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The CTBT: More Important Now Than Ever

Hello everyone, it's a pleasure and honor to be here today as the United States Under Secretary for Nuclear Security in the Department of Energy and the Administrator of the National Nuclear Security Administration.

I came to this meeting to express the strong and enduring commitment by the United States to the Comprehensive Nuclear-Test-Ban Treaty. I also want to use this opportunity to describe our national nuclear obligations and how we meet them, including elaborating on our nuclear annual assessment process and stockpile stewardship program with specifics on our subcritical experiments at the Nevada National Security Site. To conclude my remarks, I will put forward some ideas on advancing transparency.

U.S. Nuclear Obligations and Principles

In addition to supporting all Treaty obligations, the United States has a simple overarching principle about our nuclear arsenal: as long as nuclear weapons exist, the United States will maintain a safe, secure, and effective nuclear stockpile for our security and that of our allies and partners.

We maintain the safety, security, and effectiveness of our nuclear stockpile through a technically based assessment program that was put into place when President Clinton signed the CTBT in 1996. I will discuss this in more detail shortly. The decisions on declaratory policy and force posture for our security and that of our allies and partners is consistent with treaties and reviewed and published in the Nuclear Posture Review conducted near the beginning of each Presidential Administration. These reviews and the release of the 2022 Nuclear Posture Review were completed by the Biden Administration and could be the topic of another talk, but those are not the focus today.

Turning to the topic at hand, the 2022 Nuclear Posture Review is clear in its support for the CTBT and states, "Consistent with the goals of the CTBT, the United States continues to observe a moratorium on nuclear explosive testing and calls on all states possessing nuclear weapons to declare or maintain such a moratorium." Today, with an international environment that includes countries making advancements in their nuclear arsenals, and some threatening to use or test nuclear weapons, the CTBT and the associated monitoring and verification regime are more important than ever. I applaud Dr. Floyd's tireless and successful efforts to get six additional countries to ratify the CTBT.

Nonetheless, there remain barriers to U.S. ratification of the CTBT, and there is a natural tension in our principles, obligations, and political checks and balances.

That being said, we cannot forget the fact that the United States has not conducted a nuclear explosive test since 1992. In fact, for thirty years the National Nuclear Security Administration has been allocated substantial and sustained funding to advance its science-based stockpile stewardship program that, along with regular flight and lab tests, serves as the basis to maintain the safety, security, reliability, and effectiveness of the U.S. stockpile without nuclear explosive testing.

Stockpile Certification and Science-Based Stewardship

When the United States signed the CTBT, there was accompanying legislation requiring an annual letter to the President reporting on the safety, reliability, performance, and military effectiveness of the stockpile, as well as whether nuclear explosive testing is necessary to resolve any issues identified. Scientists and engineers in the NNSA nuclear security enterprise conduct work every day to support the annual assessment, and once a year the results acquired by each of the three national security laboratories are presented to the laboratory director, who in turn writes a letter to the Secretary of Energy. A similar process is conducted by the Commander of U.S. Strategic Command producing a letter to the Secretary of Defense. The Secretaries of Energy and Defense then write a letter to the President that reports on the stockpile and whether there is a technical need to test. The other four detailed letters are attached without edits. As Director of Sandia National Laboratories, I wrote two Annual Assessment letters in 2015 and 2016 and I can say that it is a rigorous process and a sobering responsibility.

The United States has significantly reduced the quantity and types of nuclear weapons in our arsenal since the last test in 1992. Additionally, all key nuclear components for current and planned systems in the U.S. stockpile are based on previously tested designs, which makes it likely that science-based stockpile stewardship will continue to succeed without nuclear explosive testing.

Much of the technical evidence for the annual assessment is derived from the science-based stockpile stewardship program. This program develops and utilizes detailed simulations on high-performance computing platforms. The physical understanding to develop the simulations is obtained from data collected in highly diagnosed experiments at science facilities such as the National Ignition Facility at Lawrence Livermore or the Dual Axis Radiography Hydrodynamic Test Facility at Los Alamos. Some experiments at some facilities are subcritical experiments that contain nuclear materials, but none of the experiments create a supercritical nuclear chain reaction. These experiments help us study details of nuclear processes in a manner consistent with the CTBT. NNSA executes these subcritical experiments at the former Nevada Test Site, now called the Nevada National Security Site or NNSS. Using the U1a underground complex at NNSS to conduct subcritical experiments for science-based stockpile stewardship is the most important way the United States maintains test readiness. Additional tests for nonproliferation efforts also sustain capabilities.

Currently, NNSA is building two new subcritical experiment testbeds at the U1a Complex. The testbeds will provide data to help address stockpile questions such as the impact of plutonium aging on weapon performance. Since halting underground nuclear explosive testing, the United States has executed 33 subcritical experiments. The United States is preparing to execute two

subcritical experiments in 2024 and plans to conduct approximately three subcritical experiments per year by the end of the decade.

The Nevada National Security Site is also being used for nonproliferation research. For example, when experiments are conducted within the U1a Complex or the Big Explosives Experimental Facility, a high explosives research facility also located at the Nevada National Security Site, monitoring is done to improve our understanding of subcritical experiment signatures. Nonproliferation research to improve low yield nuclear monitoring is also conducted at NNSA using chemical high explosives.

Advancing Transparency

Beyond our commitment to the CTBT by conducting only subcritical experiments, the United States is also committed to transparency as a key part of being a responsible nuclear power. We have maintained a commitment to transparency in our stockpile stewardship and subcritical experiment programs for decades. We were pleased to host Dr. Floyd and his colleagues at our NNSA headquarters in Washington, D.C. in September 2021, at Pacific Northwest Laboratory in October 2022, and at Los Alamos National Laboratory, Sandia National Laboratories, and the Nevada National Security Site this April.

We are also exploring ideas to provide further transparency into our program. These ideas are meant for bilateral or multilateral cooperation, and we are eager to work with those who share our goal of greater transparency. We are open to hosting international observers for monitoring and verification research and development on our subcritical experiments. We have hosted international observers for past underground chemical high explosive tests and intend to extend invitations for future experiments. Event notifications of our chemical high explosive tests are sent to regional seismic networks as well as to the CTBTO PrepCom through the U.S. Mission in Vienna. Public sharing of the data gathered from high-explosive events occurs, and we will continue to publish and present geophysical experiment findings in peer-reviewed journals and conference proceedings, including source-term and collection information.

Additionally, we are open to working with others to develop a regime that would allow reciprocal observation with radiation detection equipment at each other's subcritical experiments to allow confirmation that the experiment was consistent with the CTBT. We have many technical ideas on how this could be effective.

Additionally, I look forward to your ideas on future transparency. NNSA is exploring the possibility of live-streaming or otherwise releasing video of our subcritical experiments. Our intent in the long term is to create an environment at the Nevada National Security Site that allows for the possibility of observers to attend from a control room or other vantage point to support chain-of-custody for detection equipment containers and to witness subcritical experiments consistent with the CTBT.

I sincerely look forward to future engagement with Russia and China on participation in bi-or tri-lateral verification confidence building measures and other technological interactions to support future arms control and nonproliferation agreements.

Before I wrap up, I encourage everyone to attend NNSA's Deputy Administrator for Defense Nuclear Nonproliferation, Corey Hinderstein, as she speaks about "Examples of U.S. Transparency and Verification Supporting Nuclear Nonproliferation," tomorrow at 3 pm.

To conclude, I want to emphasize again that the United States supports the CTBT and is committed to work to achieve its entry into force, recognizing the significant challenges that lie ahead in reaching this goal. We have not conducted a nuclear explosive test since 1992 and have no plans to do so. The United States is also committed to annual stockpile assessments, science-based stewardship, and test readiness. We will achieve our objectives in part by conducting subcritical experiments at the former test site complemented by focused experiments and detailed simulations executed throughout the nuclear security enterprise. And today we put forward ideas on how to advance transparency and hope we can work with others that support the CTBT.

Thank you for your attention and for your contributions to making the world a safer place.