ROMANIA

National Commission for Nuclear Activities Control

Romanian National Action Plan post - Fukushima

Revision 2, December 2017

Table Of Contents

GENERAL INFORMATION ABOUT THE ACTION PLAN POST-FUKUSHIMA

Following the Fukushima Daiichi accident occurred in March 2011, the Romanian authorities and the nuclear industry performed reassessments of nuclear safety and emergency preparedness arrangements and implemented improvements, in line with the international efforts in this direction.

There are currently several public reports (listed in the References) which document the actions taken by the National Commission for Nuclear Activities Control (CNCAN) and Cernavoda Nuclear Power Plant (NPP) to take account of the lessons learned from the Fukushima accident.

A national action plan has been developed for bringing together the actions identified from regulatory reviews, self-assessments, peer-reviews and generic recommendations at international level.

This action plan has been elaborated by CNCAN, based on the safety reviews performed after the Fukushima accident, taking account of the guidance provided by ENSREG. The action plan was issued for the first time in December 2012 and has been reviewed and revised in December 2014 and in December 2017, respectively.

CNCAN has been monitoring the licensee's progress in the implementation of the planned improvements and continues to perform safety reviews and inspections to ensure that all the opportunities for improvement are properly addressed taking account of the lessons learned from the Fukushima accident.

All the most important safety-related upgrades have been implemented. There is a delay in the implementation of Action #31 (Cernavoda NPP will establish a new seismically qualified location for the on-site emergency control centre and the fire fighters. This location will include important intervention equipment (mobile diesel generators, mobile diesel engine pumps, fire-fighter engines, radiological emergency vehicles, heavy equipment to unblock roads, etc.) and will be protected against all external hazards.) This action is in progress and it is estimated to be completed by the end of 2018. The target date for implementation has been changed several times due to legal and administrative issues related to transfer of property of the physical location. Until the completion of this action, equivalent measures have been implemented to ensure that all intervention equipment (mobile Diesels, Diesel fire pump, fire trucks, etc.) are protected from external hazards (e.g. the equipment have been relocated so that they would not be impaired by external events).

The revision 2 of the action plan reflects the situation as of December 2017. The action plan will be reviewed annually by CNCAN to verify the progress with its implementation and revised, as necessary, to reflect any relevant new information and developments.

On the overall, it can be concluded that Romania has made good progress in the implementation of regulatory framework improvements and design upgrades to take account of the lessons learned from the Fukushima accident and improve the nuclear safety of the Cernavoda NPP.

Table 1 – Romanian Action Plan post-Fukushima - Summary of improvement activities – December 2017 update

The latest status of the Romanian National Action Plan is summarised in the table below, which provides an outline of the main improvement activities resulting from the post-Fukushima safety reviews performed to date. The table identifies, for each action, the organisation(s) responsible for implementation (SNN - the licensee, CNCAN, or both), the status of the action (implemented, in progress, planned or under evaluation) and the target date for completion. The status of the actions reflects the situation as of December 2017.

CNCAN monitors the licensee's progress in the implementation of the planned improvements and continues to perform safety reviews and inspections to ensure that all the opportunities for improvement are properly addressed taking account of the lessons learned from the Fukushima accident.

Action	Responsible for implementation	Status	Target date for implementation
Topic 1 – External events (earthquakes, floods and extreme weather conditions)			
1. Review the specific procedure which is in place for extreme weather conditions in order to include the appropriate proactive actions for plant shutdown.	SNN	Implemented	-
2. Identification of potential measures to improve protection against flooding.	SNN	Implemented	-
3. Provision of on-site of sand bags to be used as temporary flood barriers, if required.	SNN	Implemented	-
4. Improvement of the seismic robustness of the existing Class I and II batteries.	SNN	Implemented	-
5. Design modifications to replace selected doors with flood resistant doors and penetrations sealing (for improving the volumetric protection of the buildings containing safety related equipment located in rooms below plant platform level).	SNN	Implemented	-

Action	Responsible for implementation	Status	Target date for implementation
6. The seismic walk-downs and subsequent seismic robustness analyses done as part of the seismic margin assessment have not revealed a need for any safety significant design change. However, several recommendations resulted from these inspections, which have been included in the regular plant seismic housekeeping program. These do not impact on the seismic margin assessment.	SNN	Implemented	-
7. The regulator to consider routine inspections of the flood protection design features.	CNCAN	Implemented	-
8. The peer review recommended that a seismic level comparable to the SL-1 of IAEA leading to plant shutdown and inspection is established. It was suggested to the regulator to consider implementing adequate regulations. Currently the actions taken by the licensee following an earthquake are based on decision making criteria that include the estimated damage to the plant (walkdowns using a specific procedure) rather than on pre-defined level.	CNCAN	Implemented	Cernavoda NPP has established the SL-1 level. The regulation NSN-06 on the protection of nuclear installations against external events of natural origin has been published in January 2015.
9. Elaboration of more detailed regulatory requirements on the protection of NPPs against extreme external events, taking account of the lessons learned from the Fukushima accident and of the results of the "stress tests" peer reviews.	CNCAN	Implemented	The regulation NSN-06 on the protection of nuclear installations against external events of natural origin has been published in January 2015.

Action	Responsible for implementation	Status	Target date for implementation
10. The peer review concluded that there is only little information about margins to cliff edges due to external events and weak points. Further work is proposed in this area and it is recommended that CNCAN obtains good quality programmes from licensees and ensures that the work is appropriately followed up.	CNCAN	Planned	Depending on the development of a common methodology, at EU-level, for assessing margins to cliff-edge effects due to external events. The regulation of NSN-06 includes requirements on the assessment of cliff-edge effects due to external events of natural events.
Topic 2 – Design Issues			
11. Procurement and testing of mobile equipment (e.g. mobile diesel generators, mobile pumps, connections, etc.).	SNN	Implemented	-
12. Provision of a facility to open the MSSVs after a SBO.	SNN	Implemented	-
13. Provision of connection facilities required to add water using fire fighters trucks and flexible conduits to supply the primary side of the RSW/RCW heat exchangers and SGs under emergency conditions.	SNN	Implemented	-
14. Specific emergency operating procedures to cope with Station Blackout and Loss of Spent Fuel Pool Cooling events.	SNN	Implemented	-
15. The option of charging the batteries or the installation of a supplementary uninterruptible power supply for the SCA is being considered by the licensee as a potential improvement.	SNN	Implemented	-

Action	Responsible for implementation	Status	Target date for implementation
Topic 3 – Severe Accident Management and Recovery (On-Site)			
16. Validation of the station Severe Accident Management Guidelines (SAMG) through emergency exercises.	SNN	Implemented	-
17. Training for severe accident scenarios, including as part of the emergency drills.	SNN	Implemented (Refreshment training is performed periodically)	-
18. Special agreements were established with the local and national authorities involved in the emergency response in order to ensure that in case of a SBO coincident with loss of primary UHS the plant has absolute priority to grid re-connection and supply of light and heavy equipment and the necessary diesel fuel.	SNN	Implemented	-
19. Accident management provisions for events in the spent fuel pools (natural ventilation for vapours and steam evacuation, seismically qualified fire-water pipe for water make-up).	SNN	Implemented	-
20. Improvement of the existing provisions to facilitate operator actions to prevent a severe accident in SFB (water level and temperature monitoring from outside the SFB building).	SNN	Implemented	-
21. Installation of PARs for hydrogen management.	SNN	Implemented	-

Action	Responsible for implementation	Status	Target date for implementation
22. Installation of dedicated emergency containment filtered venting system for each NPP unit.	SNN	Implemented	-
23. Additional instrumentation for SA management e.g. hydrogen concentration monitoring in different areas of the reactor building.	SNN	Implemented	-
24. Improvements to the reliability of existing instrumentation by qualification to SA conditions and extension of the measurement domain.	SNN	Implemented	The design changes implemented at both Cernavoda Units to improve survivability to SA addressed the following parameters: - R/B pressure, - Calandria Vault level, - moderator level, - Heat Transport temperature.
25. Implementation of a design modification for water make-up to the calandria vessel and the calandria vault	SNN	Implemented	-
26. Verification of the completeness of event-based and symptom-based EOPs for all accident situations.	SNN CNCAN	Implemented	-
27. Severe accident management requirements to be included in a regulation.	CNCAN	Implemented	The regulation with requirements on severe accident management was issued in January 2014.
28. MCR habitability analysis to be continued (e.g. assessment of total core melt with voluntary venting, implementation of close ventilation circuit with oxygen supply).	SNN	Implemented	-
29. Review of Level 1 PSA & completion of Level 2 PSA (to include SFB accidents).	SNN	Implemented	-

Action	Responsible for implementation	Status	Target date for implementation
30. Measures have been identified (and will be implemented) that aim to improve the reliability of the: (i) communication system and (ii) on-site emergency control centre.	SNN	Implemented	-
31. Cernavoda NPP will establish a new seismically qualified location for the on-site emergency control centre and the fire fighters. This location will include important intervention equipment (mobile DGs, mobile diesel engine pumps, fire-fighter engines, radiological emergency vehicles, heavy equipment to unblock roads, etc.) and will be protected against all external hazards.	SNN	In progress	The target date was initially set for the end of 2015. It was changed due to legal and administrative issues related to transfer of property of the physical location. Until the completion of this action, equivalent measures have been implemented to ensure that all intervention equipment (mobile Diesels, Diesel fire pump, fire trucks, and so) are protected from external hazards (e.g. the equipment have been relocated so that they would not be impaired by external events). This action is a complex capital investment project and closely monitored. The updated implementation schedule indicates the completion date as the end of June 2018.
32. Review of SAMGs taking account of plant modifications and upgrades performed after Fukushima.	SNN CNCAN	Implemented	-
33. The development of SAMGs specifically for shutdown states is under consideration.	SNN	Implemented	-
Topic 4 – National Organisations			
34. Improvement of on-site emergency organisation.	SNN	Implemented	-

Action	Responsible for implementation	Status	Target date for implementation
35. Review of lessons learned from the Fukushima accident with regard to organisational factors and applicability to national organisations in the nuclear sector.	CNCAN SNN	Implemented	-
36. Implementation of recommendations from the 2011 IRRS mission.	CNCAN	Implemented	A follow-up IRRS mission has been received by Romania in 2016. Most of the recommendations have been closed. The IRRS report will be released in 2018. Work will continue for implementation of the new recommendations received by CNCAN during the follow-up IRRS mission.
37. Review of the national regulatory framework for nuclear safety to identify and implement actions for improvement.	CNCAN	In progress	Continuous activity Work continues for the revision of the regulations, in particular to incorporate the new WENRA Reference Levels into regulations and to take account of the new IAEA Safety Standards that have been updated to reflect lessons learned from the Fukushima accident
Topic 5 – Emergency Preparedness and Response and Post-Accident Management (Off-Site)			
38. Review the existing protocol with Public Authorities in order to ensure the necessary support for the Cernavoda NPP personnel in case of severe accident, when the roads are blocked due to extreme meteorological conditions, natural disasters (earthquakes, flooding, etc.) or other traffic restrictions.	SNN	Implemented	-

Action	Responsible for implementation	Status	Target date for implementation
39. Installation of Special Communication Service phones in each Main Control Room (Intervention Support Centre) and Secondary Control Area.	SNN	Implemented	-
40. An alternative off-site emergency control centre is being developed.	SNN	Implemented	The new offsite emergency control center was tested during a drill, in December 2015.
41. A review of the national off-site response is in progress to take account of the lessons learned from the Fukushima accident.	CNCAN + other national authorities	In progress	End of 2018 (Actions for improvement have been identified and are under implementation)
Topic 6 – International Cooperation			
42. Identification and consideration of additional relevant peer-review services.	CNCAN SNN	Implemented	This is, however, a continuous activity, controlled by the operating and regulatory experience feedback processes.
43. Participation in international activities for sharing experience on lessons learned from the Fukushima accident and on actions taken to improve safety.	CNCAN SNN	In progress	Continuous activity

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