Ensuring Safety and Security: How a Technical Agency Operates in a Policy Environment

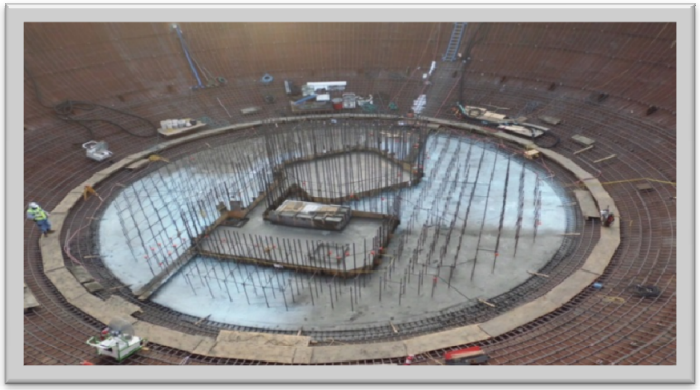
Allison Macfarlane, Chairman, US NRC

U.S. Energy Association Annual Meeting
and Public Policy Forum
April 23, 2014, Washington, DC

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

A Dynamic Environment

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment



Research Science vs. Regulatory Science

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

Research Science

- Open-ended timeframes
- Accountability through professional peers

Regulatory Science

- Statutory deadlines, legal requirements
- Accountability through mandatory legislative or judicial oversight

*At some point, regulators must make decisions based on the best available information.

*Experts who have spent time in both communities must adapt.

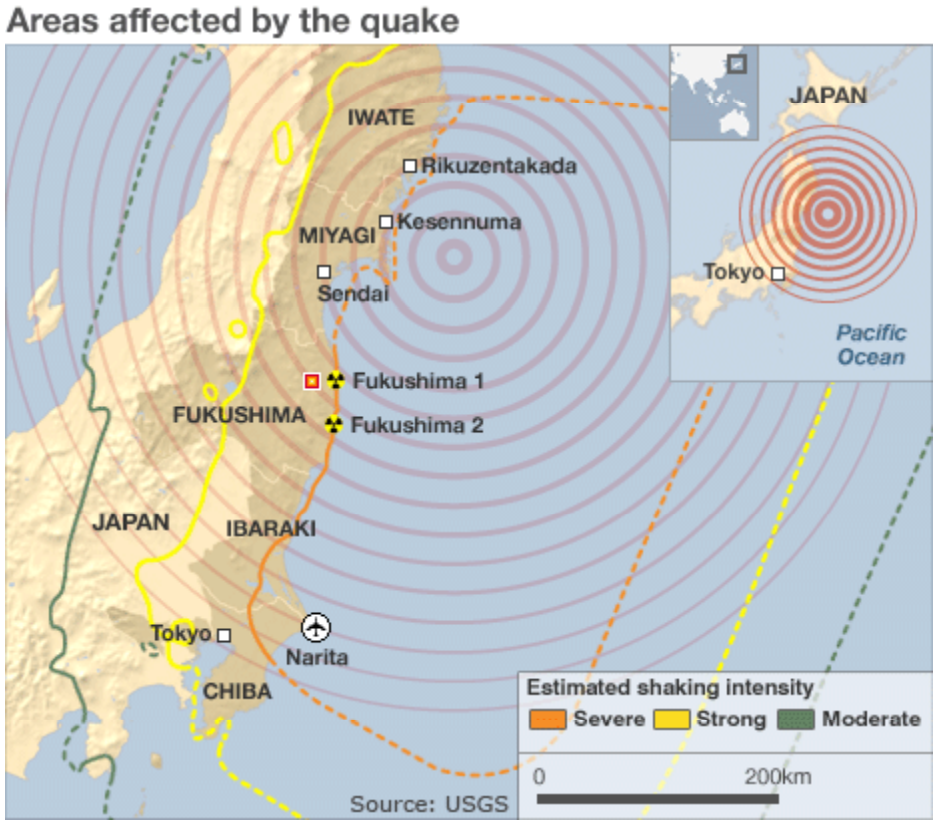
Potential Policy Issues

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

- Statutory requirements and procedures – e.g. rulemaking, licensing
- Legislative changes
- Court decisions
- Budget changes/constraints

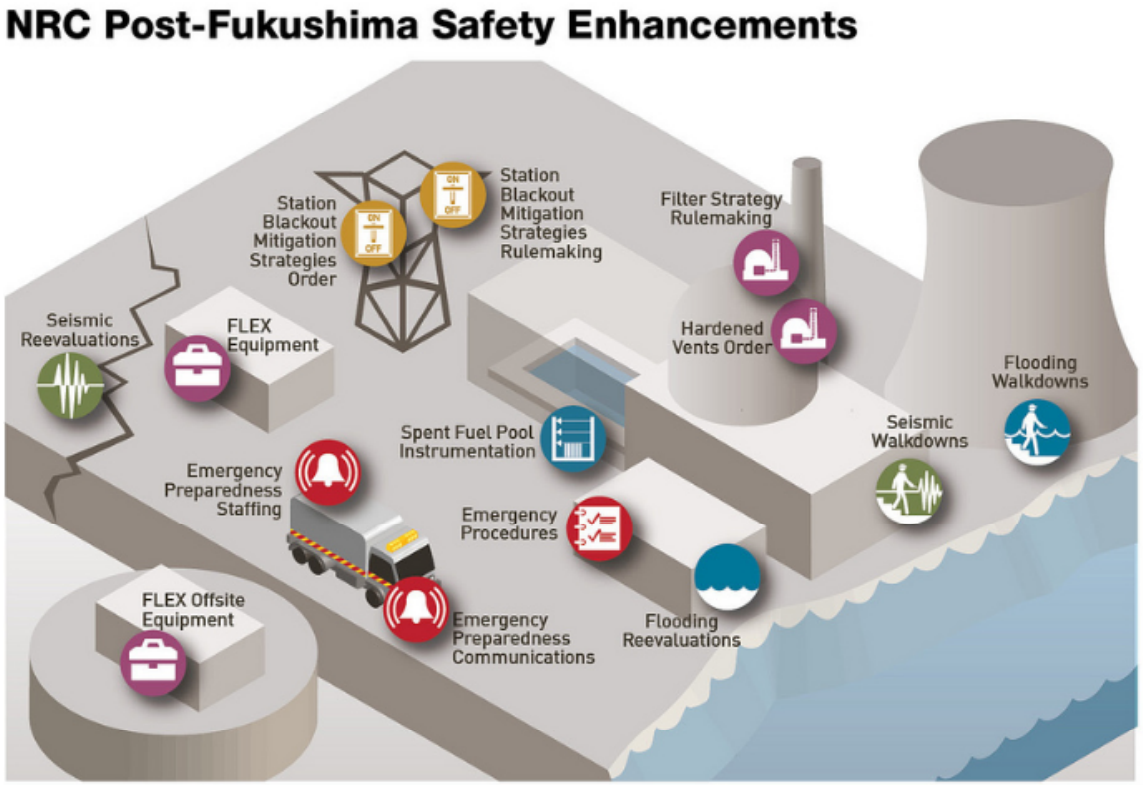
The Fukushima Dai-ichi Accident
March 11, 2011

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment



Fukushima: The NRC's Response

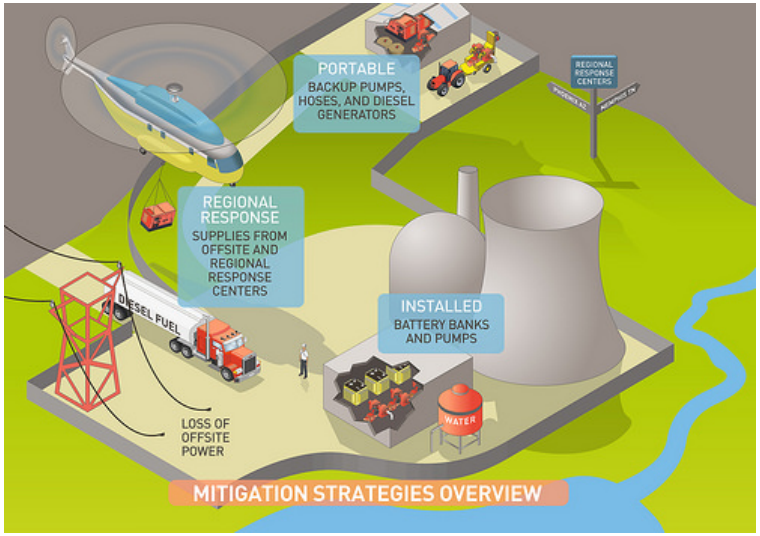
U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

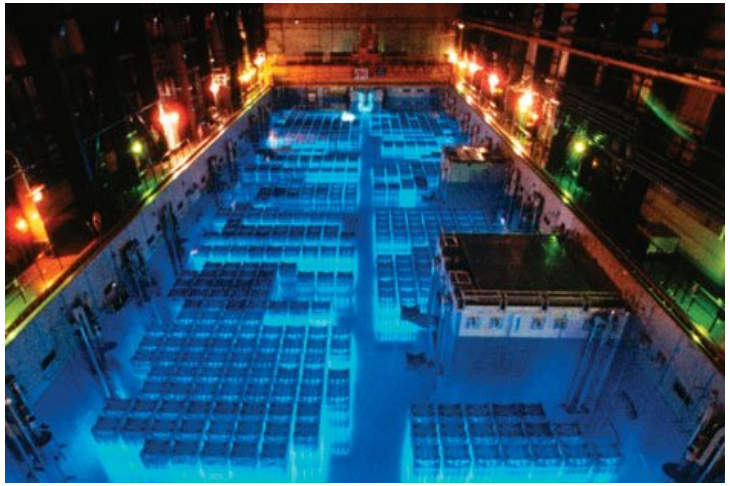


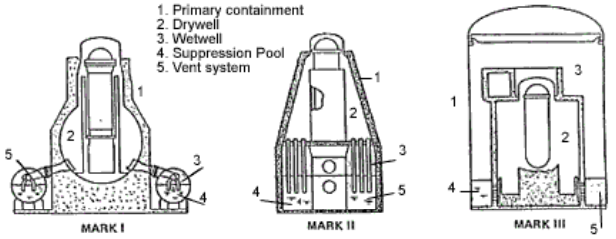
Fukushima: Commission Orders

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

- Mitigating strategies
- Spent fuel pool instrumentation
- Hardened, severe-accident-capable vents



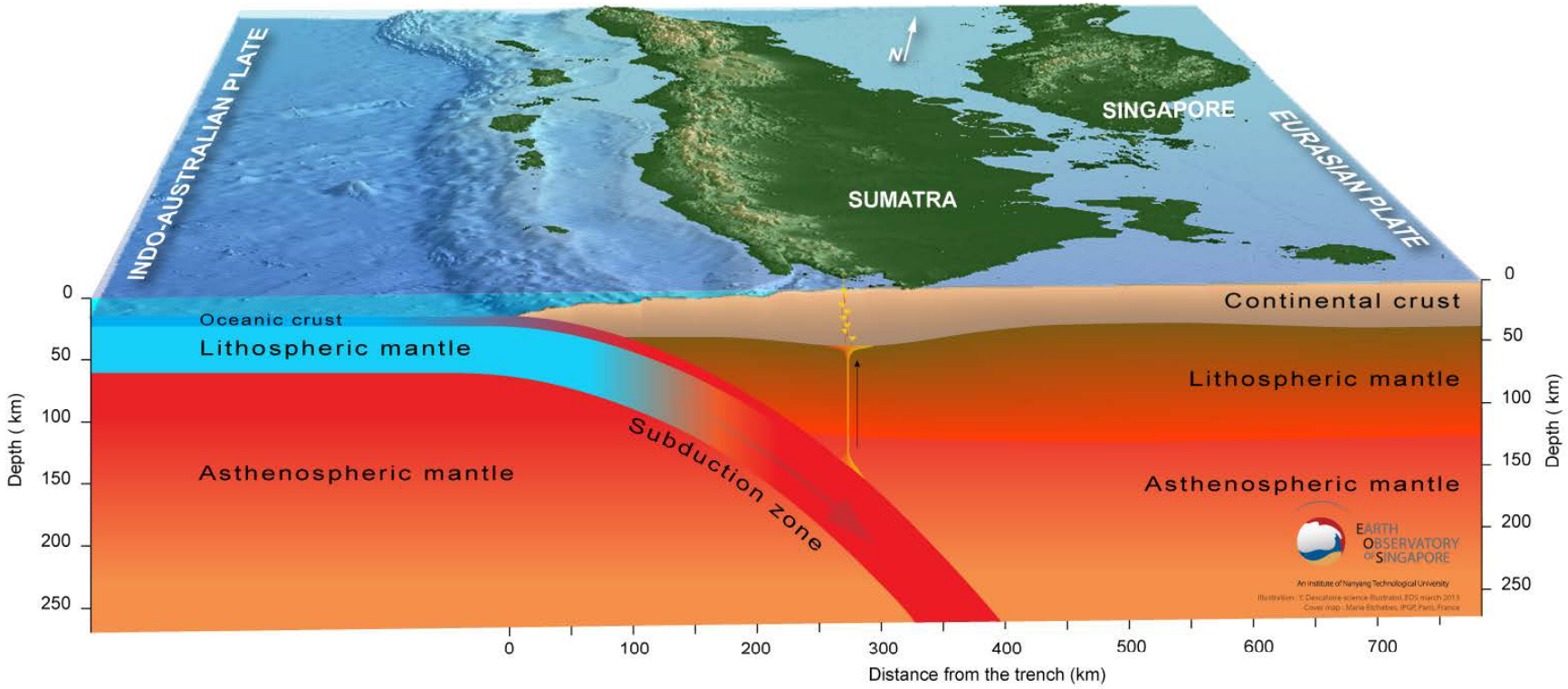




General Electric pressure suppression system designs

Subduction Zones and Megaquakes

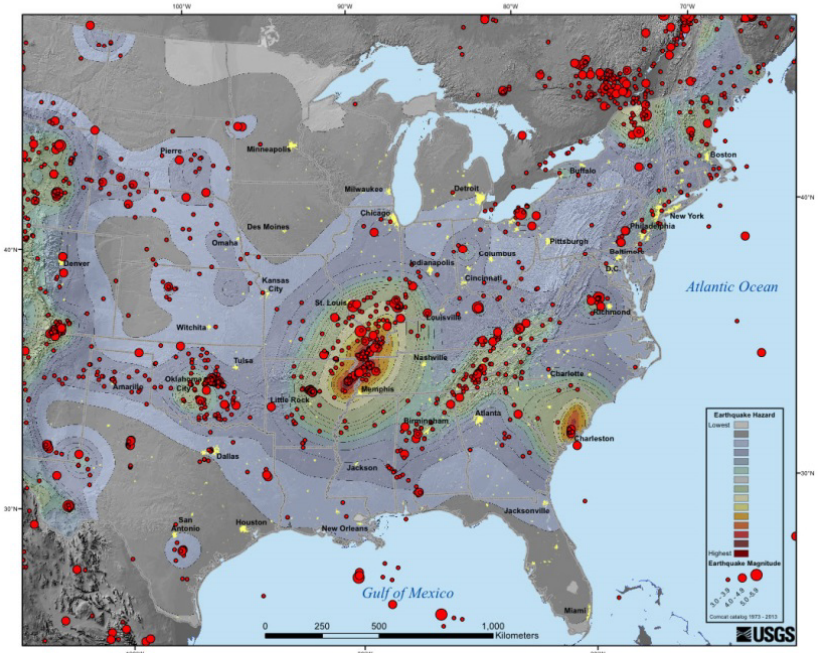
U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment



Reevaluating Seismic Hazards in the Central and Eastern U.S.

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

- Importance of taking scientific developments into account
- 2012: New information on earthquake sources → update of seismic source model
- Post-Fukushima: Using updated source model to reevaluate plant safety



Earthquakes greater than magnitude 3.0, 1974-2013
Source: USGS

EPRI ELECTRIC POWER RESEARCH INSTITUTE

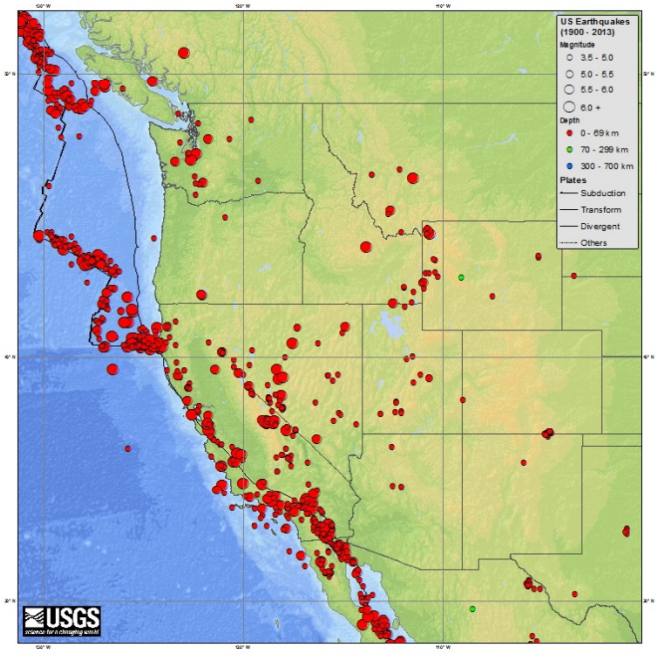
Seismic Hazard Reevaluation: The Process

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

- Thorough inspections at all reactor sites to ensure ability to withstand seismic event within design basis ✓
- NRC inspections to verify accuracy of licensee reporting ✓
- Reports from plants evaluating and updating seismic hazards at individual facilities ✓
- NRC review of licensee reports – in process
- NRC requirement for certain plants to conduct more extensive analyses - future
- Similar process being followed for flooding hazards

Seismic Hazard Reevaluation: Western States

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment



Earthquakes greater than magnitude 3.0, 1900-2013
Source: USGS

- Complex geology – no single model
- Plants get more time to complete work

License Renewal Process

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

1. Application
2. Technical Information
3. Integrated Plant Assessment
   - Current Licensing Basis
   - Time Limited Aging Analyses
   - Final Safety Analysis Report
4. Technical Specifications
5. Standard Review Plan, Generic Aging Lessons Learned (GALL) Report, and Regulatory Guide
6. Environmental Review
   - Generic Environmental Impact Statement
   - Scoping Process
   - Standard Review Plan and Regulatory Guide
   - High-Level Waste
7. Review Time
8. Timely Renewal
9. Inspection Program

License Renewal: Aging Management Issues

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

- Degradation
- Corrosion
- Buried piping
- Concrete issues

EPRI Pipe Mockup

Public Engagement

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

- Outreach to:
  - •Industry
  - •Congress
  - •Academia
  - •State, local, tribal governments
  - •NGOs
  - •Members of the public
  - •International counterparts
- NRC public comment process
- Considering a full range of views

Global Implications for Regulators

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

- Ensuring safety is always the top priority
- Balancing human resource needs with national financial and policy circumstances (new construction, decommissioning)
- Importance of a strong, independent regulator

Confidence in Decision-Making

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

- Conduct the highest quality technical and scientific analysis based on best available information
- Consult the right people internally and externally
- Identify ways to periodically evaluate regulatory work to take new information into account

Conclusions

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment

- Regulatory agencies like NRC need a balance of qualified experts from various disciplines.
- The NRC remains committed to protecting public healthy and safety through sound decision-making, regardless of changes in economic, policy, or other factors.

Thank You