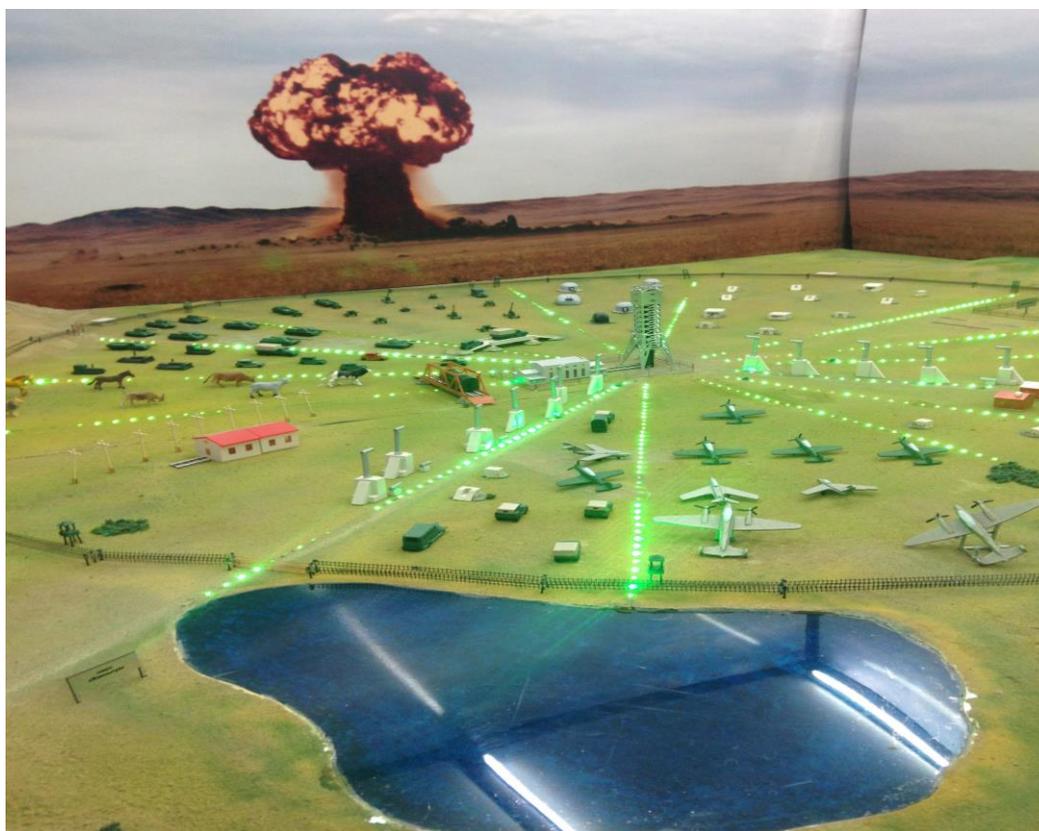




## The SEMI-NUC project on Health effects from radiation exposure of people living near the Semipalatinsk Nuclear Test Site in Kazakhstan

**The uncertainty related to possible health risks from low and protracted doses remains unsolved. The current project will address the feasibility of future epidemiological studies on health effects from low to moderate radiation doses for residents near the Semipalatinsk nuclear test site affected by radioactive fallout from nuclear testing and nuclear accidents.**



*Nuclear test model at the museum of SNTS in Kurchatov.*

The High Level Expert Group on low dose risk research has issued a vision report and a Strategic Research Agenda for a pan-European, integrated research collaboration with the aim of better quantifying the risks from low and protracted doses.

In the years 1949-1989 the Soviet Union conducted 456 nuclear tests at the Semipalatinsk nuclear test site. Before 1962 more than 118

atmospheric tests were performed. Particularly some of these early tests resulted in severe releases of radioactivity that contaminated nearby territories.

**The main goal of the SEMI-NUC project is to assess the feasibility of establishing a long-term, prospective cohort to study the health effects of low and moderate radiation exposures that resulted from the testing of nuclear weapons at the Semipalatinsk Nuclear Test Site (SNTS).**

## The project

SEMI-NUC (Prospective cohort study of residents near the Semipalatinsk nuclear test site – feasibility) is funded by the European Commission 7th Framework Programme Euratom and the Research Council of Norway. The project started in April 2013 and is expected to be concluded by April 2015.

The project gathers experts in epidemiology and dosimetry from France, Germany, Japan, Kazakhstan and Norway and is coordinated by the International Agency for Research on Cancer (IARC).

More information about the project can be found on the project web page:  
<http://semi-nuc.iarc.fr>



*The SEMI-NUC kick-off meeting in Mai 2013 was followed by an international conference that reviewed all existing knowledge on health risks of exposure to fallout from activities at the SNTS. NRPA staff were among the participants of this conference.*

The health effects of exposures to fallout from Soviet nuclear weapons testing for the residents living near the SNTS in Kazakhstan have been studied before. The reported research gave, however, contradicting results as to whether or not there was an increased frequency of disease in the population. There are reports on epidemiological studies conducted in two cohorts collected separately by the Kazakh Scientific Institute for Radiation Medicine and Ecology (KSIRME) and the National Nuclear Center (NNC) with different funding sources. Both cohorts have high potential to address the question of the effects on human health of low and moderate levels of radiation both as a result of external exposure

in the early years of activities at SNTS and following long time intake of radionuclides from the fallout. In the SEMI-NUC project attempts will be made to merge results from the studies on these two cohorts to set up a larger, unified cohort of residents around the former Semipalatinsk Nuclear Test Site. Activities will include: quality assurance for individual dose characterization and validation of dose assessment methods used in the two cohorts; determination of the outcomes to be studied in the future (cancer and non-cancer diseases); and identification of case ascertainment mechanisms and sources, depending on the outcomes. The end point of these activities is to develop a proposal for a full epidemiological study in the future if feasibility is proven in the SEMI-NUC project.

## SEMI-NUC Mission to Kazakhstan in October 2013

An international multidisciplinary research team with scientists from Norway, France, Germany and Japan visited the Kazakh Scientific Institute for Radiation Medicine and Ecology (KSIRME) in Semipalatinsk city, the Institute of Radiation Safety and Ecology under the National Nuclear Center of Kazakhstan (RSE NNC) in Kurchatov city, and the village of Bodene located nearby the SNTS area.



*The participants of the meeting at KSIRME*

There were also short visits for some of the scientists to the Radioecology Institute at the University in Semipalatinsk and the Diagnostic Oncology Centre in Semipalatinsk. At the

KSIRME as well as at the RSE NNC the international experts worked in close collaboration with colleagues from Kazakhstan. At KSIRME the experts worked in sub-groups to address specific issues during the study. Epidemiologists focused on the

existing cohorts and data registry collected by KSIRME and NNC, while people working with different aspects of dosimetry looked into available dosimetry data as well as usefulness of biological samples that the institute is collecting.



*Samples at KSIRME. Left: bricks are collected for estimation of doses by Retrospective Luminescence Dosimetry. Right: the leader of the biological laboratory presents blood-bank samples collected from the people living nearby the SNTS for DNA analysis. Samples are collected from whole families and in some case for several generations in the same family.*

During the visit to the National Nuclear Center in Kurchatov the different facilities at this institute were presented. The institute is well equipped with modern, state of the art equipment for radiation monitoring and dose assessments.



*Left: Measurements of radioactivity in the human body. Right: the quadrupole mass spectrometer with inductively coupled plasma (ICP-MS) used for the measurements of radionuclides in environmental samples at RSE NNC in Kurchatov.*

The dose assessment program, the choice of villages to be included, and some additional measurements were discussed. The contribution of the Japanese experts who have been working with dose assessment at the SNTS for years was acknowledged.

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## Meeting the local residents

At Bodene village we were kindly welcomed by the local authorities and residents at the local school. Short presentations about the life in the village and its population were given by the governor of the village and the local school director. Such visits are important to understand the situation of local residents affected by the nuclear weapons testing.



*Bodene village is located in the step, about 30km from the boundary of SNTS*



*Welcome committee in the local school greets international experts with bread and salt*



*According to the local tradition the oldest citizens in the village are present during the event. Some representatives from the local community spoke about the perception of the risk of living near the SNTS among local people*

