Nuclear War Risk Increases

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English version of Bläsius, Siekmann: Atomkriegsrisiko steigt

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Nuclear Threats

Since the first use of an atomic bomb in Hiroshima there has been a fear of a nuclear war with devastating consequences which could lead to the extinction of all life forms on this planet.

Nuclear threats from all sides reached a climax in the 1980s when new medium-range missiles with extremely short warning times were deployed on the basis of a "NATO double decision". This led to fierce protests from the population and to large demonstrations of the peace movement which received enormous popularity.

This peace movement also contributed to the population becoming all the more conscious of the risks related to nuclear war and to military leadership itself: starting in the mid-1980s there were successful disarmament negotiations and a world-wide nuclear détente. In 1987 the INF Treaty was concluded and signed by Reagan for the USA and Gorbachev for the Soviet Union. These and other disarmament agreements between the USA and the Soviet Union led to a reduction of their nuclear weapons from 70,000 to about 15,000.

New arms race

In recent years, however, work on the expansion and modernisation of nuclear weapons has intensified in various countries and the INF Treaty of 1987 has now been terminated by both sides. The USA and Russia accuse each other of violating the treaty and a new arms race is impending.

Since the beginning of 2018, the USA has had a new military doctrine that no longer excludes a first strike with nuclear weapons. It allows the USA to carry out a counter-reaction with nuclear weapons even in the case of significant non-nuclear strategic attacks including cyber attacks. The Russian military doctrine also provides for the use of nuclear weapons at an early stage in the event of war and in October 2018 Putin reiterated in very drastic terms that his country would carry out a destructive nuclear counter-attack should his country fall under attack.

Doomsday clock

After the end of the Second World War nuclear scientists set up a so-called "doomsday clock" to emphasise the danger of an imminent nuclear war. The clock hand is set once a year in January by a commission consisting of nuclear scientists, Nobel laureates and other internationally recognised scientists. The respective hand position and the reasons for it are published in the "Bulletin of the Atomic Scientists". The closer the watch is set to 12, the greater the risk is estimated and the first setting was made in 1947 with 7 minutes to 12.

After the first successful test of hydrogen bombs, the clock advanced to 2 minutes to 12 in 1953 and at the height of the Cold War in 1984 the clock showed 3 minutes to 12. At the subsequent relaxation the clock was reset by 14 minutes but since 2018, the atomic war clock is again at 2 minutes to 12 and this was confirmed in January 2019.

In other words, the Commission judges that the risk of nuclear war has never been higher than it is today and justifies this with the current modernisation of nuclear weapons by the major nuclear powers. Moreover, climate change and the resulting deterioration in living conditions in many regions, especially those suffering from overpopulation, has created significant new conflict potential. The risks of nuclear conflict are as great or greater today as they were during the Cold War.

Early Warning Systems

The military situation in the age of nuclear weapons is characterized by the so-called "second strike capability", i.e. in the event of an attack, the attacker must reckon with a nuclear counterblow that would destroy him. In the case of a massive attack with nuclear weapons, however, one's own missile silos and possibly also the military infrastructure and political leadership level could be hit and eliminated to such an extent that a counter-reaction is no longer possible. The "second strike capability" would therefore be endangered.

That is why the nuclear powers are trying to build up an infrastructure so that their own missiles could be launched before those of an opponent hit. Such a strategy is called "launch on warning".

An important prerequisite for this is that an enemy nuclear attack is recognised as such and, in order to achieve this, highly complex computer-supported early warning and decision systems (EWS) have been set up. They consist, essentially, of the following components:

- Sensors for detecting a nuclear missile attack,
- Computer centres and communication networks for the analysis and protected transmission of data,
- Command posts for the evaluation of warning information and the hazard situation as well as for the planning and arrangement of counter-reactions.

Such early warning systems are hugely complex and are of course error-prone and can lead to false alarms for missile attacks. In the past, this has often happened and has repeatedly triggered dangerous alarm conditions. Errors that led to a higher alarm level are caused by:

- Misinterpretation of sensor signals by the sun rising,
- Simulation of an attack for test purposes without informing the personnel,
- Hardware failure

(see, for example, http://www.fwes.info/fwes-19-2.pdf, actually only available in German).

When evaluating alarm messages, there is the problem that the output data of the sensors, the transmission of the data or the automatic evaluation can be faulty. Nevertheless, decisions on possible counter-reactions must be made within the shortest possible time. Particularly problematic is when certain events coincide, which causes causal relationships to be assumed which in fact do not exist.

If there is an increase in the alarm level due to a false alarm, this is also registered on the opposite side and can therefore also lead to an increase in the alarm level there. This is registered again and

so it can come to uncontrollable alarm chains, which occur at very short time intervals and are difficult to control by humans.

While in earlier crisis situations a military attack was prepared for weeks or months and was easily recognizable by the opponent within this time span. Today however, the reaction time is extremely short: intercontinental missiles can hit the opponent after a flight time of 30 minutes, submarine-supported missiles in even less time and the stationing of medium-range missiles shortens this time span even further in the minute or even second range. If an early warning system reports an attack, there is hardly any time left for a careful evaluation, but waiting until impact could mean that a counter-reaction is no longer possible.

For this reason, there were already threats in the 1980s that if an attack were detected by an early warning system, a counter-attack would be triggered automatically by a computer decision, since a serious decision - tested by humans - would hardly be possible anyway. Legally, however, the president must ultimately still make the decision – although nobody knows how this can be done within that short time span.

The danger of isolated errors in an early warning and decision-making system leading to nuclear war in peacetime is relatively small, as long as the political leaders involved can be reasonably trusted and the political situation remains stable.

But if:

- there is a political crisis or conflict situation,
- several events occur simultaneously,
- alarm chains are initiated,
- the secondary strike capacity is at risk

then the danger that mistakes and misjudgements could trigger a nuclear war is real and potentially very high depending on the situation.

This risk of misjudgement already applied during the Cold War in the 1980s. Even today there are further dangers:

- a strike by cyber attacks
- Partial decisions by artificial intelligence within an early warning system, which usually cannot be verified in the short time. This makes the evaluation of possible false alarms considerably more difficult and increases the probability that several events will occur simultaneously. In particular, there may be interactions between cyber attacks and the FWS of nuclear forces that are unpredictable and uncontrollable.

Risks from climate change

Due to climate change and the associated pressure from climate refugees, the risk of crisis situations will increase significantly in the future. Since 2007, climate change and progress in international agreements to limit global warming have therefore also taken into account when the nuclear war clock is set. Climate change may make various regions uninhabitable due to heat waves or rising sea levels.

This threatens in particular many regions in Africa and Asia:

- In Asia, the large river deltas are affected by sea-level rise in which more than 200 million people live.

- According to a report by the Max Planck Society dated 29 April 2016, extreme heat waves in Africa will lead to parts of North Africa and the Middle East becoming uninhabitable. More than 500 million people live there who are already severely affected by climate change.

If people have to leave their homes on a large scale because they are uninhabitable as a result of climate change, this will inevitably lead to political crises, tensions and perhaps also wars. The same applies to the fight for increasingly scarce resources such as water or raw materials.

This will also increase the risks posed by computer-supported EWS as alarms in such tense situations are much more likely to be taken seriously and could thus more easily lead to an accidental nuclear war.