



- circulation of information about military establishments;
- advance notification of military activities (exercises and movements);
- reduction of threatening components in existing military forces.

The main targets for verification of compliance were personnel, heavy equipment and certain military facilities. A verification system for the agreement would have to detect or monitor certain minimum combinations of personnel and/or equipment.

### *Designing the Components of a Verification System*

The round table was basically a simulation exercise covering two working sessions, one on each day. The first day's task was to determine the technological and operational requirements for a verification system for the hypothetical agreement.

After a brief orientation the participants were given a presentation by Mr. Bobby Wolfe, Programme Director at E-Systems, Greenville Division. E-Systems is an international electronics and aircraft systems company based in Texas. It was responsible for designing and implementing a major portion of the system established in the Sinai to verify the disengagement process between Egypt and Israel following the October War in 1973. Mr. Wolfe presented a concrete example of how an agreement involving conventional forces was verified and highlighted particular problems encountered as well as the solutions adopted.

Having been told the elements to look for, working groups were asked to consider which of the following verification approaches might be applicable.

#### 1. On-Site Challenge Inspection

This approach requires that an inspection team be transported at short notice (12-36 hours) to a particular area to carry out an inspection.

#### 2. Entry/Exit Points

These are agreed points through which all troop movements take place. In order to limit the possibility that troops

will filter back to their original positions, Entry/Exit monitoring can be matched with information from remote sensor fields or overhead reconnaissance. This approach requires means by which data can be gathered, stored and communicated; the staff also requires communications, living facilities and security.

#### 3. Observer/Liaison Missions

This is potentially the cheapest form of verification and, depending on the amount of freedom given the liaison officers, it can be the most effective.

#### 4. Portal Monitoring

This method is a compromise between on-site inspection and remote sensing. Inspectors are not allowed inside a base or factory but are allowed to check what goes in and what comes out. It poses more severe technological challenges than some other methodologies. Portal monitoring requires tamper-resistant enclosures and alarms, security fences and portal systems, as well as communications and security.

#### 5. *In Situ* Remote Sensing

This is a method utilizing various types of sensors which are located close to the site being monitored, but distant from the monitoring personnel. Technologies in this area relate to:

- area motion sensors
- intruder alarms
- imaging sensors
- traffic monitors

The emphasis in these applications is on reliable, tamper-resistant designs.

#### 6. Airborne/Space-Based Remote Sensing

This method constitutes the central part of the current verification mechanisms used by the superpowers. In the event that a multilateral agreement was reached which demanded the creation of a third (i.e., non-superpower) overhead reconnaissance system, significant opportunities would exist for developing the relevant technologies, including remote sensing aircraft and/or satellites, discrimination and detection systems, image processing systems, data storage and retrieval systems and communications networks.

Special worksheets were designed for the session so that groups could flesh out the technological requirements of each verification approach they decided would be appropriate for their observations. Groups were asked to fill in details regarding: sensor technology required, other necessary equipment, data handling requirements, data processing requirements, Canadian capabilities, possible constraints, potential countermeasures and cost implications.

The first day's activities concluded with a dinner address by Mr. James H. Taylor, the Under-Secretary of State for External Affairs, who briefly reviewed recent progress in arms control emphasizing important developments with respect to verification.

The second day's task was to take the individual elements of the verification system that had been considered on the previous day, and put them all together in one system.

Each group was asked to proceed according to the following series of steps:

- develop an overall verification system (information flow);
- map out the corresponding organizational structure (block diagram);
- estimate the types and numbers of personnel required;
- estimate the types and numbers of equipment/facilities required;
- estimate the costs required to:
  - a) put the system in place
  - b) maintain and operate the system
- identify particular problem areas.

In order to allow groups to make concrete cost estimates, quantitative estimates of verification activities for the West were provided. These estimates were ballpark figures intended to give participants a rough feel for the magnitude of the problem.