



## HISTORICAL AND MODERN SEISMICITY OF THE SEMPALATINSK TEST SITE TERRITORY (KAZAKHSTAN)

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Currently, there are several critical facilities at the Semipalatinsk Test Site region: 3 research nuclear assemblies, adits and boreholes at which nuclear tests were conducted earlier, etc. In addition, Kurchatov is considered as one of optional places for constructing a nuclear power plant in Kazakhstan. Thus, assessment of seismic hazard of the region is very important.

According to the current map of general seismic zoning of the Republic of Kazakhstan (2003), Semipalatinsk Test Site territory is located in the east of Kazakhstan, there are no seismic generating zones, and earthquakes with intensity more than 5 are not predicted. However, the recent investigations and analysis of archived data showed the Test Site territory and its vicinity experienced earthquakes in the past and some seismicity is observed in present. Maximum magnitude of the recorded earthquakes is 5 – 5.9.

The following activities were undertaken to solve the issue on natural seismicity at the STS region:

- world seismological bulletins, and information on historical seismicity from literature were analyzed. Historical analogue earthquake seismograms beginning from 1950 were collected, earthquake parameters were précised.

- All modern instrumental seismic data from regional Kazakhstan network beginning from 1994 were processed.

- Temporary seismic stations networks were installed on the Test Site territory during 2005-2010 to record small seismic events at the sites Sary-Uzen, Balapan and Degelen where strong nuclear tests were conducted formerly;

- huge work was conducted on seismic discriminating of tectonic earthquakes, historical nuclear and chemical research and calibration explosions as well as industrial quarry blasts;

- macroseismic information was collected for large earthquakes, strong motion records recorded by Kurchatov station were analyzed for several earthquakes;

- seismic and tectonic settings of the region were investigated, position of deep faults dividing the earth crust blocks was précised. The tectonic elements location was précised by decoding Landsat space images, and using materials of geological and topographical surveys. The map of the main tectonic structures of the STS territory and its vicinity was constructed.

A joint earthquake catalogue for the STS territory and its vicinity covering the period from 1783 till present was created, the most active seismic zones were revealed, earthquake focal mechanisms were constructed. The calculations show that the STS territory may still experience events with intensity 6-7 on MSK-64 scale.

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Availability of industrial seismicity is of high probability. It appears as small seismic quakes at the region of Degelen site where nuclear tests were conducted earlier.

The experience gained during field investigation of the STS territory seismicity confirmed the importance of real data for integrated assessment of the STS safety, and necessity to continue the monitoring by creating the permanent seismic stations network.