ENVIRONMENTAL RISK FACTORS

• PHYSICAL RISK FACTORS

Key questions and key findings

How significant is the load effecting the population due to the contents of artificial radionuclide agents in the food chain components?

- **Contents of artificial radionuclide agents in the basic food groups and forage types was at the detection limit and their contribution to radiation load on the public resulting from their potential ingestion is insignificant.**

Is the operation of nuclear power plants in Slovakia safe?

- **Similarly, even the special tests of nuclear facilities following the Japan accident of 2011 confirmed that nuclear power plants in Slovakia represent a safe option and are able to handle even exceptionally extreme events.**

Radiation protection

Environmental radioactivity monitoring was carried out in compliance with the MoE SR Act 355/2007 Coll. on protection, promotion and development of public health, and pursuant to the MoE SR Resolution 524/2007 Coll. which sets forth details regarding the radiation monitoring network.

Public Health Authority of the Slovak Republic carries out radiation situation monitoring and collection of data in Slovakia for the purposes of irradiation assessment and assessment of the effects of radiation on the health of the population.

In 2012, total number of 766 samples from the environment was extracted and 1 036 radiochemical analyses were conducted, along with 6 550 radiometric measurements.

Basic radiology indicators found in the samples of drinking water abstracted within the environmental monitoring did not exceed the reference values for implementation of measures under Annex 4 to Decree 528/2007 Coll. ^{90}Sr volume activities were at 0.005 Bq/l and less than 0.015 Bq/l for ^{137}Cs.

Surface and wastewater showed the maximum activity of 0.020 Bq/l for ^{90}Sr, and 0.066 Bq/l for ^{137}Cs.

Volume activities of tritium within drinking water samples and atmospheric precipitations stayed at the MDA level (1.9 Bq/l), and in the interval of up to MDA – 126,0 Bq/l for surface water. Highest tritium activities were recorded in the wastewater from NPP Mochovce (maximum value of 4 200.0 Bq/l). No exceeded values for the concentration limit $1.95.10^5$ Bq/l were detected in tritium discharged into the environment.

The highest ^{90}Sr activity in atmospheric fallout was 1.11 Bq/m^2 (quarterly) and 5.56 Bq/m^2 for ^{137}Cs.

Activity of nuclear installation

Nuclear facilities in Slovakia are operated under strict safety regulations, technical and environmental norms, public health and environmental protection standards.

List of nuclear installation in the SR and their operators

Location	Nuclear installations	Operator
Mochovce	NPP Mochovce, 1st and 2nd. block NPP Mochovce 3rd and 4th block under construction	**SE, Inc.**
Bohunice	NPP V-2 , 3rd and 4th block	
Bohunice	NPP Bohunice V-1 NPP Bohunice A-1 Interim Spent Nuclear Fuel Storage The Bohunice RAW Treatment Centre	**JAVYS, Inc.**
Mochovce	Liquid RAW Final Treatment Facility National Radioactive Waste Repository	

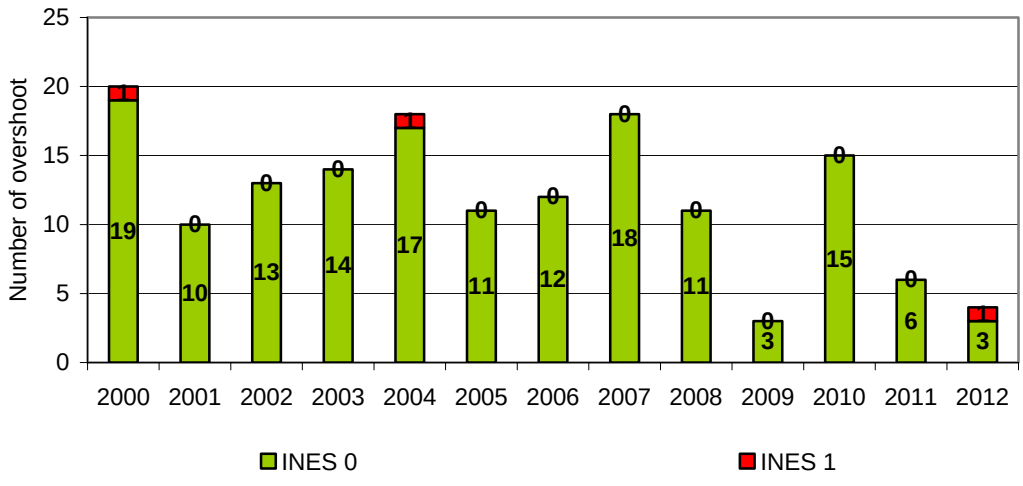
Source: NRA SR

Nuclear power plant of Bohunice V-2

The Bohunice V-2 nuclear power plant (NPP) comprises 2 nuclear blocks of the VVER 440/213 type. Since 2012, both blocks have been operated at increased thermal (1 471 MWt) and electric (505 MWe) reactor outputs. Besides, they are located at the site of NPP Bohunice V-1 and NPP Bohunice A-1 that are phased-out. In 2012, besides standard control and assessment activities related to everyday operations of power plants, the most significant activity in terms of nuclear safety was the ongoing project of implementing measures to mitigate the aftermath of so-called grave accidents.

The number and character of events under the International Nuclear Events Scale (INES) in 2012 was within the range of common technical malfunctions, without any major safety issues. Events that occurred at the power plant did not have a major impact on nuclear safety. Nuclear Regulatory Authority of the SR (NRA SR) assessed the operation of both NPP V-2 blocks in 2012 as reliable, with no major failures in the area of nuclear safety.

Number of occurances of block NPP Bohunice V-2



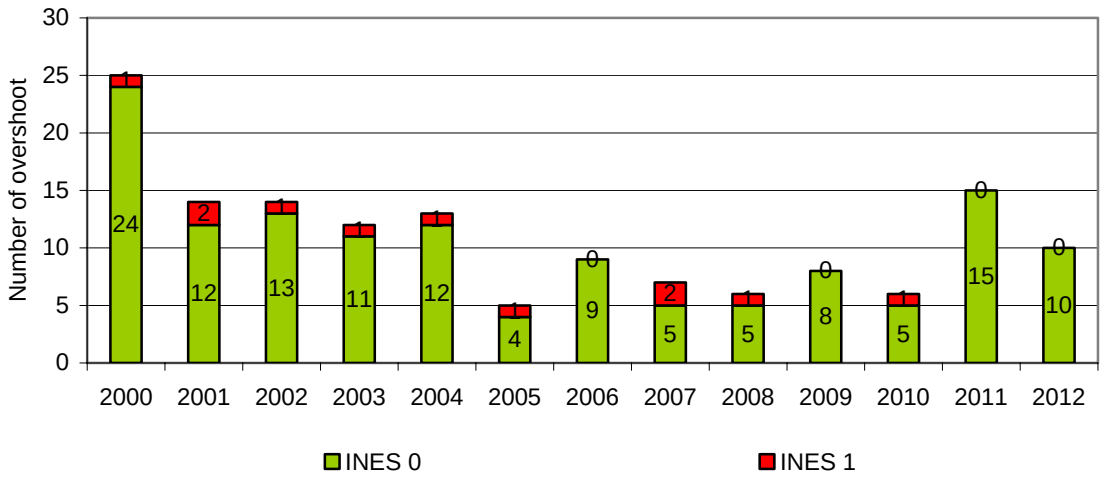
Source: NRA SR

Nuclear power plant of Mochovce 1, 2

The NPP Mochovce comprises two blocks with the VVER 440-type reactors of the nominal output of 470 MWe. Other two blocks, VVER 440/213, of this substantially improved project are under construction (3rd and 4th block of the NPP Mochovce). In 2012, both blocks of 1 and 2 NPP Mochovce met the demands of the Slovak energy control centre.

The number and character of events and occurrences in 2012 was within the realm of common technological malfunctions and did not require special attention in terms of unique safety issues.

Number of occurances of block NPP Mochovce 1, 2



Source: NRA SR

Interim Spent Nuclear Fuel Storage (ISFS) of Jaslovské Bohunice

MSVP found at the Bohunice site serves for temporary storage of spent fuel from the Bohunice V-2, Mochovce 1 and 2, and Bohunice V-1 nuclear power plants.

The facility comprises two bitumenization lines, cement line of the Bohunice RAW processing centre, fragmentation line, large-capacity decontamination line, site for the treatment of used air-conditioning filters, and RAW storage capacities.

Technology of processing and treatment of radioactive atomic waste (RAW)

It is operated by the JAVYS, Inc. This installation includes two bitumen lines, cement line, and the Bohunice RAW Treatment Centre. Outcomes of the control activities suggest that the operation of NI Technologies for radioactive waste processing and treatment may be assessed as safe.

National Radioactive Waste Repository in Mochovce (NRWR)

Designated for the final storage of solid and reinforced low and medium active RAW. In 2011, the ÚJD SR issued a decision permitting the operation of RÚ RAO for the next 10 years.

Liquid RAW Final Treatment Facility in Mochovce (LRW FTF)

This facility treats liquid RAW from the operation of the nuclear power plant of Mochovce and processes it into a form suitable to be stored at RÚ RAO. Technology consists of two individual processes involving bituminization and cementation.

Inspection activity focused on controlling the compliance with the nuclear safety criteria, as well as the criteria for supervising the RAW handling and RAW minimisation, with no major faults detected.

In response to the accident at NPP Fukushima (March 2011) in Japan, top representatives of the EC and the member states agreed to perform on-target assessment of the security risks (so-called stress testing) at NPP in the EU member states. Thorough inspections of nuclear facility safety were implemented in also in Slovakia. A number of non-standard tests and in-depth inspections to identify the areas for possible increase of nuclear power plants' resistance were carried out under the stress testing implemented at nuclear power plants.