

**Ursula Gelis**

**Interview with Dr. Steinar Høibråten, research scientist at the Norwegian Defence Research Establishment (<http://www.ffi.no>).**

1. *We are here at the Peace Palace in The Hague to learn more about nuclear dilemmas, for instance about proliferation risks. Your institute, the Norwegian Defense Research Establishment, is working together with a NGO called VERTIC on a disarmament and non-proliferation project. Could you tell us a little bit about this NGO which celebrates its 25 years of existence in 2011?*

H.: VERTIC is based in the United Kingdom, in London. The people at VERTIC and other British colleagues have worked with several Norwegian institutions on the 'UK-Norway Initiative'. VERTIC specializes in verification mechanisms applicable in the field of disarmament of weapons of mass destruction.

Together with British scientists, we conducted a major exercise in Norway and another one in the UK. The purpose was to study how a non-nuclear weapon state can verify that a nuclear weapon state really is destroying one of its nuclear weapons. Our institute and our neighbour, the Institute for Energy Technology (IFE) were chosen as the simulation site. Our facilities became – as part of the simulation – a “nuclear weapon laboratory”.

2. *At the end of August, Kazakhstan and the world were commemorating the 20<sup>th</sup> anniversary of the closure of the former Soviet nuclear testing site at Semey/Semipalatinsk. Between 1949 and 1989 about 456 nuclear tests were conducted there on Kazakh grasslands. Why so many?*

H.: The arms race that began immediately after World War II got completely out of hand. The former Semipalatinsk test site accounts for almost 25 % of all nuclear tests in the world. The mindset of the cold war went for always better, bigger and more sophisticated weapons. This required testing; in short, for a 'better bomb' more test data was desirable.

3. *Quoting a scientific source, due to all nuclear weapon testing so far we have to live with about one ton of plutonium in the atmosphere. What does this do to us?*

H.: When a nuclear bomb is exploding, heavy particles fall down first. Lighter materials stay longer in the atmosphere and are with us for many years. All these elements are around us in the ecosphere. The ton of plutonium probably constitutes less of a problem for humankind than those radioactive elements that enter the food chain and remain there for years, such as strontium-90 and caesium-137. Plutonium and uranium are less available to us, and they are the most hazardous if you breathe them into your lungs. They are somewhat radioactive, and as heavy metals, they will also affect your body they way lead and other non-radioactive heavy metals do.

If we look at our latest experience with Fukushima, the radioactive materials and the radiation effects in Japan now are somewhat similar to what you would get from bomb explosions after the short-lived radiation has decayed away.

4. *How do we detect radiation? What are the detection procedures of the IAEA?*



(Closure of the former Soviet nuclear weapon testing site in Kazakhstan).

H.: Making radiation measurements is generally not very difficult using standard radiation detectors. It is much harder to estimate the radiation doses that people have been exposed to. The latter is measured in sievert. This unit includes the health effects of different kinds of radiation at different parts of the body and thereby ideally provides a measure of the health risk of the radiation. We are all exposed to radiation from naturally occurring radioactive materials all the time.

The IAEA has issued certain recommended limits for radioactivity in food, radiation doses etc. A controversial issue is the risk associated with low-level radiation.

*5. One major topic at the conference here is the proposal by Kazakhstan to host a multinational nuclear fuel bank. What is it all about?*

H.: The concept of a nuclear fuel bank serves two purposes: First, to ensure all states with nuclear reactors access to the necessary uranium fuel. Second, to lower the risk of a country using its nuclear facilities to produce weapons grade nuclear materials. Countries using the fuel bank will not need and will not be allowed to have their own complete set of facilities for the production of nuclear materials such as uranium and plutonium. Whenever necessary, the nuclear fuel bank will supply those countries with the fuel they need for energy purposes.

6. *The Kazakh city of Ust-Kamenogorsk has a factory called Ulba Metallurgic Plant where highly enriched uranium (HEU) can be down blended. Can you explain this process?*

H.: The down blending of HEU is fairly straightforward and does not require nuclear processes. You mix HEU with natural or depleted uranium, probably by melting them, and the resulting material will have a lower enrichment than the HEU you started out with.

7. *There is an organization called the CTBTO. What are they doing?*

H.: The Preparatory Commission for the Comprehensive Nuclear-Test-Ban Treaty Organization has built a global monitoring network to detect if anyone is conducting a nuclear test. The Comprehensive Nuclear-Test-Ban Treaty (CTBT) was signed in 1996 and bans all nuclear explosions. The treaty has not yet been ratified by all required nations and has therefore not yet entered into force. In the meantime, the CTBTO has done a big job setting up the monitoring system and developing on-site inspection procedures to be used in case of a suspected nuclear test.

8. *In 2008, the CTBTO did on-site inspections at the former Soviet nuclear testing site. What was the purpose of this exercise?*

H.: In my view, the exercise in Kazakhstan was an efficiency test of the on-site inspection procedures. To be able to respond properly in case of a real event somewhere in the world, it is crucial to exercise the people involved from time to time and fine tune the procedures.

9. *In nuclear laboratories scientists can do so-called sub-critical tests. What does this mean?*

H.: A sub-critical test is not a nuclear test in the sense that no nuclear chain reaction takes place. Nuclear materials are exposed to extreme physical conditions such as high pressure and high temperature. Such tests are carried out to learn more about the properties of nuclear materials under the conditions found in a real nuclear explosion. They are also carried out to study the behavior of aging plutonium – how fresh plutonium has to be in order to be “usable”, etc. Sub-critical tests probably also provide useful data to the simulation programs that the weapons designers use.

10. *What is your personal view about the former Soviet test site? Can it be used in the future?*

H.: I think that large areas could be opened. Some areas will presumably remain unusable for all foreseeable future due to high radiation levels. A long-term expensive clean-up process must be carried out. Keep in mind that areas that may be too contaminated for schools, homes, farming etc., could still in some cases be usable for storage facilities and other industrial purposes.

11. *How can polluted areas be cleaned up?*

H.: Most of the radioactive materials will have to be removed. For example, physical objects have to be collected, top soil removed, maybe some materials sealed in concrete. Short-lived radioactive materials disappear by themselves after a while

through radioactive decay; other materials must be removed one way or another. If an area is very contaminated, the location could maybe be used as a storage facility for radioactive substances. There may be a lot to learn from the handling of the huge waste problem at the nuclear complex at Hanford, USA, for example.

In the end we always return to the nuclear waste disposal problem. If we did not have the waste dilemma, nuclear power would be a much more easily acceptable technology – despite the potential danger of nuclear disasters like Chernobyl and Fukushima.

*12. Kazakhstan renounced its nuclear arsenal, inherited from the former Soviet Union. We are talking here about the 4<sup>th</sup> biggest arsenal in the world. The country is a strong player in the disarmament field. President Nazarbayev is calling for a universal ban on nuclear weapons. Last October Norwegian grass root activists joined the international campaign to abolish nuclear weapons (ICAN) and are now strongly advocating a Nuclear weapons convention (NWC).*

*What do you think about a Nuclear Weapons Convention?*

H.: I do of course agree with the ultimate goal of the campaigners: to achieve a world free of nuclear weapons. But we seem to disagree somewhat about how to get there. Article VI of the Non-Proliferation-Treaty (NPT) with its call for “general and complete disarmament under strict and effective international control” already provides the necessary formalities. The NWC has a symbolic value which maybe could speed up the process, but it could also be seen as completely irrational. We are dealing with a long-term goal, and even under the best of circumstances it will take many, many years to properly dismantle all nuclear weapons as well as the facilities that may be used to build new weapons. The process must be verified, and the waste must be handled.

We actually should head for a status ‘below zero’ in order to prevent former nuclear weapon states from starting up again with new weapon programs. It is said that a world without nuclear weapons will not be today’s world minus its nuclear weapons, but a different world. When nuclear weapons are no longer part of the power balance, conventional weapons will rise to more importance again. That in itself may require a whole new set of treaties and a lot of political craftsmanship.

*13. How important is the relationship between Norway and Kazakhstan in the struggle to abolish nuclear weapons?*

H.: The contributions of both countries are important already today. By making a concerted effort towards disarmament, we may gain even more.

*14. What is your impression about the cooperation between distinguished governmental institutions as yours and grass root activism?*

H.: A good working relationship should be profitable for both groups. It is important that governmental institutions are in communication with the NGO community. Open discussions are useful, and I think attending each other’s events is very educational and can give many of us new insights. I see it as a ‘win-win’ situation to know more about each other’s views and challenges. Of course different perspectives are part of a vital discussion. Let us move on in this direction.

*Ursula Gelis. ‘No-to-nuclear-weapons’, Oslo. WILPF, September 2011*