SUMMARY OF THE PEER REVIEW PROCESS

Antoni Gurguí Ferrer
Vice chairman
Peer Review Board
General European Context

- Nuclear safety is a national responsibility
- National Frameworks comply with General European Safety Directive
  - IAEA Safety Fundamentals
  - CNS
  - Report to European Commission
  - Peer review of National Framework
European Steps in Reaction to Fukushima

• 11 March: Fukushima accident occurs

• 24-25 March: European Council Request
  – Stress tests to be developed by ENSREG, the 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
  – Whole process to be completed by April 2012
Objective of Stress Tests

• Targeted reassessment of safety margins and robustness of plants, in light of the Fukushima accident
  – Natural Hazards
  – Loss of Safety Systems
  – Severe Accident Management
• Improvement of Plant Safety taking into account the first lessons learned from Fukushima
• Mandate does not include security issues which are treated by a dedicated ad-hoc group
Specification of Stress Tests

• Methodology drafted by WENRA in April
• Approved by ENSREG in May
• Specification of EU Stress Tests published by ENSREG and European Commission on 25 May 2011
Stress Tests Steps

- **1 June**: National Regulators formulate request based on ENSREG Specification

- **31 October**: Operators produce reports responding to National Regulators’ requests

- **31 December**: Regulators transmit National Reports to the European Commission assessing Operators’ responses
General Approach (1)

- Assessment of current situation
  - Current Safety Requirements and Design Basis) in particular for earthquake and flooding
  - Compliance with current Safety Requirements
  - Regulatory oversight, Periodic Safety Reviews, evidence of improvements
General Approach (2)

• Robustness of Plants
  – Assessment of robustness beyond Design Basis: identification of margins and cliff edge effects
  – Strong features and possible improvements
  – Further actions and requests from Regulators
Natural Hazards Margin Assessment

- Continuous increase of severity of External Hazards (Earthquake, Flood,...)
- Corresponding destruction or unavailability of Systems, Structures and Components up to core melt
- Identification of cliff edge effects and margins
- Identification of strong features and weaknesses
- Possible improvements
Loss of Safety Systems Cliff Edge Effects

- Assumption that more and more electrical systems are lost
- Assumption that heat sink is lost
- Combination of both
- Assessment of time before core damage
- Identification of strong features and weaknesses
- Possible improvements
Severe Accident Management Robustness (1)

• Assessment of accident management organization and equipments in case of extreme conditions
  – Destruction of infrastructure
  – Isolation of site
  – Devastation of site
  – Accident affecting multiple units
  – Radioactive releases and high dose rates
  – Unavailability of instrumentation and communications
Severe Accident Management Robustness (2)

- Protection of containment integrity
  - Hydrogen explosion
  - Pressurization
  - Vessel melt through
- Cooling of core and spent fuel pool
- Necessary conditions to allow accident management by Operators (radiation protection, equipment, outside support, procedures, training)
- Identification of strong features and weaknesses
- Possible improvements
Challenges

- Over 150 reactors
- 17 countries with nuclear power
- 80 reviewers from over 20 participating countries
- Different designs
- Different regulatory regimes
- Very short time line (final report with 17 country reports as annexes to be transmitted to ENSREG on 25 April)
Peer review Process

Topical Reviews in 3 teams:
- External Events
- Safety Functions
- Severe Accident Management

Country Reviews: 6 teams in parallel

Draft Topical Reports and Draft Country Reports

Peer Review Report

Country Reports
Peer review timetable

- **ENSREG**
  - Method, schedule, structure, board, and teams
  - October

- **Pilot**
  - January

- **Topical Reviews**
  - February

- **Country Reviews**
  - March

- **Peer Review Summary Report Under Board**
  - April

- **Second Public Event**
  - May

- **National Reports Available**
  - November

- **First Public Event**
  - December

- **Peer Review Summary Report**
  - June

- **EC report to the European Council**
Board

- Chairman - Philippe JAMET (France)
- Vice-Chairman – Antoni GURGUI (Spain)
- Project Manager – Petr KRS (Czech Republic)
- Group 1 Leader – David SHEPHERD (United Kingdom)
- Group 2 Leader – Ervin LISKA (Sweden)
- Group 3 Leader – Joseph MISAK (Slovak Republic)
- Non-nuclear State Rep. – Andreas MOLIN (Austria)
- EU Commission Rep. – Massimo GARRIBBA (EC)

- Secretariat – Mark NOEL (EC)
- Communication task force advising the Board - Claire Lyons (UK)

ENSREG approved the Board on 7 November
Participants

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

**European Commission**

**Non-Nuclear Member States**
- Austria
- Denmark
- Italy
- Ireland
- Luxembourg
- Poland

**Nuclear Non-Member States**
- Ukraine
- Switzerland

**Observers**
- Canada
- Croatia
- Japan
- IAEA
- UAE
- USA
Desk-Top Review

• 1 January: Peer Review started with desk-top review
  – All National Reports reviewed
  – Over 1800 questions posted
  – First version of Country Reports drafted

• 27 January: Questions grouped, prioritized and sent to National Regulators
Topical Review

- 5 February Topical Review began in Luxembourg (2 weeks)

- Review of national reports topic by topic
  - 80 participants
  - 51 review sessions conducted over 6 days
  - 6 days of report writing with full topical teams
  - 2 additional days of report writing with team leaders and deputy team leaders
  - Plenary sessions
Country review

- Ended the end of March 2012
- 6 teams
- 4 or 5 days in each country
- One plant visit in each Country selected by the review team
- Complete previous Topical Country Reviews
- Finalize country reports
Public Outreach

- Public Stakeholder Meeting on 17 January on Peer Review process:
  - Well attended ~ 180 people
  - Most European Countries represented: Regulators, Industry, Labor Unions, Local Communities, NGOs
  - Stakeholders openly expressed their views
  - Stress tests and peer review draw significant interest and are generally seen positively
  - General agreement on scope of Stress Tests and Peer Review
  - Strong desire for tangible results
  - Comments suggesting Stress Tests and Peer Review should go further: airplane crash, comprehensive safety assessment; offsite emergency preparedness
Public Outreach

• ENSREG web site
  – Public meetings conclusions and slides
  – Periodic status updates
  – Other relevant notices

• Possibility given to stakeholders to post questions for the Peer Review

• Second Public Stakeholder Meeting to present the results (8 May 2012)
Final remarks

- Stress tests and peer review processes were done on schedule, as requested by the European Council
- Significant resources have been involved in the stress tests and its peer review
- Many observers have been following the European effort
- Many improvements have been identified which will lead to substantial investments in NPPs