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# Nuclear Risk Reduction: An Illustrative Compendium

SARAH RUTH OPATOWSKI



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Cover photo credit: Back view of controllers at work in the command section of the Pave Paws radar compound at the Cape Cod Missile Early Warning Station, Sept. 28, 1980. The US National Archives, CPT John T. Franklin. Design and layout by Trifecta Content Studio.

# About the Author



**Sarah Ruth Opatowski**

Associate Researcher, UNIDIR

**Sarah Ruth Opatowski** is an Associate Researcher with UNIDIR's Weapons of Mass Destruction Programme, Security and Technology Programme, and the Middle East WMD-Free Zone Project. She joined UNIDIR in 2021 and has published numerous articles on nuclear risk reduction, biological and chemical weapons, Middle East issues, and maritime law. Sarah Ruth has presented at multiple international and regional forums. She graduated cum laude from Leiden University with a master's degree in international politics and holds a bachelor's degree in politics with international relations from the University of York.

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# Abbreviations

|                |  |
|----------------|--|
| <b>CEND</b>    | Creating an Environment for Nuclear Disarmament initiative |
| <b>NNWS</b>    | non-nuclear weapon State(s)                                |
| <b>NPT</b>     | Treaty on the Non-Proliferation of Nuclear Weapons         |
| <b>NRR</b>     | nuclear risk reduction                                     |
| <b>NWS</b>     | nuclear-weapon State(s)                                    |
| <b>PrepCom</b> | Preparatory Committee                                      |
| <b>RevCon</b>  | Review Conference  |



Flare Training, Oct. 13, 2012. U.S. Air Force photo by TSgt. David Kujawa.

# Executive Summary

The salience of nuclear risks, after declining following the end of the cold war, began to rise again in the mid-2010s and has accelerated in the 2020s. This is due to several contributing factors, including the intensification of geopolitical tensions, increase in nuclear rhetoric, changes in nuclear stockpiles and postures, as well as the ongoing modernization of nuclear weapons systems. In consequence, States have identified a growing role for risk reduction measures in advancing the shared goal of preventing nuclear war.

However, advancing nuclear risk reduction (NRR) discussions is often complicated by differing views on the scope and purpose of NRR itself. To encourage shared understandings, this publication offers a structured framework for categorizing proposed NRR measures drawing from a decade of official materials. The framework is built around eight categories:

- arms control and disarmament;
- multilateral agreements and commitments;
- crisis prevention and management;
- transparency and confidence-building measures;
- doctrinal and declaratory measures;
- operational measures;
- technological governance; and
- outreach and research measures.

The publication is a compendium of illustrative data tracking the frequency with which proposals (broadly defined) are mentioned in key official texts. Altogether, this data shows that arms control, disarmament and strategic dialogue and reductions in nuclear weapons are some of the most discussed topics in

NRR. Generally, arms control receives more attention from the nuclear-weapon States (NWS), whereas reductions in nuclear deployments and stockpiles are a focus of non-nuclear-weapon States (NNWS). The role and importance of multilateral agreements and commitments – particularly those of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) – have been identified by both NWS and NNWS as important means to reduce nuclear risks.

For some NNWS, measures related to nuclear-weapon-free zones and negative security assurances are the key – and in some cases, the exclusive – forms of NRR measures available. The integration of these conceptual approaches into NRR-related discussions can serve to broaden engagement on NRR generally. Measures on crisis prevention and management, proposed mainly by the P5<sup>1</sup> and some NNWS, primarily concern hotlines and bilateral channels, data exchanges, and nuclear risk reduction centres.

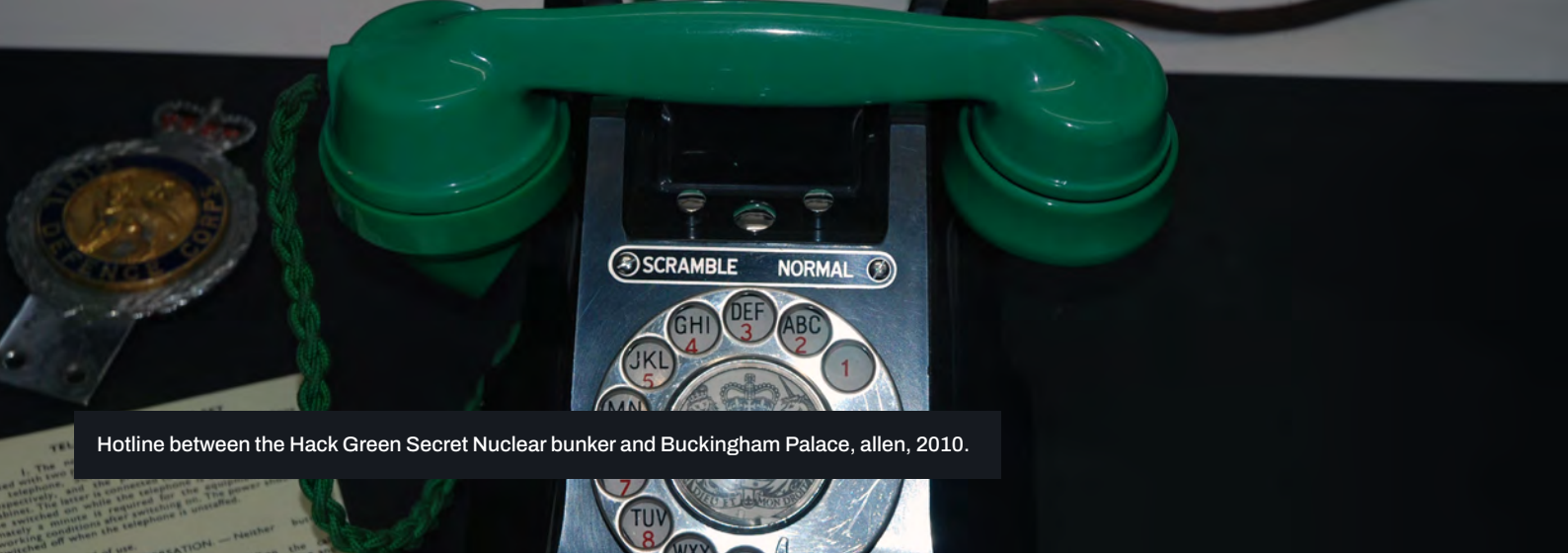
Enhancing transparency is one of the most discussed NRR topics among all States. However, differences remain in terms of the focus of transparency measures. Doctrinal and declaratory measures have been emphasized by both the P5 and NNWS. They have discussed the importance of NRR doctrinal policies and declarations, as well as rhetoric that is best avoided.

In terms of operational measures, de-targeting is the most frequently mentioned measure among the P5 and some nuclear-armed States. Among the NNWS, measures such as de-alerting, decreasing the operational status of nuclear weapons, and ensuring the security of command-and-control systems are more frequently raised.

Outreach and research measures typically receive less attention in NRR discussions than other categories of proposals. Nevertheless, both the NWS and NNWS have put forward a number of NRR-related initiatives focused on research and capacity-building. Several NNWS have also highlighted the value of education and public awareness efforts, as well as the importance of integrating gender perspectives into NRR-related work.

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1 In this publication, the term P5 is used interchangeably with NWS, reflecting how the nuclear-weapon States refer to themselves.

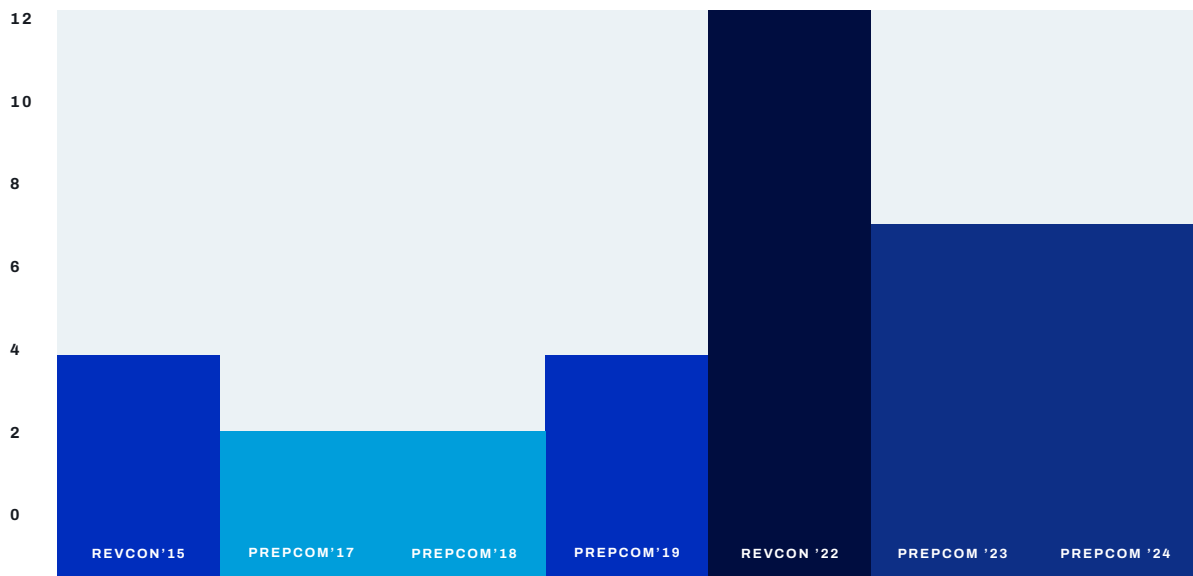


Hotline between the Hack Green Secret Nuclear bunker and Buckingham Palace, allen, 2010.

# Introduction

The risk of nuclear weapons use is at its highest point since the end of the cold war. Ultimately, the only way to eliminate nuclear risks is to eliminate nuclear weapons. However, as long as these weapons continue to exist, the increasingly tense and unpredictable geopolitical environment will generate greater attention to issues of nuclear risk reduction (NRR). This shift is evident in statements delivered across international forums, in working papers submitted throughout the latest review cycle of the Treaty on the NonProliferation of Nuclear Weapons (NPT), and in resolutions adopted by the General Assembly.

*NPT working papers dedicated wholly or in part to NRR<sup>2</sup>*



However, there is no common understanding among States as to what exactly should constitute NRR. While most States agree that it should be discussed, there are differing views on scope and objectives. Some States view NRR more broadly to include a wide range of measures – for example nuclear-weapon-free zones and technological governance – others view it as a narrow set of tools within the arms control framework. Some States see NRR as an important interim solution to prevent nuclear war that can

<sup>2</sup> It is important to note that not only has there been increase in NPT working papers on NRR, but with time the issue has moved to the foreground, with an increasing number of papers dedicated wholly to NRR.

prepare the ground for nuclear disarmament.<sup>3</sup> Others have expressed concerns that risk reduction would emerge as a distraction from or substitute to such disarmament.<sup>4</sup> Both proponents and sceptics of NRR have voiced the need for a more comprehensive understanding of this concept.<sup>5</sup>

Without a common understanding of NRR, it is difficult to advance the conversation, let alone begin the process of effectively implementing such measures. To help address this challenge, this publication is intended to serve as an accessible global reference compendium for NRR discussions. It has three core objectives. First, it maps the current landscape of official NRR policy proposals. Second, it organizes proposed NRR measures into a framework of eight overarching categories, enabling the range of measures to be considered within a single, coherent resource. Third, it analyses these measures by drawing out the similarities, differences, and nuances across the various policy proposals.

Notably, this compendium does not seek to systematically evaluate the various proposals. Rather, it provides a factual overview of existing proposals to better inform discussions and to identify areas of common scope that could be pursued further. Thus, the compendium can serve as a reference to support States in focusing on and prioritizing specific measures, and potentially in time to enable the development of a shared understanding of NRR.

To achieve these three objectives, the compendium covers proposals submitted by States between the 2015 NPT Review Conference (RevCon) and the 2024 NPT Preparatory Committee (PrepCom) covering ‘nuclear risk reduction’ and its various synonyms, including ‘strategic risk reduction’, ‘reducing the risk of nuclear war’ and ‘reducing nuclear danger’. The primary documents considered were General Assembly resolutions, NPT working papers, and official statements. As the compendium covers only official documents, it does not include the wealth of initiatives from other governmental sources and civil society.<sup>6</sup>

Every effort has been made to systematically collect NRR proposals, loosely defined here as indications of support for a particular measure, from this time period. There is natural overlap across the eight categories – they are meant as an organizing principle, not as indications of mutual exclusivity. This compendium is not exhaustive – its purpose is to collect measures that States have explicitly and publicly linked to NRR. Moreover, it is important to stress that certain NRR proposals do not necessarily enjoy consensus across the board. Indeed, on many of these issues States disagree. Furthermore, the contexts in which some of these proposals were originally made may have changed, in some cases dramatically.

The compendium concludes with a list of the official NRR documents referenced throughout the publication, totalling over 100 documents. The list offers a ready source of official NRR proposals from the last decade, by States in their own words.

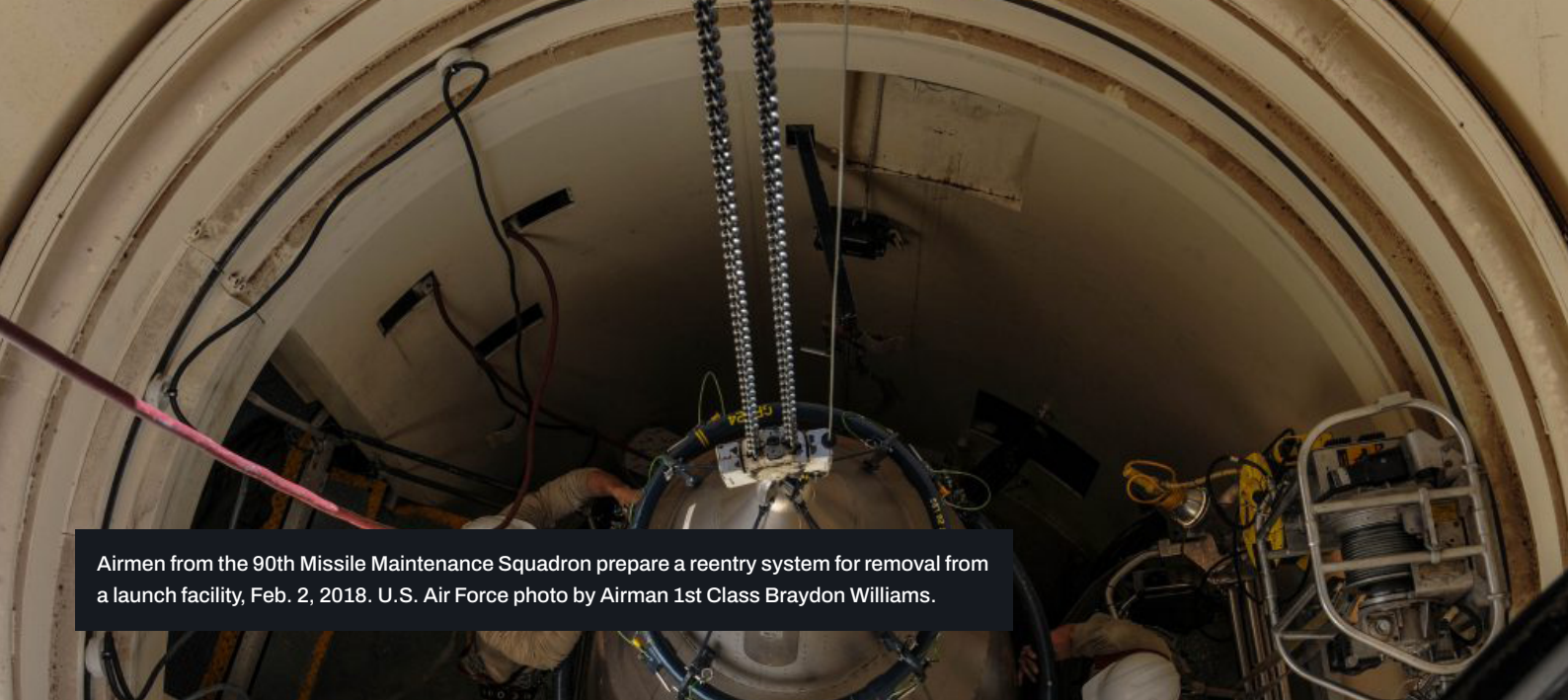
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3 See for example Germany (2022) ; P5 (2021) [NPT/CONF.2020/WP.33](#) ; Morocco (2019) [CD/PV.1515](#) ; NAC (2022) [CD/2226](#) ; Spain (2021) [CD/PV.1570](#) ; and United Kingdom (2023) [CD/PV.1665](#)

4 See for example Egypt (2024) [CD/PV.1713](#) ; Islamic Republic of Iran (2024) ; and South Africa (2023) [CD/PV.1666](#)

5 Including Algeria (2023) [CD/PV.1665](#) ; Austria (2022) [CD/PV.1628](#) ; CD (2018) [CD/WP.612](#) ; CD (2018) [CD/WP.613](#) ; Egypt (2023) [CD/PV.1665](#) ; Finland (2019) ; Pakistan (2023) [CD/PV.1665](#) ; and Nigeria (2023) [CD/PV.1665](#)

6 One exception is the Creating an Environment for Nuclear Disarmament (CEND) initiative Subgroup 3 that involved the participation of State officials from the nuclear-weapon States, non-nuclear-weapon States, as well as nuclear-armed States outside of the NPT. As the outcome documents were not consensually approved, CEND contributions are mentioned only as supporting existing proposals, and not as a source of official nuclear risk reduction proposals. See it at CEND (2024)



Airmen from the 90th Missile Maintenance Squadron prepare a reentry system for removal from a launch facility, Feb. 2, 2018. U.S. Air Force photo by Airman 1st Class Braydon Williams.

# 1. Arms Control and Disarmament

Nuclear risk reduction is neither a prerequisite, nor a substitute, for nuclear disarmament. In practice, however, disarmament and arms control measures – along with limitations on nuclear weapons – are frequently identified by States both as steps towards achieving full disarmament and as the ultimate risk reduction measure. Although the emphasis within NRR proposals may differ across the NWS, NNWS, and States outside of the NPT, both approaches highlight the importance of arms control, reductions in deployments and stockpiles, and sustained strategic dialogue to advance progress on these and related issues.

## Reductions in Nuclear Deployments and Stockpiles

Reductions in the numbers of deployed nuclear weapons and in overall nuclear stockpiles generate strong support from NNWS. On reducing deployed stockpiles, NNWS have made several NRR-related suggestions, including reducing the number of deployed (strategic and non-strategic) and non-deployed nuclear weapons;<sup>7</sup> codifying non-deployment arrangements for non-strategic nuclear warheads; moving nuclear weapons from deployment to storage;<sup>8</sup> and paving the way towards a verification arrangement for short-range and non-strategic warheads.<sup>9</sup> The 1992 Presidential Nuclear Initiatives, for example, have been proposed as useful groundwork to build upon.<sup>10</sup> Discussions within the context of the Creating an

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7 Austria (2022) [NPT/CONF.2020/WP.60](#) ; Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#) ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; Group of Non-Aligned States Parties (2024) [NPT/CONF.2026/PC.II/WP.28](#) ; and Sweden (2019) [NPT/CONF.2020/PC.III/WP.33](#)

8 Austria (2015) [NPT/CONF.2015/WP.29](#)

9 Daryl Kimball and Kingston Reif, “The Presidential Nuclear Initiatives (PNIs) on Tactical Nuclear Weapons at a Glance”, Arms Control Association, 2017, <https://www.armscontrol.org/factsheets/presidential-nuclear-initiatives-pnis-tactical-nuclear-weapons-glance>

10 Ibid.

Environment for Nuclear Disarmament initiative (CEND), initiative also pointed to proposals aimed at reducing the geographical footprint of deployed nuclear weapons.<sup>11</sup>

Several NNWS, as well as China, have put forward proposals related to reducing nuclear stockpiles.<sup>12</sup> Some of these States argue that it is the primary responsibility of those NWS possessing the largest stockpiles to lead on reductions, thereby helping to create the conditions for other NWS to join such efforts.<sup>13</sup> A number of NNWS also encourage the NWS to reduce all categories of nuclear weapons – regardless of their location or status as deployed or non-deployed – through unilateral, bilateral, regional, or multilateral measures.<sup>14</sup> Another NRR proposal includes reducing nuclear weapons that have been designated as surplus or stored stockpiles.<sup>15</sup>

In addition to quantitative reductions, some NNWS have raised concerns about qualitative upgrades to existing NWS nuclear stockpiles, as well as the development of new nuclear weapons. Modernization programmes are viewed by some NNWS as increasing risks and as representing a step back from existing commitments.<sup>16</sup> Accordingly, some NNWS seek a commitment from the NWS neither to modernize their nuclear stockpiles nor to develop new nuclear weapons.

## Illustrative NRR measures related to reductions

- Reduce all categories of nuclear weapons, regardless of location or status as deployed or non-deployed, through unilateral, bilateral, regional, or multilateral measures, with the aim of eventual elimination of nuclear stockpiles, including through appropriate legally binding measures<sup>17</sup>
- Move nuclear weapons from deployment into storage
- Refrain from the qualitative and quantitative build-up of nuclear stockpiles
- Codify existing non-deployment arrangements for non-strategic nuclear warheads
- Develop a verification arrangement for non-strategic warheads
- Reduce designated surplus stockpiles
- Commit neither to modernize, nor introduce new, nuclear weapons

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11 CEND (2024)

12 While the term ‘stockpile’ is used throughout this document, the terms ‘stockpile’ and ‘arsenal’ have been used interchangeably by States; see for example Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; CEND (2024) ; China (2023) [NPT/CONF.2026/PC.I/WP.30](#) ; and NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#)

13 See for example China (2023) [NPT/CONF.2026/PC.I/WP.30](#) ; and NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#)

14 Austria (2015) [NPT/CONF.2015/WP.29](#)

15 Austria (2022) [NPT/CONF.2020/WP.60](#) ; Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#) ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; and NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#)

16 Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#)

17 In the context of the CEND initiative, it was suggested to reduce forces to ceilings compatible with the principle of mutual and equal security. Moreover, as part of encouraging a cooperative approach to security, it was suggested to establish “a balance of relevant forces, taking into account the relevant security context”. CEND (2024) p.6

# Arms Control

Nuclear arms control agreements serve as important mechanisms to restrain arms racing among States, limit vertical proliferation, and reduce stockpiles. Arms control has also been increasingly highlighted by the NWS as a key tool for risk reduction. For example, in 2022 the P5 have jointly emphasized the importance of preserving and complying with established bilateral and multilateral arms control agreements and commitments – particularly the bilateral US–Russian arms control arrangements, but also, to a lesser extent, measures aimed at engaging China.<sup>18</sup>

Over the past 50 years, there have been eight legally binding agreements to limit the deployment of nuclear weapons and strategic defensive systems.<sup>19</sup> Notably, the recently expired New START Treaty between the United States and the Russian Federation was cited extensively both by some NWS and NNWS as a significant risk-reduction measure.<sup>20</sup> Several States have further emphasized that risk-reduction measures and arms control agreements are deeply interconnected, arguing that the former would lose much of their utility in the absence of the latter.

In the context of the CEND initiative, compliance and verification measures vis-à-vis arms control agreements were discussed as a form of nuclear risk reduction to consider further,<sup>21</sup> including through joint review mechanisms to oversee implementation, mandatory on-site inspections, challenge inspections, the possibility of verification by a third party (for instance, by the United Nations or a joint commission), and consideration of consultation mechanisms to resolve differences in interpretation, claims of non-compliance, the settlement of disputes, and more.

## Illustrative NRR proposals related to arms control

- Return to full implementation of the New START treaty and negotiate follow-up treaty
- Demonstrate willingness to engage and negotiate further arms control agreements, both bilaterally and multilaterally

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18 P5 (2022)

19 Amy Woolf, *The Past and Future of Bilateral Nuclear Arms Control*, UNIDIR, 2023, p. 6, <https://doi.org/10.37559/WMD/23/DDAC/01>

20 Including in Austria (2022) [NPT/CONF.2020/WP.60](#) ; Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#) ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; G7 (2024) ; NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) ; Republic of Moldova (2021) [CD/PV.1561](#) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

21 CEND (2024)

# Strategic Dialogue

Strategic dialogue is one of the NRR measures most frequently discussed by the NWS and NNWS.<sup>22</sup> It is mentioned in the context of bilateral, P5 Process, regional, and international discussions. Strategic dialogue can serve several purposes, including generating opportunities to increase mutual understanding on doctrines and policies. Bilateral dialogue is particularly helpful in providing space for “franker, more sensitive exchanges on specific flashpoints, postures, and policies between subject matter experts”.<sup>23</sup>

Strategic dialogue enables consideration of different “options for additional practical measures that could reduce the likelihood of nuclear weapons use”,<sup>24</sup> and, as was noted by the CEND initiative, dialogue could further encourage the joint assessment of “operational uncertainties, pathways to nuclear use, sharing of best practices, and de-escalation pathways”.<sup>25</sup>

Some NNWS have emphasized a need to firewall strategic dialogues on nuclear issues from other issues affecting States’ relationships,<sup>26</sup> as well as a need to engage the deterrence communities and military to enrich and improve NRR discussions.<sup>27</sup> Some NWS and NNWS have emphasized the importance of continuing strategic dialogue among the P5.<sup>28</sup> The P5 Process is considered a key framework for such discussions in general, and in particular on NRR measures.<sup>29</sup> On one occasion the Russian Federation highlighted the need to have comprehensive dialogue that addresses the root causes of issues among the P5 with the aim of minimizing the potential for conflict.<sup>30</sup> Several NWS and NNWS have urged that NRR be a standard item on the agenda, with some suggesting to increase dialogue on NRR through a designated P5 working group.<sup>31</sup>

More broadly, the NWS and some NNWS have noted that the NNWS should be engaged in risk reduction dialogue.<sup>32</sup> It was recognized by the P5 that they themselves “should not be the sole contributors to risk

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22 Including China (2023) [NPT/CONF.2026/PC.I/WP.30](#) ; France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; P5 (2022) ; P5 (2021) [NPT/CONF.2020/WP.33](#) ; NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) ; NPT 10th RevCon Draft Final Document (2022) [NPT/CONF.2020/CRP.1/Rev.2](#) ; Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#) ; Netherlands (2018) [NPT/CONF.2020/PC.II/WP.11](#) ; States Parties to the Treaty of Tlatelolco (2024) [NPT/CONF.2026/PC.II/WP.14](#) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

23 United States (2021) [CD/PV.1570](#) p.21

24 P5 (2021) [NPT/CONF.2020/WP.33](#) p.1 ; see also Stockholm Initiative (2024) [NPT/CONF.2026/PC.II/WP.13](#)

25 CEND (2024) p.18

26 NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#)

27 Sweden (2019) [NPT/CONF.2020/PC.III/WP.33](#)

28 See for instance China (2023) [NPT/CONF.2026/PC.I/WP.30](#) ; NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

29 For example as mentioned in P5 (2021) [NPT/CONF.2020/WP.33](#)

30 Russian Federation (2023)

31 Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#) ; see similarly CEND (2024), and United States (2022) [NPT/CONF.2020/WP.55](#)

32 See for example France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; P5 (2021) [NPT/CONF.2020/WP.33](#) ; Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#) ; United Kingdom (2021) [NPT/CONF.2020/WP.35](#) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

reduction”,<sup>33</sup> that NNWS play an important role, and thus dialogue on risk reduction should be conducted inclusively. Some NNWS have sought more dialogue between the NWS and NNWS on risk perceptions, nuclear doctrines, and force postures.<sup>34</sup> In a similar vein, the Tenth NPT RevCon draft final document also suggested that the NWS should intensify dialogue between themselves, as well as with NNWS, on the root causes of international tensions, ways to improve mutual trust, and potential implications of emerging technologies.<sup>35</sup>

The NPT review cycle offers space for deeper discussions between the NWS and NNWS. Some States have suggested establishing structures, such as facilitators or working groups, to keep the States Parties informed on NRR matters.<sup>36</sup> Similarly, some NNWS have noted that the NPT Review Conference should “consider encouraging a high-level international conference on nuclear risks”.<sup>37</sup>

## Illustrative NRR proposals related to strategic dialogue

- Continue and expand good faith bilateral and multilateral dialogue among the P5 on nuclear risks and risk reduction as well as other nuclear related issues
- Insulate discussions on nuclear disarmament and arms control from other issues in bilateral and multilateral relationships
- Maintain bilateral channels among NWS to enable frank exchange on specific flashpoints, postures, and policies
- Keep NRR as a standard item on the P5 agenda, establish a dedicated working group in the P5 Process, and facilitate better mutual understanding among the NWS
- Recognize NNWS role in contributing to NRR discussions
- Engage NNWS alongside NWS in dialogue on NRR, including in the NPT review cycle
- Intensify dialogue among NWS, as well as between NWS and NNWS, on risk perceptions, force postures, root causes of international tensions, nuclear risks, ways to improve mutual trust, and potential implications of emerging technologies
- Organize through the RevCon a high-level international conference on nuclear risks

## Mapping the Scene

Strategic dialogue, arms control agreements, and reductions in nuclear weapons are some of the most discussed topics in relation to NRR. Generally, arms control-related NRR measures have received more

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33 P5 (2021) [NPT/CONF.2020/WP.33](#) p.3

34 Members of the Non-Proliferation and Disarmament Initiative (2021) [NPT/CONF.2020/WP.10](#)

35 NPT 10th RevCon Draft Final Document (2022) [NPT/CONF.2020/CRP.1/Rev.2](#)

36 CEND (2024)

37 Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#) p.4

attention from the NWS, whereas reductions in nuclear deployments and stockpiles have received more attention from NNWS.

The following table provides an indication of where certain suggested NRR measures were and were not discussed, with a focus on NPT working papers. It offers a general overview of where convergence can be seen among the P5, as well as between the NWS, NNWS, and other States. Note that multiple proposals on a topic do not necessarily imply agreement on specific measures, as proposed modalities may differ.

*State Proposals on Arms Control and Disarmament<sup>38</sup>*

*Rows are colour-coded by State grouping: red = P5; orange = some NWS; green = NNWS; blue = NPT draft outcome document*

|   | Reducing deployments | Reducing stockpiles | Arms control | Strategic dialogue |
|---|----------------------|---------------------|--------------|--------------------|
| <b>P5 2022 joint statement</b>  |                      |                     |              |                    |
| <b>P5 2022 RevCon</b>   |                      |                     |              |                    |
| <b>China 2023 PrepCom</b>   |                      |                     |              |                    |
| <b>China 2017 PrepCom</b>   |                      |                     |              |                    |
| <b>France, United Kingdom and United States 2022 RevCon</b>               |                      |                     |              |                    |
| <b>United States 2022 RevCon</b>  |                      |                     |              |                    |
| <b>General Assembly Resolution “Reducing Nuclear Danger”<sup>39</sup></b> |                      |                     |              |                    |
| <b>Austria et al 2024 PrepCom</b>   |                      |                     |              |                    |
| <b>Austria et al 2023 PrepCom</b>   |                      |                     |              |                    |
| <b>Austria 2022 RevCon</b>  |                      |                     |              |                    |
| <b>NAC 2024 PrepCom</b>   |                      |                     |              |                    |
| <b>Non-Proliferation and Disarmament Initiative 2022 RevCon</b>           |                      |                     |              |                    |
| <b>States Parties Tlatelolco 2024 PrepCom</b>                             |                      |                     |              |                    |

38 The NPT 10th Review Conference draft final document included several risk reduction measures (while ultimately a final document was not agreed, that outcome was not due to the NRR-related passages).

39 General Assembly (2023) [A/RES/78/44](#) ; Yes: 122 (including India) | No: 8 | Abstentions: 13 | Non-Voting: 9 | Total voting membership: 193

|                                   | Reducing deployments | Reducing stockpiles | Arms control | Strategic dialogue |
|-----------------------------------|----------------------|---------------------|--------------|--------------------|
| Stockholm Initiative 2024 PrepCom |                      |                     |              |                    |
| Stockholm Initiative 2022 RevCon  |                      |                     |              |                    |
| Sweden 2019 PrepCom               |                      |                     |              |                    |
| RevCon 2022 Draft Final Document  |                      |                     |              |                    |



## 2. Multilateral Agreements and Commitments

Both NWS and NNWS have highlighted the role and importance of multilateral agreements, along with their associated commitments and obligations, as a means to reduce nuclear risks. Particularly prominent in NRR-related documents is the central role of the NPT. To varying degrees, the Comprehensive Nuclear-Test-Ban Treaty, nuclear-weapon-free zones, negative security assurances, and a possible fissile material cut-off treaty are also discussed as relevant frameworks contributing to NRR efforts.

### The NPT and Wider Disarmament Machinery

The NPT is widely regarded as the cornerstone of the global nuclear non-proliferation regime. For some States, strengthening the NPT and the norms it embodies is itself a form of risk reduction.<sup>40</sup> Other States have argued that NRR is of immediate relevance to the attainment of NPT Article VI goals<sup>41</sup> and that preserving the Treaty is of high importance for reducing nuclear risks.<sup>42</sup>

Some States have additionally proposed integrating regular NRR discussions into the agendas of other international forums, including the Conference on Disarmament, in which all nuclear-armed States participate – including those outside the NPT.<sup>43</sup> Others have suggested establishing a dedicated process for addressing NRR within the disarmament machinery, specifically through a Group of Governmental Experts or Open-ended Working Group,<sup>44</sup> in order to focus discussions and prevent the fragmentation

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40 See for example NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#)

41 United States (2022) [NPT/CONF.2020/WP.55](#)

42 Switzerland (2023) [CD/PV.1665](#) ; to this effect see also Germany (2024)

43 Netherlands (2021) [CD/PV.1571](#) ; see also Australia (2021) [CD/PV.1570](#) ; and Ukraine (2023) [CD/2373](#)

44 Broadly-Likeminded Group (2022) ; Finland (2024) ; and Finland (2022)

of processes, which has been argued may hamper progress on NRR.<sup>45</sup> A General Assembly resolution – first introduced by India – has further proposed convening an international conference to consider ways to eliminate nuclear dangers,<sup>46</sup> as referenced in the United Nations Millennium Declaration.<sup>47</sup>

Rarely, the prevention of further proliferation of nuclear weapon capabilities to other States has been mentioned as an NRR measure.<sup>48</sup> France, the United Kingdom, and the United States, for instance, have noted the importance of continuous cooperation with the International Atomic Energy Agency (IAEA) to ensure that civil nuclear energy projects are conducted safely and securely, so as to minimize the risks of nuclear weapon proliferation.<sup>49</sup> In addition, India has noted that all States should take the measures necessary to prevent the proliferation of nuclear weapons.<sup>50</sup>

## Illustrative NRR proposals related to the disarmament machinery

- Reaffirm unconditional commitment to the NPT
- Encourage States outside the NPT to join without delay or precondition
- Have NRR as a standing item for the NPT and Conference on Disarmament
- Create a specific follow-up process on NRR, such as a Group of Governmental Experts or Open-ended Working Group
- Convene an international conference on elimination of nuclear dangers, as resolved in the United Nations Millennium Declaration
- Prevent further proliferation of nuclear weapon capabilities
- Support IAEA in promoting safety and security of peaceful nuclear uses

## Prohibition of Nuclear Testing

The prohibition of nuclear testing, including by supporting or ratifying the Comprehensive Nuclear-Test-Ban Treaty (CTBT), has occasionally been identified as an NRR measure.<sup>51</sup> Some States have noted that, until the complete ratification of the CTBT, non-parties should continue to observe their moratoriums on explosive nuclear testing.<sup>52</sup> France, for instance, has noted that dismantling tests sites and the

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45 Finland (2023) [CD/PV.1665](#)

46 General Assembly (2023) [A/RES/78/44](#)

47 General Assembly (2000) [A/RES/55/2](#)

48 Including Austria (2022) [NPT/CONF.2020/WP.60](#) ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#) ; France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; and P5 (2022)

49 France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#)

50 General Assembly (2023) [A/RES/78/44](#)

51 Including the CEND (2024) ; Spain (2023) [CD/PV.1665](#) ; Ukraine (2023) [CD/2373](#) ; and United States (2023) [CD/PV.1665](#)

52 See for example CEND (2024) ; and Türkiye (2023) [CD/PV.1665](#).

ratification of the CTBT are seen as part of established efforts in favour of nuclear disarmament and as a significant contribution to reducing strategic risks.<sup>53</sup> Some NNWS have noted that until ratification the NWS should refrain from the development and testing of new nuclear weapon technologies.<sup>54</sup>

## Illustrative NRR proposals related to nuclear testing

- Support, sign, and ratify the CTBT, and observe moratoriums on testing until entry into force
- Dismantle test sites
- Refrain from development and testing of new nuclear weapon technologies

## Nuclear-Weapon-Free Zones and Negative Security Assurances

The importance of nuclear-weapon-free zones (NWFZs) and negative security assurances (NSAs) – either in themselves or in relation to NWFZs – has increasingly been stressed in NRR proposals. Such measures are usually raised by NNWS but also on occasion by China.<sup>55</sup>

Discussion on both NWFZs and NSAs broadens participation in the overall NRR discourse. For example, in the 2024 NPT PrepCom, the States Parties of the Treaty of Tlatelolco submitted a working paper addressing NWFZs as an NRR measure,<sup>56</sup> and the Islamic Republic of Iran has repeatedly stated that NSAs should be regarded as effective means of NRR.<sup>57</sup> For such assurances to be legally binding, some NNWS have asked that NSAs be provided, respected, and extended, as well as for negotiations on an international convention addressing NSAs to take place, in the context of the Conference on Disarmament or some other forum under the auspices of the United Nations.<sup>58</sup>

The working paper submitted by the States Parties to the Treaty of Tlatelolco notes that NWFZs contribute to NRR by supporting non-proliferation and arms control, and by promoting peace and stability both regionally and internationally. The working paper includes consideration of future measures that could be employed by the P5, including engaging to become a Party to or withdrawing reservations and interpretative statements made to the protocols, especially to the security assurances protocol. The

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53 France (2023) [CD/PV.1665](#)

54 Austria (2022) [NPT/CONF.2020/WP.60](#) ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; and Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#)

55 Including Bulgaria (2022) ; CEND (2024) ; China (2024) [NPT/CONF.2026/PC.II/WP.34](#) ; China (2023) [CD/PV.1665](#) ; Italy (2022) ; NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) ; States Parties to the Treaty of Tlatelolco (2024) [NPT/CONF.2026/PC.II/WP.14](#) ; and Viet Nam (2019) [CD/PV.1511](#)

56 States Parties to the Treaty of Tlatelolco (2024) [NPT/CONF.2026/PC.II/WP.14](#)

57 See for example Islamic Republic of Iran (2024) [NPT/CONF.2026/PC.II/WP.20](#)

58 Including Pakistan (2023) [CD/PV.1664](#)

working paper also asks for the NWS to incorporate or evidence more effectively in their statements and doctrines the relevance of NWFZs and their contribution to reducing nuclear risk.<sup>59</sup>

## Illustrative NRR proposals related to NWFZs and NSAs

- Recognize the value of existing NWFZs for NRR
- Provide NSAs by the NWS to States Parties to NWFZs to respect existing obligations, and to engage to solve outstanding issues, including reservations
- Refrain from reinterpreting and manipulating essential provisions of NWFZs
- Respect and extend NSAs and engage in negotiations for such to be legally binding, in the Conference on Disarmament or other forum under United Nations auspices

## Fissile Materials

Several NNWS have discussed the negotiation of a treaty banning the production of fissile material in the context of NRR.<sup>60</sup> These States note that, in the absence of a treaty in force, moratoriums on the production of fissile material for nuclear weapons purposes should be maintained or publicly declared. They note further that production facilities capable of generating fissile material usable in nuclear weapons or other nuclear explosive devices should be dismantled or converted.<sup>61</sup>

In the context of the CEND initiative, it had been suggested that surplus weapon-grade fissile material, as well as facilities associated with its production, could be reduced or converted as part of broader risk reduction efforts.

## Illustrative NRR proposals related to fissile materials

- Negotiate a treaty banning the production of fissile material, for example through the Conference on Disarmament
- Maintain or declare moratoriums on the production of fissile material for nuclear weapons purposes until such a treaty enter into force
- Dismantle or convert production facilities of fissile material for use in nuclear weapons or other nuclear explosive devices

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59 States Parties to the Treaty of Tlatelolco (2024) ; see also Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#)

60 Including Austria (2022) [NPT/CONF.2020/WP.60](#) ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#) ; CEND (2024) ; and Ukraine (2023) [CD/2373](#)

61 Including Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#)

# Mapping the Scene

The role and importance of multilateral agreements and commitments to NRR have been stressed repeatedly by both NWS and NNWS, with particular emphasis on the NPT. Other agreements and commitments related to testing, NWFZs, NSAs, and fissile material also have been addressed to various degrees. Notably, the number of States engaged in NRR discussions has expanded because of particular attention among some NNWS to specific approaches, namely NWFZs and NSAs. Overall, the NWS have discussed the general or specific role of the multilateral disarmament machinery, whereas NNWS have sought progress on particular nuclear multilateral agreements.

The following table provides an indication of where certain suggested NRR measures were and were not discussed, with a focus on NPT working papers. It offers a general overview of where convergence can be seen among the P5, as well as between the NWS, NNWS, and other States. Note that multiple proposals on a topic do not necessarily imply agreement on specific measures, as proposed modalities may differ.

*State Proposals on Multilateral Agreements and Commitments<sup>62</sup>*

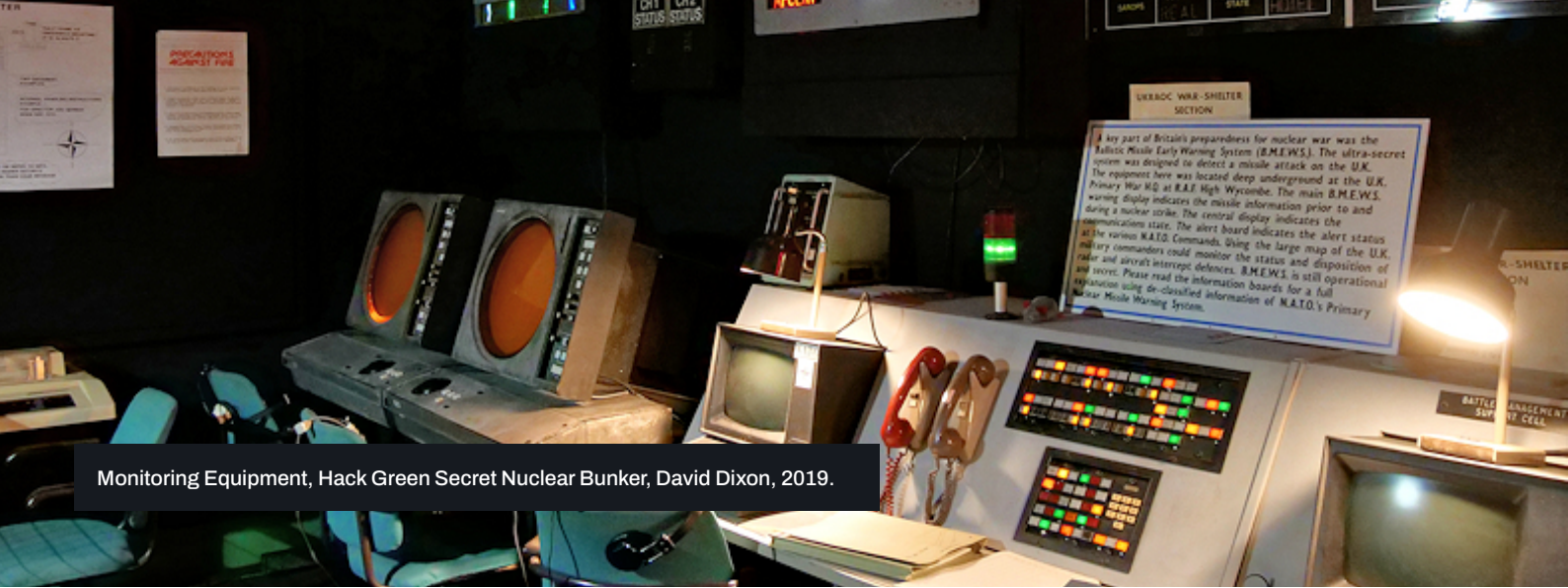
*Rows are colour-coded by State grouping: red = P5; orange = some NWS; green = NNWS; blue = NPT draft outcome document*

|   | International disarmament machinery | Nuclear testing | Nuclear-weapon-free zones | (Negative) security assurance | Fissile materials |
|---|-------------------------------------|-----------------|---------------------------|-------------------------------|-------------------|
| <b>P5 2022 Joint Statement</b>  |                                     |                 |                           |                               |                   |
| <b>P5 2022 RevCon</b>   |                                     |                 |                           |                               |                   |
| <b>China 2023 PrepCom</b>   |                                     |                 |                           |                               |                   |
| <b>China 2017 PrepCom</b>   |                                     |                 |                           |                               |                   |
| <b>France, United Kingdom, and United States 2022 RevCon</b>              |                                     |                 |                           |                               |                   |
| <b>United States 2022 RevCon</b>  |                                     |                 |                           |                               |                   |
| <b>General Assembly Resolution “Reducing Nuclear Danger”<sup>63</sup></b> |                                     |                 |                           |                               |                   |

The NPT 10th Review Conference draft final document included several risk reduction measures (while ultimately a final document was not agreed, that outcome was not due to the NRR-related passages).

63 General Assembly (2023) [A/RES/78/44](#) ; Yes: 122 (including India) | No: 8 | Abstentions: 13 | Non-Voting: 9 | Total voting membership: 193

|  | International disarmament machinery | Nuclear testing | Nuclear-weapon-free zones | (Negative) security assurance | Fissile materials |
|--|-------------------------------------|-----------------|---------------------------|-------------------------------|-------------------|
| Austria et al 2024 PrepCom                               |                                     |                 |                           |                               |                   |
| Austria et al 2023 PrepCom                               |                                     |                 |                           |                               |                   |
| Austria 2022 RevCon                                      |                                     |                 |                           |                               |                   |
| NAC 2024 PrepCom   |                                     |                 |                           |                               |                   |
| Non-Proliferation and Disarmament Initiative 2022 RevCon |                                     |                 |                           |                               |                   |
| States Parties Tlatelolco 2024 PrepCom                   |                                     |                 |                           |                               |                   |
| Stockholm Initiative 2024 PrepCom                        |                                     |                 |                           |                               |                   |
| Stockholm Initiative 2022 RevCon                         |                                     |                 |                           |                               |                   |
| Sweden 2019 PrepCom                                      |                                     |                 |                           |                               |                   |
| RevCon 2022 Draft Final Document                         |                                     |                 |                           |                               |                   |



Monitoring Equipment, Hack Green Secret Nuclear Bunker, David Dixon, 2019.

### 3. Crisis Prevention and Management

Crisis prevention and management mechanisms – including hotlines and bilateral channels, data exchanges and nuclear risk reduction centres, pre-notification arrangements, and other confidence-building measures – can reduce the risk of nuclear escalation arising from misperception, miscommunication, or miscalculation.<sup>64</sup> Such mechanisms can extend decision-making times and provide means of resolving disputes peacefully.

Many of the crisis prevention measures recommended in relation to NRR were employed during the cold war, notably between the United States and the Soviet Union, and offer a robust set of crisis prevention and management practices.<sup>65</sup> The P5 have recognized that established crisis management mechanisms can facilitate diplomatic solutions to avoid escalation and resolve crises.<sup>66</sup> However, some States, such as China, have cautioned against focusing on crisis management tools, arguing that “crisis prevention should take precedence over crisis management”.<sup>67</sup>

#### Hotlines and Bilateral Channels

Hotlines are measures establishing a permanent communication link between heads of State or national military authorities to be used in emergency situations when other consultative mechanisms

64 Including China (2023) [NPT/CONF.2026/PC.I/WP.30](#) ; G7 (2023) ; G7 (2022) ; General Assembly (2023) [A/C.1/78/L.30](#) ; General Assembly (2022) [A/C.1/77/L.61](#) ; Japan (2023) [NPT/CONF.2026/PC.I/WP.2](#) ; France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; P5 (2021) [NPT/CONF.2020/WP.33](#) ; Members of the Non-Proliferation and Disarmament Initiative (2021) [NPT/CONF.2020/WP.10](#) ; NPT 10th RevCon Draft Final Document (2022) [NPT/CONF.2020/CRP.1/Rev.2](#) ; Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#) ; Sweden (2019) [NPT/CONF.2020/PC.III/WP.33](#) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

65 United States (2021) [CD/PV.1570](#)

66 P5 (2021) [NPT/CONF.2020/WP.33](#)

67 China (2023) [NPT/CONF.2026/PC.I/WP.30](#) p.1

are insufficient or unavailable.<sup>68</sup> Such links between the United States and the Soviet Union were used frequently during the cold war. Notable hotline agreements include the 1963 Memorandum of Understanding regarding the establishment of a direct communications link between the Soviet Union and the United States,<sup>69</sup> and similar agreement in 1998 between China and the United States.<sup>70</sup> Since the cold war, interest in such measures has continued; in 2021, the P5 noted that hotlines remain a valued risk-reduction mechanism<sup>71</sup> that can help to clarify intent behind actions that might otherwise be misinterpreted, and assist in preventing incidents from escalating into crises.

In addition to hotlines for emergency use, bilateral channels connecting the military and diplomatic communities play an important role in risk reduction. The P5 and several NNWS view such mechanisms as enabling “frank and sensitive exchanges on specific flashpoints and negotiated bilateral measures” that can help to mitigate misunderstandings regarding actions and intentions.<sup>72</sup> A number of NNWS have underscored the need to secure and strengthen such lines of communication,<sup>73</sup> with some going further to propose discussions on the technologies underpinning them ensuring their credibility or even on the idea of a multilateral hotline system.<sup>74</sup>

## Illustrative NRR proposals related to hotlines and bilateral channels

- Ensure that bilateral channels include military-to-military dialogue, not only leader-to-leader and diplomatic dialogues
- Preserve existing and create new hotlines, in crisis, between senior civilian and military leadership of the NWS and establish procedures for unambiguous and credible messaging
- Ensure that hotlines are built upon robust and secure communication technologies
- Establish a multilateral hotline system

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68 Steve Tullu and Thomas Schmalberger, “Coming to Terms with Security: A Lexicon for Arms Control, Disarmament and Confidence Building”, UNIDIR, 2003, p. 160, <https://undir.org/files/publication/pdfs/coming-to-terms-with-security-a-lexicon-for-arms-control-disarmament-and-confidence-building-en-547.pdf>

69 United States (2022) [NPT/CONF.2020/WP.55](#) ; the United States noted that the success of the 1963 hotline led to the 1987 agreement to create nuclear risk reduction centres.

70 See more in Daryl Kimball, “Hotline Agreements”, 2020, <https://www.armscontrol.org/factsheets/hotline-agreements>

71 P5 (2021) [NPT/CONF.2020/WP.33](#)

72 P5 (2021) [NPT/CONF.2020/WP.33](#) p.2 ; see also to this effect European Union (2019) ; France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; Pakistan (2023) [CD/PV.1665](#) ; and Stockholm Initiative (2024) [NPT/CONF.2026/PC.II/WP.13](#)

73 See for instance the Members of the Non-Proliferation and Disarmament Initiative (2021) [NPT/CONF.2020/WP.10](#) ; NPT 10th RevCon Draft Final Document (2022) [NPT/CONF.2020/CRP.1/Rev.2](#) ; and Sweden (2019) [NPT/CONF.2020/PC.III/WP.33](#)

74 See for example Switzerland statement (2021) [CD/PV.1570](#)

# Data Exchanges and Nuclear Risk Reduction Centres

Nuclear risk reduction centres are establishments responsible for sending, receiving, and handling notifications and other information related to preventing war.<sup>75</sup> Two centres currently exist, in Moscow and Washington DC, established through the 1988 US–Soviet Agreement on the Establishment of Nuclear Risk Reduction Centers and its protocols.<sup>76</sup> The centres are widely recognized as playing an important role in reducing risks in several ways. They facilitate consultations and cooperation on hazardous incidents of a military nature and unusual military activities; provide a channel to clarify uncertain or ambiguous situations; and enable secure, rapid exchanges of data and notifications between parties.<sup>77</sup>

Moreover, these mechanisms have played an important role in implementing numerous arms control and risk reduction agreements and arrangements.<sup>78</sup> For example, the US National and Nuclear Risk Reduction Center processed approximately 24,000 notifications and 44 comprehensive data exchanges in the context of New START.<sup>79</sup> Such centres also benefit the broader community of States. The US centre, again for example, over the years has worked with more than 90 international partners, to cover a range of non-nuclear issues and provide around-the-clock multilingual, government-to-government communication.<sup>80</sup>

## Illustrative NRR proposals related to data exchange and nuclear risk reduction centres

- Facilitate agreements on joint data centres and data exchange
- Sustain existing, or establish, nuclear risk reduction centres to enable ready exchange of data and notifications between parties

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75 Tullu and Schmalberger, “Coming to Terms with Security”, p. 163

76 United States and Soviet Union, “Agreement on the Establishment of Nuclear Risk Reduction Centers (with Protocols)”, No. 26557, 15 September 1987, <https://treaties.un.org/doc/Publication/UNTS/Volume%201530/volume-1530-I-26557-English.pdf>

77 See CEND (2024) ; General Assembly (2020) [A/RES/75/71](#) ; Members of the Non-Proliferation and Disarmament Initiative (2021) [NPT/CONF.2020/WP.10](#) ; NPT 10th RevCon Draft Final Document (2022) [NPT/CONF.2020/CRP.1/Rev.2](#) ; Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#) ; and United States (2022) [NPT/CONF.2020/WP.55](#) (in which the benefits of the 1990 Treaty on Conventional Armed Forces in Europe in regard to data exchanges as well as other transparency measures was mentioned as an example to draw upon).

78 United States (2022) [NPT/CONF.2020/WP.55](#)

79 Ibid.

80 National and Nuclear Risk Reduction Center, “About Us,” <https://web.archive.org/web/20230925042412/https://www.state.gov/about-us-national-and-nuclear-risk-reduction-center/>

# Pre-Notification

Pre-notification measures – that require advance notice within a clearly defined minimum time frame before notifiable military activities take place – are crisis prevention and management tools that can reduce possible nuclear escalation resulting from misinterpretation.<sup>81</sup> Examples of pre-notification initiatives include the 1989 US–Soviet Agreement on Reciprocal Advance Notification of Major Strategic Exercises,<sup>82</sup> and subsequent notification provisions such as those in the New START Treaty.<sup>83</sup> Under the former agreement, parties are obligated to notify one another a minimum of 14 days in advance of any major strategic forces exercises. Providing such information in advance on the movement of nuclear-capable forces reduces nuclear risks linked to possible misperception. In the context of the CEND initiative, it was suggested that pre-notified large-scale military exercises could also act as an NRR measure.<sup>84</sup>

Pre-notification of ballistic missile launches is another measure that can reduce the possibility of strategic misinterpretation.<sup>85</sup> One such example is the 1988 US–Soviet Ballistic Missile Launch Notification Agreement,<sup>86</sup> which was followed by notification provisions in subsequent bilateral agreements, under which the parties agree to notify each other a minimum of 24 hours in advance of ballistic missile launches, either land or sea, and to include information about the launch area as well as the area of impact. Another example is the notification provision of the 1971 US–Soviet Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War,<sup>87</sup> which requires pre-notification of planned missile launches trajectories leading outside a party’s territory and in the direction of the other party. A multilateral example is the 2002 Hague Code of Conduct against Ballistic Missile Proliferation.<sup>88</sup> The Code, which is subscribed by 138 States, including four of the P5, provides for reciprocal pre-notification of ballistic missile and space vehicle launches.<sup>89</sup>

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81 Including CEND (2024) ; G7 (19 May 2023) ; P5 (2021) [NPT/CONF.2020/WP.33](#) ; Members of the Non-Proliferation and Disarmament Initiative (2021) [NPT/CONF.2020/WP.10](#) ; NPT 10th RevCon Draft Final Document (2022) [NPT/CONF.2020/CRP.1/Rev.2](#) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

82 US Department of State, “Article-by-Article Analysis of the Agreement on Reciprocal Advance Notification of Major Strategic Exercises”, n.d., at <https://1997-2001.state.gov/global/arms/starthtm/start/abarelat.html>

83 United States (2022) [NPT/CONF.2020/WP.55](#)

84 CEND (2024)

85 See for example CEND (2024) ; United Kingdom (2021) [CD/PV.1570](#) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

86 US Department of State, “Agreement Between The United States of America and The Union of Soviet Socialist Republics on Notifications of Launches of Intercontinental Ballistic Missiles and Submarine-Launched Ballistic Missiles (Ballistic Missile Launch Notification Agreement)”, n.d., <https://2009-2017.state.gov/t/avc/trty/187150.htm>

87 US Department of State, “Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War Between The United States of America and The Union of Soviet Socialist Republics (Accidents Measures Agreement)”, n.d., <https://2009-2017.state.gov/t/isn/4692.htm>

88 General Assembly, “The Hague Code of Conduct Against Ballistic Missile Proliferation”, A/RES/59/91, 3 December 2004, <https://digitallibrary.un.org/record/536284?v=pdf>

89 These examples were presented in the United States (2022) [NPT/CONF.2020/WP.55](#)

## Illustrative NRR proposals related to pre-notification

- Establish reciprocal pre-notification on strategic ballistic missile launches either bilaterally or multilaterally
- Establish reciprocal pre-notification on major strategic exercises

## Mapping the Scene

Many proposals related to crisis prevention and management refer to agreements made during the cold war, with NRR proposals addressing the maintenance or expansion of such mechanisms. The specific mechanisms mentioned include hotlines and bilateral channels, data exchanges and nuclear risk reduction centres, as well as pre-notification on strategic activities and ballistic missile launches. The necessity of preventing a possible nuclear crisis due to misperception, miscommunication, or miscalculation has been raised repeatedly by the NWS and some NNWS.

The following table provides an indication of where certain suggested NRR measures were and were not discussed, with a focus on NPT working papers. It offers a general overview of where convergence can be seen among the P5, as well as between the NWS, NNWS, and other States. Note that multiple proposals on a topic do not necessarily imply agreement on specific measures, as proposed modalities may differ.

### *State Proposals on Crisis Prevention and Management<sup>90</sup>*

*Rows are colour-coded by State grouping: red = P5; orange = some NWS; green = NNWS; blue = NPT draft outcome document*

|  | Crisis prevention & management general | Hotlines & bilateral channels | Data exchanges & nuclear risk reduction centres | Pre-notification |
|--|--|-------------------------------|---|------------------|
| <b>P5 2022 Joint Statement</b>                               |  |                               |   |                  |
| <b>P5 2022 RevCon</b>  |  |                               |   |                  |
| <b>China 2023 PrepCom</b>                                    |  |                               |   |                  |
| <b>China 2017 PrepCom</b>                                    |  |                               |   |                  |
| <b>France, United Kingdom, and United States 2022 RevCon</b> |  |                               |   |                  |

<sup>90</sup> The NPT 10th Review Conference draft final document included several risk reduction measures (while ultimately a final document was not agreed, that outcome was not due to the NRR-related passages).

|   | Crisis prevention & management general | Hotlines & bilateral channels | Data exchanges & nuclear risk reduction centres | Pre-notification |
|---|--|-------------------------------|---|------------------|
| United States 2022 RevCon   |  |                               |   |                  |
| General Assembly Resolution “Reducing Nuclear Danger” <sup>91</sup> |  |                               |   |                  |
| Austria et al 2024 PrepCom  |  |                               |   |                  |
| Austria et al 2023 PrepCom  |  |                               |   |                  |
| Austria 2022 RevCon   |  |                               |   |                  |
| NAC 2024 PrepCom  |  |                               |   |                  |
| Non-Proliferation and Disarmament Initiative 2022 RevCon            |  |                               |   |                  |
| States Parties Tlatelolco 2024 PrepCom                              |  |                               |   |                  |
| Stockholm Initiative 2024 PrepCom                                   |  |                               |   |                  |
| Stockholm Initiative 2022 RevCon                                    |  |                               |   |                  |
| Sweden 2019 PrepCom   |  |                               |   |                  |
| RevCon 2022 Draft Final Document                                    |  |                               |   |                  |

91 General Assembly (2023) [A/RES/78/44](#) ; Yes: 122 (including India) | No: 8 | Abstentions: 13 | Non-Voting: 9 | Total voting membership: 193



A deck view of the nuclear-powered ballistic missile submarine OHIO, PH1 Anderson / U.S. Navy.

## 4. Transparency and Confidence-Building

Enhancing transparency is one of the most frequently discussed NRR topics. However, such enhancement can take different forms. For some, the focus is on increasing transparency among the NWS; for others, between the NWS and NNWS; and yet others, transparency in relations with the public. Other proposals closely linked to transparency relate to confidence-building measures, including such intended to improve relations amongst the P5.

### Transparency

Transparency measures – understood here as the provision of information to foster predictability (including in relation to commitments and obligations under the NPT) and to minimize sources of potential misunderstanding and overreaction – are a common feature of documents related to NRR.<sup>92</sup>

However, the form and focus of transparency-related proposals vary. For example, the P5 jointly have acknowledged that increasing transparency on doctrines and intentions motivating certain activities and developments – whether between two parties or more broadly – reduces the risks of misperception, miscommunication, and miscalculation; however, the P5 also have noted that ambiguity is an inherent aspect of some nuclear deterrence strategies.<sup>93</sup> Some NWS have proposed increased transparency in

<sup>92</sup> Including Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#) ; France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; G7 (17 April 2023) ; P5 (2021) [NPT/CONF.2020/WP.33](#) ; NPT 10th RevCon Draft Final Document (2022) [NPT/CONF.2020/CRP.1/Rev.2](#) ; Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

<sup>93</sup> P5 (2021) [NPT/CONF.2020/WP.33](#)

relation to nuclear policies and capabilities, stockpile size, and budgeting and modernization plans,<sup>94</sup> as well as through verification activities and engagement with subject matter experts and civil society organizations.<sup>95</sup> The United Kingdom has noted that transparency is a starting point for dialogue in the P5 Process and that exchanges on nuclear doctrine among the P5 allow for better understanding of intentions, capabilities, and actions.<sup>96</sup> Such understandings can be shared commonly with all NPT States Parties through the review cycle.<sup>97</sup>

The NNWS have made detailed proposals related to transparency measures for the NWS to reduce risks, and have encouraged that information coming from such measures be provided at regular intervals and in a standardized manner. These various proposals cover a range of specific areas in which transparency can be pursued. Many of the States in question have referred to elements identified in the report of the Open-ended Working Group taking forward multilateral nuclear disarmament negotiations.<sup>98</sup> These have included transparency around the number, type and status of nuclear warheads, and the number and type of delivery vehicles.

Transparency also has been encouraged as a means of avoiding accidents, errors, and the possible misinterpretation of events (whether planned or otherwise), with both the NWS and NNWS repeatedly highlighting that the former must take all necessary steps to ensure that nuclear weapons are not launched unintentionally or without authorization.<sup>99</sup> There is a history of measures to address such concerns. For example, the 1971 US–Soviet Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War included measures on notifications on accidents, detection of unidentified objects, and planned missile launches if trajectories were to extend beyond national territory in the direction of the other party.<sup>100</sup>

Others have proposed transparency measures to declassify information on past events, including any instances of “close calls”, in order to raise awareness of the breadth of risks associated with nuclear weapons.<sup>101</sup> Yet others have proposed transparency measures to strengthen strategic mutual trust among the NWS and NNWS, including by sharing defence and armed forces planning information and increasing transparency in that regard to “eliminate the capability to launch surprise attacks and increase predictability of [nuclear] use conditions”.<sup>102</sup> Such measures would include increasing transparency

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94 See for example France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

95 United States (2019) [CD/PV.1501](#)

96 United Kingdom statement (2021) [CD/PV.1570](#) ; and United Kingdom (2021) [NPT/CONF.2020/WP.42](#)

97 United States (2019) [CD/PV.1501](#)

98 Open-Ended Working Group Taking Forward Multilateral Nuclear Disarmament Negotiations (2016) [A/71/371](#) ; see also Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#)

99 See for example Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; China (2023) [NPT/CONF.2026/PC.I/WP.30](#) ; China (2017) [NPT/CONF.2020/PC.I/WP.36](#) ; Members of the Non-Proliferation and Disarmament Initiative (2021) [NPT/CONF.2020/WP.10](#) ; P5 (2022) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

100 United States (2022) [NPT/CONF.2020/WP.55](#) ; see also United States and Soviet Union, Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War, 30 September 1971, <https://treaties.un.org/doc/Publication/UNTS/Volume%20807/volume-807-I-11509-English.pdf>

101 NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) p.5

102 CEND (2024) p. 15

on nuclear stockpiles – “in particular notifications and detailed exchanges of information on relevant weapons, personnel strength and their locations, transparency on command structure, and dual use capabilities (nuclear and conventional).”<sup>103</sup>

## Illustrative NRR proposals related to transparency

- Increase transparency on nuclear doctrine and policy, risk perceptions and undertaken risk reduction measures
- Increase transparency on nuclear stockpiles (including retired and dismantled warheads and delivery vehicles, including dual-capable), status (deployed/non-deployed; alert level), and location (inside and outside national territory), as well as on stocks of fissile material
- Increase transparency on nuclear capabilities, modernization plans, budgeting, and defence and armed forces planning and procurement
- Increase transparency through verification activities
- Increase transparency through engagement with subject matter experts and civil society organizations
- Enhance transparency on accidents involving nuclear weapons and adopt steps to respond to such accidents; declassify historical records regarding the accidents

## Confidence-Building Measures

There are several proposed measures that could be considered as confidence-building measures, broadly understood in relation to NRR. For example, some NWS and NNWS have suggested to establish working groups on deconfliction,<sup>104</sup> and to conclude agreements on accident measures<sup>105</sup> covering incidents in the air and at sea, with a view to promoting the safety of operations where States operate in proximity to one another and to reducing the risk of unintended confrontation between parties. Other measures include agreements on preventing ‘dangerous military activities’ (i.e., where damage to other parties might result, for whatever reason, thus causing international tensions), which provide a framework to resolve any incidents rapidly through diplomatic channels.<sup>106</sup> In this context, some States have highlighted the role of the 2011 Vienna Document as a politically binding instrument of confidence-building in military matters, including through measures such as observation of exercises, inspections of specified areas, and a consultative mechanism for risk reduction in cases of unusual activities.<sup>107</sup> In the

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103 Ibid., p. 20

104 United States (2021) [CD/PV.1570](#)

105 European Union (2019)

106 As stipulated in United States (2022) [NPT/CONF.2020/WP.55](#) ; and United States and Soviet Union, “Agreement Between the Government of the United States of America and the Government of the Union of Soviet Socialist Republics on Reciprocal Advance Notification of Major Strategic Exercises”, No.38723, 23 September 1989, <https://www.un-ilibrary.org/content/books/9789210457002s002-c047>

107 United States (2022) [NPT/CONF.2020/WP.55](#)

context of the CEND initiative, some States had elaborated on military-to-military confidence-building measures, including measures of mutual visitation to military installations, the facilitation of corresponding points of contact, as well as demonstrations of new major weapons or equipment.<sup>108</sup>

## Illustrative NRR proposals related to confidence-building measures

- Conclude accident measure agreements
- Establish working groups on deconfliction
- Establish dispute resolution mechanisms at global, regional, and bilateral levels
- Implement, and conclude new, agreements on prevention of incidents in the air and at sea and diplomatic resolution of incidents if they occur
- Implement, and conclude new, agreements on preventing dangerous military activities and diplomatic resolution of incidents if they occur
- Implement, and conclude new, instruments for military confidence-building, including observation of exercises, inspection of specified areas, and a consultative mechanism for risk reduction in case of unusual activities

## Mapping the Scene

The enhancing of transparency is one of the most discussed NRR topics among the NWS and NNWS. Differences between proposals are mainly due to what issues in which transparency is encouraged and where to draw the line between transparency and the necessary ambiguity of deterrence strategies. Proposed confidence-building measures are not necessarily related to nuclear issues, and have included suggestions to improve States relations broadly.

The following table provides an indication of where certain suggested NRR measures were and were not discussed, with a focus on NPT working papers. It offers a general overview of where convergence can be seen among the P5, as well as between the NWS, NNWS, and other States. Note that multiple proposals on a topic do not necessarily imply agreement on specific measures, as proposed modalities may differ.

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<sup>108</sup> CEND (2024) ; for more on confidence-building measures, see France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; P5 (2021) [NPT/CONF.2020/WP.33](#) ; NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) ; NPT 10th RevCon Draft Final Document (2022) [NPT/CONF.2020/CRP.1/Rev.2](#) ; and Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

### State Proposals on Transparency and Confidence Building Related Measures<sup>109</sup>

Rows are colour-coded by State grouping: red = P5; orange = some NWS; green = NNWS; blue = NPT draft outcome document

|  | Transparency & confidence-building measures |
|--|---|
| P5 2022 Joint Statement  |   |
| P5 2022 RevCon   |   |
| China 2023 PrepCom   |   |
| China 2017 PrepCom   |   |
| France, United Kingdom, and United States 2022 RevCon                |   |
| United States 2022 RevCon  |   |
| General Assembly Resolution “Reducing Nuclear Danger” <sup>110</sup> |   |
| Austria et al 2024 PrepCom   |   |
| Austria et al 2023 PrepCom   |   |
| Austria 2022 RevCon  |   |
| NAC 2024 PrepCom   |   |
| Non-Proliferation and Disarmament Initiative 2022 RevCon             |   |
| States Parties Tlatelolco 2024 PrepCom                               |   |
| Stockholm Initiative 2024 PrepCom                                    |   |
| Stockholm Initiative 2022 RevCon                                     |   |
| Sweden 2019 PrepCom  |   |
| RevCon 2022 Draft Final Document                                     |   |

109 The NPT 10th Review Conference draft final document included several risk reduction measures (while ultimately a final document was not agreed, that outcome was not due to the NRR-related passages).

110 General Assembly (2023) [A/RES/78/44](#) ; Yes: 122 (including India) | No: 8 | Abstentions: 13 | Non-Voting: 9 | Total voting membership: 193



SECDEF Pentagon Press Briefing, Oct. 27 2022. DoD photo by U.S. Navy Petty Officer 2nd Class Alexander Kubitza.

## 5. Doctrinal and Declaratory Measures

Many States have recognized the importance of doctrinal and declaratory policies for nuclear risks, and the consequent role of NRR measures in this area as a means of clarifying nuclear postures and reducing the role of nuclear weapons in national doctrines.

### Statement that a Nuclear War Must Never be Fought

Many States have emphasized the importance of declaratory statements reiterating the 1985 remarks by Gorbachev and Reagan that “a nuclear war cannot be won and must never be fought”.<sup>111</sup> This statement, which marked a milestone during the cold war, has been repeated on several occasions since 1985, including the US–Russia affirmation in 2021 and the P5 joint statement of 3 January 2022 reasserting the formula.<sup>112</sup>

Similar declaratory statements have been issued at other points. For example, France, the United Kingdom, and the United States noted that the non-use of nuclear weapons since 1945 must be retained, and separately the United States has recalled the 1973 US–Soviet Agreement on the Prevention of Nuclear War.<sup>113</sup> Some NWS and NNWS also collectively have highlighted the importance of unequivocally

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111 Ronald Reagan and Mikhail Gorbachev, Joint Soviet–United States Statement on the Summit Meeting in Geneva, 21 November 1985, <https://www.reaganlibrary.gov/archives/speech/joint-soviet-united-states-statement-summit-meeting-geneva> ; see also CEND (2024) ; NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) ; and Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

112 P5 (2022)

113 See France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; United States (2022) [NPT/CONF.2020/WP.55](#) ; and Oliver Meier, “Why Non-Nuclear Weapon States Attach Importance to a P5 Affirmation of the Reagan-Gorbachev Formula”, European Leadership Network, 1 December 2021, <https://europeanleadershipnetwork.org/commentary/why-non-nuclear-weapon-states-attach-importance-to-a-p5-affirmation-of-the-reagan-gorbachev-formula/>

repeating the notion that nuclear weapons are never to be used again, including by echoing the G20 Leaders' Declaration, which held that the use or threat of use of nuclear weapons is inadmissible.<sup>114</sup>

While such declaratory measures are clearly important and should be themselves be appreciated as NRR measures, several States Parties have observed that concrete implementation in relation to declarations is required for such statements to be seen as credible.<sup>115</sup>

## Illustrative NRR proposals related to statements against nuclear war

- Maintain the principle that a nuclear war cannot be won and must never be fought
- Practically implement commitments made in such statements to preserve their credibility

## Acknowledging the Consequences of Nuclear Weapons Use

Several NNWS have argued that NRR measures should be explicitly linked to the humanitarian consequences of nuclear weapons use.<sup>116</sup> For instance, it has been emphasized by a number of States that such consequences “know no borders”, and therefore risk reduction is in the interest of all humanity and is vital to decreasing the likelihood of nuclear detonations.<sup>117</sup> Similarly, other States have outlined several elements that NRR measures must address – including humanitarian consequences – arguing that nuclear weapon risks “cannot simply be managed away” in that they will exist so long as such weapons exist, thus any and all NRR efforts “must fully acknowledge this reality”.<sup>118</sup>

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114 Austria (2022) [NPT/CONF.2020/WP.60](#) ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; and Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#) ; see also NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#)

115 Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; and Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#) ; see also China (2023) [NPT/CONF.2026/PC.I/WP.30](#)

116 Including Austria (2022) [NPT/CONF.2020/WP.60](#) ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#) ; Broadly-Likeminded Group (2022) ; CEND (2024) ; NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) ; NPT 10th RevCon Draft Final Document (2022) [NPT/CONF.2020/CRP.1/Rev.2](#) ; Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#) ; and Thailand (2023)

117 Austria (2022) [NPT/CONF.2020/WP.60](#) p. 1

118 NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) p. 3

## Illustrative NRR proposals related to consequences of use

- Acknowledge that reducing risk of use of nuclear weapons is in the interest of all humanity
- Acknowledge that risk reduction is vital to decreasing the likelihood of nuclear detonations and the catastrophic humanitarian consequences
- Acknowledge that nuclear risks cannot be managed or removed without elimination of all nuclear stockpiles, and that NRR approaches must recognize the reality of nuclear weapons

## Declarations of Restraint

Declarations of restraint have been incorporated into influenced nuclear postures through language addressing the conditions under which nuclear weapons might be used. The importance of political statements promoting restraint as an NRR measure has been highlighted with increasing frequency in recent years.<sup>119</sup> In parallel, there have been collective declarations of restraint. For example, the P5 have affirmed that, so long as nuclear weapons exist, they should serve solely defensive purposes, deter aggression, and prevent war.<sup>120</sup> Several NWS and NNWS have likewise underscored the importance of declarations of restraint,<sup>121</sup> and have voiced concern over “provocative” or “inflammatory” nuclear rhetoric that is “intended for military coercion, intimidation or blackmail”.<sup>122</sup>

## Illustrative NRR proposals related restraint

- Acknowledge that the use or threat of use of nuclear weapons is inadmissible
- Explicitly affirm that nuclear weapons should only serve defensive purposes and issue explicit declarations of restraint
- Reaffirm that nuclear deterrence serves solely to safeguard vital national interests
- Avoid rhetoric and actions intended to coerce, intimidate, or blackmail
- Reject, condemn, and consider as inadmissible and illegitimate such rhetoric, whether implicit or explicit

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119 P5 WP (2021) [NPT/CONF.2020/WP.33](#) ; NPT 10th RevCon Draft Final Document (2022) [NPT/CONF.2020/CRP.1/Rev.2](#) ; and Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

120 See for example France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; P5 (2022) ; and the United Kingdom (2022) [CD/PV.1607](#)

121 NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#)

122 France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) p. 2 ; see also Austria (2022) [NPT/CONF.2020/WP.60](#) p. 6 ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) p. 6 ; Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#) p. 5 ; CEND (2024) ; NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) ; and NPT 10th RevCon Draft Final Document (2022) [NPT/CONF.2020/CRP.1/Rev.2](#)

# Reducing the Role of Nuclear Weapons in Doctrine and Policy

Closely linked to declarations of restraint is the effort to reduce the role of nuclear weapons in doctrine. Both the NWS and NNWS have identified such measures as conducive to nuclear risk reduction.<sup>123</sup> Perceptions, however, vary on how best to achieve this. Some proposals call for reviewing nuclear doctrines with the explicit aim of reducing the role assigned to nuclear weapons;<sup>124</sup> others focus on diminishing the value attributed to nuclear weapons in military training and education.<sup>125</sup> Still others advocate the adoption of no-first-use policies<sup>126</sup> – either unilaterally, as China has announced,<sup>127</sup> or through a mutual no-first-use agreement among the NWS.<sup>128</sup>

## Illustrative NRR proposals related to doctrine and policy

- Reduce the role of nuclear weapons in national security strategies and doctrines, including through the adoption of no-first-use or sole-purpose policies
- Review nuclear doctrines with the aim of reducing the role of nuclear weapons
- Reduce the value assigned to nuclear weapons in military education and training

## Refrain from Threat of Force and Respect Sovereignty

As part of wider NRR discussions, several States have stressed the importance of respecting sovereignty, security, and development interests with a view to maintaining strategic stability and promoting

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123 See for example Austria (2022) [NPT/CONF.2020/WP.60](#) ; Austria (2015) [NPT/CONF.2015/WP.29](#) ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#) ; CEND (2024) ; China (2023) [NPT/CONF.2026/PC.I/WP.30](#) ; China (2017) [NPT/CONF.2020/PC.I/WP.36](#) ; Denmark, Finland, Iceland, Norway, and Sweden (2015) [NPT/CONF.2015/WP.15](#) ; NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) ; Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#) ; United Arab Emirates (2022) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

124 See for example CEND (2024) ; General Assembly (2023) [A/RES/78/44](#) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

125 Austria (2022) [NPT/CONF.2020/WP.60](#) ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; and Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#)

126 Some States refer to ‘no first use’ as ‘sole purpose’; see Austria (2022) [NPT/CONF.2020/WP.60](#) ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#) ; CEND (2024) ; China (2023) [NPT/CONF.2026/PC.I/WP.30](#) ; China (2017) [NPT/CONF.2020/PC.I/WP.36](#) ; and NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#)

127 Sweden (2019) [NPT/CONF.2020/PC.III/WP.33](#)

128 China (2024) [NPT/CONF.2026/PC.II/WP.33](#) ; and China (2023) [NPT/CONF.2026/PC.I/WP.30](#)

cooperation in NRR.<sup>129</sup> Specific ideas discussed in the context of CEND included for NWS not to seek “unilateral military superiority through nuclear policies directed against other [S]tates.”<sup>130</sup>

## Illustrative NRR proposals related to threat of force

- Refrain from employing or threatening force against another State
- Respect the sovereignty, autonomy, security, and development of other States

## Extended Deterrence Arrangements

Some NNWS and at least one NWS have highlighted the potential nuclear risks involved in nuclear sharing arrangements.<sup>131</sup> China has argued that the role of nuclear weapons should be reduced in collective security doctrines of the NWS and NNWS umbrella States.<sup>132</sup> Specific NRR measures proposed in this category include ceasing nuclear sharing and extended deterrence arrangements, stopping nuclear policy of strategic force deployment, withdrawing nuclear weapons and intermediate missiles that are deployed abroad, abandoning nuclear exercises, and halting nuclear information-exchange with NNWS.<sup>133</sup> Similarly, some NNWS have recommended that States refrain from “forward-movement of nuclear weapons, including to third countries.”<sup>134</sup> In addition, the New Agenda Coalition has urged NNWS hosting nuclear weapons on their territory “to acknowledge the elevated levels of risk involved with such arrangements and seek to put an end to them”.<sup>135</sup>

## Illustrative NRR proposals related to extended deterrence arrangements

- Refrain from deploying nuclear weapons to other States and withdraw deployed ones
- Abandon nuclear exercises and halt nuclear information-exchange with NNWS
- NNWS hosting nuclear weapons to put an end to such arrangements
- NNWS to stop advocating for nuclear sharing or other extended nuclear deterrence arrangements
- NNWS hosting nuclear weapons to acknowledge the elevated risks involved
- Reduce the role of nuclear weapons in collective security doctrines of NWS and NNWS

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129 See for example CEND (2024) ; and China (2023) [NPT/CONF.2026/PC.I/WP.30](#)

130 CEND (2024) p. 6

131 China (2023) [CD/PV.1665](#)

132 China (2023) [CD/PV.1665](#) ; China (2023) [NPT/CONF.2026/PC.I/WP.30](#) ; and China (2017) [NPT/CONF.2020/PC.I/WP.36](#)

133 China (2023) [NPT/CONF.2026/PC.I/WP.30](#)

134 Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) p. 6 ; and Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#)

135 NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) p. 4

# Mapping the Scene

Both NWS and NNWS have discussed the importance of doctrines, policies, and declarations in relation to NRR, such as through declarations of restraint, and through diminishing the role of nuclear weapons in policy and practice. Similarly, some States have cautioned against inflammatory rhetoric.

The following table provides an indication of where certain suggested NRR measures were and were not discussed, with a focus on NPT working papers. It offers a general overview of where convergence can be seen among the P5, as well as between the NWS, NNWS, and other States. Note that multiple proposals on a topic do not necessarily imply agreement on specific measures, as proposed modalities may differ.

*State Proposals on Doctrinal and Declaratory Measures<sup>136</sup>*

*Rows are colour-coded by state grouping: red = P5; orange = some NWS; green = NNWS; blue = NPT draft outcome document*

|  | Statement nuclear war must never be fought | Catastrophic humanitarian consequences | Restraint declaration & defensive purposes only | Reducing role of nuclear weapons | No-first-use | Threat of force and state sovereignty | Extended deterrence arrangement |
|--|--|--|---|----------------------------------|--------------|---------------------------------------|---------------------------------|
| P5 2022 Joint Statement  |  |  |   |                                  |              |                                       |                                 |
| P5 2022 RevCon   |  |  |   |                                  |              |                                       |                                 |
| China 2023 PrepCom   |  |  |   |                                  |              |                                       |                                 |
| China 2017 PrepCom   |  |  |   |                                  |              |                                       |                                 |
| France, United Kingdom, and United States 2022 RevCon                |  |  |   |                                  |              |                                       |                                 |
| United States 2022 RevCon  |  |  |   |                                  |              |                                       |                                 |
| General Assembly Resolution "Reducing Nuclear Danger" <sup>137</sup> |  |  |   |                                  |              |                                       |                                 |

<sup>136</sup>The NPT 10th Review Conference draft final document included several risk reduction measures (while ultimately a final document was not agreed, that outcome was not due to the NRR-related passages).

<sup>137</sup>General Assembly (2023) [A/RES/78/44](#) ; Yes: 122 (including India) | No: 8 | Abstentions: 13 | Non-Voting: 9 | Total voting membership: 193

|  | Statement nuclear war must never be fought | Catastrophic humanitarian consequences | Restraint declaration & defensive purposes only | Reducing role of nuclear weapons | No-first-use | Threat of force and state sovereignty | Extended deterrence arrangement |
|--|--|--|---|----------------------------------|--------------|---------------------------------------|---------------------------------|
| Austria et al 2024 PrepCom                               |  |  |   |                                  |              |                                       |                                 |
| Austria et al 2023 PrepCom                               |  |  |   |                                  |              |                                       |                                 |
| Austria 2022 RevCon                                      |  |  |   |                                  |              |                                       |                                 |
| NAC 2024 PrepCom   |  |  |   |                                  |              |                                       |                                 |
| Non-Proliferation and Disarmament Initiative 2022 RevCon |  |  |   |                                  |              |                                       |                                 |
| States Parties Tlatelolco 2024 PrepCom                   |  |  |   |                                  |              |                                       |                                 |
| Stockholm Initiative 2024 PrepCom                        |  |  |   |                                  |              |                                       |                                 |
| Stockholm Initiative 2022 RevCon                         |  |  |   |                                  |              |                                       |                                 |
| Sweden 2019 PrepCom                                      |  |  |   |                                  |              |                                       |                                 |
| RevCon 2022 Draft Final Document                         |  |  |   |                                  |              |                                       |                                 |



Nuclear War - Regional Commissioner's bunker, Fife Scotland, Mike McBey, 2018.

## 6. Operational Measures

Operational NRR measures encompass proposals pertaining to the on-the-ground operations of nuclear weapons, their delivery and related systems, including steps such as de-targeting and de-alerting of command-and-control systems. States have considered such operational measures at various points in past discussions, and several proposals have been put forward.

### De-targeting

The NWS, NNWS and States outside the NPT have made de-targeting proposals, understood as the practice of ensuring that nuclear weapons are not aimed at specific enemy targets.<sup>138</sup> Several agreements and political commitments have addressed this issue, including the 1994 US–Russia Presidential Declaration on Mutual Detargeting,<sup>139</sup> under which the United States and the Russian Federation agreed not to target their ballistic missiles at one another, so that in the event of an accidental launch any missile would land in the open ocean rather than on the territory of either party.

The P5 have reiterated their commitment to uphold the practice of de-targeting.<sup>140</sup> On several occasions, China has suggested that de-targeting should encompass not targeting any State with nuclear weapons (i.e., de-targeting should not be merely a bilateral arrangement),<sup>141</sup> and more broadly that nuclear deterrence policies should not be directed against specific States.<sup>142</sup> These ideas were echoed by some States in the context of the CEND initiative.<sup>143</sup>

138 See for example; China (2023) [NPT/CONF.2026/PC.I/WP.30](#) ; France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; General Assembly (2023) [A/C.1/78/L.30](#) ; General Assembly (2023) [A/RES/78/44](#) ; P5 (2022) ; General Assembly (2022) [A/C.1/77/L.61](#) ; NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

139 Bill Clinton and Boris Yeltsin, *Moscow Declaration*, 14 January 1994, <https://www.govinfo.gov/content/pkg/WCPD-1994-01-24/pdf/WCPD-1994-01-24-Pg84.pdf>

140 P5 (2022)

141 China (2023) [CD/PV.1665](#) ; and China (2017) [NPT/CONF.2020/PC.I/WP.36](#)

142 China (2023) [NPT/CONF.2026/PC.I/WP.30](#)

143 CEND (2024)

## Illustrative NRR proposals related to de-targeting

- Uphold the policy of not targeting other States with nuclear weapons
- Refrain from directing deterrence policies against specific States

## De-alerting

De-alerting has been identified by several States as an NRR measure that can provide increased decision-making time in a crisis and thereby reduce the risk of accidental or inadvertent use of a nuclear weapon.<sup>144</sup> De-alerting can also reduce the risk of misinterpretation of early data or false positives from early warning systems that might otherwise contribute to an intentional launch based on incorrect information.<sup>145</sup>

Some NNWS have highlighted the importance of moving away from launch-on-warning or launch-under-attack postures,<sup>146</sup> as well as reducing the overall operational status of nuclear forces.<sup>147</sup> Suggested measures have included adopting policies or concluding agreements that reduce reliance on early launch or launch-on-warning procedures.<sup>148</sup> Some NNWS, including the New Agenda Coalition, have argued that forward stationing of nuclear weapons is contrary to efforts aimed at increasing increase reaction timelines.<sup>149</sup> They also have called for the complete abandonment of launch-under-attack postures,<sup>150</sup> whilst others have focused on improving the security of launch systems.<sup>151</sup> In the context of the CEND initiative, de-mating was raised by several States as a potential risk reduction measure.<sup>152</sup>

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144 Including Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; China (2023) [NPT/CONF.2026/PC.I/WP.30](#) ; De-Alerting Group (2015) [NPT/CONF.2015/WP.21](#) ; Denmark, Finland, Iceland, Norway, and Sweden (2015) [NPT/CONF.2015/WP.15](#) ; General Assembly (2022) [A/C.1/77/L.61](#) ; General Assembly (2023) [A/C.1/78/L.30](#) ; General Assembly (2023) [A/RES/78/44](#) ; NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) ; and United Kingdom (2021) [CD/PV.1570](#)

145 De-Alerting Group (2017)

146 Sweden (2019) [NPT/CONF.2020/PC.III/WP.33](#) ; see also Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; and Sweden (2017) [CD/PV.1411](#)

147 Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; De-Alerting Group (2019) [NPT/CONF.2020/PC.III/WP.23](#) ; Group of Non-Aligned States Parties (2024) [NPT/CONF.2026/PC.II/WP.28](#) ; Members of the Non-Proliferation and Disarmament Initiative (2021) [NPT/CONF.2020/WP.10](#) ; and Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

148 Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#)

149 NAC (2017) [NPT/CONF.2020/PC.I/WP.9](#)

150 Ibid., and CEND (2024)

151 CD (2018) [CD/WP.613](#)

152 CEND (2024)

## Illustrative NRR proposals related to de-alerting

- Encourage de-alerting and reduce operational status of nuclear weapons
- Increasing the security of launch systems
- Place appropriate legal and procedural safeguards on operational status of nuclear weapons
- Conclude agreements on de-alerting among the NWS with measurable steps and time frames
- Abandon launch-under-attack and launch-on-warning postures
- Adopt policies that reduce and eliminate dependency on early launch or launch-on-warning

## Reliable Command and Control

Some NWS and NNWS have highlighted the importance of maintaining and securing human control in nuclear decision-making.<sup>153</sup> Several NNWS have also called on the NWS and nuclear-armed States to adopt measures that reduce risks stemming from potential cyber threats, particularly those affecting nuclear command and control systems.<sup>154</sup> States further have discussed the risks from and regulation of emerging and potentially disruptive technologies that could affect command and control systems and deterrence stability, including hypersonic glide vehicles, autonomous platforms, and artificial intelligence.<sup>155</sup>

## Illustrative NRR proposals related to command and control

- Maintain human control in all actions informing and executing decisions vis-à-vis nuclear weapons use
- Address potential vulnerabilities emerging from disruptive technologies and cyberthreats to nuclear command and control systems

## Nuclear Safety and Security

The NWS and NNWS have discussed NRR measures designed to ensure the safety and security of nuclear facilities, with a varying focus on nuclear weapons, special nuclear material, and stockpiles, as well as nuclear facilities for peaceful uses.<sup>156</sup>

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153 Belgium (2024) ; and France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#)

154 Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#)

155 Sweden (2019) [NPT/CONF.2020/PC.III/WP.33](#) ; and United States (2019) [CD/PV.1501](#)

156 Including Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; Belgium (2018) ; China (2023) [CD/PV.1665](#) ; China (2023) [NPT/CONF.2026/PC.I/WP.30](#) ; France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; and P5 (2021) [NPT/CONF.2020/WP.33](#)

The P5 have noted that the safety and security of and around nuclear weapons is “essential to sustaining a credible and effective deterrent”, and complementary to NRR.<sup>157</sup> Some States have discussed training for nuclear weapons-related emergencies.<sup>158</sup> China has suggested that safety and security discussions should focus on opposing armed attacks on peaceful nuclear facilities – as in accordance with the Convention on Nuclear Safety – as well as support the avoidance of man-made nuclear accidents.<sup>159</sup> Similarly, some States in the context of the CEND initiative explored the promotion of nuclear safety through relevant agreements and associated commitments among the NWS in regard to nuclear-related facilities.<sup>160</sup> Moreover, it was suggested that States’ legislation can itself help to enhance protection, prevent unauthorized access, and promote the sharing of information with relevant international counterparts about accidents involving nuclear weapons and the steps taken in response.<sup>161</sup>

## Illustrative NRR measures linked to nuclear safety and security

- Ensure the safety and security of nuclear weapons, special nuclear material, and stockpiles, as well as nuclear facilities for peaceful uses
- Comply with the Convention on Nuclear Safety
- Prevent armed attacks on nuclear power plants and other peaceful nuclear facilities and avoid man-made nuclear accidents

## Mapping the Scene

Proposed operational measures mostly serve to increase decision-making time, avoid escalatory decisions due to miscalculation, and ensure the safety and security of nuclear systems. The most commonly suggested operational measure among the NWS and some nuclear-armed States is de-targeting. The NNWS and some NWS have proposed other measures more frequently, including de-alerting, reducing operational status of nuclear weapons, and ensuring the security of command and control systems.

The following table provides an indication of where certain suggested NRR measures were and were not discussed, with a focus on NPT working papers. It offers a general overview of where convergence can be seen among the P5, as well as between the NWS, NNWS, and other States. Note that multiple proposals on a topic do not necessarily imply agreement on specific measures, as proposed modalities may differ.

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157 P5 (2021) [NPT/CONF.2020/WP.33](#) p.2

158 CD (2018) [CD/WP.613](#)

159 China (2023) [NPT/CONF.2026/PC.I/WP.30](#)

160 CEND ([2024](#))

161 Ibid.

### State Proposals on Operational Measures<sup>162</sup>

Rows are colour-coded by State grouping: red = P5; orange = some NWS; green = NNWS; blue = NPT draft outcome document

|  | De-targeting | De-alerting | Launch-on-warning & launch-under-attack | Operational status | Command & control | Nuclear safety & security |
|--|--------------|-------------|---|--------------------|-------------------|---------------------------|
| P5 2022 Joint Statement  | Red          |             |   |                    |                   |                           |
| P5 2022 RevCon   | Red          |             |   |                    |                   | Red                       |
| China 2023 PrepCom   | Orange       | Orange      |   |                    |                   | Orange                    |
| China 2017 PrepCom   | Orange       |             |   |                    |                   |                           |
| France, United Kingdom, and United States 2022 RevCon                | Orange       |             |   |                    | Orange            | Orange                    |
| United States 2022 RevCon  | Orange       |             |   |                    |                   |                           |
| General Assembly Resolution "Reducing Nuclear Danger" <sup>163</sup> | Orange       | Orange      |   |                    |                   |                           |
| Austria et al 2024 PrepCom   |              | Green       | Green                                   | Green              | Green             | Green                     |
| Austria et al 2023 PrepCom   |              | Green       | Green                                   | Green              | Green             | Green                     |
| Austria 2022 RevCon  |              | Green       | Green                                   | Green              | Green             | Green                     |
| NAC 2024 PrepCom   | Green        | Green       |   |                    | Green             |                           |

<sup>162</sup> The NPT 10th Review Conference draft final document included several risk reduction measures (while ultimately a final document was not agreed, that outcome was not due to the NRR-related passages).

<sup>163</sup> General Assembly (2023) [A/RES/78/44](#) ; Yes: 122 (including India) | No: 8 | Abstentions: 13 | Non-Voting: 9 | Total voting membership: 193

|  | De-targeting | De-alerting | Launch-on-warning & launch-under-attack | Operational status | Command & control | Nuclear safety & security |
|--|--------------|-------------|---|--------------------|-------------------|---------------------------|
| Non-Proliferation and Disarmament Initiative 2022 RevCon |              |             |   |                    |                   |                           |
| States Parties Tlatelolco 2024 PrepCom                   |              |             |   |                    |                   |                           |
| Stockholm Initiative 2024 PrepCom                        |              |             |   |                    |                   |                           |
| Stockholm Initiative 2022 RevCon                         |              |             |   |                    |                   |                           |
| Sweden 2019 PrepCom                                      |              |             |   |                    |                   |                           |
| RevCon 2022 Draft Final Document                         |              |             |   |                    |                   |                           |

## 7. Technological Governance

NRR measures related to technological governance primarily concern delivery systems and emerging technologies, with several proposals aimed at mitigating the potential for miscalculation and misunderstanding arising from the ‘entanglement’ of nuclear and conventional systems. Measures considered in relation to nuclear weapons and dual-use delivery systems have largely been raised by NNWS, where proposals have focused either on limiting existing capabilities or on regulating the development of new capabilities. Discussions on emerging technologies have been raised by a wide range of States.

### Delivery Systems and Dual-Capable Systems

Several NNWS have expressed concern related to nuclear weapon delivery systems and have proposed measures variously limiting, preventing, and ultimately banning the deployment of all nuclear-armed cruise missiles;<sup>164</sup> committing to not developing or deploying certain categories of nuclear weapons or delivery systems;<sup>165</sup> and committing to not introducing new nuclear weapons delivery systems.<sup>166</sup> Another proposal, raised by some States in the context of the CEND initiative, is to restrict or ban certain delivery systems, with a focus on those considered most destabilizing.<sup>167</sup>

Some delivery systems are dual-capable and thus can be used to deliver either conventional payloads or weapons of mass destruction. NNWS have noted that such dual-capable delivery systems could increase the risk of misunderstanding and miscalculation due to the ambiguity of such systems and

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<sup>164</sup> Austria (2022) [NPT/CONF.2020/WP.60](#) ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; and Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#)

<sup>165</sup> Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

<sup>166</sup> Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#)

<sup>167</sup> CEND ([2024](#))

the entanglement that arises among nuclear and conventional weapons, delivery systems, and military installations.<sup>168</sup> Proposed measures to address this issue have included establishing a clear distinction between conventional and nuclear delivery systems, with the possibility of legally binding provisions having been discussed in the context of the CEND initiative.<sup>169</sup> It has also been suggested that separating nuclear and conventional military installations and platforms could reduce risks and help to “demonstrate that nuclear weapons are purely political/strategic tools, signal that militaries are not contemplating fighting to win in nuclear conflict, and reduce the risk that attacks on dual-use [command, control, communications, intelligence] facilities could be interpreted as strategic attempts to knock out a second-strike capability”.<sup>170</sup>

Another issue pertains to developments in both defensive and offensive systems and the implications for nuclear risk. Several NNWS have recommended that the NWS further examine the impact of emerging types of delivery vehicles, including dual-capable long-range systems.<sup>171</sup> In the context of the CEND initiative, some States had proposed measures to prohibit or refrain from developing defensive systems, particularly those considered to undermine strategic stability, heighten nuclear risks, or neutralize the nuclear deterrent capabilities of other States.<sup>172</sup>

## Illustrative NRR proposals related to delivery systems

- Commit not to develop or deploy certain categories of nuclear weapons and delivery systems
- Reduce perceived ambiguity and entanglement between nuclear and conventional weapons, including by clearly marking or distinguishing between nuclear and conventional weapons, delivery systems, and military installations
- Further explore the risk implications of new types of delivery vehicles as well as dual-capable long-range delivery systems
- Limit, prevent, and ultimately ban the deployment of all nuclear-armed cruise missiles

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168 Including Austria (2022) [NPT/CONF.2020/WP.60](#) ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; Austria et al. (2023) [NPT/CONF.2026/PC.I/WP.24](#) ; Members of the Non-Proliferation and Disarmament Initiative (2021) [NPT/CONF.2020/WP.10](#) ; and Sweden (2019) [NPT/CONF.2020/PC.III/WP.33](#)

169 CEND (2024)

170 Sweden (2019) [NPT/CONF.2020/PC.III/WP.33](#) p.5 ; Austria et al. (2024) [NPT/CONF.2026/PC.II/WP.16](#) ; and Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

171 Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

172 CEND (2024)

# Information and Communications Technology and Artificial Intelligence

Some NWS, NNWS, and nuclear-armed States have discussed the impact of emerging technologies – particularly information and communications technologies (ICT) and artificial intelligence (AI) – on nuclear risks. Proposals generally range from the need to discuss such technologies further, reach agreements to contain or mitigate their impact, and recognize that nuclear use risks increase with their continued development and use.<sup>173</sup>

Several States, including China, have encouraged a comprehensive assessment of emerging technologies,<sup>174</sup> noting that States should “promote the establishment of rules and regulations for such new frontiers in strategic security ... and regulate the military applications of emerging technologies”.<sup>175</sup> Pakistan has highlighted the need for NRR to be approached in a holistic manner, which could include developing a multilateral regulatory framework for norms and legally binding instruments for emerging technologies.<sup>176</sup>

On the role of AI, the United States has highlighted the 2023 Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy.<sup>177</sup> This initiative has engaged a group of NWS and NNWS with the aim of building an international consensus around norms of responsible behaviour for military use of AI, with the hope of reducing risks associated with the intersection of nuclear weapons and AI.<sup>178</sup>

Several NNWS have noted the need to minimize possible vulnerabilities related to disruptive technologies and capabilities in terms of ICT.<sup>179</sup> The NWS are encouraged to explore further possible steps to reduce the likelihood of emerging technologies – including ICT and AI – exacerbating or producing nuclear risks.<sup>180</sup> Emerging technologies were also considered in the context of the CEND initiative, where some States had discussed measures of reaching common understandings on ICT capabilities, as well as reaching agreements to work towards minimizing potential vulnerabilities in that regard.<sup>181</sup>

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173 For the latter, see NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#)

174 China (2023) [NPT/CONF.2026/PC.I/WP.30](#)

175 China (2023) [CD/PV.1665](#) p. 26

176 Pakistan (2023) [CD/PV.1665](#)

177 United States, “Political Declaration on Responsible Military Use of Artificial Intelligence and Autonomy”, 9 November 2023, <https://www.state.gov/political-declaration-on-responsible-military-use-of-artificial-intelligence-and-autonomy-2/>

178 United States (2023) [CD/PV.1665](#)

179 Spain (2021) [CD/PV.1570](#) ; Members of the Non-Proliferation and Disarmament Initiative (2021) [NPT/CONF.2020/WP.10](#) ; and Stockholm Initiative (2024) [NPT/CONF.2026/PC.II/WP.13](#)

180 Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

181 CEND ([2024](#))

Nevertheless, several NNWS have noted the potential positive role of emerging technologies in contributing to improving the security environment, mitigating and reducing nuclear risks, and have encouraged the exploration of such either among the NWS<sup>182</sup> or among all States.<sup>183</sup>

## Illustrative NRR proposals related to ICT and AI

- Conduct a comprehensive assessment of the possible security challenges raised by emerging technologies
- Minimize possible vulnerabilities related to disruptive technologies and ICT capacities
- Develop a multilateral regulatory framework for norms and legally binding instruments for emerging technologies
- Build an international consensus around norms of responsible behaviour for military use of AI
- Acknowledge that developments in ICT and AI increase the threat of use or risk of use of nuclear weapons
- Consider NRR measures with new types of destabilizing weapons systems in mind
- Engage in a structured dialogue around the impact of disruptive emerging technologies, including ICT and AI
- Promote the establishment of rules and regulations on ICT and AI in strategic security
- Regulate the military applications of emerging technologies
- Further explore the potential positive role of such technologies in contributing to improving the security environment, and mitigating and reducing nuclear risks

## Space Systems

Concerns regarding outer space and its implications for nuclear risks have been raised by China and several NNWS. For example, China has warned that the development of new weapon systems, including those involving weapons placed in outer space, may undermine global strategic stability and international nuclear disarmament efforts.<sup>184</sup> Some NNWS have proposed that the NWS further explore the impact of counter-space capabilities on nuclear risks,<sup>185</sup> while others have suggested that all States should engage in a structured dialogue on the influence of the outer space systems on strategic stability and nuclear risks.<sup>186</sup> Several NNWS have called on States to respect their obligations under the 1967 Outer Space Treaty, under which States have committed not to station nuclear weapons in orbit, on celestial bodies, or in outer space.<sup>187</sup>

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182 Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

183 Stockholm Initiative (2024) [NPT/CONF.2026/PC.II/WP.13](#)

184 China (2023) [NPT/CONF.2026/PC.I/WP.30](#)

185 Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

186 Stockholm Initiative (2024) [NPT/CONF.2026/PC.II/WP.13](#)

187 NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#)

## Illustrative NRR proposals related to space systems

- Engage in a structured dialogue on the impact of outer space systems on strategic stability and nuclear risks
- Further explore the impact of counter-space capabilities on nuclear risks
- Refrain from developing additional weapon systems for use in outer space
- Hold to the Outer Space Treaty commitments not to place nuclear weapons in space

## Mapping the Scene

Nuclear and dual-use delivery systems have received attention primarily from NNWS, with proposals ranging from reducing entanglement concerns to placing limits on certain delivery systems. Emerging technologies have been raised by the NWS and NNWS, with some detailing proposals on ICT, AI, and space systems. Proposed measures usually have concerned the need to discuss these various technologies in the NRR context or to conclude agreements addressing their possible impacts.

The following table provides an indication of where certain suggested NRR measures were and were not discussed, with a focus on NPT working papers. It offers a general overview of where convergence can be seen among the P5, as well as between the NWS, NNWS, and other States. Note that multiple proposals on a topic do not necessarily imply agreement on specific measures, as proposed modalities may differ.

*States Proposals on Technological Governance Measures<sup>188</sup>*

*Rows are colour-coded by State grouping: red = P5; orange = some NWS; green = NNWS; blue = NPT draft outcome document*

|                         | Delivery systems | Dual use | New and emerging technology | ICT | AI | Space |
|-------------------------|------------------|----------|-----------------------------|-----|----|-------|
| P5 2022 Joint Statement |                  |          |                             |     |    |       |
| P5 2022 RevCon          |                  |          |                             |     |    |       |
| China 2023 PrepCom      |                  |          |                             |     |    |       |
| China 2017 PrepCom      |                  |          |                             |     |    |       |

<sup>188</sup> The NPT 10th Review Conference draft final document included several risk reduction measures (while ultimately a final document was not agreed, that outcome was not due to the NRR-related passages).

|  | Delivery systems | Dual use | New and emerging technology | ICT | AI | Space |
|--|------------------|----------|-----------------------------|-----|----|-------|
| France, United Kingdom, and United States 2022 RevCon                |                  |          |                             |     |    |       |
| United States 2022 RevCon  |                  |          |                             |     |    |       |
| General Assembly Resolution “Reducing Nuclear Danger” <sup>189</sup> |                  |          |                             |     |    |       |
| Austria et al 2024 PrepCom   |                  |          |                             |     |    |       |
| Austria et al 2023 PrepCom   |                  |          |                             |     |    |       |
| Austria 2022 RevCon  |                  |          |                             |     |    |       |
| NAC 2024 PrepCom   |                  |          |                             |     |    |       |
| Non-Proliferation and Disarmament Initiative 2022 RevCon             |                  |          |                             |     |    |       |
| State Parties Tlatelolco 2024 PrepCom                                |                  |          |                             |     |    |       |
| Stockholm Initiative 2024 PrepCom                                    |                  |          |                             |     |    |       |
| Stockholm Initiative 2022 RevCon                                     |                  |          |                             |     |    |       |
| Sweden 2019 PrepCom  |                  |          |                             |     |    |       |
| RevCon 2022 Draft Final Document                                     |                  |          |                             |     |    |       |

189 General Assembly (2023) [A/RES/78/44](#) ; Yes: 122 (including India) | No: 8 | Abstentions: 13 | Non-Voting: 9 | Total voting membership: 193



## 8. Outreach and Research Measures

On occasion, outreach and research NRR measures have also been identified, including initiatives related to education, awareness-raising, and gender inclusivity and equality. Both the NWS and NNWS have raised the importance of research and capacity-building, although specific areas of focus have varied.

### Education and Awareness-Raising

Education and awareness-raising are discussed primarily by NNWS. Several NRR-related proposals highlight the importance of educating individuals of all generations – with a particular emphasis on youth – on nuclear risks, non-proliferation, arms control, disarmament, and the humanitarian consequences of nuclear weapons.<sup>190</sup> It has been proposed to advance such efforts through internships, model events, mentoring programmes, dialogue platforms, fellowships, and other initiatives. Specific activities could include visits to the cities of Hiroshima and Nagasaki; direct engagement with communities affected by nuclear weapon testing and use; and engagement with young professional networks. Education is also seen to be a part of ensuring the general public is aware of nuclear issues and their potential devastating impact.

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<sup>190</sup> See Broadly-Likeminded Group (2022) ; CEND (2024) NPT 10th RevCon Draft Final Document (2022) [NPT/CONF.2020/CRP.1/Rev.2](#) ; and Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

## Illustrative NRR proposals related to education and awareness-raising

- Educate individuals of all generations – with an emphasis on youth – on nuclear risks
- Raise awareness on the catastrophic humanitarian consequences of nuclear weapon testing and use through community engagement
- Further scientific research on the consequences of nuclear detonations

## Research and Capacity-building

Some States have recognized the value of research and capacity-building as a means of NRR,<sup>191</sup> although specific areas of focus vary. Several NNWS have suggested further investigation of operational uncertainties and pathways to nuclear use,<sup>192</sup> have emphasized the need to advance scientific studies on the consequences of nuclear weapon use – including the widespread and intergenerational effects of nuclear weapons<sup>193</sup> – and have encouraged the integration of gender concerns,<sup>194</sup> including sex and gender-specific impacts.<sup>195</sup>

Scientific research on such issues is seen as playing a role in preparing States to “clearly and publicly acknowledge the catastrophic consequences of any nuclear weapons use”.<sup>196</sup> Most NWS and some NNWS have noted the need to commit to and enhance active research on nuclear disarmament verification to develop reliable mechanisms to that end,<sup>197</sup> with some highlighting that such efforts should include the participation of both the NWS and NNWS.<sup>198</sup> Some States have encouraged engagement with efforts within the United Nations, such as Groups of Governmental Experts, Open-ended Working Groups, and capacity-building for ultimately achieving complete and irreversible disarmament.<sup>199</sup>

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191 P5 (2021) [NPT/CONF.2020/WP.33](#) ; see also France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; United Kingdom (2021) [CD/PV.1570](#) ; and United States (2022) [NPT/CONF.2020/WP.55](#)

192 Non-Proliferation and Disarmament Initiative Members of the Non-Proliferation and Disarmament Initiative WP (2021) [NPT/CONF.2020/WP.10](#)

193 ‘Widespread’ in the sense that nuclear detonations do not respect borders; see NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#)

194 See for example CEND (2024) ; and Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

195 Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

196 NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#) p.4

197 See for example Bulgaria (2022) ; CEND (2024) ; China (2023) [NPT/CONF.2026/PC.I/WP.30](#) ; and France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#)

198 NAC (2024) [NPT/CONF.2026/PC.II/WP.2](#)

199 France, United Kingdom, and United States (2022) [NPT/CONF.2020/WP.70](#) ; and Stockholm Initiative (2021) [NPT/CONF.2020/WP.9](#)

# Illustrative NRR proposals related to research and capacity-building

- Value contributions made by, and engage with, civil society in working on NRR
- Further investigate operational uncertainties and pathways to nuclear use
- Further advance and support scientific research on the consequences of nuclear weapons use
- Commit to and enhance active research on nuclear disarmament verification, and support multilateral efforts to develop common understandings and methodologies
- Ensure the equal, full, and effective participation and leadership of both women and men
- Apply gender-based analysis to NRR

## Mapping the Scene

Generally, outreach and research measures receive less attention in NRR proposals than other categories of measures. Nevertheless, there have been a handful of proposals by both the NWS and NNWS on research and capacity-building, and several NNWS have further discussed education and awareness-raising initiatives, as well as the importance of understanding the gendered implications of nuclear weapons.

The following table provides an indication of where certain suggested NRR measures were and were not discussed, with a focus on NPT working papers. It offers a general overview of where convergence can be seen among the P5, as well as between the NWS, NNWS, and other States. Note that multiple proposals on a topic do not necessarily imply agreement on specific measures, as proposed modalities may differ.

*States Proposals on Outreach and Research Measures<sup>200</sup>*

*Rows are colour-coded by State grouping: red = P5; orange = some NWS; green = NNWS; blue = NPT draft outcome document*

|                         | Education & awareness raising | Research & capacity building | Nuclear disarmament verification | Gender equality & inclusivity |
|-------------------------|-------------------------------|------------------------------|----------------------------------|-------------------------------|
| P5 2022 Joint Statement |                               |                              |                                  |                               |
| P5 2022 RevCon          |                               |                              |                                  |                               |
| China 2023 PrepCom      |                               |                              |                                  |                               |
| China 2017 PrepCom      |                               |                              |                                  |                               |

<sup>200</sup>The NPT 10th Review Conference draft final document included several risk reduction measures (while ultimately a final document was not agreed, that outcome was not due to the NRR-related passages).

|  | Education & awareness raising | Research & capacity building | Nuclear disarmament verification | Gender equality & inclusivity |
|--|-------------------------------|------------------------------|----------------------------------|-------------------------------|
| France, United Kingdom, and United States 2022 RevCon                |                               |                              |                                  |                               |
| United States 2022 RevCon  |                               |                              |                                  |                               |
| General Assembly Resolution “Reducing Nuclear Danger” <sup>201</sup> |                               |                              |                                  |                               |
| Austria et al 2024 PrepCom   |                               |                              |                                  |                               |
| Austria et al 2023 PrepCom   |                               |                              |                                  |                               |
| Austria 2022 RevCon  |                               |                              |                                  |                               |
| NAC 2024 PrepCom   |                               |                              |                                  |                               |
| Non-Proliferation and Disarmament Initiative 2022 RevCon             |                               |                              |                                  |                               |
| State Parties Tlatelolco 2024 PrepCom                                |                               |                              |                                  |                               |
| Stockholm Initiative 2024 PrepCom                                    |                               |                              |                                  |                               |
| Stockholm Initiative 2022 RevCon                                     |                               |                              |                                  |                               |
| Sweden 2019 PrepCom  |                               |                              |                                  |                               |
| RevCon 2022 Draft Final Document                                     |                               |                              |                                  |                               |

201 General Assembly (2023) [A/RES/78/44](#) ; Yes: 122 (including India) | No: 8 | Abstentions: 13 | Non-Voting: 9 | Total voting membership: 193



Hack Green Nuclear Bunker, Jonathan Stonehouse, 2014.

## Conclusion

There is a substantial body of proposed NRR measures put forward by the NWS, NNWS, and States outside the NPT. As the salience of nuclear weapons has again increased, a growing number of States have engaged in discussions aimed at reducing, preventing, and managing nuclear risks.

This compendium surveys a decade of official proposals, drawing on General Assembly resolutions, NPT working papers, and formal national statements. It offers a structured framework for mapping these proposals and identifies areas of convergence and divergence among States. It provides a clear picture of which proposals have – and have not – been explored in order to assist negotiators in considering options and identifying potential common ground.

The breadth of proposals demonstrates that many ideas for NRR measures already exist. Some focus on sustaining and strengthening existing mechanisms, while others call for new discussions or the development of additional measures. Certain proposals enjoy broad support across both the NWS and NNWS, whereas others have been advanced primarily by a smaller number of States.

The analysis here highlights that differences in how States conceptualize NRR continue to shape the structure of discussions. While some States emphasize strategic stability and arms control, others focus on reductions, assurances, and broader normative commitments. There are advantages to a broad understanding of risk reduction in negotiations and in applying constructive ambiguity; however, the variety of NRR-related measures can complicate operational activities where greater specificity is required. Yet differences in approaches do not preclude progress in both discussions and implementation of measures.

Progress on nuclear risk reduction – or the exacerbation of nuclear risks – will be shaped by the interests and priorities of States and their readings of their geopolitical contexts. Yet not all progress is constrained by such factors. The steady expansion of States engaging in discussions on nuclear risk reduction underscores the importance of maintaining momentum. Sustaining institutional knowledge and providing accessible resources are essential efforts to ensure that, when conditions are favourable, States are well positioned to advance implementation.

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202 Yes: 122 (including India) | No: 8 | Abstentions: 13 | Non-Voting: 9 | Total voting membership: 193

203 Yes: 147 | No: 6 | Abstentions: 27 | Non-Voting: 13 | Total voting membership: 193

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