Strål
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Swedish Radiation Safety Authority

Impact of the Fukushima Daiichi accident on requirements for new nuclear reactors

Panel discussion: Fukushima: 15 Years Later –
Driving Innovation in Nuclear Safety and Preparedness

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Outline

The European context – EU Stress Tests for NPP:s

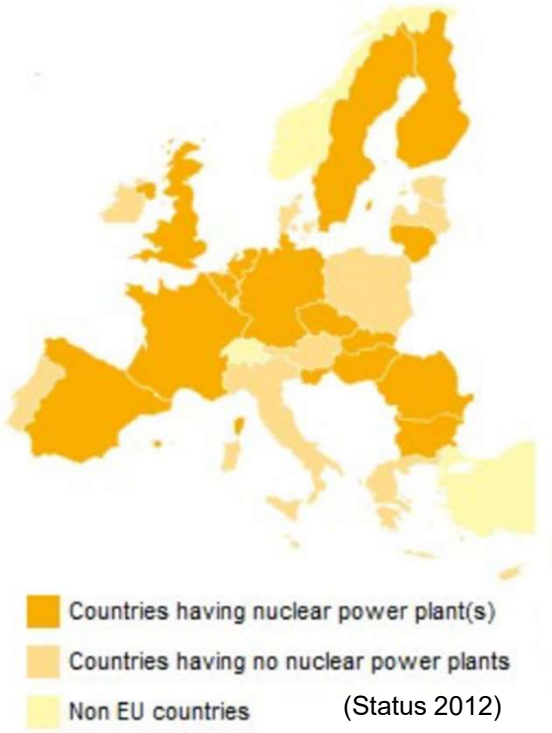
Outcome of EU stress tests (Sweden)

Conclusions concerning EPR and remediation planning

Looking ahead – the perspective of new nuclear

Post Fukushima EU Stress Tests for NPP:s

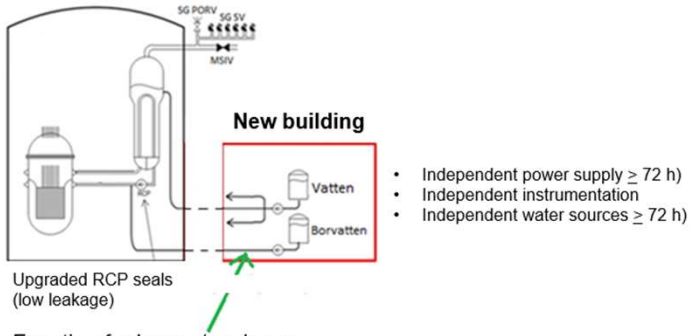
- Co-ordinated by European Commission (EC) and European Nuclear Safety Regulators Group (ENSREG)
- Approximately 150 operational reactors across 15 EU member states plus Switzerland and Ukraine
- Peer Review – regulators, utilities and international experts
- Final EU communication by October 2012
- Outcome: Status / Safety improvement measures



(Status 2012)

Outcome of EU stress tests

- Important existing features
  - Recent modernisation programme (2010)
  - Filtered venting system (1980's)
  - Severe accident management verified
  - ➔ Focus on verification of robustness and barriers
- Examples of post-Fukushima safety enhancements
  - SAMG, training and exercises
  - Preventive measures strengthened, SBO resilience
    - Independent core cooling system
  - Severe external hazards re-evaluated
  - Multi-unit events
  - Long-term effects



Independent core cooling system (Ringhals PWR)

Conclusions concerning EPR

- Need to develop the ICRP system of radiological protection
  - Especially w.r.t. optimisation using reference levels and the application of exposure situations
- Reduce the need for short-term evacuation – and resulting negative consequences
- Develop a process that facilitates justified and optimised decisions on long-term evacuation
- Maintain a general approach to emergency preparedness and response for nuclear and radiological emergencies

Remediation planning

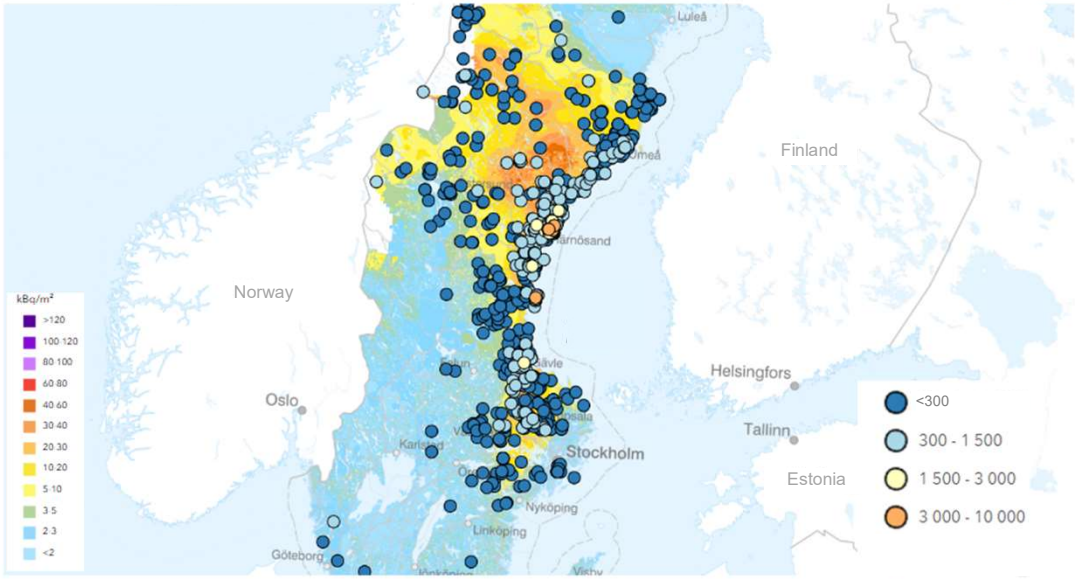
- Further development of national strategy, guidance and regional plans
- Exposures resulting from remediation operations treated as part of planned occupational exposure
  - Requires licensing application including, e.g.:
    - Remediation goals and methods
    - Radioactive waste management
- Recovery much more than decontamination and remediation
  - Cultural aspects
  - Citizen involvement

Citizen involvement – a long-term need

- Sweden - 40 years after Chernobyl accident
  - Relevance for radiation protection
    - Consumption of wild and natural food products e.g. self collected mushrooms, fresh water fish and wild boar.
  - High public and media interest

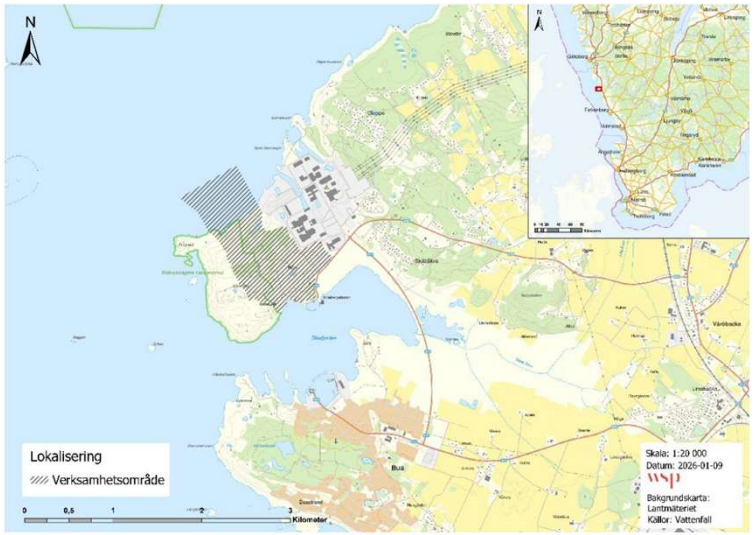
Cesium-137 in mushrooms (Bq/kg f.w.)

Number of samples	Max	Average
736 st.	5 567 Bq/kg	314 Bq/kg



Looking ahead – the perspective of new nuclear

- Specifics – implemented in regulations
  - RHR taking into account single failure and LOOP
  - Management of multi-unit events
  - Areas for logistical support at emergencies
  - Loss of coolant in spent fuel pools (incl. monitoring)
  - Strengthened power supply
- General expectations
  - Resilience by Design
  - Site Selection
  - International Cooperation
  - Use of AI



Map from early environmental permitting process (Source Vattenfall AB)

Thank you