



### Abstracts

The year 2020 was marked by the final shutdown of Fessenheim nuclear power plant (NPP). As those two reactors are the first being shut down amongst the 58 pressurized water reactors (PWR) of the French fleet, their decommissioning will provide the licensee EDF with considerable experience feedback. Pending the decommissioning decree, EDF is carrying preparatory operations in order to gradually reduce risks.

At Fessenheim, first challenges for EDF have started before the final shutdown. This involved the organization of staff departures and the reorganization of services while maintaining a high level of safety. ASN has performed inspections to ensure both that final operating activities were achieved in serenity and that post operational clean-out phase was properly planned. Although the situation observed during these inspections was satisfying, it was noted that lacks in anticipation of the final shutdown decision has led to severe constraints on the planning of decommissioning preparation.

## **Fessenheim Nuclear Power Plant**

The Fessenheim NPP comprises two PWR, each with a unit power of 900 MWe. It is situated 1.5 km from the German border and about 30 km from Switzerland. It is built alongside the Grand Canal d'Alsace, a canal channeling the Upper Rhine river, from which it drew water for cooling. Thus the site has no cooling tower. The Fessenheim NPP nuclear island is made up of a reactor building and a fuel building for each reactor and a nuclear auxiliaries building shared by the two reactors, housing the effluent treatment, ventilation and air filtration facilities. The NPP has also one turbine hall housing the two alternators that produced electricity from the steam coming from each reactor.

### Adaptation to change

In view of the ongoing personnel departures in the various departments and the end of production, the site's organisation was modified after the final shutdown as regards the size of the operating teams, the organisation of the On-Site Emergency Plan (PUI), the fire teams' service, the site's organisation chart and the number of departments.

Through its controls, ASN observed in 2020 that contrasting with the situation observed during the period of production just before the final shutdown, this period brought a transient increase in significant events with unusual "organisational and human factors" component, possibly linked to the disruption of organisational and managerial practices resulting from the ongoing reorganisation of the departments.

Moreover, since production stopped, the on-site activity concerned systems, procedures, and configurations less familiar to the site's teams than the previous habitual recurrent operating and maintenance operations.

Despite previous observations, ASN considers that the site has maintained a robust level of seriousness and vigour in the monitoring of operation of the facilities.



Primary circuits decontamination © Romain Beaumont

# **ASN's feedback of Fessenheim nuclear power plant shutdown**



### **First operations**

Following final shutdown, the cores of the two reactors have been completely unloaded and the spent fuel has been stored in the site's cooling pools pending transfer to the La Hague treatment facilities. ASN required the licensee to complete the fuel removal operations by the end of 2023. All the fuel was then evacuated before the end of 2021 for the production unit No. 1, while fuel evacuation was completed during summer 2022 for the reactor No. 2. The main operation of the preparatory phase of the decommissioning after fuel complete evacuation consists in the decontamination of primary systems, a first of its kind in France. The aim of this operation is to minimize the risks associated with ionising radiation during future decommissioning of the installation. This operation, submitted to ASN authorization, has already been run in several countries allowing to collate and capitalize on experience feedback.

As such, it has been the subject of exchanges and feedback sharing between ASN and Germany and Belgium nuclear safety regulators. In addition of fuel evacuation and primary circuits decontamination, the licensee has schedule to implement in the former turbine hall a new storage facility for the waste resulting from the decommissioning prior to site evacuation.



### **Dominique TAFANI** Vincent BLANCHARD Marie DION

ASN - French Nuclear Safety Authority





Fuel evacuation

### Contacts

To learn more about Fessenheim NPP and the ongoing regulatory decommissioning process, get in touch with:

**Dominique TAFANI**, project manager for reactor decommissioning @ASN:

🖂 dominique.tafani@asn.fr *G* + 33 146-164-398

**Vincent BLANCHARD**, head of nuclear installation control unit @ASN: ✓ vincent.blanchard@asn.fr
→ 33 388-130-714

Marie DION, nuclear safety inspector @ASN: 🖂 marie.dion@asn.fr *G* + 33 388-130-721