

transmitted to Energy, Mines and Resources Canada laboratories in Ottawa, where scientists analyze the data, locate the event's epicentre and determine whether it was caused by an earthquake or a nuclear blast.

The \$3.5 million, three-year upgrade program was undertaken jointly by External Affairs and International Trade Canada, which is responsible for formulating arms control policy, and Energy, Mines and Resources Canada, which possesses the seismological expertise needed to operate the Array. The upgrade consisted of replacing all of the Array's seismometers and data collection and control facilities, providing a new control centre building at the Array site, and adding a communication link for transmission of data from Yellowknife to Ottawa via Anik satellite in near real time.

The Array opening coincided with a workshop of the Group of Scientific Experts in Yellowknife (see accompanying article) and provided a forum for researchers from the University of Toronto to unveil the results of their work on regional seismic verification methodologies, performed under contract with Canada's Verification Research Program. □

Group of Scientific Experts Meets in Yellowknife



Participants at the Yellowknife workshop. The all-terrain vehicle is the only means of ground transportation for servicing the Array stations.

Thirty members of the Group of Scientific Experts (GSE) associated with the Conference on Disarmament in Geneva met in Yellowknife September 11-15, 1989, to attend the opening of and inspect the modernized Yellowknife Seismological Array, to discuss issues related to seismic verification and to review plans for an international seismic data exchange experiment, scheduled to begin in January 1990.

The GSE, whose full title is the Ad Hoc Group of Scientific Experts to Consider International Cooperative Measures to Detect and Identify Seismic Events, was established by the Conference on Disarmament (CD) in July 1976. It grew out of earlier, informal meetings between the CD and seismological experts from various countries. The GSE is open to government-appointed experts from all member countries of the CD and, by invitation, to experts from non-member countries. Currently there are participants in the GSE from 27 countries, not all of whom attend regularly. The GSE meets in Geneva twice a year.

Since 1976, the GSE has been defining the technical specifications of a global system for seismic data exchange that would assist all participating countries in their national monitoring requirements for a comprehensive nuclear test ban treaty. The GSE is not designing or developing an international system to monitor compliance with a treaty per se. Rather, its objective is to facilitate verification by any interested state through a cooperative exchange of relevant seismic data.

From October 15 to December 15, 1984, the GSE conducted a data exchange experiment that focused on the exchange and processing of seismic "parameter" data. Parameter data are those data (such as the arrival times and amplitudes of seismic waves) that can readily be extracted from seismic recordings at a seismograph station. Since the volume of these data is not large, they can be transmitted relatively easily and rapidly to other locations around the globe using, for example, telex-based communications systems. Thirty-seven countries participated in the 1984 test, offering data from a total of 75 seismograph stations.

Verification: What is it?

"Verification is the establishment of truth or correctness of (something), by examination or demonstration." [*Concise Oxford Dictionary*]

Countries are unlikely to agree to sign treaties that affect their national security unless they have adequate means of assuring that other signatories will, in fact, be living up to the terms of the agreement. Verification is the means by which such assurance is gained. Whether it is through the use of consultative mechanisms, photo-reconnaissance satellites or on-site inspections, the ability to agree upon an effective system of verification can mean the difference between success and failure in the negotiation of an arms control agreement. □