Tom Jones (left) attended the MSSOC course at the Warrior Preparation Center in August.**

- The *M&S Survival Course for Program Management Offices* will be taught on location and is targeted specifically toward the acquisition Program Manager and his/her staff. Its focus and priority is to assist the PM and staff in the use of M&S in the acquisition cycle. The course will provide DoD M&S information, tools and sources of M&S information. This course is also scheduled to begin this fall.

- *MS 101* will be a tutorial designed for presentation to large audiences, ideally at conferences, seminars and symposiums. Presenting basic DoD M&S information in a story-like format, it will rely heavily on multimedia and enhanced graphics to present the course information. The target audience is newcomers to M&S. This course is scheduled to debut at the Industry/Interservice Training, Simulation and Education Conference (IITSEC) in Orlando, on Monday, Nov. 30 at 2:30 p.m.

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## ITEC Asia '98

*Continued from p. 16*

den, Russia, and the UK will discuss HLA-based developments in Europe and how the HLA can enhance simulation and training in Asia.

As world events become more complicated, it is essential that multinational coalitions be able to work and train together without the necessity to actually be in the same location. Enhancing cooperation among governments in peacekeeping, hu-

manitarian aid, natural disaster relief, and regional, as well as international, security will benefit political and economic stability. Similarly, cooperation among corporations can significantly improve their competitiveness in the development of products for local, regional, or international markets. Distributed simulation provides a means for individuals, organizations, companies and governments to operate together in the same synthetic environments from distant points without the time and money consumed in travel.

Delegates at *ITEC Asia '98* will have a unique opportunity to join a broad international audience of M&S professionals to discuss the future of distributed simulation across a broad spectrum of uses, including training, analysis and acquisition.

*ITEC Asia '98* is sponsored by ITEC Ltd. The event manager is Nelson Jackson at (703) 247-2575, fax (703) 522-1885, or e-mail [njackson@ndia.org](mailto:njackson@ndia.org). Information is available online at <http://www.itec.co.uk/>.

# MSOSA adds HBR special interest area

By Marc Erlandson  
MSOSA Director of Operations

The Modeling and Simulation Operational Support Activity (MSOSA) will introduce its newest Special Interest Area (SIA) on its web site at this fall's Simulation Interoperability Workshop, September 14-18. The SIA is devoted to Human Behavioral Representation (HBR) in simulations, which is attracting an increasing level of interest in the modeling and simulation (M&S) community in the wake of the publication of the National Research Council study, *Modeling Human and Organizational Behavior — Application to Military Simulations*.

The purpose of an MSOSA SIA is to provide a forum for the exchange of information on key M&S topics. Among the SIA features are a collection of the latest articles, briefings and news bulletins on the topic; links to related web sites; and a threaded discussion area where experts in the field and other interested parties can exchange ideas.

The MSOSA initiated the SIA concept with its web sites devoted to Operations Other than War (OOTW) and Simulation Based Acquisition (SBA).

Visitors to the MSOSA SBA SIA will find the just-released draft *Road Map for Simulation Based Acquisition* and a forum for expressing their views on the topic.

Other popular features of the MSOSA web site are the new Frequently Asked Questions (FAQ) page and the M&S Calendar. Since its introduction in June, the M&S Calendar has quickly become the definitive source of information on upcoming M&S related events. Through the calendar's interactive pages, visitors can find a wide variety of event information and register for upcoming events using online registration forms. Information on events is easy to obtain using several of the optional calendar views and the site's integral search features.

The MSOSA continues to serve as the central M&S help desk. It is the first place to look for M&S advice, information and answers to specific questions. In addition to general M&S questions, the MSOSA Help Desk also serves as the help desk for High Level Architecture (HLA) and Modeling and Simulation Resource Repository (MSRR) related requests for assistance.

Call the MSOSA Help Desk at (703) 998-1623, or contact it through its web site at <http://www.msosa.dmsmo.mil>. MSOSA's new toll-free phone number in the Continental U.S. is (888) 56 MSOSA (or 566-7672). International toll-free numbers are also available from several foreign countries. These numbers are listed on the MSOSA web site. Send e-mail requests for assistance to [msosahelps@msosa.dmsmo.mil](mailto:msosahelps@msosa.dmsmo.mil).

## Looking for a Date?

Need the dates, registration information, a point of contact, or the web site for an upcoming M&S conference, but don't know where you put the brochure?

Check the new  
**"M&S Calendar"**  
at

<http://www.msosa.dmsmo.mil/>



# HLA opens market for simulation tool developers

By Chris Turrell  
DMSO HLA Staff

DoD's High Level Architecture (HLA) for simulation opens the market for tools developers.

At a July HLA Tools Development Workshop for simulation tools developers, Air Force Col. Crash Konwin, Director of the Defense Modeling and Simulation Office (DMSO), challenged participants to "drive the DMSO out of the tools development business." He said the DMSO was interested in leveraging the talents of the modeling and simulation (M&S) community to improve the efficiency of simulation development and integration.

Dr. Judith Dahmann, DMSO Chief Scientist, provided an update of the HLA standards activities and told attendees that the DMSO strategy with regard to simulation tools development was to provide only the basic "starter kit" necessary to support early implementations. She stressed that the DMSO felt the M&S community needed to know the Defense Department's tools development plans in order to see the gaps where additional tools could be used. DMSO-developed basic HLA tools fall in three

distinct categories: *Object Model Tools*, *Federation Execution Planning and Verification Tools*, and *Runtime Tools*.

Bob Lutz of the Applied Physics Laboratory at Johns Hopkins University provided an overview of the HLA Tools Architecture. Roy Scrudder of the Applied Research Laboratory at the University of Texas described the DMSO data interchange format (DIF) development process.

Workshop participants were encouraged to get involved by providing early feedback on new developments.

Dr. Dahmann announced DMSO plans to host an "HLA Tools and Services Bulletin Board," open to the entire M&S community for posting HLA product information. According to Dr. Dahmann, the purpose of the bulletin board will be to enhance community awareness of products available to assist with HLA implementations. So far 23 tools have been nominated for posting and additional requests for information are received daily.

The HLA Tools and Services Bulletin Board will be operational by mid-September. For additional information visit the HLA web site at <http://hla.dmsmo.mil/>.

# HLA implementations appearing from broad spectrum of M&S users

By Chris Turrell  
DMSO HLA Staff

Implementations of the DoD High Level Architecture (HLA) for simulation are taking off across the modeling and simulation (M&S) community.

HLA applications are beginning to appear from a broad spectrum of M&S users who are discovering that they can now efficiently and effectively accomplish tasks through the application of M&S in areas that had previously been considered too costly or too high risk. A sampling of these initiatives include the Joint Warfighting Program (JWP) Information Superiority Experiment (ISX) *Trailblazer*, the *Foundation Initiative 2010* (FI 2010), and an Army command and control application, *Army Experiment 5* (AE5). A brief review of each of these programs provides some insights into the use of the HLA across the mix of very complex environments.

## **Trailblazer**

The JWP ISX *Trailblazer* is a congressionally funded program under the direction of the DoD's Director of Defense Research and Engineering (DDR&E). The program will be executed over a period of five years through the conduct of a series of ISXs designed to coevolve technologies, doctrine and organizations to achieve information superiority of U.S. military forces. Modeling and simulation applications relying on the HLA will support a number of these exercises beginning with a Joint Staff (J-6) experiment looking at Joint Suppression of Enemy Air Defense (JSEAD) against mobile surface-to-air missiles (SAMs). This will be followed by a J-6 live exercise (LIVEX)/analysis to provide a "model-test-model" approach to this complex problem. In addition to providing insights into real-world problems facing the Armed Forces, these experiments will offer valuable feedback to the HLA development process and will contribute to the future shaping and hardening of the HLA specification.

## **Foundation Initiative 2010**

*Foundation Initiative 2010* is a DoD Test and Evaluation (T&E) program aimed at enabling interoperability among ranges, facilities and simulations in a quick and cost-efficient manner. The goal is to foster reuse for range asset utilization and development of future resources. The HLA is being applied to bring together a number

of existing disparate initiatives within the T&E community. Across the country development test cells are being established at test facilities configured as range surrogates. Operated by range personnel, the range surrogates allow for the unobtrusive interface validation of range assets and insight into product performance in a range environment. Early experiments have enabled crews aboard live submarines at sea to fire virtual torpedoes against synthetic targets generated on the actual test ranges. The payback on these experiments goes well beyond the initial T&E initiatives with significant implications for training and readiness.

## **Army Experiment 5**

*Army Experiment 5*, Digital Training Experiment, supporting the Army's Digital Leader Reaction Course (DLRC), is being used to evaluate collaborative battle command tools, assess ways to train *Army XXI* leaders, and finally to assess the effectiveness of After Action Review systems as training support tools for digital leaders. This experiment, conducted with the support of the military faculty of the Army's Command and General Staff College and the World Class Opposing Force (OPFOR) from the Battalion Commander's Training Program, tested the DLRC's ability to provide an environment for training leaders in the visualization of the battlespace while making tactical decisions in a timely manner. Brigade-level tactical operations centers, equipped with actual command and control devices, including the Maneuver Control System (MCS), SINCGARS radios, All Source Analysis System (ASAS), Advanced Field Artillery Tactical Data System (AFATDS) and an unmanned aerial vehicle (UAV) terminal, were linked to simulation drivers using the HLA. Voice and message traffic, as well as digital displays, were all supported by the HLA Runtime Infrastructure (RTI) interface.

The early successes enjoyed by these programs as well as the lessons learned in the application of the HLA in actual test and training environments will enhance the future applicability of M&S processes and technologies to support experimentation.

### **• HLA Help Desk •**

Have a question about the HLA? Send your query to the HLA Help Desk at [hla@msis.dmsi.mil](mailto:hla@msis.dmsi.mil). We'll sort it out, send your question to the right people and get you an answer.

HLA

# HLA Compliant Federations

By Chris Turrell  
DMSO HLA Staff

The following High Level Architecture (HLA) federations have successfully demonstrated compliance with the HLA Specification:

- Airlift Flow Model
- Bradley A2
- CMPSS
- Eagle
- Eglin Guided Weapons Federate
- FedProxy (AEGIS Tool)
- In-Flight Refueling Federate (O'Sim Tool)
- Naval Simulation System
- NAWC-TSD F-14
- Rhino High Mobility Multi-Wheeled Vehicle (HMMWV)
- SAM Model Federate
- SIM II

HLA Federate Compliance Testing is a web-based service offered at no charge by the Defense Modeling and Simulation Office (DMSO) to the modeling and simulation community.

It is essentially a four-step process which begins with the submission of an application. Once the application is approved, there are three conformance tests designed to evaluate whether a federate conforms to the items specified in the HLA Compliance Checklist. Current testing supports versions 1.1 and 1.3 of the HLA Specifications, and Runtime Infrastructure versions 1.0.3 and higher.

Both classified and unclassified testing are available.

Additional information on HLA Compliance Testing and the compliant federates are available on the HLA web site at <http://hla.dmsomil> (select "HLA Compliance Testing"), or by contacting the certification agent at [hlatest@msosa.dmsomil](mailto:hlatest@msosa.dmsomil).

## HLA emphasis, *Continued from p. 1*

fact that they have participated in and significantly contributed to the success enjoyed by the HLA to date," Dr. Judith Dahmann, DMSO Chief Scientist, told members of the Architecture Management Group (AMG) of the DoD Executive Council for Modeling and Simulation (EXCIMS) recently. "Numerous challenges remain to be addressed during the implementation phase, but none are viewed as insurmountable, thanks to your hard work and community support."

The following recap helps frame the significance of this new phase.

### • Phase 1

Phase 1 of the HLA development process occurred between June 1994 and March 1995. The initial HLA definition was developed through the efforts of the Defense Advanced Research Projects Agency (DARPA) Broad Area Announcement (BAA) contractor teams and a separate Program Evaluation Team. Phase 1 culminated with the release of the initial HLA definition at the Spring Distributed Interactive Simulation (DIS) Workshop in March 1995.

### • Phase 2

Phase 2, Baseline Development, extended from March 1995 through September 1996. During this phase the focus shifted to the development of a baseline definition by the AMG through the prototyping and assessment of the HLA across a broad range of DoD M&S applications. These early protofederation experiments gave form and substance to the HLA specification and resulted in DoD's adoption of the HLA in September of 1996 as the standard technical architecture for all DoD simulations.

### • Phase 3

Phase 3 of the HLA development cycle was marked by the technical transition of the specification, which included its stabilization and submission for industry standardization to both the Institute of Electrical and Electronics Engineers (IEEE) and the Object Management Group (OMG). This process was supported by the development and fielding of freeware supporting software and the creation and deployment of HLA support services, including compliance testing, HLA education and training outreach programs, and a supporting tools architecture and tools development program. Membership in the AMG was expanded from the initial 16 members to 22 to broaden the development base and further the maturation process of the specification. Two recent events have broadened the HLA's exposure beyond the traditional M&S community. It was incorporated into the DoD Joint Technical Architecture (JTA), Version 2.0, and was accepted as the foundation for the NATO interoperability architecture when the Steering Group on M&S (SGMS) adopted it in the NATO M&S Master Plan (NMSMP).

### *The new stage...*

Phase 3 draws to a close in September 1998, setting the stage for the transition to Phase 4 and its focus on HLA implementation. As in the past, the DMSO plans to do its part in providing the support essential for the successful implementation of the HLA. The HLA Cadre Program, initiated during Phase 3, will continue to mentor and support key HLA transition efforts across a broad spectrum of the M&S community. A marked increase in support from industry and NATO is also expected during this phase. The HLA supporting tools architecture initiated during Phase 3 is being overtaken by commercially developed tools and support services. An example is the software interface, the RTI, that enables the federation of disparate simulations through a common interface specification.

With the SGMS approval of the NMSMP in July the plan moves into the final coordination process in NATO. Acceptance of the NMSMP is expected before the end of the year. The recommendation for implementation of the NMSMP includes a series of *Pathfinder* exercises to forge the way for further expansion and use of the HLA among NATO allies.

This broad base of support will significantly improve and mature the HLA specification over the near term, and insure its development and growth in the future.

## Latest CMMS Resource Center to demo at SIW, JSIMS/JWARS data now available

By Tom Johnson, CMMS Toolset Project Manager, and Micharel Loesekann, DMSO CMMS Lead

The latest version of the Defense Modeling and Simulation Office (DMSO)-sponsored Conceptual Models of the Mission Space (CMMS) Resource Center and associated tools will be demonstrated at the Simulation Interoperability Workshop (SIW) in Orlando, Sep. 14-18.

The goal of the CMMS as stated in Sub-Objective 1-2 of Department of Defense's (DoD) Modeling and Simulation Master Plan is to "develop a conceptual model of the mission space for each DoD mission area to provide a common basis for development of consistent and authoritative modeling and simulation (M&S) representations."

CMMS Program Objectives include:

-- Enhance interoperability and reuse of models and simulations by accessing descriptions of real-world operational entities, their actions and interactions.

- Identify authoritative sources of information.
- Integrate information from independent knowledge acquisition sources.
- Develop and maintain management processes (a plan for validation of real-world knowledge, coordinated presentation of knowledge).
- Establish a broadly applicable set of CMMS resources and tools.

The World Wide Web-deployed CMMS Resource Center and tools provide a common starting point for constructing consistent and authoritative M&S representations, and to facilitate interoperability and reuse of simulation components

An important feature of the CMMS is its ability to capture conceptual or mission space models produced by the major DMSO Partner Simulation programs including the Joint Simulation System (JSIMS) and the Joint Warfare System (JWARS).

Converters provide automated support for translating JSIMS and JWARS data from its "native format" into CMMS Library data structures. A CMMS Data Interchange Format (DIF) provides a standardized intermediate form between heterogeneous native formats and the CMMS Library. During the conversion and integration process tests for referential integrity, common semantics and syntax and the identification of redundant entities and processes are performed on the data.

The CMMS is being incrementally developed and deployed over six-month development cycles. The latest cycle, which concluded in early September, completed the development of converters that im-

port native format, "tag" and parse both JWARS and JSIMS Mission Space Model (MSM) documents into the CMMS Resource Center Common Library.

Using innovative software techniques these converters are able to translate free-text MSM documents according to explicit business rules and load the data into an Oracle database. Once the information is in the database other developed tools export this information in a variety of formats for reuse by users.

The CMMS Library supports user-tailored views of the library and associated tools with a variety of browse, locate, export and report features to access and use MSM data. The CMMS Libraries store atomic model elements so they can be combined into views supporting diverse users and their specific analytic and programmatic needs. A "hierarchical" view presents a "snap shot" of model behaviors and associated decompositions. A "functional" view allows an analyst to display detailed information concerning a model's explicit processes or entities. An analyst can view data concerning a process' inputs and outputs, allocations, behavioral controls and conditions, as well as its parents and children.

The different CMMS Library views are supported by a variety of tools including a Model "Analyzer," Common Semantics and Syntax, detailed dictionaries, style guides, knowledge acquisition templates and a CMMS User Forum

The recently increased functionality of the CMMS makes the CMMS Resource Center the "first stop" for conceptual modelers and simulation developers.

A "beta" version of the CMMS Toolset can be found online at <http://38.241.48.9>. A final CMMS version is scheduled for release in late September.

### For further info...

For further information about the CMMS Resource Center contact:

**Jack Sheehan, CMMS Technical Director**  
Defense Modeling and Simulation Office  
(703) 998-0660

**Michael Loesekann, DMSO CMMS Lead**  
[mloeseka@msis.dmsi.mil](mailto:mloeseka@msis.dmsi.mil)  
(703) 824-3432

**Tom Johnson, Project Manager**  
CMMS Toolset Project  
[tjohnson@imcva.com](mailto:tjohnson@imcva.com)  
(703) 318-8044, ext. 205

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## The KAT that roars

# Beta testers line up for new KA tool

By Cynthia Tuttle, Project Leader,  
and Bruce Harris, Project Manager  
CMMS KAT

Simulation programs are lining up to become beta testers of the Defense Modeling and Simulation Office's (DMSO) Knowledge Acquisition Tool system, commonly known as the "KAT."

### Develop-and-capture tool

The KAT is a type of development-and-capture tool within the Conceptual Models of the Mission Space (CMMS) Toolset Architecture. The purpose of a development-and-capture tool is to assist subject matter experts and knowledge engineers in gathering mission space information for their mission space models during knowledge acquisition (KA). Examples of develop-and-capture tools include Computer Aided Software Engineering (CASE) tools and text-based forms. The KAT combines features from CASE tools and text-based forms into an economical solution for modeling and simulation (M&S) KA needs.

The DMSO is sponsoring the effort to develop the KAT. The need for the tool was recognized early during CMMS prototyping and became even more apparent during the CMMS Prototype Experiments (*DMSO News*, Volume 3, Number 2).

Current KA efforts by major simulation programs involve the use of Commercial-Off-The-Shelf (COTS) CASE tools, such as *Rational Rose* and *Statemate*, and custom text-based forms. The Joint Simulation System (JSIMS) Enterprise Formalized Data Products (FDPs), which are based on *Microsoft Word* templates, are an example of text-based forms.

A CASE tool enforces business rules for more accurate data entry, but typically is very expensive and requires training in the design methodology that it supports. Often, the methodology supported by the CASE tool is not appropriate for the KA effort, because a CASE tool is usually built to support software design rather than KA.

A text-based form has the advantage of being simple to use and having inexpensive up-front costs. Often, the form is designed in a common word processing

application such as *Microsoft Word*. The disadvantages of the text-based form include the lack of business rule enforcement, lack of common semantics and syntax enforcement, lack of a query capability, and the difficulty in exporting the forms to another format. The hidden cost of using the text-based form is the time spent interpreting the semantics of the descriptions, re-entering data multiple times, and trying to extract only subsets of data from the



form without having to sift through the entire document.

The KAT is a database application. It provides data entry forms for capturing knowledge and stores the data in a relational database. KAT users are not required to have database skills. The current version of KAT is based on *Microsoft Access 97*. Use of the *Microsoft Access* database allows for the software to be released in a royalty-free format for users who do not own a license for *Microsoft Access*.

### KAT supports JSIMS FDPs

The KAT is designed to support the JSIMS Enterprise FDPs. The FDPs represent models of the enterprise mission space. They are categorized as processes, organizations, communication networks, information items, and equipment. Until now, FDPs have been created in *Microsoft Word* and stored as *Word* documents. The KAT collects the same information that is captured by the FDP Forms.

The current version of KAT generates FDP *Word* documents from the data stored in the database. The JSIMS Enterprise is still dependent on having their FDP mod-

els in the recognizable *Microsoft Word* format for their validation efforts. Future versions of the KAT will be capable of importing and exporting to the DMSO CMMS Data Interchange Format (DIF), which will enable users to store, integrate, analyze and reuse models in the CMMS Model Library.

### KAT features

The KAT has features that support data quality and promote efficiency. Features include:

- Convenient dropdown-list boxes. These controls reduce data re-entry and enforce consistency.
- Support for pictures. Very often paragraphs are accompanied by a diagram that assists in describing the concept.
- Enforcement of business rules. For example, a new record may not be created unless all of its mandatory fields are filled.
- Supports filtering and queries. Users can search for and view only the information in which they are interested.
- Extendable. Input forms and output formats can be tailored.

### KAT benefits

• Low cost alternative to CASE tools. The KAT can be released as a royalty-free application.

- Supports quality assurance. Enforcement of business rules promotes accuracy.
- Increases productivity. Convenient controls such as dropdown-list boxes reduce typing. Users don't have to worry about making pretty documents, they can concentrate on just filling in the data.
- Raises potential for reuse. Export to the CMMS DIF will make the data available for other purposes through the CMMS Model Library and integration and analysis tools.

The KAT was publicly demonstrated at the JSIMS CMMS Integrated Product Team (IPT) meeting in June and at the last DMSO Data Engineering Quarterly Performance Review (QPR) in July, receiving

See *KAT ROARS*, p. 11

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## CMMS Registration Template

# Project key to exchange of registration info

By Peggy Gravitz, CMMS Registration Template Project Manager,  
and Michael Loesekann, DMSO CMMS Lead

The Conceptual Models of the Mission Space (CMMS) Program has an objective to register the conceptual models being developed by the major Defense Modeling and Simulation Office (DMSO) Partner Simulation Programs, including the Joint Simulation System (JSIMS) and Joint Warfare System (JWARS).

The CMMS Registration Template (RT) provides simulation developers with access to CMMS registration information in a standard format. The CMMS RT will be key to creating a system which supports the exchange of registration information among cooperating autonomous and heterogeneous peer nodes. Each node will develop the capability to interface with the specified common format and structure.

The CMMS RT provides the format and content for interchange of registration metadata among conceptual models that were constructed by distinct organizations using disparate metadata storage implementations. The registration template eliminates the need for simulation developers to understand the differences between the registration metadata specifications of related programs. The CMMS RT specifications provide a mechanism for seamless interchange of metadata between programs, as well as allow simulation developers a standard for accessing metadata information for each participating program.

The CMMS-RT will be developed and demonstrated in two iterations. The first iteration will encompass requirements from the JWARS Program, the JSIMS CMMS Formalized Data Products, and the DMSO CMMS Library. The second iteration will extend the CMMS RT to include requirements from the Army's Warfighters' Simulation 2000 (WARSIM) Functional

Description of the Battlespace, the Ballistic Missile Defense Organization (BMDO) Virtual Data Center, the Office of the Secretary of Defense Program Analysis and Evaluation (OSD PA&E) Joint Data System, the High Level Architecture (HLA) Object Model Data Dictionary and the HLA Object Model Library.

Each iteration of the CMMS RT will create a data interchange format (DIF) package and a data dictionary using the Data Analysis and Reconciliation Tool (DART). The DIF package will consist of the logical template, physical data structure and the set of business rules.

The DMSO Data Engineering Division is developing the CMMS RT project with technical support from COLSA Corporation.

### *For more info...*

For further information concerning the CMMS Registration Template contact:

**Jack Sheehan, CMMS Technical Director**  
Defense Modeling & Simulation Office  
(703) 998-0660

**Paul Agarwal**  
COLSA Corporation  
*pagarwal@colsa.com*  
(256) 922-1512, ext. 2977

**Michael Loesekann, DMSO CMMS Lead**  
*mloeseka@msis.dmsi.mil*  
(703) 824-3432

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## DAVIE available as GOTS product, runs on Windows 95/NT 4.0

By Bob Senko  
DAVIE Project Manager

The Data Verification Interactive Editor (DAVIE), a data quality checking tool, is designed to accomplish data verification edits on existing American Standard Code for Information Interchange (ASCII) data files or relational database tables.

Development of the DAVIE application was a Defense Modeling and Simulation Office (DMSO)-sponsored project. Completed in March, it is available as a Government-Off-The-Shelf (GOTS) product. The DMSO will provide initial training and extensive online help is available.

The DAVIE can be installed at any site having a Structured Query Language (SQL)-based Relational Database Management System (RDBMS), such as *Oracle*, *IBM Database 2*, *Ingres*, *Sybase*, *Informix*, and many other Open Data Base Connectivity (ODBC)-compliant database systems. It operates on data in ASCII fixed-length files, other ASCII file formats such as comma-separated variable formats, and *dBase*, *Foxpro*, and *Paradox*. The DAVIE runs on *Windows 95*, or *Windows NT 4.0*. While it requires an SQL-based, ODBC-compliant RDBMS at the user site, the target database can be held internally in

DAVIE or be accessed from other RDBMSs through a network.

The DAVIE performs data verification as follows:

- Descriptions of the data elements are entered in the DAVIE data directory and data element dictionary, either through manual entry or automated download from the source.
- The user then creates rules to verify the data in close coordination with the data owner. Some rules, such as blank checks,

See *DAVIE*, p. 13

# MSRR Intel Node goes online Sep. 30th, demo set for SIW

By Richard Bernstein  
DIA Liaison to DMSO

The classified Intelligence Node of the Defense Intelligence Agency's Classified Modeling and Simulation Resource Repository (MSRR) will go online starting Sep. 30.

## **An initial capability**

The DIA, which is responsible for providing Department of Defense (DoD) Intelligence community with product support to DoD model and simulation (M&S) users and developers, developed the Intelligence Node as an initial capability to meet the ever expanding requirements of the M&S community.

Currently, processing intelligence data for the M&S community can be very manpower intensive. The M&S community must be able to access, acquire and capture valid intelligence data. Access to the MSRR is designed to reduce the processing overhead associated with loading intelligence data into Defense simulations and wargames. The Intelligence Node establishes the foundation for the electronic retrieval of classified, finished intelligence products by sanctioned M&S programs. Resource owners of intelligence products are encouraged to host these resources on their local systems and to register them in the Intelligence Node of the MSRR where users or developers can readily locate them.

Intel Node resources include:

- Tools
- Authoritative Information Sources

- Models and Simulations
- Intel Node services include:
- Dynamic browser of resources by category and key words
  - List and link to the 10 most-requested resources for the last month
  - Interactive calendar of events
  - Message board to share information by subject area
  - Answers to frequently asked question
  - Link to other M&S nodes
  - Resource registration

## **Future efforts**

Future efforts call for authoritative intelligence products to be available to the M&S community via standard data interchange formats such as Unit Order of Battle, System's Characteristics and Performance, and Targets and Facilities.

Access to the DIA Intelligence Node of the MSRR will be via the DoD's Secret Internet Protocol Router Network (SIPR-Net). An unclassified demonstration of the Intel Node will be available at the Simulation Interoperability Workshop in Orlando, Sep. 14-18.

DIA is the DoD M&S Executive Agent (MSEA) for Intelligence, and the Joint Simulation System (JSIMS) Executive Agent (EA).

## **For more info...**

For more information contact Richard Bernstein at (703) 824-3435 or (202) 231-8934, or e-mail at [rbernste@msis.dmsos.mil](mailto:rbernste@msis.dmsos.mil).

# UOB

## **Unit Order of Battle Program Update**

By Michael Hopkins  
UOB Project Manager

The Unit Order of Battle (UOB) Project, sponsored by the Defense Modeling and Simulation Office (DMSO) Data Engineering program, includes two main items.

The first is the UOB *Data Interchange Format* (DIF). The DIF casts unit-oriented order of battle information from any source in a single understandable format. This format eliminates the need for simulation developers to understand the minor differences between service specific and foreign UOB data sets. Further, the format is based on accepted DoD standards.

The second item is the UOB *Data Access Toolset*. The toolset provides a mechanism to produce unit order of battle data in the interchange format. The toolset features a data browser to allow a user to inspect unit order of battle data and a force structure editor (FSE) to task organize forces for a particular simulation exercise. The toolset includes the unit order of battle data library, which comprises several authoritative unit order of battle data sources.

The toolset, a web-based application, is available over the Internet and the DoD's Secret Internet Protocol Router Network (SIPRNet). Therefore, users can access UOB data in the interchange format without having to host and maintain UOB databases. The toolset is available as part of the Defense Modeling and Simulation Office (DMSO) classified and unclassified Modeling and Simulation Resource Repository (MSRR).

## **Kat roars**

*Continued from p. 9*

much interest from prospective users among the JSIMS Enterprise modeling and simulation programs. The initial release of the KAT in July is undergoing testing by the NASM program. The August release of KAT will be tested by the *Force XXI* program. Future versions of the KAT will support the CMMS Common Semantics and Syntax Data Dictionaries. In Fiscal Year 99 the KAT will be integrated into the Joint Warfighting Center (JWFC) Joint Exercise Management Package (JEMP) suite of tools.

## **For more info...**

For additional information on the KAT contact Mike Loesekann at (703) 824-3432, or by e-mail at [mloeseka@msis.dmsos.mil](mailto:mloeseka@msis.dmsos.mil).

## Meanings matter

# CMMS Data Dictionary key resource for producing conceptual models

By Bruce Harris  
CMMS Data Dictionary Project Manager

The Conceptual Models of the Mission Space (CMMS) intends to support a variety of modeling methods and to be compatible with a number of commercially available modeling tools.

The CMMS concept is to permit mission space model developers to employ their preferred modeling methods and tools to instantiate the Entity-Action-Task-Interaction (EATI) representation. Of necessity, some consensus on the data to be entered into the EATI representation is required for interoperability.

Because the CMMS supports multiple methodologies and a variety of Commercial-Off-The-Shelf (COTS) tools, it needs to specify more than just a lexicon in a data dictionary. Under direction of the Defense Modeling and Simulation Office (DMSO), a CMMS Common Semantics and Syntax (CSS) has been developed as follows:

- The CMMS CSS is composed of a lexicon, or dictionary, embedded in a domain-specific taxonomy, common representation templates (for the EATI components) and Computer Aided Software Engineering (CASE)-tool specific style guides.
- The lexicon and domain-specific taxonomy is composed of nouns-to-name entities and attributes and verbs-to-name processes, tasks and actions.
- The lexicon and taxonomy are derived from over 650 data sources, such as Joint Publication 1-02.
- An analysis of the Department of Defense (DoD) Data Dictionary System (DDDS) was conducted to map and match CMMS CSS terms where possible.
- Recommended "common data elements" were selected.

### Current issues

The following issues still need to be addressed:

- CMMS mission space models will eventually feed High Level Architecture (HLA) Federated Object Models (FOMs)

and Simulation Object Models (SOMs) development. Therefore, the CMMS CSS and the HLA Object Model Data Dictionary (OMDD) need correlated and consistent content.

• CMMS CSS content is critical to the CMMS Technical Framework Toolset integration procedure. Therefore, CMMS-CSS content needs to be verified and validated by appropriate military operations subject matter experts. Knowledge acqui-



sition needs to be conducted as necessary to fill in missing data.

- CMMS CSS and HLA OMDD content needs to be tested for completeness and usability by simulation development projects which are building CMMS mission space models and HLA FOMs and SOMs.
- The DDDS does not support HLA and CMMS needs as presently constituted and filled. Therefore, concrete recommendations are required for modification and improvement of the DDDS.

### CMMS CSS Project

The objectives of the project are to:

- Develop and execute, as appropriate, a formal Verification and Validation (V&V) Plan for CMMS CSS content.
- Analyze authoritative sources for doctrine and systems, the HLA OMDD, the CMMS CSS, and the DDDS for common semantics and syntax directly relevant to the Army's Warfighters' Simulation 2000 (WARSIM) and the Air Force's National

Air and Space (Warfare) Model (NASM) development.

• Extract suitable *nouns, verbs*, and other semantic elements for inclusion in the OMDD and CMMS Data Dictionary (DD), and eventual use in WARSIM and NASM mission space models and HLA FOMs and SOMs.

• Map and match OMDD and CMMS DD *nouns, verbs*, and other semantic elements to the DDDS lexicon as appropriate.

• Identify new lexicon items for inclusion in the DDDS, as appropriate (the U.S. Army Electronic Proving Ground's Joint Data Base Elements (JDBE) would be tasked to actually submit to the DDDS).

### Where we are

A Data Dictionary Requirements Analysis and formal V&V Plan were submitted in May. Identification of doctrine and systems relevant to WARSIM and NASM were completed in June. Formal V&V of the references used in the existing CSS database were completed in July and the V&V of the lexicon items is expected to be completed in September. Fill of the missing lexicon items and the other project tasks is ongoing.

Of note, the Data Dictionary Requirements Analysis examined eight WARSIM and NASM Formalized Data Product types and determined that 19 of 23 data elements used in WARSIM and 26 of 31 data elements in NASM needed lexicons. The doctrine and systems analysis also identified additional potential user groups for DMSO products (CMMS CSS, Order of Battle Data Interchange Format, etc.) and was able to identify doctrine requirements specific to WARSIM and NASM, plus an additional category supporting cross-domain interactions.

The V&V process is being supported by a *Microsoft Access*-based tool which uses a variety of forms to capture V&V information and store it in a database (see figure on page 12). The use of dropdown-

See DATA DICTIONARY, p. 13

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# ***DMSO tool expedites KA efforts ADS provides knowledge acquisition...today***

By Dave Kendrick, Project Manager,  
and Michael Hopkins, DMSO Deputy Data Engineer  
ADS Project

The Authoritative Data Source (ADS) Project is providing the Department of Defense (DoD) modeling and simulation (M&S) community a valuable knowledge acquisition (KA) tool...today.

The Defense Modeling and Simulation Office's (DMSO) ADS Project is populating a catalog of data and knowledge sources. The resource is commonly referred to as the ADS Library. In addition to identifying sources by name a standard set of metadata is included for each. The library is robust with search capabilities, ease of access and user friendliness. It expedites the KA efforts required by either the development of new models or simulations like the Joint Simulation System (JSIMS), or the population of runtime databases utilized by existing M&S applications like the Joint Theater Level Simulation (JTLS).

The standard set of metadata being assembled for each source is intended to provide the user of the library sufficient information to make an informed decision as to the appropriateness of the particular information for his needs and to expedite the process in acquiring that information. To further assist in determining appropriateness Components are asked to provide designations, or levels of recognized authoritativeness, to each

of their sources. These are included in the metadata set. If security handling instructions or other constraints permit, direct links will be provided within the metadata as well.

The library is currently populated with metadata for 756 sources and is available at an unclassified level on the Modeling and Simulation Resource Repository (MSRR) at <http://ads.msrr.dmsomil>.

Sources include a wide selection of functional areas and come from the DoD, non-DoD Government, foreign and commercial producers. The next update to the library is scheduled for November and should bring the library to over 1000 sources. A large number of additional candidate sources have been identified and the process of assembling the metadata on these is on going.

The near future will see the ADS Library available on the Secret Internet Protocol Routing Network (SIPRNet) at the appropriate level of classification. This will allow for the expansion of metadata content and increase the number of direct links to the sources.

## ***For more info...***

For additional information contact:

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(703) 824-3431

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## ***Data Dictionary***

*Continued from p. 12*

list boxes, enforcement of business rules, and support for "filtering and queries" increases productivity and promotes accuracy and completeness.

The purpose of the complementary focus on WARSIM and NASM is to present two of the current M&S programs actively involved with conceptual modeling with a tailored resource that satisfies the needs of the knowledge engineer, the agency or

program conducting the knowledge acquisition, and the software engineer. To enable the CMMS DD team to carry out that task, constant communication is maintained among representatives of NASM and WARSIM and the CMMS DD administrators. That communication also helps to properly balance the interests of all involved user groups in a collective resource like the CSS.

The end result of the CMMS Data Dictionary project should be a resource em-

ployed as an integral part of the production of conceptual models.

## ***For more info...***

For additional information on the CMMS Data Dictionary Project contact:

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## ***DAVIE***

*Continued from p. 10*

duplicate checks, and domain checks are semi-automated by checking boxes. Other rules are created in the form of SQL statements.

- Once rules are created, they are stored in the DAVIE for reuse.
- The target database is then copied into DAVIE and the rules are executed against the copy.

- The DAVIE displays any violation of the rules and highlights problem record(s).

If problems are found, the user can send a system-generated report to the data owner for corrections. The DAVIE also allows the user to make on-the-spot corrections in the DAVIE copy of the database. If the user elects to change the database, DAVIE will generate SQL statements to send to the owner of the original data. It will also output a report showing any

data that was changed, with a view of the original and changed data, and the complete set of rules from the verification run.

## ***For more info...***

For additional information contact:

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**MEL access moves to MSOSA in Oct**

# **MSEAs integrate efforts to meet technology challenges**

By Paul Foley  
DMSO Environmental Representation Project Manager

Meeting the challenges facing modeling and simulation (M&S) environmental technology is an integrated effort for the three Department of Defense (DoD)-designated M&S Executive Agents (MSEAs) for authoritative representation of the natural environment -- terrain, ocean, air and space.

The challenges facing the MSEAs are:

- Unambiguous description and representation of the simulation objects required for representation of the physical environment.
- Definition of the processes and procedures that can generate databases containing those objects.
- Development of a library structure that allows those critical environmental resources to be discovered, ordered and tailored to meet simulation requirements.

Several essential programs addressing these challenges are:

- The Synthetic Environment Data Representation and Interchange Specification (SEDRIS).
- Various technology process-and-procedure developments focused on the generation of M&S resources to meet just-in-time requirements.
- The Master Environmental Library (MEL) system and related services.

Each of these programs is designed to meet specific aspects of the overall technology challenge. Together they comprise an integrated package that provides exercise managers, simulation developers, staff planners and analysts the resources required for conducting complex simulation operations.

## ***A robust interchange mechanism***

SEDRIS Project deliverables include a data model that unambiguously describes the representation of objects in the physical environment, an application programmer's interface, and interchange format. The SEDRIS will complete its initial development phase in October. The interchange specification will support all environmental domains -- terrain, ocean, atmosphere, and space, as well as descriptions of man-made objects that comprise the M&S physical environment. Additionally, a suite of tools has been developed to facilitate the evaluation of simulation databases, as well as source datasets, and generate and evaluate SEDRIS-compliant transmittals. With these capabilities the SEDRIS meets the environmental object definition challenge and provides a methodology for the interchange and reuse of resources through the MEL system. SEDRIS documentation will begin formal standardization review in Fiscal Year 99.



## Database generation technology

Data generation technology is comprised of:

- Technology supporting the use of a wide variety of source information.
- Procedures for use of commercial production processes.
- Definition of procedures that evaluate database correlation and consistency during both the generation phase and follow-on evaluation that are associated with simulation federation development.

The ability to exploit a wide variety of imagery, sensors and various physics-based model outputs is essential in employing simulation technology to responsively meet operational requirements. Procedures that allow the use and densification of existing environmental information to fill data gaps must also be defined. Reports on the evaluation of alternate imagery involving multi- and hyper-spectral sources, infrared, thermal, radar and inferomet-

The tools and procedures needed to evaluate database generation and reuse potential are critical requirements in achieving database reuse and simulation federation interoperability. Defined measures of consistency coupled with software tools that afford ease in evaluation are being investigated in all environmental domains and in virtual and constructive simulations. Determining when to use true multiresolution database design versus using database insets at variable resolution are essential design parameters for simulation networks. This issue is particularly important to simulation federations that must interface dismounted combatants in joint scenarios involving a wide range of unit configurations, naval, air-to-air, and close air support operations.

### Access to resources

The MEL M&S Access Site will be relocated to the M&S Operational Support Activity (MSOSA) in October. The MEL system continues to

ing of resource requests. An early capability in this area will allow weather scenario generation in response to specific simulation requirements. The resulting correlated and consistent datasets will ensure simulation events are controlled by realistic environmental conditions to meet training, analysis, and system test and evaluation requirements. Procedures are also being defined to provide integrated ocean datasets that support movements ashore and off-shore simulation operations.

### MSEA collaboration

All MSEA programs represent collaborative activities involving leveraged investments of the Defense Modeling and Simulation Office (DMSO), the Defense Advanced Research Projects Agency (DARPA), the Military Departments and Service laboratories, Joint program offices, the DoD and other Federal agencies.

### For additional info...

For additional information on the programs described above and other related activities contact the DoD MSEAs at the addresses below.

*(NOTE: The ASNE Office and the TMPO have both relocated and have new phone numbers. Because the OEA will soon relocate the DMSO Liaison phone number is also listed below.)*

#### Air and Space Natural Environment (ASNE) MSEA Office

asne@afcc.af.mil  
http://mse.scott.af.mil  
(828) 271-4210, Fax (828) 271-4334,  
DSN 673-9017

#### Ocean Executive Agent (OEA) Office

oceanea@msis.dmsomil  
http://rsd-www.nrl.navy.mil/OceanEA  
(202) 404-1369, Fax (202) 404-1662,  
DSN 754-, DMSO Liaison (703) 824-3434

#### Terrain Modeling Project Office (TMPO)

lillegardk@nima.mil  
http://www.tmpo.nima.mil  
(703) 262-4587, Fax (703) 262-4599



ric synthetic aperture radar have been prepared, or are under development. Use of historical climatology, data densification strategies in all environmental domains, and littoral classification schemes are being evaluated.

Use of commercially available hardware and software production environments is essential to development of an expanded marketplace to meet escalating database production demands. Accredited processes must be available to support database tailoring in meeting both mission planning and rehearsal, and analysis objectives. Interface with emerging three-dimensional geographic information systems technology is an important factor in providing the required database generation environment.

support discovery and ordering for a wide range of environmental information in all domains. The MEL will support delivery of resources in standard formats (e.g., SEDRIS) and be accessible over both the Internet and the Secret Internet Protocol Routing Network (SIPRNet). Some resources will require limited SIPRNet access owing to classification or release restriction. MEL operations are part of the M&S Resource Repository (MSRR) system and are linked to the Authoritative Data Sources (ADS) catalog. The MEL will host a models-and-algorithm catalog that initially addresses the atmosphere and space domains with follow-on expansion to all environmental areas. A services layer is being expanded to allow special tailor-

## **NATO MSMP**

*Continued from p. 1*

Council of National Armaments Directors (CNAD), and a Simulation Coordination Office (SCO) on the International Staff. The report invites endorsement by the Research and Technology Board (RTB), the CNAD, and the Military Committee (MC) before forwarding to the NAC for approval.

The Final Report and the NMSMP, Version 1.0 will be briefed to the RTB in Athens on Sep. 24, the National Armament Director representatives (NADREPs) in Brussels on Sep. 25, and the CNAD and MC again in Brussels on Nov. 5.

The NMSMP, which has taken just under two years to write and develop, crafts an Alliance approach to achieve interoperability and reuse that is essential to provide the Alliance the cost-effective simulation capabilities it needs. The Steering Group believes the NMSMP lays out the goals, objectives and actions to meet NATO's needs.

U.S. Air Force Col. Ken Konwin, Director of the Defense Modeling and Simulation Office (DMSO), is the Chairman of the SGMS.

### **ASK DMSO • [ASK\\_DMSO@msis.dmsomil](mailto:ASK_DMSO@msis.dmsomil)**

Have a question about the DMSO, its programs or DoD M&S policy, but don't know who to call? Send your query to [ASK\\_DMSO@msis.dmsomil](mailto:ASK_DMSO@msis.dmsomil). We'll sort it out, send your question to the right people and get you an answer.

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## **DMSO helps develop program ITEC Asia '98 program expands to include M&S**

By Larry Alexander  
DMSO Outreach Coordinator

ITEC Asia, a major event in the international training and education community, is expanding its focus this year to include modeling and simulation (M&S). Accordingly, the Defense Modeling and Simulation Office (DMSO) has been invited to be a primary contributor in developing this year's program.

The Fourth Annual International Training and Education Conference in Asia (*ITEC Asia '98*) will be held at the Raffles City Convention Center, Singapore, on Oct. 21 and 22. It is the first conference in the Far East that will feature tutorials, panels, and other presentations on the Department of Defense (DoD)-sponsored High Level Architecture (HLA) and other elements of the DoD Common Technical Framework (CTF) for M&S. The gathering will bring together approximately 150 technical leaders from the Ministries of Defense, industry, and academia of several countries from four continents.

The HLA, the cornerstone of the CTF, is proposed for acceptance by the North Atlantic Treaty Organization (NATO) as the standard for simulations used within the NATO Alliance, and has been nominated for consideration as an IEEE standard. To familiarize attendees with the technology, two tutorials are planned.

The first tutorial, presented by Dr. Judith Dahmann, DMSO Chief Scientist, will be a comprehensive introduction to the HLA. While designed for those unfamiliar with the subject, it will also be useful as a basic refresher. The tutorial includes an overview of the HLA development process, why it was conceived and how it is evolving. Descriptions of the latest versions of the HLA definition — the Rules, the Interface Specification and the Object Model Template — will also be presented.

The second tutorial covers the Object Development Process and will be presented by Bob Lutz of the Applied Physics Lab at Johns Hopkins University. The session will provide an overview of the Federation Development and Execution Process, as well as the HLA object modeling process. The HLA Object Model Tool suite will be described and demonstrated, along with how delegates can employ the features and components in their own M&S development efforts.

Two international panels are scheduled. In the first, representatives from commercial ventures in Canada, Sweden, the United Kingdom, and the United States will discuss the tools available to aid in developing HLA-compliant simulations. In the second, leading experts from France, the Netherlands, Swe-

*See ITEC ASIA '98, p. 4*