



Bundesministerium  
für Umwelt, Naturschutz  
und Reaktorsicherheit

# **Nuclear Safety in Europe The German perspective**

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## 1. Policy decisions and legislation in Germany

- Euratom-Directive on nuclear safety - transposition
- Response Fukushima: milestones and legislation towards phase-out

## 2. Achievements and assessments - German perspective

- Global nuclear safety and security framework – major European impact
- Lessons learned from the enlargement process – common ground and perspective for nuclear safety in Europe
- Implementation of WENRA Reference Levels – the German experience
- Safety Reviews: German review and EU Stresstests – need for harmonized approaches



## Directive 2009/71/Euratom (Safety Directive) Transposition of into German law

- Safety Directive constitutes a legally binding basis for cooperation within the European Union
- National responsibility for nuclear safety
- Germany: obligations resulting from the Directive were in parts covered by existing national provisions
- Entire transposition by means of the 12th amendment to the German Atomic Energy Act; entry into force: 27 December 2010



# German response to the nuclear accident in Japan

- Social and political reassessment of risks adherent to the use of nuclear energy
- Political decisions of 15 March 2011:
  - safety review of German NPPs
  - shut down of seven oldest NPPs during three-month moratorium



# The work of two commissions

## Reactor Safety Commission (RSK)

- Task: review of plants with respect to their behaviour in the event of impacts beyond the design basis and upon postulated unavailabilities of safety system
- Conclusion: high levels of robustness of NPPs

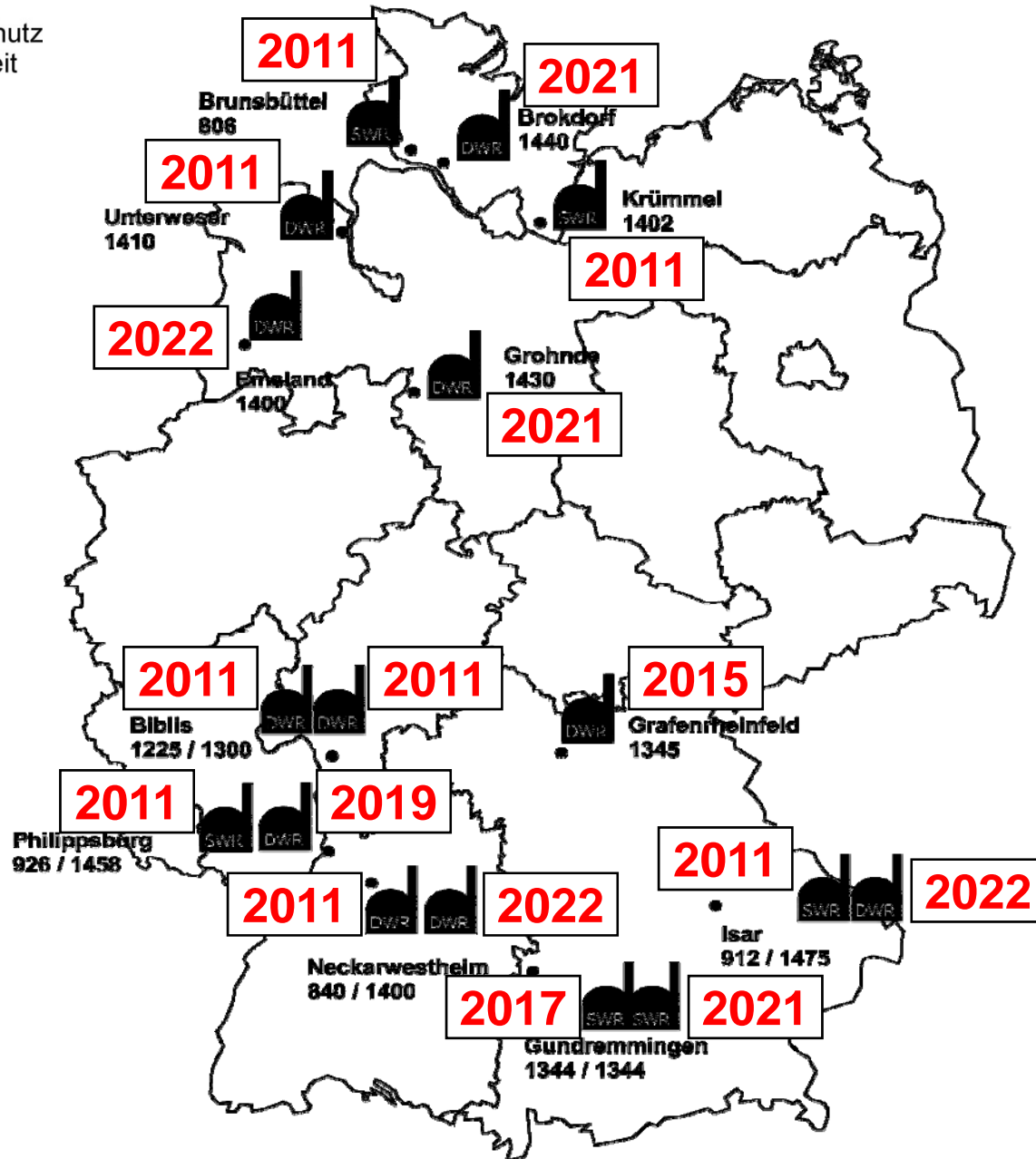
## Ethics Commission „Safe Energy Supply“

- Purpose: reaching a social consensus
- Opinion: nuclear phase-out possible within one decade



## 13th amendment to the German Atomic Energy Act (draft)

- End of use of nuclear energy for the commercial generation of electricity in Germany by 31 December 2022
- Successive permanent shut down of NPPs
- ➔ Challenge for licence holders and regulatory bodies: maintaining a high level of nuclear safety for the time of operation





# Global Nuclear Safety and Security Regime

- Lead role by EU Member States and Commission
  - Nuclear conventions
  - Strengthening and regular updating of IAEA safety standards
  - Missions and services such as IRRS, OSARTS
- Common ground for today's EU framework and practices
- Need for Commission initiative for strengthening EU safety competence and lead role in a joint effort with Member States





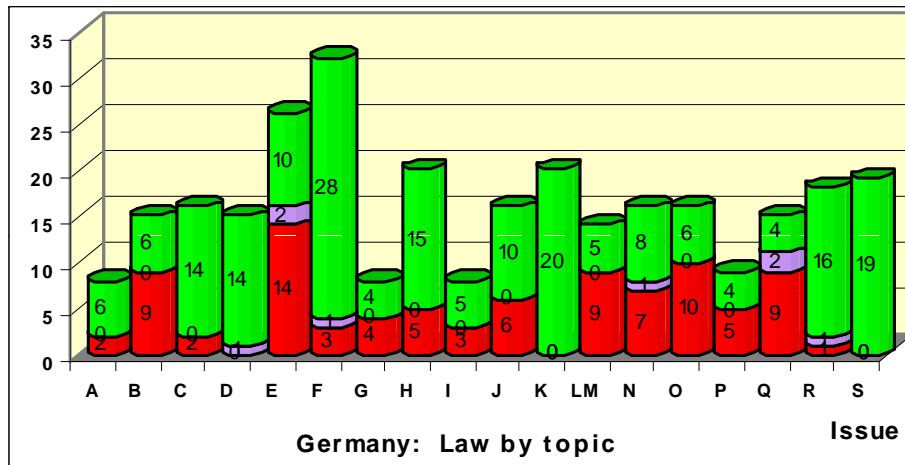
# Lessons learned from the European Enlargement Process

- Challenge: Common Position on „high level of nuclear safety“ in the European context
- No European Standards available
- Report by AQG and WPNS based on WENRA experience in 2001
  - Based on the instruments of the Global Regime
  - Common understanding also with new members
- Firm ground for EU framework and creation of ENSREG
- Proposal: Establishment of an European Agency for Nuclear Safety

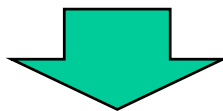


# WENRA Reference Levels German Situation

## Regulations

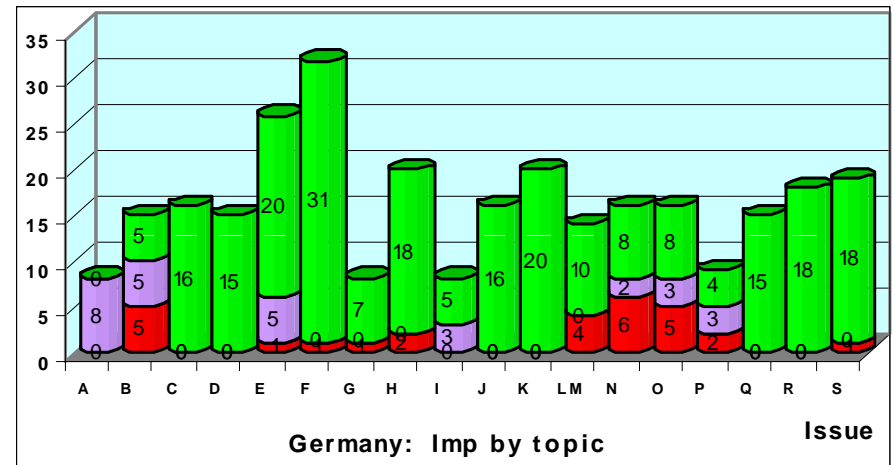


Assessment in 2006  
90 RL not adequately regulated

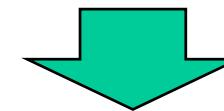


Assessment in 2010  
No consensus

## Implementation



Assessment in 2006  
28 RL not adequately implemented



Assessment in 2010  
Nearly all RL implemented with  
tolerable differences



# WENRA Reference Levels Implementation in Germany

- Safety Management and Organisation
- Design and Extension of design
- Accident Management
- Safety analysis report and safety documentation
- Periodic safety reviews, in particular probabilistic safety reviews



# RSK Safety Review

## Issues addressed

- Natural hazards: Seismic and Flooding
- Postulated events: SBO, LOOP (long lasting >72h), Loss of Service Water
- Precautionary Measures: Internal flooding in different Areas, Failure of high-energy-lines, Failure or drop of large component
- Aggravating boundary conditions to perform AM measures
- Man-made hazards: Airplane crash, Blast pressure waves, burnable and toxic gases, impact from neighboring unit, terroristic attacks, cyber attacks



# RSK Safety Review

## Four level approach

### Categorization

#### Definition of a **base-level**:

- current licensing base
- including preventive and mitigative accident management

#### Definition of **three levels of robustness**,

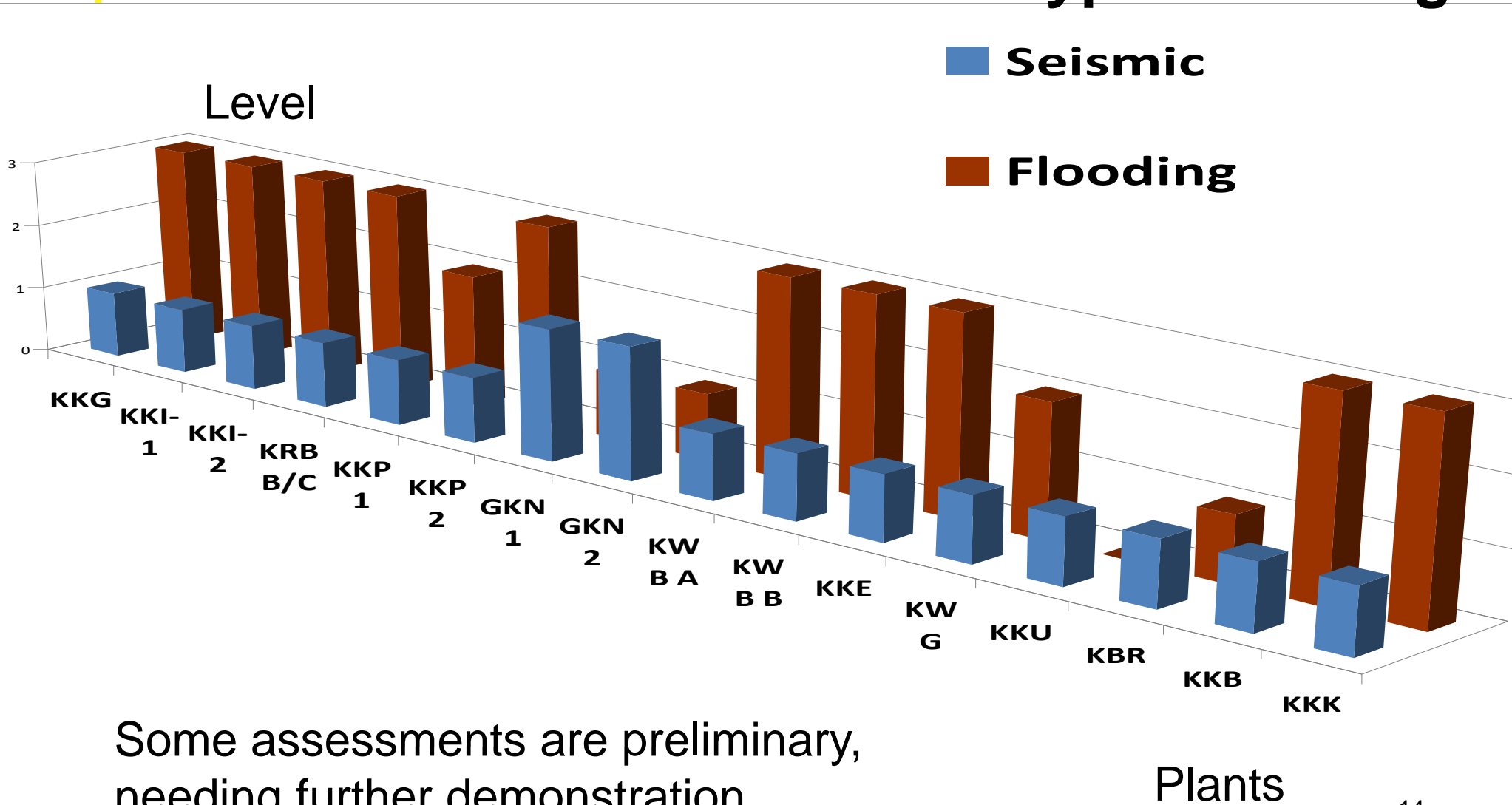
- the higher the level - the higher the robustness
- definition is topic-specific

#### Example Flooding:

- Base level: Design flood (10.000 yearly flooding)
- Level 1: Some reserves compared to base level (e.g. river flow increased by factor 1.5)
- Level 2: Higher reserves compared to level 1 (e.g. river flow increased by factor 2)
- Level 3: Loss of vital function under condition of level 2 can be excluded



# RSK Safety Review Typical findings



Some assessments are preliminary,  
needing further demonstration



# Summary

- Immediate cessation of operation of eight plants and phase-out of the remaining nine plants within one decade
- Continued improvement of safety in Europe by strengthening the legal framework in Europe and through cooperation within ENSREG and WENRA
- Commission initiative for revitalizing scientific technical cooperation of experts from regulatory bodies and TSOs in particular for safety cooperation with third countries
- Harmonised approaches for EU stresstests by optimal use of national safety review experience
- Establishment of a European Agency for Nuclear Safety by Members States and Commission based on national TSOs and JRC



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**Thank you very much for your attention!**