

**Report on the status of the International Monitoring System (IMS)
Seismic Network of the
Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO)**

The IMS seismic primary seismic network consist of 50 seismic stations that transmit continuous authenticated data within 5 minutes of being recorded to the International Data Center (IDC) in Vienna, Austria which is used in automatic processing. The primary network includes 30 seismic arrays and 19 three-component broadband stations and 1 station location to be determined. In addition, the 120 seismic stations of the auxiliary seismic network respond to requests from the IDC for authenticated data segments that are used to improve event location that includes 7 arrays, 112 three-component broadband stations and 1 station location to be determined. The auxiliary network is comprised of stations that have a dual purpose, many of them are part of national or international seismic networks, and have been included in the Treaty as contributions from the state signatories that host these stations. Stations in the primary and auxiliary seismic networks are connected by a private communication network to Vienna which is known as the global communication infrastructure (GCI).

Site surveys for the primary and auxiliary seismic networks have been mostly completed, with only 3 site surveys pending for the primary network and 3 for the auxiliary network. Station upgrades and installation of new stations as well as connectivity from existing stations has progressed steadily since 2000 and at an accelerating pace since 2002. This flare in activity is due in part, to the existing contract with the Commission equipment supplier, which has allowed for station standardization, as well as the signature of new contracts or agreements with local station operators or with parent network operators such as IDA and the USGS. Thus in the case of existing auxiliary stations, IMS has been able to upgrade them in partnership with local station and parent network operators by adding the seismic station interface, which authenticates the data and connects the upgraded station to the GCI. In November 2002 the Preparatory Commission authorized data transmission in parallel using the GCI VSAT antenna, to the IDC in Vienna and to the local station operator or parent network headquarters in real time. As of June 2003, eight IMS seismic stations are using a shared VSAT and many more will take advantage of the GCI capability in the near future.

Installations at the primary seismic network will be almost completed (82%) by the end of 2003. In 2004 it is expected that at least 5 more stations will be completed and 4 stations cannot be planned at this time (see Table 1 for details). A seismic station is certified by IMS when it meets the minimum IMS requirements. Table 2 shows the names of the 18 primary seismic stations that have been certified to date, and at least 9 more station certifications are planned by the end of 2003. It is expected that 80 to 88 % of the stations in the primary network will be certified by IMS by the end of 2004.

As for the auxiliary network the stations have been classified into 5 categories as follow:

- 25% Meets specifications, except GCI and authentication, no work required
- 37% Minor work required
- 16% Major upgrade required
- 10% Full station installation required, existing site
- 12 % New station construction and installation required

IMS auxiliary stations with completed installations, those in progress and those expected to have additional connectivity by the end of 2003 are listed in Table 3. Certified auxiliary seismic stations to date are listed in Table 4.

Table 1: Progress of Primary Seismic Network Installation Work

In 2003

PS3 Alice Springs, Australia	Bilateral Agreement
PS7 Brasilia, Brazil	Installation in 3 rd quarter
PS15 Bangui, Cental African Rep.	Bilateral Agreement
PS22 Matsushiro, Japan	Installation in 3 rd quarter
PS26 Torodi, Niger	Under procurement
PS31 Wonju, Rep. of Korea	Under installation
PS38 Haleban, Saudi Arabia	Installation in 3 rd quarter
PS39 Boshof, South Africa	Under installation
PS41 Chiang Mai, Thailand	Bilateral Agreement
PS42 Thala, Tunisia	Installation 4 th Q
PS49 Eielson, U.S.A.	Reduced Assessment
PS50 Vanda, Antarctica	Installed, no GCI

In 2004

PS32 Khabaz, Russian Fed.	Under construction
PS33 Zalesovo, Russian Fed.	Under construction
PS34 Norilsk, Russian Fed.	Under procurement
PS36 Petrop-Kamch, Russian Fed.	Under construction
PS37 Ussuryisk, Russian Fed.	Under construction

Cannot be planned

PS16 Luxor, Egypt
PS20 TBD
PS29 Pari, Pakistan
PS44 Alibeck, Turkmenistan

Table 2: Certified Primary Seismic Stations to date

PS2	Warramunga, Australia	2000
PS4	Stephens Creek, Australia	2002
PS08	Lac du Bonnet, Canada	2003
PS9	Yellowknife, Canada	2000
PS10	Scheferville, Canada	2003
PS17	Lathi, Finland	2000
PS18	Tahiti, France	2001
PS19	Freyung, Germany	2002
PS21	Tehran, Iran	2001
PS23	Makanchi, Kazakhstan	2002
PS24	Kilimambogo, Kenya	2002
PS27	Hamar, Norway	2000
PS28	Karasjok, Norway	2001
PS40	Sonseca, Spain	2001
PS45	Malin, Ukraine	2002
PS46	Lajitas, USA	2001
PS47	Mina, USA	2000
PS48	Pinedale, USA	2001

Table 3: Progress of Installation Work of the Auxiliary Seismic Network Stations

(*) No GCI in place

Completed in 2000-2001

AS8	San Ignacio, Bolivia	
AS26	Vranov, Czech Republic	
AS35	SANAE, Germany/South Africa (*)	<i>connected in 2003</i>
AS46	Kerman, Iran	
AS61	Ambohidratompo, Madagascar	
AS69	RataPeaks, New Zealand	
AS71	Urewera, New Zealand	
AS101	Hagfors, Sweden	

Installation Completed in 2002

AS1	Coronel Fontana, Argentina(*)	<i>connected in 2003</i>
AS2	Ushuaia, Argentina(*)	<i>connected in 2003</i>
AS5	Fitzroy Crossings, Australia	
AS9	Lobatse, Botswana (*)	
AS36	Anogia, Greece	
AS50	Valgarnera, Italy	
AS56	Tel Al-Asfar, Jordan	
AS57	Borovoye, Kazhakstan	
AS79	Davao, Philippines	
AS80	Tagytay, Philippines	
AS81	Montele Rosu, Romania	
AS102	Davos, Switzerland	
AS109	Yreka, U.S.A.	
AS119	Lusaka, Zambia	

Installation in Progress or Additional Connectivity in 2003

AS3	Garni, Armenia	
AS4	Charter Towers, Australia (*)	
AS6	Narrogin, Australia (*)	
AS8	San Ignacio, Bolivia	
AS18	Easter Island, Chile	
AS19	Limon Verde, Chile	
AS24	Rarotonga, Cook Islands	
AS25	Las Juntas, Costa Rica	
AS32	Mt. Dzoumac, New Caledonia, France	
AS38	Borgarnes, Iceland	
AS47	Shushtar, Iran	
AS48	Eilath, Israel	
AS49	Mt. Meron, Israel	
AS61	Ambohidratompo, Madagascar	
AS64	Colonia Cuauhtemoc, Mexico	
AS65	La Paz, Mexico	
AS66	Midelt, Morocco	
AS67	Tsumeb, Namibia	
AS73	Jan Mayen	
AS75	Port Moresby, Papua New Guinea	
AS77	Atahualpa, Peru	
AS95	Afiamalu, Samoa	
AS98	Honiara, Solomon Islands	
AS99	Sutherland, South Africa	

Installation in Progress or Additional Connectivity in 2003 (cont.)

AS113 Elko, U.S.A

AS114 South Pole, Antarctica (*)

AS116 San Juan, Puerto Rico

AS117 Santo Domingo, Venezuela

AS118 Puerto La Cruz, Venezuela

Table 4: Certified Auxiliary Seismic Stations to date

AS26	Vranov, Czech Republic	2002
AS56	Tel Al-Asfar, Jordan	2003
AS57	Borovoye, Kazakhstan	2002
AS69	Rata Peaks, New Zealand	2002
AS71	Urewera, New Zealand	2002
AS80	Tagaytay, Philippines	2002
AS101	Hagfors, Sweden	2002