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

ADDRESS BY THE EXECUTIVE SECRETARY TO THE INTERNATIONAL SCIENTIFIC STUDIES CONFERENCE 10 TO 12 JUNE 2009, VIENNA, AUSTRIA

Your Excellency, Mr. Foreign Minister Dr. Spindelegger
Excellencies,
Distinguished delegates
Dear friends and colleagues

1. There would be too many individuals to thank for having made the ISS possible. For fear of omission, let me thank all who contributed to this process. I am grateful for the overwhelming response and interest by scientists and scientific institutions that the ISS project has generated. I would also like to thank the Austrian Foreign Ministry for the generous contribution without which this conference in this beautiful setting would not be possible. Let me also thank Australia, the Czech Republic, France, Spain and Sweden for their generous voluntary contributions to the ISS Project.

2. The last time we had a scientific gathering in the Hofburg was in 2006. We celebrated to 10th anniversary of the establishment of the CTBTO Preparatory Commission with a Scientific Symposium, entitled "Synergies with Science: 1996-2006 and Beyond". We are now 3 years "beyond" this point and we - this Treaty and this organization - find ourselves in a very different world. The past 3 years have brought significant new challenges and opportunities. There are political opportunities. The prospects for the entry into force of the CTBT look brighter today than in 2006. The discourse about the CTBT and the nuclear non-proliferation and disarmament regime in general has gradually changed. Political leadership now seems to be at hand to strengthen this regime that has come increasingly under duress in recent years. The CTBT is one of the key elements of this debate.

3. The challenges, both political and technical, were evidenced not the least by two events that happened since our last scientific meeting in September 2006. Only one month later, we were confronted with the first nuclear test by North Korea in October 2006. This, and just recently, the claimed test in the early hours of 25 May were

    - real-life,

- real-time,
- involuntary and
- imposed performance tests for the CTBT verification system.

These events underscore that the ISS' original idea to address the readiness and capability of the CTBT verification system is not a theoretical scientific enterprise. It is not somewhat detached from reality. There are clear and present political necessities to do this. Let me explain how this system was tested and how it performed.

4. At 00:54:43 am (GMT) of 25 May, a seismic event took place on North Korean territory.

5. 23 of our primary seismic stations – all over the world - registered this event and transmitted their data to Vienna. Data from the monitoring stations was transmitted near real time via the Global Communications Infrastructure – 5 geostationary satellites – to the International Data Centre (IDC) in Vienna. Less than 1 ½ hours later, our member states received the first automated bulletin of the time, depth, location and magnitude of the event. By the time the test was announced, our experts were processing and analyzing the data. By the time, the UN Security Council meeting convened, all members, big or small, permanent or non-permanent, had first hand information from the CTBTO at their disposal. The seismic data from this particular event proved more complex than from typical explosions. Our experts concluded that the recorded signals contain distinct characteristics of an explosion and simultaneous signals with earthquake–like characteristics. The search for radioactive particles, radionuclides or radioactive noble gases, to determine the nuclear character of this event is still ongoing as we speak, involving sophisticated atmospheric transport models (ATM).

6. What you see here is the location of both, the 2006 nuclear test and the event of May 2009 as indicated by our seismic network. You can see that both events were in the same area. The small – red – ellipse indicates a smaller area, a bit more than 500 km2. This high degree of precision is important. Firstly, because it demonstrates the progress that has been made since 2006. There are significantly more stations contributing to the system since 2006. Secondly, it is important since it give a precise location for the event. This is important for an on-site inspection, the final arm of the verification regime. On-Site Inspections can, of course, only be invoked by the future Executive Council after the CTBT has entered into force. However, in my view, the recent nuclear test claimed by North Korea could not have been a clearer demonstration of the importance of this final verification tool. CTBT verification is not complete without the ultimate eyes-on-the-ground proof that only an on-site-inspection can provide.

7. While we can look at the performance of the IMS and the IDC in the North Korean event –I am sure that the next 3 days touch upon this -, we must remember that the verification regime is composed of different layers of technologies. These 3 layers are each comprised of several sub-layers of science and technology. All of this has to come and work together in an integrated way as safety nets, complementing each other, to ensure that potential cheaters are caught.

8. We have come far in the past 13 years in building up all elements the CTBT verification system. When we meet next at the Hofburg for a scientific meeting, I hope, in particular, that the global IMS map will look like this.

9. The "Manhattan Project" of the 1940s to research and build the world's first nuclear weapon is sometimes referred to as the first "Big Science" project. If "Big Science" is needed to build and test nuclear weapons, then "Big Verification" (with a capital "V") is needed to monitor compliance with a Comprehensive Nuclear-Test-Ban. And, the CTBT verification regime is, indeed, a highly complex scientific endeavor. It is an unprecedented global joint venture, unique for multilateral treaties. It is Verification with a capital "V".

10. By the moment the event was triggered in North Korea on 25 May, the verification system was in a high gear. It displayed its global reach of the

    - 250 facilities that are operational today,
    - of the 200 VSATs and of
    - 1000 persons in the more than
    - 100 states that receive our data that were alerted.

11. We continue to wait for measurements of radioactive particles from our radionuclide noble gases stations. However, the Atmospheric Transport Modeling (ATM) that is applied to project a possible release is another case in point for the complexity of this BIG Verification effort. Six million sources of daily meteorological information from thousands of ships, aircrafts and satellites and other sources are processed for ATMs. These draw on many technological and scientific platforms and networks, all of which, thus, contribute to this unique verification effort.

12. BIG Verification is also at work on our road towards achieving on-site inspection readiness. The first integrated on-site inspection field exercise took place in September 2009 in the former Soviet Union nuclear test site of Semipalatinsk, Kazakhstan.

    The parameters of the exercise speak for themselves:

    - 1000 square kilometers of inspection area,
    - a team of 40 inspectors,
    - overall logistical support for nearly 200 participants,
    - 4 weeks of activities,
    - 50 tons of equipment, comprising a dozen of different verification technologies.

    Many valuable lessons were learned, which will be fed into our OSI preparations as we move forward towards operational readiness.

13. To remain relevant and effective and to sustain this BIG Verification effort, we must keep pace with science. But science is also changing rapidly. Intel co-founder Gordon Moore stated what became known as "Moore's Law": that IT processing capacity doubles every 24 months. Science today moves faster and is becoming ever more

globally interconnected. Open Source, Wikipedia and global communication platforms are all vectors that drive and contribute to rapid scientific change and progress. One could say in a provocative way that "Nuclear weapons unleashed the ultimate forces of nature" and "Open Source unleashes new forces of scientific cooperation". We need to harness this collective scientific force, much of which is gathered in this room.

14. The ISS idea, to initiate a cooperative global scientific process to address the readiness and capability of the CTBT Verification Regime was hatched 2 years ago. However, in reality this process did not really start two years ago. It is only the temporary end-point of a tradition of scientific cooperation. A development that commenced in the mid 1970s. For 35 years, science and scientists have played a crucial role in the CTBT. In 1976, the Group of Scientific Experts (GSE) started to discuss in Geneva how a Comprehensive Ban could be verified. To see what the components and capabilities of a future CTBT verification would have to look like. The GSE was also a global scientific endeavor. This group kept working despite the political ups and downs of the Cold War. Scientists, thus, laid and prepared the ground for the time when the political environment was ripe for progress. And once the political treaty negotiations started, they could proceed on a firm scientific footing and could be concluded in a relatively short time in 1996. Science had kept the CTBT flame burning. (If you wonder who the arrow is pointing at, it is the youthful Ola Dahlman, the ISS Coordinator)

15. All of what you see that has been accomplished in building up the CTBT verification system was, in one way or another, envisioned by the GSE. Big things are possible if a small group thinks big.

16. There can be no doubt that the urgency of completing this vision is just as great if not greater than at the time of the GSE. North Korea's actions are a stark reminder of the need to bring the CTBT into legal effect and to operationalize its verification regime. This legal barrier needs political leadership to finally be put into place. Its verification regime, however, needs the best of science to be a credible, final, barrier on the road to nuclear weapons capability. Given the highly specialized technological focus of the CTBT verification mandate, staying abreast of scientific developments maybe our greatest challenge as an organization. The constant close interaction with the scientific community is a must.

17. We at the CTBTO also need to constantly examine that way we do things, the way we run this global system and, if needed, reinvent ourselves and change course. We cannot take our role for granted and must not afford to become complacent. There is so much scientific expertise and knowledge out there. There are also other systems and networks of scientists that are involved in the same fields as we are. Just look at the IRIS system as one impressive example.

18. It is only through close interaction and scientific exchange that we can retain our relevance and provide the best value and highest return on investment for our member states. The importance of our mandate obliges us to do this.

19. This exchange and cross-fertilization is, in a nutshell, what I hope that this conference will contribute to.