



In preparation for the Wilton Park dialogue

## Irreversibility in Nuclear Disarmament

Wednesday 16 – Friday 18 March 2022 | WP2019

### Introduction

The principle of irreversibility is widely considered to be essential when implementing nuclear disarmament measures. At present, however, there is no common definition or unified understanding of the principle of irreversibility. States parties interpret and use the principle in different ways and there is no clear framework which explains how this principle is or could be applied in practice.

The Norwegian Ministry of Foreign Affairs and the UK Foreign, Commonwealth & Development Office are seeking to advance a long-term effort to develop the principle of irreversibility in nuclear disarmament (IND).<sup>1</sup> The aim is to start an international dialogue to better understand and identify requirements for IND and to develop more detailed thinking about how states can apply the principle in relation to the implementation of their Non-Proliferation Treaty (NPT) obligations. The purpose of this work is to enable disarmament – to explore a central principle that will need to be unpacked on a process towards disarmament and in a nuclear weapons-free world. And to ensure, when the political and security context presents itself, that much of the analytical thinking has been done for the international community to capitalise on that opening.

### The emergence of IND

The relationship between irreversibility and disarmament/arms control gained currency within the 1990s. At the first Summit Meeting between U.S. President Clinton and Russian President Yeltsin in January 1994, both sides committed to the goals of “transparency and irreversibility of the nuclear arms reduction process.”<sup>2</sup> A Joint Working Group, Safeguards, Transparency and Irreversibility (STI), was subsequently established, with a mandate to “build confidence and promote stability in the two countries’ mutual security relationship.”<sup>3</sup> According to a non-paper outlining the objectives of the STI initiative, “The measures should build each side’s confidence that the nuclear arms reductions that are being carried out are irreversible, and in particular that fissile materials declared excess to military needs (including civilian weapons-usable materials) are not being used to build new nuclear weapons.”<sup>4</sup>

While the principle of irreversibility does not appear in the Treaty text of the Nuclear Non-Proliferation Treaty (NPT), it was evoked in the 2000 NPT Review Conference Final Document. In the 13 practical steps towards nuclear disarmament, step five acknowledged: “The principle of irreversibility to apply to nuclear disarmament, nuclear

<sup>1</sup> Irreversibility in the context of the Treaty on the Non-Proliferation of Nuclear Weapons: recommendations for the tenth Review Conference of the Parties to the Treaty Working paper submitted by Norway and the United Kingdom of Great Britain and Northern Ireland (NPT/CONF.2020/WP.16): <https://undocs.org/NPT/CONF.2020/WP.16>

<sup>2</sup> White House, “Joint Statement by the President of the Russian Federation and the President of the United States of America on Non-Proliferation of Weapons of Mass Destruction and the Means of Their Delivery,” January 14, 1994, p. 2.

<sup>3</sup> U.S. Department of Energy, Transparency and Verification Options: An Initial Analysis of Approaches for Monitoring Warhead Dismantlement, Office of Arms Control and Nonproliferation (May 19, 1997), p. 21.

<sup>4</sup> Cited in *ibid.*, p. 22.

and other related arms control and reduction measures.”<sup>5</sup> It was later reaffirmed in the 64-point action plan adopted at the 2010 Review Conference: “All States parties commit to apply the principles of irreversibility, verifiability and transparency in relation to their implementation of their treaty commitments” (Action 2); and, “In the context of action 16, all States are encouraged to support the development of appropriate legally binding verification arrangements, within the context of the International Atomic Energy Agency (IAEA) to ensure the irreversible removal of fissile material designated by each nuclear-weapon State as no longer required for military purposes” (Action 17).<sup>6</sup> The principle has since been recognised by all nuclear weapons states,<sup>7</sup> and many non-nuclear weapons states, either in joint-statements or national reports, and is explicitly linked to implementation of article VI.<sup>8</sup>

### Defining IND

Despite its regular use in NPT and disarmament discourse, there have been few attempts to define the parameters of irreversibility in nuclear disarmament. The Oxford University Dictionary defines irreversibility as the “character or quality of being irreversible,” which refers to something which “cannot be undone, repealed or annulled”, nor “turned backwards, upside down, or in the opposite direction.”<sup>9</sup> These definitions imply that the condition, action, or measure in question is irrevocable; that it cannot be reverted to its former state.

Some scholars have pointed out that this definition might be ill-suited to the nuclear disarmament context, where all disarmament measures might, in principle, be reversible. It is difficult to conceive of a situation in which it is impossible for a state to reconstitute their weapons programme. The knowledge and expertise required to re-build a nuclear weapons capability will prevail for many generations to come.<sup>10</sup> Growing interest in and reliance on peaceful applications of nuclear technology mean that the underlying nuclear infrastructure required to reconstitute a programme will continue to exist, further complicating efforts to define, ensure, and enforce irreversibility. It follows that threat perceptions and political priorities can change, sometimes rapidly and unexpectedly, and a state might calculate that a previous disarmament commitment or action is no longer in its interest and needs to be revoked.

Acknowledging these challenges, a 2011 VERTIC study proposed that a more useful definition is: “the costs and difficulty of reversal.”<sup>11</sup> From this perspective, irreversibility is

<sup>5</sup> 2000 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Final Document, volume 1, [NPT/CONF.2000/28 Parts I and II](#)

<sup>6</sup> 2010 Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Final Document, volume 1, [NPT/CONF.2010/50 Vol. I](#), part I. See also the joint Norway-U.K. working paper submitted in preparation for the 2020 Review Conference: *Irreversibility in the context of the Treaty on the Non-Proliferation of Nuclear Weapons: recommendations for the tenth Review Conference of the Parties to the Treaty*, [NPT/CONF.2020/WP.16](#), p.2.

<sup>7</sup> At the 2010 NPT Review Conference, a joint statement by the nuclear weapons states affirmed “enduring commitment to the fulfilment of our obligations under article VI of the Non-Proliferation Treaty and our continuing responsibility to take concrete and credible steps towards irreversible disarmament, including provisions for verification.” *Statement by China, France, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland and the United States of America to the 2010 Review Conference* [https://www.un.org/en/conf/npt/2010/statements/pdf/russia5\\_en.pdf](https://www.un.org/en/conf/npt/2010/statements/pdf/russia5_en.pdf)

<sup>8</sup> For example, the Group of Non-Aligned States Parties highlighted: “The 13 practical steps for systematic and progressive efforts to implement article VI of the Treaty should be fully implemented in accordance with the principles of transparency, verifiability and irreversibility.” See: *Elements for a plan of action for the elimination of nuclear weapons*, [NPT/CONF.2020/PC.II/WP.15](#). For further examples, see the Norway-U.K. working paper, pp. 2-7.

<sup>9</sup> “irreversible, adj.”. OED Online. March 2022. Oxford University Press. <https://www.oed.com/view/Entry/99824> (Accessed 11 March 2022). See also David Cliff, Hassan Elbahtimy and Andreas Persbo, “Irreversibility in Nuclear Disarmament: Practical steps against nuclear rearmament (VERTIC, September 2011), p. 11.

<sup>10</sup> Cliff et al, “Irreversibility in Nuclear Disarmament,” p. 11.

<sup>11</sup> *Ibid.*, p. 6.

a spectrum or “scale”, with easily reversible measures at one end, and actions that are difficult and costly to reverse at the other. “The question”, these scholars state, “is not whether disarmament can be reversed, but how costly – and, by the same token, how difficult – would it be to do so?”<sup>12</sup>

The advantage of this approach is that it does not treat irreversibility as a binary, but acknowledges that many different measures and actions can contribute to irreversible disarmament, some more significant and difficult to revert than others. The path towards nuclear disarmament is not necessarily a linear, sequential process, but can entail numerous or standalone measures that, combined, can increase the likelihood that a state will not backslide on its commitments. It also allows for the possibility that some irreversibility steps might be more conducive to certain national contexts than others. In raising the costs and difficulty of reversing a particular action, the aim is to make it as undesirable as possible to do so.

### **Applying the principle of IND**

In developing an improved understanding of irreversibility, it is useful to distinguish between two different approaches to the principle: 1) Irreversible measures towards nuclear disarmament; and 2) Irreversibility in a nuclear-weapons-free world. The first refers to actions, measures, and steps that can be implemented before a country has fully disarmed. Such examples might entail (but are not exclusive of): efforts to control, limit, or reduce weapons-usable fissile materials; the dismantlement of nuclear warheads; or the separation of nuclear warheads from their delivery vehicles. The latter refers to actions, measures, and steps that can be implemented after global disarmament has been achieved. These might include, among others: the destruction of fissile material from dismantled weapons; the transfer of excess fissile material from a military to civilian nuclear fuel cycle; or the destruction of all nuclear delivery vehicles.

It is also important to differentiate between the removal of existing materials and capabilities and a state’s capacity to produce new materials or capabilities. Even in a disarmed world, a state’s underlying nuclear infrastructure could potentially be appropriated to reconstitute a weapons programme. In this respect, those states who possess the requisite materials, infrastructure and knowledge will occupy a different place on the irreversibility ‘spectrum’ than others – essentially possessing a ‘hedge’ that may mitigate concerns about the permanency of certain actions. Applying the concept of IND – either during the process towards nuclear disarmament or in a nuclear weapons-free world – will therefore require detailed analytical thinking about the capabilities, facilities, and knowledge of specific national contexts.

### **Developing the principle of IND**

An effort to develop the principle of irreversibility might include addressing the following questions. This is a non-exhaustive list, and the upcoming Wilton Park conference is intended to solicit feedback from government and non-governmental experts about which priorities and questions should guide the future agenda in this area.

1. What are the current political, legal, and technical approaches towards IND and can they provide useful approaches or tools to advance the principle of irreversibility in practice?
2. What practical steps towards IND are feasible and desirable, both today and in the future?
3. How can previous case studies be leveraged to inform existing and future thinking on IND?
4. What challenges might states confront when implementing irreversibility and how can these challenges be mitigated?
5. What measures and mechanisms can incentivise states to pursue IND and to ensure that they do not renege on their commitments?

<sup>12</sup> Ibid., p. 12.

6. When can irreversibility undermine, or complicate, efforts to pursue nuclear disarmament?
7. What is the relationship between irreversibility, transparency, and verification?
8. How can governmental and non-governmental experts contribute to the future IND agenda and what efforts should be prioritised?

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