Status of nuclear regulation and industry in Japan 15 years after the FDNPS accident

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Lessons learned from the accident

Plant design and countermeasures

- Underestimation of natural hazards, especially tsunami.
- Insufficient knowledge of phenomena and system response in accident, e.g. transport of hydrogen and fission products, response of valves under loss of power, etc.

Off-site response

- Fatalities in elderly and care-needed people due to physical and mental stresses by evacuation.

General

- Overconfidence that we had achieved safety.

Enhancement of regulatory requirements

Consideration of external hazards

- Earthquake, tsunami, volcano, tornado, flooding, fire, etc.

Countermeasures

- Permanent and mobile equipment for preventing core damage and for preventing containment failure.
- Filtered containment venting system (FCVS).
- “Specialized safety facility” against large-scale natural disaster and terrorism including aircraft crush.
- On-going feedback of knowledge from domestic and international Fukushima-related activities.

Enhancement of EPR strategy

Emergency preparedness and response

- Evacuation in PAZ (precautionary action zone; up to 5 km)
- Sheltering in place in UPZ (urgent protective action planning zone; from 5 to 30 km)
- Recent establishment of guidelines for sheltering in place.
  - Conditions for termination or switching to evacuation.
  - Anticipated limit of sheltering to be 3 days.
  - Top priority on protection against natural hazards.
- On-going optimization of EALs (emergency action levels) to avoid too early decision making for protective actions.

Present status in Japan

Power reactors

- 12 PWRs and 3 BWRs in operation
- 2 BWRs permitted
- 3 PWRs and 6 BWRs in licensing process
- 8 PWRs, 15 BWRs and 1 GCR under decommissioning

Framework of safety review for long-term operation

- 40 + 20 years, from 2012 to 2025
- 30 + 10 + 10 + … years, presently

Inspection framework

- Introducing ROP (reactor oversight process) in 2020.

To the future

Plan of new build for replacement

- SRZ-1200, Mitsubishi's new PWR
  - New design with integrated "Specialized safety Facility"
  - Under discussion before licensing process

NRA will never forget the pain of Fukushima and keep asking ourselves if we miss something insufficient.

At the same time, NRA will seek a regulatory framework that encourages licensees to introduce new technologies with higher safety performance.