

Updating WENRA Reference Levels for existing reactors in the light of TEPCO Fukushima Daiichi accident lessons learned

International Experts' Meeting on Severe Accident Management in the Light of
the Accident at the Fukushima Daiichi Nuclear Power Plant
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WENRA

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01

WENRA

01 WENRA

Basic facts

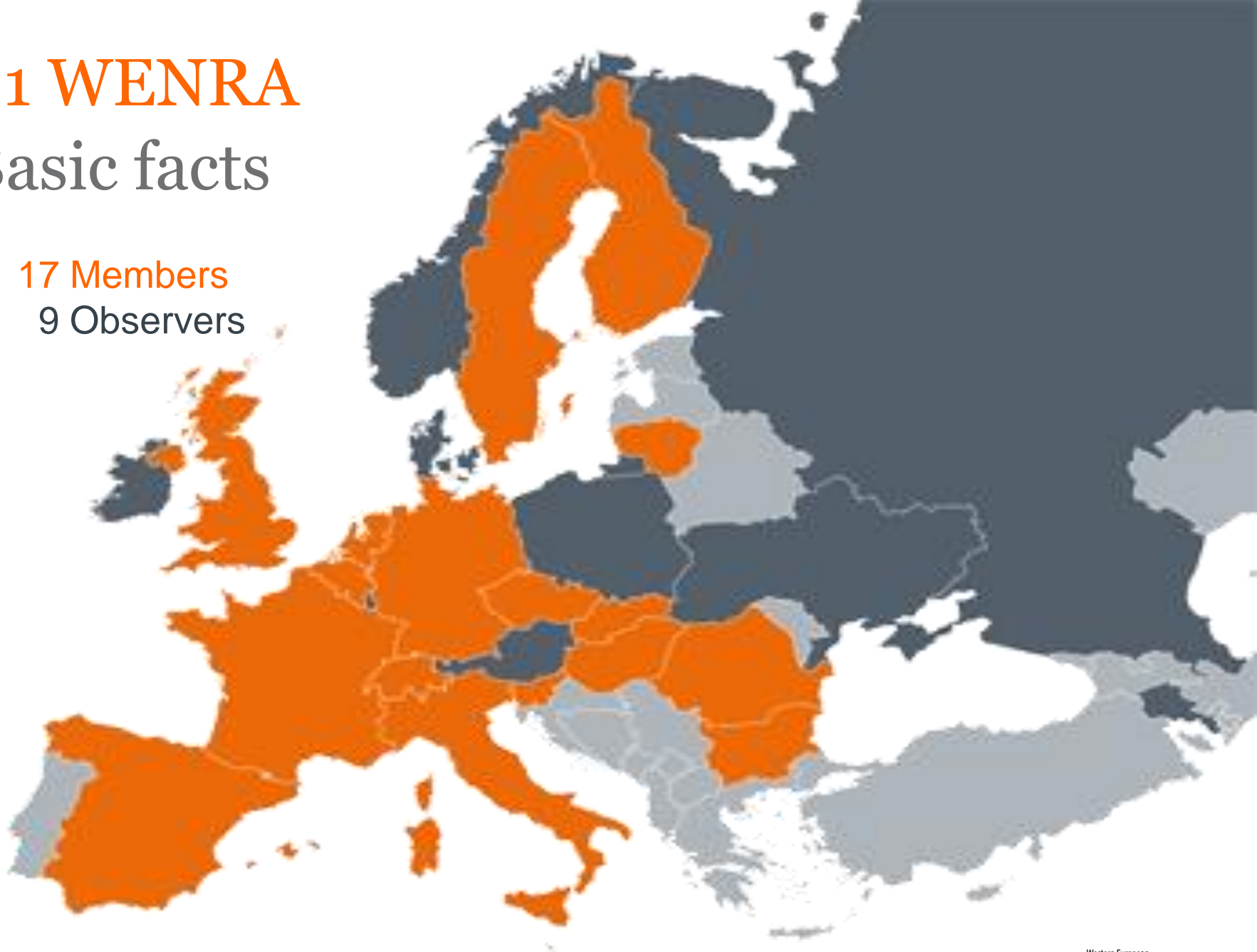
- Association of the Heads of nuclear regulatory authorities of the EU countries with NPP and Switzerland
- Original Terms of Reference signed on 4 February 1999
 - Revised on 14 March 2003
 - Revised on 26 March 2010
- Independent from politics
- European centre of competence for Nuclear Safety
- Common approach and commitment to continuous improvement of nuclear safety

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01 WENRA

Basic facts

- 17 Members
- 9 Observers



01 WENRA

Working Groups

RHWG Reactor Harmonization Working Group

WGWD Working Group on Waste and Decommissioning

Ad-hoc Working Groups established for post-Fukushima activities (sub-groups of RHWG) :

- Natural hazards
- Containment integrity
- Accident management
- Periodic safety review
- Mutual assistance

02

WENRA Safety Reference Levels for Existing Nuclear Power Plants

02 WENRA Safety Reference Levels

Development of Safety Reference Levels

OBJECTIVE

to increase **harmonisation** within WENRA countries on **safety requirements** issued by the regulatory bodies and **their implementation** in existing NPPs.

PROCESS

- Initiated in 2000
- Set of Reference Levels (RLs) available in 2006
- Adapted version in 2008 taking into account the stakeholder comments

02 WENRA Safety Reference Levels

Content of Safety Reference Levels

Sets of RLs in 18 areas where harmonisation was considered as necessary

- Issue A : Safety Policy
- Issue B : Operating Organisation
- Issue C : Management System
- Issue D : Training and Authorization of NPP Staff
- Issue E : Design Basis Envelop for Existing Reactors
- Issue F : Design Extension of Existing Reactors**
- Issue G : Safety Classification of Structures, Systems and Components
- Issue H : Operational Limits and Conditions
- Issue I : Ageing Management
- Issue J : Systems for Investigation of Events and Operational Experience
Feedback

02 WENRA Safety Reference Levels

Content of Safety Reference Levels

Sets of RLs in 18 areas where harmonisation was considered as necessary (con't)

Issue K : Maintenance, In-service Inspection and Functional Testing

Issue LM : Emergency Operating Procedures and Severe Accident Management Guidelines

Issue N : Contents and Updating of Safety Analysis Report

Issue O : Probabilistic Safety Analysis

Issue P : Periodic Safety Review

Issue Q : Plant Modifications

Issue R : Onsite Emergency Preparedness

Issue S : Protection against Internal Fires

02 WENRA Safety Reference Levels

Implementation of Safety Reference Levels

WENRA Countries agreed upon

- The incorporation of the RLs within their national requirements
- The implementation of the RLs in all NPPs

Action plans within countries to harmonise at both levels

03

Review of the WENRA Safety Reference Levels for existing plants after the Fukushima Dai-ichi accident

03 Post-Fukushima review

WENRA's commitment

March 2012 : WENRA Statement - WENRA Conclusions arising from the Consideration of the Lessons from the TEPCO Fukushima Dai-ichi Nuclear Accident

WENRA Emphasizes institutional (roles and responsibilities of governments, regulators and utilities) and cultural (continuous improvement) aspects of nuclear safety in addition to technical issues. WENRA is ready to tackle further issues as necessary on the basis of the lessons learned from the Fukushima accident.

WENRA's commitment is to proceed along the path of defining or revising existing Reference Levels as well as developing guidance documents for practical use by regulators.

03 Post-Fukushima review

RHWG Task

To review and revise the existing RLs (2008) or to develop additional RLs

3 Sub-groups

- T.1 Natural hazards
- T.2 Containment integrity
- T.3 Accident management

Goals :

- Include the lessons learned from Fukushima
- Maintain consistency and balance within RLs

03 Post-Fukushima review

Main areas of changes

Design Extension for existing plants – Issue F

- In accordance to IAEA SSR 2/1, “Design Extension Conditions” (DEC) were introduced (instead of Beyond DBA)
- Clear differentiation between DEC without core melt (DEC A) and DEC with core melt (DEC B)
- More prescriptive on the identification and selection of DEC to be analysed
- Expressing more detailed the goals of the safety analysis for DEC

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Main areas of changes

Design Extension for existing plants – Issue F

- Addressing safety in the spent fuel pools
- Addressing ‘multi-unit’ sites
- Requiring effective means after natural hazards more severe than design basis
- No preferences expressed on the use of mobile or fixed equipment
- Requirements on the use if relied upon in the safety assessment :
 - Capacity and capability
 - Availability and accessibility
 - Connection points
- NPP autonomy for a justified time

A guidance document will be issued to explain and support the RLs in Issue F

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Main areas of changes

Additional RLs on natural hazards – Issue T

- Screening of hazards relevant to the site
- Identification of the design basis events
 - Target value 10^{-4} /year
 - 0.1 g minimum PGA for seismic events
- Requirements on the development of a protection concept to minimize the threats
- Considerations on events exceeding the design basis events
 - To ensure that the chosen design basis is sound
 - To ensure that sufficient margins exist before cliff edge effects

A guidance document will be issued to explain and support the RLs in Issue T

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Main areas of changes

Emergency Operating Procedures and Severe Accident Management Guidelines – Issue LM

- Addressing spent fuel storage safety
- Addressing multi-unit sites with common resources
 - All reactors challenged by the same event
 - Possibility of mutual support
- Qualification of equipment relied on in SAMGs
- Stress the need to carefully consider whether measures from accident procedures can be implemented taken into account deterioration of site conditions
- Extend training needs to all emergency response personnel, reflecting realistic conditions

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Main areas of changes

On-site emergency preparedness – Issue R

Enhancing the emergency preparedness

- Improving the consideration on accidents affecting several installation on site
- Addressing consideration on long lasting accidents and disrupted regional infrastructure
- Enhancing requirements on staff in the above situations (number, training)
- Appropriate procedures to manage the emergency, including for the use of mobile equipment

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Other changes

- Addressing Safety Culture – Issue C (Management System)
- Clarifications and aligning of Issue E (Design Basis Envelope) to Issue T en F
- Treatment of natural hazards and spent fuel storage in PSA – Issue O
- Consequential changes for
 - Contents and Updating of the SAR – Issue N
 - Periodic safety review – Issue P

04

Conclusions

04 Conclusions

Thorough review of the RLs for existing plants

- Adding an issue on natural hazards
- Taking into account the Fukushima lessons learned and European Stress Test Actions
 - multi-unit site, mobile equipment, natural hazard, enhanced emergency preparedness and training,...
- Resulting in a coherent and well balanced set of new RLs for existing plants

Available on <http://www.wenra.org/publications/>

Public consultation has been held (01/12/2013 – 28/02/2014).

RHWG is considering the received comments.

Final version expected in the middle of 2014

Thank you.

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