

**RAPORTEURS' REPORT**

**Ukraine**

**ENSREG NATIONAL ACTION PLANS WORKSHOP 2015**

**1.0 ASSESSMENT OF THE STRUCTURE OF NATIONAL ACTION PLAN**

**1.1 Compliance of the national action plan with the ENSREG Action Plan:**

The National Action Plan of Ukraine contains a compilation of conclusions and recommendations contained in the Compilation of Recommendations of ENSREG, key topics of the 2nd Extraordinary Meeting under the CNS, the state review of stress test results and findings, Peer Review Country Report and the Communication from the Commission to the Council and the European Parliament on the stress test.

Update 2015: No change

**1.2 Adequacy of the information supplied, taking into account the guidance provided by ENSREG.**

The NAcP has followed the ENSREG guidance very closely. The National Action Plan is structured, in accordance with the structure suggested by ENSREG into four parts. Part I is devoted to the issues of external hazards (earthquakes, floods, extreme weather conditions), loss of safety systems and severe accident management. Part II deals with key topics of the Extraordinary CNS (national organization, emergency preparedness and international cooperation). Part III is devoted to Additional Topics and Activities (peer review recommendations, Commission Communication, improvement of the national regulations). The focus of the Action Plan - Part IV - contains the list of measures aimed at implementing the recommendations contained in parts I - III. The set of these measures is the sum of corrective actions identified.

Update 2015: The Updated NAcP has followed the ENSREG guidance document. The National Action Plan is structured into two parts Part I lists the updated status of safety improvement measures at NPPs including Chernobyl NPP . Part II contains a description of the safety improvement measures listed in Part I. Annex of the report contains the NAcP as prepared in 2013.

**2.0 ASSESSMENT OF THE CONTENT OF NATIONAL ACTION PLAN**

**2.1 How has the country addressed the recommendations of the ENSREG Action Plan?**

The proposed measures addressing each type of operating NPP units (VVER-440 V-213, VVER-1000 V-320, VVER-1000 V-302/338), ChNPP units 1-3 (decommissioning stage) and the interim spent fuel storage facility (ISF), and indicating the timeframe for the implementation. It is mentioned in the NAcP that the national regulator (SNRIU) regularly monitors this process.

In some cases it is not clear to which extent the NAcP is covering some of the ENSREG recommendations.

Update 2015: The proposed measures addressing each type of operating NPP units (WWER-440 V-213, WWER-1000 V-320, WWER-1000 V-302/338), ChNPP units 1-3 (decommissioning stage) It is mentioned in the NAcP that the SNRIU continued to monitor this process. Some additional information requested by the workshop ToR in the revised NAcP is missing such as : relevant outcomes of studies and analyses identified in the 2012 action plan and completed since the 2013 ENSREG workshop.

In some cases it was not clear to which extent the activities is covering some of the ENSREG recommendations/findings for example in the area of bunkered backup systems, alternate ultimate heatsink. . During the discussion it was explained that the technical specification of back up systems and for the alternate heat sink takes into account possible external events.

Updated information is provided on the status of safety measures related to e.g. the unified state automated radiation monitoring system or the implementation of the RODOS system . The report also contains information on the harmonisation of Ukrainian nuclear and radiation safety regulations with WENRA reference levels as suggested by the previous workshop in 2013.

## 2.2. Schedule of the implementation of the NAcP

The implementation of improvement measures identified on European and National level in the aftermath of Fukushima is clearly scheduled. A number of measures are already on-going as defined by the Comprehensive (Integrated) Safety Improvement Program.

This Program already existed and was updated in 2011 in the aftermath of the Fukushima accident (approved by the Government of Ukraine in December 2011). The majority of measures will be completed between 2013 and 2017 depending on the type of the NPP.

The compliance with the schedule is a licensing condition and regularly monitored by the regulator.

Update 2015: In 2013 a number of measures were already on-going as defined by the Comprehensive (Integrated) Safety Improvement Program. This Program was established before 2011 and was updated in the aftermath of the Fukushima accident.

This situation changed. Almost all deadlines for the implementation of safety measures has been rescheduled (postponed) in comparison with the original NacP as of 2013. This relates to the so-called pilot power units (except for SUNPP unit 1 (WWER-1000/V-302)) and to all operating units accordingly. The main reasons

for rescheduling are technical complexity of their development implementation and required scope of funding, taking into account the situation on the territory of Ukraine over the last year. In this regard, for those units that are under lifetime extension process, the operating organization made a decision to implement the remaining measures during a long outage period before obtaining a license for long-term operation. For other units, all measures are implemented stepwise according to the annual schedule.

### 2.3 Transparency of the NAcP and of the process of the implementation of the tasks identified within it

The NAcP informs on how the operator of NPPs intends to improve the safety of NPPs. The NAcP has been discussed and agreed at the open SNRIU Board meeting. Stakeholders including non-government organizations and media have been involved.

The Ukrainian version of NAcP was made public on the SNRIU website and the English version on the ENSREG website.

Update 2015: The NAcP informs on how the operator of NPPs intends to improve the safety of NPPs. The English version of the updated NAcP is available on the ENSREG website. The progress in implementation of the safety upgrades is discussed at annual SNRIU Board meetings. The outcomes of the SNRIU meetings are made public. The Ukrainian version of Updated NAcP is publicly available at SNRIU website.

### 2.4 Commendable aspects (good practices, experiences, interesting approaches) and challenges

Ukraine joined the stress test exercise voluntarily and as a follow up prepared a NAcP.

The NAcP addresses each type of NPP including the ChNPP and the ISF facility. A number of safety improving measures are being implemented under the “Comprehensive (Integrated) Safety Improvement Program for Ukrainian NPPs”, which was updated after Fukushima in 2011 and monitored on a regular basis by the regulator.

The Safety Upgrade Program was developed based on results of in-depth deterministic and probabilistic safety assessments (within the SAR), results of the EC-IAEA-Ukraine Joint Project “Safety Evaluation of Ukrainian Nuclear Power Plants” and Upgrade Package for Khmelnytsky2 & Rivne-4. A number of important measures have been already implemented like mobile diesel generators and seismic monitoring systems in some sites.

It should be noted that the measure on containment filtered venting at VVER-1000 units was requested by the regulator prior to the stress tests based on the first analysis of the accident. The relevance for VVER-440 units is subject to further analyses. The Safety Improvement Programme was approved by the Government of Ukraine.

An interesting aspect is that a measure is first implemented in a pilot power unit with reactors of each design and afterwards in other units taking into account the experience gained from the pilot NPP (results, technical solutions and findings).

Update 2015: A number of safety improving measures are being implemented under the “Comprehensive (Integrated) Safety Improvement Program for Ukrainian NPPs”, which was updated after Fukushima in 2011 and monitored on a regular basis by the regulator. A significant challenge is in the implementation of the updated NAcP because of financial constraints and technical complexity of their development. SNRIU has required to implement a set of safety upgrades as a condition for lifetime extension. A substantial number of measures are to be implemented within lifetime extension process during a long outage period.

## 2.5 Technical basis related to main changes and relevant outcomes of studies and analysis

The technical bases for rescheduling safety upgrading measures is to reflect experience in implementation of measures at pilot power plants and the technical complexity of their development.

A number of technical analyses have been performed or are planned for example analyses of severe accident phenomena based on available experimental data and improvement of computer models, the possibility of IVR strategy at WWER 440 reactors or the spread of melted core and its interaction with the structures. The purpose of these studies are to identify further administrative and technical measures.

## 3.0 PEER-REVIEW CONCLUSIONS

The original NAcP follows the structure proposed by ENSREG and covers all aspects specified in the ENSREG Action Plan. Additional topics related to the specific recommendations of the Peer Review of Stress Tests for Ukrainian NPPs and Safety Improvement Measures at Chernobyl NPP were reported.

The NAcP has been discussed and agreed at the open Board meeting of the national regulator, stakeholders including non-government organizations and media have been involved. The compliance with the schedule is a licensing condition and regularly monitored by the regulator. The Periodic Safety Review is used to verify the compliance with the licensing conditions and to identify additional measures if necessary.

It should be noted that the measure on containment filtered venting at VVER-1000 units was requested by the regulator prior to the stress tests based on the first analysis of the accident.

An interesting aspect is that a measure is first implemented in a pilot power plant unit with reactors of each design and afterwards in other units taking into account the experience gained from the pilot NPP.

The updated Ukrainian NAcP provides information on the status of safety measures related to e.g. the unified state automated radiation monitoring system or the implementation of the RODOS system. The report also contains information

on the harmonisation of Ukrainian nuclear and radiation safety regulations with WENRA reference levels as suggested by the previous workshop in 2013.

A number of safety improving measures were defined before the Fukushima event and are subject to the on-going Comprehensive (Integrated) Safety Improvement Program (for operating plants) and under the “Safety Improvement Plan for Chernobyl NPP Nuclear Installations. In this regard a challenge remains in technical solutions for e.g. bunkered backup systems , alternate ultimate heatsink or bunkered safety systems. During the discussion it was explained that the technical specification for those equipment and systems takes into account possible external events and severe accident conditions.

A number of technical analyses have been performed or are planned to be performed for example analyses of severe accident phenomena based on available experimental data and improvement of computer models, the possibility of IVR strategy at WWER 440 reactors or the spread of melted core and its interaction with the structures at WWER 1000 units. The purpose of these studies are to identify further administrative and technical measures.

Despite the efforts of the regulatory body and of the operator the situation since 2013 changed. Almost all deadlines for the implementation of safety measures has been rescheduled (postponed) in comparison with the original NacP as of 2013. This relates to the so-called pilot power units (except for SUNPP unit 1 (WWER-1000/V-302)) and to all operating units accordingly. The main reasons for rescheduling are technical complexity of their development, implementation and required scope of funding taking into account the situation on the territory of Ukraine over the last year. In this regard, for those units that are under lifetime extension process, the operating organization made a decision to implement the remaining measures during a long outage period before obtaining a license for long-term operation. For other units, all measures are implemented stepwise according to the annual schedule.