# BRIEF SUMMARY

The period from May to October 2020 was also marked by the continuation of the global outbreak of the coronavirus, in particular the escalation of the second wave after the summer holiday. During this period all nuclear installations have been operating without any events affecting the nuclear safety.

In the area of legislation, the Decree Amending the Decree on the Criteria for Determining the Compensation Rate Due to the Restricted Use of Areas and Intervention Measures in Nuclear Facility Areas was adopted. The Krško NPP is stepping up the preparations for the next outage and the plant’s Safety Upgrade Programme (SUP) is progressing without major delays. The Slovenian Environment Agency decided that an environmental impact assessment (EIA) for the Krško NPP lifetime extension needs to be submitted and the NPP has already begun with the preparation activities for the EIA. The licencing process for the new radioactive waste repository is also ongoing. In October a virtual meeting with Austria was held to discuss issues under the bilateral agreement. The scheduling and implementation of emergency preparedness trainings and exercises has been significantly influenced by the Covid-19 pandemic.

# COVID-19 OUTBREAK RESPONSE

## SNSA Measures

After another surge of Covid-19 cases throughout the country in early October, the SNSA decided to introduce measures preventing the spread of the virus among its staff. At first 50% of the staff started teleworking, but after just ten days a modified scheme was adopted, where only the minimum number of the staff work is present in the office and all the others are teleworking. Like in March a rotating schedule for the office staff has been prepared for several weeks ahead.

All the scheduled meetings at the SNSA headquarters have been postponed and all duty trips abroad have been cancelled. The regular services regarding licencing and registration of sources are being carried out online or via mail, which is the normal way of doing business. The visitors are allowed to enter the premises only in exceptional cases.

The SNSA is monitoring the operation of the nuclear and radiation facilities and is maintaining daily contacts with the NPP Krško and with other operators on a case by case basis. So far, the on-site inspections to the Krško NPP have been performed. More complex inspections with more inspection team members are postponed and some of them (audit-type inspections) are planned to be performed with just one inspector on-site and the other members will be present remotely via videoconference. The inspections of sources in industry are combined: the remote and on-site inspection.

## Measures at the Krško NPP

Since the start of the Covid-19 epidemic in March the Krško NPP has been preparing the measures to cope with the risks imposed by another rise of infections which started increasing in autumn.

As requested by the SNSA the NPP conducted a comprehensive analysis of the impacts of the Covid-19 pandemic on the plant operation. The future risks of the rise of infections will be managed by the necessary protective measures set out in the internal Epidemic or Pandemic Response Plan, which has been developed by the NPP based on their own and foreign experience.

All the necessary measures to prevent the possible spread of infections among the essential staff needed for the safe operation of the plant are being carried out, such as personal distancing, disinfection and wearing respiratory protection equipment.

The NPP is also speeding up its preparations for the upcoming outage in April 2021, including the possibility to perform a reduced scope of the outage activities in case of the increased risks of the Covid-19 outbreak. The Epidemic or Pandemic Response Plan is under revision to include the measures for safe planning and implementation of outages during an epidemic or pandemic. The activities on the 2021 outage preparations are further described in Chapter III.1 below.

# LEGAL SYSTEM

The previous issue of the News from Nuclear Slovenia did not report that in February 2020, the government adopted the Decree Amending the Decree on the Criteria for Determining the Compensation Rate due to the Restricted Use of Areas and Intervention Measures in Nuclear Facility Zones (UV11). This decree directly relates to the Decree on the Areas of Limited Use of Land due to a Nuclear Facility and the Conditions of Facility Construction in These Areas (UV3) as it lays down the criteria for determining the amount of compensation for limited use of urban areas due to the presence of a nuclear facility, and for the areas of planning and implementation of intervention measures.

Apart from the above-mentioned decree no piece of legislation has been adopted during the reporting period: Although some decrees and rules are in different stages of preparation for their later adoption. In the field of radioactive waste management two decrees are under preparation:

* Decree on Performing a Compulsory Public Utility Service of Radioactive Waste Management, and
* Decree Establishing a Public Radioactive Waste Management Company.

In the field of nuclear safety:

* amended Rules on Qualification of Workers in Radiation or Nuclear Facilities (JV4).

In the field of radiation protection:

* amended Decree on the National Radon Programme (UV4).

Furthermore, a draft of the SNSA Regulatory Guide 1.01 - Content and Scope of the Periodic Safety Review of a Radiation or Nuclear Installation(which is legally non-binding) has been prepared internally within the SNSA and is already in the process of revision by the stakeholders.

# THE KRŠKO NPP

## 2021 Outage Preparations

The Krško NPP is preparing for the upcoming outage which is planned for April 2021, taking into account that the pandemic may still be present at the time of the outage. The outage is originally planned to be carried out without limitations, including the completion of 13 modifications; several of them are part of the SUP, such as the bunkered building 2 (BB2), the alternate safety injection and the alternate auxiliary feedwater. However, due to the hazards imposed by the Covid-19 pandemic, the NPP is also preparing for a potential reduction of outage activities, if needed. For this purpose, the Krško NPP has identified the main potential hazards in the pandemic circumstances:

* insufficient number of healthy personnel and workers on the NPP site to carry out required activities,
* inability for external personnel/equipment to reach the NPP, and
* problems with procurement of spare parts.

While the latter two hazards depend mainly on external factors, the NPP intends to deal with the first hazard through the maximization of the protection measures against the Covid-19 as well as strict following of these measures. The Krško NPP prepared the Epidemic or Pandemic Response Plan, which has been in force since August 2020. This document is based on the NEI 06-03 Technical Report, international experience from WANO (World Association of Nuclear Operators), INPO (Institute of Nuclear Power Operations) and IAEA (International Atomic Energy Agency), as well as on local experience and the National Epidemic Response Plan. It is therefore expected that the majority of key outage activities, such as the fuel replacement and most activities related to the Technical Specifications, can be executed within the planned outage time schedule. Problems might occur with external personnel and equipment where involved in the planned activities such as changing the ex-core neutron detectors, eddy-current tests of steam generator tubes, inspection of the reactor pressure vessel head, and the majority of the planned SUP modifications. In such cases the activities will have to be delayed or postponed to the next outage after gaining an official approval from the SNSA.

## Events and Non-Conformances

On 8 April 2020, the regular monthly test of the diesel generator No. 2 was carried out according to the test procedure for the diesel generators. Immediately after the synchronization the staff noticed that when the MD2-DG2 output circuit breaker was connected to the MD2 bus, an alarm occurred on the electrical control panel. Due to the deviations during testing the test was interrupted at 08:34 and the diesel generator was shut down and declared inoperable. The cause for the event was a failure on the auxiliary contacts of the MD2-DG2 circuit breaker due to the insufficient spring preload force of the auxiliary contact switching mechanism. After the spring preload force was increased, the test was repeated and it was successful.



Figure 1: Electrical cabinet with auxiliary contacts of the MD2-DG2 circuit breaker

On 16 June, a monthly check of the indicators and the condition of equipment in the emergency control room was carried out. One of the two level meters intended to measure the coolant level in the containment sump in the design extension conditions accident was found to show a higher value than the acceptance criterion. The second level measurement was still within the acceptance criterion, but rising. Both level meters were declared inoperable. Both measurement channels were reinstalled during the 2019 outage after the previous problems with the original sensors installed in 2018. The Krško NPP will solve the problem during the 2021 outage.

On 20 August, a regular monthly test of the diesel generator No. 1 was carried out according to the test procedure. The generator was automatically shut down after 15 minutes of operation due to the high cooling water temperature of the B engine. It was found that the cooling water cooler fan did not start due to the failure of the electric motor. After the electric motor was replaced, the test was repeated, and it was successful.

## Safety Upgrades

The implementation of the Krško NPP’s Safety Upgrade Program (SUP) is underway. Several modifications of the SUP Phase II are still in the process of implementation. The alternative design of the NPP spent fuel pool cooling has just been completed. The installation of the ventilation and habitability system of the new emergency control room will be completed by the end of the year. The operation support centre reconstruction and the installation of the alternative residual heat removal pump are to be completed by the end of 2021.

Regarding the SUP Phase III modifications, the Krško NPP has divided the project of the BB2 into three phases. The first phase will be the excavation of the construction pit and the installation of the reinforced diaphragm wall, which was licensed in 2018. The second phase will be the construction of the BB2, which was licensed in 2019. The third phase will be the installation of the support systems which is in the process of final licensing. The BB2 will contain the design extension conditions (DEC) systems such as the alternate safety injection (ASI) and the alternate auxiliary feedwater (AAF), both with dedicated tanks of borated and unborated water, respectively, with capabilities for replenishment from an underground water well, which are in the process of final licensing. The SUP Phase III also envisages the construction of the spent fuel dry storage (SFDS) described in more detail below.

All modifications of the Krško NPP’s SUP are to be completed by the end of 2021.

## Construction of the New Spent Fuel Dry Storage

The spent fuel dry storage licensing process is still on-going. The process of the Krško NPP spatial planning was completed: the amendments and supplements to the spatial plan were adopted in April 2020, following the comprehensive environmental impact assessment and the cross-border consultation process with Austria and Croatia. The project is currently in the process of obtaining a construction license (an integrated procedure which includes both environmental and construction licensing). The cross-border assessment process is in the final stage. The construction of the spent fuel dry storage building is expected to be started by the end of 2020 or in early 2021 and the transfer of the spent fuel elements (first campaign) is planned by the end of 2022 or in early 2023.

The “nuclear“ licensing process began in February 2020. Fifteen pieces of multi-purpose container lids have already been delivered to the Krško NPP site, the first shipment of containers is to be delivered in mid-November 2020. Due to the Covid-19 pandemic, the delivery has been postponed from May to November. The HI-STORM metal cylinders (placed between the container and the concrete cladding) are in production and will be delivered to the Krško NPP in February 2021.

# RADIOACTIVE WASTE MANAGEMENT

## New revision of the Krško NPP Decommissioning Programme

In 2019, the third revision of the Krško NPP Decommissioning Programme and the third revision of the Krško NPP Radioactive Waste and Spent Fuel Disposal Programme were completed. In 2020, both were approved by the Intergovernmental Commission. These documents include annuities for each country, calculated and presented with respect to the internal rate of return.

According to the Government Decision, the Slovenian electrical power company GEN energija, d.o.o. should continue to contribute to the Slovenian Decommissioning Fund by financing one half of the decommissioning and spent fuel and radioactive waste disposal costs, Based on new revisions of the programmes, these payments have increased from the previous rate of 0.30 euro cents per kWhe to 0.48 euro cents per kWhe, starting on 1 August 2020 until the next revisions of the programmes have been approved.

## Recent development in the approval of the LILW repository

The cross-border environmental impact assessment began in 2019 and it is planned to be finished by the end of 2020. In parallel, the public hearing process in Slovenia is ongoing. The new revision of the safety case (safety report) is under preparation. The current target is that the repository could start receiving waste in 2024.

# INTERNATIONAL COOPERATION

## Bilateral Meetings

The annual meeting within the framework of bilateral agreements among the nuclear safety regulators of the Czech Republic, Hungary, Slovakia and Slovenia, the so-called Quadrilateral Meeting, was planned to be held in mid-May in the Czech Republic, but was postponed to the next year due to the Covid-19 pandemic.

The regular annual meeting between Slovenia and Austria under the respective bilateral agreement was hosted by Austria and held virtually on 6 October. During the video conference the delegations discussed the most important events and development since their last meeting in 2019, in the fields of regulatory infrastructure, radiation monitoring, emergency preparedness, radioactive waste management, research reactors, operation of the Krško NPP, its safety upgrading, measures adopted by its management to manage risks imposed by Covid-19, and the status of the new spent fuel dry storage project, as described in Chapter III.4 above.

## Other Topics

As a result of the global coronavirus outbreak several international events such as training courses, workshops, scientific visits and organizational meetings of various international organizations’ working groups and bodies, were cancelled or postponed to an undefined period or held virtually.

This year’s IAEA General Conference was also converted into a hybrid event with only a minimum number of participants attending the meetings physically and most events being organized as virtual meetings. Several SNSA staff members participated in various online meetings and side events.

# EMERGENCY PREPAREDNESS

## Exercises and Trainings

The Covid-19 pandemic has also influenced the performance of trainings and exercises at the SNSA. From March to May 2020, most of the SNSA staff were working from home, with the aim to significantly reduce the staff present at the SNSA headquarters. Most of the trainings were adjusted to this situation. Therefore, they were conducted in smaller, isolated groups. Many activities were conducted remotely using the information technology, where emergency team members attended IAEA webinars on emergency preparedness and response topics. Because of the situation, some of the planned exercises were cancelled. Nevertheless, the SNSA participated in several exercises and trainings in the field of nuclear and radiological safety, including two radiological exercises in September 2020 within the ENRAS project. The ENRAS (ENsuring RAdiation Safety) is a two-year project, ongoing since 2018 within the framework of the cross-border cooperation between Slovenia and Croatia. The overall goal of the project is to strengthen the cross-border cooperation between the entities operating in the area of safety in order to ensure more effective rescue and intervention in the event of a nuclear or radiological emergency, to improve their capabilities and knowledge and to establish the first system for safe joint interventions in the Central Balkan region. Due to teleworking launched in October the trainings and exercises for the SNSA staff will have to be adjusted to this situation.

## Implementation Status of the EPREV Action Plan

Despite the measures taken during the Covid-19 pandemic, the activities in the field of the EPREV action plan continue to be implemented. In August 2020, the SNSA held a meeting with the representatives of the Public Relations Office of the Ministry of the Environment and Spatial Planning. In case of emergency both organizations are responsible to inform the public according to the National Emergency Response Plan for Nuclear and Radiological Accidents. The protection strategy is still in coordination with the Administration for Civil Protection and Disaster Relief.

Map of Slovenia showing the positions of nuclear installations