MAJOR PROGRAMME 1

International Monitoring System

Major Programme 1:
International Monitoring System

The year 2002 saw significant advancement in the establishment of the International Monitoring System (IMS). Progress was made on all aspects of installing monitoring stations in all four technologies (seismic, infrasound, hydroacoustic and radionuclide). Installations were completed at 39 additional stations; 23 more stations, including the first of the auxiliary seismic stations, were certified as meeting the technical requirements of the Preparatory Commission, bringing the total number of certified facilities to 47. This includes one of the radionuclide laboratories designated in Annex 1 to the Protocol to the Treaty. Many more stations are now complete and moving through testing and evaluation, the final phase before certification. With these stations added to those already certified, by the end of the year 46% of the stations in the IMS were completed and met or substantially met specifications.

The number of site surveys completed during 2002 declined because this phase is nearing completion; site surveys have now been completed at 88% of the 321 sites.

Considerable effort was devoted during the year to the further development of procedures for provisional operation and maintenance (O&M) of certified stations for testing and evaluation purposes.

IMS ESTABLISHMENT

A summary of the status of the establishment of the IMS in each of the monitoring technologies, giving the main highlights for 2002, is presented below. The status of the site survey and station installation programmes at the end of 2002 is provided in Tables 1 and 2. The site survey programme determines whether station locations given in the Treaty are suitable, and establishes vital information required in order to construct the stations. The installation programme encompasses site preparation, equipment purchase, installation and testing and evaluation, leading to certification that the station meets the technical requirements of the Commission.

Table 1. Status of the Site Survey Programme as of 31 December 2002

IMS Station Type	Complete/ Not Required	Under Way	Contract Pending	Not Started
Primary seismic	45	0	1	4
Auxiliary seismic	116	2	1	1
Infrasound	48	3	2	7
Hydroacoustic	11	0	0	0
Radionuclide	64	4	3	9

Table 2. Status of the Station Installation Programme as of 31 December 2002

IMS Station Type	Complete/ Substantially Meets Specifications	Under Way	Contract Pending	Not Started
Primary seismic	30	11	3	6
Auxiliary seismic	79	17	0	24
Infrasound	16	12	8	24
Hydroacoustic	3	7	0	1
Radionuclide	22	12	10	36

Seismological Monitoring System

During 2002, in the primary seismic monitoring programme, site preparation and installation were completed for 11 stations and 5 stations were certified, bringing the total to 16. Site preparation and/or installation was proceeding for 15 stations, under contract to the Provisional Technical Secretariat (PTS), under conditions of reduced assessment (whereby a State Signatory undertakes work with national fund-

Primary seismic station PS25, Songino, Mongolia.

Auxiliary seismic station AS1, Coronel Fontana, Argentina.

Primary seismic station PS4, Stephens Creek, Australia.

Auxiliary seismic station AS69, Rata Peaks, New Zealand.

ing that is later deducted from that State's assessed contribution for the year after the station is certified) or by means of gifted national funding through bilateral agreements. A primary seismic station in the Russian Federation that was due to be upgraded was destroyed by a landslide in the latter part of 2002, and a new site will need to be found.

In the auxiliary seismic monitoring programme, three site surveys were under way. Ten stations had installations completed and were connected to the International Data Centre (IDC), either under contract to the PTS or through national funding, and the first six auxiliary stations were certified. Site preparation and/or installation was in progress for 17 auxiliary stations.

Infrasound Monitoring System

In the infrasound monitoring programme, two new site surveys were completed. Five new stations began sending data to Vienna and six stations were certified, bringing the total number of certified stations to 10. Site preparation and/or installation was under way for 13 stations, including the second infrasound station in Antarctica. Construction at this remote site is expected to be completed by February 2003.

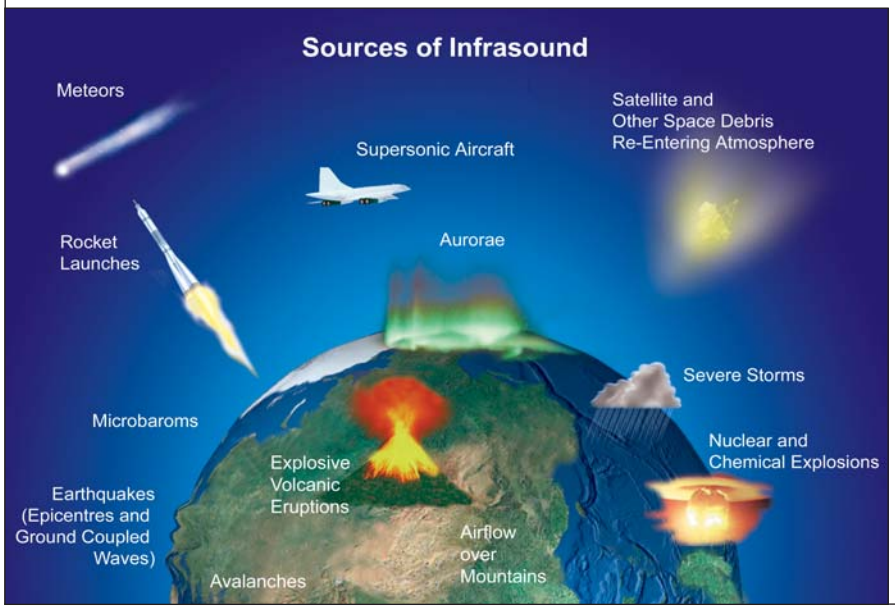
1. Aerial view of one element of infrasound station IS17, Dimbokro, Côte d'Ivoire, certified in December 2002.

2. Certification visit to infrasound station IS18, Qaanaaq, Greenland (Denmark), October 2002.

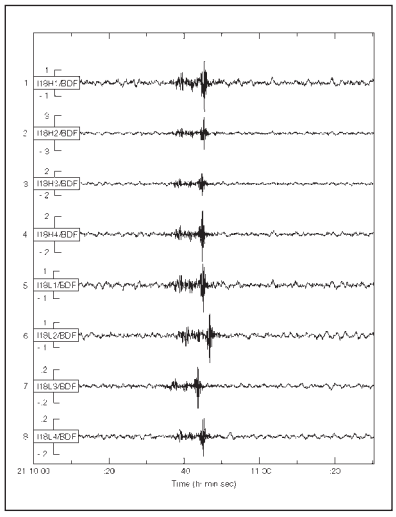
3. Record of ice breaking during the certification visit to IS18.

1

2



3



The PTS and the Atomic Energy Commission of France have agreed to collaborate on the design and testing of an effective noise reducing system for use at infrasound stations located in high wind environments. Work on this project will begin in early 2003.

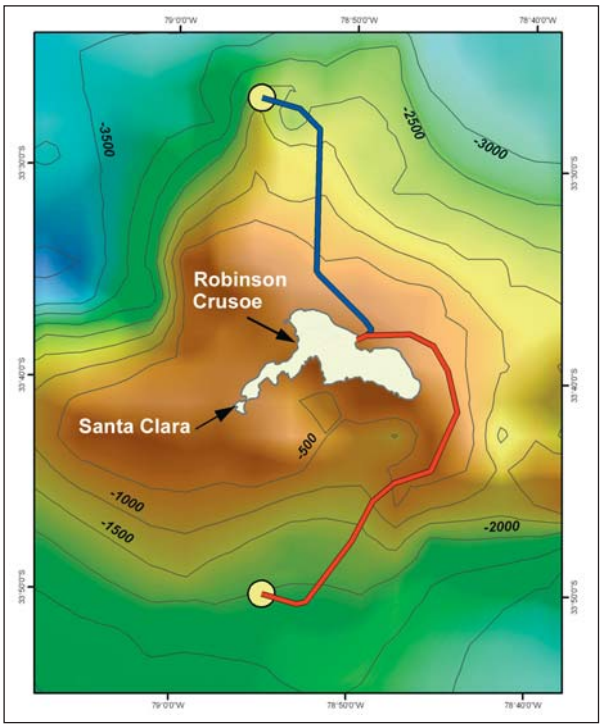
In September 2002, an infrasound technology workshop was held in De Bilt, Netherlands. Discussions focused on the design and construction of infrasound stations and on the processing of infrasound data.

Hydroacoustic Monitoring System

The hydroacoustic monitoring programme achieved steady progress in all aspects. Perhaps the most singular achievement was the completion of the site survey programme for all 11 hydroacoustic stations. Work included the development, manufacture and testing of two hydrophone based hydroacoustic stations. This work, which had been started prior to 2002, has prepared these two stations for installation during the first quarter of 2003. Work on a third hydrophone based station has been advanced by a national contribution, including equipment purchase and shore facility construction. The PTS will continue work on this station during 2003.

1

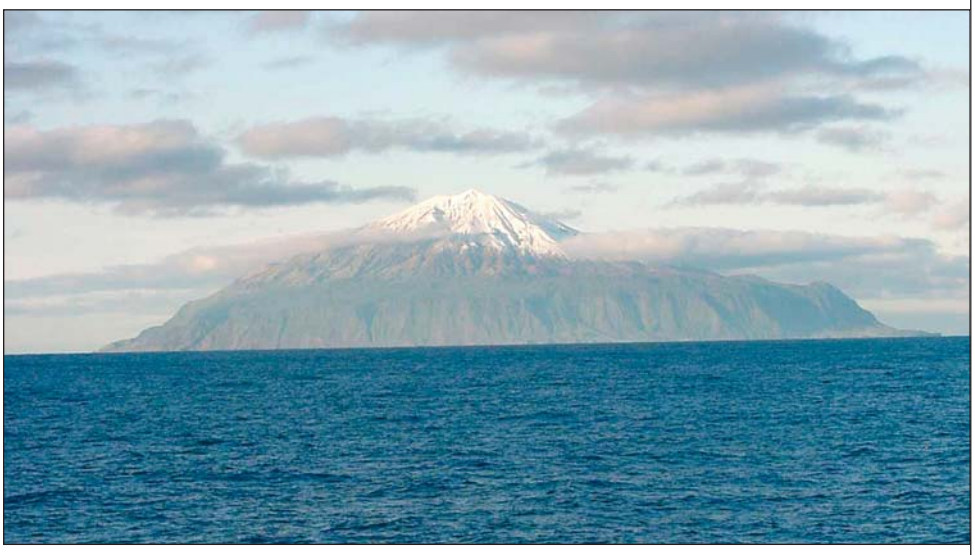
2



1. Solar panels, battery packs and satellite dish at the southern element of HA5, Guadeloupe (France), the first T phase hydroacoustic station to be certified (January 2002).

2. Diagram of underwater cables and hydrophones at hydroacoustic station HA3, in the Juan Fernández Islands (Chile). The cables come ashore at Robinson Crusoe Island.

3. Hydroacoustic station HA9 will be located on the island of Tristan da Cunha (United Kingdom), the remotest inhabited place in the world.



3

There was also considerable progress on the T phase stations of the hydroacoustic network. At the beginning of 2002, the first T phase station was certified. By the end of the year, equipment and installation contracts were in place, or were in the procurement process, for all of the four remaining T phase stations. Installation work at all four stations is scheduled for 2003.

Radionuclide Monitoring System

Two types of radionuclide station make up the radionuclide network – particulate and noble gas. Particulate stations can be manually operated or automatic. In addition, Annex 1 to the Protocol to the Treaty designates 16 radionuclide laboratories.

Ten particulate stations were completed and six were certified, of which four were manual stations and two were automatic. At the end of the year, the construction of 20 additional particulate stations was in progress. Four certification visits to stations were made towards the end of the year and certification of these stations is expected during the first quarter of 2003.

Tests of the manual particulate air sampler were completed in a climatic wind tunnel facility, using a modified air inlet designed for polar conditions. The next task will be to install and test the new design at a station with polar conditions. The assessment of the global collection efficiency of air sampling systems was completed, and recommendations on the design to improve collection efficiency are being considered.

The laboratory proficiency test exercise involving all 16 designated radionuclide laboratories was completed, and results will be used to assess the quality of radioanalytical measurements currently made by the laboratories. In September 2002, a laboratory workshop was held in Blumau, Austria. Discussions focused on the proficiency test programme, certification issues, software applications and the laboratories' future involvement in noble gas measurements and, possibly, on-site inspection (OSI) sample analysis.

Phase III of the noble gas experiment began with the installation of noble gas systems in Tahiti, Norway and China. The fourth system will be installed in Brazil during the first quarter of 2003. Tests of a fifth system are under way in Canada and a sixth system is planned for installation in Germany. Noble gas workshops were held in January 2002 in Tahiti and in September 2002 in the United States of America. Discussions at these workshops focused on Phase III, field operation of the systems, remote monitoring of the systems by the PTS and the future role of radionuclide laboratories within the noble gas network.

Radionuclide station RN51, Kavieng, New Ireland, Papua New Guinea, during a certification visit.

Measurement of airflow through the manual particulate air sampler at radionuclide station RN45, Ulaanbaatar, Mongolia.

Automatic particulate air sampler (RASA) installed at radionuclide station RN11, Rio de Janeiro, Brazil.

Radionuclide station RN18, Punta Arenas, Chile.

PROVISIONAL OPERATION AND MAINTENANCE OF IMS STATIONS

The Nineteenth Session of the Commission in November 2002 provided guidelines to the PTS on the technical testing and provisional O&M of certified IMS stations, the Global Communications Infrastructure (GCI) and the IDC during 2003 and 2004. The guidelines include a temporary relaxation of the station performance requirements. This is expected to result in lower costs in testing and provisionally operating and maintaining stations during these years. The PTS began a thorough review of O&M costs and will keep them as low as possible, while ensuring that the investment made by the Commission is protected and the equipment and personnel are utilized effectively.

The implementation of provisional O&M activities is a complex process involving many tasks of both a technical and an administrative nature. These are carried out by many parts of the PTS working closely together. Coordination was strengthened and is managed by an integrated group that meets weekly. In addition, a new model O&M contract that simplifies the contracting procedures was developed. A request for proposals was prepared to undertake the first stage of development of an integrated logistics support system for the IMS. A contract was signed for development and documentation of O&M procedures. The first release of the Database of the (Provisional) Technical Secretariat (DOTS), related to the management of the IMS network configuration, was launched in December 2002. It includes modules for recording information on States and stations, IMS equipment and points of contact. DOTS is now being populated with information on the certified stations.

A full technical training programme (TTP) for IMS station operators was held in April 2002, with the first part in Vienna and the second part in various institutions in Finland, France and the USA, depending on the technology. In June 2002, for the first time, a full TTP was hosted by a State Signatory – China. The first part was held in Beijing, and the second part took advantage of new IMS stations – the primary seismic station in Hailar and the radionuclide station in Guangzhou. A third reduced TTP with only radionuclide training components was conducted in November 2002 in Finland and the USA. In addition to these TTPs, two training sessions for seismic station operators took place in May and October 2002 at the premises of the seismic equipment supplier in Canada. In total, 83 station operators from 58 IMS facilities attended one or another form of IMS training.

FOLLOW-UP TO EXTERNAL EVALUATION OF THE IMS MAJOR PROGRAMME

Following an external evaluation of the IMS Major Programme carried out in Vienna in November 2001, the report of the evaluating team was examined during each of the three Working Group B (WGB) sessions in 2002 and the PTS reported on its implementation of the team's recommendations. By the end of the year, action had been taken on all of the recommendations that were within the power of the PTS to implement. WGB expressed its satisfaction with these actions and concluded its consideration of the report of the evaluation.