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SANDIA REPORT

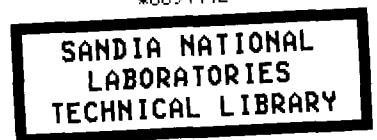# Cooperative Monitoring Workshop: Focus on the Middle East

Arian L. Pregenzer, Michael Vannoni, Kent Biringer, Pauline Dobranich

Cooperative Monitoring Workshop:
Focus on the Middle East

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Abstract

Sandia National Laboratories and the Institute for Global Conflict and Cooperation hosted a workshop on the application of cooperative monitoring to the Middle East. The workshop, held in Albuquerque, New Mexico, from July 17 through 21, 1994, was sponsored by the U. S. Department of Energy, the Arms Control and Disarmament Agency, and the U. S. Department of State. The meeting, which focused on use of technical monitoring tools and sharing of collected information to facilitate regional agreements, included participants from five regional countries as well as from American universities, the U. S. government, and U. S. National Laboratories. Some attendees previously participated in meetings of the Arms Control and Regional Security working group of the Middle East Multilateral Peace Talks. The workshop combined presentations, demonstrations and hands-on experimentation with monitoring hardware and software. An exercise was conducted to evaluate and recommend cooperative monitoring options for a model agreement between two hypothetical countries. Historical precedents were reviewed and the role of environmental and natural resource conflicts explored. These activities were supplemented by roundtable discussions covering Middle East security issues, the relationship of "national means" to cooperative monitoring, and cooperative monitoring of ballistic missiles in the Middle East.

Cooperative Monitoring Workshop:

Focus on the Middle East

July 17-21, 1994
Sandia National Laboratories
Cooperative Monitoring Center

Authors:
Arian Pregenzer
Michael Vannoni
Kent Biringer
Pauline Dobranich

Cooperative Monitoring Workshop:
Focus on the Middle East

Sandia National Laboratories
Albuquerque, New Mexico
July 17-21, 1994

Workshop Summary

Abstract

Sandia National Laboratories and the Institute for Global Conflict and Cooperation hosted a workshop on the application of cooperative monitoring to the Middle East. The workshop, held in Albuquerque, New Mexico, from July 17 through 21, 1994, was sponsored by the U.S. Department of Energy, the Arms Control and Disarmament Agency, and the State Department. The meeting, which focused on use of technical monitoring tools and sharing of collected information to facilitate regional agreements, included participants from five regional countries as well as from American universities, the U.S. government, and U.S. National Laboratories. Some participants previously participated in meetings of the Arms Control and Regional Security working group of the Middle East Multilateral Peace Talks. The workshop combined presentations, demonstrations and hands-on experimentation with monitoring hardware and software. An exercise was conducted to evaluate and recommend cooperative monitoring options for a model agreement between two hypothetical countries. Historical precedents were reviewed and the role of environmental and natural resource conflicts explored. These activities were supplemented by roundtable discussions covering Middle East security issues, national means and cooperative monitoring, and cooperative monitoring of ballistic missiles in the Middle East.

A high degree of rapport was developed among the technical specialists and the regional participants. The participants agreed that technically based monitoring has a role in the Middle East Peace Process and should be discussed in future working groups. Participants were very positive about future interactions with Sandia and the Cooperative Monitoring Center. Several participants emphasized that an important benefit of the Cooperative Monitoring Center and future regional workshops will be to create a constituency for arms control and peace within the technical community in a region. In light of the

importance of education and training, virtually all participants encouraged Sandia to host similar workshops in the Middle East.

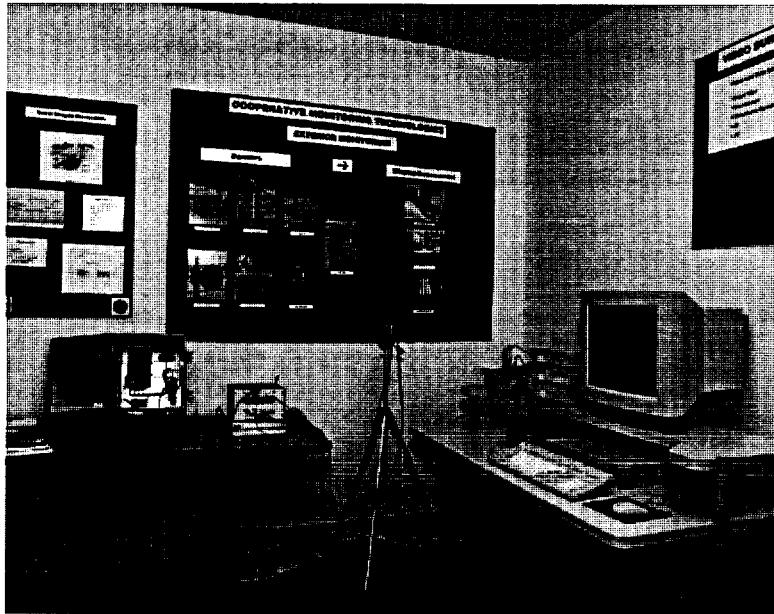*Participants in the Cooperative Monitoring Workshop, July 17-21, 1994*

Cooperative Monitoring Workshop:
Focus on the Middle East

INTRODUCTION

Sandia National Laboratories and the Institute for Global Conflict and Cooperation (IGCC) of the University of California conducted the "Cooperative Monitoring Workshop: Focus on the Middle East" from July 17 through 21, 1994. The purpose of the workshop was to assemble a select group of Middle East arms control experts and technical specialists and explore how cooperative monitoring could facilitate regional security efforts in the Middle East. The workshop was primarily sponsored by the International and Regional Security Division of the Department of Energy (DOE). The Arms Control and Disarmament Agency (ACDA) and the Department of State also provided guidance and support. Members of the academic, military, and government communities from Israel, Egypt, Qatar, Oman, and Kuwait attended the workshop. Also present were academics from several American universities and DOE and ACDA officials. Some participants had previously participated in formal and informal, or "track 2," meetings of the Arms Control and Regional Security (ACRS) working group of the Middle East Multilateral Peace Talks. There were last-minute cancellations from Jordan, the United Arab Emirates, and Syria. The workshop agenda is included in the addendum to this paper.

The four-day workshop was the first visit by foreign experts to Sandia's new Cooperative Monitoring Center (CMC). The goal of the CMC is to provide a neutral forum where international and regional representatives can meet to share the extensive U.S. experience in monitoring and verification and explore ways that technology can facilitate regional confidence building in areas such as arms control, resource management, and environmental monitoring. The CMC promotes communication between political and technical experts and provides visitors with hands-on experience with monitoring hardware, software, data processing, and data integration capabilities for a variety of applications, including arms control and environmental monitoring.

The idea for the workshop evolved as a result of Sandia contributions to three earlier unofficial, "track two," Middle East peace process meetings hosted by the IGCC. At the most recent of these workshops, at Delphi, Greece, in January 1994, Sandia verification experts made presentations on the role of technology in facilitating

A Technology Development Room in the Cooperative Monitoring Center

regional security in the Middle East and described our vision of a Cooperative Monitoring Center. Participants responded positively to Sandia's presentations and expressed interest in a specialized workshop.

Sandia experts at the July workshop included specialists in sensor hardware, software development, vulnerability assessment, and policy analysis. During the planning stages for the workshop, we had extensive contact with U.S., Jordanian and Israeli participants in the official peace process and determined that border security and ballistic missile control issues in the Middle East would be the most fruitful focus areas.

WORKSHOP SUMMARY

Introduction to the Concept of Transparency and Cooperative Monitoring

The workshop began with a series of presentations defining the concept of cooperative monitoring. We used a systems analysis approach to identify and evaluate options for facilitating the solution of regional problems with cooperative monitoring. "Cooperative monitoring scenarios" are key to this process. In our approach, a generic cooperative monitoring scenario is independent of a particular region and consists of five major components:

1. Identification of a regional problem and goal for cooperation, such as:

    - conventional arms control
    - nuclear arms control
    - missile control
    - natural resource management
    - environmental monitoring

2. A hypothetical agreement among two or more parties

3. Definition of monitoring objectives to assure that the agreement is being upheld

4. Identification of relevant observable items or actions

5. Identification of a range of technically based cooperative monitoring options.

We used generic scenarios to serve as examples of broadly applicable cooperative monitoring situations. Fundamental to our approach is that many options exist for each step in the process of selecting monitoring techniques for regional confidence building. In particular, we discussed degrees of intrusiveness for technical monitoring, stressing that the appropriate level of intrusiveness for a particular agreement will be determined by many factors, including the special sensitivities of the countries involved. We also emphasized the importance of achieving a proper mix of technical and human presence, as well as agreed-upon procedures for dealing with anomalies, as elements in a successful cooperative monitoring regime.

As a specific and timely example of U.S. efforts in the area of nuclear transparency, a DOE staff member summarized the U.S./Russian initiative to provide transparency of weapon dismantlement activities at sensitive production facilities. The process focuses on inspection of plutonium stockpiles and consists of several steps: (1) site familiarization, (2) demonstration of monitoring methods, (3) exercises using agreed measures, and (4) establishment of an agreement for a full-scale monitoring program. We felt that the presentation might provide information that potentially would be useful in future regional discussions. This presentation provoked a discussion that set the stage for the afternoon session dealing with Middle East security issues.

Round Table Discussion on Middle East Security Issues

We devoted the afternoon of the first day to a round table discussion of Middle East security issues, focusing on border monitoring and missile control. The discussion was led by a Middle East specialist from Lawrence Livermore National Laboratory. Since the remainder of the week would be devoted to proposals of technical monitoring options for these issues, the round table was intended to establish a common understanding of their relevance in the Middle East.

The participants considered most of the borders of Israel to be fairly well-defined. However, there are areas where the fear of attack on both sides of the border, either by neighboring countries (the Golan Heights) or by non-governmental third parties (the Lebanon border), creates tension. The Israelis thought that the basic problem was that whoever controlled the Golan Heights had an automatic advantage over the other side, so that there would be the temptation to cheat on an agreement. Even with a demilitarized Golan, Israel would be concerned about the large standing Syrian Army. Monitoring of these strategic areas may be a key element of any future Middle East Peace Accord. In addition to security concerns, equitable access to water in the Golan Heights is a potentially contentious issue. Although there is little military tension on the border between Israel and Jordan, water management, pesticide pollution, and transmission of animal-borne disease are important bilateral problems. Some type of cooperative monitoring may be needed to manage these non-military problems and will become more important as Middle Eastern countries enter into peaceful relations.

In other regions of the Middle East, for example the Arabian Peninsula and the territory between Iraq and Kuwait, borders have yet to be clearly defined, and there is the potential for tension that does not involve Israel. Some form of cooperative monitoring could play a role in achieving and implementing agreements in these areas as well.

Ballistic missiles were acknowledged as being relevant to all Middle Eastern countries. There was some difference of opinion, however, as to how large a problem they posed. Many participants thought missiles were a major problem for security in the region. They also emphasized that with the obvious breaches in the Missile Technology Control Regime, there are no simple solutions to the problem. Ballistic missiles were perceived as supporting both political and military goals, with the historical uses of missiles in the Middle East being primarily political. One person from the region thought that recent initiatives by various Arab states to acquire ballistic missiles are intended to increase their relative strength and, as such, their acquisition actually might be a stabilizing influence in the region.

At previous "track two" meetings, a great deal of interest had been expressed in the relationship of cooperative monitoring to national technical means. In particular, several countries had expressed concern that cooperative monitoring regimes could undermine national security if they were perceived as replacing information received from other sources. In response to these concerns, we included a discussion of the relationship between the two types of monitoring led by a member of the Stanford Center for International Security and Arms Control. The potentially complementary nature of cooperative monitoring and national technical means was emphasized. Another key point in the discussion was that decisions regarding compliance with national security agreements should always remain the prerogative of individual countries, not the prerogative of monitoring organizations. This assures that individual countries can make use of all information at their disposal, including information from national capabilities, when making compliance decisions.

Included in the discussions of national technical means was an interesting proposal on the role of emerging technology in the field of unmanned aerial vehicles as a means of increasing the national capabilities of countries without access to satellite imagery or other sophisticated technical means. The relative inexpensiveness of such new technology could "equalize" access to information relevant to compliance monitoring. The availability of such information to all countries, even if not used cooperatively, could itself function as a confidence-building measure.

Monitoring Hardware and Software Demonstrations

The morning of the second day of the workshop was devoted to demonstrations of monitoring hardware and software applicable to cooperative monitoring. Demonstration capabilities for both arms control and environmental applications at the CMC included

- exterior monitoring and tamper-indicating technologies (seismic, magnetic, video, electronic perimeters, breakbeams, tags, seals)

- portal perimeter monitoring as used for monitoring missile production facilities under the Intermediate Range Nuclear Forces Treaty

- monitoring technologies applied to remotely monitoring the interior of nuclear facilities (sensors similar to those used for exterior monitoring plus data authentication)

- seismic monitoring, emphasizing detection and characterization of nuclear explosions versus earthquakes and the use of single stations as compared to sensor arrays

- commercial satellite and aerial overflight imagery and data integration (LANDSAT, SPOT, synthetic aperture radar, image processing)

- pollution dispersion modeling (meteorological data collection, airborne particulate dispersion models, air and water sampling)

- software to match environmental problems with monitoring and remediation technologies

- simulation software to act as training and demonstration tools for the interaction of sensors and their environment

Demonstration of Monitoring Hardware during Workshop

There were two purposes for the demonstrations: (1) to acquaint the participants with monitoring technologies that would be used in the development of the border monitoring scenarios on the third day and (2) to provide the participants with a survey of a wide range of readily available monitoring technologies. One important goal was to stimulate the participants' imagination about the role of technology in implementing regional confidence-building measures.

Participants reacted to the demonstrations with a great deal of interest. Because of their widely varying backgrounds, they exhibited a variety of responses. Those with military experience were particularly interested in practical implementation issues and were eager to spend more time becoming familiar with the equipment and technology. One participant with a scientific background was familiar with many of the technologies and wished that a broader range of technologies were available. All observed that complete summaries of the technical demonstrations, including performance specifications, strengths, weaknesses, application (including previous use), cost, and possibly vendor information, would be extremely useful.

Precedents for Cooperative Monitoring

Historical precedents were presented to provide evidence of the value of technically based monitoring. The highlight of the discussion was a presentation on the use of technology in monitoring the Sinai Disengagement Agreement between Israel and Egypt in the late 1970s. Because of the familiarity of many of the participants with this historic agreement, the briefing incited a great deal of interest. Participants asked numerous questions about details of the Sinai system. The mood of the meeting shifted from one of "if" cooperative monitoring could work to "how to implement" a cooperative regime. The need to mix technology and human presence, as illustrated in the Sinai Disengagement, was a dominant theme of this session. There were observations about the value of a third party, such as the United States or the United Nations, in the mediation and implementation of an agreement. Many thought the need for such mediation was as great today as in the 1970s.

This historical example illustrated the importance of working out all technical, procedural issues as conclusively as possible before execution. Of particular concern is the problem of the "rogue colonel," a lower official who obstructs the implementation of an agreement. This situation illustrates the problem of how ambiguity in the text of an agreement can later create unnecessary conflict in the field during implementation. A field commander may obstruct an inspection or monitoring procedure if he is unfamiliar with procedures that are not clearly defined in the agreement.

We also presented examples of cooperative environmental monitoring of air pollution and water management along the U.S./Mexican border and regional ecological monitoring to study desertification in an arid climate. Partly because of the orientation of the participants toward security issues, these briefings did not stimulate a high level of interest. However, the participants suggested that regional environmental specialists would be very interested in the subject. It also was acknowledged that cooperation on environmental monitoring issues may be a more feasible near-term goal in the Middle East than cooperation on military security issues. Some proposed that the CMC consider hosting a specialized water and environment multilateral working group meeting to focus on technical options for managing these problems.

Application: Zone Monitoring of Border Regions

This application session walked participants through the process of designing a cooperative monitoring system for a variety of applications relevant to an agreement to limit military presence in the zone near a national boundary. The importance of assessing the vulnerability of potential monitoring regimes was emphasized, including a presentation on the methodology of making such assessments. The purpose of these presentations was to illustrate a systems approach to selecting technical monitoring options, highlighting tradeoffs between cost and effectiveness, between human presence and technical monitoring, and between monitoring intrusiveness and system vulnerability.

To serve as a concrete basis for discussion, we prepared a "model text" for an agreement limiting military forces in a region adjacent to the boundary between two countries. The setting for the model text agreement was the Albuquerque region, with the Rio Grande River representing the national border.
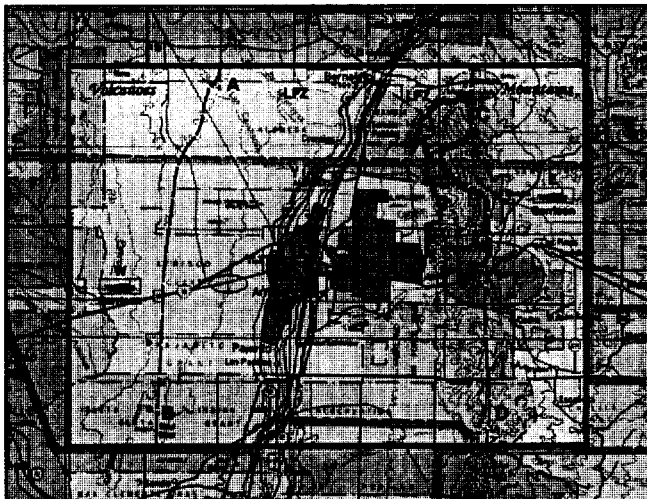
Map of Border Monitoring Exercise

After a description of monitoring options in the model text, with illustration by computer simulation, we conducted a "confidence-building exercise" in which the group was divided into two parts, one representing each hypothetical country. The two groups met separately and developed strategies for establishing a cooperative monitoring regime for the hypothetical agreement expressed in the model text. They used the experience gained from the technology demonstrations and system design briefings to define monitoring and negotiation strategies.

The participants enjoyed this exercise, felt it was useful, and thought it should have lasted longer. Most suggested that we should have provided more historical context for the model text and, consequently, before they separated to design monitoring regimes, voted to adopt the historical context of the Iran/Iraq wars. Interestingly, although using the Golan Heights as the setting for the exercise was briefly considered by Sandia, it was rejected as being too politically volatile for this group to discuss. Participants also recommended seeking input from military experts on the design of the model text and monitoring regimes in order to make the exercise more realistic in the future. They also thought a post-exercise discussion that reviewed the political and procedural processes each "country" used in developing monitoring options should be included. Some thought a cooperative monitoring "game," supported by computer simulation, would be very useful.

Application: Ballistic Missile Monitoring

Presentations on the problem of missile control identified a range of goals for missile control agreements, highlighted challenges in monitoring missile control agreements, then offered a range of options for controlling missiles at different stages in a ballistic missile's life cycle. In particular, options for controlling missiles through limits on production and testing, deployment, and missile range, payload, or accuracy, as well as through export and import regulations, were discussed. It was agreed that controls on missiles imported to the region were currently more pertinent than indigenous production.

Our final presentation in this session was given by a member of the UN Special Commission on Iraq on the Baghdad Monitoring Center and its current efforts to verify destruction of missiles. Although monitoring in Iraq is not an illustration of a cooperative regime, there was a great deal of interest in the technical details of the operation, especially from Kuwait. In fact, this presentation elicited one of the most lively discussions of the week, reflecting once again the strong interest the parties have in regional examples of cooperative monitoring.

Although participants generally were interested in missile control issues, they felt that our presentations did not offer enough concrete technical options. They recommended that future presentations on missiles focus more heavily on providing technical options for monitoring potential agreements, not on analyzing options for agreements.

OBSERVATIONS AND KEY THEMES

Reactions to the Cooperative Monitoring Center and the Workshop

Participants were very positive about future interactions with Sandia and the Cooperative Monitoring Center. Particularly critical to the success of the workshop was the active involvement of military officers from the region who were concerned about the impact of security arrangements on the soldier in the field. Many especially liked the problem-solving orientation of this workshop and its technical focus, in contrast to what was described as the "talkfest" that sometimes occurs at meetings on regional security issues.

The more technically oriented participants emphasized the need for the Cooperative Monitoring Center to establish as broad a technology base as possible in order to offer a full spectrum of monitoring options. This can be accomplished by means of collaborations with other National Laboratories, universities, and regional organizations.

The interactive workshop sessions were perceived as being the most useful. However, participants recommended that we carefully plan future meetings to include adequate time for group discussion. Many felt that discussions had to be terminated just as they were becoming exciting. Some felt that too much information was presented for adequate digestion. They also expressed the desire for more unstructured time, including shorter working sessions.

All recommended that Sandia staff should increase their familiarity with the historical/political context of conflict in the Middle East in order to better understand the implementation environment for potential cooperative monitoring regimes. Recommendations included visiting research institutes in different regions, soliciting guest lectures by regional specialists, and establishing collaborations with regional academic and technical specialists.

The ability to present technical options for solutions to regional problems is a unique capability of a technical institution such as Sandia. Participants emphasized that Sandia should focus on providing technical options, rather than analysis of security issues. Close interaction with policy analysis groups will ensure that we direct our attention to relevant problems. There was agreement that technically based monitoring has a role in the Middle East Peace Process and should be discussed more in future working groups.

## Technical Asymmetry and the Importance of Education

A recurring theme of the workshop was technical asymmetry among countries in the Middle East. Implications of technical asymmetry are complex. On the one hand, less technically capable countries may not be willing to engage in discussions of cooperative monitoring out of a misunderstanding of the capabilities of technology. Education and training about relevant monitoring technologies could make a significant impact on their attitudes toward monitoring regimes for the region. On the other hand, the more technically sophisticated countries may be opposed to projects that would provide monitoring technologies to the region as a whole, since this could diminish their relative advantage. Nevertheless, it was generally agreed that efforts to familiarize countries in the region with sharable monitoring technologies would have a positive effect.

Conducting a Workshop in the Region

In light of the importance of education and training, virtually all participants encouraged Sandia to host similar workshops in the Middle East. A regional setting would facilitate participation from a much wider audience. The Egyptian and Qatari representatives offered to investigate possibilities for hosting workshops in their countries. Several participants thought that a long-term goal should be to establish a Cooperative Monitoring Center in a Middle Eastern country.

Benefits of Establishing a Regional Arms Control Infrastructure

Several participants emphasized that an important benefit of the Cooperative Monitoring Center and future regional workshops will be to create a constituency for arms control and peace within the technical community in the region. By supporting scientists and technologists in developing technologies that can be used to monitor arms control or regional security agreements, we can help establish an infrastructure for supporting the implementation of such agreements. One American participant, who has taught students from South Asia, observed that some American-educated scientists eventually work in nuclear programs when they return home. In his opinion, these scientists might be happier working on technologies to promote peace in the region, rather than developing weapon technologies.
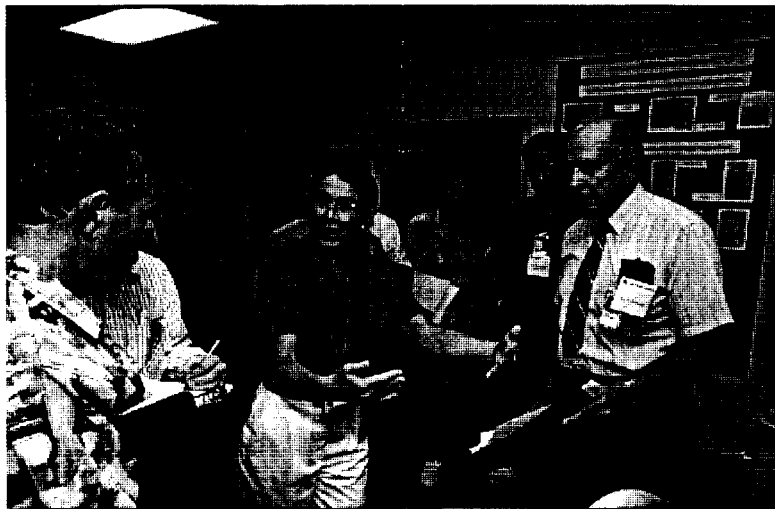
The Workshop Stimulated Animated Conversations
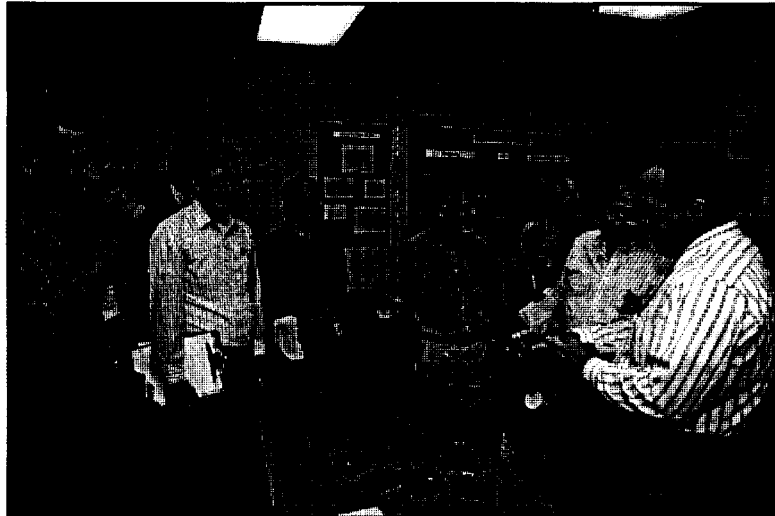
Increasing Attendance at Future Workshops

Pointing out the importance that workshops be attended by influential and credible people from each country, the participants recommended that Sandia be aggressive in seeking help from the local American Embassies, with ACDA and State Department approval, to secure representatives from the relevant government ministries at future meetings. Many have provided names of people in their countries to act as points of contact. These will be important both for future meetings at Sandia and at workshops conducted in the Middle East.

Social Occasions and Free Time

A high degree of rapport was developed among the technical specialists and the regional participants by the end of the week. This was due in part to the informal nature of the workshop, the enthusiasm of the Sandia team, and the degree to which we attempted to make life pleasant for the regional visitors. We might have been too assiduous in scheduling social events for each evening, however. Some of the participants would have appreciated less structure in the evenings to allow them to rest and reflect on the day's events. It also was suggested that more free time in the evenings would be welcome to provide for shopping opportunities for the foreign visitors.

Cooperative Monitoring Workshop:
Focus on the Middle East

Agenda

July 17-21, 1994

Sandia National Laboratories
Albuquerque, New Mexico

Sunday, July 17

Sheraton Old Town Hotel

Social Period

Fireplace Room

6:00 p.m.

Welcome Dinner

Fireplace Room

7:00 p.m.

Welcoming Remarks

Introduction

Dr. Arian Pregenzer, Manager

Verification and Monitoring Analysis Department

Sandia National Laboratories

Dr. Ed Fei, Director

Department of Energy

International & Regional Security Division

Dr. Susan Shirk, Director

University of California

Institute on Global Conflict and Cooperation

Keynote Speaker

Ambassador Paul Robinson

Sandia National Laboratories

Vice President for Laboratory Development

Title

Joint Experimentation:

The Key to Successful Negotiation of Technical Inspections

Monday, July 18
Cooperative Monitoring Familiarization
Cooperative Monitoring Center Facility, Research Park Complex

Exchange of background information on cooperative monitoring and define security issues in the Middle East.

INTRODUCTION AND GOALS

7:45 a.m.	Depart Hotel
8:00 a.m.	Badging, Cooperative Monitoring Center
8:30 a.m.	Welcome and Administrative Information
	Dr. Arian Pregenzer, Sandia National Laboratories
8:40 a.m.	Overview of Sandia National Laboratories Activities
	Dr. Gerald Yonas, Sandia National Laboratories
9:00 a.m.	Overview of Cooperative Monitoring and Workshop
	Dr. Arian Pregenzer, Sandia National Laboratories
9:30 a.m.	Introduction of Attendees
10:30 a.m.	**Break**
10:45 a.m.	Cooperative Monitoring Scenarios: Framework For Cooperative Monitoring
	Mr. Kent Biringer, Sandia National Laboratories
11:15 a.m.	Regional and Bilateral Transparency Measures:
	Example of United States Nuclear Facilities
	Mr. Tim Ingle, Negotiations and Analysis Division, Department of Energy
11:45 a.m.	**Lunch**
1:00 p.m.	Tour of Cooperative Monitoring Center Facility
	Mr. Michael Skroch, Sandia National Laboratories
1:15 p.m.	Roundtable Discussions
	Middle Eastern Issues
	(borders and security issues; missiles; natural resources)
	Moderator: Dr. Andy Terrill, Lawrence Livermore National Laboratory
2:30 p.m	**Break**
2:45 p.m.	National Means and Cooperative Monitoring
	Moderator: Dr. Terry Taylor, Stanford University Center for Intentional Security and Arms Control
4:00 p.m.	Return to hotel
6:45 p.m.	Depart hotel for dinner at the home of Dr. Gerald Yonas
	Vice President for Systems Applications
	Sandia National Laboratories

Tuesday, July 19
Cooperative Monitoring Technology Orientation
Cooperative Monitoring Center Facility, Research Park Complex

Make attendees aware of available monitoring technologies, software simulation, and implementation issues.

SENSORS AND SOFTWARE

8:00 a.m.	Depart Hotel
8:30 a.m.	Demonstration Preview
	Ms. Pauline Dobranich, Sandia National Laboratories
8:45 a.m.	Sensor and Simulation Demonstrations
10:00 a.m.	**Break**
12:00 p.m.	**Working Lunch**
	Informal Discussions of Hardware and Software

CONSIDERATIONS IN THE DESIGN OF COOPERATIVE MONITORING SYSTEMS

1:00 p.m.	Historical Precedents for Cooperative Monitoring
	Mr. Michael Vannoni, Sandia National Laboratories
1:30 p.m.	Cooperative Environmental Monitoring Between the United States and Mexico
	Mr. Art Verardo, Sandia National Laboratories
2:00 p.m.	**Break**
2:15 p.m.	Rio Grande River Valley Long-Term Ecological Monitoring
	Dr. James Gosz, National Science Foundation and the University of New Mexico
2:45 p.m.	Concept of Zone Monitoring and Application to a Scenario Based on the Albuquerque Region
	Mr. Larry Trost, Sandia National Laboratories
3:00 p.m.	Return to hotel
6:00 p.m.	Leave hotel for dinner at Sandia Peak
9:45 p.m.	Arrive back at hotel

Wednesday, July 20

Scenarios for Monitoring of Geographic Zones
Cooperative Monitoring Center Facility, Research Park Complex

Demonstrate the application of sensor hardware and simulation software to a specific scenario and geographic location.

INTRODUCTION TO GEOGRAPHIC ZONE MONITORING

8:00 a.m.   Depart Hotel

8:30 a.m.   Design of a Cooperative Monitoring System

   Ms. Pauline Dobranich, Sandia National Laboratories

9:00 a.m.   Vulnerability Assessment in Monitoring Systems

   Mr. Byron Gardner, Sandia National Laboratories

9:45 a.m.   Break

10:00 a.m.   Characteristics of Albuquerque Cooperative Monitoring Scenario
   Mr. Michael Vannoni, Sandia National Laboratories

10:45 a.m.   Example of Strategy for Sensor Selection and System Design

   Jointly performed by Issues, Sensor, and Simulation Teams

   * Garrisons: small enclosed areas

   * Chokepoints: mountain passes, river crossings

   * Linear Areas: river bank

   * Open Areas: demilitarized zone

11:45 a.m.   Lunch

APPLICATION OF COOPERATIVE MONITORING WITHIN A MIDDLE EASTERN CONTEXT

1:00 p.m.   Group Discussion: Applicability of Albuquerque Scenario to Middle East
   Moderators: Vannoni, Dobranich, Dean; Sandia National Laboratories

2:15 p.m.   Break

2:30 p.m.   Middle East Specific Issues
   Dr. Arian Pregenzer and Mr. Kent Biringer, Sandia National Laboratories

4:00 p.m.   Depart from Cooperative Monitoring Center

7:00 p.m.   Dinner at Sheraton Hotel, Isleta Room
   Professor Al Utton, University of New Mexico School of Law
   "Water in the Arid American Southwest: An International Region Under Stress"

Thursday, July 21

Introduction to Ballistic Missile Issues
Cooperative Monitoring Center Facility, Research Park Complex

BALLISTIC MISSILE MONITORING ISSUES

Introduce options in monitoring potential ballistic missile agreements.

8:00 a.m.	Depart Hotel
8:30 a.m.	Introduction to Missile Issues
	Mr. Kent Biringer, Sandia National Laboratories
9:00 a.m.	Options for Control
	Mr. Larry Trost, Sandia National Laboratories
9:30 a.m.	Examples of Missile Monitoring
	Dr. Steve Dupree, Sandia National Laboratories
10:00 a.m.	**Break**
10:15 a.m.	Roundtable Discussion:
	Cooperative Monitoring of Ballistic Missiles in the Middle East
	Moderator: Dr. Steve Dupree, Sandia National Laboratories and UN Special Commission on Iraq
11:45 a.m.	**Lunch**

CONCLUSIONS AND CLOSURE

Evaluate presentations and discussions for application to confidence building in the Middle East and proposals for future action.

1:15 p.m.	Group Discussion: Conclusions from Workshop and Suggestions for Future Developments, Scenarios and Presentations
	Moderator: Dr. Arian Pregenzer, Sandia National Laboratories
3:00 p.m.	Close of Workshop
	Return to hotel or transportation to airport for evening departures
6:30 p.m.	Depart hotel for farewell banquet at El Pinto restaurant

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