

VERIFIABLE MULTILATERAL NUCLEAR DISARMAMENT

WHY IS RESEARCH INTO VERIFICATION OF MULTILATERAL NUCLEAR DISARMAMENT IMPORTANT?

Article VI of the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT) sets out that the ultimate objective of all states parties is to achieve a world free of nuclear weapons ‘under strict and effective international control’. Much consideration has been given to the role of verification in fulfilling and maintaining that goal, particularly in relation to the interplay between the non-nuclear weapon states and the nuclear weapon states. In this context, verifiable dismantlement of nuclear warheads is of particular importance as it can help to build international confidence in arsenal reductions.

However, such verification is fraught with difficulties—not least how to conduct it without undermining national security or revealing proliferation-sensitive information. Furthermore, neither a nuclear weapon state nor a non-nuclear weapon state can develop internationally accepted verification protocols or techniques in isolation. Consequently, the United Kingdom and Norway, with the assistance of the Verification Research, Training and Information Centre (VERTIC), have established a collaborative research project to examine some of the technical issues surrounding the verification of nuclear disarmament.

Technical verification of warhead dismantlement can occur only up to a certain point—it will never be 100 per cent perfect. While recognizing that disarmament is a political as well as a technical issue, the research project focuses on the technical solutions associated with disarmament verification and does not seek to address the equally important and challenging political and diplomatic questions.



INSTITUTES PARTICIPATING IN THE UK-NORWAY INITIATIVE

- AWE plc, Aldermaston, UK
- Institute for Energy Technology, Kjeller, Norway
- NORSAR, Kjeller, Norway
- Ministry of Defence, London, UK
- Norwegian Defence Research Establishment (FFI), Kjeller, Norway
- Norwegian Radiation Protection Authority, Østerås, Norway
- VERTIC, London, UK

WHAT IS THE UK-NORWAY INITIATIVE?

Representatives of VERTIC, several Norwegian laboratories (see the box), the UK Ministry of Defence and the AWE plc met in London in early 2007 to discuss groundbreaking co-operation on matters connected with the technical verification of nuclear arms reductions.

WHAT IS THE INITIATIVE INVESTIGATING?

Whilst driven by the definitive aim of seeking technical solutions to the verification of the dismantlement of a nuclear warhead, the underlying methodology is based on simplicity and widely used, multi-purpose technology. Overly complex verification might undermine mutual trust. The key intention is to point to verification solutions rather than to verification problems. Presently, the research of the UK-Norway Initiative focuses on two aspects, information barrier technology and on-site inspection methodology.

Information barrier technology

In a future verification regime, it is unlikely that inspectors will enjoy unrestricted access to nuclear warheads. Such access would breach mutual nonproliferation obligations under Articles I and II of the NPT, as well as reveal national security-sensitive information. The question remains as to how an inspector can certify that the item being presented (which is probably going to be in a sealed container) is consistent with declared attributes?

An *information barrier* may be one solution, since it is designed to confirm mutually agreed attributes to the inspectors while preventing the disclosure of sensitive information.

The intention is to develop a robust, simple and cheap information barrier system that is capable of identifying a radiological source (representing

Flags of Luvenia and Torland. IFE Old Cantina, 9 December 2008 - Photo credit: Christian Tandberg, FFI

the warhead) to a specified level of confidence, based on agreed attributes. The AWE plc on the UK side and the Institute for Energy Technology and the Norwegian Defence Research Establishment on the Norwegian side have developed initial designs for a limited prototype device for use on a radiological source. Utilising these designs, the UK and Norwegian groups will each build one instrument. These prototypes will be tested in an exercise in 2009.

On-site inspection methodology

In a future verification regime, inspectors are likely to require access to highly sensitive facilities, such as warhead disassembly sites. Such access will have to be managed carefully to prevent the revelation of sensitive information.

With VERTIC acting as an independent observer, the UK and Norway are to investigate procedures that may enable inspectors to gain access to a nuclear weapons complex under so-called *managed access* conditions. A scenario based on a mock generic disassembly facility is to be set up in Norway with a radioactive source representing a hypothetical nuclear warhead, with fictitious classified attributes, undergoing dismantlement. Torland (Norway) will play the part of the nuclear weapon state under inspection, whilst a group of Luvenian (UK) officials will assume the role of non-nuclear weapon state inspectors. VERTIC will report subsequently on how a nuclear weapon state and a non-nuclear weapon state may interact to overcome the many challenges to such co-operation.

A 'familiarisation visit' by the inspection team to the mock disassembly facility in Norway took place in December 2008. The exercise will continue with a more in-depth 'monitoring visit' to inspect the dismantlement of the packaged radioactive source in June 2009. This exercise will provide valuable insights for possible future inspections at real nuclear weapons facilities.

WHAT REMAINS TO BE DONE?

All NPT states parties share the responsibility for working for a nuclear weapons-free world. We must all collaborate in addressing the complex issues related to this objective such that we collectively create an international climate supportive of further reductions in nuclear weapons and eventually a nuclear weapons-free world. The technical (and political) issues may take many years to resolve but this should not stop us from taking steps to tackle them now.

The research of the UK–Norway Initiative is in its early stages and it deliberately seeks to be as transparent as possible to the international community, including reporting on progress to the NPT Review Conference and in other international fora.

The Norwegian combined storage and repository for low and intermediate level radioactive waste at Himdalen, Norway, which is operated by IFE. 11 December 2008 - Photo credit: Christian Tandberg, FFI.

