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On-Site Inspection



Major Programme 4: On-Site Inspection

The primary objective of Major Programme 4 is to make the necessary preparations for the establishment of the OSI regime at entry into force of the Treaty. The major elements of OSI are inspectors, equipment and the OSI Operational Manual, together with supporting infrastructures.

BUILD-UP OF THE OSI REGIME

The year 2003 saw a continuous build-up of the programme elements. A database of lessons learned was developed to facilitate the process of elaboration of the draft OSI Operational Manual and the application of the results obtained by field experiments, tabletop exercises, workshops and experimental advanced courses. The first demonstration and selection of equipment for some techniques used in the continuation phase of an OSI were conducted.

An external evaluation of the OSI Major Programme was conducted in May in order to assess progress in the build-up of the OSI regime. The evaluation team of five experts from five States Signatories, chaired by Ambassador Richard Starr of Australia, met in Vienna and produced a report for the Commission. Consideration of the report commenced in both WGB and the PTS and will continue in 2004. The PTS believes the report to provide useful guidance and recommendations for the efficient build-up of the OSI regime, while noting that the implementation of some of the recommendations would have budgetary and other resource implications. The PTS took steps for the early implementation of some of the recommendations. For example, development of a strategic planning process commenced and a coordination group for OSI was established.



Participants of OSI Workshop-9, Hiroshima, Japan.



Atomic Bomb Dome, Hiroshima Peace Memorial Park.

OSI OPERATIONAL MANUAL, OPERATIONAL EXPERIMENTS, INFRASTRUCTURE AND TRAINING

The elaboration of the draft OSI Operational Manual, which is to be presented to the initial session of the Conference of the States Parties, remains a major task of the Commission. Working on the basis of the initial draft rolling text, WGB had covered approximately two thirds of the main body of this document by the end of 2003. It is expected that consideration of all of the main chapters will be finished in 2004. In the interim, States Signatories have continued to explore possible ways of improving the manual drafting process. Issues receiving attention are possible supplementation of the manual with a series of subordinate documents that contain operational, technical and administrative details, entrusting the PTS with more drafting and related tasks and exploration of other options for continuing the elaboration process.

The Commission encouraged States Signatories to continue to contribute to the development of the manual. The PTS increased its efforts to provide relevant input to the elaboration process by preparing material based on results from field experiments, tabletop

exercises and workshops. The PTS will continue to give priority support to this process.

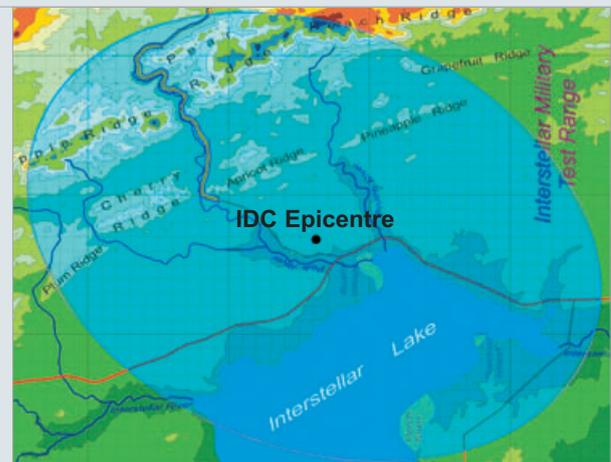
At the request of the Task Leader for the draft OSI Operational Manual, the PTS submitted its view and comments on the search logic and other important topics on the basis of the results of field experiments, tabletop exercises and workshops. The PTS also presented important lessons learned from field experiments to improve procedures at the point of entry and base camp.

OSI Workshop-9, hosted by Japan from 30 June to 4 July 2003 at facilities provided by the City of Hiroshima, was conducted in order to contribute to the elaboration of the draft manual. The topics addressed at the workshop covered confidentiality issues, the results and lessons from field experiments and equipment testing. There were 50 participants from 14 States Signatories and the PTS.

Following the large scale field experiment in Kazakhstan (FE02) in 2002, the PTS made a comprehensive evaluation of the results. The more than 370 lessons formulated by the participants in FE02 were subsequently refined to approximately 140. More than 300 implementable actions were in turn derived. The majority of the actions are expected to be implement-



Third OSI tabletop exercise: the inspection team (IT, on the left) conducts negotiations for access to the inspection area with representatives of the inspected State Party (ISP), while the control team (CT) and the evaluators (at the far end) watch.



Third OSI tabletop exercise: map submitted by the requesting State Party with the request to conduct an on-site inspection on the territory of a (fictitious) State. The map depicts the virtual triggering event and the surrounding location error ellipse calculated by the IDC.

ed by the PTS, mainly within the OSI Division. Several of the actions would have implications for the financial, procurement or other administrative practices of the PTS. A few actions pertain to decision making by an inspection team leader or by the Director-General of the future Technical Secretariat, while others would require decisions by the Commission.

A special purpose database was designed by the PTS for monitoring and managing the implementation of these actions. States Signatories will be able to monitor the rate of progress in implementation through Internet access to the database.

One of the major results of FE02 was the recognition that field analysis of very small seismic events that follow a small underground explosion imposes requirements on the seismic equipment, processing computers and analytical software, and even on the seismologists who interpret the data, that are different from the requirements in the case of natural seismic events. As a result, in 2003 the PTS began to plan a directed exercise primarily to examine alternative seismic software for OSI purposes, but with attention also given to issues of communications, field navigation and seismic array geometry.

Although FE02 was conducted with no health or safety incidents, it reinforced the importance of a robust health and safety programme for OSI. To this end, the PTS began to develop a list of appropriate health and safety standards for inspectors and for the conduct of an OSI. The PTS plans to establish a small panel of health and safety experts in 2004 to propose and elaborate quantitative thresholds, where possible.

The main goal of OSI training activities continued to be the development of a programme of training and exercises for future inspectors and inspection assistants and testing of its elements by means of experimental courses and tabletop exercises. These activities were planned and conducted according to the Long Range Plan for the training and exercise programme, whose principles and objectives were discussed and agreed by the Policy Making Organs.

In order to examine the issues involved when an inspected State Party might employ managed access provisions, the PTS designed a tabletop exercise (TTE-3), which was conducted in close cooperation with the host institution, the Russian Federal Nuclear Center, Snezhinsk, from 29 September to 4 October. The main objectives of TTE-3 were to highlight possible managed access situations and methods of operation during



Fourth OSI Experimental Advanced Course, Paris: the visual inspection and survey sub-team calculating its position on the map during a navigation exercise.



Fourth OSI Experimental Advanced Course, Paris: demonstration of a multispectral instrument for the study of the environment.

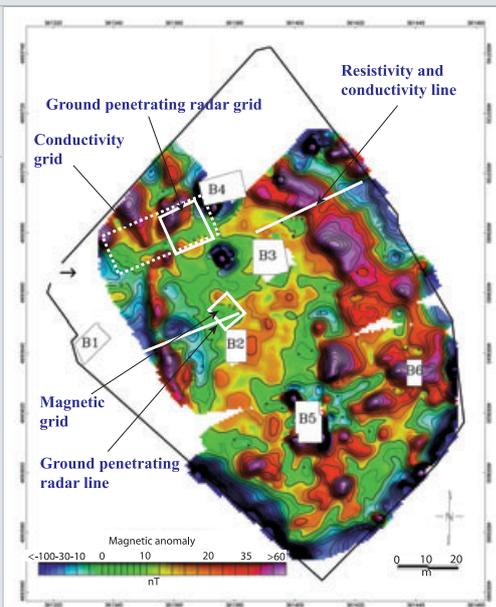
these situations. Technical and negotiation skills were tested in the resolution of various case studies. Eighteen experts from 11 States Signatories and the PTS participated in the event. Some States Signatories also sent observers and the PTS engaged two experts to observe and evaluate the exercise. The case studies and discussions yielded many lessons for the use of tabletop exercises in the training and exercise programme.

The fourth OSI Experimental Advanced Course (EAC4) was held from 22 to 30 October 2003 in Paris in cooperation with the host institution, the French Training Centre for the Prohibition of Chemical Weapons (CEFFIAC). EAC4 was dedicated to developing the curriculum of an advanced course for the future inspectors in the visual observation and survey sub-team. Twenty-seven experts from 15 States Signatories participated as trainees or lecturers. The course concentrated on signatures of nuclear explosions, multispectral imagery, map reading, visual observation, overflight and overflight planning, and included navigation field exercises and demonstration of equipment. Lessons learned from FE02 were included in the curriculum. It is expected that the recommendations of the participants will contribute to improvement of the curriculum of the future advanced course.

The seventh OSI Introductory Course took place in Vienna from 31 March to 4 April 2003 with 28 participants from 22 States Signatories and the PTS, consisting of experts in OSI technologies and representatives of National Authorities. The main topics covered were the phenomenology of nuclear explosions and the OSI process, including key elements such as managed access. By the end of 2003, 246 trainees had participated in introductory courses, contributing to a cadre of potential candidates for advanced training activities, field experiments and OSI equipment testing.

OSI EQUIPMENT

A list of equipment for use during OSIs must be considered and approved at the initial session of the Conference of the States Parties. The current status of the Commission's work on a list of equipment, including the status of approval of initial specifications, is summarized in Table 3. The Commission's mandate also requires it to acquire or otherwise make provisions for the availability of relevant inspection equipment, including communication equipment, and conduct technical tests of such equipment as necessary. The types of equipment currently in the custody of the PTS are indicated in the table. In 2003, efforts contin-



OSI equipment demonstration, Italy: map of total magnetic field at the test site in L'Aquila, showing the location of the survey area for each type of instrument demonstrated (B1 to B6: positions of buildings).



OSI equipment demonstration, Italy: magnetometers.

Table 3. Current Status of List of OSI Equipment and Technical Specifications Approved by the Commission for Testing and Training Purposes

Activities and Techniques Specified in Part II of the Protocol to the Treaty	Equipment Approved (or to be Further Considered) by the Commission	Equipment Obtained by the PTS ^a		
		In PTS custody	In State Signatory custody	
Position finding (para. 69(a)) <ul style="list-style-type: none"> • From the air • At the surface 	Analogue altimeter Satellite based positioning system Handheld range finding equipment Pocket transit compass Analogue altimeter	✓ ✓ ✓ ✓ ✓		
Visual observation (para. 69(b))	Field glasses/binoculars Binocular microscope Magnifying glass	✓ ✓ ✓		
Video and still photography (para. 69(b))	Handheld 35 mm camera Handheld instant camera Media for camera Processor for photographic film Handheld video camera (analogue) Video cassette recorder	✓ ✓ ✓ ✓ ✓ ✓		
Multispectral imaging (including infrared measurements) (para. 69(b))	Not yet approved			
Measurement of levels of radioactivity – gamma radiation monitoring and energy resolution analysis (from the air and at or under the surface) (para. 69(c))	Handheld search and limited gamma identification tools Vehicle-portable search and limited gamma identification tool	✓		
Current list of radionuclides of OSI interest: ³⁷ Ar, ⁹⁵ Zr, ⁹⁵ Nb, ⁹⁹ Mo, ¹⁰³ Ru, ^{115m} Cd, ¹³¹ I, ¹³² I, ¹³² Te, ^{131m} Xe, ^{133m} Xe, ^{133g} Xe, ¹³⁵ Xe, ¹⁴⁰ Ba, ¹⁴⁰ La, ¹⁴¹ Ce, ¹⁴⁴ Ce, ¹⁴⁴ Pr, ¹⁴⁷ Nd, ⁹⁹ Tc, ¹⁰⁶ Rh	High resolution gamma spectrometer tool for field and laboratory use – ‘blinded’ or measurement restricted		Project ongoing	
	Equipment for xenon sampling, separation and measurement		Project ongoing	
	Argon-37 equipment for sampling, separation and measurement – not yet considered			Project ongoing
	Aerial gamma spectroscopy equipment			
Environmental sampling and analysis of solids, liquids and gases (para. 69(d))	To be elaborated			
Passive seismological monitoring for aftershocks (para. 69(e))	Passive seismic equipment	✓		
Resonance seismometry and active seismic surveys (para. 69(f))	Resonance seismometry equipment – not yet approved			
	Active seismometry equipment – not yet approved			
Magnetic and gravitational field mapping, ground penetrating radar, electrical conductivity measurements at the surface and from the air (para. 69(g))	Magnetic field mapping equipment		Project ongoing	
	Gravitational field mapping equipment		Project ongoing	
	Ground penetrating radar		Project ongoing	
	Electrical conductivity measurement equipment		Project ongoing	
Drilling (para. 69(h))	Not yet considered			
Communication equipment (para. 62)	Not yet considered			

^a Equipment ‘obtained by the PTS’ is categorized in accordance with paragraphs 39 and 40 of Part II of the Protocol and is obtained by the PTS through special procurement procedures in accordance with the decision of the Commission at its Eighth Session (CTBT/PC-8/1/Annex II).

ued towards the acquisition and technical testing of core OSI equipment in additional categories. This work focused on equipment for measuring levels of radioactivity and equipment used in geophysical methods during the continuation phase of an OSI. No additional items were able to be obtained or added to the PTS custody or inventory in 2003, but nonetheless significant advances were made towards achieving the Commission's objectives.

A demonstration of continuation phase technologies was held in May 2003 in Italy, hosted by the Istituto Nazionale di Geofisica e Vulcanologia, Rome. Nine manufacturers demonstrated 12 different sets of equipment in three geophysical technologies. The suppliers of the data collection, analysis and visualization software package used by the PTS supported the event by processing, displaying and comparing data gathered during the demonstration. As a result of the demonstration and consideration of the results at the OSI workshop in Hiroshima, the PTS selected two types of magnetometer and two types of ground penetrating radar that fulfil the Commission's requirements, for use in further testing and in training activities during 2004. The display of equipment for shallow electrical conductivity measurement generated discussion among technical experts and the exact technical specifications needed will be considered further.

Steady progress was made towards obtaining, for testing and training purposes, measurement tools for the radioactive noble gases xenon and argon, which are on the list of radionuclides of interest for an OSI.

The PTS initiated two separate projects for xenon and argon. Following discussions between the PTS and the technical institution of the State Signatory that has developed an argon-37 measurement system, a programme for possible demonstration during 2004 was developed. For xenon measurement, proposals were received from several national institutions. Consideration of the proposals, and of the programmatic implications, as requested by the Commission, commenced. The PTS also continued to keep abreast of current developments in the commercial radionuclide measurement equipment market for unique radionuclide survey and analysis tools. A survey showed that the commercial market continues to advance towards being able to supply equipment in configurations as originally envisaged by the Commission. For example, a version of the high resolution instrument that is portable and has removable memory media or PC cards is now commercially available. Thus the PTS anticipates further progress in the coming years in satisfying the Commission's requirements cost effectively in this area.

A multifunctional prototype database for equipment item inventory control and reporting was developed by staff of the PTS. Relevant information is being entered. When completed the database will be used to help monitor the status and location of all equipment items and to generate reports both for operational purposes and to meet Treaty requirements. It is anticipated that with further development this database will be integrated into DOTS.

