

Ballistic Missile Defense WALEXs: Collaborative Examination of Requirements

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Warfare Analysis Laboratory Exercises (WALEXs) have been successful in addressing complex problems in a collaborative environment, especially in the areas of mission analysis, concept exploration, requirements definition, and system acquisition. WALEX participants have gained extensive knowledge at significant cost and time savings to the sponsor compared with the amount of time and effort that would be expended in trying to achieve the same outcome through ordinary meetings, seminars, or war games. The Ballistic Missile Defense Organization has successfully employed WALEXs to improve their understanding of missile defense issues for both the United States and the international community. (Keywords: Ballistic Missile Defense, WALEX.)

INTRODUCTION

The Ballistic Missile Defense Organization (BMDO) has used the Warfare Analysis Laboratory Exercise (WALEX) process successfully since 1993. BMDO has found the process to be useful in several ways by, e.g., increasing the understanding and appreciation of critical issues; promoting consensus and exchange of information among participants; allowing for the examination of concepts, doctrine, systems, architectures, and policy issues; and facilitating the identification of new issues and ideas. For example, General and Flag Officers from the U.S. Pacific Command (USPACOM) and the U.S. Central Command (USCENTCOM) have participated in WALEXs designed to help them better understand the need for Ballistic Missile Defense (BMD) systems and assist in

defining the BMD requirements for their respective areas of responsibilities. In other exercises, the process has been used to help Action Officer-level representatives from the U.S. Joint Forces Command (USJFCOM), U.S. European Command (USEUCOM), U.S. Forces Korea (USFK), USPACOM, and USCENTCOM as well as North Atlantic Treaty Organization (NATO) coalition committees to understand critical BMD concepts and refine operational doctrine and requirements for BMD. BMDO has also used the process with high-level national and international defense policy and acquisition groups comprising the Office of the Secretary of Defense, National Armament Directors for NATO nations, and retired high-level officials to discuss the need for BMD, the need for multiple types

of systems to build a better defense, and the importance of international cooperation to achieve a robust BMD.

To achieve a successful WALEX, BMDO has recognized that appropriate participation in the exercises is a critical issue. Thus, BMDO-sponsored BMD WALEXs were the first WALEXs to be conducted at many sites around the world to enable full participation, including the Netherlands, Belgium, Germany, Japan, and several cities in the United States.

In this article, we present three WALEXs to demonstrate how the process has been successfully used by BMDO to address complex problems in a collaborative environment. These WALEXs will be explored in the context of meeting sponsor objectives and highlighting their impact.

NATO BMC³ WALEX

Background and Objectives

The NATO Battle Management Command, Control, and Communications (BMC³) WALEX was conducted on 22 and 23 October 1996 at NATO Headquarters in Ramstein, Germany. As a defense organization, NATO faces a growing air threat, not only from conventional aircraft but also from ballistic missiles, cruise missiles, and unmanned aerial vehicles. This threat, and ballistic missiles in particular, is increasing in sophistication and range, placing in jeopardy both a large area of NATO territory (Fig. 1) and NATO forces deployed out of area. The problem is aggravated by the proliferation of weapons of mass destruction. NATO's existing air defense system mainly focuses on aircraft threats, but it is now building an Extended Air Defense (EAD) to counter this growing threat.

The objective of this WALEX was to explore BMC³ issues related to the development and deployment of NATO's Air Command and Control System (ACCS) for EAD, focusing on BMC³ requirements for incorporating BMD into ACCS. Figure 2 illustrates the ACCS.

The NATO BMC³ Subworking Group, comprising 25 attendees representing 11 NATO nations, participated in this exercise. A portable network of laptop computers, using the Electronic Seminar Support (ESS) System, captured pertinent ideas and comments. Since English was a second language for most of the international audience, attendees were able to take

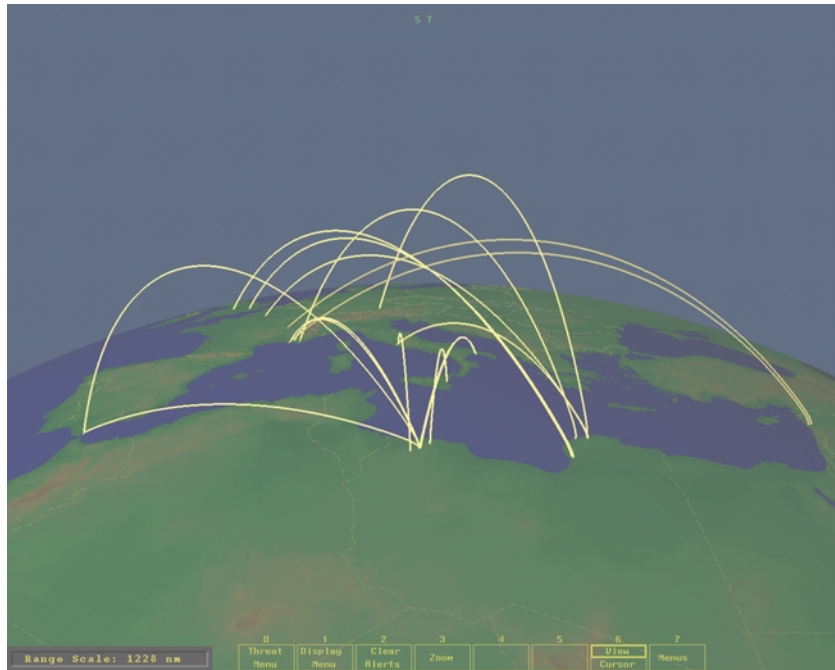


Figure 1. Screen shot of potential ballistic missile threats to NATO territory.

full advantage of this system by composing and recording their thoughts on the laptops. The working environment in the Ramstein conference room is shown in Fig. 3. A brief synopsis of the key issues discussed during the 2-day exercise follows.

Discussions

Information Management

Information management within ACCS, a key element of effective battle management, permeated the discussion of all scenarios presented in this WALEX. Participants agreed that for ACCS to adequately support the BMD mission, several information management issues had to be addressed:

- Early warning of a ballistic missile launch was deemed critical to EAD. The consensus was that an architecture and process for dissemination of ballistic missile early warning into NATO is required, even before the implementation of ACCS.
- Track data fusion and correlation were considered important issues; the discussions helped to clearly identify critical factors that required further study and examination (e.g., when and where the data fusion and correlation should take place).
- Although internal ACCS interfaces were specified and standardized, other factors were not adequately defined, i.e., the means by which the system was able to accept and provide information to external producers and users to support the BMD mission.

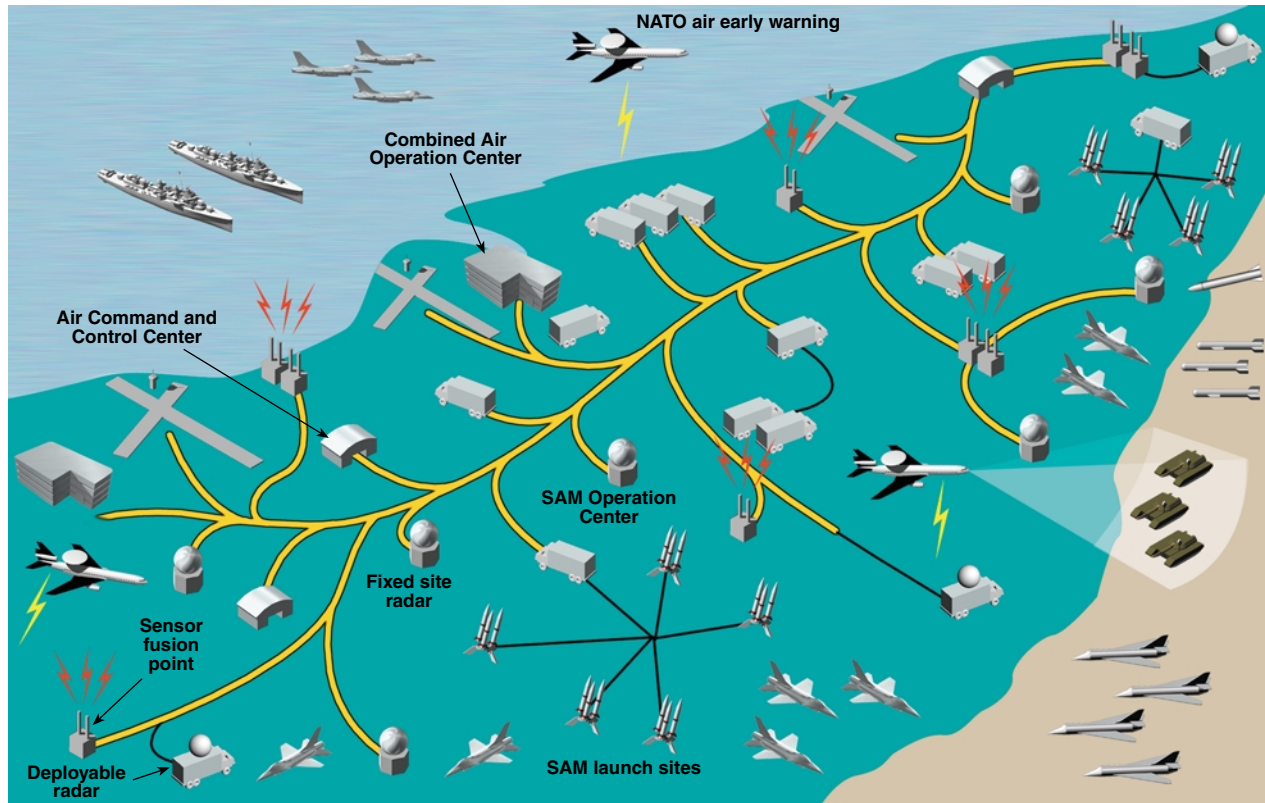


Figure 2. The NATO Air Command and Control System.

Command and Control

The main thrust of these discussions was to investigate and understand the command and control issues of a ballistic missile EAD. Several conclusions were drawn, including the following:

- Because of the short time lines of ballistic missile attack, establishing the command authority and rules of engagement would be especially critical when the trajectory of the missile crossed command boundaries within NATO regions.
- A consensus was reached that senior commanders and political leaders must understand the limitations and capabilities of ACCS to allow prioritization of defended assets.
- Participants recognized that ACCS must be flexible enough to match the deployments and mission assignments of defensive dual-capable systems (ballistic missiles versus aircraft, cruise missiles, and unmanned aerial vehicles).

Deployment of ACCS Out of Area

Within the ACCS structure, several elements have been designated as deployable. The WALEX presentations on out-of-area situations raised many issues regarding the ability to deploy, place, and provide connectivity



Figure 3. NATO BMC³ WALEX at Ramstein, Germany.

among these elements. Interoperability and coordination were seen as important issues in the context of a deployed out-of-area scenario, both within NATO-deployed forces and with other non-NATO forces.

Counterforce

ACCS will be designed to provide a force management and intelligence dissemination capability for the counterforce phase of missile defense operations. Critical issues important to ACCS were identified as the rapid and efficient exchange of information; the acquisition and dissemination of pertinent intelligence data; and the ability to identify targets, recognize the value of the information, and provide it to an appropriate counterforce asset.

Impact

The co-chair of the group was able to use the information gathered from this WALEX in his report to NATO's Missile Defense Ad Hoc Group. The results were also used to further discussions and studies by the BMC³ Working Group to clarify the issues uncovered during the exercise. The co-chair summed up his appraisal of the NATO BMC³ WALEX as follows:

In my view, the WALEX was a huge success. It took us step-by-step through the basics of the missile defense problem and enabled us to address a number of complicated battle management issues and develop approaches to deal with them. ... I consider the BMC³ WALEX to be an excellent problem solving mechanism and educational tool.

U.S.–ISRAEL BMD BATTLE MANAGEMENT WALEX

Background and Objectives

The United States has been helping the Israelis develop their own BMD system, a need that became evident during the Gulf War. Both countries recognize that it is to their mutual advantage to determine, before a conflict, how to best establish Battle Management Command, Control, Communications, Computers, and Intelligence (BMC⁴I) interoperability between their assets. Establishing this combined interoperability is critical should the United States have to deploy in or near Israel. Working groups consisting of representatives from both nations have been examining this problem for some time. To facilitate the process, BMDO, in conjunction with the Joint Staff and the USEUCOM J3 Staff, sponsored a WALEX developed and conducted by APL on 17 through 19 November 1997 (Fig. 4).

The goal of the exercise, from an operational perspective, was to identify relevant procedural and technical requirements associated with U.S.–Israel BMD interoperability. In addition, it was to be used to provide a forum through which the participants could achieve a common understanding of critical functions and relationships required to conduct combined BMD operations, and as a result, develop working BMC⁴I Combined System Operating Procedures (CSOPs). The development of CSOPs that would be acceptable to both nations had to be based on an understanding of the inherent differences between their philosophies on such issues as placement of defense assets, rules of



Figure 4. U.S.–Israel BMD WALEX (17–19 Nov 1997).

engagement, control of assets, doctrine, etc. The participants from each side were able to proceed once these differences were identified and understood.

Impact

Through full utilization of the WALEX process, the participants achieved consensus on key issues and produced a U.S.–Israel BMD BMC⁴I architecture concept and a CSOP. The Director of Operations, USEUCOM, made the following comment based on this WALEX experience:

The WALEX produced a common understanding of the critical functions crucial to conducting combined BMD operations with Israel. The exercise afforded the participants an intense and focused forum that produced a working BMC⁴I blueprint for integrated operations of a multi-tiered BMD force. In less than a week, the WALEX completed what would have required many months of staff work and travel and no doubt would still not have achieved the level of understanding generated by the WALEX.

SPACE-BASED LASER STRATEGIC POLICY ASSESSMENT WALEX

Background and Objectives

A growing concern exists in the United States regarding the increase in sophistication and range of ballistic missiles. As more and more nations build and test ballistic missiles that have the potential to threaten not only our allies but the United States itself, efforts have turned toward developing and testing a

new generation of defense systems to counter this threat. One such defense concept is the use of a space-based laser (SBL) to shoot down ballistic missiles (Fig. 5). Inherent in exploring this technology is examining the policy implications of developing and deploying an SBL system.

In the last 5 years, the SBL Program has overcome several technical hurdles and is continuing to advance the technologies necessary to realize a future operational capability. Congressional legislation has called for the development of a subscale SBL space experiment.

On 24 and 25 February 1999, APL conducted the SBL Strategic Policy Assessment WALEX. It drew on insights from a WALEX for the SBL Strategic Panel held on 4 and 5 June 1998. Both WALEXs examined the implications that the SBL system would have on U.S. national policy formulation. The panelists for the second WALEX were selected from former high-ranking policy officials from DoD, Capitol Hill, and selected government agencies, with a former Space Command Commander-in-Chief as the panel chair.

The purpose was to identify those issues that might affect technology selection and other decisions being made regarding the actual development of an SBL system. The exercise focused on exploring potential policy options afforded by an SBL, identifying key issues, and discussing the arguments for and against the system. To assist the panel in focusing their discussions, several key areas related to the development and deployment of an SBL system were presented (Fig. 6). These issues allowed the panelists to discuss each area in depth while still recognizing the cross-implications of decisions in

one area on another. The panel's specific role was to provide perspective and judgment about these key SBL issues and, in particular, which issues would weigh more heavily than others and which would be the "show stoppers."

Impact

During this WALEX and the wrap-up session, several insights were gained. Potential benefits were identified for developing an SBL system, especially in light of recent events (i.e., more countries are obtaining ballistic missiles that can directly threaten the U.S. homeland). Aside from providing national missile defense, the system might also play key roles in providing theater and tactical BMD, space control, and ballistic missile deterrence. Balancing the

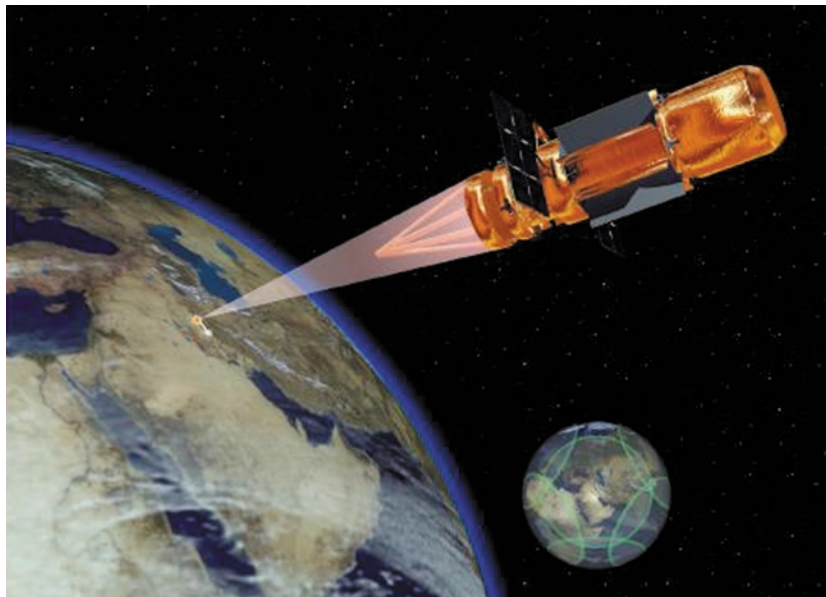


Figure 5. Spaced-based laser (with constellation depicted in background).

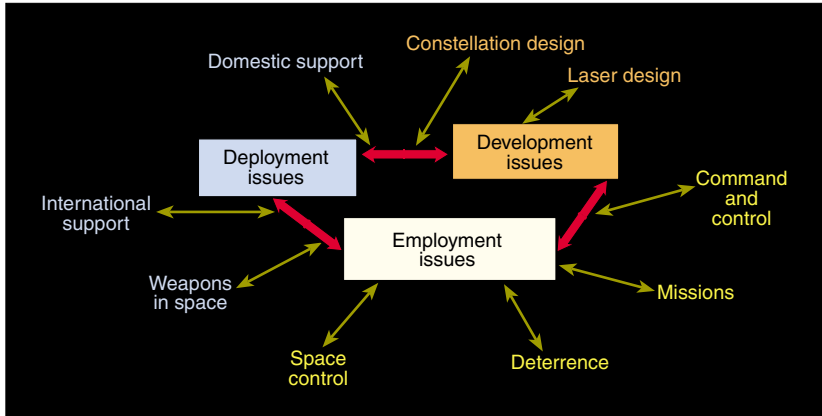


Figure 6. Key issue areas concerning use of an SBL system.

be an ongoing challenge. The panel noted that there will always be budgetary and emotional arguments against the system, but the need may eventually outweigh them.

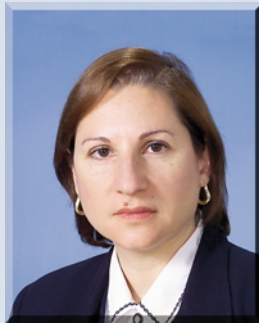
SUMMARY

Examples cited in this article show how BMDO has applied the WALEX process to a diverse set of problems, ranging from technical to operational to political. The process has allowed BMDO and the participants at each WALEX to gain knowledge and insight in a shorter

types and number of missions that such a system would perform against the cost and support for the system will

time and with less effort than would have been achieved through ordinary meetings, seminars, or war games.

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