# BRIEF SUMMARY

In the reporting period from October 2021 to April 2022, all nuclear installations in Slovenia were operating without any significant safety events. SNSA is closely monitoring the status of nuclear installations in Ukraine and is cooperating and sharing information with other European countries and with the relevant international organizations.

Several pieces of legislation were amended in order to comply with the provisions of the Euratom directives, whereas the new rules regarding the protection from the harmful effects of radon, the decree regarding the public service of radioactive waste management and the ordinance establishing a public radioactive waste management company were adopted. An IAEA pre-SALTO mission took place at the Krško NPP to review its ageing management programme and the modifications within the NPP’s Safety Upgrade Program (SUP) are being implemented as planned. The Periodic Safety Review (PSR) Requirements for the NPP and for the research reactor were amended. SNSA is maintaining its close bilateral relations, particularly with the regulators from the neighbouring countries. An IRRS mission was conducted in the first half of April. In the area of emergency preparedness, SNSA participated in the ConvEx-3 and in the annual Krško NPP exercise. Several improvements of the emergency preparedness infrastructure at the Krško NPP were executed. The Guidelines for safe management of radioactive waste in a nuclear or radiological emergency and the Arrangements for the Termination of the Emergency were prepared.

# LEGAL SYSTEM

As a response to the formal notice from the European Commission (non-notification of all provisions transposing Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from ionizing radiation), the amendments to the ***Rules on the Special Radiation Protection Requirements and the Method of Dose Assessment*** and the amendments to the ***Rules on the Radioactive Waste and Spent Fuel Management*** were adopted. Since the last reporting, two additional pieces of legislation were also adopted, i.e. the amendments to the ***Act on Ionizing Radiation Protection and Nuclear Safety (ZVISJV)*** and the new ***Rules on the Requirements for New Constructions and Interventions in Existing Facilities to Protect Human Health from the Harmful Effects of Radon.***

In response to the EC letter of formal notice for non-compliance with certain provisions of the Directive 2011/70/Euratom establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste, a new ***Resolution on the National Program for Radioactive Waste Management and Spent Fuel 2023 - 2032 (ReNPRRO23-32)*** is being prepared to replace the current one. The Ministry responsible for the environment held a public debate on the draft of the Resolution and at the same time decided that the new Resolution would not require a comprehensive environmental impact assessment.

The previous issues of the News from Nuclear Slovenia reported on the progress in the adoption of two regulations in the field of radioactive waste management, namely: the ***Decree on Performing a Compulsory Public Utility Service of Radioactive Waste Management*** and the ***Ordinance Establishing a Public Radioactive Waste Management Company***. They were finally adopted in January and came into force on 1st February 2022, when the validity of the old decree and ordinance also expired.

# THE KRŠKO NPP

## Pre-SALTO mission at the Krško NPP

In October 2021, an IAEA pre-SALTO mission took place at the Krško NPP. The mission was primarily expected to verify the quality and adequacy of the ageing management programme with subject programmes and procedures of the Krško NPP, for these are the key factors for a safe long-term operation which, in the case of the Krško NPP, begins after 2023. The pre-SALTO mission was carried out in the frame of the third Periodic Safety Review (PSR3) in order to optimize the needed human resources. In this way, most of the ageing management area in the PSR3 (Safety Factor 4) was covered by the mission.

Prior to the pre-SALTO mission, the Krško NPP carried out some additional activities in the frame of preparations for the long-term operation. The most notable were the establishment of the Department of engineering support for long-term operation, the new long-term operation programme, upgrades of existing corrective action programme for better ageing management involving operating experiences as well as new programmes for ageing management of active components and technological obsolescence.

The findings of the pre-SALTO mission included 5 recommendations, 9 suggestions and 9 good performances. IAEA issued the final report of the pre-SALTO mission in early 2021; this report will also serve as a backup for the PSR3 report in areas that concern the Krško NPP‘s long-term operation and ageing management of the systems, structures and components. Apart from that, the action plan is currently being established at the Krško NPP in order to properly address and solve all the issues from the pre-SALTO final report. A SALTO mission that will serve as a follow-up of the executed pre-SALTO mission, is expected to be carried out at the Krško NPP after the completion of the PSR3 action plan for the Safety Factor 4.

## Updates on the PSRs of the Krško NPP and the TRIGA Research Reactor

Currently, the third PSR of the Krško NPP and the second PSR of the TRIGA research reactor (RR) are in course. Every PSR starts with an approval of the PSR program which defines the content and scope of the PSR. The PSR program for the Krško NPP was approved in December 2020 and was prepared according to the SNSA safety guide PS 1.01. The PSR program of the TRIGA RR was prepared according to the IAEA SSR-99 which defines the PSR process for research reactors. Additionally, the new safety factors from the Rules JV9 were also included. The PSR program for the TRIGA RR was approved in September 2021.

In early 2022, the Krško NPP delivered for review the topical reports for the individual safety factors. SNSA is currently performing the review of all reports and will provide comments to be included in the final versions of the topical reports.

The TRIGA RR delivered the first topical report on the plant design in February 2022.

## Spent Fuel Dry Storage (SFDS)

The spent fuel dry storage (SFDS) of the Krško NPP is under construction. The SFDS building with external arrangements and all the necessary infrastructure is expected to be completed in the second half of 2022. The SFDS project with first transfer of spent fuel shall be completed by the end of 2023.



Figure 1: Construction of the spent fuel dry storage building.

# INTERNATIONAL COOPERATION

## Bilateral Meetings with Austria and Croatia

The annual meeting with Austria, under the respective bilateral agreement, was hosted by SNSA and took place in Ljubljana on 4 and 5 October 2021. The delegations discussed the most important events and developments since their last virtual meeting in 2020, in the fields of regulatory infrastructure, radiation monitoring, emergency preparedness, radioactive waste management, research reactors, as well as the operation of the Krško NPP, its safety upgrading, long-term operation and the status of the new spent fuel dry storage project.

The bilateral meeting with Croatia on 10 December 2021 was virtual and was organised by the Croatian side. The participants discussed the recent developments in the fields of regulatory infrastructure, emergency preparedness and radiation monitoring. The countries reaffirmed their close cooperation in all nuclear and radiation safety areas, particularly in the emergency preparedness exercises and in the harmonisation of protective measures in case of a radiological emergency.

## IRRS and ARTEMIS as Back-to-Back Missions

The Slovenian IRRS and ARTEMIS missions will be the first missions to test the IAEA Guidelines on the back-to-back missions. The preparatory meetings for IRRS and ARTEMIS were held in October and November last year respectively. The IRRS self-assessment was performed by both participating organisations, Slovenian Nuclear Safety Administration and Slovenian Radiation Protection Administration, thus all modules were comprehensively covered, which meant that the mission can be considered a full scope mission.

The IRRS mission took place between 4–14 April 2022, the mission materials were uploaded to the IAEA Share Point and made available to the experts in the beginning of February. The mission concluded that Slovenia permanently strengthens and improves nuclear and radiation safety. The reviewers pointed out that the Government should allocate sufficient financial as well as human resources to both administrative bodies for their effective long-term functioning and that the government must continue to ensure full independence to both regulatory bodies in carrying out their statutory tasks. The reviewers also noted good practices and performances: the preparation and organization of the SNSA international cybersecurity exercise in nuclear facilities, the instructions for carrying out effective and successful remote inspections during the pandemic, the SNSA web portal *Radioactivity in the Environment* and the national protection strategy in case of a nuclear and radiological accident.

The ARTEMIS mission is to follow on 22–30 May 2022 and the parts of the ARTEMIS materials, which were meant to be covered during the IRRS mission, were made available to the IRRS experts in February as already described. We look forward to the outcome of this combined mission and we hope that lessons learned, which we intend to share, will be beneficial also to other countries, who would decide for a “back-to-back missions” approach.

# EMERGENCY PREPAREDNESS

## Exercises and Trainings

In October 2021, SNSA participated in the ConvEx-3 exercise, one of the largest international emergency exercises, organized by IAEA and joined with the European Commission’s ECUREX 2021 exercise. Due to the measures to restrain the spread of Covid-19, a planned national theoretical exercise on the topic of preparedness for a nuclear accident at the Krško NPP was cancelled in 2021 and is now planned to be conducted in October 2022. In early March 2022, SNSA intended to participate in two international exercises to be organised by IAEA, which were postponed due to the war in Ukraine. On 14 April 2022, this year's first NPP Krško annual exercise “NEK2022-1” was conducted. The main objective of the exercise was to test the emergency response procedures and the efficiency, communication, and coordination between the NPP’s and SNSA’s emergency response teams. The Croatian National Civil Protection Commander and Head of the Sector for Radiological and Nuclear Safety in the Civil Protection Department of the Croatian Ministry of the Interior both participated in the exercise at the Krško NPP as observers.

## Upgrade of the Infrastructure at the Krško NPP

With the completion of the SUP, the plant has significantly improved its robustness to the Design Basis Accidents (additional redundancy) and moreover, to the design Extension Conditions (DEC) events, both in categories A and B (DEC-A and DEC-B). Accordingly, the Krško NPP amended its accident management documentation, such as the Emergency Operating Procedures (EOP), the Severe Accident Management Guidelines (SAMG) and the Alternative Equipment Support Procedures (AESP). The AESP are employed for the use of mobile equipment that support the actions of the EOP and the strategies of the SAMG. The training of personnel was extended with these new procedures and guidelines.

The reconstruction of Operational Support Center (OSC) consisted of building a new bunkered building and reconstruction of existing shelter for the NPP personnel. The purpose of the OSC is to provide support to the accident management in the Krško NPP. The OSC was designed according to DEC conditions external events: seismic, flooding, extreme weather, aircraft crash. The OSC offers the protection and living conditions for up to 200 persons for 30 days in case of a severe nuclear accident with radioactive releases to the environment, with the criterion that the doses shall not exceed 50 mSv/person over the period of 30 days. The construction of the OSC was completed at the end of 2021. The technical inspection of the OSC by the Ministry of the Environment and Spatial Planning was performed on 7 April 2022 and only some minor noncompliance was found. The new OSC was used for the first time in the Krško NPP emergency exercise on 14 April 2022.

Due to all the modifications that were implemented within the Krško NPP’s SUP, an upgrade of the Emergency Response Data System (ERDS) was also necessary. The ERDS enables a direct electronic transmission of selected parameters of the Process Information System (PIS) from the Krško NPP to SNSA during or after a possible accident at the NPP. There are over 1000 different parameters shown in numerical and graphical forms, and trending or analysis of data is also possible by the ERDS. The PIS data are also transferred during the regular operation of the Krško NPP. For the purpose of the emergency preparedness training and exercises, the data from the Krško NPP full scope simulator can be transferred to ERDS. The parameters transmitted via the ERDS system include information on the primary circuit, core condition, safety systems, cooling systems, and conditions within the containment. An upgrade of the parameters was needed because of all the new data on the new systems installed within the SUP modifications. This new set of data allows SNSA to have a better understanding of the development of the events during a possible DEC accident at the Krško NPP.

## SNSA Emergency Preparedness and Response During the War in Ukraine

In relation to the latest unfortunate events in Ukraine from 24 February 2022 onwards, SNSA is closely following the situation in Ukrainian nuclear facilities and attending the relevant meetings on bilateral and quadrilateral level as well as the meetings within the international organizations on this topic. On 4 March 2022, the SNSA Emergency Response Team was activated due to the fire at the Zaporizhzhya NPP. Press releases for the public were prepared and several interviews with the media were conducted with SNSA´s Director. In addition to these activities, we are now daily preparing answers for the media and public to the questions related to the current status in Ukraine, the nuclear safety, the emergency preparedness, and mostly related to the protective actions to be taken in case of a nuclear accident.

## EPREV Action Plan and Follow-up Mission

The implementation of the EPREV Action Plan is still ongoing. Currently 86 % of all the actions are completed, and only 14 % (just 5 actions) are remaining. One of the latest actions taken are the **Guidelines for safe management of radioactive waste in a nuclear or radiological emergency**, prepared by the Radioactive Waste Management Agency in September 2021. These guidelines are harmonized with the Protection Strategy and the valid National Emergency Response Plan for Nuclear and Radiological Accidents and represent a major improvement in this area. The revision of the National Emergency Response Plan is in progress since the **Arrangements for the Termination of the Emergency** were prepared.

In November 2021, a preparatory meeting for the EPREV follow-up mission was conducted with IAEA and the Administration for Civil Protection and Disaster Relief (ACPDR), as part of the preparations for the EPREV follow-up review mission, which will take place in Slovenia in October 2022.

Map of Slovenia showing the positions of nuclear installations