

## I. BRIEF SUMMARY

In the period from November 2017 to May 2018, there were no safety significant events to be reported about the Slovenian nuclear installations.

The main activity of the SNSA in this period was the finalization of the Ionising Radiation Protection and Nuclear Safety Act and continuation of intensive work on the secondary legislation to ensure alignment of the remaining provisions (not covered by the Act) with the EU BSS Directive in the Slovenian legal framework. Preparations for Topical Peer Review workshop were finished. In April, the Krško NPP refuelling outage took place, which was successfully finished by connecting the NPP to the grid on 1 May. Slovenia hosted the EPREV mission in November 2017. The Early Warning System software was upgraded to include data from the mobile units and a number of additional functionalities was added.

## II. LEGAL SYSTEM

In previous issues of News from Nuclear Slovenia (April 2017 and October 2017) it was reported that in the last two years, in the field of legislation, one of the biggest projects was the preparation of a new Ionising Radiation Protection and Nuclear Safety Act (ZVISJV-1). This long lasting and demanding task was completed on 12 December 2017, when the ZVISJV-1 was adopted by the National Assembly. After publishing it in the Official Gazette, the Act entered into force on 6 January 2018 and from that day on the previous Law ceased to apply.

Based on the transitional provisions of the new Ionising Radiation Protection and Nuclear Safety Act (ZVISJV-1) many implementing Governmental Decrees and/or Ministerial Rules have to be adopted, while some secondary legislation (4 implementing Decrees and 13 implementing Rules) adopted on the basis of the previous Act of 2015 (ZVISJV-D), will remain in force.

Some of implementing regulations that transpose EU BSS provisions into the legal system of our country have also been recently adopted:

- Decree on national radon program (UV4) – on 21.3.2018
- Decree on dose limits, reference levels and radioactive contamination (UV2) – on 4.4.2018
- Decree on activities involving radiation (UV1) – on 7.4.2018.

Transposition of the EU BSS Directive is the on-going process and in Slovenia it has not been finished yet. There are several other pieces of legislation still to be adopted, as for example:

- Rules on the use of radiation sources and on activities involving radiation (JV/SV2)
- Rules on the monitoring of radioactivity (JV10)
- Rules on the criteria of using ionising radiation sources for medical purposes (SV3)
- Rules on the requirements and methodology of dose assessment for the radiation protection of the population and exposed workers (SV5)
- Rules on approving of experts performing professional tasks in the field of ionising radiation (SV7)
- Rules on the obligations of persons performing radiation practices and holders of ionising radiation sources (SV8).

## III. THE KRŠKO NPP

### III.1. Event »Electric Shock in the Krško NPP«

On 18 December 2017, when the Krško NPP was at normal power, a work accident occurred during the morning hours. While performing the review, a worker pushed the bar (part of the work process) between the cables and damaged the insulation of one of the cables that consequently caused a ground fault with the worker being shocked and with burns on his arm. The worker was hospitalized although he was not seriously injured. The event

did not trigger the electric protection system, which means that the 400-volt electrical bus MCCD221 remained powered during and after the event. In case of triggering of the protection system, a 400-volt MCCD 221 bus which supplies a series of safety-critical equipment, would be lost.

The main causes of the event were poor safety culture of contractors, lack of supervision over the contractors and a failure to respect the prescribed processes and procedures.

### III.2. Topical Peer Review

Slovenia prepared a National Report within the Topical Peer Review (TPR) on aging management under the Nuclear Safety Directive, based on WENRA technical specifications. Ageing management processes and the program established in the Krško NPP is presented in the National report emphasising four technical areas, which are foreseen within the TPR. Namely, electrical cables, concealed piping, reactor pressure vessel and concrete containment. The Krško NPP ageing management program fully complies with the Slovenian regulation and it is constantly being improved based on internal and external operating experiences and results of R&D activities in the world.

After completing the National report, it has been forwarded to ENSREG in December 2017. The process of reviewing other country reports and preparing the relevant questions have been already done. By the end of April 2018, is planned to answer the questions, that other countries have submitted on Slovenian Technical report. The Slovenian delegation will present the report and answers on the questions at the TPR workshop (14 to 18 May) in Luxembourg.

### III.3. Refuelling Outage and Safety Upgrades in the Krško NPP

The Krško NPP refuelling outage took place from 1 April to 1 May 2018.

During the outage, extensive maintenance work and technological improvements and safety upgrades were performed. Some of the main activities of the post-Fukushima safety upgrade plan are the construction of the Emergency Control Room, RCS Containment Alternative Cooling, installation of additional Pressurizer PORVs, etc

The plant safety upgrades modifications are licensed by the SNSA before the outage. The implementation of modifications and outage activities are the subject of the oversight by TSOs and SNSA inspectors and other SNSA staff. In accordance with the Slovenian legislation, the NPP can be restarted to produce electricity only after the TSOs and the SNSA confirm that all the work was properly carried out, all the tests were successfully performed.



Fig. 1: Emergency Control Room in the Krško NPP



## IV. RADIATION MONITORING

### IV.1. Refurbishment of the Early Warning System Software

The new software for Early Warning System will contain improved collection, archiving and displaying environmental radiation monitoring data. In addition, the software will also display data from laboratory measurements of environmental samples and real-time measurements from mobile units. The first testing of the new online tool began at the end of 2017. All these features will be accessible to the public at the same URL as it was used by the old system.

Users at the SNSA will have access to broader contents, such as a detailed overview of data by location, deposition, statistical data, popular and fast state reviews and export of simple reports. Important new features are the menu Exercise and Emergency events (exercises and simulations) and the menu Mobile Units (requests of field measures and display of real-time data from mobile units). The system provides a two-way communication with mobile units through a specially developed application for smartphones, which gives information about requested measurement and sends real-time measured data and data from track monitoring in the system, where they are displayed in the map.

The system provides improved functionality for data statistics. Graphical views can be edited (display, colours, scale, multiple parameters etc.). In addition, the average value enables the rapid identification of any deviations of radiological parameters in the environment. The overview can be also exported as an image or in basic tabular forms. The system offers simple administration of individual measurement stations as well as levels and colours of alarms.

## V. INTERNATIONAL COOPERATION

### V.1. Projects of Assisting the Third Countries

The SNSA is involved in four projects of assisting the third countries. In the framework of multinational Training and Tutoring project the SNSA trained two participants in the duration of two months (December 2017 - January 2018) in the area of regulatory requirements and safety evaluation of the NPP Safety Analysis Report. The on-site activities of the project of assisting the Thai regulatory body were finished at the end of 2017 and the final reports were prepared in the beginning of this year. The project of assisting nuclear and radiation safety regulators of West Balkan countries is just before the conclusion in June 2018. The final verification of alignment of the beneficiaries' legal framework with the EU Acquis is still pending. Within the project of strengthening the Iranian regulator, the SNSA prepared Feasibility Study for establishing a Nuclear Safety Center, which final draft was successfully presented in Tehran and also to the diplomatic representatives of the E3+3 countries in Vienna in April 2018.

## VI. EMERGENCY PREPAREDNESS

### VI.1. EPREV

EPREV («Emergency Preparedness Review») missions are designed to provide a peer review, which is based on the IAEA Safety Standards of emergency preparedness and response (EPR) arrangements.

The mission was undertaken from 4 - 16 November 2017. Within the two-week appraisal the mission team reviewed the entire national EPR framework, including legislation and regulation, plans and procedures on all levels as well as staffing and technical capabilities to respond properly in case of a nuclear or radiological emergency. The mission team conducted site visits or interviews with 35 different stakeholders involved in the response system on all levels. At the end of the mission the team presented its findings and the draft mission report, while the final report was submitted to the SNSA on 8 January 2018.

In general, the mission team commended the preparedness of Slovenia and inter alia highlighted the excellent cooperation between all the stakeholders and response organizations during the mission and during detailed discussions regarding the EPR arrangements in the country.

The team also noted a number of specific good practices. The first one is the communication and coordination system, which allows rapid sharing of technical and operational information across a wide range of national and international response organizations. The second one is a GIS system of regional emergency notification centres that includes the location of all High Activity Sealed Sources in the country, providing for a rapid assessment of the hazard and appropriate emergency response. The third good practice was conducting a simulated EPREV mission



that provided a good basis for improving EPR arrangements in the country and updating the national self-assessment.

The mission team also noted some areas where improvements could be made. The report of the mission includes 19 recommendations and 12 suggestions for improvements. Based on these findings an action plan with 31 actions was prepared. The main areas where some improvements shall be conducted are the finalization of revision of the national plan to fully reflect the international safety standards, in particular for the development of a protection strategy for taking protective actions and other response actions during an emergency, especially arrangements for the later phases of an emergency response, preparation of the concept of operations for a nuclear or radiological emergency, preparation of a comprehensive monitoring strategy as part of the overall protection strategy, detailed assessment of needs and available resources and an overall training and exercise programs for all response organizations.

