DECISIONS

COUNCIL DECISION 2010/461/CFSP

of 26 July 2010

on support for activities of the Preparatory Commission of the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO) in order to strengthen its monitoring and verification capabilities and in the framework of the implementation of the EU Strategy against Proliferation of Weapons of Mass Destruction

THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on European Union, and in particular Articles 26(2) and 31(1) thereof,

Whereas:

(1) On 12 December 2003, the European Council adopted the EU Strategy against Proliferation of Weapons of Mass Destruction (the Strategy), Chapter III of which contains a list of measures that need to be taken both within the European Union and in third countries to combat such proliferation.

(2) The Union is actively implementing the Strategy and is giving effect to the measures listed in Chapter III thereof, in particular through releasing financial resources to support specific projects conducted by multilateral institutions, such as the Provisional Technical Secretariat of the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO).

(3) On 17 November 2003, the Council adopted Common Position 2003/805/CFSP on the universalisation and reinforcement of multilateral agreements in the field of non-proliferation of weapons of mass destruction and means of delivery [1]. That Common Position calls, inter alia, for the promotion of the signature and ratification of the Comprehensive Nuclear-Test-Ban Treaty (CTBT).

(4) The States Signatories of the CTBT have decided to establish a Preparatory Commission, endowed with legal capacity, and which has standing as an international organisation, for the purpose of carrying out the effective implementation of the CTBT, pending the establishment of the CTBTO.

(5) The early entry into force and universalisation of the CTBT and the strengthening of the monitoring and verification system of the Preparatory Commission of the CTBTO are important objectives of the Strategy. In this connection, the nuclear tests carried out by the Democratic People's Republic of Korea in October 2006 and May 2009 further underlined the importance of the early entry into force of the CTBT and the need for an accelerated building-up and strengthening of the CTBT monitoring and verification system.

(6) The Preparatory Commission of the CTBTO is engaged in identifying how its verification system could best be strengthened, including through the development of noble gas monitoring capabilities and efforts aimed at fully involving States Signatories in the implementation of the verification regime.

(7) In the framework of the implementation of the Strategy, the Council adopted three Joint Actions on support for activities of the Preparatory Commission of the CTBTO: Joint Action 2006/243/CFSP of 20 March 2006 [2] in the area of training and capacity building for verification and Joint Actions 2007/468/CFSP of 28 June 2007 [3] and 2008/588/CFSP of 15 July 2008 [4] in order to strengthen the Preparatory Commission's monitoring and verification capabilities.

(8) This support of the Union should be continued.

(9) The technical implementation of this Decision should be entrusted to the Preparatory Commission of the CTBTO,

[1] OJ L 302, 20.11.2003, p. 34.

[2] OJ L 88, 25.3.2006, p. 68.
[3] OJ L 176, 6.7.2007, p. 31.
[4] OJ L 189, 17.7.2008, p. 28.

HAS ADOPTED THIS DECISION:

Article 1

1. For the purposes of ensuring the continuous and practical implementation of certain elements of the EU Strategy against Proliferation of Weapons of Mass Destruction (the Strategy), the Union shall support the activities of the Preparatory Commission of the Comprehensive Nuclear-Test-Ban Treaty Organisation (CTBTO) in order to further the following objectives:

— to strengthen the capabilities of the CTBT monitoring and verification system, including in the field of radionuclide detection,

— to strengthen the capabilities of the States Signatories of the CTBT to fulfil their verification responsibilities under the CTBT and to enable them to benefit fully from participation in the CTBT regime.

2. The projects to be supported by the Union shall have the following specific objectives:

(a) to improve the operation and sustainability of the monitoring and verification system of the Preparatory Commission of the CTBTO;

(b) to strengthen the verification capabilities of the Preparatory Commission of the CTBTO in the areas of on-site inspections and noble gas monitoring and verification for the detection and identification of possible nuclear explosions;

(c) to provide technical assistance to countries in Africa, Latin America and the Caribbean aimed at fully integrating States Signatories into the CTBT monitoring and verification system.

These projects shall be carried out for the benefit of all States Signatories of the CTBT.

A detailed description of the projects is set out in the Annex.

Article 2

1. The High Representative of the Union for Foreign Affairs and Security Policy (the HR) shall be responsible for the implementation of this Decision.

2. The technical implementation of the projects referred to in Article 1(2) shall be entrusted to the Preparatory Commission of the CTBTO.

3. The Preparatory Commission of the CTBTO shall perform its tasks under the responsibility of the HR. For this purpose, the HR shall enter into the necessary arrangements with the Preparatory Commission of the CTBTO.

Article 3

1. The financial reference amount for the implementation of the projects referred to in Article 1(2) shall be EUR 5 280 000.

2. The expenditure financed by the amount stipulated in paragraph 1 shall be managed in accordance with the procedures and rules applicable to the general budget of the Union.

3. The European Commission shall supervise the proper implementation of the Union's contribution referred to in paragraph 1. For this purpose, it shall conclude a financing agreement with the Preparatory Commission of the CTBTO. The financing agreement shall stipulate that the Preparatory Commission of the CTBTO is to ensure visibility of the Union contribution, commensurate with its size.

4. The European Commission shall endeavour to conclude the financing agreement referred to in paragraph 3 as soon as possible after the entry into force of this Decision. It shall inform the Council of any difficulties in that process and of the date of conclusion of the financing agreement.

Article 4

The HR shall report to the Council on the implementation of this Decision on the basis of regular reports to be prepared by the Preparatory Commission of the CTBTO. These reports shall form the basis for the evaluation carried out by the Council. The European Commission shall provide information on the financial aspects of the projects as referred to in Article 3(3).

Article 5

This Decision shall enter into force on the day of its adoption.

It shall expire 18 months after the date of the conclusion of the financing agreement referred to in Article 3(3) or six months after the date of its adoption if no financing agreement has been concluded within that period.

Done at Brussels, 26 July 2010.

For the Council
The President
S. VANACKERE

ANNEX

European Union support for the activities of the Preparatory Commission of the CTBTO in order to strengthen its monitoring and verification capabilities and in the framework of the implementation of the EU Strategy against Proliferation of Weapons of Mass Destruction

I. INTRODUCTION

The building up of a well-functioning monitoring and verification system of the Preparatory Commission of the CTBTO is a crucial element for preparing the implementation of the CTBT once it will have entered into force. The development of capabilities of the Preparatory Commission of the CTBTO in the area of noble gas monitoring is an important tool for assessing whether or not an observed explosion is a nuclear test. In addition, the operability and performance of the CTBT monitoring and verification system depends on the contribution of all States Signatories of the CTBT. Therefore, it is important to enable States Signatories to participate in and contribute fully to the CTBT monitoring and verification system.

The Union will support four projects, the objectives of which are the following:

(a) to improve the operation and sustainability of the auxiliary seismic stations (ASS) network of the CTBT's International Monitoring System (IMS);

(b) to improve the CTBT verification system through strengthened cooperation with the scientific community;

(c) to provide technical assistance to States Signatories in Africa and in the Latin American and Caribbean Region so as to enable them to fully participate in and contribute to the implementation of the CTBT verification system;

(d) to develop an OSI noble gas capable detection system.

The prospects for entry into force of the CTBT have improved due to a more favourable political environment. Given this new dynamic, an increased and urgent focus needs to be put in the coming years on both completing the build-up of the CTBT verification regime and ensuring its readiness and operational capability. The nuclear tests announced by the Democratic People's Republic of Korea (DPRK) in October 2006 and May 2009 not only demonstrated the importance of a universal ban on nuclear tests, they also underscored the need for an effective verification regime to monitor compliance of such a ban. A fully operational and credible CTBT verification regime will provide the international community with reliable and independent means to ensure that this norm is respected.

In Joint Actions 2006/243/CFSP, 2007/468/CFSP and 2008/588/CFSP, the Union has focused on strengthening key elements of the CTBT verification capabilities in the areas of noble gas detection, on-site inspections as well as training and technical assistance. While the present proposal builds upon the previous Joint Action projects, a particular focus has been put on elements that strengthen CTBT verification capabilities in a sustainable manner. This is of particular importance in view of the entry into force prospects of the Treaty, at which time the verification regime must be fully operational.

Maintaining the highest possible level of availability of verification data of the IMS will be an important benchmark in assessing the operational readiness of the verification regime at entry into force. Project I therefore addresses the operation and sustainability of the ASS network of the IMS in a systemic way.

Project II addresses the key issue of maintaining the scientific and technological credibility of the CTBT verification regime over the long haul. It aims at ensuring that scientific and technological progress in some specific areas related to CTBT verification are integrated in and applied to CTBT verification requirements. Project III is a direct follow-up to the training and technical assistance projects of Joint Action 2008/588/CFSP in Africa and will be expanded to some states of the Latin and Caribbean (LAC) region. Project IV focuses on strengthening the CTBT on-site inspection (OSI) capabilities through the further development of an OSI capable noble gas (Radio-Xenon) detection system.

The four projects in support of activities of the Preparatory Commission of the CTBTO mentioned above will be implemented and managed by its Provisional Technical Secretariat (PTS).

II. DESCRIPTION OF THE PROJECTS

Project I: Improve the operation and sustainability of the ASS Network of the CTBT's IMS.

Background

1. In light of the need to increase efforts towards readiness of the CTBT verification regime at the time of entry into force of the CTBT, it is of utmost importance to ensure the highest possible levels of operation and sustainability of the ASS network. The aim of this project is, therefore, to gather the necessary facts and sustainability conditions for each of the facilities of the ASS network in order to improve their sustainability level up to the mandated level of technical and operational requirements.

2. Paragraph 8 of Part I of the Protocol to the CTBT provides that: 'To supplement the primary network, an auxiliary network of 120 stations shall provide information, directly or through a national data centre, to the International Data Centre upon request. (…) The auxiliary stations shall fulfil the technical and operational requirements specified in the Operational Manual of the Seismological Monitoring and the International Exchange of Seismological Data. Data from the auxiliary stations may at any time be requested by the International Data Centre and shall be immediately available through on-line computer connections'. ASS must meet essentially the same technical and operational requirements as primary seismic stations.

3. Regular costs associated with the operation and maintenance of the ASS, including facility physical security, are to be met by the State responsible for such facilities. This does not cause a problem for ASS hosted and/or operated by developed countries. However, it constitutes a significant challenge with respect to the 36 certified ASS of the IMS which are located in developing countries. Many of these stations have been operating for many years and the installed equipment is now reaching end of life status.

Scope of the Project

4. The main scope of this project is to assist local authorities to improve the operation and sustainability of the ASS network of the IMS. This includes:

   — assessment of the current status of the certified ASS,

   — station visits, during which a system calibration will be performed,

   — additional on-site training to local station operators, if feasible,

   — infrastructure and security upgrades, if required,

   — replacement of backup power systems, if required,

   — replacement/recapitalisation of obsolete equipment.

Operational costs for the stations will not be covered by this project.

5. When selecting the ASS for this project priority will be given to:

   — currently certified ASS of the IMS that are located in a developing country or a country in transition,

   — ASS that are currently non-mission capable,

   — ASS nearing non-mission capability, and

   — ASS that have been identified as a potential substitute for a primary seismic station of the IMS.

6. Phase I of this project will consist of station visits to assess the current status and continuing needs of the ASS and to perform pending maintenance actions of equipment and infrastructure. A final list of stations requiring future work will only be available after such visits took place. Moreover, the replacement of equipment, backup power systems, security and infrastructure will be done in Phase I where possible to ensure that aging ASS are ready upon the entry into force of the CTBT.

7. In Phase II, following the initial visit to the ASS requiring immediate attention, a more detailed list of stations requiring future work will be identified. This list will be provided as a deliverable of Phase I and will include the details related to necessary replacement of equipment, backup power systems, security and infrastructure that are required to ensure that aging ASS are ready upon the entry into force of the CTBT. In this Phase, a series of targeted visits to the local authorities of ASS host countries will be undertaken to raise acknowledgement of their treaty responsibilities with respect to operation and maintenance of ASS and encourage the establishment of the required national support structure and resources.

8. Two dedicated trainings/workshops for ASS operators will be organised. It is envisioned to organise one in South America and the other in Africa or Asia.

9. The result and expected benefit of this project will be an improved capability, reliability and long-term sustainability of the IMS network.

Benefits and Outcome

10. The expected benefits would include stations with modern well-functioning equipment, which are maintained at the highest possible level of data availability, thus guaranteeing the scientific and technological credibility of the verification regime over the long haul. Assistance in terms of equipment and training will ensure that station operators are able to maintain and operate their station at expected IMS standards, keeping in mind long-term sustainability and quality data.

11. A final report will be provided to the HR including the following information:

— ASS visited and action taken,

— resources expended on a station-by-station basis,

— a list of all local authorities met and a summary of agreed forward actions,

— a list of all problem reports and trip reports (included as attachments to the final report).

Project II: Improvement of the CTBT verification system through strengthened cooperation with the scientific community

Background

12. Given the rapid pace of scientific and technological progress, it is a key challenge for the Preparatory Commission of the CTBTO to stay attuned to the latest developments in the sciences underpinning the CTBT and to regularly assess them in relation to its verification mandate. Remaining at the forefront of verification efforts upon (and beyond) the entry into force of the CTBT is essential to maintain the credibility of the CTBT verification regime.

13. The CTBT relies more on cutting-edge science and technology than any other international arms control treaty. All components of the CTBT's unique verification system — the IMS with a global network of 337 monitoring facilities, the International Data Centre (IDC) for the analysis of large amount of data and an OSI regime that includes a series of complex technologies — are dependent on ongoing development of science and technology and a close relation to, and interaction with, the scientific community.

14. The CTBT and the Protocol thereto provide a clear mandate to the CTBTO to improve its verification technologies, calling upon each State Party to '… cooperate with the Organization and with other States Parties in the improvement of the verification regime…' (Article IV(11) of the CTBT) and upon the IDC to '…progressively enhance its technical capabilities…' (paragraph 18(b) of Part I of the Protocol to the CTBT).

15. The PTS initiated in early spring 2008 the International Scientific Studies (ISS) project with the aim to assess the capability and the readiness of the CTBT verification system and to identify scientific and technological developments that might enhance the capabilities as well as improve the efficiency and effectiveness of PTS processes. The broad engagement of the technical and scientific community through the International Scientific Studies Conference in June 2009 (ISS09) provided many suggestions to improve the verification capabilities using cutting-edge technologies and methods.

16. As follow-on to the ISS09, the PTS is working to harness these ideas and suggestions to make concrete improvements to its processes and to explore the verification potential of new methods. Under PTS management, focused workshops involving the general scientific community are being held to advance some of the promising ideas from the ISS09. Contracts to develop new and innovative processes identified at the workshops are being awarded and a Virtual Data Exploitation Centre (vDEC) is being established to provide a platform for developing and testing these processes. Potential verification related improvements and innovations stemming from the contracted work will be submitted to the Policy Making Organs (PMOs) of the Preparatory Commission of the CTBTO for consideration.

Objectives

17. The objectives of this project are to improve the CTBT verification system by supporting the involvement of the external scientific and technical community at large:

— in evaluating the existing CTBT verification system's capabilities,

— in contributing to the development of those technologies not yet fully explored within this framework, and

— in providing a solid scientific and technical basis for assessing the long-term needs to ensure CTBT verifiability.

Scope

18. The scope of this project comprises the three following tasks:

— to establish a framework for a structured cooperation with the external technical and scientific community to support new projects and innovations aimed at benefiting CTBT verification capabilities,

— to identify areas where the potential impact of focused research and development activities aimed at advancing the effectiveness and efficiency of the verification system will be substantial, and

— to develop those techniques for presentation to and consideration by the PMOs.

19. These tasks will be achieved through focused workshops discussing and identifying the areas with the greatest potential for CTBT verification and, secondly, through funding the development and testing of these methods for possible use in the verification system. vDEC will enhance the participation of the scientific and technical community and provide access to data and computer resources in support of the projects.

20. The ISS09 reviewed the capabilities of the CTBT verification system. Currently, and as a basis for this project, information and research results that were submitted to the ISS09 are being compiled and assessed within the PTS. Subsequently, and based on these findings:

— Phase I of the project will consist of a series of targeted workshops and technical meetings with scientific and technical experts. These workshops, starting in the latter half of 2010 and early 2011, either as part of the regular calendar of events of the Preparatory Commission of the CTBTO or specifically funded by this project, will include presentations on, and examine, techniques and processes that have the best potential to improve the effectiveness and efficiency of the verification system.

— In Phase II the development and testing of the most promising solutions identified in Phase I will be contracted out to scientific research institutions with the aim to test and consolidate these promising studies into workable software. This software will be presented to the PMOs which will consider its incorporation into the provisional operational environment of the CTBT verification system.

21. In addition to the activities in Phases I and II, the broader scientific community will be involved in an examination of emerging sciences and technologies of relevance to the CTBT verification system through a technology foresight. This parallel activity will also be based on the compilation and analysis of the ISS09 findings and will be pursued through workshops and bibliometric analysis during the course of 2010 and 2011. This technology foresight has the aim to provide the information and analysis that are necessary to remain at the forefront of verification science in the foreseeable future.

Management

22. All aspects of this project will be managed by the PTS with potential outside participation. The PMOs will be informed on a regular basis of the activities and their potential benefits. This will include summary information on ongoing projects as well as focused presentations on specific projects as appropriate.

23. Capitalising on the momentum of the ISS09, the coordinators and integrators of the different verification related subject areas who were involved in the ISS09 process will be potential candidates for contributing to the organisation and leadership of the focused workshops. These prominent scientists will work with the PTS management to ensure wide participation by the scientific community and to help organise and co-chair sessions of these meetings and workshops.

24. The ideas and potential projects generated and recommended by the focused workshops will be reviewed by the PTS. The PTS management will ensure that the activities of the project are focused on the ultimate objective of improving the capabilities of the verification system.

vDEC

25. The implementation of vDEC is moving forward as it is a key tool in the PTS's efforts to progressively enhance its capabilities. The initial impetus for vDEC stemmed out of the Machine Learning/Data Mining (innovative processing techniques) efforts conducted under the ISS09 project and was motivated in large part by the perceived need for exchange and communication platforms, allowing data and PTS software access.

26. Based on these needs, and to provide access to data and processing tools, the vDEC development platform (hardware and software) will:

— host scientific exchange,

— provide a large archive of parametric, waveform and radionuclide data to researchers working on improving the processing,

— provide access to software,

— provide access to test versions of the processing pipelines to be able to insert and test alternate modules,

— integrate additional data with IMS data to investigate improvements resulting from this addition.

Monitoring and OSI Technologies

27. The monitoring and OSI technologies are the foundations of the CTBT verification regime. The ISS09 provided an external scientific review of these technologies as well as a look at many cutting-edge advances in these fields. It is important to both capture the essence of the information presented and to pursue those areas where concrete improvements could be brought to the verification capabilities.

28. Information and research results from scientific posters and presentations at the ISS09 are being compiled and will be made available for registered users and scientists. This will form the basis for targeted workshops and meetings (Phase I) in specific subject areas to further consolidate the ISS09 input and to explore and identify other promising ideas worthy of pursuit to benefit the CTBT verification system. Selected projects aimed at developing and testing the most promising ideas will be funded (Phase II). The results of these projects will be submitted for eventual consideration by the PMOs when improvements are proven. The benefits of this element of the project are improved efficiency and effectiveness of the CTBT verification system processes.

29. Among the specific topics that could be pursued under Phase II of the project are:

— data fusion,

— waveform phase identification,

— OSI techniques, and

— advanced data processing and event categorisation for radionuclide analysis.

System performance monitoring and assessment in these specific areas will be a priority activity to quantify the results of the newly developed processes.

30. Waveform data fusion was a topic of a recent data mining (innovative processing techniques) technical meeting, and the ideas presented will be ready for funding by the end of 2010. Two data fusion subprojects are anticipated for funding through contractors: for example, fusion of waveform (seismic, hydroacoustic, and infrasound) data; and fusion of waveform and radionuclide products/data to produce a Fused Event Bulletin.

31. Phase identification is an area identified by the PTS where the scientific community could make a significant contribution. Data mining workshops have addressed this issue — and will continue to do so —, and the Infrasound Workshop in late 2010 will include phase identification as one of its topics. A contract will be solicited in 2011 to develop promising techniques and to test them on the vDEC processing infrastructure.

32. The CTBT authorises the use of a set of different techniques during an OSI in accordance with the provisions and constraints on collection, handling and analysis of samples and measurements. A total of nine groups of techniques are allowed, many of which have been adapted for application in an OSI environment. Three of these techniques, namely multispectral imaging, active seismics and drilling, are in their infancy in the OSI-specific framework despite being well developed in the geophysical prospecting, commercial and research environment. It is therefore necessary to discuss with experts how these techniques can be adapted to the peculiarities and restrictions in which an OSI will be conducted: time and resources constraints, logistical particularities, potential limitations imposed by the inspection State Party, etc.

33. Three expert meetings with attendance by representatives of exploration companies and scientific institutions, researchers, and nuclear test experts will be held between the second half of 2010 and the first half of 2011 on the following topics:

— multispectral imaging (including infrared wavelengths) — is allowed during the initial phase of an OSI; combined with radiometric surveys from the air, surface anomalies could be characterised that could be potentially related to nuclear test observables,

— active seismics — could be used to detect the presence of cavities, or at least of changes in the rock properties around the detonation point of an underground nuclear explosion,

— drilling — would provide samples from near the cavity that will lead to a conclusive answer to the question whether a nuclear test occurred.

34. As these technologies are standard in the industry, the workshops of Phase I will not be followed by Phase II development; the recommendations from these expert meetings will be put in a report on the application of these technologies to OSI that will be submitted to the PMOs for consideration.

35. With the emphasis on incorporating the noble gas technology into the verification system, improved data processing and event categorisation for radionuclide analysis are needed. In the second half of 2010 the scientific community will be encouraged to participate in the International Noble Gas Experiment workshop where the scientific community's ideas on the subject will be gathered and discussed. A contract will then be solicited in 2011 to develop promising techniques and to test them on the vDEC processing infrastructure.

36. Work to assess system performance through the resources of the vDEC will be contracted out in 2011. External participation in assessing system performance is essential to maintaining scientific credibility towards the global community and will improve the confidence of States Parties when they consider validating the verification system and commissioning its various elements. Performance measures developed through this funding are expected to produce novel and improved system performance assessment measures that can be presented to the PMOs as proposed improvements.

Technology Foresight

37. While the emerging CTBT verification system is being prepared for operational use, attention must also be paid to the road ahead to maintain the scientific and technological credibility of its verification capabilities in the long term. Technology foresight, examining scientific and technological developments that would contribute to these capabilities in the long-term, will help the Preparatory Commission of the CTBTO to be at the forefront in its field. The wealth of the ISS09 scientific and research contributions provided a valuable input and baseline for a comprehensive technology foresight approach. With knowledge of emerging technologies, a roadmap can be developed for incorporating those technologies into the verification system, and come up with recommendations to the PMOs for implementation plans for those technologies that improve the monitoring processes.

38. In 2009 the PTS invested in technology foresight consulting services, notably to develop and apply bibliometric analysis to two technology foresight topics. Based on these experiences, this project envisages extending this proven technique to four additional topics critical to technology development for the CTBT systems beginning in the second half of 2010, namely:

— information technology and communication,

— energy sources,

— sensors and imaging,

— automation and human systems interfaces.

39. In addition to the analyses, a series of four targeted, focused workshops drawing participants from the science and technology communities will be held in 2011 to further explore and develop these topics and, consequently, to ensure awareness of the latest technological developments and state-of-the-art level of CTBT systems.

40. Funding would be used to license technology foresight software tools for 18 months and to contract expert services to enhance and improve the accessibility and effectiveness of the existing Technology Foresight Communication System (TFCS) with a view to make it a more effective tool and a true collaborative forum with the scientific community.

41. Future advances in new energy sources, geophysical sensors, automation and displays will benefit the Preparatory Commission of the CTBTO by potentially lowering the operational costs of stations, increasing reliability of stations and automatic processing, and increasing the efficiency and effectiveness of analysis, to name a few.

Conclusion

42. The broad engagement of the technical and scientific community through the ISS09 provided many suggestions to improve CTBT verification capabilities using cutting-edge technologies and methods. The PTS is working to capture the most promising ideas and suggestions to make concrete improvements to its processes and to explore the verification potential of new methods.

43. The proposed activities of this project will engage the scientific and technical community in examining specific technical issues and developing innovative processes that improve upon the existing CTBT performance and its assessment, first through a set of targeted workshops to explore the new ideas, and second by testing the promising techniques and developing them into workable processes. These will be presented to the PMOs which will consider their incorporation into the provisional operational environment of the CTBT.

44. In addition, the broader scientific community will be engaged to examine emerging sciences and technologies of relevance to CTBT verification. This activity will also be based on the compilation and analysis of the ISS09 findings and will be pursued through workshops and bibliometric analysis during the course of 2010 and 2011. Technology foresight has the aim to provide the information and analysis that is necessary to remain at the forefront of verification science in the foreseeable future.

45. The initial funding will cover the costs related to developing and supporting the best ideas of the ISS09 and to technology foresight. In the course of the project, the PTS will establish and refine the processes and tools for engaging the scientific community and demonstrate the value of this partnership as a mechanism for developing, testing and implementing improvements to the verification system. It is intended (beyond this project) to expand links to the global scientific community, thereby increasing the status of, and the number of potential contributors to, the collaborative efforts so that maximum benefit for the verification system can be derived from cutting-edge research.

Project III: Technical Assistance to States Signatories in Africa and in the Latin American and Caribbean Region so as to enable them to fully participate in and contribute to the implementation of the CTBT verification system

Background

46. One of the unique features of the CTBT verification system among arms control regimes is the real-time provision of compliance-relevant information directly to States Signatories. In addition to the primary verification purpose of the CTBT monitoring system, the technologies and the data of the IMS are of considerable use to civilian and government agencies in their analyses of (for example) earthquakes, volcanic eruptions, underwater explosions, climate change and tsunamis.

47. While interest among developing countries in the establishment of National Data Centres (NDC) has grown significantly over the past years — an increase of subscribers to the IDC of approximately 20 % — many developing countries still do not yet have full access to the CTBT system.

Therefore, additional efforts are being made by the PTS to increase the number of established NDCs, the number of Secure Signatory Accounts and the number of authorised users. In particular, the 70 remaining States Signatories that do not yet have access to IMS Data and IDC products are targeted (29 in Africa, 8 in Latin America, 10 in the Middle East and South Asia, 12 in South-East Asia, the Pacific and the Far East, 3 in Eastern Europe and 8 in North America and Western Europe). These efforts are directed towards those who need PTS technical support in order to increase their use of these data and products.

48. Pursuant to Joint Action 2008/588/CFSP a technical assistance project was initiated with the aim of facilitating the improved participation of African States in the CTBT verification system and its civilian and scientific benefits. A total of up to 19 African States were selected as beneficiaries for that project. However, additional resources are necessary to address the identified needs in Africa as well as in other regions.

49. The proposed new technical assistance project is a follow-up of the project initiated under Joint Action 2008/588/CFSP. It will extend the technical support to the African States that could not be included in the first project as well as to selected states in the Latin American and Caribbean Region (LAC Region). When selecting the proposed beneficiary countries, priority will be given to:

— States Signatories without a Secure Account (37 in the two regions), and

— States Signatories having a Secure Account but with a need to strengthen their technical infrastructure in order to increase their use of IMS data and IDC products for their effective participation in the verification regime as well as for civil and scientific applications.

50. To sustain the activities of the NDCs, the necessary resources for the operation of the facility must be provided by the recipient countries. The commitment of the recipient country is regarded as a prerequisite for the success of the project.

51. As with the project initiated under Joint Action 2008/588/CFSP, this project will involve the provision of group training in the region on the processing of IMS data and analysis of International Data Centre (IDC) products, as well as the provision of basic equipment when needed. If feasible, targeted training and other assistance activities will be devised for the beneficiary States in which particular needs regarding the establishment of NDCs and SSAs as well as regarding the system's civilian and scientific benefits have been identified and assessed. All activities in beneficiary States will be carried out in close coordination with and support from the PTS to ensure efficiency and sustainability of training and assistance efforts undertaken in this project, as well as to ensure adequate harmonisation with the activities undertaken under Joint Action 2006/243/CFSP.

52. On the basis of the selection criteria mentioned in paragraph 47, the PTS foresees activities in as many of the following States as possible, subject to a prior assessment of feasibility by the PTS given local conditions prevailing at that time:

— in Africa, States listed, but not selected as part of the project initiated under Joint Action 2008/588/CFSP: Angola, Comoros, Swaziland, Rwanda, Benin, Equatorial Guinea, Guinea, Guinea-Bissau and Togo, as well as the following States: Botswana, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Cote d'Ivoire, Congo-Brazzaville, Djibouti, Liberia, Madagascar, Mali, Namibia, Niger, Nigeria, and Senegal,

— in the LAC Region: Antigua and Barbuda, Barbados, Bahamas, Belize, Bolivia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Panama, Paraguay, Suriname, and Uruguay.

Benefits

53. The project aims to generate a number of important benefits for the CTBTO and the beneficiary States, namely to enable the NDCs in the beneficiary States to have better qualified technical capabilities for:

— the upkeep and maintenance of their IMS stations,

— the analysis and management of the data and data products. In addition to CTBT verification, this will also be beneficial for the purposes of risk assessment and natural disaster reduction through disaster alert processes, preparedness and mitigation.

54. It will allow those states that establish NDCs to receive and analyse the raw data provided by the IDC in real time. States establishing NDCs will receive technological and human support from the PTS, and such support will help recipient States to build and maintain the technical capabilities necessary to participate fully in the CTBT verification system. In addition, a greater appreciation among beneficiary States of how the establishment of an NDC can help enrich their own scientific base and how IMS data can be used for analyzing events in the region will be obtained.

Description

55. The PTS will identify and provide two technical experts as consultants who will be based either directly in the two regions or in Vienna for this project and who will coordinate all their activities in consultation with and under approval of the PTS management.

Phase 1: Technical evaluation visits

56. A visit will be made to potential beneficiary States as described above to assess the awareness and usage of IMS data and IDC products. The experts will interact with the National Authorities (designated or set up by the States concerned pursuant to Article III of the CTBT) to understand the current needs and perceptions, and to increase the awareness of IMS data and IDC products, including their potential use for civil and scientific purposes. In addition, contact will be established with other relevant institutes in each country that may benefit from utilising IMS data and IDC products. Networking will be facilitated between the National Authorities and relevant institutes, as appropriate. In cases where an NDC exists, the status of each NDC in terms of personnel and infrastructure (including computer and Internet infrastructure) will be assessed, in order to formulate priority activities.

Phase 2: Training

57. Regional training sessions will be held, which will bring together participants from the institutions identified in Phase 1. This training will provide technical instruction on IMS data and IDC products. During this training, participants will work with PTS software developed for NDCs, which can be used to access and analyse IMS data and IDC products. This training will also provide an opportunity to foster cooperation between technical staff at institutes in the region.

58. Subsequently, extended technical assistance will be given to select NDCs to help apply the lessons learned from the regional training to their specific situation. This training will be customised on the basis of the needs of each NDC, the set of skills of each NDC's staff and taking into account the official languages of the beneficiary countries. Participants will install and configure NDC software with the assistance of the technical expert and establish a routine data acquisition, processing, analysis and reporting regime according to the needs of each National Authority. In addition, NDC basic equipment including computer hardware and peripherals will be given to some countries, based on their assessed needs. If equipment is provided, training on the installation, maintenance, and operation of that equipment will also be provided by the technical expert.

Phase 3: Follow-up

59. In order to consolidate the acquired skills and/or to close remaining gaps after Phase 1, a return visit to the beneficiary States will be made to assess how the participants are making use of what was learned at the training sessions in Phase 1.

60. The objective of these shorter follow-up visits is to ensure that the local technical staff can routinely use IMS data and IDC products. These efforts will be customised on the basis of the local needs and skills, with an eye towards sustainability, so that the activities continue even after the conclusion of this project. A concluding comprehensive report for each beneficiary country will form the basis for further follow-up activities in the respective countries.

Duration of the project:

61. Depending on the assessed needs in the beneficiary State, it is anticipated that technical experts will stay between 3 and 6 weeks in each beneficiary country. The total presence in beneficiary countries is foreseen to be 12 to 15 months. The total estimated duration of the implementation of the project is 18 months.

Project IV: Strengthening the CTBT OSI capabilities: through the development of an OSI capable noble gas (Radio-Xenon) Field Detection System (OSI XeFDS)

Background

62. The importance of noble gas detection has become evident in recent years, not the least in the context of the two nuclear tests announced by the Democratic People's Republic of Korea (DPRK) in 2006 and 2009. Building up this capability in particular for OSI-specific purposes is therefore a key element to ensure the future verification of the compliance with the CTBT. Recent OSI exercises, such as the Integrated Field Exercise in 2008 (IFE08) in Kazakhstan, the initial crude test of the Radio-Xenon equipment in 2006, as well as the Noble Gas Experiment (NG09) exercise in Slovakia in autumn 2009 have provided valuable operational experience as regards the requirements for an OSI XeFDS. Based on analysis derived from those exercises it has become evident that the existing noble gas systems will not fulfil typical field and operational conditions encountered during a real OSI [1]. Three main technical reasons have been identified for this.

— In terms of sample quantification, soil gas sampling strategies indicated a need to process 10 to 30 samples per field day. With up to four sampling teams in the field collecting bulk and soil gas samples during an OSI, a single analytical unit with only two sensors is not sufficient to handle these quantities. This is a bottleneck for the entire noble gas methodology.

— The procedural experience of IFE08 showed that OSI specific operational needs are based on a tight and closed chain of custody.

— A reduction of the bulk weight and volume of the OSI noble gas system is necessary given the stringent logistical concepts and foreseeable operations in remote locations under severe climate conditions as well as constraints by limited energy supply. Special emphasis needs to be put on a highly ruggedised design for its operational capability in the field.

Objective

63. The objective of this project is the re-engineering and delivery of a prototype modular OSI XeFDS that meets the OSI specific requirements particularly in terms of throughput of noble gas samples and transportability. The aim is to have the system delivered in time for the preparation for the next Integrated Field Exercise in 2013 (IFE13).

Scope

64. In order to fulfil the abovementioned OSI needs for a noble gas detection system, potential suppliers will be invited to submit proposals to meet the following technical requirements.

— Modular System: modular OSI specific Radio-Xenon equipment consisting of one central processing unit that will have to control several analytical chambers simultaneously and equally is to be developed. This project proposal only aims to cover the delivery to the PTS of one base unit and two plug-on units, each with two analysing chambers (total of four). However, the initial pair of modular analytical units will provide the technical possibility to be upgraded later on with add-on pairs of additional sensors, e.g. by connecting up to 16 pairs of analysing chambers to only one base unit.

[1] The noble gas systems, which were procured under Joint Action 2008/588/CFSP, are transportable equipment which meets the requirements to be deployed as a 'mobile base station' for global, continued Radio-Xenon background measurements but are not designed for OSI field purposes. These systems will be held in the custody of the PTS and will serve as training units for OSI and as a mobile backup system for the IMS.

— Geometrical re-engineering: This proposal covers not only a technical/functional redesign, but also a geometrical re-engineering to meet specific operational constraints found in an OSI. The engineering challenge and the value added of this project is the considerable downsizing of existing systems without losing initial detection capabilities in the order of 1 mBq/m^3. All noble gas detectors in their modular housing should therefore either be able to operate under a variety of ambient climate conditions without the problem-loaded operation of liquid nitrogen or use electrical power for thermo electrical cooling (if it is needed).

— The electrical design of the OSI XeFDS should be as energy efficient as possible to minimise the consumption of electrical power during a field deployment.

— In order to tighten the chain of custody, the system will have to be capable to monitor all operational steps in real time from a data recorder for recording equipment parameters, sample number, operational steps, etc. This will be achieved by a proper redesign of the operating software.

65. After the delivery of the prototype modular system, a validation, testing and training phase is envisaged with a view to have the system operational for the IFE13.

66. In addition to the abovementioned generic technical requirements, further development specifications and particular technical system requirements will later be based on the detailed findings from the NG09 and envisaged technical discussions to be conducted during a planned Noble Gas Expert Meeting in the second quarter of 2010. However, the main findings and conclusions from expert discussions during the NG09 have been used in the preparation of this proposal and are not expected to change in the report nor in the project requirements.

Benefits

67. Strengthening the noble gas detection capability is a key requirement for OSI operational readiness and, thus, for the effectiveness and credibility of the CTBT verification regime. As a result of this project, one full operational and easily transportable base unit with two pairs of modular, plug-on sensors is expected to be delivered before the envisaged IFE13. This will allow significant operational advancements in the noble gas detection capability during an OSI without losing the detection capacity in the order of 1 mBq/m^3.

68. The envisioned modular system will also allow for easy upgrades of the existing hardware before the launch of a specific OSI mission by simply integrating additional modules of sensors as robust plug-ins to one basic system. Moreover, maintenance and the fitting of spare parts under field conditions during an OSI will be greatly facilitated.

Duration of the project

69. Based on similar technical redesign projects, it is expected that an engineering crew of two people will have to work for two years continuously; the maximum duration of the entire project is set to two years.

70. The project is envisaged to begin in the third quarter of 2010 and to last until 2012. The phases and timelines are presented below:

— Phase I Conceptualisation and Blueprint making III.2010 – VI.2010,

— Phase II Building one Prototype of OSI XeFDS I.2011 – II.2011,

— Phase III Prototype test bedded & Refining of Concept III.2011,

— Phase IV Refined Prototype into test bed IV.2011,

— Phase V Production of one refined OSI XeFDS I.2012 – III.2012 (one base unit, four sensors/two pairs of sensors),

— Phase VI Delivery & Initial Equipment Familiarisation Training IV.2012.

71. The above timelines do allow for internal flexibility. However, the training of surrogate inspectors on the OSI noble gas detection system is a compulsory requisite for the operation of the system during the planned IFE13. The date of delivery of the tested OSI XeFDS, which will consist of one base unit and two modular pairs of analysing chambers, is therefore fixed to 31 December 2012. Given the considerable time constraints, efforts will be made to initiate and conduct the application phase (Phase zero) of this project simultaneously with the conceptualisation and initial blueprint making phase (Phase 1).

III. DURATION

The total estimated duration of the implementation of the projects is 18 months.

IV. BENEFICIARIES

The beneficiaries of the projects to be supported pursuant to this Decision are all the States Signatories of the CTBT, as well as the Preparatory Commission of the CTBTO.

The final selection of beneficiary States for the project component 'Technical Assistance' will be made in consultation between the implementing entity and the HR in the framework of the competent Council Working Party. The final decision will be based on proposals by the implementing entity in accordance with Article 2(2) of this Decision.

V. IMPLEMENTING ENTITY

The Preparatory Commission of the CTBTO will be entrusted with the technical implementation of the projects. The projects will be implemented directly by staff of the Preparatory Commission of the CTBTO, experts from the States Signatories of the CTBT and contractors. In the case of contractors, the procurement of any goods, works or services by the Preparatory Commission of the CTBTO in the context of this Decision will be carried out as detailed in the financing agreement to be concluded between the European Commission and the Preparatory Commission of the CTBTO.

The implementing entity will prepare:

— a mid-term report after the first six months of the implementation of the projects,

— a final report not later than one month after the end of the implementation of the projects.

The reports will be sent to the HR.

VI. THIRD PARTY PARTICIPANTS

The projects will be financed in their entirety by this Decision. Experts from the Preparatory Commission of the CTBTO and from the States Signatories of the CTBT may be considered as third-party participants. They will work under the standard rules of operation for experts of the Preparatory Commission of the CTBTO.