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LLNL-TR-618034

REPORT OF ON-SITE INSPECTION WORKSHOP-20
Debriefing on OSI Build-Up Exercises (BUE) I and II/IV and Preparations for BUE III

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Oleg Rozhkov, Matjaz Prah, Deng Hongmei, Gordon MacLeod - Organizing Committee
Vitaly Shchukin, Jay Zucca - Chairpersons

1 March 2013

Vienna, Austria, 29 October — 2 November 2012

Lawrence Livermore National Laboratory is operated by Lawrence Livermore National Security, LLC, for the U.S. Department of Energy, National Nuclear Security Administration under Contract DE-AC52-07NA27344.

Distr.: LIMITED
CTBT/WS/OSI-20/1
1 March 2013

ENGLISH ONLY

CTBTO PREPARATORY COMMISSION | preparatory commission for the comprehensive nuclear-test-ban treaty organization

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(Vienna, Austria, 29 October – 2 November 2012)

Organizing Committee:
Oleg Rozhkov, Matjaz Prah, Deng Hongmei, Gordon MacLeod

Co-Chairpersons:
Oleg Rozhkov, Vitaly Shchukin, Jay Zucca

Rapporteur: Jerry Sweeney

Subject Co-Leaders:
John Walker, Hermann Lampalzer, Malcolm Coxhead, Li Peng,
Allen Smith, Luis Gaya-Piqué

Summary

OSI Workshop-20, "Debriefing on OSI Build-Up Exercises (BUE) I and II/IV and Preparations for BUE III", took place on 29 October – 2 November 2012 at the Vienna International Centre. There were a total of 83 participants from both the Provisional Technical Secretariat (PTS) and 19 States Signatories. This workshop is part of the planning and preparation process leading up to the 2014 Integrated Field Exercise (IFE14). The opening plenary session provided an overview of the build-up exercises (BUEs) and the overall planning process for IFE14 and preparations for BUE I and BUE II/IV, and the closing session provided a summary of findings. Other sessions consisted of a summary of the preparations for BUE I (launch phase), review and discussion of the execution of BUE I, review and discussion of BUE II/IV (pre-inspection and post-inspection phases), and review and planning of elements of BUE III (inspection phase) and IFE14. BUE I was conducted in mid-April and BUE II/IV in mid-September 2012. BUE III is planned for 26 May – 7 June 2013 and IFE14 for November-December 2014.

The purpose of this workshop was to give the participants who took part in the exercises and participants at the workshop a chance to review the preparation and execution of BUE I and BUE II/IV, assess them as to their value to the exercise build-up process, determine what went well and what did not go well, and provide recommendations to help the planning for BUE III and IFE14. This was accomplished by means of presentations by PTS staff and other participants, discussions following the presentations and separate expert working group discussions.

The consensus of the participants was that BUE I and BUE II/IV validated the exercise concept contained in CTBT/PTS/INF.1105 (Concept for Preparation and Conduct of the Next Integrated Field Exercise). The many details dealt with in the launch, pre-inspection and post-inspection exercises provided an opportunity to test a host of issues prior to IFE14. The exercises showed that the PTS has made considerable progress in developing capabilities in logistics, administration and planning of an OSI since IFE08, and pointed as well to a number of areas where more attention is needed – most notably in the areas of health and safety and equipment checking at the base of operations. A number of areas for which results from the two initial exercises can be applied to BUE III and IFE14 were identified. Also, the review of plans and preparations for BUE III and IFE14 provided the participants with an excellent baseline of information on these two exercises. Probably the most significant impressions that resulted from this workshop are the significant level of complexity involved with preparing the OSI verification regime, the extent of planning involved in the preparation of exercises, and the great value of these types of BUE for assessing and building OSI capabilities.

The recommendations section at the end of this report contains the findings of the workshop, grouped into lessons learned from the first two BUEs, proposals relevant to BUE III and IFE14 and issues for the attention of Working Group B.

Contents

Abbreviations

BOO	base of operations
BUE I	build-up exercise I (launch phase)
BUE II/IV	build-up exercise II/IV (pre-inspection and post-inspection phases)
BUE III	build-up exercise III (inspection phase)
CPT	continuation period technique
CT	control team
CTBT	Comprehensive Nuclear-Test-Ban Treaty
CTBTO	Comprehensive Nuclear-Test-Ban Treaty Organization
DC	direct current
DG	Director-General
DSA	daily subsistence allowance
EC	Executive Council
EIF	entry into force
ESMF	Equipment Storage and Maintenance Facility
FIMS	field information management system
GIS	geographical information system
H&S	health and safety (radiological and occupational)
HVAS	high volume air sampler
IA	inspection area
IDC	International Data Centre
IFE	Integrated Field Exercise
IIMS	Integrated Information Management System
IIP	initial inspection plan
IMRDS	Intermodal Rapid Deployment System
IMS	International Monitoring System
ISP	inspected State Party
IT	inspection team
ITF	inspection team functionality
ITL	inspection team leader
L&A	logistics and administration
lidar	light detection and ranging
LIMS	laboratory information management system
LOSP	logistics and operations support plan
MSIR	multispectral including infrared
NG	noble gas
NTM	national technical means
OSC	Operation Support Centre
OSI	on-site inspection
OSIRIS	On-Site Inspection Rapid Inspector Selection (database)
PFD	preliminary findings document
PI	public information
POE	point of entry
PTS	Provisional Technical Secretariat
QMS	Quality Management System
RA	receiving area of the IIMS
RN	radionuclide
RSP	requesting State Party

SAMS	Seismic Aftershock Monitoring System
SOP	standard operating procedure
SP	State Party
TS	Technical Secretariat
UNE	underground nuclear explosion
VIC	Vienna International Centre
VOB	visual observation
VSAT	very small aperture terminal
WA	working area of the IIMS
WGB	Working Group B
WIN	work instruction

INTRODUCTION

As recommended in the revised on-site inspection (OSI) strategic plan (CTBT/PTS/INF.793) and in accordance with the implementation of the OSI action plan (CTBT/PTS/INF.1020), conduct of a second Integrated Field Exercise (IFE) by the CTBT organization has been planned to evaluate progress made with respect to OSI operational capability. At the request of Working Group B (WGB), the Provisional Technical Secretariat (PTS) presented at its Thirty-Fifth Session a concept for building OSI operational capability via a series of exercises prior to undertaking the next IFE (CTBT/PTS/INF.1105). The exercises are designed to address individually and in a systematic way the different phases of an OSI in order to be well prepared before undertaking the next IFE. OSI Workshop-20 is a part of the build-up, being designed as a forum to review and assess the two exercises that have been carried out so far and to influence planning for the next build-up exercise and IFE14.

This report is written according to the chronological order of sessions of the workshop. The initial part of the plenary session consists of an overview of the two build-up exercises, BUE I and BUE II/IV, conducted during April and September 2012 (refer also to CTBT/PTS/INF.1195: Report on On-Site Inspection Build-Up Exercise I; and CTBT/PTS/INF.1214: Report on On-Site Inspection Build-Up Exercise II/IV), and concepts for BUE III and the 2014 Integrated Field Exercise (IFE14). The later part of the plenary was devoted to a panel discussion by PTS staff on details of the preparations for BUE I and BUE II/IV. Workshop sessions A and B provided a thorough look into BUE I and BUE II/IV that included presentations by PTS staff and participants and discussions. The focus on these sessions was to identify the parts of these exercises that should be taken to BUE III and/or IFE14 and the elements that should be played fully, played notionally or not played at all. Session C involved a review of the planning to date for BUE III and IFE14, with most of the focus on BUE III. A break-out discussion session that followed the PTS presentations provided a forum for PTS staff, exercise participants and workshop participants to openly discuss aspects of BUE I and BUE II/IV relative to specific OSI technologies and make recommendations for BUE III planning. The workshop closed with a plenary session composed of summaries and final recommendations provided by the workshop Co-Chairpersons and subject co-leaders for Sessions A-C.

Presentations made during the workshop are referred to according to the main author and the presentation number (designated as “PR#” in the text). Refer to Annex IV for a list of the presentations, giving the name of the presenter, title and presentation number. The presentations are summarized in this report along with highlights of any discussion that followed the presentation. The presentations are contained on a DVD that the PTS has made available. The last section of this report contains the workshop summary and recommendations.

OPENING AND PLENARY SESSIONS

Opening Session

OSI Division Director Rozhkov opened the workshop by welcoming the participants and noting that both the PTS and the States Signatories were well represented. Rozhkov noted that this workshop is a part of the process of planning for IFE14, whose concept and funding have been adopted by the Preparatory Commission. He stated that the schedule of this workshop is designed to be an overview of the BUEs, providing a chance to discuss the first two exercises (BUE I and BUE II/IV) in terms of what was done right or wrong and what could be done better for BUE III and IFE14. He emphasized that this is a chance for a free exchange of ideas, with in-depth discussions. Finally, he challenged the participants, as an outcome of the workshop, to come up with clear guidance for what should be done during IFE14, based on results to date.

OSI Task Leader and workshop Co-Chairperson Shchukin (PR43) provided further guidance on the workshop objectives. He reiterated that the workshop is an integral element of the entire process of the implementation of IFE14 and the preceding BUEs. Shchukin noted three main objectives for the workshop: facilitate the debriefing process of BUE I and BUE II/IV; obtain feedback and comments from participants of BUE I and BUE II/IV; and discuss preparations for BUE III, including recommendations for improvements that could be incorporated into BUE III and IFE14. As to long range objectives, Shchukin noted that some feedback will contribute to the draft OSI Operational Manual elaboration process and other findings will contribute to further development of OSI capabilities. He closed his remarks by encouraging the participants to keep in mind that the purpose of the workshop is to obtain points of agreement regarding findings from the BUEs and to identify points for further consideration.

Workshop Co-Chairperson Zucca briefly reviewed the work agenda for the workshop, noting that one day would be devoted to an overview of BUE I and BUE II/IV, one day to in-depth analysis of BUE I, and one day to in-depth analysis of BUE II/IV and detailed discussion of the planning and preparations for BUE III. He reminded participants of a statement in the planning document for IFE14 (CTBT/PTS/INF.1105) that the exercise should focus on "testing the integration of core/critical inspection capabilities". Zucca challenged the participants to consider their own understanding of the meaning of "integration" and keep this in mind during the planning process.

The opening session closed after a short presentation by the Rapporteur regarding the report drafting process and administrative remarks by the Chief of the Documentation Section of the OSI Division, Deng. Deng gave guidance for presenters and outlined the process for breakout sessions on day four. She noted that the supporting documents list (refer to Annex I) was available on the Alfresco web site (set up for access by participants of the workshop) and that copies of the documents could be made available on request.

Plenary Session

The purpose of the plenary session was to give the workshop participants an initial overview of the preparations for and execution of BUE I and BUE II/IV and preparations for BUE III and IFE14. The session included overview and short presentations on preparations, followed

by a panel discussion. Finally, two presentations were made covering public information aspects and the evaluation process; the latter included initial thoughts on an approach to evaluation of IFE14.

Overview

Lampalzer: Debriefing of BUE I Launch Phase (PR2)

Lampalzer reviewed the BUE concept provided in CTBT/PTS/INF.1105, which is the planning concept for IFE14. BUE I is the first element of the four stage process ending with the execution of IFE14. BUE I was designed to exercise the launch phase of an OSI, practising processes and procedures, testing current concepts of the Operations Support Centre (OSC) and Equipment Storage and Maintenance Facility (ESMF) infrastructure, and identifying areas for further improvement leading up to IFE14. He noted that BUE I was primarily a command post exercise with selected live elements. The exercise involved 'free play' (allowing participants to make decisions and act on them in the course of the exercise) and limited time compression. Cost triggering activities such as actual call-up and travel of external exercise participants were only played out to a limited extent. Relevant Executive Council (EC) decisions were simulated and information related to the inspection team (IT) and inspected State Party (ISP) was injected by exercise control. Lampalzer reviewed the details of the duration of the exercise, the structure of the exercise and its participants, the scope of the activities carried out and activities that were not included in the scope. Activities carried out included: equipment preparation, packing and certification; limited personnel and equipment transport arrangements; PTS-wide decision processes related to the launch, OSC operations, the IT selection process, preparation of an initial inspection plan (IIP) and limited public information (PI) activities. In his overall assessment of the exercise, Lampalzer noted that there were significant improvements compared to IFE08 experience: the BUE concept of CTBT/PTS/INF.1105 was validated; the value of the ESMF was demonstrated; and the exercise demonstrated the great value and effectiveness of PTS cross-Divisional interaction.

Li: Debriefing of BUE II/IV Pre-Inspection and Post-Inspection Phases (PR3)

In a review of the elements of BUE II/IV, Li noted that logistics is at the core of other elements of the inspection such as health and safety (H&S) procedures, IT strategy and planning, interactions with the ISP and inspection team functionality (ITF). All these elements played a role in BUE II/IV. He reviewed the exercise concept, noting that it used the same scenario as used in BUE I, use of the free play concept and limited time compression. The exercise involved arrival at the point of entry (POE), checking of inspectors against the mandate, equipment checking, handover of the inspection mandate to the ISP, the pre-inspection briefing of the ISP, negotiation of the logistics and operations support plan (LOSP) with the ISP, limited transportation of equipment from the POE to the base of operations (BOO), set-up of the BOO, injection of press interaction, including a press conference, consultation with the ISP on field mission plans, preparation of sub-team field missions, preparation of the preliminary findings document (PFD) and decommissioning of the BOO. Li revealed the scale of this exercise when he noted that there were more than ninety participants, 65 tonnes of equipment transported, 17 tents erected, and seven working days of activities that included a PTS-wide cross-Divisional effort and strong support from Austrian military personnel. He noted that this exercise addressed many aspects of an OSI not tested before (equipment preparation and packing, a new design of the BOO and a new type of

satellite communications equipment) and there were many valuable lessons learned that provide guidance for BUE III and IFE14 and will be discussed further during the workshop.

MacLeod: Preparation for BUE III and IFE14 (PR4)

MacLeod provided a status update on the preparations for BUE III and IFE14. After reviewing the exercise concept of CTBT/PTS/INF.1105 and the context of the build-up activities, MacLeod stated that the idea of the BUEs is to make sure that certain processes, such as the Integrated Information Management System (IIMS), the field information management system (FIMS), communications and the IT sub-team's technical processes, are ready to go for IFE14. He noted that following BUE III there will be about 18 months to implement lessons learned prior to IFE14. In reviewing preparations to date for BUE III, MacLeod said that the exercise will be held from 26 May to 7 June 2013, with 12 days of inspection activities. BUE III will be a 'slice' of the full suite of inspection activities outlined in paragraph 69 of the Protocol to the Treaty. A key element of the exercise will be to test ITF, e.g. how well the inspection logic proceeds in an ordered sequence. He noted that, because the inspection activities of measurement and sample collection were not exercised in BUE II/IV, that element of drafting of the PFD was not tested; part of BUE III will exercise this element. The goal of BUE III will be for the IT to use search logic driven by the scenario to devise an inspection plan that determines the inspection equipment and technology needs, not one based on a need to demonstrate equipment operation.

During the following discussion, MacLeod noted that the possibility of rotating inspectors in and out during the inspection is being considered. He also noted that the full launch phase will not be played out in either BUE III or IFE14. In response to a question, MacLeod noted that the technologies that will be exercised during BUE III will depend on equipment availability and other factors, such as the extent of time and number of personnel needed. He cited active seismic surveys as an example of a technology that would be difficult to fully exercise.

Preparations for BUE I and BUE II/IV – Panel Discussion

To start off the panel discussion, nine members of the OSI Division each provided short overviews of the details of preparations for BUE I and BUE II/IV. Summaries of these presentations are given below, followed by elaboration of some of the discussion issues.

Lampalzer (PR6): He noted that the key issues and tools used in the planning were CTBT/PTS/INF.1105, OSI action plan sub-project 1.8 (exercise management guidance), exercise specification documents for each BUE, a Web based Alfresco site for information sharing, exchange of letters, use of PRINCE2 for management planning and use of Microsoft Project for time lines and tracking. His assessment of BUE I was that CTBT/PTS/INF.1105 provided a good framework and the BUE concept was proven; he also noted that pressure and strain were put on the OSI Division staff in preparing and running the exercise, and observed the vital importance of timely information sharing in the exercise process.

MacLeod (PR5): In his overview of preparations, he mentioned preparation of a project initiation document to cover the BUEs and IFE14, the decision to use one scenario for all BUEs, mapping out the standard operating procedures (SOPs) that would be needed and how they were updated and written, as well as other elements such as the layout of the OSC and developing aspects of the scenario.

Li (PR7): He began by noting that BUE II/IV was built on BUE I and planning involved coordination between stakeholders such as PTS senior management, supporting Divisions and the BUE II/IV project management team. He noted that cooperation within the OSI Division also played a major role in the exercise in areas such as logistics, equipment, documentation and training, and policies, procedures and operations. The overall concept of the exercise was created via development of a breakdown structure and flow chart of pre-inspection and post-inspection phases.

Kozma (PR8): He described the supporting products that were developed – the scenario and time line, an LOSP and a list of injects (the time line is a combination of screenplay and 'director notes' – helpful for control purposes). The LOSP was notional for BUE I but was needed for BUE II/IV. He noted that some details could have been planned better, such as the timing of an inject and the expected response -- the goal is to try to plan for all eventualities.

Arndt: He noted that the problem with the equipment list revealed by BUE I had been corrected in time for BUE II/IV. It was important to make sure that the equipment for BUE II/IV was inventoried, maintained and sealed 3-4 weeks before the exercise.

Labak (PR9): With respect to the scenario, he noted that it was built on three levels – a general level, the level of data flow elements and finally the level of scenario products. He described the formats and form of data.

Balczo: He described the BUE I infrastructure, equipment and operations at the ESMF and the equipment management system used during BUE II. He noted that there was an improvement in operations between the two exercises and that storage stock was loaded and labelled for BUE II.

Gavish: He described the objectives, goals and training methods for BUE preparatory training. He noted that there is a need to develop draft procedures for equipment operation. He suggested that, as a prerequisite for adequate training, all procedures should be cleared (or at least be at a 'near readiness stage'), equipment to be utilized in the exercises should be available, and participants in the exercises(s) should have been already nominated.

Deng (PR10): She discussed documentation prepared for the BUEs, including the hierarchy of documentation, standardization of SOPs, coordination of development or revision of the OSI Division's SOPs and other Quality Management System (QMS) documents, and documentation kits used for the BUEs, and listed some lessons learned.

In answer to a question about the nature of press access during the exercises, MacLeod said that this occurred on the ISP territory. This is an expected realistic occurrence during a real OSI. There are many organizations which have conducted similar high profile inspections that have had this experience. In answer to a question about data products, MacLeod pointed out that for the exercise data products were simulated as being provided by other States, through the International Data Centre (IDC), to the team.

Dekin advised that, for the equipment checking process and set-up of the BOO, sub-teams should know where their container is and what is in it. Zucca noted that the PRINCE2 planning tool is a very important element for the planning process. MacLeod noted that, in planning, the focus was always on getting equipment and other support items ready for the IT,

but this was not done for the ISP or control team (CT). This is an area that needs much more work – planning for support of the ISP and the CT is also needed.

Two more presentations were given at the end of the plenary session – one describing the PI process as played out in the BUEs, and the other describing the exercise evaluation process.

Public Information Aspect

Mützelburg: Public Information in the BUEs: Injects and Lessons Learned (PR41)

Mützelburg described the different types of PI injects used during the BUEs and the lessons learned. Types of information used in the exercise were: requests for input to the OSC for drafting press releases and Director-General (DG) statements; IT interaction with the media through a media 'ambush'; a press conference with the inspection team leader (ITL) and the ISP; and simulation of the media echo through 'press clippings' reflecting reactions of the OSC and IT to the PI injects.

In the following discussion, Shchukin asked whether the PTS gained enough experience from this part of the game. Mützelburg answered that the information flow from the OSC could be improved. The exercises also showed that it was useful for the IT to have an informed PI expert on the ground and that a draft PI policy should be tested during the next BUE.

Evaluation Aspect

Oliver and Walker: Evaluating the IFE: Assessing OSI Preparedness (PR11)

Oliver began by describing the 'blueprint' for the evaluation process, which consists of an 'evolving' concept paper covering all the evaluations supported by individual frameworks for evaluations covering each exercise. He noted that the purpose of the BUEs is to develop operational capability, to assess progress and to strengthen and improve specific OSI operational capabilities. The IFE is designed to be a "test of OSI preparedness" that will include a summary evaluation of the operational capability as demonstrated by the exercise. Oliver presented four high level evaluation questions, dealing with issues such as progress made, the current level of preparedness, identification of capability gaps and training required, and assessment of how the series of exercises serves to provide a platform for testing operational capability. He described the framework of the exercise evaluation process with graphical displays of the process and examples of data collection guides and tools. He noted that the evaluation report will contain key findings based on the four high level questions and recommendations that flow from those key findings. Walker then went on to address finer level details associated with how High Level Question 2 (OSI preparedness) might be addressed in the evaluation process for IFE14, the OSI capability components that might be addressed, the need for definitions (as they will be used for evaluation) of terms such as "timely" and "effective", and assessment criteria. He finished with an explanation of a possible scoring system and a list of challenges (in the form of questions) involved with the evaluation process for IFE14 that have been identified.

SESSION A
Build-Up Exercise I (Launch Phase)
Subject Co-Leaders: J.R. Walker and H. Lampalzer

Introduction of Session A by Subject Co-Leaders

Walker opened Session A by providing a brief overview of the scope and referred to two related discussion papers (PR12: Introductory Comments on Build-Up Exercise I, and PR13: BUE I Key Findings and Recommendations from the External Evaluation Report) prepared by the Co-Chairpersons. Subsequently, Lampalzer informed the workshop about the key findings identified as a result of the plenary session and outlined the detailed programme and presentations to be given in the course of Session A. Finally, Walker made reference to the group discussion in the afternoon session and raised seven specific questions (refer to the discussion session included below) for consideration therein.

MacLeod: Build-Up Exercise I: Operations Support Centre (Activation and Operations, Lessons Learned) (PR42)

MacLeod started the series of presentations with an account of issues related to the OSC. First, he reviewed the BUE I scenario and highlighted the main tasks of the OSC. Second, he described the key activities and main products prepared by the OSC during the exercise. Third, he explained the OSC structure and described the physical layout adopted by the OSC and 'core' IT at the ESMF. In addition, MacLeod discussed design and data flow aspects related to information technology that are required to support OSI planning and preparation activities. In this context, he highlighted challenges facing construction of a data flow process that meets the requirements of an OSI (including confidentiality, data protection, data availability and access issues for the various stakeholders). MacLeod identified a core IT as a cadre of PTS personnel who function as IT members during initial activities of the OSC leading up to the OSI decision by the EC. The OSC/core IT was generally on track in meeting tasks within the time lines.

MacLeod also touched upon lessons identified in the course of the exercise follow-up process and particularly highlighted observations related to the 'method of operations'. He identified the need to have further discussions on the LOSP structure, its content and the respective responsibilities for its preparation. The following issues were identified during the subsequent discussion:

- In response to a question about how the lessons learned from BUE I are related to the evaluation process, MacLeod indicated that each lesson learned is assigned a priority, partly based on whether the item can be or should be corrected prior to IFE14. The lessons learned also took this factor into consideration.
- Additionally, a question arose on the staffing of the OSC with respect to the use of PTS staff. MacLeod stressed the fact that the OSC was staffed with experts from across the entire PTS, which proved to be highly valuable and represented major progress compared to previous exercises.

Prah: Build-Up Exercise I: Core Inspection Team Plans and Activities (PR14)

Prah began by requesting thoughts from participants on the definition of the core IT. In this context he highlighted the time criticality of the various planning and preparatory activities to be conducted by the core IT during the launch period. Additionally, Prah noted the need to begin preparation activities as soon as possible after a request for an OSI is received. Furthermore, he recalled the Treaty provisions that provide the option of incorporating Technical Secretariat (TS) staff members into the IT, enabling an early start to the planning and preparatory activities. The tight time line required by the Treaty means that the full IT will not be available in the first few hours, so those available immediately will develop the IIP until the main body of the IT arrives; some or all of those involved in this planning process will deploy to the field. Time would be wasted otherwise in briefing the IT on the details of the plan and the thinking that underpinned it.

In his presentation, Prah explained the core IT composition, its major tasks (particularly for IIP development) and related support activities for other key products to be prepared during the launch phase. Finally, Prah presented "highlights" and "lowlights" from the core IT perspective. Among the various highlights, he noted the good working atmosphere, the proactive approach taken by the core IT, the usefulness of the SOP describing the launch process and the document outlining the search logic approach. Among issues for improvement, Prah itemized the need to clarify further the interaction among the various OSC teams (to be reflected via revisions to the SOP), the need for IT hardware improvements, the need for adequate staffing for the geographical information system (GIS), and improvements to the core IT infrastructure. The following issues emerged during the subsequent discussion:

- Further information was provided on BOO related issues, where it became clear that the IT had in fact prepared two alternative options for the BOO set-up.
- Debate arose on the process of the assembly and composition of the core IT. In this context, participants emphasized the need to have a sufficient number of trained subject matter experts as part of the IT core team.

Gavish: Operations Support Centre During OSI Launch Phase: Planning Team (PR15)

Gavish started off by highlighting the key outcomes of the launch phase and respective responsibilities of the planning team. He described the role of the OSC planning team in the exercise and the key activities conducted (inter alia, support of the core IT in the IIP preparation, collection and maintenance of technical information, and support of the DG and EC, as well as preparation of the inspection mandate and notification of the IT arrival at the POE).

Gavish also identified the difficulties faced in running the OSC and proposed some solutions. In this context, he noted the need for closer cooperation between the planning team and the core IT (including joint meetings and infrastructure issues) – at the very least they should sit in the same room. He also acknowledged the need to keep up to date the On-Site Inspection Rapid Inspector Selection (OSIRIS) database (the roster of inspectors and contact information), which would require periodic revision. Furthermore, he highlighted a requirement for an information package to be provided to IT members. Gavish also suggested making use of visual displays to highlight critical planning issues; he suggested a number of data sharing and information exchange related aspects as well as a number of logistical and

infrastructure issues. He noted that a better and clearer definition of OSC roles was also essential. The following issues emerged in the subsequent discussion:

- Should the planning team and core IT be merged, or should they be kept as separate units? Gavish suggested that they stay apart but still try to work together closely. Regardless of the ultimate choice, participants stressed the need for close coordination and cooperation throughout the launch phase.
- Furthermore, the distribution of logistical expertise between the planning team, logistics team and core IT at the OSC during the launch phase was noted – a key concern here was that if responsibilities were duplicated beyond the logistics team, then there was a risk of confusion over responsibilities for performance of specific tasks and a possibility that some urgent ones might be overlooked on the assumption that someone else was dealing with them.
- Finally, Gavish suggested that the OSIRIS database be updated constantly, but especially before training activities and call-up exercises.

Balczo: Logistics Team – ESMF (PR18)

Balczo described the structure of the logistics team (i.e. consisting of a logistics planning group, a certification group and an ESMF and infrastructure support team). He summarized key tasks performed in the first 120 hours following the inspection request and in particular elaborated on challenges related to the equipment list that arose during BUE I. Balczo also suggested that the current composition of the OSC be reconsidered and be based on a different distribution of logistical expertise between the various OSC sub-teams – sole logistics responsibility should reside with the logistics team, with points of contact identified in the others, such as the planning team.

Balczo reported on logistical arrangements taken for BUE I and noted the vital need for standing arrangements with shipment companies. He noted that there were major problems in preparing the equipment list for the IT during the exercise, but this was largely due to the fact that the Hardcat (equipment database) system was not fully functioning at the time of the exercise. Furthermore, he referred to the OSI databank (action plan sub-project 2.8, CTBT/PTS/INF.1020) and elaborated on the LOSP preparations and the need for adjustments to be made to this latter document that were revealed as the exercise unfolded. In addition, he suggested revising the existing OSC SOP by clearly outlining logistics related responsibilities. Balczo highlighted the importance of having sufficient H&S expertise available within the IT as well as within the OSC during the launch phase. Finally, Balczo outlined the progress made on the lessons from BUE I and the critical importance of the exercise in preparing for IFE14. In the subsequent discussion, the following issues arose:

- The major improvements made on the equipment inventory list as a result of the availability of the Hardcat asset management system were highlighted as a critically important advance, since Hardcat can meet different inspection information needs through the way in which relevant information is presented.
- Additionally, a brief discussion highlighted the issue of personal kits (protective clothing and personal equipment) for inspectors. Balczo noted that the OSI Division is considering this and a gradual implementation approach will be applied, taking into account resource implications. Items would be held in store at the ESMF and

issued to individuals when an inspection was called – separate clothing kits would not be prepared for the total number of inspectors eventually trained.

Arndt: Equipment Certification (PR16)

Arndt opened his presentation by referring to Treaty provisions related to certification (Part II, paragraph 38, of the Protocol) and characterized the approach currently being adopted by the OSI Division in the equipment certification process. He noted that this consisted of six distinct stages, which are now reflected in one approved SOP. Arndt outlined the respective technical documentation and templates now in place and discussed the dependencies related to the certification process. Finally, he shared his observations on the lessons identified from BUE I and provided concrete suggestions for improvement. The following issues were raised in the subsequent discussions:

- Arndt stressed the need to have all available equipment ready and certified before a request for an OSI is received so that it would be ready for immediate deployment, not least taking into account the tight Treaty time lines.
- Given the interest raised in this issue among participants, the Co-Chairpersons decided to address the issue in the discussion session (see results below).

Deng: OSI BUE I: Administration Team (PR19)

Deng focused her presentation on three aspects: roles and responsibilities of the OSC administrative team, key elements and challenges faced during BUE I, and improvements and suggestions for consideration. As regards challenges faced, she suggested that the need for access controls to offices within the OSC that had been put in place for BUE I be reconsidered. Furthermore, she noted the challenges faced pertaining to logging and archiving the extensive amount of information generated during an OSI launch phase and highlighted the need to augment respective resources for accomplishing all tasks – in terms of administration and IT assistance as well as office equipment.

Concerning improvements, she noted, inter alia, the need to address further the confidentiality issue, which was tested during BUE I only in a very simplified manner with only a single level of confidentiality assumed. Furthermore, Deng highlighted the critical importance of working on information flow and its management during the launch phase. She noted that revisions to the OSC SOP were needed following the BUE I experience. Finally, Deng suggested that separate work instructions (WINs) could be prepared to provide instructions covering procedures for each OSC team, document handling and financial issues.

Tonos Paniagua: OSC Personnel Team: BUE I Major Steps, Challenges and Lessons Learned (PR47*)*

Tonos Paniagua reported on the composition of the personnel team, its role, the major steps undertaken during the exercise and challenges faced during BUE I. She noted the usefulness of the OSC SOP and also highlighted aspects currently not reflected in the current version but which merit consideration for incorporation in a revised edition.

Tonos Paniagua also stressed the importance of constantly keeping the OSIRIS database updated, as this is vital for checking inspector availability during the launch phase.

Additionally, amending the current information available in OSIRIS is essential. Coverage of OSIRIS needs to be extended to include the sort of data relevant for the acquisition of visas. Tonos Paniagua suggested that the personnel team be augmented at the initial stage of the launch phase in order to have the capacity to address all availability and travel related issues for a full IT of 40 inspectors plus rotations. As for travel planning, she noted the need to consider open tickets for round trips for the IT (unless a clear rotation plan has been already decided upon) as well as further clarity in the daily subsistence allowance (DSA) related calculations in the context of an OSI.

Tonos Paniagua noted that contracts should be in place before an OSI occurs and suggested improvements to the current template contained in CTBT/PTS/INF.1036. In this context, she highlighted the benefit of putting in place a contract management system, as part of the OSIRIS database or otherwise, to ensure that contracts of available inspectors are renewed and finalized in advance of an OSI. Furthermore, and given the extensive interaction of the personnel team with inspectors to be activated and called up, sufficient technical support infrastructure (e.g. telephones, computers and office equipment) needs to be available at the OSC. Finally, Tonos Paniagua proposed that different templates be prepared and attached to the OSC SOP to facilitate personnel team related tasks. The texts prepared during BUE I could serve as a reference for these purposes.

Group Discussion

Discussions centred on the following set of key questions identified by the Co-Chairpersons and related aspects that arose during the presentation session.

Question 1: What is the status of the follow-up process implementation (status, challenges in view of BUE III and IFE14 preparations as well as priorities, support required from States Signatories)?

(a) *Equipment Certification Process*

- Arndt clarified that the last process step in essence only involves a paper trail and signature, since all the actual technical checking (maintenance, calibrating, testing, cleaning and decontaminating) and all other time consuming aspects are carried out in advance during ‘peacetime’ with the clear aim of ensuring that equipment is ready to be deployed to the field at a moment’s notice.
- Furthermore, and given the discussion on this issue, it was reiterated that acceptance of the certification process as described above is required among States Signatories. A common understanding to this effect by the States Signatories might be sought in WGB.
- While acknowledging the progress on certification made during BUE I, participants suggested proceeding with an equipment system-oriented approach as opposed to an item-oriented approach to certification. In this respect, participants stressed that the certification document should be seen as an overarching confirmatory statement that the respective equipment systems meet Treaty related requirements.
- In addition, the close link between the equipment list (to be approved at the initial session of the Conference of the States Parties) and the certification documentation was highlighted. In this context, it was noted that a template for the equipment list recently approved by WGB and respective information such as certification criteria

are reflected therein. Accordingly, efforts should particularly focus on the practical implementation aspects.

- Participants underlined the need to put in place a feasible solution for certification that meets Treaty requirements while simultaneously facilitating the ISP equipment checking process. Hence a bureaucratic approach that generates large amounts of paper should be avoided at all costs as this will delay and complicate matters at the ESMF, POE and BOO.
- A suggestion was made to examine the potential contribution of the Hardcat asset management system for equipment certification purposes.
- In light of the BUE I exercise results, participants agreed that the equipment list in the mandate should be relatively simple. The detailed equipment description should be contained in separate packing documents accompanying each transportation pod.

(b) *Logistical Support Request and Standing Arrangements*

- Much more attention is required in the follow-up process on the request for logistical support from the State Party (SP) sought to be inspected or ISP, depending on the stage of the launch phase. As such, follow-up work should establish a much more detailed and well documented standard template setting out precise and specific support requirements.
- The detailed logistical support availability template should be sent promptly once the inspection request has been submitted, inviting the SP to be inspected to indicate what it can or cannot provide. (A State would be within its rights to ignore this, but this would be self-defeating if the EC approved the request.)
- As part of this aspect, some discussion arose on the function of the IT advance team, its mission and delegated authorities, as well as its related equipment needs.
- The discussions on advance support covered the nature and extent of future TS–SP standing arrangements and the extent to which these could be relied upon as an indicator of available logistical support. Accordingly, the importance for the logistics planning process during the launch phase was emphasized, although the existence of standing arrangements cannot be assumed in all cases. Certainly, the availability of standing arrangements with SPs might considerably facilitate logistical preparations. Such things would provide clarity on the extent of ISP support that might be expected.
- The OSC launch phase planning process should be a seamless effort involving all the sub-components working jointly with clear lines of responsibility to enable the IT to deploy to the POE.

(c) *SOP Revision and Preparation in View of IFE14*

- As part of the IFE14 related preparations, the need for and current availability of QMS documentation covering various aspects of an OSI were stressed. In this context, the need for clarity on the various inspection related activities, processes and techniques was underlined so that those SOPs, WINs and other documents that were not yet written or revised could be done so in good time for the exercise. Furthermore, it was suggested to define those aspects that are not reflected in CTBT/PTS/INF.1105.

Question 2: What were the main challenges affecting information sharing between the various participant groups (ISP, IT, CT, evaluation team)?

(a) *Distribution of Logistical Expertise Within the OSC*

- Participants highlighted the vital importance of avoiding duplication of logistics responsibilities among the various OSC teams. Hence a clear allocation of responsibilities and delineation of assignments must be decided upon and reflected in the OSC SOP. In this context, the usefulness of regular meetings among the various OSC teams – particularly the planning team, logistics team and core IT – was stressed, as these would facilitate information sharing among all OSC groups.

(b) *Role of the OSC*

- Regarding the role of the OSC, it was noted that an OSI would be the primary TS priority at that time, and indeed possibly even the sole task of the entire organization. TS resources would thus be focused fully on that undertaking, given its strategic and political importance. Accordingly, the OSC can be considered as the organization's focal point in the course of an OSI, which could draw upon the entire organization's resources to enable deployment of the IT to the field within the Treaty time lines.
- Taking into account the understanding that an OSI would be the sole priority of the entire organization, respective responsibilities within the organization (and the OSC) need to be identified and reflected in the structure of the future TS upon entry into force (EIF). This would enable a clear identification of individual roles and the assumption of new tasking in the event of an inspection; it would be expected that current skills and expertise would need to take into account the specific circumstances of an individual inspection scenario. In this respect, the importance of putting in place a mechanism that enables the rapid activation of the OSC was also emphasized.
- Additionally, and as part of the discussion, the key role of the Logistics and Operations Support Section of the OSI Division was emphasized, given its first-hand knowledge of all OSI equipment related issues.
- Taking into account the importance of the OSC for supporting an OSI, a suggestion was made to conduct a cross-Divisional, organization-wide integrated exercise that could focus exclusively on OSC aspects.

(c) *Logistics and Operations Support Plan*

- During discussions some participants expressed their belief that the LOSP should be viewed as an overarching comprehensive document, capturing all the logistical and operational support requirements and thereby serving as both a planning and a conceptual document for the entire OSI process. This means that the LOSP is revised throughout the four inspection phases. The LOSP exists to facilitate IT deployment to the field, its sustainment once deployed, and its recovery and post-inspection actions. Hence, a too narrow interpretation of the LOSP should be avoided.
- Also noted was the fact that the LOSP has to address both ISP related logistical support requirements and TS related support. However, the LOSP is a TS document and only its applicable portions are to be shared or negotiated as required when specific types of logistical support are sought from the ISP.

- Participants further noted that the OSC SOP provides some guidance on the responsibilities and key products to be prepared for inclusion in the LOSP. Nevertheless, additional information and guidance on the interaction between the various OSC teams in this process would be beneficial and should be reflected in the OSC SOP.

(d) *Information Sharing*

- Results of BUE I clearly identified the need to put in place a more capable information technology infrastructure for information sharing within the OSC. Such improvements would help to minimize the sorts of problems that degraded OSC capabilities and performance during BUE I. The need to ensure the availability of such a capability in advance of an OSI was stressed.

Question 3: What aspects need to be changed or improved for IFE14 from BUE I, what actions are required, who leads, and how are these actions to be implemented and according to what time line?

Which Launch Phase Related Elements Should Be Rerun for IFE14?

- In view of time and resource related constraints, one option might be to refrain from exercising all aspects in IFE14 that have already been tested during BUE I. That said, there is a risk that capabilities can atrophy if not regularly tested. However, a suggestion was made to exercise a number of radionuclide (RN) related issues pertaining to the launch phase, as BUE I captured these aspects only to a very limited extent. One expert suggested that the RN sub-team currently does not have the necessary tools to interpret IDC data.
- Participants also stressed the different character of BUE I and IFE14. While BUE I served the purpose of building capabilities, IFE14 is to be seen as a full exercise for the organization, from which conclusions as regards readiness will be drawn and remedial actions identified. Hence it is important to test several crucial launch related activities to obtain a comprehensive picture of PTS capabilities at that point in time. Additionally, it is important to obtain feedback as to what aspects were improved since BUE I.
- Experts highlighted the fact that some launch related activities such as personnel selection, personnel call-up and equipment transport cannot be tested in real time in IFE14 as they need to be carried out in advance for exercise purposes. Nevertheless, these aspects could be simulated or tested notionally so that the issues that underpin them are not overlooked.

Question 4: What aspects that were not addressed in BUE I should be simulated in IFE14? What aspects should be tested notionally, if any, and what should be tested for real?

Question 6: How can or should the OSC be tested in IFE14, taking into account lessons from BUE I?

Aspects to Be Simulated in IFE14 That Were Not Simulated in BUE I

- The suggestion was made to test the advance team aspect in more depth than in BUE I and explore the related implications for the IT structure. Participants saw considerable merit in the advance team concept, which is also reflected in the Model Text for the draft OSI Operational Manual (CTBT/WGB/TL-18/47). Therefore it is worthwhile to consider testing this in IFE14.
- Participants also noted that the free play principle should guide the IT decision on whether or not to make use of an advance team.
- Furthermore, the proposal was made to exercise confidentiality issues to a much larger extent in IFE14. In this context it was explained that the limited simulation of confidentiality aspects during BUE I reflected the current lack of an overarching confidentiality concept at the PTS.
- In order to provide clarity on the various aspects that were tested during BUE I, the PTS provided a detailed table from the BUE I and II/IV exercise specifications document (Annex II).
- Finally, one participant noted the need to look into the lessons identified from the two IFE08 follow-up workshops and relate them to IFE14.

Question 5: To what extent can artificialities and exclusions be simulated in future exercise play?

Notional Testing of Certain IFE14 Activities

- A suggestion was made to test the OSI databank in IFE14. In particular, aspects related to acquisition of information during the launch phase should be tested.
- As indicated above, certain activities such as movement of personnel, visa issuance and equipment transport issues are problematic for testing in real time during IFE14. A suggestion was made to test them in smaller, separate exercises or to build them into the exercise play so that they were addressed in the overall game even though they were not being tested for real.
- Regarding inspection technical activities, it was suggested that CTBT/PTS/INF.1105 provides a clear framework for the specific aspects to be exercised in IFE14. Without prejudice to this core requirement, certain issues can be considered in the context of inspection planning, such as initial thinking on drilling requirements presented by a specific inspection area (IA) geology and prior drilling experience of operations in comparable geologies. This might be part of the work of the core IT as it prepares the IIP – this task had been highlighted in the 2011 expert meeting on drilling and subsoil sampling.

Question 7: What amendments need to be made to the IIP, mandate and LOSP preparation and updating?

- A participant noted that BUE III will help indicate the extent to which the IIP and LOSP prepared by the IT meet respective requirements, and that better judgement can probably be made afterwards on the content and layout of these important documents and on any changes that might be needed.
- A recommendation was given to revisit the contents of the files containing IA and triggering event file information prepared for the IT, as they showed some level of

duplication. A suggestion was made that these two files should be checked for better delineation of these types of information.

- Integration is the key for IFE14 and that means it should be done across the whole inspection process – it is not just about the techniques in Part II, paragraph 69, of the Protocol; another definition of integration also highlights integration across the PTS – planning and supporting an OSI are not just the responsibility of the OSI Division.
- As for phenomenology, the Model Text includes a chapter on underground nuclear explosion (UNE) observables and those from nuclear weapon tests in other environments – the TS also has some data on UNE observables available to it to assist with training and development of concepts of operations and equipment requirements.

SESSION B
Build-Up Exercise II/IV (Pre-Inspection/Post-Inspection Phase)
Subject Co-Leaders: Malcolm Coxhead and Li Peng

Introduction

In this session, there were twelve presentations on BUE II/IV: one each on general overview, ISP perspectives, IT–ISP interaction and OSC activities, six on specific ISP perspectives and two on CT perspectives.

Kozma: ISP Preparations for OSI (PR20)

Kozma summarized the many tasks and activities likely to be expected of an ISP in relation to the conduct of an OSI, focusing on its preparation. He described the roles of ISP personnel during an OSI, the goals and objectives of ISP personnel and ISP preparations for an OSI. Preparations by an SP for conduct of an OSI include long term arrangements such as legislation, institutional arrangements and development of national procedures. Short term preparations include logistical support for an IT, as well as a host of issues related to IT access to the IA, including potential arrangements required to protect ISP interests in accordance with the Treaty. Kozma noted that the many preparations required by an ISP have to be completed in as little as six days, pointing out that an IT should understand the difficulties the ISP representatives may face during an OSI.

Coxhead: Observations on IT–ISP Interaction at BUE II/IV (PR21)

Coxhead (who played the role of the principal ISP representative during BUE II/IV) observed that there is much to coordinate between the IT and ISP at the POE and in the following days. Against that background, arguments may arise. He suggested that an IT will need to find ways to maximize work efficiency quickly at the POE and build an effective working relationship with the ISP while not allowing minor disputes to escalate. He recommended that functional objectives and time frames for POE activities should be proposed to the ISP as soon as possible. He added that guidance in the OSI Operational Manual should highlight the need for parallel work from the beginning to allow flexibility in how activities are ordered at the POE, and should clearly recognize the need for equipment checking to start as soon as possible.

Coxhead observed that at BUE II/IV the ISP used positive comments made to the ISP about its cooperation for political point scoring, but nevertheless accounts of cooperation in the PFD became a source of IT–ISP disagreement. He said that careful thought should be given to how the IT presents its assessment of ISP cooperation to ensure that it is clear and defensible, and not open to misrepresentation. Coxhead recalled that at BUE II/IV discussions between the IT and ISP resulted in preliminary working solutions for the interplay of ISP confidentiality concerns and inspector privileges and immunities, but said that the effectiveness of an inspection could be at significant risk if a stand-off ensues. He observed that while the OSI Operational Manual can provide some guidance on solutions, flexibility for the IT and ISP to negotiate is critical. At BUE II/IV, legal support was valuable for defining parameters around which a solution could be shaped.

Prah: Build-Up Exercise II/IV Inspection Team Activities and Challenges (PR22)

Prah (who played the role of ITL during BUE II/IV) offered a number of lessons from the perspective of the IT experience in BUE II/IV. He outlined those aspects of ITF during the exercise that he considered had been most effective. Prah began by describing the structure of the IT and its major tasks and activities at the POE and BOO. Following this, he offered positive assessments of the working atmosphere in the IT, noting the overall cooperative and proactive approach to efforts of team members, as well as support by the OSC. He also praised the integration of expertise within the IT as well as specific activities such as deployment of equipment at the BOO.

Prah offered less positive assessments of:

- The clarity and execution of exercise ground rules;
- Heavy compression of time, especially for the BUE IV part of the exercise;
- The impractical separation of the working part of the BOO from IT accommodation;
- Aspects of H&S equipment and application of H&S culture;
- Interaction with OSC 'push–pull' mechanisms (push by the OSC to provide information and support and/or pull of the information and necessary support from the OSC by the IT).

Prah added that some additional fine-tuning of the IT structure may be useful, as well as of office infrastructure within the IT working tents.

Abushady: Inspection Team Communications (PR23)

Abushady began by citing Part II, paragraph 62, of the Protocol: "The members of the inspection team shall have the right at all times during the on-site inspection to communicate with each other and with the Technical Secretariat." He noted that a possible failure of communications systems would pose a serious risk for safe and effective conduct of an OSI. Abushady said that there has been notable improvement in IT communications capabilities since the first field exercise in 1999, but there is still a need to find a concrete solution to enable the team to communicate freely and reliably during an OSI without downtime and with enough redundancy. He described current options being implemented for the IT to communicate from the field to the BOO, within the BOO, and with the TS via the OSC. IT communications with the OSC include broadband satellite technology for secure voice and data communications, hand-held telephones for IT leadership personnel, and HF communications as a backup option. In-field communications options include HF/VHF/UHF communications for full secure coverage of the IA in various types of terrain, handheld (satellite) telephones as backup and possible use of cellular networks.

The next steps for the development of IT communications that Abushady outlined included the following: final modifications in the design of the IT communications radio system in 2013; fleet expansion and operational and procedural testing during BUE III; and an expert meeting on communications to test whether the equipment is meeting key requirements in different geographical and topographical conditions.

Tweed: BUE II/IV: IT Reporting (PR24)

Tweed reviewed IT experiences at BUE II/IV with respect to record keeping and report preparation. She described the procedures used by the IT during the exercise for record keeping and identified areas for improvement, such as recording and settling written arrangements with the ISP and managing USB media, and introduced questions about issues such as email logging and how record keeping should be handled in the IIMS.

Regarding IT reporting, Tweed reviewed the procedures followed during the exercise and the use of formats for summary updates and field team and sub-team reports. She noted a need for written guidance on these types of reports. Tweed described how the PFD was prepared, taking into account limitations resulting from the nature and scope of the exercise. She noted that for the first time the process involved combining automated input from the IIMS with guidance spelled out in the Model Text, and commented that further experience with preparation of a PFD at BUE III will be needed.

Gavish: OSC Operations, Reporting, Recovery (PR25)

Gavish reviewed the role played by the OSC in BUE II/IV, describing activities and outcomes, identifying difficulties and proposing solutions. He noted that the OSC was run by 19 specialists from across the various PTS Divisions, with additional support as needed from within the PTS as well as from the United Nations Department of Safety and Security. He described the roles and activities of the various teams working within the OSC as well as equipment and infrastructure.

Gavish highlighted the need for comprehensive expert support within the OSC throughout the inspection, including legal advisers and scientific and technical advisers with OSI experience. He suggested improvements in the definition of responsibilities and duties for OSC members, as well as cross-training so that each OSC member is able to respond to a variety of incidents. He suggested that the decision to locate all 19 people in the same room should be reconsidered. He proposed the development of new OSC procedures for replacement of inspectors and for correcting or updating the inspection mandate. He also noted that some new document templates are needed. In terms of support equipment, he noted a need for additional office equipment and software and more visual displays for monitoring inspection activities.

Arndt: Control Team Perspective: Equipment Checking (PR26)

Arndt offered a number of observations and lessons in relation to the transport of inspection equipment – in particular, the advance boxes and the equipment checking process. He proposed that the advance team should use multi-wheel suitcases (no more than three) instead of the ZARGES boxes used during the exercise and that these should include hand tools, sealing material, a simple digital camera, and office stationery and equipment. He also suggested the inclusion of a tablet computer containing relevant Treaty documents. In order to build confidence with an ISP, Arndt suggested that plastic sheets manufactured to hold photographic slides could be used to store all removable data media.

On the basis of other observations, Arndt also proposed that:

- An IT member should be delegated as the responsible custodian of all equipment while at the POE;
- IT members involved in equipment checking should clearly record checking protocols settled with the ISP;
- A senior IT member should be present at all times during equipment checking;
- An IT member should have the task of holding records and managing equipment unsealing and resealing.

Deng: Control Team Perspective: Application of Procedures in BUE II/IV (PR27)

Deng offered a number of observations from a CT perspective and suggestions for new or revised procedural guidance. These included:

- For the OSC, a more tightly drafted SOP is needed as well as new WINs to include security and confidentiality issues. Priority for these tasks should be clearly defined.
- For POE activities, procedural guidance should stress early handover of the inspection mandate and pre-inspection briefing to allow an early start to equipment checking. Additional guidance to facilitate equipment checking may also be useful.
- At the BOO, a new WIN providing detailed procedures for set-up and maintenance of tents in the field might be needed.
- Continuous drafting of the PFD (i.e. drafting during the inspection) is the key for its timely finalization. Detailed procedures for preparation of IT internal reports should be further developed. Procedures on review and signing of the PFD need to be fully played out in future exercises. Post-inspection procedures should address handling the PFD at headquarters and include issues related to sample handling and storage.
- A well structured and prioritized H&S documentation framework needs to be developed or revised, and H&S guidance in the Model Text needs to be strengthened.

Dekin: Observations on BUE II/IV (PR28)

Dekin offered observations and proposals to enhance ITF based on experience at BUE II/IV, including the following:

- Equipment inspection and information exchange should have priority at the POE, with specific IT members designated for these tasks. Arriving IT members should be intimately familiar with how their equipment was packed and with related documentation. Dekin suggested enhancements for the contents of advance team and POE boxes and the early distribution of short range radios to all IT members.
- An advance team to examine potential BOO locations (if allowed) should start as early as possible.
- The advance team composition (operations, RN and visual observation (VOB)) was effective but could have benefited from at least one more person with logistics and administration (L&A) expertise.
- Human essentials (inter alia, coffee, snacks and protective items) should be available early at the BOO.

- Leaders for tent erection (or any activity) should hold a short meeting with crew members to discuss the work to be performed, discuss any concerns and stress safe working conditions, including use of required personal protective equipment – "plan the work and work the plan".
- Containers should be clearly labelled (in large letters) on the doors as to team or function.
- If power cables are placed on the ground, crossing locations should be defined with protection for the cable(s).
- The meaning of caution tape should be defined and 'traps' (places where personnel inadvertently enter a caution area without crossing the tape) should not be created.
- Daily briefings should be short and focused and follow a more formal structure, covering issues such as weather, assigned missions and L&A assignments.
- If an item of equipment was broken during BUE II/IV, consideration should be given to the cause of failure and whether an alternative piece of equipment might be more reliable.

Anderson: Set-Up of the BOO During BUE II/IV (PR39)

Anderson reviewed the process of establishing BOO facilities as well as their disassembly, providing detailed illustrations of the steps followed, their sequence and timing. He noted that time lines for these tasks were affected by exercise specific conditions. In relation to the design of the BOO, Anderson noted benefits of the 'cross design' used and indicated that it needs to be tested further.

With respect to BUE III and IFE14, Anderson indicated the following as issues for consideration:

- H&S at the BOO, including decontamination facility management;
- Power generation;
- Finalizing load plans for the Intermodal Rapid Deployment System (IMRDS) containers and their sheltering and positioning;
- RN laboratory;
- BOO with separate accommodation and work areas, and how this will work;
- Separation of the IT from all other participants, and independence of the IT.

Labak: Set-Up and Application of the Integrated Information Management System (IIMS) During BUE II/IV (PR40)

Labak reviewed the main elements of the IIMS, described its deployment during BUE II/IV and offered thoughts about elements to be further examined at BUE III and IFE14. The IIMS is the central data management system to be used during the entire inspection, so only a subset of the IIMS functionality was deployed at the POE during BUE II/IV. Labak offered examples of the relevant functionality and uses to which the system was put. He noted that the main users were administration and IIMS officers in the IT, but suggested that use by the ITL, sub-team leaders and all IT members should be allowed for in the future. Labak provided an overview of the process of set-up and demonstration, and describing the IIMS receiving area (RA) and working area (WA) to the ISP at BUE II/IV, including simulation of data transfers

to and from the RA. He also reviewed its role in development of the PFD during the inspection.

Labak noted how important it will be to test data upload fully to the RA and from the RA to the WA during BUE III, as well as training for IT members who will do this work. In relation to IIMS functionality, Labak highlighted that more work needs to be done on reporting functions and to integrate FIMS functions.

Christov: Communications for the Inspection Team at the Point of Entry (PR48)

Christov observed that communications systems required for use by the IT at the POE must have sufficient mobility and portability in order to be hand-carried by the inspectors between the time of leaving the TS and arriving at the POE. These must have both voice and data capabilities. The scope of the POE communications process and equipment during BUE II/IV was limited. However, the exercise and injects demonstrated the mission critical impact of the availability of adequate communications. Christov recommended that both voice and data systems used by the IT at the POE must be light and user friendly, and have backup options based on systems, hardware or redundant volume. Public cellular system telephones might be used if practical, with backup to the BGAN (voice and data) and/or Iridium portable telephones (voice only).

Christov counselled that one should consider carefully the volume and quality aspect of the communications equipment at the POE – flexibility, user friendliness, size and weight are all important. The latest user friendly models must be used by all systems in order to maintain functional standards and save time for the IT. He proposed that Treaty based approval of communications equipment must be based on systems, not single hardware models.

Discussion

At the outset of Session B, Li presented a summary of items for discussion as well as a list of questions identified by the Co-Chairpersons as a basis for discussions following the presentations. The questions focused on how to use lessons from BUE II/IV to improve the efficiency of activities in the first days at the beginning and end of the inspection, help guide the conduct of BUE III and IFE14, and enhance IT H&S.

The results of the discussion are contained in Workshop Findings and Recommendations at the end of this report.

SESSION C
Build-Up Exercise III (Inspection Phase)
Subject Co-Leaders: A. Smith and L. Gaya-Piqué

Introduction of Session C by Subject Co-Leaders

Gaya-Piqué opened Session C by providing details about BUE III (PR30) that supplement CTBT/PTS/INF.1105. The additional details concern the location of the exercise (a military site at Ujmajor, Hungary), the number of participants and reframing the technical scope. The first part of the session consisted of four presentations addressing four main pillars of OSI development related to BUE III: procedures, equipment, documentation and training. The second part involved four detailed presentations on multispectral and infrared technologies, RN issues and logistical issues. Finally, the afternoon session was devoted to parallel group discussions led by discussion leaders about the status of development and needs of the four main technical areas involved in BUE III – passive seismology, RN, VOB and continuation period techniques (CPTs) – plus logistical issues. Smith asked the discussion leaders to report at the end of the day in front of the plenary about major findings.

Gaya-Piqué: BUE III Scope and Techniques PR31

In his presentation, Gaya-Piqué suggested that BUE III should not be an exercise driven by application of OSI techniques but rather it should be driven by the ITF concepts. In that sense, ITF would be the backbone for the deployment of certain OSI techniques, and would be the tool to direct the course of the exercise without the need for extensive intervention by the CT. This approach gives the IT the ability to make its own choices about planning steps on a daily basis in a realistic way.

Gaya-Piqué suggested that BUE III specifications, which include the ITF concepts to be exercised, the technical scope of the exercise and some points regarding the ground rules and scenario concept, are still to be finalized. He pointed out that the scenario will be designed to allow for the implementation of both initial techniques and CPTs (should the IT so decide) from the very beginning of the exercise. This scenario will follow as much as possible the scenario developed for BUE I and BUE II/IV with necessary adaptation to the new IA.

The following issues were identified during the subsequent discussion:

- Clarification was provided on the concept of familiarization with certain techniques within BUE III itself. Given the impossibility in some cases of training surrogate inspectors in the use of certain equipment or technologies, there will be some techniques, such as those mentioned in CTBT/PTS/INF.1105 (e.g. multispectral analysis), that will be available to the exercise participants for the first time. Because of this inexperience with the technology, Gaya-Piqué proposed that BUE III be used as an opportunity to familiarize trainees with the equipment and procedures and provide on the job training.

- A question arose about whether BUE III will be a 'slice' of IFE14. Gaya-Piqué clarified that BUE III is only a very limited slice of an integrated exercise, since the techniques used will be limited and time compression will play a certain role.

Arndt: Equipment Status and Availability (PR32)

Arndt gave a presentation on the status and availability of equipment for BUE III and IFE14. The focus of the talk was on the equipment provided as contributions in kind by States Signatories for IFE14. Arndt presented the four options to obtain OSI equipment: equipment owned by the PTS, equipment obtained from States Signatories as long term loans, contribution in kind and equipment rented from commercial entities. The equipment to be used for the different technologies was presented in detail, but Arndt could give no conclusive information on the availability of the equipment since this is an ongoing process, and he mentioned that the presentation was only a baseline of what could be available for exercises in the near future. The following issues emerged during the subsequent discussion:

- If a mobile radioxenon measurement system (TXL) is to be included in the list of equipment available for IFE14, the logistical impact on the transportation of such a system has to be considered.
- The contributed equipment for analysis of noble gas (NG) samples will most probably not be available during BUE III. On the other hand, the possibility of having such equipment to conduct active seismic surveys or direct current (DC) resistivity measurements during BUE III is contemplated. Gaya-Piqué noted that there is a difficulty involved with conducting OSI-relevant active seismic surveys in the short duration of BUE III because of the time it takes to conduct a full survey.
- The necessity of having the equipment to be used in BUE III in advance for training purposes was stressed by the audience.

Stickney: Procedures Development, Including SOPs and WINs (PR51)

Stickney presented the current status of OSI documentation and the procedures for developing, approving and issuing documents under the QMS policy. The documents that were prepared for BUE I and II/IV were listed; of these, six SOPs and one WIN will be used again in BUE III. The documents that have to be prepared for BUE III were enumerated: a total of seventeen SOPs, eight WINs and two manuals have to be drafted or updated specifically for BUE III. Focusing on H&S, Stickney presented the list of QMS documents that have been prepared (including four SOPs and one manual), but stressed that the list is subject to revision and reorganization. The following issues emerged:

- The hierarchy and naming convention of the OSI QMS documents were the main focus of the subsequent discussion. Assurance was given to the audience that the drafters of manuals, SOPs and WINs are properly briefed in order not to reinterpret the higher level documents such as the Model Text, and to follow the guidelines offered by these documents.
- For the documents to be developed for BUE III in the list presented by Stickney, especially a document on confidentiality and a manual on ITF, it was proposed to put some thoughts together and prepare a document to provide guidance to the IT during

BUE III. After that, lessons could be captured in order to develop the appropriate type of document. It was said that H&S issues could be treated the same way.

Milic: BUE III Training (PR38)

Milic reported on the training approach for BUE III. She started by asking the audience about the impact of training for the previous BUEs. The audience answered that training was essential to prepare for them. Milic stated that one of the main objectives of this training is to manage the expectations of the participants in the exercises. She proposed that before BUE III is conducted, job descriptions and functions for the IT should be defined and then the team should be built around these descriptions, rather than selecting good participants and building the team around them. The concept of training as a simulation and not as a replica of the BUEs was presented. Milic insisted on defining 'smart' exercise results and objectives as the key for the development of the right training, and presented BUE III as an example of such an approach. Regarding the content of the training, Milic proposed training on: type and level of knowledge, as reflected by knowledge of the OSI documents; technical skills, for which use of equipment is necessary; operational abilities of the IT; and non-technical skills. The scope of the training will be to show the IT how to make a bigger picture out of the smaller details in order to become strategic and operational. The methods proposed were: a simulation based programme; field to classroom and classroom to field training; situation based training; and hands-on equipment training.

In the subsequent discussion, the following issues arose:

- The audience supported the training scope as presented by Milic, especially the targeting of data flow, the IIMS and ITF.
- A question was asked about the use of experts from States Signatories for such training. Milic and the OSI senior management replied that the concept and programme are under development, and their finalization depends on the previous approval by PTS senior management of the exercise specifications for BUE III.

Rowlands: MSIR: Progress to Date and Steps for an Operational System for IFE14 (PR37)

Rowlands presented the current status of development of multispectral including infrared (MSIR) technology for OSI through a detailed review of all of the expert meetings and field tests conducted by the PTS in the last year and a half. He provided a solid technical description of the relevance of these tests for OSI by presenting the results of the analysis of the data collected during the tests. Plans were reviewed for the development of a PTS-owned MSIR platform for IFE14 that would combine equipment developed and acquired through the European Union Joint Action V and equipment contributed by States Signatories. This modular system will allow the PTS to add sensors as they become available. He stated that an externally mounted platform holding two instruments, probably red–green–blue and colour infrared cameras, could be realistically possible for BUE III. Finally, Rowlands proposed that the audience consider the possibility of using light detection and ranging (lidar) technology, which would use only the visible part of the spectrum, during an initial overflight.

The following issues were raised in the subsequent discussion:

- The audience appreciated the quality of the technical material presented by Rowlands and suggested that the material be published in a specialized peer reviewed journal.
- The possibility of bottlenecks in the entire concept (data collection, data transfer to the IIMS and data analysis) should be explored.
- The potential use of unmanned aerial vehicles to conduct MSIR surveys was proposed by one participant.
- The need to develop appropriate documentation was noted. Some of the documents have to be broad enough in order to cover equipment-independent aspects of MSIR imaging. Rowlands confirmed that he is working on the drafting of such a document. At a more detailed level, WINs detailing specific aspects of the implementation of MSIR surveys (e.g. how the type of aircraft affects this implementation) have to be drafted in the future.

Haas: An Overview of RN Equipment for IFE14 (Availability and Training Needs) (PR45)

In his presentation, Haas defined the data quality objectives to be used for the identification of RN equipment and software, and for the design of the concept of operations and data interpretation tools; all these areas lead towards the definition of training needs. The data quality objectives were based on the amount of data necessary to clarify the nature of the event that triggered an OSI and to support the search logic, and the type of data that would be most satisfactory. Haas also touched upon the different options required for the RN equipment – commercially available off the shelf in some cases, with technologies yet to be developed in others. After presenting a summary of the different RN methods, Haas suggested some threshold values to define the sensitivity requirements as well as operational requirements for RN/NG equipment in order to make these methods valuable for OSI. These values were determined by Haas in consultation with other experts and presented at the session as a first basis for further discussions. Haas invited the participants to bring recommendations to the RN breakout session to be held in the same afternoon and made it clear that full scientific calculations are needed in order to set the draft sensitivity requirements for the equipment.

A point was made during the discussion about the bottleneck that the current OSI field laboratory represents for the analysis of samples. In response, Haas offered different alternatives: analysis of more than one sample at a time; a quicker preparation of the sample (which may reduce the sensitivity but allows the possibility to have more samples analysed per day, i.e. as a trade-off against the possibility of detecting a weak signal); or reduction of the volume of the samples collected[1]. Haas pointed out that the choice of any of these alternatives is based on the source term.

Wieslander: RN/NG Equipment and Sampling for BUE III (PR46)

Wieslander presented a description of the RN particulate and NG equipment and its availability for BUE III. She divided the activities of the RN experts into five blocks,

[1] This was also discussed at OSI Workshop-16; see Report of On-Site Inspection Workshop-16: IFE Lessons Learned and Follow-Up (Brunn am Gebirge, Austria, 3-7 May 2009), pages 11-13.

belonging to RN particulate or to NG technologies: gamma ray survey (airborne, vehicle mounted and handheld) and in situ spectrometry (airborne, vehicle mounted and handheld); subsoil air sampling; RN particulates in water samples (using water filters or taking sediments); flora samples; and NG sampling in subsoil and in atmospheric air. She noted that gamma ray survey equipment is already available for identification, count rate and dose with one backpack and vehicle-borne detector, and for count rate and dose with various kinds of handheld detector (which, she pointed out, are outdated and should be replaced). One standard backpack for H&S, which includes a neutron detector, is also available. Concerning air particulate sampling, the PTS has one high volume air sampler (HVAS) and one low volume sampler as well as one small volume sampler that is potentially available and two additional HVAS units promised but not yet delivered. The availability of water sampling equipment is uncertain for BUE III since the PTS has on temporary loan only a prototype that needs further development. For environmental RN particulate sampling, some equipment could potentially be made ready for flora sampling (limited in scope, use and interpretation), but application of specific equipment for soil sampling is not likely to be ready since the experts need to discuss the equipment concepts in further detail and the hardware needs to be developed and tested. Finally, all the available equipment for a very limited and basic BOO laboratory needs refurbishment and repair; it is not clear to what extent this equipment will be available for BUE III. Additional detection equipment is required if the BOO laboratory is to be fully furnished. BOO laboratory consumables should be available for BUE III.

Concerning NG technologies, the PTS owns equipment for making holes in the ground to collect subsoil gas samples using the techniques of direct push and augering (Geoprobe). Training is needed on this equipment (Wieslander emphasized the heavy work needed to operate the equipment) and it is not suitable for hard rock. The equipment needed for collecting gas from the subsoil gas sampling spot is being developed and the basics will be available during BUE III. The preferred equipment for soil gas sampling is under development and the final set of equipment suitable for IFE14 is yet to be determined. Sampling alternatives exist either as the “Smart-Sampler” (a semi-automatic, stand-alone system developed in the USA that can take up to five sampling spots simultaneously) or as separate items that need to be put together into a full gas line (one sampling spot per line), but training on both approaches is needed before BUE III. The suggested approach regarding subsoil gas sampling for OSI is to use the direct push equipment, carry out the hole installation, collect the sample into intermediate sampling bags (2-3 cubic metres is size) and then compress it into scuba bottles. However, these samples will not be analysed because the NG processing, detection and analysis systems are not available for BUE III. Wieslander noted that there is no homogenized software for the BOO laboratory that covers analysis of RN particulate and NG samples, no laboratory information management system (LIMS), no OSI specific reporting software and no way of completing logs for specific information. Currently, all equipment has individual machine specific software. Wieslander finished by presenting different options for future consideration and implementation, such as the use of the ‘NDC in a box’ software package, designed for National Data Centres, from the IDC, listing RN particulate and NG calibration software tools and software for in-depth analysis, and identifying the need for specific OSI-relevant reporting software tools and software and hardware covering the chain of custody considerations relevant to RN particulate and NG technologies.

During the subsequent discussion, Wieslander clarified that information barrier tools will not be implemented for all the equipment prior to IFE14; however, it would be possible to apply

the concept of an information barrier to what is reported from the OSI field laboratory, given that the software developments are expected to start during 2013.

Osugi: Suggestion for BUE III and IFE14 Logistics and Administration Issues (PR33)

Osugi presented practical and easily implementable proposals to improve logistics in the IT and therefore the efficiency of the entire team. His first proposal was to create a searchable database (by container and by box) to be used in the field, with inspectors having access to the database via computers. Related tables could be developed by container, box and item. This database would also include diagrams showing how to load the containers in sequential steps. The second idea that Osugi proposed was to streamline team operations by defining clear responsibilities, creating a deployment plan of boxes and designing a chart for L&A items. He proposed to try all these concepts during BUE III by having an L&A sub-team carry out the establishment and decommissioning of the BOO.

The participants acknowledged both sets of proposals. During the discussion, the PTS showed interest in having access to the database proposed and created by Osugi in order to adapt the output from Hardcat software to the same format and therefore make possible the use of Hardcat in the field. A point still to be worked out is the location of a centralized database that takes into account changes in the containers or boxes during an OSI.

Group Discussion

Five breakout group sessions were held in separate rooms, with participants free to choose which session to attend. Each session was guided by an expert group leader, as follows:

- VOB, led by W. Dekin;
- Seismic Aftershock Monitoring System (SAMS), led by O. Meless;
- RN, led by H. Miley;
- CPT, led by S. Stefanova;
- L&A, led by G. González.

Following the separate group discussions, the expert group leaders gave short presentations of the major findings from their groups. The ideas presented are summarized below.

Dekin: The VOB group decided that there is a certain level of readiness regarding ‘classical’ VOB (i.e. without using MSIR technologies). Equipment, documentation and concept of operations are well defined. Specific training in interpretation and processing of digital images should be explored in the future, but not as a first priority. A concern arises from the fact that it may be necessary to provide some additional training in VOB, since a significant number of VOB team members from the second training cycle may not be available for IFE14. MSIR techniques remain an area of concern because they have not been fully integrated into the VOB concept.

Meless (PR34): The SAMS group specifically discussed issues related to BUE III and the identification of needs. The group considered that most of the SAMS equipment is ready, but more training in deployment of seismic mini-arrays would be welcomed. The issue requiring

most urgent attention is the SAMS data centre, not only because one of the servers requires repair (it is expected to be repaired in time for BUE III), but also because training on the new additions to the processing software is a fundamental need before BUE III. This issue was also raised by the participants during the panel discussion. Other areas where training is required are the SAMS SOP and WINs. Finally, Meless suggested that the SAMS sub-team needs to practise integration of data coming from and going to the OSC, especially how to receive and integrate the data coming from the IDC. A comment was raised during the panel discussion about the possibility of processing SAMS data from previous events during BUE III. The PTS noted that this is possible, and it was proposed to send these data to the trainees, together with the necessary processing software so that they could gain familiarity with the software. A participant noted that it has to be kept in mind that one of the outcomes of SAMS data processing is to identify which stations work properly and which do not.

Miley (PR49): He reported on the RN discussion, including the new design of the part of the BOO laboratory devoted to RN measurements. The group pointed out that most of the RN/NG equipment should be delivered soon, but delays could occur if there are unforeseen circumstances. Miley proposed that a good exercise from the RN point of view, considering the status of development, would be the following:

- Gamma ray surveys from airborne and vehicle platforms as well as handheld detection systems;
- NG sampling as described in the presentation by Wieslander with the limitation of not being able to perform measurements on the samples owing to the lack of NG processing systems;
- Soil measurements by the use of in situ gamma ray spectrometers as well as by means of taking soil samples (the latter includes measurements with high purity germanium detectors in the BOO laboratory);
- High and low volume air particulate sampling (the process would include sample receipt, preparation and archival).

The group believed that the addition of other targets, such as water or flora sampling, would add risk of failure to the exercise. Gaya-Piqué commented that the PTS will do its best to accommodate all these techniques, but he was sceptical about the possibility of conducting gamma radiation surveys from the air. Besides all these proposals, Miley pointed out the need to have a document covering chain of custody as discussed in the presentation by Stickney.

Stefanova (RN35): She stated that she would be referring not only to the results from the CPT group discussion but also to the comments provided by some CPT trainees from the second training cycle, to whom a questionnaire was sent before OSI Workshop-20 (feedback was received from six CPT trainees). The group had the general feeling that the IT is ready to apply shallow geophysical techniques and enough training has been provided for equipment and software (although more hands-on training would be beneficial). However, the PTS needs to complete the appropriate SOPs and WINs for all the technologies to be tested during IFE14, particularly: ground magnetic methods; gravity methods; ground penetrating radar; shallow electromagnetic methods; and (depending on the availability of equipment provided as contributions in kind and prior training) DC resistivity. The group noted a need for further training in the integration of CPT data within the search logic using the IIMS, as well as in how the data return from the IIMS to the IT once they have been analysed. Stefanova noted the benefit of properly identifying the secondary expertise of each CPT sub-team member

(and, in general, of each IT member). The CPT sub-team would also benefit from e-learning modules similar to those developed for the magnetometer equipment owned by the PTS. Stefanova reported that, from the CPT point of view, a successful BUE III would simulate the briefing given to the CPT group (by the OSC and/or by the IT) upon rotation at the conclusion of the initial period, the application of shallow geophysical techniques, their integration into the search logic and use of ITF concepts, use of the IIMS, and testing of existing SOPs and WINs.

González (PR39): The L&A group discussed the logistical needs associated with BUE III, identifying the daily logistical support at the BOO as the main need, including simulation of the support provided by the ISP. González suggested that the CT for BUE III should revise annex VI to the IIP, prepared during the BUEs, to adapt it for BUE III. Concerning the daily logistical support at the BOO, the group would like to test issues such as: the use of equipment provided by the ISP (amenities); finance related aspects (i.e. to track properly and confirm the cost of logistical support provided by the ISP); distribution of resources for the conduct of field missions; inspector replacement or rotation; implementation of H&S procedures; CPT equipment checking; joint storage of equipment and/or samples; and chain of custody procedures. The group also pointed out that other issues to be tested could be: use of interpreters; logistical support provided by the OSC; and use of a management system for equipment spare parts. The suggestions presented in the presentation by Dekin in Session B (PR28) should be implemented.

The logistics expert group noted that the set-up of accommodation and working areas will be done outside the BUE III simulation; however, it suggested inviting some trainees for these activities in order to acquire additional training. The L&A group could suggest the distribution of inspectors in accommodation tents. The group pointed out that a scenario involving IT operation 24 hours a day and 7 days a week would imply many logistical issues. In this context, González raised concerns about the implementation of night shifts when working and accommodation areas are separated. Regarding equipment, González expressed the need to refine the list of equipment to make it more practical for use at the BOO. A tracking mechanism is needed to understand where the equipment is located at any time. Containers should be properly and visibly labelled according to contents. Finally, as stated by other speakers during Session C, the logistics group thinks that creating a job description for logisticians would be beneficial.

CLOSING SESSION AND CONCLUDING REMARKS

The final morning of OSI Workshop-20 consisted of three sessions in which the subject co-leaders presented summaries of each of the Sessions A, B and C, followed by brief discussions. The final content of these sessions is presented in Workshop Findings and Recommendations. Closing remarks were made by the Co-Chairpersons.

OSI Division Director Rozhkov stated that this workshop provided a very useful forum for reviewing and discussing the concepts, planning and initial execution of the build-up to IFE14. He thanked all the staff and participants for their work in this workshop, which provides clear guidance to the PTS for the planning and execution of BUE III and IFE14. OSI Task Leader Shchukin also agreed that this workshop provided a comprehensive review of BUE I and BUE II/IV, with many points of agreement by participants as well as some issues for further consideration. Finally, in his closing remarks, Co-Chairperson Zucca again emphasized the integration aspect of IFE14. He listed five elements of integration to consider: use of technologies in a logical sequence; integration of capabilities across the PTS; integration to consider special circumstances of the IA; integration of data on a daily basis with the IIMS; and finally, integration of results into the PFD.

WORKSHOP FINDINGS AND RECOMMENDATIONS

General Findings

- The PTS has applied a comprehensive and well documented exercise planning approach (based on PRINCE2) for BUE I and BUE II/IV, and 'best practice' lessons learned are to be applied for IFE14.
- The basic BUE concept as outlined in CTBT/PTS/INF.1105 has been validated by the exercises to date.
- Several lessons were drawn during BUE I and BUE II/IV from the PI perspective; the draft PI concept for OSIs should be tested in BUE III and IFE14.
- The first draft concept for IFE14 evaluation was presented. The main challenge is how to link the current evaluation approach in the BUEs to the process for addressing High Level Question 2 (What is the organization's current level of operational preparedness to conduct an OSI?).

Specific Findings Regarding BUE I

(a) *OSC Related Issues*

- Revision/Amendment of the OSC SOP is required.
- Further consideration is required on the allocation of clear responsibilities among the various OSC teams, particularly on logistical aspects; there should be a 'controlling mind' and no duplication of effort or responsibilities.
- More thought is needed on how to merge the planning team with core IT functions or, alternatively, if they are to be kept as separate entities, on exactly how the responsibilities and tasking should be arranged and organized. An independent approach was favoured by some, while ensuring closer coordination along with adapting the infrastructure. Exactly how this should all be done remains far from clear and requires attention.
- Further improvements in infrastructure (i.e. printers, better information sharing capabilities, more extensive use of visual displays and sufficient telephone lines for the personnel team) for the OSC are essential.
- More regular OSIRIS updating and enhancement in terms of information held are required (visa related information; call-up information up to date, ATLAS related information needs attention).
- With regard to the status of inspectors, further amendments regarding CTBT/PTS/INF.1036 issues are needed. Development of a contract management system should also be considered in this context.
- Different templates need to be prepared to facilitate planning and preparation activities (inter alia, for the personnel team).

(b) *LOSP*

- Further efforts on LOSP preparation are needed. The LOSP needs to be an overarching document containing in a single place all the relevant planning and information requirements necessary for the IT call-out, assembly, deployment, in-field support, rotation, recovery and disposition on return to Vienna.

- There is no requirement to share the entire LOSP with an ISP.

(c) *Equipment List*

- The focus should be on an equipment system-wide approach, preferably with minimal paper documentation and consistent with Treaty requirements.
- WGB should be invited to endorse as a common understanding the approach to certification as outlined above.
- It is suggested to make full use of Hardcat and tailor information requirements accordingly in various templates needed for equipment deployment to the field.

General Findings Regarding BUE II/IV

The following measures should be considered to facilitate efficient conduct of IT (and ISP) activities on arrival at the POE and in the days thereafter:

- Procedural guidance should establish clear (but indicative) roles and tasks for IT members.
- Checklists of objectives to be met at the POE should be created, along with indications of time lines and resource requirements (e.g. Gantt chart).
- The use, on a case by case basis and if agreed by the ISP, of an advance team of several IT members.
- The use of further flexible arrangements between the TS and the ISP, if practicable and agreed by both sides, involving persons other than inspectors, such as the observation of equipment packing by an ISP representative at the ESMF.
- Steps, either in connection with an OSI or at other times, to provide States with information on likely IT expectations during the conduct of an OSI.
- A team of IT members previewing sites for a BOO should have the authority to negotiate adjustments on the spot.
- OSC staff could provide technical support to the IT by participating in some POE discussions (e.g. by teleconference).
- Adjustment of IT composition for the early days of an inspection, where significant logistical activity will be required.
- The value of having a legal adviser (possibly based at the OSC) to assist the IT in the early days of an inspection should be further considered.

One participant noted that most of the negotiations during BUE II/IV were carried out by the ITL and the ISP chief representatives. It was also noted that key discussions on inspection planning and the LOSP were delegated. For the purpose of efficiency, suggestions were made to carry out the negotiations between the IT and the ISP at different levels.

Specific Findings Regarding BUE II/IV

(a) *Equipment Checking*

- Equipment checking should start as soon as possible at the POE.
- The issue of advance team boxes is a very good concept, but needs further development.

- Packing configurations for equipment could be enhanced.
- The usability of equipment lists and equipment packing documentation should be enhanced, including ways to assist the ISP in understanding the system. Since all the equipment is recorded in Hardcat, is it possible to move from equipment checking based on paper documentation to checking based on electronic documentation?

(b) *Proposals on Game Play in Future Exercises*

- The role of the host country team should be clearly defined during the exercises – whether as part of the ISP or as part of the CT. Wherever possible, the host country team should be part of the ISP.
- The most challenging ISP could disrupt the capability of the IT. A view was expressed that exercises with such an ISP could help to build important IT skills, but another view cautioned that such exercises have to be carefully planned and considered only after the initial level of readiness to conduct an OSI is achieved.
- Confidentiality was not fully tested in BUE II/IV. In future exercises, confidentiality should be involved.
- Views were expressed that time compression was too heavy in BUE IV (there were only 5-6 hours for this phase). Sample and data handling was tested only notionally. It was noted, however, that the Treaty allows only a relatively short period for finalization of the PFD.
- Guidance should be made available to the IT to clarify for all cases how the exact timing of the end of an inspection is determined.
- Information technology support for all exercise teams should be improved, in particular the CT and ISP team.
- Effective operation of an exercise ISP team also requires that it has working premises and communications equipment available for its use.

(c) *IT Communications*

- Communications equipment is very useful during the set-up of the BOO. Handheld radios as well as a public address or intercom system could be quite helpful for the IT during the set-up or during the routine operation of the BOO, and for H&S.
- Communication is not only an issue of equipment but it also involves procedures/protocols for communication activities.
- It was noted that transmission of digital information from the IA to the TS via the communication system could be achieved. Views were expressed that procedures for the use of such functionality should be further considered by WGB.
- In relation to the very small aperture terminal (VSAT), a GATR Technologies inflatable satellite dish for communications with global communication satellites was tested in extreme weather conditions. It was noted that approved specifications for communications equipment should focus on systems rather than particular hardware.
- Technology can change quickly.

(d) *Recommendations on IT H&S*

- Trained paramedics should be included as members of the IT.
- The IT should take care that enthusiasm, complacency or fatigue among IT members does not put their safety at risk.
- Post-inspection H&S issues and protection of mental health should not be forgotten.
- During the deployment of containers (or other use of heavy equipment), other IT activities in the vicinity should be avoided.
- A strong safety culture needs to be developed among IT members, involving both knowledge of proper equipment operation and other skills to protect against normal occupational H&S risks.

(e) *Development of Procedures*

- On the relationship between SOPs and WINs, it was clarified that an SOP would generally provide an overview of how multiple related sub-processes interact, if these are complicated and require much elaboration, while each related WIN would focus in detail on a single sub-process. An important consideration in developing usable QMS documents is to keep them to a manageable length, and the relationship between SOPs and WINs facilitates this.
- Video based instruction was suggested as part of WINs, if useful. Views were expressed questioning whether this would be appropriate as it did not satisfy the PTS specification in regard to QMS documentation.
- For the testing of SOPs and WINs during the exercise, the PTS will rely on the participants to use and test them and provide feedback for improvement.

(f) *IT Activities and Challenges*

- A clarification was made that putting generators and uninterruptible power supply systems at a central location at the BOO would be a standard configuration.
- To avoid electrical and other physical interference, the set-up of the BOO may need to have the equipment test area located several hundred metres from other BOO facilities.
- There was no appointment of an H&S officer in BUE II/IV. Suggestions were made to have at least one person in the core IT to function as H&S officer in future exercises.
- The use of photography to document the packing of containers should be considered to facilitate their repacking by IT members.

(g) *Other Issues*

- For information security regarding the IIMS, password control is in place to make the IIMS available to all IT members with allowance for different access rights, depending on their role in the IT.
- There exists a communication hierarchy (procedures) in the OSC which needs to be further tested during the upcoming exercises**.**

Suggestions for BUE III

- Proficiency of IT members in their areas of responsibility is a priority.
- IT personnel should be more than familiar with secondary technical areas.
- Training and proficiency in the ITF concepts of search logic, methodology and operational conduct of the inspection are needed.
- Proficiency is needed in data flow management; there is a need to finalize the concept and provide suitable training.
- Proficiency in H&S procedures is essential to conduct a safe exercise.
- The team is ready for 'classical' VOB, but there may be a need to build up new team members.
- How MSIR technology will be applied in these exercises is unknown at this time, but the PTS will continue with the concept of using it.
- The SAMS team is proficient with equipment but needs more proficiency in data analysis.
- RN/NG items that would make for a good BUE III:
  - Gamma ray survey vehicle and airborne measurements – equipment provided as contributions in kind is needed for training in airborne measurement, while vehicle equipment is already available.
  - Gamma ray survey on foot (one backpack is available).
  - Subsoil NG sampling and sample collection equipment is available, but the equipment needs further testing and preparation for training – an NG processing, detection and analysis system is not available for BUE III.
  - Air particulate sampling equipment is available (high and low volume).
  - Individual machine specific software is available for the equipment, but homogenized software for analysis, calibration, logs, LIMS, etc., for RN particulate and NG data is not available.
  - Limited scope for soil sampling and water sampling could potentially be available for BUE III.
- The CPT team is ready to apply shallow methods; it may be possible to apply DC resistivity, depending on equipment and training.
- A CPT goal for BUE III will be to test the equipment that is ready and has adequate documentation. The exercise should focus on continuity into the continuation period with briefing of incoming new team members.
- There is a need to finalize CPT equipment configurations, SOPs and WINs.
- The logistics team needs a better logistics concept, with clearly identified equipment that is easy to locate and track, including consumables.
- Work is needed on the equipment field database along with a better understanding of how to distribute and pack equipment, with associated training.
- CPT equipment checking needs further development.
- Concepts of joint storage of equipment need to be developed.
- Sample chain of custody procedures should be comprehensively tested.
- Many elements of BUE IV, including the preparation of the PFD – at least in terms of technical data and findings — should be played in BUE III.
- Procedures for equipment decontamination should be considered.
- Use of the IIMS should be comprehensively tested.
- Confidentiality issues should be tested further.

IFE14 Related Proposals

- Not all aspects exercised in BUE I need to be exercised again during IFE14, especially in light of certain exercise related necessities (e.g. the need to ship equipment in advance of the exercise, and personnel selection and the visa process all being done in advance and thus outside Treaty guidelines).
- In spite of the above, some aspects of BUE I could be tested on a notional basis and/or simulated.
- A suggestion that RN/NG aspects, such as use of IDC data for advance planning, should be tested in more depth.
- Aspects of an advance team and requests for logistical support from the ISP should be simulated in more depth and should be worked notionally into the exercise as appropriate.
- Confidentiality issues should be tested to a larger extent in IFE14 than in BUE I – this is critical.
- The OSI databank should be tested in IFE14.
- A focus should be kept on integrated use of inspection activities and techniques, avoiding 'project creep'.
- Early clarity on the exact scope of various inspection activities to be simulated during IFE14 is essential.
- A major undertaking will be to put in place all QMS procedures before IFE14 – this could become a major bottleneck in the preparation process, since they will be needed for training and testing well before the exercise. This means that the total preparation time is closer to 18 months rather than two years (from the date of this workshop).
- Consolidation of the list of equipment provided as contributions in kind for IFE14 is under way – equipment availability has a major impact on the exercise and related preparations.

Issues to Be Taken up by WGB

- A recommendation that the equipment certification process should focus on a system oriented approach that can be accomplished and avoids generating excessive documentation. The aim would be to have a common understanding that this is the most pragmatic way to adhere to Treaty provisions.
- Guidance on OSI H&S issues might be needed. It is expected that the conduct of the exercise will generate many lessons and input material for WGB to consider.
- Procedures for use of the communication system for transmission of digital information from the IA to the TS should be further considered by WGB.

ACKNOWLEDGEMENTS BY THE RAPPORTEUR

There were more than fifty presentations in OSI Workshop-20 and more than a third of the participants made suggestions for improvement of the first draft of the report; thus this report truly represents a group effort. I express special thanks to the Co-Chairpersons, subject co-leaders and expert group leaders for chairing sessions, leading discussions, and providing summaries of the presentations and the findings and recommendations, which are the most important part of the workshop and report. Staff of the Documentation Section of the OSI Division, Deng Hongmei, Marie Tweed and Kevin Stickney, provided superb support throughout the course of drafting the report, tracking and making revisions, and final publication.

ANNEX I

LIST OF SUPPORTING MATERIALS

1. PTS Procedures Documents

- SOP on Set-Up, Organization and Activities of the Operations Support Centre (OSI-OSC-SOP-001, issued on 11 April 2012.
- Draft SOP on Set-Up, Organization and Activities of the Operations Support Centre (draft version as of 30 August 2012).
- Draft SOP on Launch Support and Control of an On-Site Inspection (draft version as of 30 August 2012).
- Draft SOP on IIMS (draft version as of 12 April 2012).
- SOP on Preparation of OSI-Relevant Documents and Document Related Materials for an OSI (OSI-DOC-SOP-002, issued on 3 April 2012).
- Draft SOP on Logistics Support for Rapid Deployment of OSI Equipment During the Launch Phase of an OSI (draft version as of 12 April 2012).
- SOP on Equipment Certification (OSI-EQT-SOP-001, issued on 27 March 2012).
- Draft SOP on Post-Inspection and Departure (draft version as of 19 June 2012).
- Draft SOP on IT Activities at the POE (draft version as of 19 June 2012).
- Draft SOP on Base of Operations (draft version as of 19 June 2012).
- Draft SOP on Communications (draft version as of 19 June 2012).
- SOP on Development of Inspection Team Reports (OSI-REP-SOP-001, issued on 15 June 2012).
- Draft SOP on In-Field Security and Safety (draft version as of 19 June 2012).
- Draft WIN on Setting up IIMS (draft version as of 19 June 2012).
- WIN on Developing and Handling the Preliminary Findings Document (OSI-REP-WIN-001, issued on 15 June 2012).
- Draft Manual on Geographical Information System Field Information Management System (draft version as of 19 June 2012).
- SOP on Development of OSI Division's QMS Documents (OSI-DOC-SOP-001, issued on 5 December 2011).
- WIN on Drafting an OSI Division SOP (OSI-DOC-WIN-001, issued on 5 December 2011).

2. Documents and Presentations Related to the Build-Up Exercises

- CTBT/PTS/INF.1020, Action Plan Developed as a Result of the Review and Follow-Up Process for the 2008 Integrated Field Exercise.
- CTBT/PTS/INF.1105, Concept for the Preparation and Conduct of the Next Integrated Field Exercise.
- CTBT/PTS/INF.1195, Report on On-Site Inspection Build-Up Exercise I.

- Presentation on IFE14 Build-Up Exercise I (Launch Phase) (by G. Macleod on 22 May 2012).

3. Key Documents Produced from BUE I and BUE II/IV

- Inspection Mandate.
- Initial Inspection Plan.
- Preliminary Findings Document.
- Logistics and Operations Support Plan.

4. Summaries of Individual Feedbacks from BUE I and BUE II/IV

- Summaries of Individual Feedbacks from BUE I.
- Summaries of Individual Feedbacks from BUE II/IV.

5. Supporting Documents for Group Discussions

- CTBT/PTS/INF.994, Report of On-Site Inspection Workshop-15: 2008 Integrated Field Exercise (Baden, Austria, 1-5 December 2008).
- CTBT/PTS/INF.1055, Report and Evaluation of the 2009 OSI Directed Exercise (DE09).
- CTBT/PTS/INF.1111, OSI Continuation Period Techniques: Proposal for a Road Map.
- CTBT/PTS/INF.1161, Report on the Advanced Training Course of the Second OSI Training Cycle for Surrogate Inspectors.
- CTBT/WS/OSI-17/1, Report of On-Site Inspection Workshop-17: On-Site Inspection Essential Techniques, Equipment and Targeted Applications (Baden, Austria, 3-7 May 2010).
- CTBT/WS/OSI-19/1, Report of On-Site Inspection Workshop-19: Development of OSI Equipment List: Initial Period Techniques (Baden, Austria, 16-20 May 2011).
- CTBT/PTS/TR/2010-1, Technical Report: 2009 Tabletop Exercise (TTE09) in the Use of Continuation Period Techniques During an On-Site Inspection.

ANNEX II

OVERVIEW OF ELEMENTS TO BE EXERCISED DURING BUE I VERSUS IFE08

Elements of an OSI	Options of Exercise Play: Play/Inject-Simulate/Do Not Play	IFE08 Played/Inject-Simulated/Not Played
Receipt of request by the DG	Play	Played
TS activation	Play	Played
Acknowledgement receipt of OSI request	Play	Played
OSC activation	Play	Played
Security in the OSC	Play	Played
OSC – Duty roster	Play	Played
OSC – Access logbook	Play	Played
OSC – Daily documentation logbook	Play	Played
OSC – Duty logbook	Play	Played
OSC – Inspection folder maintenance	Play	Played
OSC – Daily reports	Play	Played
Communication to State sought to be inspected and request for acknowledgement within 12 hours	Simulate	Simulated
Communication of request to all States Parties	Simulate	Simulated
Assembly of core planning team in VIC (incl. some IT movement to Vienna)	Play (limited)	Whole team assembly in VIC
IDC briefing	Play	Played
Ensuring (ascertaining) that request meets requirements	Play	Played
DG – Clarification with the SP sought to be inspected	Play/Simulate	Inject
Results of consultation and clarification process	Inject	Inject
EC decision making process (EC procedures will be developed by EC)	Do not play/inject	Inject
EC decision	Inject	Inject
Preparation of country file	Play	Played
Preparation of LOSP	Play	Not played (new concept developed this year)
Request for logistical support	Play	Played
Notification of flight plan for use of non-scheduled aircraft	Simulate	Not played
Preparation of trigger event file	Play	Played
Interaction with IDC/IMS, incl. special data analysis	Play	Played
Preparation of inspection area file	Play	Played
Preparation of inspection mandate	Play	Played
Preparation of initial inspection plan	Play	Played
Preparation of administrative aspects (will include contributions and briefings provided by other PTS units)	Play	Played

Elements of an OSI	Options of Exercise Play: Play/Inject-Simulate/Do Not Play	IFE08 Played/Inject-Simulated/Not Played
Notification of inspection to ISP	Play	Played
List of equipment requested from ISP	Play	Played
Preparation and loading of documentation management system	Play	Not played
IT selection and personnel preparation (admin, H&S, etc.)	Play (limited)	Simulated (prepared in advance)
Inspectors' travel arrangements (this aspect will include contributions and briefings provided by other PTS units)	Play (limited)	Not played (prepared in advance, not in accordance with Treaty time lines)
Medical screening – Pre-inspection measurements (incl. whole body count), as applicable	Play (limited)/Full execution in real life	Arranged in advance
Vaccinations, as applicable	Simulate	Arranged in advance
Interaction with ISP, incl. handling of requests for information and assistance	Play/Simulate	Played
Interaction with RSP and other SPs, incl. handling of NTM data	Play/Simulate	Played
Equipment selection	Play (limited)	Simulated (prepared in advance)
Equipment packing, certification, manifesting and out-loading	Play (limited)	Not played (prepared in advance)
Confidentiality	Play	Played (limited scope)
Security in OSC	Play	Played
Public affairs and media handling	Play	Played
IT move to POE	Simulate (only checking of tickets)	Played
Equipment shipment to POE	Play (limited: out-loading ops only)	Not played (prepared in advance, not in accordance with Treaty time lines)
Inspection mandate completed	Play	Played
List of inspectors completed	Play	Played
List of equipment completed	Play	Played
IA file completed (IA coordinates, description of area, geology, maps)	Play	Played
Triggering event file completed (date, time, depth, nature, coordinates, IDC/IMS information, ISP/RSP/SPs information)	Play	Played
Country file completed	Play	Played
Initial Inspection plan completed	Play	Played
Emergency procedures ready	Play	Played
Upload of all OSI related documents into IIMS	Play	Not played

ANNEX III

OVERVIEW OF ELEMENTS TO BE EXERCISED DURING BUE II/IV VERSUS IFE08 AND IFE14

Elements of an OSI	IFE08	BUE II/IV	IFE14
Point of entry procedures			
• Inspection mandate handover	Played	Play	Play
• Initial inspection plan presentation	Played	Play	Play
• Inspected State Party briefings	Played	Play	Play
• IT–ISP negotiations of IIP	Played	Play	Play
• IIP modification as applicable	Played	Play	Play
• Inspection equipment check	Limited at BOO	Play	Play
• IT reporting back to TS HQ	Limited	Play	Play
IT transfer from POE to BOO/IA			
• Deployment of an advance party to prepare setting up of BOO, if permitted	Played	TBD	TBD
• IT in-country travel	Played	Play	Play
• Equipment transport from POE to BOO	Played	Play	Play
• Confirmation of coordinates (IA corresponding to inspection mandate)	Played	Play	Play
Constructing and establishing operational readiness at BOO			
• Conduct of specific ISP briefings at BOO, as applicable	Played	Play	TBD
• Radiation survey of BOO	Played	Play	Play
• Set-up of communications infrastructure	Played	Play	Play
• Establishing IIMS at BOO	Not played	Play	Play
• Set-up of BOO (working area/living quarters)	Played (both)	Play (working area)	Play (scope TBD)
Operational activities (limited extent)			
• Checking IIMS functionality	Not played	Play (limited)	Play
• Checking communications functionality	Played	Play	Play
• Checking FIMS/GIS functionality	Played	Play	Play
• Checking inspection equipment functionality	Played	Play (limited)	Play
IT–ISP interaction and negotiations throughout exercise			
• Regular meetings between IT and ISP	Played	Play	Play
IT–OSC communications and support			
• Daily/Regular reporting of IT to DG/OSC	Limited	Play	Play
• Joint IT–OSC return planning	Not played	Play	Play

Elements of an OSI	IFE08	BUE II/IV	IFE14
• OSC support activities, as applicable	Played (limited)	Play	Play
Reporting (to a limited extent)			
• Review of preliminary findings (PFD)	Played	Play	Play
Dismantlement of BOO			
Decommissioning of BOO	Not played	Play	Play
IT travel through point of exit to home countries/TS HQ	Not played	Play	Play
Equipment transport through point of exit to TS/HQ	Not played	Play	Play
Point of exit procedures	Not played	Play	Play
IT debriefings (confidentiality, H&S, etc.), as applicable	Not played	Do not play	Play
IT medical check-up, as applicable	Played	Do not play	TBD
Preparation of draft inspection report by DG to ISP	Not played	Do not play	TBD
Submission of inspection report to RSP, ISP, EC and all other States Parties	Not played	Do not play	Do not play
Review of inspection report by EC (EC procedures will be developed by EC)	Not played	Do not play	Do not play
Equipment receipt, clean-up, check-in, inventory and return to States Parties, as applicable	Not played	Do not play	Do not play
Data archiving and sample storage	Played (limited)	Play (limited)	Play
Financial and administrative follow-up of inspection (this aspect will include contributions and briefings provided by other PTS units)	Not played	Do not play	TBD

ANNEX IV

LIST OF PRESENTATIONS

Opening Session

1. Rozhkov, O., PTS, Opening Remarks.
2. Shchukin, V., Russian Federation, Briefing on the Objectives of Workshop-20 (CTBT/OSI/WS-20/PR/43).
3. Zucca, J., USA, Briefing on Workshop Programme and Outcome (CTBT/OSI/WS-20/PR/1).
4. Sweeney, J., USA, Guidance on Workshop Report Drafting (CTBT/OSI/WS-20/PR/44).
5. Deng, Hongmei, PTS, Division of Roles, Administrative Information.

Plenary Session

1. Lampalzer, H., PTS, Debriefing on BUE I (CTBT/OSI/WS-20/PR/2).
2. Li, Peng, PTS, Debriefing on BUE II/IV (CTBT/OSI/WS-20/PR/3).
3. MacLeod, G., PTS, Preparations for BUE III and IFE14 (CTBT/OSI/WS-20/PR/4).
4. MacLeod, G., PTS, Overview of Preparation for the BUE (CTBT/OSI/WS-20/PR/5).
5. Lampalzer, H., PTS, Build-Up Exercises I and II/IV Exercise Planning (CTBT/OSI/WS-20/PR/6).
6. Li, Peng, PTS, Aspects of BUE II and IV Preparation (CTBT/OSI/WS-20/PR/7).
7. Kozma, J., PTS, Build-Up Exercises I, II/IV Supporting Products (CTBT/OSI/WS-20/PR/8)
8. Labak, P., PTS, Scenario Development for Build-Up Exercises I and II/IV (CTBT/OSI/WS-20/PR/9).
9. Deng, Hongmei, PTS, Preparations for BUE I and BUE II/IV (CTBT/OSI/WS-20/PR/10).
10. Mützelburg, T., PTS, Public Information in the BUEs: Injects and Lessons Learned (CTBT/OSI/WS-20/PR/41).
11. Oliver, I., PTS and Walker, J., UK, Evaluating the IFE: Assessing OSI Preparedness (CTBT/OSI/WS-20/PR/11).

Session A: Build-Up Exercise I

12. Walker, J., UK, and Lampalzer, H., PTS, Introductory Comments on Build-Up Exercise I (CTBT/OSI/WS-20/PR/12).
13. Walker, J., UK, BUE I Key Findings and Recommendations from the External Evaluation Report (CTBT/OSI/WS-20/PR/13).
14. MacLeod, G., PTS, Operations Support Centre (Activation and Operations, Challenges, Lessons Learned, Issues Still to Be Addressed) (CTBT/OSI/WS-20/PR/42).
15. Prah, M., PTS, Core Inspection Team Plans and Activities (Describing Major Elements, Challenges, Lessons Learned, Issues Still to Be Addressed) (CTBT/OSI/WS-20/PR/14).
16. Gavish, R., PTS, OSC Planning Team (Describing Major Steps, Challenges, Lesson Learned, Issues Still to Be Addressed) (CTBT/OSI/WS-20/PR/15).
17. Balczo, B., PTS, Logistics Team – ESMF (Describing Major Elements and Steps, Challenges, Lessons Learned, Issues Still to Be Addressed) (CTBT/OSI/WS-20/PR/18).

18. Arndt, R., PTS, Equipment Certification (Describing Major Elements and Steps, Challenges, Lessons Learned, Issues Still to Be Addressed) (CTBT/OSI/WS-20/PR/16).
19. Deng, Hongmei, PTS, Administrative Team (Describing Major Elements and Steps, Challenges, Lessons Learned, Issues Still to Be Addressed) (CTBT/OSI/WS-20/PR/19).
20. Tonos Paniagua, F., PTS, Personnel Team (Describing Major Elements and Steps, Challenges, Lessons Learned, Issues Still to Be Addressed) (CTBT/OSI/WS-20/PR/47).

Session B: Build-Up Exercise II/IV

21. Coxhead, M., Australia, and Li, Peng, PTS, Introductory Comments on BUE II/IV (CTBT/OSI/WS-20/PR/50).
22. Kozma, J., PTS, ISP Preparations for On-Site Inspection (CTBT/OSI/WS-20/PR/20).
23. Coxhead, M., Australia, Observations on IT/ISP Interaction (CTBT/OSI/WS-20/PR/21).
24. Prah, M., PTS, Inspection Team Perspective: Activities and Challenges (CTBT/OSI/WS-20/PR/22).
25. Abushady, A., PTS, Inspection Team Perspective: Communications (CTBT/OSI/WS-20/PR/23).
26. Anderson, J., PTS, Inspection Team Perspective: BOO Set-Up (CTBT/OSI/WS-20/PR/39).
27. Tweed, M., PTS, BUE II and IV: IT Reporting (CTBT/OSI/WS-20/PR/24).
28. Labak, P., PTS, Set-Up and Application of Integrated Information Management System (IIMS) During BUE II/IV (CTBT/OSI/WS-20/PR/40).
29. Gavish, R., PTS, OSC: Operations, Reporting, Recovery (CTBT/OSI/WS-20/PR/25).
30. Christov, A., PTS, Communications for the IT at the POE (CTBT/OSI/WS-20/PR/48).
31. Arndt, R., PTS, Control Team Perspective: Equipment Checking (CTBT/OSI/WS-20/PR/26).
32. Deng, Hongmei, PTS, Control Team Perspective: Application Procedures (CTBT/OSI/WS-20/PR/27).
33. Dekin, W., USA, Observations on BUE II/IV (CTBT/OSI/WS-20/PR/28).
34. Coxhead, M., Australia, and Li, Peng, PTS, Framework Paper for Discussions (CTBT/OSI/WS-20/PR/29).

Session C: Build-Up Exercise III

35. Gaya-Piqué, L., PTS, and Smith, A., USA, Introductory Comments on BUE III (CTBT/OSI/WS-20/PR/30).
36. Gaya-Pique, L., PTS, Exercise Scope and Techniques (CTBT/OSI/WS-20/PR/31).
37. Arndt, R., PTS, Equipment Status and Availability (CTBT/OSI/WS-20/PR/32).
38. Stickney, K., PTS, Procedures Development, Including SOPs/WINs (CTBT/OSI/WS-20/PR/51).
39. Milic, A., PTS, BUE III Training (CTBT/OSI/WS-20/PR/38).
40. Rowlands, A., PTS, MSIR: Progress to Date and Steps for an Operational System for IFE14 (CTBT/OSI/WS-20/PR/37).
41. Haas, D., USA, Data Quality Objectives for RN OSI Equipment (CTBT/OSI/WS-20/PR/45).
42. Wieslander, E., PTS, RN/NG Equipment and Sampling for BUE III (CTBT/OSI/WS-20/PR/46).

43. Osugi, S., Japan, Suggestions for BUE III and IFE14 – Logistics and Administration Issues (CTBT/OSI/WS-20/PR/33).
44. Meless, O., PTS, Discussion Framework for SAMS Expert Group (CTBT/OSI/WS-20/PR/34).
45. Miley, H., USA, RN Methods and Equipment Discussion (CTBT/OSI/WS-20/PR/49).
46. Stefanova, S., PTS, CPT Expert Group Discussion (CTBT/OSI/WS-20/PR/35).
47. González, G., Chile, Logistics Administration Discussion Led by Expert Group Leader (CTBT/OSI/WS-20/PR/39).

Closing Session

48. Walker, J., UK, and Lampalzer, H., PTS, Suggested Workshop Report Elements for Session A: Build-Up Exercise I (CTBT/OSI/WS-20/PR/53).
49. Coxhead, M., Australia, and Li, Peng, PTS, Summary of Discussions at WS-20 (CTBT/OSI/WS-20/PR/54).
50. Gaya-Piqué, L., PTS, and Smith, A., USA, Closing Talk (Session C) (CTBT/OSI/WS-20/PR/55).
51. Zucca, J., USA, A Few Conclusions (CTBT/OSI/WS-20/PR/56).
52. Sweeney, J., USA, Brief on Workshop Report Drafting Schedules (CTBT/OSI/WS-19/PR/57).

ANNEX V

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