

SUMMARY OF THE PEER REVIEW PROCESS

Antoni Gurgu 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

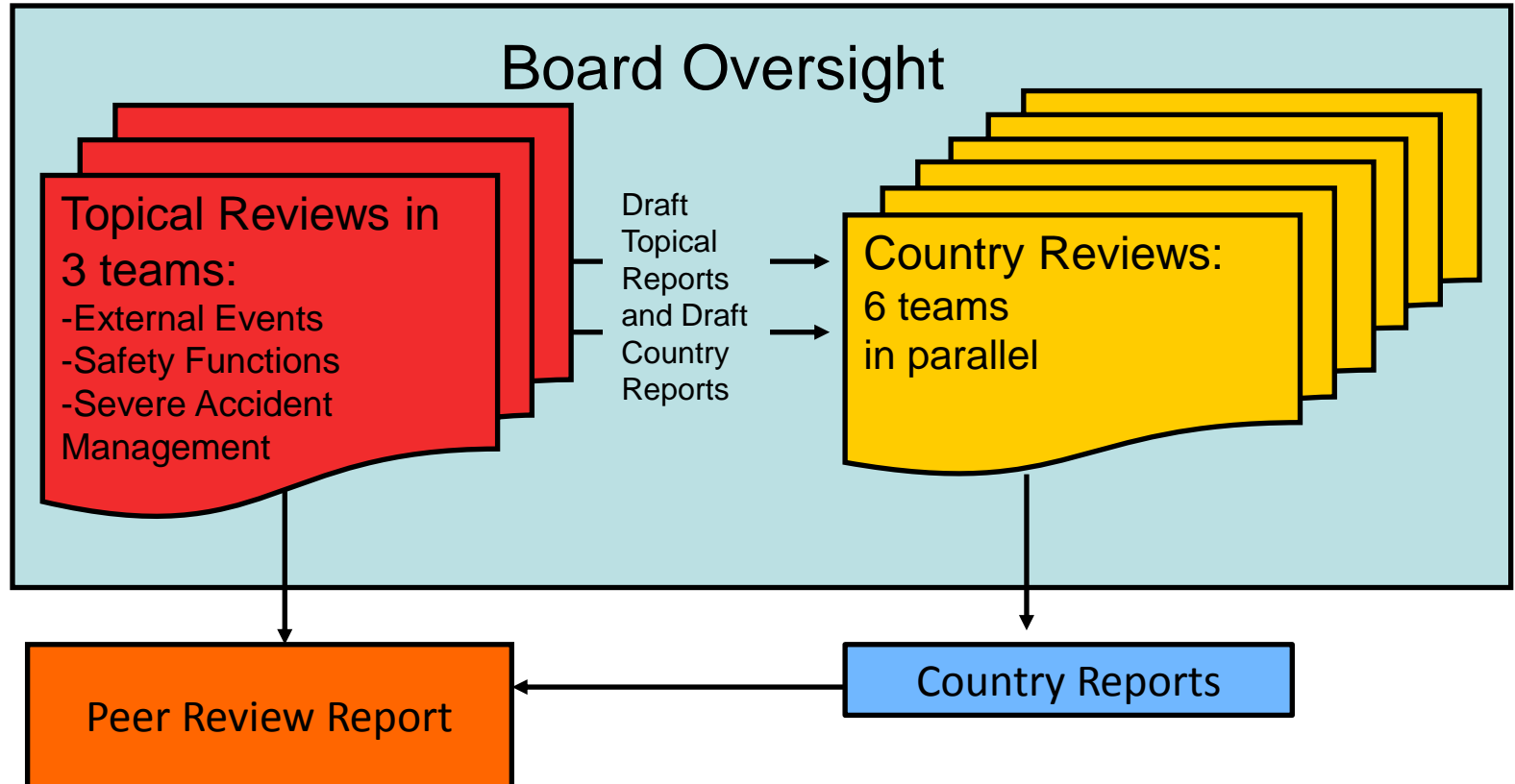
Severe Accident Management Robustness (2)

- 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

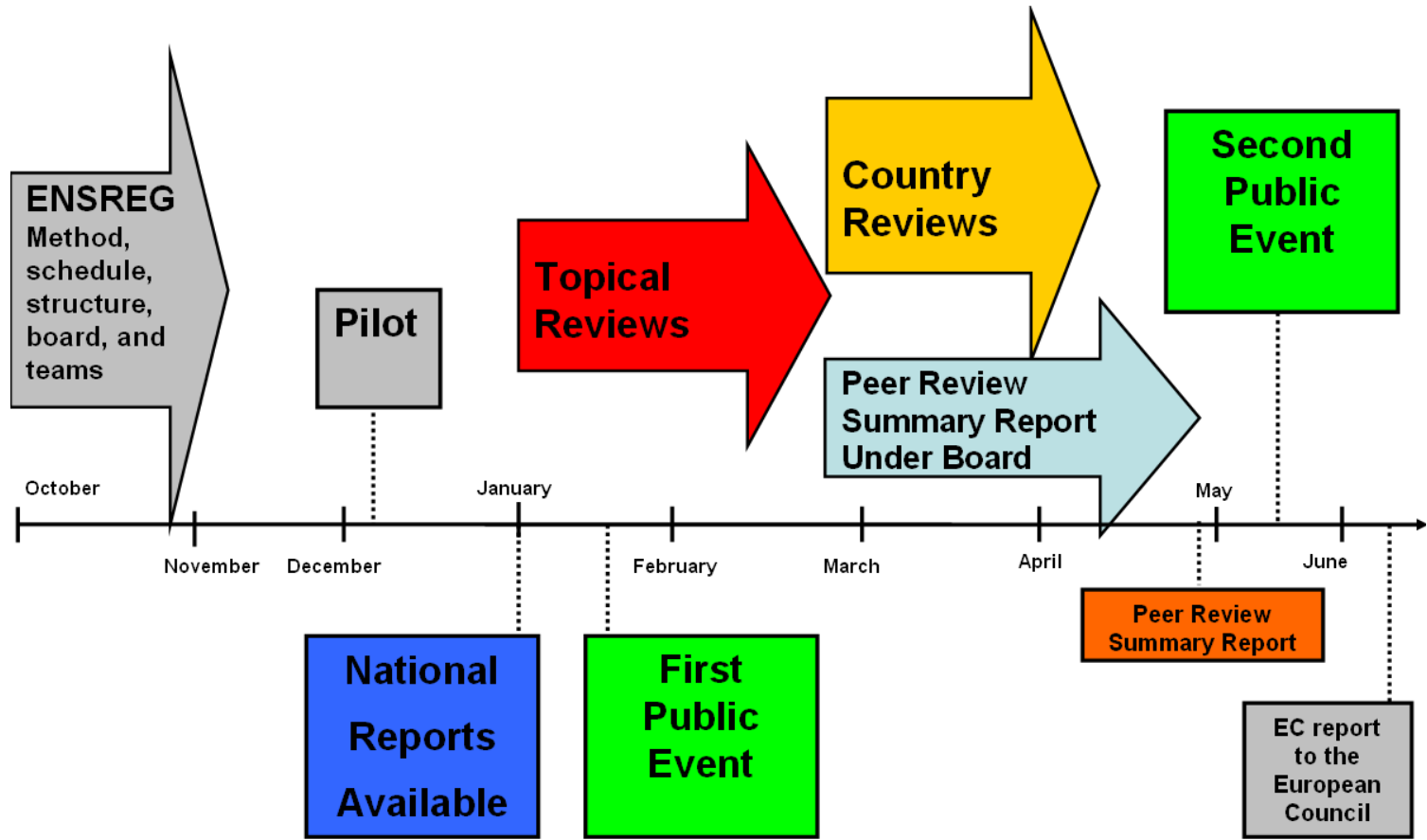
Challenges

- 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



Peer review timetable



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)
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- 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

Public Meeting

- 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