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TEACHING POLICY TO SCIENTISTS

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Engaging the Experts, Training the Trainers: a Seminar on CTBT education in the 21st Century

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1. Thank you so much Nikolai for this kind introduction. You do make me sound like a true jack-of-all-trades.
2. Let me first of all thank the CTBTO for its kind invitation. This is important. I am a great believer in education, and I think that this initiative is showing how we, in the verification community, can be better at sharing our knowledge and expertise.
3. I am glad so see so many friends and colleagues here today. And I am especially happy to see very distinguished universities represented here.

The importance of education

4. Teaching, in my mind, is one of the noblest pursuits that you can be engaged in.
5. But let us not forget that teaching also is great responsibly. Knowledge that is not shared can lead to elitism and a feeling of them and us.
6. Teaching can be dangerous. Opinion in the guise of knowledge can lead to unspeakable terror. Theories of social Darwinism, for instance, have led to ideas that the survival of the fittest is a perfectly reasonable idea to base a society on. Such ideas have led to intolerance and distain, and also apartheid and genocide.
7. Of course, it does not end there.
8. Sharp educated minds have developed theories of deterrence and mutual assured destruction. Sharp educated minds have prompted the detonation of thousands of nuclear weapons on and in our Earth. And you know what, these theories have been developed by people that believe that human beings can only co-habit this planet or ours peacefully under the imminent threat of extinction.
9. The cold warriors were, and still are, convinced that nuclear weapons are for the greater good. It is an article of faith, but one that was formulated under a scientific umbrella.
10. I've been asked to speak about teaching policy to scientists. I don't think this is very difficult. It is more difficult to teach science to policy makers. And you'll soon see why.



11. In any case. What is the main lesson for scientists? What are the main points that scientists should try to get across?
12. Lets start with one important point. Scientific research does not exist in a policy vacuum. The policy maker needs to understand it, and support it. And without the support of the policy community, basic scientific research would never happen.

No bucks, no Buck Rogers

13. I think one of the best depictions of the policy interface with science is in Philip Kaufman's iconic 1983 movie The Right Stuff.
14. In one of the scenes, America's Mercury Astronauts is confronting a number of scientists over a technical matter. The Astronauts wants a number of modifications to their spacecraft. They want control over re-entry attitude. They want to see control thrusters on the craft. Above all, they want a window on the ship.
15. The scientists are confused. The computers can handle the re-entry of the ship. And why would the "capsule-occupant" want to see out a window? A window is just problematic on a spaceship.
16. Gordon Cooper, on of the Mercury astronauts loses his temper and asks, "you boys know what makes this bird go up?" He pauses and then delivers the punch line: "funding makes this bird go up". His colleague Gus Grissom quickly adds, "he's right. No bucks, no Buck Rogers".
17. The Astronauts point to the waiting press, eager to photograph America's new heroes. The scientist quickly gets the point. The taxpayer wants to see Buck Rogers, the spaceman. They're not interested in the science. Not really. So the scientists relent, and they agree to the placement of attitude controls, and a window.
18. This brief exchange captures some important points. The principal being that the greatest idea is worthless if it cannot be captured well, explained in simple terms, and sold to the policy makers. It is only then the investment will come.

Science and policy applied

19. For many years, I participated in the so-called UK-Norway Initiative on verified warhead dismantlement. This is, for those who don't know, the first ever initiative involving a nuclear and a non-nuclear weapon state looking at nuclear warheads. And until 2010, it also involved an NGO, us at VERTIC, as an independent observer.
20. We presented to the NPT review cycle.
21. In our first presentation we addressed about 30 people in Geneva. The next meeting, the count was up to about 60. In 2010, we presented to a full auditorium. About 130 delegates were in the room, all listening to our words. Every year, we doubled the count.

22. Believe me, the people of the UK Ministry of Defence, and the UK Atomic Weapons Establishment, are not known for their excellent communications skills. So how did we manage to grow the audience so much?
23. It was very simple. We decided not to show the NPT review cycle what we had done. Instead, we showed them what our initiative had the prospect of becoming. We tickled people's imagination.
24. We gave them things they did not even know they wanted.
25. This initiative is still on going. We are no longer part of it. But those who are may want to remember that if they stop tickling the imagination of the policy maker, they may quickly find themselves in a situation of decline.
26. See it from the perspective of the policy maker. If a group of scientists cannot show me how, and why, their work matters to the advancement of the greater good, then why would I care?
27. No bucks, my friends, no Buck Rogers.
28. So let me conclude this presentation with a few simple rules.

Simplicity

29. The first is simplicity. We all know that life is complex. In fact, human co-existence can only be explained by chaos theory. A simple word in passing can have severe consequences. Most of the time, we cannot foresee the consequences of our actions.
30. At the same time, no one is interested in chaos. We seek order in life. We want a system.
31. My favourite example is the clean lines and 45-degree angles of the London underground map. It is a clean approximation of reality. It is not the truth. The tube does not run in straight lines. It gives us Londoners a sense of order and tranquillity in our exceptionally hectic lives. It is simple, which means that we trust it. We desire it. We forget that above us is one of the busiest cities in the world.
32. In other words, always present your ideas in a simple way.

Context

33. The second is context. Your effort cannot exist in a vacuum. Why is astrophysics so popular today? Why is Brian Cox's series on the universe so popular? It's simply because our brains can imagine the vastness of space. We can put these massive events, the birth of stars, of galaxies, in context. And it amazes us. It makes us want to know more.
34. In other words, always put your ideas in the right context.

Visualisation

35. The third is visualisation. Give the decision makers a vision of what your science can bring them. Make them understand, indeed visualise, what the future may bring. Visualization is the mind's most powerful feature. Some argue that imagery is where all knowledge starts.
36. Recall the words of Albert Einstein: "I am enough of an artist to draw freely upon my imagination. Imagination is more important than knowledge. Knowledge is limited. Imagination circles the world." What a beautiful phrase. I think it is difficult to put it better than that.

Solutions

37. The fourth is to remain solution driven. If I want to buy something, I am not interested in how difficult it is to build the thing. I often not interested in the complexity of the technology. I am interested in the end product. I want to see solutions. I want to see how science and technology can better my life, or deepen my understanding.
38. Do not ever loose sight of the solutions. Don't get lost in the challenging questions. Problems are only there to be overcome. Most things can be done. We can find solutions to most problems.

Persistence

39. And finally, teach the scientists never give up. In 1847, Thomas Edison said "I have not failed 700 times. I have not failed once. I have succeeded in proving that those 700 ways will not work. When I have eliminated the ways that will not work, I will find the way that will work".
40. So be simple. Put your ideas into context. Visualize. Seek solutions. And be persistent. Those are the simple traits that appeal to policy makers. Indeed, these are the traits that appeal to all of us.
41. The good thing is that all of these traits are inherent in the good scientists. And this is why, I think, that teaching policy to scientists is such an easy thing.
42. Thank you for your attention.