THE PRIMARY SEISMIC NETWORK, INTERNATIONAL MONITORING SYSTEM: STATUS AND PLANS

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ABSTRACT

The primary seismic network is one of five monitoring networks of the International Monitoring System (IMS) established under the Comprehensive Nuclear-Test-Ban Treaty. The Signatory States of the Comprehensive Nuclear-Test-Ban Treaty have formed a Preparatory Commission to oversee Treaty-related activities until the Treaty enters into force. The Preparatory Commission has established technical requirements, certification standards, and draft operational practices for the primary seismic network. The Seismic Monitoring Section of the International Monitoring System Division of the Preparatory Commission's Provisional Technical Secretariat (PTS) is responsible for the establishment, certification, and operation of the seismic stations according to Commission's requirements and standards.

The primary seismic network comprises 31 arrays and 19 3-component seismic stations, including 12 new arrays and two new 3-component stations that did not exist prior to signature of the Treaty in 1996. Site surveys have been completed for all but 5 of these "new" stations. Although uniform network requirements and standards apply, the primary seismic network in fact has a diverse set of station equipment. About 30% of the primary seismic stations have some affiliation with the US nuclear test monitoring program through national or international agreements. Most new stations built during the next 24 months with direct funding from the Preparatory Commission will use integrated seismic data acquisition systems provided by the company Nanometrics. These systems use Nanometrics HRD-24 digitizers with an incorporated authentication token recording either Geotech GS-13 or Guralp Systems CMG-3ESPV sensors for short-period channels for vault/posthole or deep borehole deployments respectively. Three-component stations will use a seismometer covering the IMS passband of 0.02-16 Hz that is appropriate for the sensor environment at the station. A Sun Microsystems Unix workstation will provide data reformatting and buffering, command interpretation, and onward communications to the Global Communication Infrastructure. Stations will have a standard channel sensitivity appropriate for either low or moderate background noise profiles.

The Preparatory Commission has stated that stations may be certified when the PTS is assured that the site, the station equipment, and the infrastructure substantially meet the technical specifications for IMS stations; when data authentication devices, including anti-tampering devices, are in place and have been demonstrated to function properly; and when the existing and proper functioning of the station interface to the Global Communications Structure is confirmed. Certification status indicates that an IMS monitoring station is complete and ready to be used in the global monitoring mission. With current projections and staffing, at least 30% of the stations of the primary seismic network are expected to be certified by the end of 2001.