

# VERIFICATION RESEARCH, TRAINING AND INFORMATION CENTRE

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## VERIFICATION IN A DISARMED WORLD

Andreas Persbo, Vienna, December 2013

Thank you for coming this afternoon. It is encouraging that some many remains interested in a topic and a goal which, to paraphrase US President Barack Obama, will not be reached quickly—perhaps not even in our lifetime. Given the prevalence that nuclear weapons still have in the military planning of nations that possess them—together representing about half the worlds population and more than half of the world's gross domestic product—it is indeed easy to say that the abolition of this class of weapons will not happen tomorrow, next year, or the next decade.

But this does not mean that we should not plan for the contingency that it abolition may occur, and that it may occur soon. The prudent strategy is to prepare for the future. It reminds me of my days studying to become a lawyer. The exam might have been a term away, but those who excelled on exam day started their work in the first week. Those who barely passed went to the pub for the first few months, had a few beers, and then spent hours on end trying to catch up during the last few weeks. Sure, it is possible to pass an exam with minimum preparation. Perhaps the Agency's verification effort in South Africa was one such situation. The question now, however, is whether one can afford to fail the much larger verification challenge posed by comprehensive nuclear disarmament, and whether we as a community can afford any other score on exam day than the very highest.

The commonly accepted thinking is that verification requirements will be more stringent as the world moves to zero. The exam, if you will, will be more difficult to pass. Those who have heard me speak about this previously know that I'm skeptical of the argument. It's a proposition based on conjecture. Highlighting challenges based on conjecture may mean we're setting ourselves up to fail, or that we find ourselves focusing on the wrong things. After all, there is little point in making the exam more difficult than it need to be.

So where to start? Well, to begin, let's avoid discussing metaphysics. With this, I mean questions such as did nuclear deterrence preserve the peace in Europe during the dark days of the Cold War? Will nuclear disarmament make the world safer or more dangerous place? Get me right: I'm not saying that these questions are not important. They are. But to me, they're a little like trying to prove the existence of God. You're not going to get anywhere. You either believe, or you don't.

For a verification systems designer, these questions are unnecessary, and fundamentally unpractical. Verification system designers need to start to look at the problem from a perspective of what they know, and not what they think they know.

So what do we know? Thomas Schelling last year asked us where the arms build-up experts are in the debate? It's an important observation. We know what it takes to build a nuclear bomb. We know what raw materials are required, what industrial processes needs to be set up and how long it takes. The fundamental



physics of bomb making is now well known. And since we know what it takes to set the system up, we know what it takes to take it down. We know what facilities we're supposed to be examining, we know what they generally look like, and we know what they are supposed to do. We know what materials we're going to account for, what they look like and what their properties are likely to be. We know they are physical items, and we know that physical items can be accounted for.

Let me go through what I think the challenges facing us are, and then a little bit about how we are intending to tackle them. These are assumptions, right or wrong, that are guiding my own thinking.

First, disarmament does not mean arms reductions. When I am thinking about nuclear disarmament, I think about a state where no country possesses nuclear explosive devices; a situation that very much resembles that under the Chemical Weapons Convention today. States are required to abolish an entire class of weapons, and then prevent the re-emergence of them. But I'm not thinking green fields. I am assuming that the right to harness the might of the atom, and the many benefits of the conquered nuclei, for peaceful purposes remains untouched.

Second, Getting to zero highlights three principal problems: How would one know how many warheads a nuclear weapon state has, how would one know how many warheads a state has disarmed, and how would one know that all weapons that should have been destroyed have, in fact, been destroyed?

Third, Preventing the re-emergence of nuclear weapons highlights two principal problems: As one cannot manufacture a nuclear weapon without access to special fissionable material, how would one know how much special fissionable material a state has at its disposal, how would one know that all material that should be accounted for, has in fact been accounted for?

Does this sound familiar to you? It should.

When you fundamentally consider nuclear disarmament in all its aspects, you eventually come to the realization that you're essentially studying a safeguards problem, albeit on a very large scale. This appears to be recognized to some degree by the members of the nuclear non-proliferation treaty. After all, why would they otherwise state in for instance action 30 of the 2010 Final Document that the ultimate objective is to apply nuclear safeguards, as applied in the non-nuclear community, to today's nuclear weapon states?

Some of you will now think that I have lost the plot. Safeguards are not disarmament. Disarmament is not safeguards. You are thinking that these are fundamentally different things. I would urge you to examine your own beliefs on that. Is not the objective of nuclear disarmament, if working under my assumptions at least, to equalize the military nuclear capabilities of the nuclear weapon and the non-nuclear weapon states? And, by the way, is not my assumption shared by all NPT member states?

Lets work with the idea for a while; the idea that special fissionable material flowing out from former weapons complexes should ultimately subject itself to safeguards. Safeguards professionals around this table are now likely to silently shake their heads, to think that the present safeguards system is nowhere near at a state where it can be applied on the nuclear weapon states. I think they may be right. How do you reach a broader conclusion states such as Russia or the United States? How do you reach it on China, India and Pakistan? Can you reach it? I don't have the answers to those questions, but I can tell you this. It will appear on exam day, so we better study them.

Safeguards are the fundament, the solid foundation, of the disarmament construct. Without safeguards, comprehensive nuclear disarmament loses a lot of its relevance. And, by the way, having this perspective also means that the non-nuclear community, by adhering to safeguards, clearly fulfils a major part of their NPT Article VI obligations. Adhering to safeguards, and supporting the strengthening of safeguards, ultimately means strengthening the vision of a nuclear weapon free world. It's in my mind not a matter of obligation or burden, as it's so often portrayed, but one of leadership. The application of safeguards in a nuclear weapon free world will be one exam question. Prepare for it.

Ah, you will now say: how can one prepare for an exam question if you're forbidden from reading the course literature? After all, are not most of these matters proliferative to discuss? At VERTIC, we are now working together with a group of governmental institutes and non-governmental researchers on three continents to come up with a way to solve that question. I wanted to talk to you a bit more about what our plans are, but perhaps not in this session.

Suffice to say, however, that this is just the first of a series of meetings that Elena, Nikolai and I are planning from now up until the next IAEA General Conference in 2014. I suspect there will be more opportunities to develop ideas in this room.

Thanks for your attention.