

Comprehensive risk and safety assessments
of nuclear power plants (EU Stress Tests) as
a follow-up to the Fukushima accident

Peer Review

Practical arrangements

Extension covering Peer Review of Belarus National Action Plan

1. INTRODUCTION

This document complements and updates the Practical Arrangements agreed between ENSREG and Gosatomnadzor (GAN) in October 2017 for the targeted reassessment of the safety margins and robustness of the Belarusian NPP in light of the Fukushima accident (stress tests). It describes the process of preparing and conducting the peer review of the National Action Plan following the results of stress-tests of the Belarusian NPP. This peer review will be conducted on the same general principles (voluntary basis, prime responsibility, openness and transparency; access to information) as the original stress tests exercise (para 2.3 of the said document) and will cover the same topic areas, namely:

1. external hazards: earthquakes, flooding and other extreme weather conditions;
2. loss of electrical power and loss of ultimate heat sink;
3. severe accident management.

The scope of the peer review will be the:

- assessment by ENSREG of the NAcP against the recommendations presented in the ENSREG stress test peer review report;
- assessment by ENSREG of the progress in the implementation of the planned actions.

The peer review will be **based on**:

1. Belarus's National Stress Test Report (2017);
2. ENSREG Stress Test Peer Review Report (2018);
3. National Action Plan (August 2019);
4. Updated National Action Plan (January 2020).

The following documents will be used as a **reference**:

1. ENSREG Compilation of recommendations and suggestions (2012);
2. Report of the 2nd Extraordinary CNS Meeting (2012).

In a similar fashion to the original stress test peer review, the peer review of the NAcP will be carried out in the following **main phases**:

1. Collection of ENSREG written comments and questions
2. Receipt of written answers from GAN
3. Drafting of the preliminary report
4. Technical discussions in Minsk and at the Belarusian NPP
5. Presentation of the final report

The expected schedule for the exercise is attached as Annex I. GAN and ENSREG will agree detailed agendas and timings for the various visits to Minsk and Belarusian NPP site at least five weeks before the visit in question. Both sides agree to respect the attached schedule in view of conducting the Peer Review swiftly and completing the exercise without delays, except for any justified *force majeure*.

The situation of the COVID pandemic at the start of December 2020, constitutes force majeure in the sense of the preceding paragraph. As was recognized in the originally planned schedule, it may not be possible to meet in full the originally planned schedule. In particular, the planned full PRT mission in December 2020 to Minsk and to the site of the NPP had to be reorganized and rescheduled as a hybrid mission in order to complete the peer review on recommendations related to high priority issues (see list in Annex II). Peer review of the remaining recommendations would be completed after Covid-19 pandemic allows a full mission to Belarus. In the hybrid mission, some activities are carried out physically at the Belarusian NPP site, while the remaining activities are carried out virtually. To address the changes above, a revised schedule is annexed to this update.

The questions, collected from the experts of the NAcP peer review team and ENSREG members, will be sent to GAN as a single Word file (in EN and RU versions) for written answers. The Peer Review Secretariat (mentioned in the Annex I of the Practical Arrangements 2017) is responsible for receiving questions from the desktop review, compiling them into one set and transmitting them to the Belarusian counterparts. In compiling the questions, the Peer Review Team ensures that the technical content of all questions can be covered by answering the subset of questions submitted by the Peer Review Team and linking the answers to the remaining questions, thus avoiding duplication. Following transmission of the questions, video calls can be arranged with the topic teams to clarify the questions and expected responses.

The purpose of the review team's visit to Minsk (which can be replaced or complemented by virtual meetings) is to obtain further clarification on the NAcP and its implementation in discussions with the experts of GAN and the NPP Operator. The purpose of the visit to the Belarusian NPP is to continue discussion on NAcP implementation with GAN and the Belarusian NPP and to access areas relevant to the peer review areas in order to demonstrate implementation of ENSREG's recommendations.

In the context of the missions, the Peer Review Team Leader may brief concerned Belarusian NGOs on the Peer Review Team's work (in a virtual mode due to the pandemic situation) and respond to their questions and comments. If so, GAN will be invited to observe.

Based upon the above activities, the peer review team will prepare a preliminary report based upon the hybrid mission and submit it to the plenary for endorsement by ENSREG, in accordance with its internal procedures. GAN will take part to observe and make comments if applicable during the plenary presentation. During the hybrid mission, virtual activities and the site visit will address recommendations which are related to the high priority issues identified by the PRT (see list in Annex II). EC/Peer Review Team and GAN will consult in the event that the physical mission contributing to the completion of the preliminary report cannot be completed in a timely way owing to the pandemic situation.

The accuracy of facts in the preliminary report is to be checked and confirmed by GAN before its presentation to ENSREG.

The final peer review report – covering the full National Action plan – will be prepared after a final visit to the Belarusian NPP by the Peer Review Team which will take place once pandemic conditions allow.

The accuracy of facts in the final report is to be checked and confirmed by GAN. The final report will be passed to ENSREG plenary for endorsement (approval).

The PRT's report will be transmitted to GAN before the closure meeting. During the closure meeting at the end of both the hybrid mission and the final visit, the Peer Review team presents its observations and conclusions in a written form to GAN. The Peer Review team will give due consideration of the comments of GAN (Belarus Team) in the process of preparation of the preliminary and final peer review report.

Following approval by ENSREG, the final report will be presented by the Peer Review Team Leader, normally together with one or more representatives of the **ENSREG Board for Stress Tests in Third Countries**, to Belarus Team at the end of the process – if possible in Minsk. During this visit, the representatives of the Board will also meet with concerned NGOs. The representatives of GAN will participate in this meeting as observers. GAN will keep intelligent ownership over the recommendations of the follow-up peer-review exercise (conclusions of preliminary and final reports).

2. Output

The main output of the peer review will be the peer review team's preliminary and final reports, structured as follows:

- Assessment of the Structure and the Content of the NAcP by ENSREG.
- Peer Review Conclusions.

Conclusions and results of the preliminary report will focus on the recommendations related to the high priority issues and any generic part of the peer review for which conclusions can be made at the end of hybrid mission in particular the structure and comprehensiveness of the NAcP. A tabular appendix setting out the detailed assessment will be included in the reports, which will be distributed to ENSREG Members, and published on the ENSREG website. GAN will also publish it on its website, translated as appropriate. Documents including questions and answers are working documents and not published as part of the peer review outputs.

3. Composition of the Peer Review Team and the Peer Review Board

The Peer Review Team will be composed as follows:

Team Leader: Mr. Petteri Tiippana

Director General of the Radiation and Nuclear Safety Authority (STUK), Finland

Topic 1:

Mr. Oskar Grözinger (Topic Leader)

- Former head of the nuclear regulatory body of Baden-Württemberg (Germany)
Presently member of the ENSI Board (Switzerland)
- Mr. Kurt Decker (AT)
Geologist, Austrian; Senior Researcher at the University of Vienna; Consultant to IAEA, Austrian Ministry of the Environment etc.; Member of the WENRA Working Groups RHWG and WGRR
- Mr. Tamás Kantona, (HU)
Emeritus Professor, Doctor of Science of Hungarian Academy of Sciences, Chief Technical Expert of the MVM Nuclear Power Plant Paks, Hungary
- Mr. Marc Noel (BE)
Policy Officer in Unit A.7 Euratom Coordination, Joint Research Centre, European Commission

Topic 2:

- Mr. Sebastian Stransky (Topic Leader) (DE)
Department Head International Projects, Division Project Management, Gesellschaft für Anlagen- und Reaktorsicherheit (GRS) gGmbH, Germany
- Ms. Päivi Salo (FI)
Senior Inspector, Nuclear Reactor Regulation, Reactor and Safety Systems, Radiation and Nuclear Safety Authority (STUK), Finland
- Ms. Elizabeth Tsvetanova (BG)
Head of Safety Analysis and Research Division Nuclear Regulatory Agency, Bulgaria
- Mr. Evaldas Kimtys (LT)
Head of Safety Analysis Division, State Nuclear Power Safety Inspectorate (VATESI), Lithuania

Topic 3:

- Mr. Jozef Misak (Topic Leader) (SK)
Vice-president for Strategy UJV Rez, a.s. (Nuclear Research Institute), Husinec-Rez, Czech Republic
- Mr. Andrii Goroshansky (UA)
Chief expert – state inspector, Division on Operating Nuclear Facilities Safety, Directorate on Nuclear Facilities Safety, State nuclear regulatory inspectorate of Ukraine (SNRIU), Ukraine
- Mr. Dimitris Mitrakos (GR)
Assistant Professor, Nuclear Engineering Dept., School of Mechanical Engineering, National Technical University of Athens, Greece

Rapporteur: Ms. Aila Asikainen
Policy Officer, Unit D.1 - EURATOM coordination, legal matters and international relations, DG Energy, European Commission

The Team will be supported by the following experts from the Commission acting as back-ups for team members listed above who are unable to travel during the hybrid mission or the final mission:

Back-ups for the technical experts:

Mr. Bharat PATEL, Nuclear safety and radiation protection policy officer, Unit D.3 - DG Energy, European Commission

Mr. Janos VEGH, Scientific/technical officer, Joint Research Center, Unit G.I.4, European Commission.

Mr Brian FARRAR, Deputy Head of Unit, Joint Research Center, Unit G.10, European Commission.

Mr Ján ŠTULLER, Nuclear Energy Advisor at the Ministry of Industry and Trade of the Czech Republic

Back-ups for the rapporteur:

Mr Hans Rhein, representing the ENSREG Secretariat

Mr Finlay MacLean, representing the ENSREG Secretariat

Subject to the agreement of the Belarusian side, the review team may include Observers from third states or the IAEA.

The Peer Review Board will be composed as follows:

(Chairperson :) Mr. Andreas Molin (AT)

Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology, Austria

Members :

Ms. Sylvie Cadet-Mercier (FR)

Commissioner ASN, France

Mr. Frank Hardeman (BE)

Director General of Federal Agency for Nuclear Control (FANC), Belgium

Mr Tsanko Bachiyski (BG)

Chairman of the Nuclear Regulatory Agency, Bulgaria

Mr. Massimo Garribba (IT)

Deputy Director General DG Energy, European Commission

Secretariat: by European Commission

4. Composition of Belarus Team

Belarus Team will be composed as follow:

Team Leader: Ms. Olga Lugovskaya, Head of Gosatomnadzor

Topic 1:

Mr. Sergey Tretiakovich, Deputy Head of Nuclear Safety Regulation Division of Gosatomnadzo/Ms. Irene Vityaz, Chief Specialist of Nuclear Safety Regulation Division of Gosatomnadzor;

Mr. N. Karpenko, Leading Safety Analysis Engineer, Reliability and Safety Analysis Department of SE “Belarusian NPP”;

Mr. A. Mitskevich, 1st Category Safety Analysis Engineer, Reliability and Safety Analysis Department of SE “Belarusian NPP”;

Mr. Vladimir Ledenev, Deputy Head of the Department for Engineering Survey of JSC EC “ASE”;

Mr. Georgiy Kostrov, Chief Specialist of the Construction Division of JSC “Atomproekt”;

Mr. Alexandr Solodovnikov, Chief Specialist of OKB “Gidropress”;

Topic 2:

Mr. Vihen Marukhian, Head of Nuclear Safety Regulation Division of Gosatomnadzor;

Mr. R. Valeev, Head of Reliability and Safety Analysis Department of SE “Belarusian NPP”;

Mr. A. Atamaniuk, Shift Supervisor of the Operational and Production Service Unit of SE “Belarusian NPP”;

Mr. Alexey Gubarev, Head of the Group of OKB “Gidropress”;

Mr. Konstantin Zaitsev, Leading Specialist of JSC “Atomproekt”;

Mr. Evgeniy Tkachev, Leading Engineer of JSC “Atomproekt”;

Mr. Evgeniy Tolstov, Chief Specialist of JSC EC “ASE”;

Topic 3:

Mr. Sergey Tretiakov, Deputy Head of Nuclear Safety Regulation Division of Gosatomnadzor;

Mr. D. Zavialov, Deputy Chief Engineer for Engineering Support and NPP Modernization of SE “Belarusian NPP”;

Mr. A. Yurko, Head of the Department of Engineering and Technical Operation Support of SE “Belarusian NPP”;

Mr. Stanislav Pantiushin, Head of the Group of OKB “Gidropress”;

Mr. Valeriy Sidorov, Head of the Laboratory of JSC “Atomproekt”.

Rapporteur: Mr. Oleg Sobolev, Consultant, Department for Nuclear and Radiation Safety of the Ministry for Emergency Situations of the Republic of Belarus (Gosatomnadzor)

5. Interfaces and contact points

Interface between the EC/Peer Review Team and GAN

The purpose of assigning single points of contact is to ensure ease of communication on practical matters related to the peer review.

The single point of contact of GAN should

- Coordinate the work of Belarus Team for this Review.
- Serve as the point of contact for administrative and logistical matters and communicate with the EC on detailed arrangements.

- Support the review team in administrative and logistic needs during the visit.
- Coordinate and support the formalities needed to allow access of the review team to the NPP.
- Receive the questions from the desktop reviews and ensure their distribution to the responsible stakeholders.
- Coordinate the technical answers and presentations during the country review.
- Take care of arranging local transport from/to airport / hotel / place of work / NPP site visits.
- Coordinate input for any joint Press Statement released at the time of the final report, as relevant.

The single point of contact of the EC/Peer review team should

- Coordinate the work of the experts for this peer review.
- Receive and compile the questions from the desktop review and transmit them to GAN in English and Russian.
- Give administrative and logistics support to the peer review team before, during and after the visits.
- Coordinate the preparation of the peer review report before, during and after the country review.

Similar to the stress test peer review, GAN will provide the venue and necessary office facilities for the part of the peer review that will take place in Minsk and facilitate the arrangements for obtaining access to the identified areas of Belarusian NPP.

Contacts:

GAN: Mr Oleg Sobolev, Department for Nuclear and Radiation Safety of the Ministry for Emergency Situations of the Republic of Belarus (Gosatomnadzor); +375 17 2720286; e-mail: sobolev@gosatomnadzor.gov.by

EC/Peer Review Team: Ms Aila Asikainen (Directorate D - Unit D.1 - EURATOM co-ordination, legal matters and international relations, phone: (+352) 4301 36988, e-mail: aila.asikainen@ec.europa.eu)

In the event of an unexpected event or difficulty which could adversely impact the conduct of either of the peer review missions or their preparatory activities, the two sides will promptly discuss the issue, including communication aspects at senior official level.

At the end of the Peer Review process the HC/Belarus team and EC/ENSREG develop a joint Press Release on the findings of the peer review.

Annex I
Expected schedule for ENSREG Peer Review of the Belarus National Action Plan

	Tentative date	Comment
Step 1a: Collection of ENSREG written comments and questions on the NAcP (<i>English</i>)	17/07/2020	Including possible regrouping of questions
Step 1b: Compilation of questions	24/07/2020	Including overview of questions
Step 1c: translation into Russian	14/08/2020	Translation by Commission
Step 2a: written answers provided by GAN (<i>Russian</i>)	30/10/2020	Written answers to PRT questions*
Step 2b: Video conferences by Topics to discuss written answers provided by GAN (<i>Russian</i>)	Up to 15/11/2020	Topic Teams available to clarify questions by video call.
Step 2c: translation into English	[...]	Translation done by EC
Step 3a: Drafting of the preliminary follow-up report by the ENSREG team	24/11/2020	EN version submitted to GAN
Step 3b: translation into Russian**	By 11/12/2020	Translation provided by EC

* Remaining questions will be answered by the end of November.

** The Commission is undertaking all necessary efforts to submit the text in Russian as early as possible, aiming at 8 December.

Submittal of the preliminary report to GAN	23.12.2020 (in English)	Translation to Russian provided by EC
Step 4a: Technical discussions online and at the Belarusian NPP between the ENSREG team and Belarusian Team on the preliminary	Duration about week and a half Tentatively starting in the week of 25 January 2021	Conduct of the site visit may depend on the development of Covic-19 pandemic Interpretation provided by EC

report focusing on the high priority issues	(technical discussions online) in the week 8 February 2021 (Belarusian NPP site visit)	
Step 4b: Consistency check between the 3 topics and preparation of the preliminary report by the ENSREG team, including consultations with Belarus Team (if necessary)	By mid-February 2021	Interpretation provided by EC (if necessary)
Step 4c: Presentation of the preliminary report to GAN, following fact-checking and comments by Belarus Team	At the end of the hybrid mission	
Step 4d: translation into Russian		Translation done by EC
Step 4e: Presentation of the preliminary report to ENSREG, GAN will take part to observe and make comments if applicable during the plenary presentation.	End February /early March	For endorsement by ENSREG
Step 5: Online presentation of the preliminary report to GAN by Team Leader (plus representatives of the Stress Test Board.)	Late February or early March 2021	Interpretation provided by EC
Step 6: Final technical discussions and site visit at the Belarusian NPP between the Peer Review team and Belarusian Team on the report	As soon as COVID pandemic allows, tentatively: May-June 2021	Focus on the recommendations not included in the pre-final report Interpretation provided by EC
Step 7: preparation of the peer review team's final report and translation to Russian	Schedule depends on the Step 6 timing	
Step 7a: Presentation of the final report to GAN, following fact-	At the end of the visit	

checking, and comments by Belarus team.		
Step 7b: translation into Russian	Schedule depends on the Step 6 timing	Translation done by EC
Step 8: Presentation of the final report to ENSREG (GAN will participate as ENSREG observer), followed by approval by ENSREG in plenary	Schedule depends on the Step 6 timing	For ENSREG approval
Step 9: Presentation of the final PRT report in Minsk by Team Leader plus representatives of the Stress Test Board.	To be foreseen	Publication of Final PRT report. Translation provided by EC

Annex II

High Priority Issues

- For natural hazards there is one high priority issue:
 - Verification of the adequacy of the Design Basis Earthquake (DBE with a PGAH of 0.1059 g) and verifying that this DBE is used as basis for evaluating seismic margins to cope with the seismic Design Extension Condition (DEC).

- For Loss of Safety Functions there are two high priority issues:
 - Implementation of measures to address the identified vulnerabilities of the JNB50 make-up pump (additional redundant pump and permanent power supply)
 - Completing the permanent connection of the diesel generator devoted to Channel 7.

- For Severe Accidents there are four high priority issues:
 - Development, validation and implementation of symptom-based EOPs and SAMGs
 - Evaluation of adequacy and/or enhancement of means for depressurization of the reactor coolant system
 - Review and/or enhancement of habitability of control areas (main and emergency control rooms) during a severe accident combined with SBO
 - Prevention and mitigation measures for severe accidents under open reactor conditions