

## CEND Subgroup 3

### Interim Measures to Reduce the Risks Associated with Nuclear Weapons

#### **Conclusions**

Risk reduction measures which can contribute to an improved security environment, and how and where these risk reduction measures could be addressed.

#### **Summary**

This text was prepared under the responsibility of the Co-Chairs, Ambassador Michael Biontino and Ambassador Jarmo Viinanen, and assisted by the NGO-facilitator Wilfred Wan to reflect the discussion and the diverging views of Subgroup 3, including on the use of the terminology concerning risk reduction. This text, as well as Compendium 1 and Compendium 2 reflecting previous stages of the discussion in Subgroup 3, do not reflect a consensus and are without prejudice to national positions.

1. As states aim to achieve a world free of nuclear weapons, it will be necessary to pursue interim measures to enhance security and reduce all risks associated with nuclear weapons, as appropriate, and the likelihood of nuclear weapons use.
2. Nuclear risk reduction is neither a substitute nor a prerequisite for nuclear disarmament and efforts in this area could, without conditionality, contribute to forward movement related to nuclear disarmament commitments.
3. Deep concerns about nuclear risks between nuclear-armed states<sup>1</sup> and towards non-nuclear-armed states, have been a long-standing item on the agenda of relevant fora for nuclear arms control, disarmament and non-proliferation. In addition, there are considerable contributions from civil society, research centers and academia, highlighting, in particular, the persistent existence of nuclear risks and pathways to address them.
4. In the light of
  - a deteriorating international security environment,
  - including the continued or increased salience of nuclear weapons in the respective security policies and
  - the lack of progress in the pursuit of disarmament commitments and obligations, in particular as required by Article VI of the NPT, as applicable, as well as
  - the development and deployment of new offensive and defensive weapons systems,

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<sup>1</sup> the term nuclear-armed states refers to nuclear-weapon States under the NPT as well as other possessor states, not implying a legitimization of the possession of nuclear weapons.

there is an urgent need to promote discussions on risks of nuclear weapons use between nuclear-armed states and with non-nuclear-armed states and other States concerned, to foster understanding between diverging views.

5. In the framework of the initiative “Creating an Environment for Nuclear Disarmament” (CEND) a substantive exchange of views has been carried out on the issue of “Interim Measures to Reduce the Risks Associated with Nuclear Weapons”.
6. In doing so, the CEND discussion aimed at
  - at taking stock of different types of nuclear risk reduction measures (political-dochtrinal, strategic, operational, confidence and security building and crisis and conflict managements measures) and
  - identifying potential ways to address all nuclear risks, as appropriate, and, in particular, the risk of nuclear weapon use, as an important step towards an improved international security environment and a world without nuclear weapons.
7. As part of the CEND discussions all participants affirmed their commitment to non-proliferation and disarmament.
8. In order for nuclear risk reduction to be to be effective and efficient it seems important to distinguish unilateral, bilateral and multilateral risk reduction measures. They should be tailored accordingly.
9. The political will, especially among nuclear-armed states, to agree, or unilaterally decide, and consequently implement nuclear risk reduction measures is essential. In addition, the role of non-nuclear-armed states is vital and they can contribute to nuclear risk reduction in meaningful ways.

## **Background**

10. Deep concerns about nuclear risks between nuclear-armed states and towards non-nuclear-armed states, have been a long-standing item on the agenda of relevant fora for nuclear arms control, disarmament and non-proliferation.
11. The deliberations on nuclear risks and how to address have been a central issue in a number of fora, including the 2022 Review Conference of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT), where a wide cross-section of States Parties participated in this discussion and presented working papers<sup>2</sup>, reflecting, in particular, the urgency of the issue.

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<sup>2</sup> See in particular

- Draft Final Document of the 2022 Review Conference; NPT/CONF.2020/CRP.1/Rev.1
- Taking forward nuclear disarmament , Working paper submitted by Brazil on behalf of the New Agenda Coalition, NPT/CONF.2020/WP.5
- A nuclear risk reduction package, Working paper submitted by the Stockholm Initiative; NPT/CONF.2020/WP.9
- Measures to reduce the breadth of risks associated with nuclear weapons and measures to avoid increasing this risk, Working paper submitted by Austria, Chile, Colombia, Costa Rica, Ecuador, Guatemala, Honduras, Kazakhstan, Kiribati, Liechtenstein, Malta, Mexico, Nigeria, Paraguay, Peru, San Marino and Thailand, NPT/CONF.2020/WP.60/Rev.1
- Recommendations for consideration by the tenth Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Joint working paper submitted by the members of the Non-Proliferation and Disarmament Initiative; NPT/CONF.2020/WP.10
- Nuclear disarmament, Working paper submitted by the members of the Group of Non-Aligned States Parties to the Treaty on the Non-Proliferation of Nuclear Weapons; NPT/CONF.2020/WP.20

12. Previously, such risks have been considered, among others, as well in the framework of
  - the Conference on Disarmament
  - the First Committee of the United Nations and
  - the UN Disarmament Commission,
  - the UN-SGs Disarmament Agenda “Securing our Common Future”,
  - Nuclear-Weapon-Free Zones (NWFZs) as well as
  - the meetings of the five nuclear-weapon States of the NPT
  
13. In addition, there is a considerable body of publications with pertinent contributions from civil society, research centers and academia, highlighting, in particular, the persistent existence of nuclear risks and pathways to address them.
  
14. Furthermore, substantial efforts were undertaken in informal political processes, such as the Stockholm Initiative<sup>3</sup> and the initiative “Creating an Environment for Nuclear Disarmament<sup>4</sup>”, to develop proposals to address nuclear risks.
  
15. In the framework of the initiative “Creating an Environment for Nuclear Disarmament” (CEND) a substantive exchange of views has been carried out on the issue of “Interim Measures to Reduce the Risks Associated with Nuclear Weapons” to contribute to progress on nuclear risk reduction in general and, in particular, on
  - Political-doctrinal measures: commitments regarding decreasing the role of nuclear weapons in doctrines and security policies, including those of alliances, and limiting the circumstances under which these weapons may be used (e.g. no first use; non-use against non-nuclear-armed states; strictly defensive purposes) including transparency on these measures,
  - Strategic measures: changes in the deployment of nuclear weapons, including reductions, restrictions, and protection of nuclear weapons systems
  - Operational measures: changes in operational procedures, including launch, storage, and transport procedures, as well as commitments regarding de-targeting and de-alerting of nuclear weapons, and preventing unauthorized access to nuclear weapons-related materials, equipment and technology, as appropriate
  - Confidence and security building measures: increased dialogue, information exchange and transparency regarding nuclear weapons
  - Crisis and conflict prevention and management measures: improving crisis and conflict prevention and management mechanisms, in particular communication channels, in order to prevent any situation escalating towards potential nuclear levels. Crisis management should be complementary to crisis prevention.

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- Substantive recommendations for incorporation into the final document of the tenth Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons, Working paper submitted by the Group of Non-Aligned States Parties to the Treaty on the Non-Proliferation of Nuclear Weapons; NPT/CONF.2020/WP.26
  - Strategic risk reduction, Working paper submitted by China, France, the Russian Federation, the United Kingdom of Great Britain and Northern Ireland and the United States of America; NPT/CONF.2020/WP.33
  - Priorities of the European Union for the tenth Review Conference of the Parties to the Treaty on the Non-Proliferation of Nuclear Weapons; Working paper submitted by the European Union; NPT/CONF.2020/WP.36
  - U.S. Leadership in Strategic Risk Reduction, Working paper submitted by the United States of America; NPT/CONF.2020/WP.55
  - Principles and responsible practices for Nuclear Weapon States, Working paper submitted by France, the United Kingdom of Great Britain and Northern Ireland and the United States of America; NPT/CONF.2020/WP.70

<sup>3</sup> See: Stepping stones for advancing nuclear disarmament; [www.auswaertiges-amt.de/en/newsroom/news/npt-50/2310112](http://www.auswaertiges-amt.de/en/newsroom/news/npt-50/2310112) and NPT/CONF.2020/WP.6

<sup>4</sup> See: <https://2017-2021.state.gov/united-states-hosts-the-creating-an-environment-for-nuclear-disarmament-working-group-kick-off-plenary-meeting/index.html>; <https://2017-2021.state.gov/creating-an-environment-for-nuclear-disarmament-working-group-meets-in-wilton-park/index.html>

16. The present “Conclusions” endeavor to summarize the diversity of views expressed during these discussions and to contribute to thinking in order to identify risk reduction measures which can contribute to an improved security environment, and how and where these risk reduction measures could be addressed.

### **Urgency of addressing nuclear risks**

17. Today, addressing nuclear risks will have to take into account the present international security environment, especially the deteriorating geo-strategic situation as well as the development and deployment of new offensive and defensive weapons systems. Both as a driver of, and as a reaction to the present security environment, nuclear-armed states and other states concerned have maintained or increased the salience of nuclear weapons in their respective security policies.

18. Concerning the deteriorating geo-strategic situation, the following drivers would have to be taken into consideration:

- the re-emergence of great power strategic competition,
- the present stress on multilateralism and the nuclear arms control, disarmament and non-proliferation architecture including the demise of arms control arrangements,
- disquieting trends of non-respect of international law,
- offensive nuclear rhetoric and behaviour of certain political leaders intended for military coercion, intimidation or blackmail,
- a perceived lowered threshold for the use of nuclear weapons (e.g. non-strategic nuclear weapons),
- persistent regional crises and the emergence of new regional crises scenarios, with global political and economic implications,
- crises involving nuclear-armed states as well as non-nuclear-armed states, with asymmetric and hybrid means of warfare and the potential of spiraling out of control,
- heightened risks of nuclear proliferation crises and proliferation dynamics

19. Concerns related to new offensive and defensive weapon systems have emerged, in particular, in relation to new technologies and capabilities that could increase the impact of conventional weapons such as

- proliferation of conventional weapons with strategic impact,
- cyber threats,
- operational space capabilities
- qualitatively new missile technologies, e.g. hypersonic delivery systems.

This can affect the strategic balance and contribute to doctrinal decisions by nuclear-armed states which could be perceived as influencing the use of nuclear responses to conventional attacks. Such a scenario, linked to developments of offensive and defensive capabilities, could compound perceived risks amongst nuclear-armed states and heighten the risk of nuclear escalation.

20. Some of the concerns above have been mentioned in existing work as listed in Paras 13 and 14, as heightening the risk associated with nuclear weapons.

21. Against this backdrop an inclusive dialogue on nuclear risks is a shared responsibility and requires serious commitments from all states, especially nuclear-armed states.

## **Factors to be taken in consideration concerning measures on nuclear risk reduction**

In the discussion on nuclear risk reduction a number of important arguments have been brought forward:

22. The devastation that would be visited upon humankind by a nuclear war, and the consequent need to make every effort to avert the danger of such a war and to take measures to safeguard the security of peoples,
23. Nuclear risks will persist as long as nuclear weapons exist and the total and permanent elimination of nuclear weapons in a transparent, irreversible, and verifiable manner, is the only way to fully eliminate all risks associated with these weapons,
24. Nuclear risk reduction is neither a substitute nor a prerequisite for nuclear disarmament and efforts in this area could, without conditionality, contribute to forward movement related to nuclear disarmament commitments,
25. The deep concern about the catastrophic humanitarian consequences of nuclear war, or about any such use of nuclear weapons, including through the potential pathways, identified as:
  - intentional use - in accordance with declaratory policies and ambiguities thereof,
  - use by miscalculation - based on incorrect assumptions or linked to a conflict or crisis spiraling out of control,
  - accidental use - linked to error, technical malfunction or false alarm,
  - unauthorised use, non-sanctioned use or use by non-state actors,
26. Furthermore, a dialogue, joint efforts and especially concrete measures on nuclear risk reduction could contribute to a number of important functions, inter alia by
  - improving the international security environment by re-establishing trust in general,
  - building confidence and reliable communications between nuclear-armed states and with non-nuclear-armed states,
  - serving as an intermediate step to engage in substantive discussions towards a world without nuclear weapons,
  - preserving the norm against the use of nuclear weapons,
  - facilitating agreements on measures that reduce the risk associated with any use of nuclear weapons,
  - bridging gaps in security perceptions and risks between nuclear-armed states and between nuclear-armed states and non-nuclear-armed states, and thus contribute to an improved international security environment, promote international stability, peace and security for all states and without prejudice to national security, contributing to disarmament and arms control by reducing the role of nuclear weapons in security doctrines and policies, and which in turn can contribute for re-evaluation of force postures.

## **Overview of nuclear risk reduction measures and their short, medium and long-term perspectives**

27. Given the need of addressing nuclear risks, immediate, intermediate and long-term measures for nuclear risk reduction should be considered equally. There is a shared understanding that nuclear risk should be addressed across the board, even if a number of them will require medium or longer term planning to be negotiated and eventually implemented.

28. For analytical purposes, however, risk reduction measures can be identified that address current nuclear risks, and constitute a contribution to improving the present security environment and
- could be enunciated unilaterally, bilaterally or multilaterally on a voluntary basis,
  - could be enshrined in politically or legally binding documents,
  - would not require but benefit from reciprocity and
  - would not have to be, in a first step, accompanied by intricate verification measures, but ideally be transparent or observable.
29. Based on thorough analysis of previous efforts and initiatives on risk reduction in the nuclear field and relevant experiences in the conventional field, work in the context of the CEND initiative was able to discuss a considerable number of nuclear risk reduction measures pertinent to the present security environment and without prejudice to national security (for a more complete overview see the “Matrix of notional priority measures to reduce risk associated with nuclear weapons” in Annex I). Without prejudice to national positions, they can include, but are not limited to, in particular:
30. Political-doctrinal measures:
- Commitment to the principles and norms as laid out by the Charter of the United Nations, such as the recognition of state sovereignty, political independence, territorial integrity and the inviolability of borders and states’ right to choose their alliances freely
  - Increased transparency and dialogue on nuclear policy documents such as doctrines and on capabilities/arsenals
  - Commitments, policies and declarations of nuclear restraint (e.g., no first use of nuclear weapons)
  - Commitments, policies and declarations of non-use of nuclear weapons against non-nuclear-armed states
  - Commitment not to employ force or the threat of force against any other state
  - Rejection of irresponsible rhetoric concerning potential use of nuclear weapons for military coercion, intimidation or blackmail
  - Reaffirmation that a nuclear war cannot be won and must never be fought
  - Commitment to peaceful conflict resolution through dialogues and negotiations, including on outstanding issues of regional and global relevance
  - Reaffirmation of the importance of states working together in non-adversarial ways
  - Commitment to a cooperative approach to security
  - Commitment to political statements against nuclear conflict
  - Commitment to establish a balance of relevant forces, taking into account the relevant security context, and not to seek unilateral military superiority through nuclear policies directed against other states
  - Information exchange on defense policy in general
31. Strategic measures:
- Reductions and elimination of nuclear arsenals in quantitative and qualitative manner
  - Negotiations on a treaty pertaining to the use of fissile material for nuclear weapons (e.g., a ban on future production, fissile material stocks, as well as other manners such as a moratorium)
  - Ratification of the CTBT leading to its entry into force and, as an interim measure, commitment to refrain from nuclear testing

- Restricting and/or banning classes of nuclear weapons and/or delivery systems and/or defensive systems, particularly those seen as most destabilizing
- Reduction of forces to ceilings compatible with the principle of mutual and equal security, on which states with the largest nuclear arsenals bear primary responsibility
- Verifiable reductions in numbers of deployed nuclear weapons
- Establishment of Nuclear-Weapon-Free Zones on the basis of arrangements freely arrived at among the states of the region concerned
- Limiting geographic locations of nuclear weapons deployment
- Commitments and agreements not to attack nuclear-related facilities
- Increasing protection of nuclear-related facilities, materials and systems
- Increasing non-proliferation efforts

32. Operational measures:

- De-alerting and de-targeting measures
- Measures to prevent hazardous military activity
- Enhancing safety and security of nuclear weapons and materials
- Preventing unauthorized access to nuclear weapons, related materials, equipment and technology

33. Confidence and security building measures:

- Enhanced dialogue among nuclear-armed states
- Early and complete notification of relevant military exercises
- Hosting observation of certain large scale notified military exercises
- Notification of nuclear-related incidents
- Pre-launch notifications (e.g. ballistic missiles, other relevant technologies that could create misperceptions)
- Notification of actions susceptible to misinterpretation
- Exploring/encouraging comprehensive security dialogues and consultations on reducing conflict risks

as well as the negotiations of arrangements that include, inter alia

- Military confidence-building through establishing and maintaining contacts, visits to military installations and transparency on new major weapon systems or equipment
- Dialogue and information exchange on pertinent issues
- Notifications and relevant exchange of information on relevant weapons, personnel strength and their locations; highest possible transparency on command structure
- Compliance and verification measures, as provided for in the relevant arms control agreements, in order to check the information provided, including mandatory on-site inspections, challenge inspections
- Complementary verification measures such as national and multinational technical means of verification
- Cooperative verification measures with the participation of both the inspecting and inspected party
- Verification by a third party, as appropriate, e.g. the United Nations or a joint commission
- Consultation mechanisms to consider and decide issues of implementation - including resolution of ambiguities and differences in interpretation, settle disputes, claims of non-compliance and of measures to enhance the viability and effectiveness
- Joint review mechanism to oversee the implementation of agreed arms control agreements
- Commitment to settle disputes through good-faith talks, mediation or arbitration

34. Crisis and conflict prevention and management measures:

- Establishment of crisis and conflict prevention and management mechanisms
- Ensuring of communication in crisis situations

as well as the negotiations of arrangements that include, inter alia

- Exchange notifications of missile launches and other relevant information, including through Nuclear Risk Reduction Centres
- Mechanisms to make inquiries about unclear situations
- Mechanisms for consultations and co-operation as regards unusual military activities, cooperation as regards hazardous incidents of a military nature
- Dedicated communications networks/ hot-lines to provide for a secure and reliable infrastructure for the exchange of relevant information between national military/ political authorities

**Processes to address nuclear risk reduction measures**

35. In order for nuclear risk reduction to be to be effective and efficient it seems important to distinguish unilateral, bilateral and multilateral risk reduction measures. They should be tailored accordingly, i.e. generic or scenario specific, which in turn conditions the appropriate fora or processes to consider them. In the framework of the CEND initiative a number of perspectives have been raised which include but are not limited to:

36. Addressing generic nuclear risk reduction measures:

- Treaty on the Non-Proliferation of Nuclear Weapons (NPT): During the 2022 Review Conference of the Treaty on the Non-Proliferation of Nuclear Weapons (NPT) nuclear risks and how to address them were a central issue throughout the deliberations. In this context an intersessional process on nuclear risk reduction was supported by a considerable number of States Parties. Given the urgency of the issue and its relevance for the Treaty, topical discussions could be held in the course of the current review cycle, including in intersessional settings.
- Conference on Disarmament: The Conference on Disarmament (CD), recognized by the Tenth Special Session on Disarmament of the United Nations General Assembly (SSOD I 1978) as a single multilateral disarmament negotiating forum of the international community considers as one of its standing items “Prevention of nuclear war, including all related matters”. As such it has addressed frequently, including in the framework of Nuclear-Weapon-Free Zones, issues relative to nuclear risks. The CD has also discussed in detail the important issue of Negative Security Assurances, which is on the agenda but could attract more attention. In this vein, it seems appropriate that the CD could continue, without prejudice to its autonomy, to conduct exploratory discussions on nuclear risk reduction measures, possibly in a subsidiary body as for instance in 2018<sup>5</sup>.
- The United Nations, in accordance with the Charter, has a central role and primary responsibility in the sphere of international peace and security. Given the universal nature of the General Assembly (GA) and thus legitimacy it could be appropriate to consider nuclear risk reduction measures in the framework of its First Committee of

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<sup>5</sup> CD/2139; Subsidiary Body 2: Prevention of nuclear war, including all related matters.



the United Nations. Likewise, the Security Council could address nuclear risk reduction measures in accordance with its mandate. In addition, further deliberations could take place in the UN Disarmament Commission. In operational terms the GA could task a Group of Governmental Experts (GGE) or an Open-ended Working Group (OEWG) to elaborate further details and make recommendations.

### 37. Addressing specific nuclear risk reduction measures

- Treaty on the Non-Proliferation of Nuclear Weapons (NPT) engagement  
At the 2022 NPT Review Conference the five nuclear-weapon State Parties “committed to continue structured efforts to exchange views on doctrines and risk reduction measures.., and to remain open to deepening the discussions among themselves and with others and will seek to continue to engage on this topic in the future”<sup>6</sup>. Given the deteriorating international environment and re-emergence of great power strategic competition and noting that dialogue among nuclear-weapon States is by itself a measure of strategic risk reduction, the NPT nuclear-weapon States have indeed a special responsibility in this context. They should continue their work on strategic risk reduction and nuclear doctrines in a transparent and constructive manner.
  
- Regional Approaches  
In a regional context Nuclear-Weapon-Free Zones (NWFZs) have been discussed as an efficient and effective means to address nuclear risks. In this context NWFZs, in particular,
  - are considered as one of the most effective means for preventing the proliferation of nuclear weapons,
  - serve as an effective tool to reduce the risk associated with nuclear weapons use based on intention, miscalculation or accident,
  - contribute to the elimination of the danger of the devastation that would be caused by a nuclear war,
  - lower the risk of conflict, in particular nuclear conflict, between states of a NWFZ and nuclear-armed states,
  - facilitate further steps in nuclear disarmament and towards a world without nuclear weapons,
  - benefit both nuclear-armed states and non-nuclear-armed states alike

States should support the efforts to establish NWFZs on the basis of arrangements freely arrived at among the States of the region concerned and sign and ratify protocols to relevant NWFZ treaties.

Furthermore, regional approaches to nuclear risk reduction can be found in a number of security arrangements or treaties. For further reference, see Compendium 1.

Relevant States should continue implementing existing arrangements and engage in the discussion of further arrangements.

### **Concluding reflections:**

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<sup>6</sup> See NPT/CONF.2020/WP.33

38. A number of conclusions have emerged in the discussions of nuclear risk reduction measures in the CEND initiative. They include:
39. Risks associated with nuclear weapons have multiple causes and could result from a wide spectrum of generic scenarios as applicable, including:
- intentional use - in accordance with declaratory policies and ambiguities thereof,
  - use by miscalculation - based on incorrect assumptions or linked to a conflict or crisis spiraling out of control,
  - accidental use - linked to error, technical malfunction or false alarm,
  - unauthorised use, non-sanctioned use or use by non-state actors.
40. Nuclear risk reduction is neither a substitute nor a prerequisite for nuclear disarmament and efforts in this area should contribute to forward movement related to nuclear disarmament commitments.
41. The political will, especially among nuclear-armed states, to agree, or unilaterally decide, and consequently implement risk reduction measures<sup>7</sup> is essential. In addition, the role of non-nuclear-armed states is vital and they can contribute to nuclear risk reduction in meaningful ways.
42. Interim measures to lower and ideally prevent these risks, pending the complete elimination of nuclear weapons, should be tailored accordingly and be specific in order to be considered effective and efficient. This applies to universal, regional, bilateral and unilateral risk reduction measures.
43. Nuclear risk reduction can consist of and may be enhanced by an interlocking web of mutually re-enforcing risk reduction measures and can encompass e.g. political-doctrinal measures, strategic measures, operational measures, confidence and security building measures and crisis and conflict prevention and management measures and be subject to an interactive, broad and inclusive approach to risk reduction, open to all interested states.
44. Nuclear risk reduction measures should be designed to remain effective and resilient in situations when political tensions are high, trust is low, and crisis or potential conflict might influence their implementation. For that purpose, nuclear risk reduction can include and be re-enforced by appropriate mechanisms for communication, dialogue and crises or conflict resolution<sup>8</sup>.
45. An inclusive approach and a broad set of risk reduction measures, tailored to the specific security environment, can broaden and multiply their effect, since it can facilitate security and stability, including on a strategic level.
46. Nuclear risk reduction can have positive direct and indirect effects. Specific and concrete risk reduction measures in one area could lead to further risk reduction measures in other areas<sup>9</sup>. Nuclear risk reduction can under certain circumstances be a cumulative process.
47. Nuclear risk reduction can contribute to a more stable security environment and thus to reductions of nuclear arsenals and progress in nuclear disarmament.

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<sup>8</sup> e.g. establishment of crisis and conflict prevention and management mechanisms, risk-reduction centers and dedicated communications networks and hot-lines for crises prevention.

<sup>9</sup> e.g. Doctrinal restraint could enable strategic risk reduction measures, which in turn could be followed by operational risk reduction measures (not necessarily in that order).

48. A cooperative approach to security<sup>10</sup>, is an integral part of effective risk reduction measures. Furthermore, such an approach demonstrates a common understanding of risks associated with nuclear weapons.
49. There is a need to consider the impact of new and emerging technologies<sup>11</sup> on the effectiveness and resilience of nuclear risk reduction measures.
50. Dialogue and communication are central elements in agreeing and implementing nuclear risk reduction measures and can constitute a risk reduction measure in itself by demonstrating a willingness to co-operate and show good faith.
51. Furthermore, dialogue on nuclear risk assessment, possibly extended to new and emerging technologies, could be an initial element to underpin effective and resilient risk reduction measures.
52. Universal, regional, bilateral and unilateral risk reduction measures are most effective and credible when they are declared in an unambiguous and reliable manner.
53. Universal, regional and bilateral nuclear risk reduction measures can include built-in provisions for regular consultation and updating, with a view to improve them and in order to reflect in a dynamic manner eventual changes in the geostrategic security environment as well as new technologies. However, in a situation of heightened tensions, risk reduction measures have to be maintained, as taking them back would fuel tensions and risks.
54. Implementation of and compliance with nuclear risk reduction measures, including existing disarmament obligations, are key elements to enhanced security, which is a central objective of nuclear risk reduction.
55. Nuclear risk reduction measures can include mechanisms for review and evaluation as well as for resolving disagreements.
56. Transparency provisions can enhance credibility and accountability, and provide confidence that risk reduction measures are fully implemented. Such provisions could apply to the entire range of risk reduction measures. Implementing transparency in nuclear risk reduction supports and is supported by meeting transparency and accountability obligations under nuclear disarmament and non-proliferation agreements, including under the Nuclear Non-Proliferation Treaty.
57. Nuclear risk reduction measures, such as doctrinal restraint, would have to be designed to ensure that they are consistent with ensuring nuclear capabilities are at the lowest possible levels.
58. Discussions and decisions on risk reduction measures should be inclusive, including through the full, meaningful and equal participation of women, and benefit from the contributions of civil society

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<sup>10</sup> e.g. in a particular commitment to the collective security system created by the UN Charter.

<sup>11</sup> e.g. These include, but are not limited to, cyber capacities, artificial intelligence, outer space capabilities, new strategic offensive and defensive capabilities.

**Matrix of notional priority measures to reduce risk associated with nuclear weapons**

Notional priority measures to reduce risk associated with nuclear weapons.	The risk(s) addressed by this measure	Why is this a priority?	Additional comments and/or explanations
<b>Political-doctrinal measures</b>			
<p>1. Declaratory commitments against nuclear conflict (e.g. Reagan-Gorbachew statement: “a nuclear war cannot be won and must never be fought”)</p>		<p>A reaffirmation of the Reagan-Gorbachew statement by the P5 would send a strong signal of maintaining global strategic stability as well as promoting world peace and security.</p>	<p>The Reagan-Gorbachew statement was already reaffirmed by China and Russia in the Joint Statement on the Twentieth Anniversary of the Treaty of Good Neighbourliness and Friendly Cooperation between Russia and China as well as by the U.S. and Russia in the U.S.-Russia Presidential Joint Statement on Strategic Stability.</p>
<p>2. Doctrinal restraint, with the objective to diminish the role of nuclear weapons in security doctrines/policies, such as</p> <ul style="list-style-type: none"> <li>- “no first use”,</li> <li>- “sole purpose”,</li> <li>- “no launch on attack”,</li> <li>- “nuclear deterrence only to safeguard vital interests”,</li> <li>- efforts to reduce perceived ambiguity and entanglement between nuclear and conventional weapons, possibly enshrined in a legally binding instrument.</li> </ul>	<p>Addresses the risk, that uncertainty about the strategic objectives of potential adversaries can lead to pre-emptive build-up of nuclear arsenals and, in the case of crisis/conflict to a pre-emptive deployment of nuclear forces.</p> <p>Attacks on dual purpose assets, e.g. in space or C3, can be misinterpreted as part of nuclear attack resulting in retaliation.</p> <p>Furthermore, non-nuclear armed states might not trust that they will not be targeted by nuclear weapons and decide to acquire nuclear weapons.</p>	<p>Doctrinal restraint can</p> <ul style="list-style-type: none"> <li>- contribute to strategic mutual trust and global strategic stability,</li> <li>- create confidence among nuclear-armed states as well as with non-nuclear armed states,</li> <li>- reduce the role of nuclear weapons in security policies,</li> <li>- prevent escalation leading to the use of nuclear weapons,</li> <li>- lessen the danger of nuclear war,</li> <li>- facilitate numerical reductions in stockpiles and thus constitute, under certain conditions, constitute a pathway to nuclear disarmament,</li> <li>- could enable strategic risk reduction measures, which in turn could be followed by operational risk reduction measures such as de-alerting/lowering the alert status of nuclear weapons systems.</li> </ul>	<p>By its very nature, doctrinal restraint cannot be verified in advance. Therefore</p> <ul style="list-style-type: none"> <li>- without adequate transparency of force posture and</li> <li>- accompanying confidence and security building measures it risks only to have limited impact in terms of nuclear risk reduction.</li> </ul> <p>Furthermore, the point has been made, that</p> <ul style="list-style-type: none"> <li>- doctrinal restraint concerning nuclear weapons (e.g. no first use) could in certain circumstances actually increase the risk of conventional conflict and</li> <li>- “subjective” policies (e.g. “nuclear deterrence only to safeguard vital interests”) would not be operational and would require further discussion (see as well the 1996 ICJ advisor opinion).</li> </ul> <p>An initial step would be to restate by NPT states parties the</p>

			<p>implementation of Action 5C of the 2010 Action Plan which calls on NWS to ‘diminish the role and significance of nuclear weapons in all military and security concepts, doctrines and policies’.</p> <p>Doctrinal restraint such as “no first use”, “sole purpose”, “no launch on attack”, “nuclear deterrence only to safeguard vital interests” could possibly be enshrined in an international legally binding instrument.</p>
<p>3. Doctrinal restraint with a legally binding character such as negative security assurances (NSA), including greater clarity not to use or threaten to use nuclear weapons against non-nuclear-weapon States and conclude a legally binding international instrument to this effect.</p>	<p>Addresses the risk that nuclear weapons could be used by nuclear-armed states against non-nuclear-armed states</p>	<p>See above, in particular - creates confidence among nuclear-armed states and non-nuclear-armed states.</p>	<p>The point has been made, however, reservations by nuclear-armed states (e.g. attacks with other WMD or against vital interests) would diminish their credibility of NSA as risk reduction measures.</p> <p>Furthermore, the point has been made, that NSA can be an important contribution to non-proliferation efforts</p>
<p>4. Doctrinal restraint in the framework of nuclear-weapon-free zones (NWFZ)</p>	<p>See above</p>	<p>NWFZ are an important contribution to global and regional peace and security as the entail doctrinal restraint both by nuclear-armed states and non-nuclear-armed states</p>	<p>Nuclear-armed states should continue to support non-nuclear-armed states in establishing NWFZ or zones free of WMD on the basis of arrangements freely arrived at among the States of the region, including through ratifying protocols to the existing nuclear-weapons-free zones.</p>
<p>5. Commitment to - a cooperative approach to security, including commitment not to employ force or threat of force inconsistent with international law and the UN Charter and to that end - avoid any armed conflict, as well as</p>	<p>Addresses the risk of an arms race or military buildup or the introduction of new strategic offensive or defensive capabilities which could worsen the international security situation.</p>	<p>Underlines the commitment to the collective security system created by the UN Charter and to peaceful conflict resolution through negotiations and demonstrates a common understanding of risks associated with nuclear weapons.</p>	<p>Entails a commitment not to employ force or the threat of force against the other party or parties, unless authorized by the UN.</p>

<p>- preclude deliberate unsafe, hazardous or dangerous actions that entail the risk of escalation and</p> <p>- preserve and strengthen the existing arms control architecture.</p>			
<p>6. Intensified dialogue and trans-parency, both among nuclear-armed states and between nuclear-armed states and non-nuclear-armed states, on risk perceptions and risk reduction measures, nuclear doctrines, in particular nuclear strategies and policies, as well as force postures, defence and armed forces planning and procurements, with the objective to strengthen strategic mutual trust.</p>	<p>Progress on disarmament, risk reduction measures is not made due to lack of nuclear-armed states' dialogue. Decision makers make overly pessimistic assumptions about potential adversaries' intent and adopt more aggressive nuclear postures than necessary. Overly pessimistic assessments accelerate escalation in a rising conflict. Addresses, furthermore, the concern that risk reduction measures such as doctrinal restraint or a commitment to a cooperative approach to security are discounted as not having concrete security policy consequences.</p>	<p>Strategic mutual trust is crucial and enhances confidence and reduces the risk of misperceptions or miscalculations among nuclear-armed states as well as with non-nuclear-armed states about the strategic objectives of nuclear deterrence.</p> <p>Discussions on risk perceptions, doctrine and even force posture as less linked to numerical arsenals have more likelihood of progressing while concerns about numerical asymmetry persist.</p>	<p>Transparency can enhance credibility and provide confidence that risk reduction measures in general are fully implemented. However, due regard will have to be given to security and non-proliferation concerns.</p> <p>Nuclear risk reduction should be addressed not only by nuclear-armed states but also with non-nuclear-armed states. It is important that nuclear-armed states conduct dialogues on nuclear doctrines, deterrence policies and risk reduction measures and then explain them and discuss concrete risk reduction measures with non-nuclear-armed states.</p>
<p>7. Increasing awareness of the devastation that would be visited upon all mankind by a nuclear war and the consequent need to make every effort to avert the danger of such a war and to take measures to safeguard the security of peoples as enshrined by states parties in the NPT.</p>	<p>Addresses all risks associated with nuclear weapons and the likelihood of nuclear weapons use.</p>	<p>To ensure that nuclear weapons are never used again.</p>	<p>The point has been made, that humanitarian consequences of the use of nuclear weapons has to be balanced with national security interests.</p>

<b>Strategic measures</b>			
1. Reductions in numbers and locations of deployed nuclear weapons.	Addresses all risks associated with nuclear weapons and the likelihood of nuclear weapons use.	Contributes to an improved overall international security environment, decreases the salience of nuclear weapons in defence postures and enables further progress towards nuclear disarmament and a world without nuclear weapons.	Nuclear risk reduction measures, including at the strategic level should be tailored to the specific security environment. This applies to universal, regional, bilateral and unilateral risk reduction measures.  Pending the entry into force of the Comprehensive Nuclear-Test-Ban Treaty, it is essential to refrain any action that would undermine the object and purpose of the CTBT and maintain the existing moratorium on nuclear-weapon-test explosions.
2. Banning and refraining from the development of classes of nuclear weapons and/or delivery systems and/or defensive systems, which diminish strategic stability and increase nuclear risks and could neutralize the nuclear deterrence of others.			
3. Reductions towards an eventual elimination of nuclear arsenals, including through appropriate legally binding measures, by the nuclear-weapon States of agreements concerning nuclear weapon reductions, as well as further consideration of unilateral disarmament measures.			
4. Reduction/conversion of weapons- grade surplus fissile material and their production facilities.			
5. Transparency to eliminate the capability to launch surprise attacks and increased predictability of use conditions.	Addresses the concern that risk reduction measures such as lowering the alert status of nuclear weapons, de-targeting and de-mating could be purely declaratory and not having concrete security policy consequences.	Important towards reductions of nuclear arsenals.  Contributes to an improved international security environment in the light of  -the re-emergence of great power competition,	Due regard will have to be given to security and non-proliferation concerns. The point has been made, that transparency - is as well an important confidence building measure and - should extended to conventional armaments as well and that underlying political issues need to be

		<p>-the present stress on the nuclear arms control, disarmament and non-proliferation architecture,</p> <p>- perceived lowered threshold by some for the use of nuclear weapons,</p> <p>-new technologies and capabilities</p> <p>-the emergence of new regional crises scenarios</p>	<p>addressed by the same token.</p> <p>Furthermore, the point has been made, that</p> <p>- efforts to eliminate the capability to launch surprise attacks might be unrealistic,</p> <p>- there is a need to regulate the military use of emerging technologies in a legally binding instrument.</p>
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<b>Operational measures</b>			
1. De-alerting/lowering the alert status of nuclear weapons systems, de-targeting (e.g. not to target their nuclear weapons at any State and not list any State as the target of nuclear attacks) and de-mating.	Decision making in a time of crisis is truncated, time for verification of an attack is reduced, thus increasing risk of accidental use. Therefore, addresses the risk of use by miscalculation, based on incorrect assumption, inadvertent use, especially in crisis or escalating conflict spiralling out of control, accidental and unauthorized use.	<p>Important towards reductions of nuclear arsenals.</p> <p>Contributes to an improved international security environment in the light of</p> <ul style="list-style-type: none"> <li>-the re-emergence of great power competition,</li> <li>-the present stress on the nuclear arms control, disarmament and non-proliferation architecture,</li> <li>- perceived lowered threshold by some for the use of nuclear weapons,</li> <li>-new technologies and capabilities and</li> <li>-the emergence of new regional crises scenarios</li> </ul>	The argument has been made that such risk reduction measures are not verifiable and entail the risk of a rush to higher alert status to potentially counter an adversarial first strike, thus the potential of creating an uncontrollable dynamic. Furthermore, the point has been made, that the development of new weapons systems could substantially enhance the importance of such risk reduction measures.
2. Enhancing safety and security of nuclear weapons and materials, including measures to avoid accidental or unauthorized launch of nuclear weapons, through appropriate legal/procedural safeguards. In addition, appropriate transparency regarding accidents involving nuclear weapons and on the steps taken in response to these accidents would be essential.	Addresses in particular the risk of accidental and unauthorized use of launching systems in uncertain circumstances, malicious cyberattacks as well as possibly use by non-state actors.	Contributes to contain the “fog of war” particularly in the context of new regional crises scenarios, with global political and economic implications, involving nuclear-armed states as well as non-nuclear-armed states, relying, in particular, on asymmetric means of warfare, and thus of the specter of regional crises spiraling out of control.	<p>Exchange of experiences and elaboration of best practices would be of particular relevance.</p> <p>The point has been made, that historically regional crises have not contributed to risks associated with nuclear weapons.</p>
3. Agreements to minimize vulnerabilities related to potentially disruptive new technologies and understandings not to launch cyber capacities.	Dialogue and agreements on these issues would reinforce other confidence building measures through building mutual understanding and mechanisms for ongoing	Given exponential growth of cyber capabilities, risk is likely to grow in this area quickly and should therefore be addressed as a priority.	Dialogue on emerging technologies, comprehensively would be important, assessing their implications and addressing potential risks that might arise from

<p>4. Further investigation of and dialogue, including joint assessment, on operational uncertainties, pathways to nuclear use, sharing of best practices, and de-escalation pathways.</p>	<p>dialogue on other risk reduction measures. In particular, malicious manipulation of early-warning data and C3 results in escalation based on false premises.</p>	<p>Mitigations may be more readily achievable given the clear national security interest to the nuclear-armed states concerned.</p>	<p>them, including a possible moratorium of application of emerging technologies to nuclear weapons systems.</p>
<p>5. Enhance cooperative verification measures with participation of both the nuclear-armed states and non-nuclear-armed states (e.g. IPNDV and GGE on Nuclear Disarmament Verification).</p>	<p>Non-existence of effective verification measures is an obstacle to mutual trust and confidence in compliance with agreements.</p>	<p>Contributes to development of cooperative verification tools, procedures and technologies, but also reinforcement of cooperation between nuclear-armed states and non-nuclear-armed states. Furthermore, verification can be an important confidence and security building measure.</p>	<p>The argument has been made, that verification would have to be treaty specific and thus not a generic risk reduction measure.</p>

<b>Confidence and security building measures</b>			
1. Avoiding rhetoric and actions that create an environment that is not conducive to nuclear disarmament and that would increase the risk of nuclear conflict is essential.	Addresses all risks associated with nuclear weapons and the likelihood of nuclear weapons use.	Contributes to an improved overall international security environment	
2. Pre-notification and data exchange agreements, in particular of actions susceptible to misinterpretation, in particular pre-launch notifications.	Missile launches, activity in space etc. can be misinterpreted. Addresses the risk of - outbreak of nuclear war, in particular through misinterpretation, miscalculation, or accident, by providing information in advance, inter alia on ballistic missile launches, especially in crisis or escalating conflict spiralling out of control, accidental and unauthorized use, - serious, unintended confrontation between forces by providing a framework for resolving any incident expeditiously and peacefully.	Relatively modest, achievable measures that could lay foundation for other more comprehensive risk reduction measures. Given the increasing number of states, in particular non-nuclear-armed states, possessing dual use means of delivery, a precautionary approach to their use/deployment is of heightened relevance.	<p>On Ballistic Missile Launch Notification Agreement see - 1988 U.S.-Soviet Agreement (preceded by notification provisions under the 1971 Accident Measures Agreement and the SALT II Treaty (which never entered into force); and followed by notification provisions in the START I Treaty and the New START Treaty) - 2002 Hague Code of Conduct against Ballistic Missile Proliferation (United States, Britain, France, and Russia are Subscribing States.) The point has been made, however, that HCoC concentrates on military aspects and does not foster civilian developments. - 2009 Chinese-Russian Agreement, extended in 2020.</p> <p>On Agreement on Reciprocal Advance Notification of Major Strategic Exercises see - 1989 U.S.-Soviet Agreement (followed by notification provisions under the START I and New START Treaties.</p> <p>On Incidents at Sea Agreements see - 1972 U.S.-Soviet Agreement (with 1973 Protocol and 1998 Exchange of Notes)</p>

			<p>- 1986 British-Soviet Agreement</p> <p>- 1989 French-Soviet Agreement</p> <p>- 2014 U.S.-China MOU on Rules of Behavior for the Safety of Air and Maritime Encounters.</p> <p>On Dangerous Military Incidents Agreement see</p> <p>- 1989 U.S.-Soviet Agreement</p> <p>However, the point has been made, that such risk reduction measures are contingent on the general political framework</p>
3. Sustained efforts to enhance transparency on nuclear arsenals, in particular notifications and detailed exchange of information on relevant weapons, personnel strength and their locations, transparency on command structure and dual-use capabilities (nuclear and conventional).	Addresses the risk, that states overestimate the size, posture or growth of nuclear arsenals of potential adversaries and respond by increasing and/or deploying their own arsenals more aggressively, leading to a pre-emptive build-up of nuclear arsenals and the risk of an arms race or the introduction of new strategic offensive or defensive capabilities which could offset a stable strategic balance.	Major power competition (e.g. in the form of nuclear weapons build-up and modernization) threatens to diminish trust. Transparency can contribute to an improved international security environment in the light of	The argument has been made, that the effectiveness of transparency as a risk reduction measure is contingent on
4. Military confidence-building, including military-to military dialogues, through contacts, visits to military installation and demonstrations of new major weapon systems or equipment, and facilitating contacts.		-the re-emergence of great power competition,	- the appropriate degree, in order not the endanger relevant security concerns (e.g. enhance the risk of a first strike),
		-the present stress on the nuclear arms control, disarmament and non-proliferation architecture,	- the concrete security situation and
		-new technologies and capabilities.	- the general political framework (regionally or globally).
		Overall, transparency delivers more stability – for everyone.	
5. “Nuclear Risk Reduction” as a standard item on the agenda in relevant fora or meetings, be it the NWS (P5) meetings, keeping the wider NPT membership informed, or the meetings of the NPT states parties by establishing appropriate		Establish work structure for sustained attention in the appropriate format. Conduct such a risk reduction dialogue in an inclusive manner, taking into account the perspectives of non-nuclear-weapon States and including them in these efforts	

structures (facilitators, working groups).			
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<b>Crisis and conflict prevention and management measures</b>			
<p>1. Mechanisms for consultations and co-operation, including risk reduction centers, with regard to unusual military activities, cooperation with regard to hazardous incidents of a military nature.</p>	<p>Addresses the risk that uncertainty about unusual military activities and/or hazardous incidents of a military nature can lead to unintended escalation. Such mechanisms would reduce the risk of misinterpretation by providing immediate information about accidental, unexplained, or unauthorized nuclear use.</p>	<p>Given increasing strategic competition, escalation is the most likely pathway to nuclear use. In this context, crisis and conflict prevention and management measures are of particular relevance in light of</p> <ul style="list-style-type: none"> <li>-new technologies and capabilities</li> <li>-the emergence of new regional crises scenarios</li> <li>-the proliferation of dual use means of delivery</li> </ul> <p>Risk Reduction Centers, in particular, provide a permanent, rapid, reliable, and secure means for exchanging notifications under arms control and confidence building agreements.</p>	<p>On Agreement on Measures to Reduce the Risk of Outbreak of Nuclear War (“Accident Measures” Agreement) see in particular:</p> <ul style="list-style-type: none"> <li>- 1971 U.S.-Soviet Agreement</li> <li>- 1976 French-Soviet Agreement</li> <li>- 1977 British-Soviet Agreement</li> </ul> <p>On National and Nuclear Risk Reduction Centers see</p> <ul style="list-style-type: none"> <li>- 1987 U.S.-Soviet Agreement on the Establishment of Nuclear Risk Reduction Centers (Amended in 2013)</li> </ul>
<p>2. Dedicated and crisis-proof communications networks, hot-lines lines for secure and reliable exchange of relevant information between high level national political authorities, in particular in crisis situations.</p>	<p>Addresses the risk that lack of communication can lead to use</p> <ul style="list-style-type: none"> <li>- by miscalculation, based on incorrect assumption,</li> <li>- inadvertent use, especially in crisis or escalating conflict spiralling out of control,</li> <li>- accidental and unauthorized use</li> </ul>		<p>On hotline agreements see in particular:</p> <ul style="list-style-type: none"> <li>- 1963 U.S.-Soviet Memorandum of Understanding (MOU)</li> <li>- 1966 French-Soviet Hotline Agreement</li> <li>- 1967 British-Soviet Hotline Agreement</li> <li>- 1996 Chinese-Russian Hotline Agreement</li> <li>- 1998 U.S.-Chinese Hotline Agreement</li> </ul>
<p>3. Enhanced military-to-military contacts, dedicated and crisis-proof communications networks, joint data centers and hot-lines lines for secure and reliable exchange of relevant information between national military authorities, in particular in crisis situations.</p>	<p>by creating channels for rapid communication to reduce the risk of misunderstanding in crisis situations and thus to reduce the risk of nuclear use</p>		<p>On Prevention of Nuclear War Agreement see</p> <ul style="list-style-type: none"> <li>- 1973 U.S.-Soviet Agreement</li> </ul>
<p>4. Pursuit of early conflict prevention and resolution in relation to nuclear threats and in particular crisis and conflict prevention and management mechanisms</p>	<p>Addresses the risk that unusual military activities, hazardous incidents of a military nature and regional crisis could spiral out of control if not contained in time through effective and efficient crisis and conflict prevention and management mechanisms by framing relations in line with the objective to remove the</p>		

	danger of nuclear war and of the use of nuclear weapons.		
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