

Future verification challenges

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Firstly, I'd like to thank King's College London for inviting me to contribute to this dialogue. I'm very pleased to take part and to represent my organisation, VERTIC, here this week.

I've been asked to speak to you on the topic of 'future verification challenges', which I think can be divided into two categories:

- Firstly, future challenges associated with *nuclear safeguards and non-proliferation*;
- And secondly, challenges associated with the future verification of *nuclear disarmament*.

Within both of these categories I think it's also possible to divide challenges into those of a *political* nature and those that are *technical*.

1. Safeguards and non-proliferation

So let me first address safeguards and non-proliferation.

Given the audience here today I don't feel it's necessary to go into the kind of reforms to the global safeguards system that the IAEA has implemented over the past 20 years.

For now it's necessary only to point out that the IAEA's Additional Protocol—the centrepiece of strengthening measures introduced in the 1990s—is now in force in 122 countries around the world.

1.1 Political: opposition to the Additional Protocol

But the IAEA has struggled to achieve universal acceptance of the protocol, and resistance to it represents—to my mind—the principal political challenge in the realm of safeguards and non-proliferation.

Some countries dislike the idea of being compelled to take on an additional verification burden while progress on nuclear disarmament in nuclear-weapon-owning countries remains so slow; others simply dislike the implication that more verification is required of them to prove they are not seeking to divert material into a weapons programme.

Opposition to the Additional Protocol is particularly troublesome when we consider that a number of the states opposed to it are countries with significant civil nuclear activities—and some are those of particular safeguards concern.

1.2 Technical: resource constraints and new technologies

Aside from this key political challenge, there are a variety of technical challenges facing safeguards and non-proliferation.

Above all perhaps, as new countries seek to develop nuclear energy so the resource requirements on organisations such as the IAEA, that implement safeguards, will grow. Simply because more facilities in more places will require more safeguards inspections on the ground.

What's more, as nuclear facilities undergo evolutions and even revolutions in design, new safeguards approaches will need to be developed and applied.

2. Nuclear disarmament

There is, of course, much more that can be said about all of these issues but I want to move on to talk about disarmament, and the verification of future disarmament activities in particular.

Nuclear disarmament verification is the issue that I've spent much of my time at VERTIC working on and it's this issue that I want to focus on here today.

VERTIC, for those who aren't aware of it, is a UK-based non-governmental organisation that works to promote the effective verification of treaties. We do this through research, participation in events such as this, and in some cases by working directly with states.

2.1 Overview of recent initiatives (i): UK-Norway

Before getting into specific challenges, though, I think it's worth giving a brief overview of recent work programmes, at least those in Europe and the United States.

One of the best known is perhaps the UK-Norway Initiative, which has been running since 2007.

For those who aren't familiar with it, the UK-Norway Initiative is a technical initiative that addresses the involvement of non-nuclear-weapon states in nuclear disarmament verification.

Specifically, the UK-Norway work deals with verification of the dismantlement of nuclear warheads.

To date, the initiative has held a number of exercises, including a mock dismantlement exercise in Norway in 2009 and a exercise looking at access and security constraints held in the UK in late 2010.

The initiative partners have also jointly designed and built prototype 'information barriers' to work on both surrogate radionuclides as well as, more recently, samples of plutonium.

2.2 Overview of recent initiatives (ii): US-UK

Less well-known, and only announced recently, is a 13-year-old programme of cooperation between the US and the UK, which continues to this day.

This has involved personnel from the UK Atomic Weapons Establishment, the UK Ministry of Defence, the US Department of Energy as well as personnel from US national labs.

This collaboration, again a technical one, has looked at a whole range of equipment-and procedure-related issues associated with the verified dismantlement of nuclear warheads. This programme has sought to better understand the nuclear weapon dismantlement process, as well as to identify and develop technologies and procedures for protecting sensitive information and increasing confidence in the dismantlement process.

Beyond a presentation at the United Nations First Committee in October last year, however, few real details of the US-UK work have so far been revealed.

2.3 Overview of recent initiatives (iii): NTI pilot project

A verification ‘pilot project’ has also been running by the Nuclear Threat Initiative in the US—but involving experts from around the world—since 2012.

Topics covered have included the role of non-nuclear-weapon states in verification, and also how to verify warhead and nuclear material ‘baselines’ for disarmament.

This project is set to report on its findings later this year.

2.4 Overview of recent initiatives (iv): the VERTIC multilateral project

In addition to that, for the last several years, VERTIC—my own organisation—has been engaged in research to investigate the potential role of intergovernmental organisations in disarmament verification.

This is centred on a project whose membership includes officials and experts from five member states of the IAEA, as well as experts from intergovernmental organisations and NGOs.

The project is focused on the role that the IAEA might be able to play in future disarmament scenarios where verification is called for.

To date, the IAEA’s involvement in disarmament verification, while significant, has been far more limited than its work on safeguards implementation.

A role for the agency in disarmament verification is included in the IAEA statute, however, and the agency has carried out disarmament verification—and research into disarmament verification—on a number of occasions in the past.

VERTIC’s project but differs from what the UK and Norway and the UK and US have done in a number of respects, but mainly because it doesn’t just focus on warhead dismantlement and addresses policy issues in addition to technical work.

The political side of this project is in contact with and developing ways to engage with member states of the IAEA and with the IAEA secretariat itself.

Technical work is currently based around the idea of ‘modelling’ notional nuclear fuel cycles onto which multilateral verification ‘solutions’ can be applied and tested.

2.5 Political challenges

It’s fair to say that all the work being done—whether it be between the UK and Norway, or between the US and the UK, or at VERTIC—is very forward-looking.

And that’s chiefly because verified nuclear disarmament hinges greatly on the political will for disarmament itself—and on political decisions as to what should and shouldn’t be verified, and who should be involved.

Politically-speaking, countries reducing their nuclear arsenals as part of a bilateral or a multilateral process will need to address the challenge of reaching agreement with their treaty partners on what elements of an agreed disarmament process should be verified—and, crucially, *how* this should be done.

Bound up in this is the political question of transparency: how much do states want to reveal? And what kind of information are they willing to give away?

Two kinds of transparency come to mind:

The first is transparency measures that relate to the *purpose* of whatever arms control agreement is under consideration.

In an arms control treaty, parties are generally required to provide an initial declaration on what they are going to do, in order that parties have a baseline and index against which to carry out verification activities.

For any given treaty, there will be certain pieces of information that will be required for the initial declaration. For example, a treaty requiring the verified dismantlement of 100 warheads would require state parties to be open with one another regarding certain details—to be agreed between them—about those warheads. The more information agreed upon, and provided, the greater the level of confidence in verification is likely.

But transparency measures can also be those measures that aren’t essential to the fulfilment of any particular treaty obligation, or necessarily tied to any particular treaty at all, but which serve as *confidence-building measures* and expressions of goodwill, and good intent.

Information provided as part of treaty declarations, is essential to the proper implementation of arms control and disarmament accords.

Meanwhile, confidence-building measures and general openness can help build an atmosphere of greater trust, in which cooperation and improved relations may become more likely.

Beyond transparency, a further political challenge will be the need to reach agreement on *who* should carry out verification.

Questions here will concern whether treaty partners alone should verify, or whether third-parties—who may *want* to be involved—should be allowed to take part; and, if so, what kind of role might they be able to play?

2.6 Technical challenges

In many ways, however, these kind of fundamentally political questions will be informed by what can be accomplished technically and by what kind of technologies are available.

Without the time to go into more specific details, it's possible to sum up the basic technical challenge of disarmament verification with, in my opinion, the following formula:

Nuclear disarmament verification is underpinned by, on the one hand, the requirement to balance states' need to protect classified and proliferative information with, on the other, verifying parties' natural inclination to obtain sufficient information about the process to be confident in its full and proper implementation.

It is, essentially, about finding the right balance between confidentiality and openness.

That balance will be different in different situations and according to which parties are involved.

Technical research into how to effectively verify aspects of disarmament such as warhead dismantlement—how to balance the need for sensitivity against the need for openness—as well as how to involve non-nuclear-weapon states in verification processes, is likely to continue for the foreseeable future.

Whether the products of this work is ever put to use, however—whether that is seen as desirable—is largely down to political decisions and the will of states to press ahead with turning disarmament commitments into concrete action.