EU Topical Peer Review

Ageing Management of
nuclear power plants and research reactors

Belgian National Action Plan

(update December 2023)

RR1 Ageing Management Program

The licensee shall extend the scope of the ageing management program to include all SSCs relevant for safety that are present within the premises of the BR2. Notably the hot cells, experimental devices and spent fuel storage system should be included. In addition, spare parts for safety related SSCs that are in stock should also be included.

Answer
At this moment all relevant components are included. It is to be noted that the hot cell and the spent fuel storage are not systems on themselves, but are included in other systems such as buildings, manipulation devices and for the spent fuel storage also pool water cooling and purification system. These SSCs are in the scope of the AMP. In as far as they are not identified as safety related SSCs for the reactor, they are taken in scope from the operability or efficiency point of view and the safety relevant failure modes are taken into account in the FMECA analyses.

A dedicated strategy for spare parts follow up is not defined. In general following principle will be used:

- It is preferred to have a qualified supplier instead of maintaining a stock; physical ageing and obsolescence are taken into account in the stock management of spare parts as appropriate.
- For newer systems (diesel generators, fire detection) a maintenance contract with the supplier is made. This includes replacement parts and is periodically renewed in order to have timely detect and mitigation of obsolescence.

RR2 Ageing Management Program

The on-going development of the ageing management program should be focused on safety-related SSCs.

Answer
Although according the initial classification (Asset Configuration Management - ACM) a few non-safety components are categorized in the class of safety systems (class A or B). The initial classification will not be modified. The issue is handled in the follow up Installation Concept Management (ICM) report, with the detailed safety and analysis and definition of the requirements. It is to be noted that components with a safety relevance are always classified as class A or B.

RR3 Ageing Management Program

The licensee shall develop procedures to review and update the ageing management program once the current implementation phase is completed and to measure its effectiveness.

Answer
A continuous feedback mechanism exists in the procedure to define and evaluate modifications to the installation (which includes also the management procedures). Modificatins can be triggered by non conformities in maintenance or inspections (either reactive or scheduled within the AMP) or in safety evaluations (for example during a periodic safety reassessment). As such, the AMP is continuously reviewed and updated by operational and maintenance feedback.
Formally, the impact of each modification on the AMP (each of the 3 steps of the AMPis considered – classification, ageing risk assessment and mitigating measures) is included in each mdofication applicaton evaluation.

RR7 Concealed piping (monitoring)

Additional monitoring, testing, sampling or inspection activities should be implemented for:

- *the piping for transport of pool water from the reactor building to the storage basin under the ventilation building,*
- *the fuel transport piping for the Diesel generators and*
- *the concealed part of the feed water line for firefighting in the reactor building.*

Answer

- Leakage of the transport piping of pool water can be detected by the presence of water in the cellar.
- The transport piping for feed of the diesel generators is monitored according the regulation of the Flemish environmental protection
- The feed line for fire fighting to the reactor building is normally empty. Its tightness is periodically tested. The part connected to the reactor building is included in the tightness test of the reactor building.

RR8 Concealed piping (city water)

The need for a replacement of the piping for city water should, based on the projections provided by SCK•CEN, be investigated.

Answer
The city water distribution network is renewed. For BR2, the system has no longer a direct safety function. It is only used as one of the water sources for fire extinction and for cooling of the compressor air.

RR9: Concealed piping

It is suggested to consider additional monitoring, testing, sampling or inspection activities for city water and feed line for cooling water from the lagoon.

Answer

The city water system is completely renewed. Since the replacement of the diesel generators, the only safety related function is fire extinguishing water. For this system, a back up is available (lagoon water or independent source by fire trucks)

The feed water from the lagoon was used for cooling of the old diesel generators (safety relevant function). This is no longer necessary. It also used for cooling of the hydraulic oil of the primary pumps. The functioning of the primary pumps is not necessary for the safety of the installation. The lagoon water is one of the possible backup feeds for the fire extinction system, but mobile equipment is available to replace the fixed lagoon water feed loop for fire fighting. Te primary fire fighting water network has been completely renewed on the SCKCEN site.

RR10: Concealed piping (monitoring)

It is suggested to update or validate the ageing management program for concealed piping based on data obtained from the piping that was removed.

Answer

All piping with a safety function is located in a containment and is no longer concealed. The piping can be inspected. Especially the piping for transferring contaminated waste water has a double wall (with leak detection) and the pipe for transfer of pool water towards and from the storage basin is placed in a concrete cellar.

RR 13: Concrete containment structure

The need for monitoring, testing, sampling and inspection activities as well as for preventive and remedial actions should be determined on the basis of a dedicated ageing assessment.

Answer

The inspection and follow up program is still to be defined. At first the refurbishment of the cooling tower was done. Although the cooling towers have no safety function, they are essential for the operation of the reactor. The concrete of the cooling towers was in bad condition, due to the continuous contact with demineralized water.

For the containment building and the other concrete structures, no degradation can be seen and no urgent action on the concrete is required. A follow up program (including measurements) is to be defined. A more urgent problem is the steel dome where corrosion is observed. This issue has been assessed in terms of safety significance and sufficient margin has been identified for the short term. A methodology for removing the corrosion and repainting is defined and is planned to be executed in the short term. Another issue on the containment building is the presence of an asbestos isolation layer. This has no consequences either on the nuclear safety. However, in case of severe degradation, the asbestos poses a high risk for the workers and could make the installation out of operation. A remedial plan is under development.