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“Emerging technology and nuclear risks;
sustaining and developing expertise in the next generation”

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I want to thank RUSI for the opportunity to speak with you today. RUSI has been conducting forward-looking thinking on the strategic issues of the day for almost two centuries now. Today’s topics exemplify that.

At the outset, I should make clear that I am not a technological expert. I cannot give technical responses about the technologies we are discussing today, so instead I’ll try to focus on the broader political and security challenges.

The second caveat I would like to stress at the beginning is that many of the transformational technologies redefining our world have predominantly beneficial applications, including in terms of serving the goals of disarmament, non-proliferation and arms control.

Unfortunately, ceaseless efforts to apply developments in science and technology to weapons are enhancing existing risks and creating new ones, including increasing the possibility of nuclear weapon use.

These developments are both the product of and exacerbate an international environment characterized by decreasing trust and transparency and a preference for competition over cooperation.

Taken all together, developments in a variety of technologies are diminishing predictability, shared understandings and trust, while raising the risks of misperception, arms races, and potential escalation through miscalculation.

While there are intergovernmental initiatives addressing challenges posed by individual technologies or domains, on cyber, AI etc., none of the nuclear weapons-related forums are discussing the intersection between technology and nuclear risk, adding to decreasing transparency and a climate of misperception.

This needs to change, especially as some nuclear doctrines now carry the possibility of a nuclear response to any attack on critical infrastructure, potentially including a cyberattack, and where space-based assets are considered critical infrastructure.
Unless the tools of arms control and norms of responsible behavior are adopted in new
domains such as outer space, even benign or non-aggressive actions can be misunderstood or
misinterpreted, potentially with unclear outcomes.

To take the example of outer space, the absence of an agreed framework for preventing the
extension of armed conflict into this domain leaves a vacuum for the development of overt
counter-space capabilities, either for self-defense or to negate the perceived advantage of
more advanced rivals, leading to dangerous arms races with unpredictable consequences.
Advanced technologies are increasing nuclear risks through three avenues of impact.

First, through qualitative improvements to the weapons themselves. Second, through the way
in which they are increasing the possibility of miscalculation escalating a conventional
conflict. And third, by exposing potential new vulnerabilities in nuclear weapons structures.

Qualitative improvements to nuclear weapons are part of ongoing modernization campaigns
in all nuclear-armed States. Such efforts do not only maintain the status quo but are creating
new generations of weapons that are faster, stealthier and more accurate. Combined with
doctrines that call for tailored deterrence options, such qualitative improvements arguably
make these weapons more attractive as usable options.

To the second point, risks of miscalculation and escalation posed by the use of new
technologies in armed conflict could include greater speed of information and the weapons
themselves, ambiguous missions for weapons, problems with attribution and response, and
concerns about the predictability of the technology itself.

Concerns have been raised that accelerated tactical decision-making would mean less time for
commanders to respond and, as a result, delegate more command and control to machines,
raising issues about human control and safety. Many experts have worried in particular about
the black box nature of self-learning algorithms and the unpredictability that has been
observed in their behavior.

A second example relates to the increasing reliance by many States on missiles. The
development of missiles with conventional payloads that can undertake missions previously
only the domain of nuclear weapons has blurred the line between the two. This creates ambiguity that could lead to dangerous uncertainty and miscalculation during a crisis.

Nowhere are the issues of ambiguity and speed more clearly on display than in so-called hypersonic weapons. Here the uncertainty as to whether a payload is nuclear or not and the intended target is compounded by a greatly reduced response time.

Thirdly, technological advances have highlighted potential vulnerabilities in nuclear systems, including early warning and command and control systems. These include hacking or other cyber disruption, interference with early warning systems, or simply creating uncertainty about whether a system has been compromised.

Networks, enhanced sensors, machine-learning, data analysis and uncrewed vehicles could also, theoretically, reveal nuclear forces intended for second strikes, leading to concerns about incentivizing pre-emptive or “use it or lose it” strikes.

Each of these three factors I have outlined is mutually-reinforcing. I am concerned that, together, they are increasing the role of nuclear weapons in national strategies and, in turn, the possibility of their potential use.

I’ve painted such a dire picture which begs the question: What can we do about it?

Part of the problem is that we don’t have a complete understanding of the ramifications of certain emerging technologies. There is a need for dialogue to enhance mutual understanding about their roles and implications. There is also a need to better understand the national assumptions that are driving acquisition of these technologies.

In seeking solutions to prevent catastrophe, we should have technical experts at the table. This requires the development of multistakeholder forums that include, for instance, the tech industry to better understand the technologies in question.

More broadly, if we are to reduce the growing risks of nuclear use, we need dialogue on transparency and confidence-building measures related to escalation control, the speed of combat, ambiguity and other issues that could lead to miscalculation.
Such dialogues cannot be just between diplomats, they also need to be military-to-military and leader-to-leader.

Developing rules of the road and norms for responsible behavior is also critical to avoiding disaster. The two intergovernmental cyber processes, and those on outer space and lethal autonomous weapons, are leading the way in this respect.

If the international community cannot, at this stage, agree on legally binding agreements, then it should seek political arrangements, or even reciprocal unilateral declarations, for example not to target command and control or early warning systems. But we may need, at some point, the kind of treaty-based agreements that have helped provide stability in the past, including on the most destabilizing and dangerous kinds of weapons.

In the near-term, I can think of two useful immediate steps. First, all States should demonstrate restraint, including in the deployment and testing of new weapons. Second, extending the “New START” treaty would ensure strategic constraints and buy time for States to consult on new arrangements that – inter alia – address new developments and challenges, including technological ones.

Many, including the world’s largest military powers, seem to agree that a new vision is needed for arms control and disarmament. In addition to technological developments, the overall security environment has shifted to a more complex mixture of increased geo-political tension among three “great” powers and the rise of multiple regional powers. There are increased proliferation risks in regions with both old and new conflicts. We are reaching a point where we need to take a fresh and comprehensive look at our approaches to eliminating nuclear weapons, maintaining prohibitions on other weapons of mass destruction, regulating the use of conventional weapons and ensuring that new technologies are used in accordance with international laws and norms.

Now, the next generation of global citizens will be absolutely key in crafting such a vision. They will be responsible for developing the ethical, moral, security and legal frameworks for the future. Young people around the world have a critical role to play in raising awareness and developing new ways to reduce threats from those weapons.
For these reasons we are stepping up our engagement with young people across the spectrum of our activities.

In his agenda for disarmament, UN Secretary-General António Guterres clearly articulated how young people have been a tremendous force for change in the world, noting how they have “proved their power time and again in support of the cause of disarmament. Young campaigners have worked at the forefront of successful international campaigns to ban landmines, cluster munitions and nuclear weapons.”

Recognizing the importance of young people in bringing about change, on International Youth Day 2019, the Office for Disarmament Affairs launched its youth outreach initiative, “#Youth4Disarmament” and has now placed the 3 ‘E’s: Engagement, Education and Empowerment, at the core of its disarmament youth outreach efforts.

The ultimate goal is to increase youth participation and create space for young people to make meaningful substantive contributions to facilitating progress on disarmament. We firmly believe that imparting knowledge and skills to young people empowers them to make a contribution, as both national and global citizens.

With the generous support of Germany, we called on young people to apply for our new “United Nations Youth Champions for Disarmament Training programme”, which seeks to empower young people to work for disarmament in their communities.

The programme received thousands of applications from young people who are motivated to use their talents to help raise awareness and promote change for a more peaceful and secure world. In addition to young people interested in international affairs, we encouraged those with backgrounds ranging from Science, Technology, Engineering, and Mathematics (STEM) to the creative arts to submit applications. The intention is to bring together an eclectic and geographically diverse group of advocates for disarmament.

Other next generation focused projects that we have launched recently include our project to engage with STEM students in Asia-Pacific, helping them to think about the long-term impacts of their design choices, and become responsible innovators. Another is the “Open Minds Project”, an e-newsletter of the #Youth4Disarmament Initiative that provides
resources for young people to meaningfully engage on disarmament and non-proliferation issues, to be launched later this year. We also have a dedicated website to provide space for young people to make meaningful substantive contributions to facilitating progress on disarmament and the achievement of the Sustainable Development Goals.

Through its #Youth4Disarmament Initiative, the Office for Disarmament Affairs will continue to work closely with Member States, regional organizations, civil society and academic institutions to “promote the meaningful and inclusive participation and empowerment of youth on disarmament and non-proliferation issues”.

I want to conclude with a personal observation that relates to what I think is a transformational trend on advocacy for change. This trend is starting to have an impact both at the international as well as at the national level.

We are used to the processes of change or creation of new frameworks occurring through top-down initiatives. The original idea for the Organization that I serve, the United Nations, came from two visionary leaders and was captured in the “Declaration by the United Nations” of 1 January 1942. However, the three most recent transformative movements – MeToo, Friday for Future and now Black Lives Matter – all indicate that in today’s world with social media and technological connectivity, bottom-up movements will have much greater impact.

When I talk about youth engagement and empowerment, I do not do so as lip service. I believe that the continued relevance of multilateralism and international cooperation really depends on how we will be able to create space for youth and work with youth.

At the turning point of UN75, I am convinced that an important element of responsible leadership is to equip young people with knowledge and skills, but also to let them innovate and to work with them.

I thank you very much.