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## **Joint US/PRC CTBT OSI Simulation Exercises**

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### **BACKGROUND**

While the Comprehensive Test Ban Treaty (CTBT) has not yet entered into force, the US and other countries have begun to prepare for its implementation, and in particular, to prepare for the implementation of the on-site inspection (OSI) provisions of the treaty. In the US, these preparations are spurred by a necessity to understand the technologies and processes of conducting an OSI not only to more meaningfully participate in Preparatory Commission negotiations but also to understand the practical implications of an OSI on US defense and nuclear installations. While an on-site inspection is limited to a thousand-square kilometer region of any given country, the ramifications of an OSI may reach far beyond that confined area to affect both the internal politics of that country as well as the perceptions of that country in the international community.

For these, and other reasons, the US has conducted a US-only CTBT OSI simulation exercise and is in the process of conducting such an exercise jointly with the Russian Federation. These exercises are aimed at simulating the processes and procedures used during an on-site inspection in order to better understand the limitations of those techniques and the proper operation of the various technologies employed.

### **PROPOSED ACTIVITIES WITH CHINA**

The US proposes to conduct a joint US/PRC tabletop exercise. This type of OSI exercise involves simulating the conduct of an OSI without the use of real equipment, and not in real time. A planning team, called a “control team” develops a scenario, which may or may not involve a violation of the treaty. A group of technical experts, acting as an inspection team (IT), inspects the scenario during a period of several days. Because a clandestine nuclear test would most likely be conducted in an area with other activities occurring to mask the event, the control team simulates this situation by preparing other ambiguous data to present to the inspection team. The inspection team, then moves through the notional inspection area, prioritizing how they will allocate their limited resources to investigate all possible locations of a clandestine test. The IT determines what techniques and equipment would be used by evaluating the simulated inspection data. The control team, then evaluates the processes and technologies employed by the inspection team, as well as the negotiations between the mock inspection team and the mock inspected State Party.

In the US-only exercise, the control team evaluated the techniques and technologies that the inspection team used in narrowing the thousand-square kilometer inspection area during the initial phase of the inspection. Via this process, the US control team determined that there were several deficiencies in the equipment list such as the number of seismic stations allowed and an insufficient number of high-purity germanium detectors. The control team also identified issues that required further exploration such as testing the procedures and technologies allowed in the continuation

phase of an inspection, determining the effective implementation of managed access provisions, and developing an efficient data integration system.

In developing a similar type of exercise with the Russian Federation, the US and the RF chose to develop two scenarios; one developed by the US with the RF as inspector, and the other developed by the RF with the US as inspector. A joint US/RF evaluation team will evaluate both inspection teams and provide comments relating to the following four objectives of the exercises:

- exercise and evaluate concepts of operations for an OSI and make recommendations to the Preparatory Commission, in Vienna, based on results of exercise
- exercise and evaluate the utility of various technologies and equipment used in an OSI
- observe and evaluate the functioning of the IT
- develop a set of lessons learned for the development of CTBT OSI tabletop exercise for use in planning future exercises

Time permitting, the US would propose to conduct a similar type of joint exercise with the PRC, but rather than employing the US/RF model, the US would propose to have one scenario developed jointly by the US and China and both the inspection and inspected state party teams, to be mixed. While either model would allow both sides to evaluate their respective concepts of operations and determine how the US and PRC differ with respect to OSI implementation, the model utilizing mixed teams would allow resolution to begin and continue throughout the planning as well as execution phases of the exercise.

The control team would consist of representatives from the US Department of Energy's National Laboratories and the Institute of Applied Physics and Computational Mathematics in the PRC. The control team would determine the scope and objectives of the exercise, the composition of the inspection and inspected state party teams, and the appropriate level of involvement of each country's political establishment. The control team would also ascertain the utility of international observers for the execution of the exercise.

A follow up exercise would build upon what was learned in the first exercise and perhaps bring in academics and foreign affairs specialists as observers and/or participants.