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VERIFICATION IN A NUCLEAR WEAPON FREE WORLD

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Stable Nuclear Zero: Feasible, Realistic?

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Many thanks for the invitation to speak today. While my heart belongs to the great city of London, it is always wonderful to be back in Vienna and see so many friends and colleagues. I feel humbled, also, to be on the same panel as Professor Thomas Schilling and Ambassador Rolf Ekeus. Yesterday, I told a good friend that this is possibly one of the highlights of my career so far. So thank you Elena for this opportunity.

The topic for my presentation is “verification in a nuclear weapon free world.” This is a subject that will require a fair deal of speculation. I think that a nuclear weapon free world is many years away, if it indeed ever becomes reality. The road ahead is cast in shadows.

Thinking about a nuclear weapon free world is a bit like thinking about Plato’s cave allegory. In this allegory, a group of prisoners are stuck in a cave facing a wall. Behind them is a fire and a walkway. People walk in front of the fire, casting shadows on the wall. For the prisoners, the shadows are reality. They do not know, nor can they know, that these shadows are nothing but an approximation of the true form of reality. We, as a community, are trapped in this cave, and we’re watching the shadows dance in front of us.

For we do not really know what conditions will enable a world free of nuclear weapons. Will it, as some argue, require a fundamental transformation of world affairs? Do we, as others say, need to live in a world with considerably reduced international tension, and a massive reduction in conventional arms, before we can consider giving up nuclear explosives?

We do not have any good answers to these questions. As we do not, almost every answers assumes almost equal weight. The arguments becomes articles of faith, not carried by empirical evidence. You either believe in deterrence, that nuclear weapons preserved world peace, or you do not. Neither advocate can disprove the other.

Irreversibility

First, let us ask ourselves what we mean when we use the term “a world free of nuclear weapons.” For some, the phrase simply means a place where there are no nuclear explosives in existence. For others, it means a world without weapons, but also where the capacity of states to re-establish their arsenals is curbed. We examined these questions in some detail in our irreversibility report published a year ago.



In our report, we found that nuclear disarmament is not a binary state. We argued that a country can be disarming while not being fully disarmed. Despite this, the *process* to achieve the final abolition of an entire class of weaponry may still be called disarmament.

The report makes one overriding point: replacement weapons can always be produced. Even a fully disarmed state can rearm, if there is political will and resources to do so. A country that controls the raw materials, the necessary industrial infrastructure, and technical and scientific knowledge will always be able to hedge against the loss of nuclear weapons.

Therefore, we found it more suitable to talk about *unarmed* states rather than *disarmed* states. From this perspective, any state with capacity to enrich or reprocess nuclear material are practically speaking on the threshold of weapons acquisition.

Irreversibility becomes an economic argument. The key question is how difficult, but above all how costly, it will be for a country to reverse a state of disarmament. The more facilities a state decides to get rid of, and the more fuel cycle options it foregoes, the more irreversible disarmament will be. If a country has no nuclear facilities, and no stocks of fissile materials, it cannot produce weapons without re-establishing a major industrial infrastructure.

Clearly the question of irreversible nuclear disarmament is closely associated with the question of the future of nuclear energy. You cannot have the cake and eat it too. If we assume that states do not want to totally forgo the nuclear energy option, we quickly find ourselves focusing on questions of acceptable risk.

What kind of nuclear processes constitutes an acceptable risk? Is it an acceptable risk to allow for enrichment by any government? Is it an acceptable risk to allow for reprocessing? If it is so, how should these most sensitive processes be regulated?

You will find that the questions are very similar to those now facing the Agency's safeguards system, and the question of the multilateralisation of the nuclear fuel cycle. The debate here is not new, yet these things need to be seriously addressed if we are to establish a world without nuclear weapons.

Requirements

Let's turn to verification.

There may be two principal tasks for a verification regime. During the transition period, the regime needs to be able to verify that nuclear explosives are being destroyed. After the world has been declared nuclear-weapon free, it needs to ensure that explosives do not re-emerge. These two top-level tasks are sounds easy enough, but they involve many complications.

Both tasks require a fundamental investment of thinking about details and particulars. We, as a community, has not invested nearly enough energy and thought into the problems. This leaves us in a state of unpreparedness and, perhaps, resignation.

Where do we start?

Do we start our examination by looking at the warheads, how they can be verifiably dismantled? Do we rather focus our attention on weapons components: such as the fissile material that they contain? In my mind, only the short sighted focuses on one discreet problem. What we need to do is look at the problem in its entirety. We also need to cut away those areas of verification that are too difficult, too expensive, or too controversial. After all, if we can't do it, don't want to do it, or cannot afford to do it, why should we waste our time thinking about it? I don't want to look back at my career, at least, finding that I've been chasing shadows on a wall.

In the 1990s, the so-called Trilateral Initiative did some conceptual thinking on how to verify the disposition of weapons-grade fissile material. They divided the verification tasks into four stages: the most sensitive stage involved verifying the removal of warhead fissile material components whereas the least sensitive stage involved unclassified nuclear material.

The Trilateral Initiative chose to focus on the disposition of weapons usable material. At the end of the day, nuclear explosives cannot function without nuclear material. In my mind, it is less important to establish that a certain number of weapons have been destroyed. It is perhaps, to quote from a 1967 memo that Allan Lebowitz once wrote to Glenn Seaborg, "immaterial whether real weapons are in fact destroyed provided that the agreed amounts of fissionable materials are transferred to peaceful uses." Or, in other words, it is more important to ensure that all nuclear material in a country has been declared, that there is no undeclared material remaining, and that the stuff is being put under safeguards.

That should sound familiar to you, and I'll say a few more words about that later.

Would verification need to be exceptionally intrusive?

But first, let's examine one of the holy grails of disarmament arguments.

It is sometimes said that verification will need to be exceptionally intrusive in a world free of nuclear weapons. In 1961, Jerome Weisner argued that as zero approached the quantity of undisclosed weapons and militarily significant amounts of fissile material would get progressively smaller. Therefore verification demands would be progressively larger. This is a point repeated so often that people now take it at face value. Yet, the underlying assumptions are rarely examined, and rarely challenged.

I don't find this argument entirely convincing. We do have some empirical data available to test this hypothesis. Stockpile numbers have fallen quite significantly since the end of the Cold War, as this graph shows. If the argument would hold, verification requirements on arms reductions would have increased as stockpiles decrease. Yet, some of the largest reductions were made any verification at all. The data, to date,

indicates that verification requirements vary irrespective of actual force levels. The START treaty had an elaborate verification system, the Moscow treaty had no system at all, and the New-START treaty a streamlined verification regime.

Granted, you could argue that the Moscow treaty was simply “unilateral disarmament in a bilateral shape” as someone put it yesterday, and that START-II the result of “a learning experience.” You could also argue that it all depends on how you define the word ‘intrusive’ and that that: “the dynamic is not linear.”

Still, for me at least verification requirements appears to be in flux. They are certainly not becoming progressively stricter. And whatever side of the argument you come down on, I think it is fair to say that Mr. Weisner’s argument remains unproven, and that it may be on the path to invalidation.

Now we do not know whether the argument would apply in a situation where we transition from few weapons, no more than a hundred, down to zero. Some say that the marginal utility of attempting to cheat in a situation of near-zero would increase as stockpiles drop. This would make states hesitant to commit to the dismantlement of their weapons unless they have near assurance that the others have done the same.

But if we assume that the argument is true, would it not make most sense to attempt to cheat while stockpiles are moderately high, but the verification regime relatively lax. If you want to retain your edge by keeping a nuclear weapon, does it matter when in time you hide it away?

Therefore, I believe that verification requirements are likely to be consistent throughout the disarmament period. They can be consistently intrusive or, for that matter, consistently relaxed. I do not think we have enough data to draw one conclusion or the other.

The role of safeguards in the future

But I believe that one thing is near certain. Safeguards, as administered by the International Atomic Energy Agency, will become increasingly important in a nuclear weapon free world. Fissile material will need to be accounted for, and the absence of undeclared stockpiles of these materials would need to be confirmed. We have decades of data on safeguards implementation in the disarmed and unarmed world. This data points to a need from member states to successively ask for higher and higher degrees of assurance.

So safeguards have been significantly strengthened in the last decades and are constantly refined. While verification requirements on disarmament may fluctuate, safeguards stringency is on an upwards trend.

As I hinted above, I think that verification in a nuclear weapon-free world will look very similar to safeguards in non-nuclear weapon states, but on a much larger scale. The fuel cycles of the two largest nuclear weapon states, the United States and Russia, are fundamentally different, and much larger, than cycles found elsewhere. It will be challenging to take them on, and to bring them under full-scope safeguards. There are some large uncertainties in the stockpile numbers, and it may take decades, many decades, before anything resembling a completeness determination can be drawn.

But I think that these challenges can overcome. Putting some political capital into the negotiation of an FMCT will be a good start. Empowering the IAEA secretariat to be able to address some of the technical tasks that await them is a step that can be taken today. The IAEA already has a reasonably completed technical protocol for material disposition, but need to start to prepare for future verification challenges as well. And let me be clear. I believe that this task belongs with the Agency. Perhaps not the Agency as we know it today, but a stronger, more powerful version of the body.

It is here, in Vienna, that we must start the path to strengthen our abilities to take care of future tasks. And it is here, in Vienna, that non-nuclear and non-nuclear weapon states alike can, and indeed should, come together to start the process.

Socrates asks us to consider a person freed from the cave. He asks, “Wouldn't he remember his first home, what passed for wisdom there, and his fellow prisoners, and consider himself happy and them pitiable? And wouldn't he disdain whatever honors, praises, and prizes were awarded there to the ones who guessed best which shadows followed which?”

It is time, I believe, to break free of the shadows.

I thank you for your attention.