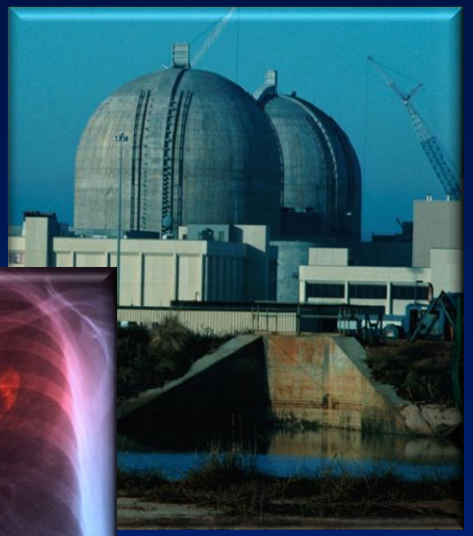
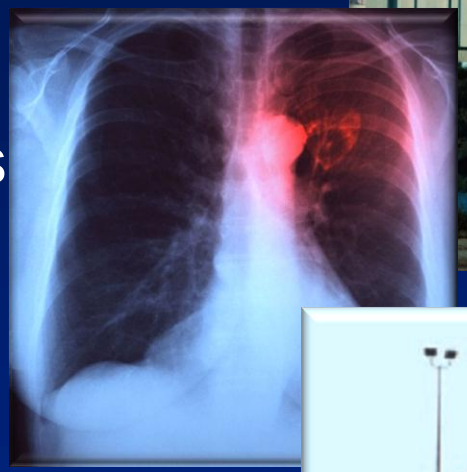
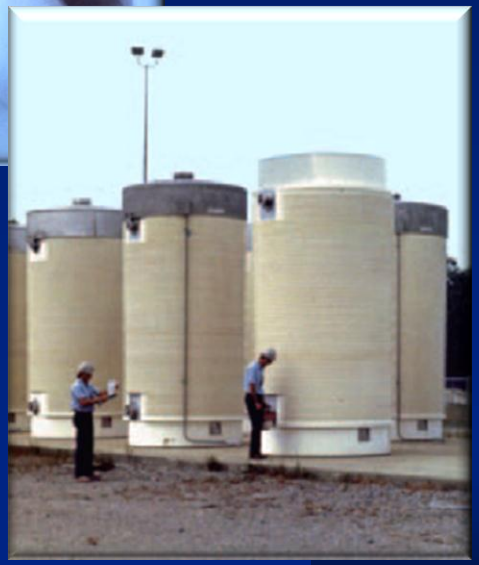
Nuclear Regulatory Commission
What We Regulate

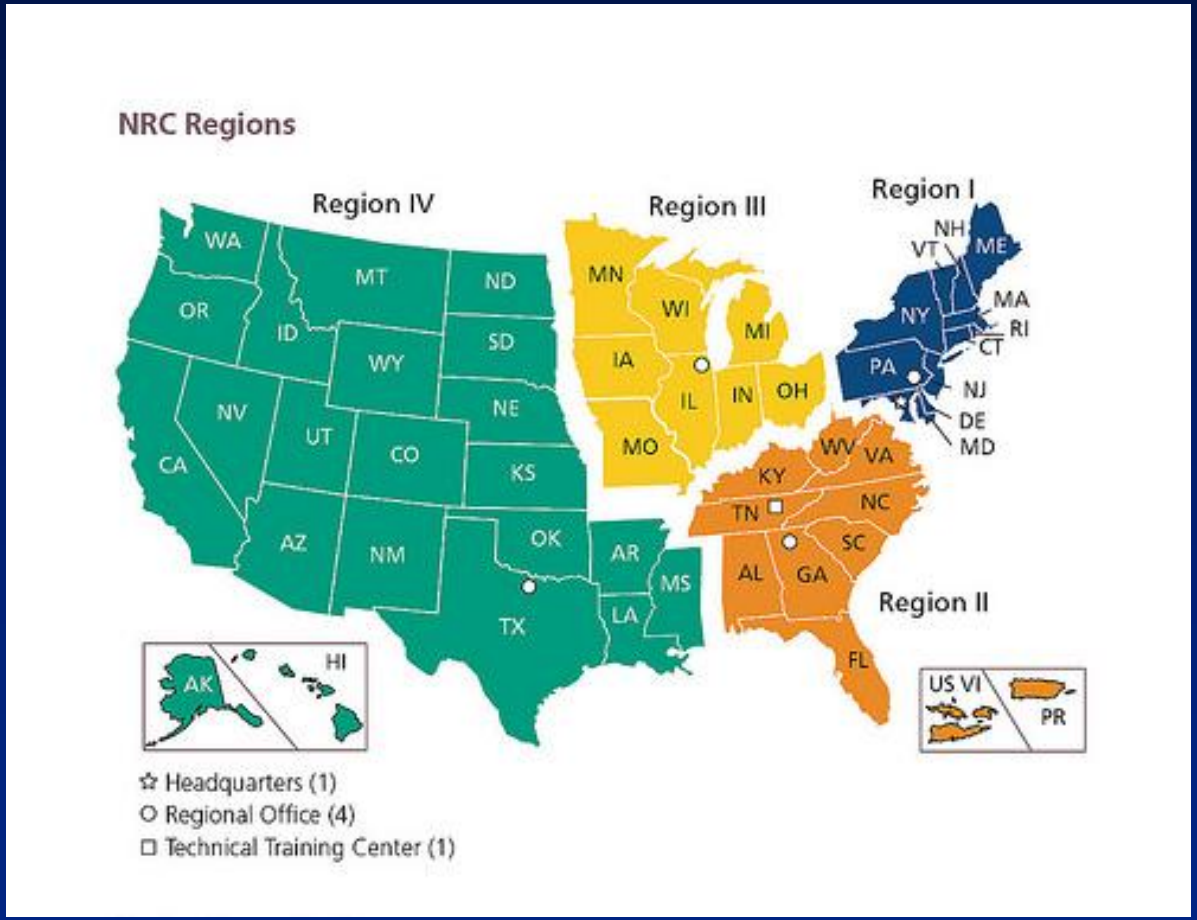
- **Nuclear Reactors** - commercial power reactors, research and test reactors, new reactor designs.
- **Nuclear Materials** - nuclear reactor fuel, radioactive materials for medical, industrial and academic use.
- **Nuclear Waste** ±transportation, storage and disposal of nuclear material and waste, decommissioning of nuclear facilities.







Nuclear Regulatory Commission
Four Regional Offices



The Commission
Designed to Assure Independence

‡ The Commission is a collegial, quasi-judicial body

‡ Five members with staggered five-year terms:

- ± Each is nominated by the President, approved by the Senate
- ± President designates one commissioner to serve as Chairman

‡ Decisions on all regulatory issues are determined by majority voting:

- ± Each member has an equal vote
- ± Commissioners may speak one-on-one to discuss voting P D W W H U V E X W ³ 6 X Q V K L Q H $ F W ´ U H T X L U discussion with more than two commissioners unless such meetings are noticed and held in public
- ± Once voting matters are completed, votes are made public

Fukushima Daiichi
Leading to Changes in Regulation

NRC Near-Term Task Force

U.S. Plants Are Safe – But More Can Be Done

- Continued operation and licensing of nuclear power plants do not pose an imminent risk to safety.
- Mitigation measures already in place (i.e., ³ % E ´ F R X C reduce likelihood of core damage and radiological releases.
- 12 technical recommendations to further enhance nuclear safety.

After Fukushima
We Must Learn the Big Lessons

- **Must Understand the Natural Hazard Risks Facing Each Plant**
- **Potential for Common Cause Failure of On-Site and Off-Site AC Power (SBO)**
- **We Can't Predict Every Event**
- **Recovering from Disaster is At Least as Important as Preparing for Disaster**

The Commission's Approach
Methodical and Thorough

- Careful, public review and enhancement of Task Force recommendations
- Implementation of highest S U L R U L W \ D F W L R G H O D \´
- Formed special directorate to integrate, prioritize, and oversee implementation of post-Fukushima actions

NRC Actions Taken in 2012
Focus on High-Priority Items

Order	Mitigating Strategies for Beyond Design Basis Events
Order	Reliable Hardened Vents for Mark I and II Containments
Order	Enhanced Spent Fuel Pool Instrumentation
Analyses	Seismic and Flooding Walk-Downs
Analyses	Seismic and Flooding Reevaluations
Analyses	Emergency Preparedness Staffing and Communications for Multi-Unit Events

NRC Actions Taken in 2012
Rulemakings

- **New Station Blackout Rule**
  Modify SBO requirements to establish enhanced capability to mitigate a prolonged SBO

- **Integration of Plant Emergency Procedures**
  New rule requiring the integration of EOPs, SAMGs, and EDMGs (i.e., post-9/11 measures)

Enhancements to Nuclear Safety
Mitigating Strategies for Beyond Design Basis Events

‡ **Expands upon the existing "B.5.b" requirements (which were established after the 9/11 attacks):**

- í Assure reactor core and spent fuel pool cooling in the event plant systems are disabled by a site-wide disaster
- í Equipment must be protected and/or dispersed to prevent loss from a single cause
- í Requires preparation for multi-unit emergencies - one more of each set of emergency equipment than is needed based on the number of reactors at a site (N+1)

Enhancements to Nuclear Safety

Industry's FLEX Initiative

FLEX: Industry-developed strategy to meet new NRC requirements. Diverse, flexible means to prevent core damage after beyond design basis external events

FLEX Regional Response Centers

FLEX Features

‡ Applies installed equipment, onsite portable equipment, and pre-staged offsite resources (at all US plants and two regional centers)

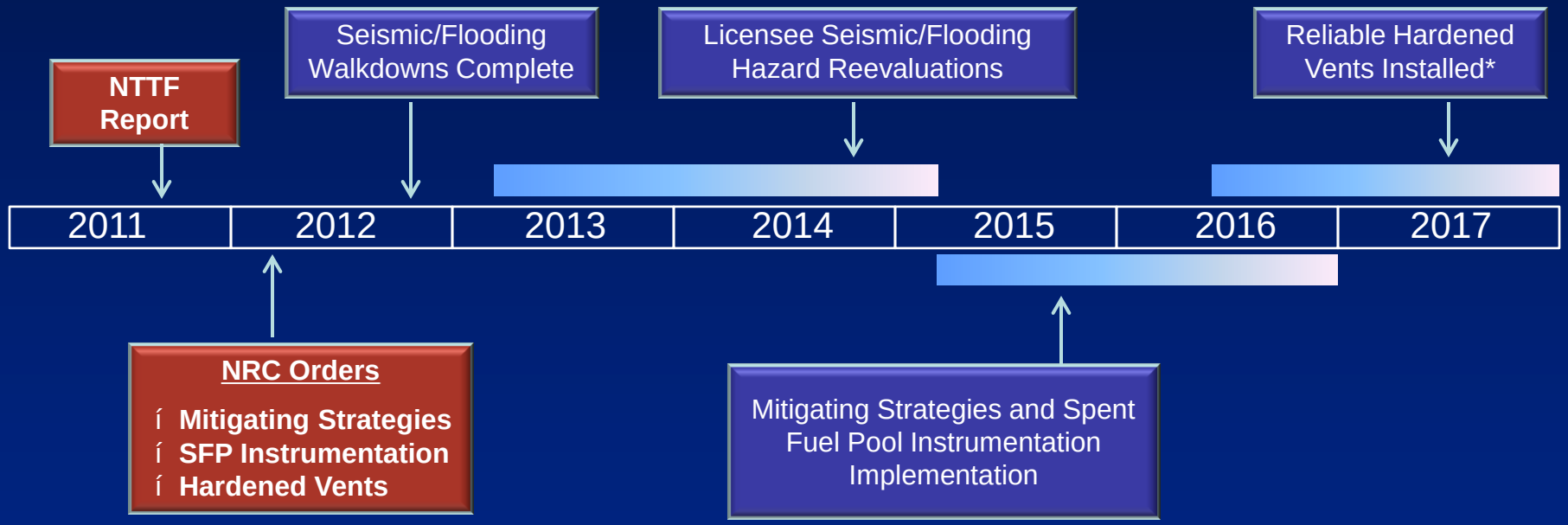
‡ Provides essentially indefinite cooling capability

‡ Provides capabilities beyond NRC requirements

Enhancements to Nuclear Safety
Industry's FLEX Initiative

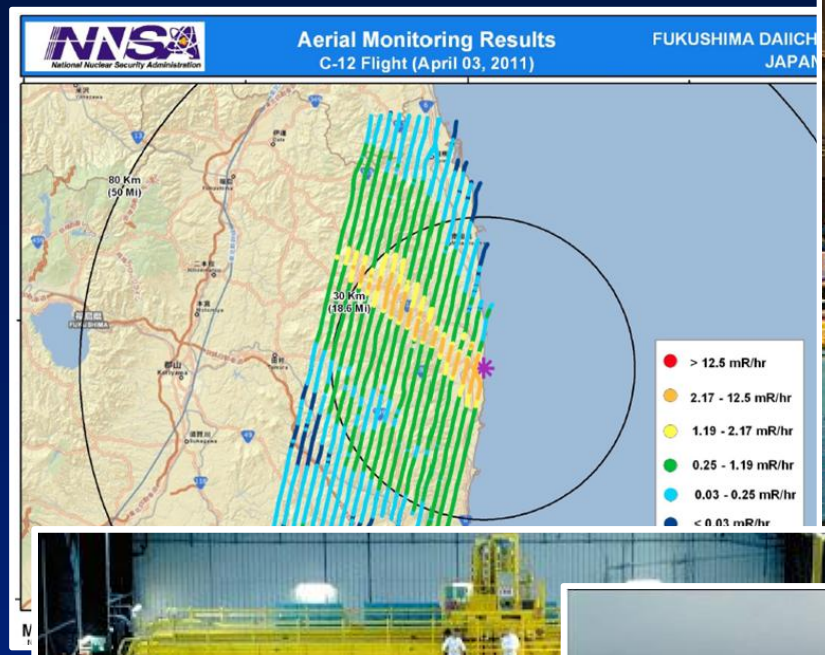
- More than 300 pieces of safety equipment (generators and high-capacity pumps, etc.) installed or ordered
- Standardized fittings and redundant access points for water and electric power
- Layered defense strategy:
  - installed plant equipment
  - on-site portable equipment
  - offsite equipment (deployable by the 24th hour)

Schedule of Key of Regulatory Actions Based on Fukushima Lessons Learned

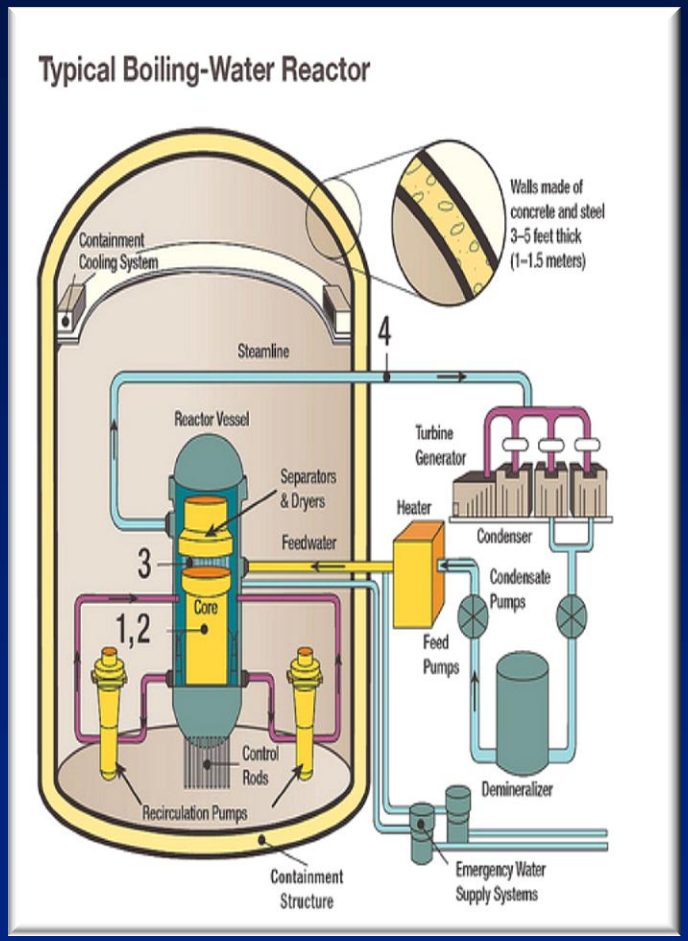


* Schedule may be impacted by 2013 Commission decision regarding severe accident capable vents and vent filtering.

Fukushima Teaches
The Public Listens



Enhancements to Nuclear Safety
Next Steps: Severe Accident Venting



‡ **Severe Accident Vents**

Modifies 2012 order requiring vents on Mark I and II containments to be *"severe accident capable"*

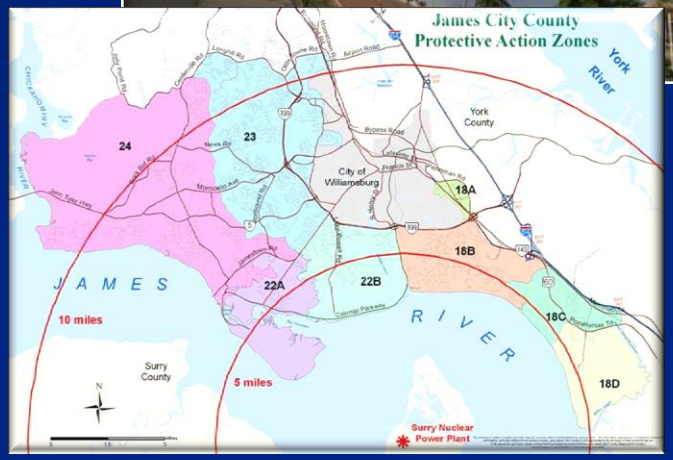
‡ **Vent Filtering and Containment Integrity for Mark I and II BWRs**

New rule requiring development of strategies to prevent release of significant amounts of radioactive material during severe accidents

- í features site-specific analyses
- í allows for wet scrubbers, dry filters, and in-containment strategies

Enhancements to Nuclear Safety

Next Steps: Lower Tier Actions



‡ **Evaluation of Spent Fuel Pools**

Review safety of pools during extreme events and consider need for calculated dry storage

‡ **Consideration of Other Natural Hazards**

Review natural hazards beyond seismic and flooding, e.g., storms, extreme temperatures, etc.

‡ **Review Emergency Preparedness Requirements**

Review adequacy of 10-mile EPZ and current potassium iodide distribution practices

After Fukushima
The Work Continues

Georgia Power has initiated full scale construction of Vogtle units 3 and 4 after receipt of a combined Construction and Operating License from the NRC

After Fukushima
The Work Continues

SCANA was the most recent power company to receive a license to build and operate a Generation III+ nuclear plant. Work is now underway at the V.C. Summer site in South Carolina to construct two AP1000 reactors

NRC continues to evaluate:

- ‡ Four additional ALWR designs
- ‡ 10 additional new plant applications
- ‡ Power uprates
- ‡ License renewals

Concluding Thoughts
Fukushima's Impact on U.S. Regulation

- **Some Things Have Not Changed:**
  - Public consciousness increased, but views of existing plants and new projects remain generally positive
  - Very limited impact on U.S. nuclear power; low natural gas prices present a much larger challenge
- **Some Things Have Changed Forever:**
  - 7KH GLVWLQFWLRQ EHWZHHQ ³GHVLJQ EDVLV´ HYHQWV KDV EHHQ EOXUUHG
  - Operator and regulator mindsets have been dramatically altered ±particularly with regard to extreme scenarios