

Harmonisation of Nuclear Safety in Europe

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WENRA Basic Facts

WENRA Basic Facts

Origins

- Association of the Heads of nuclear regulatory authorities of the EU countries with nuclear power plants (NPPs) and Switzerland and Ukraine
- Founded in 1999
- Assisted EU Commission in assessing nuclear safety in applicant countries

Mission

- Commitment to **continuous improvement** of nuclear safety in member countries
- Develop a common, **harmonised approach** to nuclear safety
- Develop **common Safety Reference Levels** (SRLs) based on IAEA standards and good practices in member countries

WENRA Members and Observers

18 Members

- Belgium
- Bulgaria
- Czech Rep.
- Finland
- France
- Germany
- Hungary
- Italy
- Lithuania
- Romania
- Slovak Rep.
- Slovenia
- Spain
- Sweden
- Switzerland
- The Netherlands
- Ukraine
- United Kingdom

13 Observers

- Armenia
- Austria
- Belarus
- Canada
- Cyprus
- Denmark
- Ireland
- Japan
- Luxembourg
- Norway
- Poland
- Russian Fed.
- Serbia



WENRA Working Groups

- Two technical Working Groups established to **harmonise safety approaches** with the aim to continuously improve nuclear safety:

RHWG Reactor Harmonisation Working Group

WGWD Working Group on Waste and Decommissioning

Ad-hoc Working Groups as needed

- Development of Safety Reference Levels (SRLs) for harmonisation of nuclear safety in Europe
- Objectives of **Harmonisation:**

No substantial differences between countries in national safety requirements and in their implementation in the nuclear installations

2

Implementation of the updated WENRA Safety Reference Levels

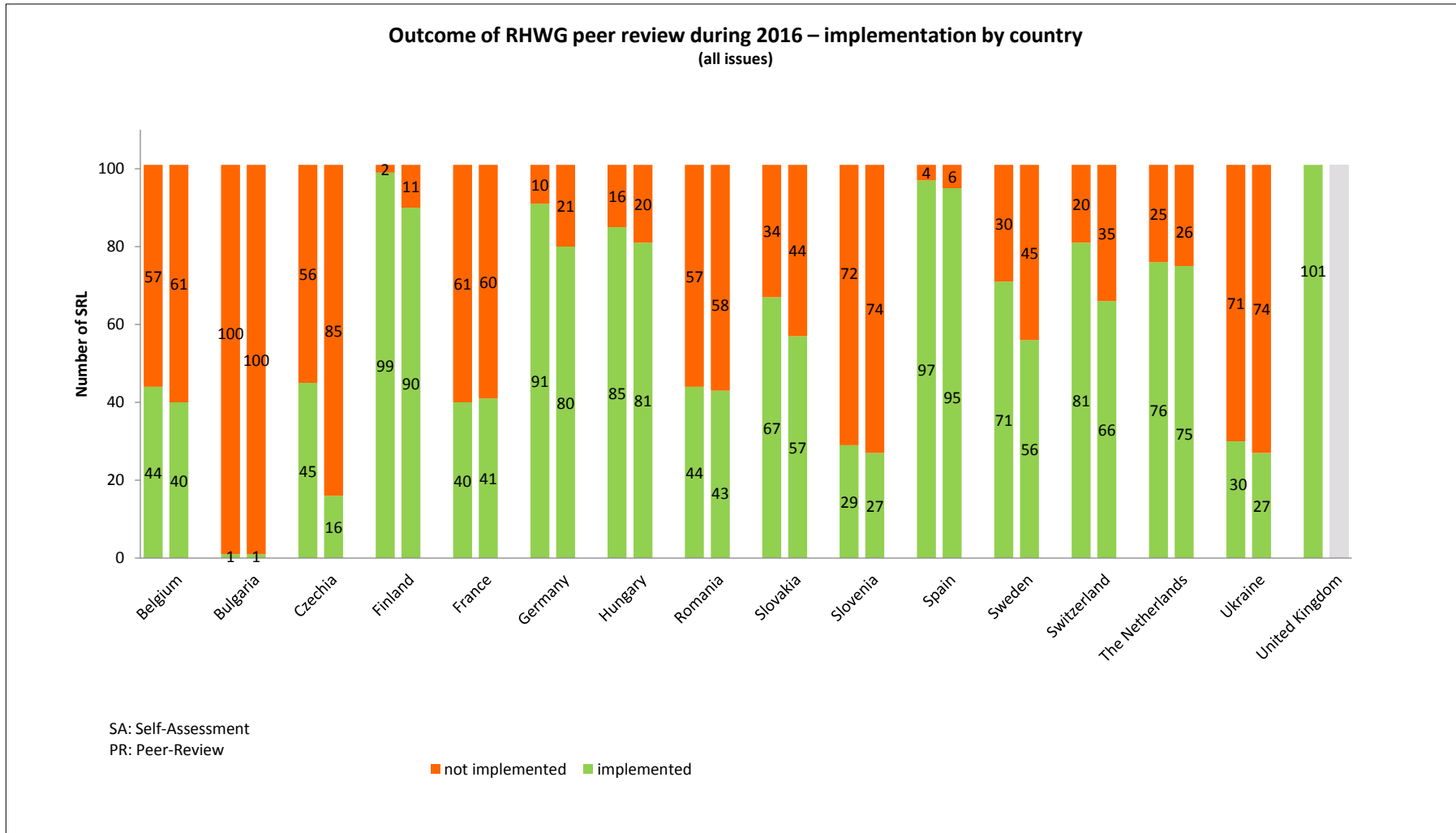
2014 SRLs for Existing Reactors

- Reference levels reviewed and revised in response to the Fukushima accident
- Issue T on Natural Hazards was added to the Reference Levels
- 101 Reference Levels were either new or revised compared to the previous version
- WENRA statement accompanying the Reference Levels:
 - The national regulators make a commitment to improve and harmonize their national regulatory systems, by implementing the new SRLs until 2017 as a target date.

Peer review process by WENRA's Reactor Harmonisation Working Group (RHWG)

- Each country undertook a self-assessment against the 101 new or revised Reference Levels
- RHWG peer reviewed the self assessments in 3 steps:
 - Desktop review of self-assessments
 - Written answers
 - Discussion of written questions & answers and related open issues
- Implementation categorised as:
 - A: RLs considered to be fully implemented
 - B: A difference exists, but can be justified from a safety viewpoint;
 - Category C: RLs considered as not being implemented
- Adequate implementation is Category A or B
- Issues changed to Category C by RHWG have been added to implementation plans

RHWG Peer Review Outcome



Footnote - UK approach to reference the RLs document directly as relevant good practice in its guidance was not amenable to RL by RL review

Future publications

- In 2018 WENRA will publish:
 - A report of the RHWG peer review
 - Status of implementation in the WENRA countries at the end of 2017
- Several countries announced implementation by the end of 2017, but some have announced to need more time to fully implement the 2014 Reference Levels.

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WENRA Doel Recommendation

Background

2012

UT indications in the RPV of Doel-3 and Tihange-2 assigned to hydrogen induced flaws (“hydrogen flakes”).

2013

WENRA recommended to request the licensees to verify the material quality and integrity of the RPV in a 2-Step procedure

2014

Report about activities in WENRA countries following the recommendation regarding flaw indications found in Belgian reactors

Recommendation

WENRA recommended to take actions with regard to the safety verification of RPVs in a 2-Step procedure

- 1st Step: Review of manufacturing and inspection records
- 2nd Step: Examination of the base material of the vessels

Member Countries

Member Countries	
Belgium	The Netherlands
Bulgaria	Slovak Republic
Czech Republic	Slovenia
Finland	Spain
France	Sweden
Germany	Switzerland
Hungary	United Kingdom

- The issue has no relevance for NPP in Romania (pressure-tube reactor) or Lithuania and Italy (no NPP in operation)
- Ukraine was not WENRA Member in 2013

Implementation Results and Next Steps

Results 2014

- Check of manufacturing records completed. No flaws or unacceptable indications have been found.
- Some further UT inspections carried out.
- Further UT inspections planned.
- In only few cases indications leading to further assessments were found.
- Report 2014 available on WENRA Website.

Findings of UT inspections at Beznau 1 NPP (Switzerland)

- UT inspections in 2015 revealed flaw indications.
- Indications were assigned to aluminum oxide inclusions.
- Replica of RPV shell C was manufactured for destructive testing .
- Material testing by licensee still ongoing.

→ Update 2017 will be published within next weeks

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WENRA Guidance on Timely Implementation of Reasonably Practicable Safety Improvements

Background

- ENSREG invited WENRA to provide guidance on Art 8a of the Nuclear Safety Directive - “Timely implementation of Reasonably Practicable Safety Improvements to Existing Nuclear Power Plants”
- Timescale to be consistent with the implementation time table for the Nuclear Safety Directive (August 2017)
- WENRA Spring 2016 meeting decision made to establish an Ad-Hoc Group to develop guidance
- UK agreed to Chair the group and Finland, Germany, France, Hungary and Switzerland agreed to be members

Concept of Continuous Improvement

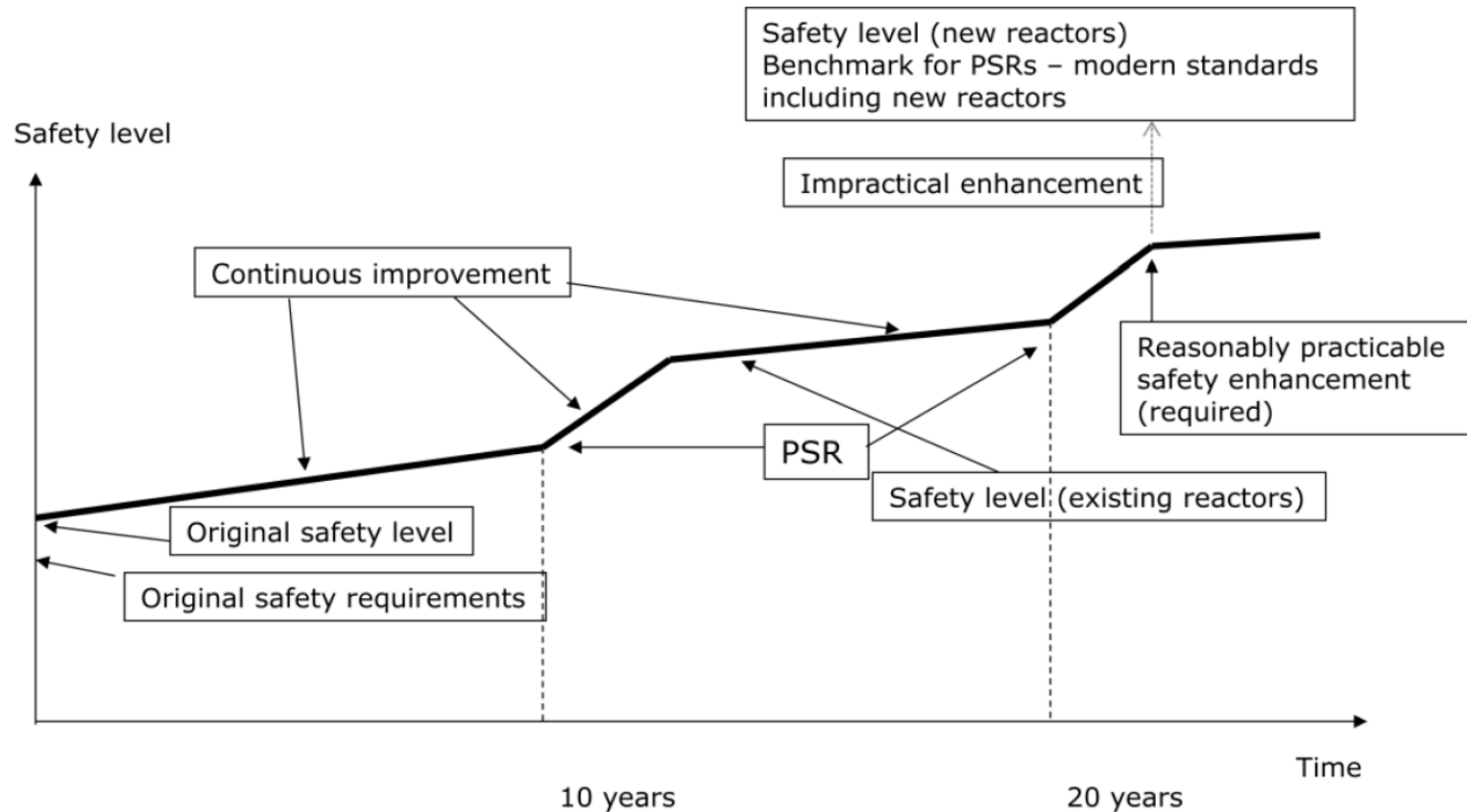


Figure 1. The concept of continuous improvement.

WENRA Guidance Report (1/4)

- PSR and Continuous Improvement
 - Highlights the important role that PSR has in continuous improvement.
 - Need for improvements can also occur anytime between PSRs, eg safety improvements following the Fukushima accident.
- Modern standards and practice
 - Adopting recognised modern standards and practice will be sufficient to show achievement of what is “reasonably practicable”.
 - PSA is helpful in identifying areas of plant design or operation where improvement will provide most benefit.

WENRA Guidance Report (2/4)

- Defence in Depth
 - All levels of defence in depth should be considered when considering safety improvements.
 - Enhancing independence between different levels of defence in depth should be considered.
- Timely Implementation
 - Not only should planned improvements be reasonably practicable, but they should be implemented as soon as reasonably practicable.
 - A less effective option may be the best solution if it can be implemented more quickly than a full solution.

WENRA Guidance Report (3/4)

- Proportionality
 - Being “proportionate” is a common aim of WENRA members and is a strong element in deciding what is or is not reasonably practicable.
 - A strong feature of being proportionate will be that the greater the shortfall, the more needs to be done to identify and implement measures to remove or reduce it.
 - Being proportionate should also take account of the individual circumstances of a facility and its future lifetime.
 - It is expected that licencees should look at what others have done to prevent and mitigate radioactive releases, to see if it is appropriate for them.

WENRA Guidance Report (4/4)

- Role of Cost
 - In some instances licensees may claim that a particular measure is too costly and therefore not reasonably practicable.
 - In some WENRA countries, the regulator may be prepared to listen to such arguments, in others the regulator does not take account of costs, though in the event of dispute the courts may take cost into account.
 - Claims that a licensee can't afford a reasonably practicable improvement are not accepted.

Conceptual Model

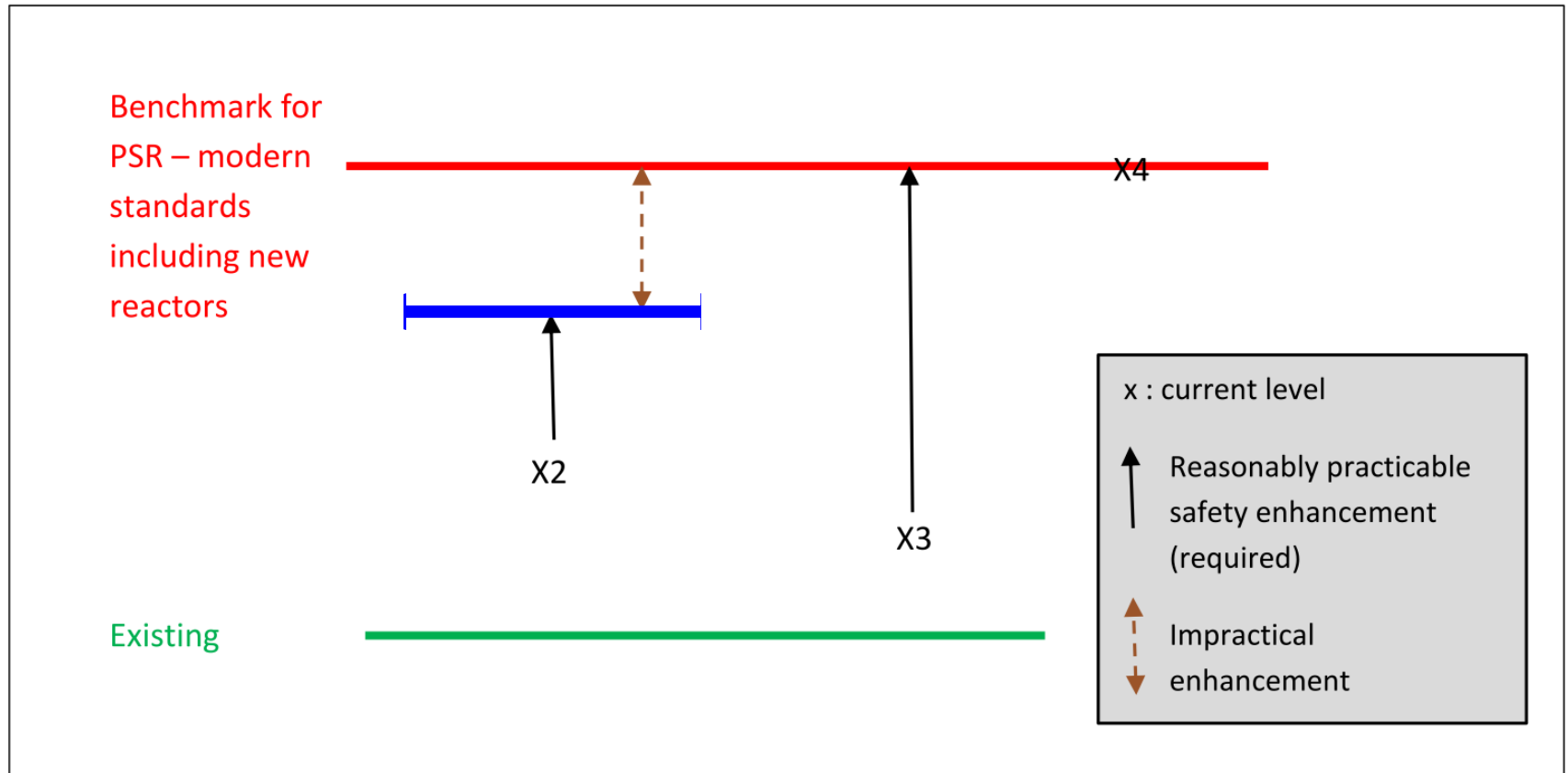


Figure 2 Conceptual model

Thank you.

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