ENSREG

European Nuclear Safety Regulators Group

# European Peer Review of the Stress Tests performed as the Follow-up of the Fukushima Accident

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# Content

- **Summary of the Stress Tests and Peer Review process**
- Main results of the Peer Review
- Follow-up action plan
- Conclusion

# European Council Request after Fukushima

- **11 March: Fukushima accident**
- **24 – 25 March: European Council Request**
  - Stress tests to be developed by ENSREG, the European Commission and WENRA
  - Review all EU plants in light of lessons learned from Japan
  - Assessments conducted by national Authorities
  - Assessments subject to a peer review

# Specification of Stress Tests and Peer Review

- Methodology drafted by WENRA and approved by ENSREG
- Topics:
  - Natural hazards
  - Loss of safety systems
  - Severe accident management

# Stress Tests and Peer Review Steps

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- **1 June – 31 October**:
  - Assessment of plants by operators requested by national Regulators
- **31 October – 1 January:**
  - Review of operators assessments by national Regulators
  - National report to the EC
- **1 January – 26 April**:
  - Peer Review of national reports

# Participants

**Nuclear Member States**

- Belgium
- Bulgaria
- Czech Republic
- Finland
- France
- Germany
- Hungary
- Lithuania
- Netherlands
- Romania
- Slovakia
- Slovenia
- Sweden
- Spain
- United Kingdom

**European Commission**

**Nuclear Non-Member States**

- Ukraine
- Switzerland

**Non Nuclear Member States**

- Austria
- Denmark
- Ireland
- Italy
- Luxembourg
- Poland

**Observers**

- Canada
- Croatia
- IAEA
- Japan
- UAE
- USA

# Process

- Topical Review of national reports topic by topic
  - 80 participants
  - Desktop review for a month
  - Full two weeks seminar in Luxemburg
- Country review by peers
  - 6 teams
  - 4-5 days in each country
  - One plant visit in each Country selected by the review team

# Public Outreach

- Public meetings
  - 17 January on Peer Review process
  - 8 May on Peer Review results
- ENSREG web site
  - All national and Peer Review reports
  - Comprehensive information on the Stress Tests and Peer Review
- Possibility given to stakeholders to post questions for the Peer Review

# Output

- Main report: Final conclusions and recommendations at European level
- 17 country reports: Specific conclusions and recommendations
- Compilation of main recommendations and suggestions

Approval of final reports of peer review by ENSREG on 26 April 2012





9

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# Adequacy of the Assessments (1)

- Compliance of plants with current licensing basis
  - National reports provided clear evidence of plants compliance
  - Approaches vary with countries

# Adequacy of the Assessments (2)

- Assessment of robustness: evaluation of margins and cliff edge effects
  - Topic 1: generally not consistent with ENSREG specification
  - Topic 2 and 3: generally in line with ENSREG specifications

# Assessment of Natural Hazards and Margins

- The peer review Board recommends that WENRA, involving the best available expertise from Europe, develop guidance on natural hazards assessments, including earthquake, flooding and extreme weather conditions, as well as corresponding guidance on the assessment of margins beyond the design basis and cliff-edge effects.

# Periodic Safety Review

- The peer review recommends that ENSREG underline the importance of periodic safety review. In particular, ENSREG should highlight the necessity to re-evaluate natural hazards and relevant plant provisions as often as appropriate, but at least every 10 years.

# Containment Integrity

- Urgent implementation of the recognized measures to protect containment integrity is a finding of the peer review that national regulators should consider

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# Prevention of Accidents Resulting from Natural Hazards and Limiting their Consequences (1)

- Necessary implementation of measure allowing prevention of accidents and limitation of their consequences in case of extreme natural hazards is a finding of the peer review that national regulators should consider

# Prevention of Accidents Resulting from Natural Hazards and Limiting their Consequences (2)

- Such situation can result in:
  - Devastation and isolation of site
  - Event of long duration
  - Unavailability of numerous safety systems
  - Simultaneous accidents in several plants, including their spent fuel pools
  - Radioactive releases

# Prevention of Accidents Resulting from Natural Hazards and Limiting their Consequences (3)

- Typical measures:
  - Bunkered equipment including instrumentation and communication means (hard core)
  - Mobile equipment protected against extreme natural hazards
  - Emergency response centers protected against extreme natural hazards and radioactive releases
  - Rescue teams and equipment rapidly available to support local operators

# Off-site Emergency Preparedness

- Not part of the mandate of the peer review
- Strong demand resulting from public interaction
- Peer review Board recognizes the importance of dealing with off-site emergency preparedness in Europe, as a follow-up of Fukushima disaster

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# Main Objectives of Action Plan

- Insure that recommendations and suggestions of peer review are addressed by national regulators in a consistent manner
- Contribute to enhancement of standards for world-wide nuclear safety

# General Approach of Action Plan

- Continuous improvement of safety
- Use of further peer reviews
- Openness and transparency
- Strong connection with IAEA

**Action plan approved by ENSREG on 1 August 2012**

# Member States and ENSREG Main Actions

- National action plans to be developed and made public
- ENSREG workshop to peer review national action plans
- Fact-finding site visits focused on implementation of measures to improve safety, as part of action plans

# WENRA Actions

- Review of existing Reference Levels in light of the lessons learned from Fukushima
  - Natural hazards
  - Containment integrity
  - Accident management
  - Periodic safety review
- Specific task on mutual assistance between Regulators in case of an emergency

# Additional Actions

- Off-site emergency preparedness
  - Actions to enhance robustness of emergency preparedness in Europe
- Airplane crash
  - Handled by AD-Hoc group on security
  - Possible support of ENSREG, in its area of competence

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# CONCLUSION (1)

- Sress tests and peer review required exceptional resources and resulted in suggestions and recommendations focused on preliminary lessons learned from Fukushima

  (about 500 men x year)
- Follow-up action plan now being implemented

# CONCLUSION (2)

- Expected to contribute to enhancing safety in Europe and each European country
- Ambition to give a leading role to Europe in promoting safety world-wide