



New findings and insights on the consequences of radiological disaster

Brief study by Dr. Nikolaus Müllner

Leading physicists warn not to underestimate the danger of a nuclear meltdown during warfare. The possibility of a nuclear catastrophe with wide radiological dispersion is real.

Nuclear physicist and Nobel Peace laureate Professor Joseph Rotblat (Nuclear radiation in warfare, 1981) wrote: „The radioactivity released from damaged spent fuel ponds could be even greater than from a meltdown at the reactor itself“. Rotblat’s study makes clear that a military attack on a reactor or spent fuel pond could release more and longer-lasting radioactivity than even a large (megaton range) nuclear weapon.

Nuclear physicist Ed Lyman, Union of Concerned Scientists, said: „Whenever nuclear reactors operate in unusual conditions that have not been thoroughly analyzed, risks increase.“

Dr. Müllner, Institute of Risk Sciences, University of Vienna, today: Disaster management during warfare will not be possible. Remember the fact that fire brigades were not admitted to the Zaporizhzhia NPP after the Russian occupation.

Even though all details of the radiological dispersion into the environment cannot be foreseen, scientists agree on the fact that there will be a zone of very high contamination of more than 1480 K_{Bq}/per m², similar to the Chernobyl exclusion zone, within a larger contamination zone, which would have more than 185 K_{Bq}. This would make agricultural production impossible because of long lasting soil contamination.

Taking the Chernobyl disaster as an example: the graphite moderated reactor burnt for 11 days and sent radioactive plumes over the Republics of the former Soviet Union and most of the European continent. 36 % of the total radioactive fallout was in

Belarus, Russia and Ukraine; about 53 % over the rest of Europe. 11 % was distributed around the rest of the globe.

The Fukushima nuclear meltdown:

Large atmospheric radioactive releases, and leaks into groundwater and the ocean from the damaged reactors and spent fuel pond 4, went on for several weeks (26 days). 19% of the nuclear fallout affected the main Japanese island Honshu, 79% was deposited in the Pacific and 2% over the rest of the globe. It was entirely a matter of luck that it didn't rain on the night of 14-15 March 2011, when the largest radioactive cloud went over Japan, including the greater Tokyo area with 36 million inhabitants.

Air and especially soil contamination, as well as the contamination of the food chain, are long-term hazards.

According to the many health studies that were conducted after the Chernobyl catastrophe we know the following:

Zablotska¹ evaluated the health impacts of the Chernobyl nuclear accident 30 years later. She states that „epidemiological studies reported increased long-term risks of leukemia, cardiovascular, cerebrovascular diseases, and cataracts among clean-up workers. Also thyroid cancer and non-malignant diseases were found in those exposed as children and adolescents“. M. Hatch and E. Cardis² point out that „the dose-dependent increase in Papillary Thyroid Cancer (PTC) following childhood I-131 exposure in Ukraine and Belarus has now been shown to persist for decades“. They also affirm that “studies of clean-up workers/liquidators suggest dose-related increases of thyroid cancer and hematological malignancies in adults”. They also report increases in cardiovascular and cerebrovascular disease.

What does IPPNW recommend for NPT member states?

In simple, clear language, the NPT PrepCom and subsequent meetings of the NPT need to act to establish as a principle that an attack on nuclear power plants or other nuclear facilities is not a legitimate act of war, without exception. Due to the indiscriminate harm caused by a nuclear meltdown due to military activities, affecting combatants and non-combatants alike, we join with the IAEA to establish as principle a demilitarized zone around nuclear power facilities.

Specifically, that there be:

- 1) No attacks of any kind targeting nuclear power facilities, including reactors, spent fuel storage, and other critical infrastructure or personnel;
- 1) No use of nuclear power facilities as a storage site for heavy weapons or a base for military personnel who could attack from such nuclear power facilities;
- 2) No actions that put nuclear power facilities offsite power sources at risk;
- 3) Protection provided to all structures, systems, and components essential to the safe and secure operation of nuclear power facilities from attacks or acts of sabotage; and,
- 4) No action of any kind that undermines the preceding principles.

¹ Lydia Zablotska (2016) 30 Years after Chernobyl accident

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4899336/>

² M. Hatch, E. Cardis (2017) <https://pubmed.ncbi.nlm.nih.gov/28929329/>