# BRIEF SUMMARY

There was an outbreak of coronavirus in the world, which significantly marked this period. This is described in a separate chapter below. In the period from November 2019 to April 2020 all nuclear installations have been operating within the safety limits. Also, the safe operation of the Krško NPP was not affected by the earthquake in Croatia.

In the area of legislation, in December 2019 the Decree on the Areas of Limited Use of Land due to a Nuclear Facility and the Conditions of Facility Construction in these Areas, was adopted. The Krško NPP refuelling outage was completed as planned. In December Slovenia hosted the annual bilateral meeting with Croatia to discuss issues under the bilateral agreement. In the area of emergency preparedness, the SNSA participated in the Krško NPP annual exercise and in the national table-top exercise.

# COVID-19 OUTBREAK RESPONSE

## SNSA Measures

Most of the SNSA staff started teleworking and the staff present at the SNSA headquarters has been significantly reduced. Only the essential positions are working from the office, i.e. those, who belong to the management, areas of nuclear and radiation safety licensing, inspection, general services and the on-duty officer. The rotating schedule for the office staff has been prepared for several weeks ahead.

The SNSA decided to support the governmental measures and temporarily postponed all inspections on the site (exceptions will be potential reactive inspections). For the time being, the daily contacts with the Krško NPP are maintained via the communication means and in a similar way also with the other licensees. The status of the NPP Krško operation is followed through daily reports and phone conversation with the plant personnel. Daily updates about the NPP status are being prepared, covering any changes and restrictions related to Covid-19 measures as well as the operational status.

## Summary of Measures at the Krško NPP

The actions in the Krško NPP have been gradually accelerated since the beginning of March. The current most important measures adopted by the Krško NPP to manage risks imposed by Covid-19 are as follows:

* The NPP appointed a working group to monitor and propose the measures to ensure a smooth operation of the power plant in case of Covid-19 spread and stepping up of the national measures.
* Electronic recording of the contacts of the Krško NPP staff has been introduced, which serves as a history of mutual contacts and enables the diagnosis of potential infection.
* The entrance into the NPP is possible only within a predetermined time window. Urgent entry is allowed upon approval from the shift supervisor. In addition, the time window for arrival and leaving of the operational shift staff is different from others, so that they do not mix with the other (critical) staff at the entrance.
* The respiratory protection needs to be used in all NPP areas and additionally the use of gloves is needed for the MCR.
* The shift staff stays in the so-called healthy quarantine (an isolated hotel in the vicinity of the NPP), meaning that the staff goes directly into quarantine after they have finished their 12-hour shift. The area is physically protected. This routine has been planned for two weeks and two shifts are under this regime. Before entering the quarantine, the staff is tested for Covid-19 infection.
* The NPP introduced contactless measurement of body temperature for all personnel at the entrance. Those with fever cannot enter.
* All non-essential NPP staff not needed for safe plant operation were ordered to work from home.
* Instead of holding the working meetings at the Krško NPP those are being replaced by correspondence sessions or by other means.
* The staff will not be sent on any business travels until further notice.
* For the shift staff during shift turnover close contacts cannot be avoided. Therefore, the shift staff need to wash their hands in the nearby sanitary area and disinfect all common means (keypads, panels, handsets, telephones, radios, etc.) before and after the shift turnover.
* All civil construction sites are closed. The contractors’ workers are not allowed to enter the Krško NPP.
* The public transport for workers has been cancelled.
* Almost all workers who are coming to work to Krško NPP from Croatia, are working from home. However, a few Croatian workers who were assigned to work at the Krško NPP are accommodated close to the NPP in Slovenia to avoid crossing the border.
* The medical centre in the NPP has been closed down as one of the first measures. All workers should refer to the local community medical centre, which is located outside the NPP.

## SNSA International Coordination

The SNSA promptly replied to the letter received from the ENSREG Secretariat regarding the national preparation and contingency planning for the nuclear safety of nuclear installations under its regulatory control in scenarios of widespread disease epidemic or pandemic. The SNSA shared information about the current measures in the country and particularly in the Krško NPP with the U.S. Nuclear Regulatory Commission and provided an information exchange through the IAEA Incident Reporting System (IRS), as well as reported to the WENRA Reactor Harmonization Working Group.

Furthermore, the SNSA received an offer from the IAEA Secretariat to donate rapid detection kits for Covid-19. Slovenia accepted the offer and the SNSA immediately proceeded with the necessary coordinating activities for the timely delivery of the rapid detection kits.

# LEGAL SYSTEM

In December 2019 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) was adopted by the Government, coming into force on January 4, 2020. The conditions for the construction of individual facilities were harmonized with the new regulation on the classification of facilities. The list of land plots around the Krško Nuclear Power Plant has also been updated.

The internal review revealed many necessary changes of the current Rules on Providing Qualification for Workers in Radiation and Nuclear Facilities. This draft has been sent for inter-ministerial coordination and will be ready for adoption, publication and entry into force within two months.

# THE KRŠKO NPP

## Outage 2019 Completed

The last outage at the Krško NPP was completed in October 2019. The outage was carried out smoothly and in line with the plan. After the restart problems with two feedwater pumps were encountered. The corrective actions on one of the feedwater pumps included intervention of the manufacturer. Apart from that, a temporary loss of the containment integrity occurred during the fuel change due to activities on isolation valves. The SNSA was informed about that and some administrative corrective measures were promptly taken by the NPP to avoid similar situations in the future. Some wear and bending of the in-core instrumentation thimble guides were indicated during the outage as well. The level of thimble guides’ degradation was found low enough not to endanger the fulfilment of the Technical specifications’ requirements; however, an analysis was started by the NPP in order to find the causes for the degradation and to determine further corrective actions accordingly.

The chemical cleaning of the steam generators’ bottom plate was executed for the first time during this outage. The sequence of operations has been changed in the second steam generator, which furnished a much better cleaning result. Moreover, the activities on several modifications that are a part of the Safety Upgrade Program were earmarked for this outage and all were accomplished in the planned extent. As usual, the SNSA actively monitored the outage activities, backed by the experts from several domestic and foreign authorized organizations. The next outage is planned in 18 months, that is in April 2021.



Figure 1: Outage 2019 - maintenance works on thimble guide tubes

 Close-up image of a part of the equipment for the chemical cleaning of the steam generators

Figure 2 and 3: Outage 2019 - equipment for chemical cleaning of steam generators

## Earthquake on 22 March 2020

On 22 March at 6:24, an earthquake occurred in the region of Zagreb (Croatia). The earthquake was also sensed at the Krško NPP site while the NPP was operating at full power. The maximum peak ground acceleration (PGA) recorded at the NPP site due to this earthquake reached 0.04 g. The operating basis earthquake (OBE) for the Krško NPP is much higher at PGA = 0.15 g. The Krško NPP therefore stayed at power, i.e. no reactor trip occurred. The appropriate actions were promptly taken in accordance with the relevant procedures. The Krško NPP entered the procedure that is used by the operational crew as an immediate response to the earthquake and announced a Level 0 event (Unusual event) in line with the four-level emergency classification system. Due to the Covid-19 pandemic there was no activation of personnel carried out by the software, which is normally used for rapid staff activation. Instead, a group consisting of NPP's department heads arrived to the site. The SNSA was notified about the event and immediately activated a team for monitoring the situation and for informing the public. The inspection team composed of the system engineers from the Krško NPP carried out the inspection of the plant’s structures, systems and components (SSC). This was executed according to the procedure that is aimed as the follow-up to verify the plant status after an earthquake. As the inspection team concluded the inspection and reported no indications on the SSC, the emergency class “Unusual Event” was terminated at 9:54. After the event, the Krško NPP continued to operate normally at full power without any deviations or alarms due to the earthquake.

The plant safety during the earthquake raised many concerns by the public, thus the SNSA promptly produced two press releases and the statements of the SNSA Director and the NPP Management Board President were broadcasted on the national television.

## Status of the Krško NPP’s Safety Upgrade Program and Other Improvements

Since the last reporting the main Safety Upgrade Program (SUP) improvements conducted in the Krško NPP were the continuation of construction of the bunkered building 2, as well as the installation of the alternate safety injection, the alternate auxiliary feedwater, the alternate heat removal and the installation of the spent fuel pool alternate cooling. The installation of the habitability systems for the new emergency control room and the new technical support centre has been completed. However, the site acceptance tests have been interrupted due to the Covid-19 outbreak. The on-site activities on all SUP modifications have temporarily been halted.



Figure 4: Part of the newly installed piping and valves   
of the alternate heat removal system (ARHR)

## Construction of the New Spent Fuel Dry Storage

The licensing process for the SFDS is still on-going. The amendments of the Spatial Plan of the Krško NPP, which is needed for obtaining a construction licence, were adopted in 2019. The SNSA issued a positive opinion about the proposed amendments and the related environmental report. The cross-border consultation process about the environmental impact assessment was successfully finished.

In April 2020 the Krško NPP submitted an application for the construction licence of the spent fuel dry storage to the Ministry of the Environment and Spatial Planning. The construction of the dry storage of spent nuclear fuel is envisaged in 2020/2021 and its operation is planned to start in 2022. Four campaigns of transfer of the fuel spent elements into casks and then to the dry storage are planned.

# RADIOACTIVE WASTE MANAGEMENT

## The LILW repository in Vrbina

In autumn last year the consultation on the transboundary impacts has started. Austria and Croatia expressed interest to be involved in the review of the Environmental Impact Assessment report for the low- and intermediate-level radioactive waste (LILW) repository in Slovenia. Presentations or meetings to discuss open questions were carried out in both countries.

The licensing process is still ongoing. During the procedure for obtaining a consent for construction the SNSA involved independent experts for the review of documentation on engineered barriers.

# INTERNATIONAL COOPERATION

## Bilateral Meeting with Croatia

This year's meeting between Slovenia and Croatia under the respective bilateral agreement was hosted by the SNSA in mid-December.

The participants reported and discussed the most important events and developments since their last meeting in 2018, particularly in the fields of the management system, legislation and emergency preparedness. The Croatian delegation reported on the reorganisation of their regulatory body. The Slovenian delegation presented the recent developments regarding the adoption of legislation as well as important updates to the emergency preparedness communication tool “KID” to which Croatia has got the on-line access. The participants also visited the SNSA emergency response centre which is activated in case of a nuclear or radiological emergency and is also being used for trainings and exercises.

# EMERGENCY PREPAREDNESS

## Exercises and Trainings

On 21November 2019 the SNSA participated in the second annual exercise of the Krško NPP. The main objective of the exercise was to test the emergency response procedures and the efficient communication and coordination between the NPP’s and SNSA’s emergency response teams.

The national table-top exercise was conducted only a week later utilizing the modified scenario of the Krško NPP exercise. The exercise was organized with the goal for all local, regional and national stakeholders involved in the response during a nuclear emergency at the Krško NPP to participate in the exercise and review their protection and rescue plans, action plans and coherence of actions implemented by a given scenario. The exercise was a table-top type, thus giving the participants opportunity to discuss and identify many challenges in their response. For instance: distribution of iodine tablets during an emergency, evacuation of vulnerable groups of the public, coordination of public press releases between the local, regional and national level etc.

## Implementation Status of the EPREV Action Plan

According to the governmental decision the SNSA’s role is to monitor the progress of EPREV Action Plan adopted by the Government in 2018. The SNSA is also responsible for the realization of a number of tasks and some of them have already been completed. In March 2020 the Government of the Republic of Slovenia took note of the status of the EPREV Action Plan. Due to the fact that some of the tasks are long-term and challenging, the status of the implementation is relatively successful, since 54% of the tasks have already been completed. 46% of the tasks are still ongoing - including the revision of the national emergency plan, the development of a protection strategy, the decontamination procedures, the guidelines for treatment or for the designation of medical personnel to treat radiation injuries, etc., which all need to be completed by the end of 2020.