

Practical organization of peer reviews of the « stress tests » of European NPP's

This paper provides the plan for implementing peer reviews of the European NPP “stress tests”. It is in line with the specifications agreed by ENSREG in May 2011 and is based on the proposal presented by a Task Force to the ENSREG meeting on the 11th of October, 2011. The Task Force proposal was agreed in consensus by ENSREG, with some clarifications that are incorporated to the text in Section III.

TWO FIRST SECTIONS I AND II ARE DISCUSSING THE EVOLUTION OF THE PROPOSAL BUT ARE NOT PART OF THE PROPOSAL. THE ACTUAL PROPOSAL IS MADE IN SECTION III.

I. Excerpts from EU “stress tests” specifications by ENSREG in May 2011

Peer review process

(...) The main purpose of the national reports will be to draw conclusions from the licensees' assessment using the agreed methodology. The peer teams will review the fourteen national reports of Member States that presently operate nuclear power plants and of those neighbouring countries that accept to be part of the process.

- Team composition. ENSREG and the Commission shall agree on team composition. The team should be kept to a working size of seven people, one of whom should act as a chairperson and a second one as rapporteur. Two members of each team will be permanent members with the task to ensure overall consistency. The Commission will be part of the team. Members of the team whose national facilities are under review will not be part of that specific review. The country subject to review has to agree on the team composition. The team may be extended to experts from third countries.

- Methodology. In order to guarantee the rigor and the objectivity of any peer review, the national regulator under review should give the peer review team access to all necessary information, subject to the required security clearance procedures, staff and facilities to enable the team, within the limited time available.

- Timing. Reviews should start immediately when final national reports become available. The peer reviews shall be completed by the end of April 2012.

Transparency

(...) The reports should be made available to the public in accordance with national legislation and international obligations, provided that this does not jeopardize other interests such as, inter alia, security, recognized in national legislation or international obligations.

(...) The peer will review the conclusions of each national report and its compliance with the methodology agreed. Results of peer reviews will be made public.

II. Evolution of the proposal for practical organisation of “stress tests” peer review

1. **The Reactor Harmonization Working Group (RHWG) made the first proposal for practical organization on 26th of May 2011.** After informal consultations concerning the proposal, conducted in connections with various international meetings, the

WENRA Chair made a slight revision of the proposal, which was then sent to ENSREG Members by ENSREG Chair on 7 July.

The basic proposals on measures that are still valid were as follows:

- to provide national reports in English
 - to start reviews on a topical basis, with three topics oriented/related expert teams looking at all of the countries' contributions on that topic
 - to scrutinise the relevant topics in all of the national reports and make separate comments on each country
 - to incorporate the results for each of the topical peer review into single country reports for each country
 - to have a secretariat support, to organise the peer review process (convene the meetings, co-ordinate the process of setting up the peer review groups, compiling and sharing the review documents)
2. ***Comments were received on the first proposal and a discussion on practical organisation continued in a ENSREG Task Force meeting in Helsinki on 5th of September.*** The meeting was attended by 31 persons, including representatives of all other EU nuclear countries except Bulgaria and Romania, of several non-nuclear EU countries, and of Switzerland, Ukraine and Russia.

Among the conclusions made in the meeting, and still being valid, were the following:

Concerning the Topical Review Meetings :

- At least one expert from each country to be reviewed and from the EC is expected to participate in each of the three topical review
- Topical Review Meetings could start earliest on week 4 (23.1.2012), in order to have time to investigate the national reports and make questions to the authors of these reports
- Topical Review Meetings could be conducted in parallel, and up to 2 weeks should be reserved in calendar for the topical meetings (the actual duration could be 1-2 weeks, pending on experience of pilot reviews to be conducted separately at the end of 2011)

Concerning the Country Reviews :

- The Country Reviews should be conducted by teams consisting of team leader, rapporteur and five members
- Team leader could be an EU Regulator, a Regulator from outside Europe or an expert from the IAEA (principle to be determined by ENSREG)
- Rapporteur should be from the secretariat (JRC representative)
- Country Review should be conducted in the respective country, in order to give the regulatory body and the licensees an opportunity to provide clarifications and necessary additional information to the reviewers; the team could also visit one nuclear power plant in the country if that is considered to give worthwhile information on issues discussed in the Country Report.
- Each Country Review should be conducted in two days and focus on issues identified important for the respective country in Topical Review Meetings

(it was also suggested that the team leader and the rapporteur should conduct all Country Reviews, in order to meet the ENSREG specifications and ensure consistent reviews; however, it would require conducting each review one after another and would be an

immense burden to the two key reviewers; in view of the tight peer review schedule it seems not to be feasible to have same persons participating all Country Reviews)

3. **A subgroup of the WENRA Task Force had a meeting on 20th of September** in Paris to make more deliberation of the peer review process and to present a more detailed proposal. This subgroup consisted of representatives of Austria, Finland, France, Germany, and the UK.
4. **The proposal of the subgroup was at hands in an informal ad hoc meeting that was held in Vienna on 21st of September, during the IAEA General Conference.** Invitation to this meeting was circulated to all ENSREG members and was attended by a significant part of ENSREG members.

A modified version of the ENSREG Task Force subgroup's proposal, taking into account the discussions held in Vienna, was prepared by the ENSREG Task Force chair and sent out for comments of the Task Force.

5. **WENRA's Reactor Harmonisation Working Group that discussed the proposal in its meeting in Portoroz on 27-28th of September, 2011.** Valuable comments for the proposal were received from that meeting.
6. **ENSREG Task Force had its second meeting in Helsinki on 3rd of October.** The final proposal presented below was prepared in that meeting.

III. Proposal of practical arrangements

1. General framework

- The peer review will comprise **both horizontal / topical (3) and vertical / country (17 or 18¹) peer reviews**, which are complementary. Planning bases is to be prepared for 18 peer reviews.
- For the Topical Reviews there will be 3 separate teams conducting the review in respective team meetings that are chaired by individuals agreed by ENSREG.
- For the Country Reviews there will be 6 separate teams, each conducting 3 Country Reviews.
- Adequate supervision to ensure consistency of the peer review process has to be provided. The supervision should be provided by a Board consisting of 7 persons: a Chairperson for the entire peer review process, a full time Project Manager ensuring adequate coordination of the activities, the 3 Team Leaders of the Topical Reviews, a representative of a non-nuclear EU State, and a representative of the European Commission. The Board members will be agreed by ENSREG. In addition, ENSREG agrees the Team Leaders of the Country Reviews who are expected to serve also as either Team Leaders or Deputy Team Leaders of the Topical Reviews.
- The Topical Reviews should be conducted first. These should provide already sound conclusions on national reports and make preliminary recommendations to

¹ 14 EU Member States having NPP in operation plus LT, CH and UA who submitted their national progress reports in September and possibly Russia assuming that it submits a national report and wants to join the peer review.

the countries, as appropriate. The results of Topical Reviews should feed the Country Reviews with inputs.

- During the Topical Review, with only limited time for each country, issues will emerge for each country which will require follow-up discussions in more detail; issues can also emerge during the review of one country which are equally relevant for other countries. The Country Review provides an opportunity for follow-up discussions on these issues and it will be logistically easier for the national regulator to get relevant national experts to take part in the whole or in parts of the Country Review.
- At the end of the process, a Peer Review Summary Report will be written as an input for the Commission report that is submitted to the European Council. The responsibility for the contents of the summary report is with the Board. Compilation of the information included in the report will be done by the Secretariat in JRC in close cooperation with the Country Review Team Leaders.

2. Objectives of the peer reviews

The main objective of the peer review should be to promote nuclear safety enhancement in all of the participating countries. Safety should be enhanced in a consistent way by providing the licensees and national regulators with new insights on the need for improvements.

In addition, the peer reviews should:

- provide an international, third line complementary assessment (in addition to the assessment conducted by the licensees and national regulators) to ensure that no important issues have been overlooked as concerns the “stress test” topics.
- give information to national regulators for consideration of any further potential improvements or good practices that may have been identified from the reviews of some national reports².

3. Outputs of the “stress tests” process

The first outputs of the process are the Licensee Reports, due by the end of October 2011, and the National Reports, due by the end of December 2011. These should already provide valuable information to the general public, the political decisions makers and the news media. The Licensee and the National Reports also serve as reference to the peer review summary report and the Commission report to the European Council by providing detailed information to interested readers.

At the end of the Topical Review phase, the review teams, with the support of the secretariat, will:

- issue a working document that summarizes the overall (generic) conclusions of each Topical Review
- draft preliminary Country Reports compiling the results of the 3 Topical Reviews.

²

these items may become apparent to the review teams when they see all national reports and this may allow the peer review to add value to the individual national reports

At the end of each Country Review, the review team will prepare and present in an exit meeting the final Country Report, in which the accuracy of facts has been confirmed in discussions with the national regulator and the licensees. The responsibility for the final Country Report remains with the review team. In cases of disagreement, the chair of the review team is entitled to decide on its final wording.

As the final step of the peer review process, an ENSREG Summary Report prepared under supervision of peer review Board will be issued.. The report will:

- describe the methodology followed for the peer reviews,
- describe the objectives of the process,
- summarize the technical highlights such as strong safety features identified during the process, needs for safety improvements and national plans presented for implementation of the improvements,
- summarize the key lessons learned from the regulatory perspective, and
- provide a conclusion regarding the overall level of nuclear safety in Europe.

The Topical Review's summary conclusions, the Country Reports and the Peer Review Summary Report should provide input to the Commission report to be handed over to the European Council. The report for the European Council could include all Country Reports as an Appendix.

4. Organisation for the conduct of peer review

The peer review process implementation is lead by a Board. In the ENSREG meeting it was decided that the Chairperson of Board is Philippe Jamet from France. He is currently one of the Commissioners at the French Regulatory Body ASN and before joining ASN has worked with the IAEA as Director of Nuclear Installations Safety Division. The Chairperson will supervise the process through the Board meetings and by observing the work of review teams, as he finds appropriate. The Chairperson will also give "a face" to the process by being the spokesperson towards the stakeholders and by presenting the results to interested parties.

The peer review process is managed by a full time Project Manager. His tasks comprise also providing guidance to the review teams on issues to be addressed in the review meetings and on writing consistent reports. In the ENSREG meeting it was decided that the Project Manager is Petr Krs from the Czech Republic. He works in the management of the Czech Regulatory Body SUBJ and was Chair of the Council Working Party on Atomic Questions during Czech Presidency, leading the preparation of the Council Nuclear Safety directive..

The experts suggested to participate to the Topical Review meetings and to the Country Reviews should be nominated and communicated to the secretariat (JRC) not later than 21 October, ten days after the next ENSREG meeting. Each EU Member State has a right (but not any obligation) to nominate one expert for each of the three Topical Review meetings. In the same way, the Commission as well as CH, UA and RUS (assuming it submits a report and participates) can nominate one expert per team. In addition, the JRC is expected to appoint two Rapporteurs and Secretariat for each Topical Review. The qualifications of experts are decided by the nominating parties, and in connection with the nomination of experts for the Country Review teams, short information on the expert area is given to facilitate composing of balanced Country Review teams.

In nominating their participants for the Topical Review teams, the countries should also indicate whether they suggest their nominee to serve as Team Leader or Deputy Team Leader or an expert tasked to draft three topical Country Reports. The

appointment of Topical Review Team Leaders and Deputy Team Leaders is prepared by the “stress test” Chair and the ENSREG Chair by 28th of October. Appointment needs to be confirmed by the ENSREG not later than 7th of November.

Each of the six Country Review teams should have a Team Leader and six experts to be nominated by the parties of the process. In addition, each team should have a Rapporteur, who will be appointed by the Secretariat (JRC). Team Leaders of Country Review Teams are preferably the same persons who have served either as Team Leaders or Deputy Team Leaders in the Topical Reviews. The Country Review teams will be assembled by the Secretariat from the persons suggested by 21st of October and the secretariat also specifies the countries to be visited by each team. The composition of each team needs to be confirmed by the Board and the respective country. In the appointment of the Country Review teams, a principle should be followed that each team will have two reviewers from each topic of the phase 1, i.e. the Topical Review. This principle aims to provide consistency and continuity of the review. If a country prefers to change its reviewers between the Topical Review and Country Review, it should ensure adequate transfer of information between the two reviewers.

The Topical Review meetings can be attended by observers who are invited from Japan and from the IAEA.

The work of all review teams is supported by the Secretariat provided by the Joint Research Centre of EU (JRC). The tasks of the Secretariat comprise:

- administrative coordination of the peer reviews: scheduling the meeting, assembling the review teams, administrative supports for the missions, support for arranging the site access
- collecting and grouping the written questions before the Topical Reviews
- peer review report compilation and editorial control
- publication (on the ENSREG website)

Phases of the peer review

a) Phase 0 – pilot phase

Pilot phase to emulate Topical Review Meetings will be conducted in December.

Pilot phase provides a review of one national report, with respect to the three topics. Countries which have volunteered to submit, by 30th of November, a draft national report on one topic for the pilot review are the UK, Germany, and Finland. The draft national report of the UK is reviewed with respect to the first topic, of Germany with respect to the second topic, and of Finland with respect to the third topic.

The objectives of the pilot phase are to test the process:

- issuing written questions in advance on the national report,
- giving the answers in the review meeting,
- answers and questions dialogue during the review meeting,
- proposing and discussing comments and recommendations to the country,
- assessing the technical scope of the review, and
- writing the section for the draft Country Report.

The pilot review would also give an idea of the realism of the time schedule.

The pilot reviews should be chaired by the appointed Topical Review Team Leaders and conducted by the same reviewers who are going to make the respective review in 2012. The Topical Review Deputy Team Leader should write the draft Country Report.

The three Topical Pilot Reviews should preferably be conducted in parallel at the same venue and last for two days. The pilot review would not replace the Topical Review of the respective country, and the country could still improve its National Report after the pilot review.

The Board members not serving as Topical Review Team Leaders should observe a part of each Pilot Topical Review and should evaluate the lessons on the day after the pilot review, together with the three Team Leaders.

b) Phase 1 – Topical Reviews

Three Topical Review teams should work in parallel, each on one of the following topics :

1. earthquake, flooding and other external events
2. loss of power, loss of UHS and combination of loss of power + loss of UHS
3. severe accident management issues

Each team should have a Team Leader chairing the Topical Review meeting and a Rapporteur responsible for writing overall conclusions of the Topical Review. Six of the experts in each topical Review team should be assigned with responsibility to write three draft Country Reports each, and these persons should also attend the Country Reviews of the respective countries.

- Desktop review should be performed by each expert, on all national reports or a subset of them (each national report reviewed by at least 3 experts). Written questions arising from desktop review should be sent both to the Secretariat and also directly to the respective country by January 20th.
- By 27 January, the secretariat should compile and group all questions and send generalised questions to all reviewers of the respective topic and to all countries; with the aim to facilitate the discussion during the review meeting.
- 6th -17th February: Topical Review meetings in Commission premises in Luxembourg; a group of experts from the national regulators could participate during the session when the respective National Report is discussed; they should present their National Report and be prepared to answer both the questions sent written in advance or raised spontaneously during the meeting; reviews of National Reports are conducted so that different topics are not discussed in parallel, thus permitting same presenters to participate all topic areas; a country representative in the Topical Review team will not participate in the review of his/her National Report but may serve in the role of presenter. Draft report (general conclusions + draft Country Reports) should be ready by the end of the meeting.
- 20th -21st February: In each Topical Review area, a meeting of Team Leader, Deputy Team Leader, Rapporteur and the six experts who have written the draft Country Reports, to harmonize the draft Country Reports.
- 22nd February: Meeting among the Board and the Country Review Team Leaders to share the results of phase 1: weaknesses, best practices, questions to be addressed during Country Reviews.

c) Phase 2 – Country Reviews

Six teams are organised (6x8), with two reviewers of phase 1 from each topic of phase 1. In addition, each team has a Team Leader and a Rapporteur. Each team conducts three Country Reviews in the same composition.

Draft Country Reports are sent to each country as soon as they are ready, and the reports can be discussed by mail or phone already before the actual Country Review, in order to ensure full understanding of the issues to be reviewed.

To prevent any conflict of interest the reviewers can't come from a country the team will be reviewing.

- 12th March-5th April: 6 teams conduct the Country Reviews in parallel; each review is expected to take two days; the focus is in topics having raised questions, comments, and recommendations during the Topical Review; a nuclear power plant visit is recommended in each country; plant visit should focus on issues raised during the process
- Team Leaders should keep close contact with the Board between Country Reviews to confirm methodology & reinforce consistency.

d) “Wrap up” meeting of the ENSREG

An ENSREG meeting is suggested to be held on 27th April to discuss peer review conclusions and final report.

5. Technical scope of the peer review

Definition of the Technical scope still needs more work. This work should be the responsibility of the Board and should be taken in several stages: in preparation of the pilot phase, in preparation of the phase 1 (on the basis of lessons learned from the Pilot Review), and in preparation of the phase 2 (on the basis of the lessons from the Topical Review).

Tentatively, it is proposed that the technical scope covers:

a) Compliance

- “Stress tests” have addressed all topics listed in the specifications
- National Report provide adequate information, content is consistent with the guidance given by ENSREG
- Supporting documentation used for conclusion of stress tests is adequately validated in the regulatory process

b) Margins to hazards and fault conditions (suitable standard & best practices)

For each hazard or fault (seismic, tsunami, weather, SBO, LUHS, severe accident management),

- related safety requirements have been recently reviewed and their validity has been confirmed (comparison against international standard, operating experiences, or research results)

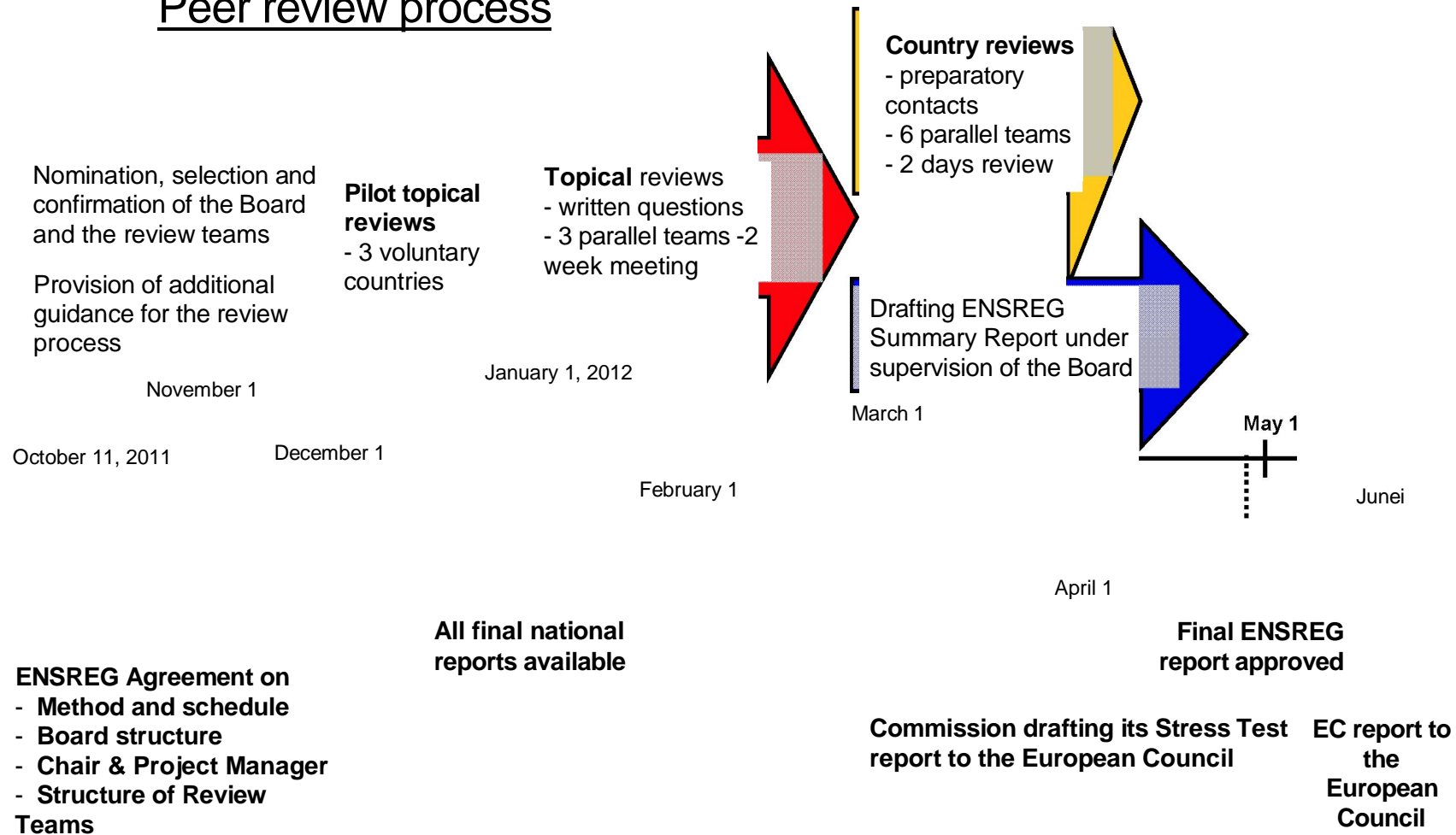
- the national regulatory review has re-confirmed that each plant meets, as a minimum, the current safety criteria applicable for the design and site, or has identified the non-conformances that need to be addressed as a condition for continued operation,
- a systematic approach to safety margin definitions has been applied
- safety enhancing measures have been identified when increased safety margins are judged appropriate
- further studies have been defined as needed for better determination of the safety margins, for confirming the decisions with respect to the safety improvements, for ensuring the actual safety impact of proposed measures, and for avoiding any new risks possibly involved in plant modifications.

c) Safety Enhancements

- Improvements to design
- Improvements to qualification
- Improvements to defence in depth
- Improvements to resilience
- Improvements to accident management
- Are there safety issues or improvements missing from the report or any good practices valuable for other countries
- Additional studies needed

Wherever applicable, significant safety improvements should be highlighted.

Peer review process



ENSREG

National Reports

BOARD supervising the peer review process

(Chairperson + Project Manager + the 3 TR Chairs + Commission & non-nuclear country representative)

RB's of participating States:

Candidates to manage Topical Reviews and participate in the Country Reviews (deadline 23rd October 2011)

3 topical reviews on:

- External hazards
- Loss of safety functions
- Severe accident management

4

Draft Country Reports (compilation of 3 topical reviews)

18 Country Reviews:

- 6 teams working in parallel
- 8 members / team (Chair, rapporteur, 2 experts from each Topical Review))
- Team approved by Country
- Review meetings in each country
- One site visit

Final Country Reports

Topical Summary reports

Board & ENSREG: Technical Summary Report asan input for the Commission report to the European Council