Fukushima Disaster

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Introduction

- Disaster
- Precautionary Solutions
- Current Issues
- Solutions
- United States
Initial Disaster

- March 11th 2011, Earthquake occurs.
- Back-up generators turn on.
- An hour later Tsunami strikes main plant.
- Generators Fail.
- Reactors Overheat.
Precautionary Solutions

- Use more automated cooling systems.
  - Fans, filters, generators.
- Build more generators to cool reactors.
- Increase the height of seawalls.
Current Solutions To Problem

- Install filters and detectors throughout the Nuclear Plant.
- Adapt to more safety issues.
- Plan ahead of time in order to prevent disaster.
- Build stronger walls to protect against Tsunami’s.
Current Issues

- Cesium – 137 is main contaminant.
  - Very mobile isotope
  - Highly water soluble
- Has contaminated the local vegetation, soil, and plant itself.
- Contaminated water leaking from reactor and storage tanks to groundwater.
Ground Water Contamination

Groundwater contamination at Fukushima

- Temporary storage tanks
- Excess water from cooling system transferred to storage tanks
- Reactor building
- Turbine building
- Steel wall (under construction)
- Tank leak
- Groundwater flow
- Sea

Source: Reuters
Solutions to Current Issues

- Decontaminate soil, vegetation, and plant.
  - Using chemicals to leach the radioactive elements out and capture in filter
- Prevent contaminated groundwater from reaching ocean.
  - Metal wall and frozen wall between plant and ocean
Could This Happen in the US?

- 23 Mark 1 nuclear power plants in US.
- Mark 1 boiling water reactor: under-engineered containment system.
- Japan has more seismic activity than US.
Locations of Nuclear Power Plants

Peak Ground Acceleration

- 0.0 to 0.06
- 0.07 to 0.10
- 0.11 to 0.16
- 0.17 to 0.35
- 0.36 to 0.59
- 0.60 to 1.0

Nuclear Plant Key

- Mark 1
- Other

SOURCES: USGS, NUCLEAR REGULATORY COMMISSION, REUTERS
A SHORTFORMBLOG ORIGINAL: BY ERNIE SMITH & CHRIS TOGNOTTI

FYI: GE has created several versions of the Mark 1 reactor, the same model used at the Fukushima Daiichi plant. The U.S. government says the American models are operating safely.
Possible, but not Probable

- Fair much better than Japan.
- More strict regulations.
- Quick response plan.
- Cooling system redundancies.
Conclusions

- Catastrophic Disaster.
- Preliminary safety.
- There are still issues.
- Solutions to issues.
- How the United States would cope with this disaster.
Works Cited


Questions?