

Protection of Power Plants from Severe Accidents and External Events

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Overarching Observations

- The nuclear community's willingness to examine the Fukushima accident thoroughly no doubt has helped to reassure decision makers and the general public.
- The variety of independent reviews have converged on the same fundamental conclusions, which provides confidence that significant issues have not been overlooked.

Fundamental Changes Resulting From the Fukushima Accident

- There have been extensive efforts to ensure that power plants have the capacity to respond to external events.
 - Probability of occurrence is not subject to accurate prediction or control.
 - Probability of extreme events will grow over time as a result of climate change.

Fundamental Changes (cont)

- The accident has resulted in reexamination of the foundations of the safety system.
 - Design basis approach has been supplemented in the past in an ad hoc way.
 - Fukushima has resulted in immediate efforts to provide protection regardless of the initiating event.
 - Efforts are underway to amend the regulatory structure to provide an integrated approach and thereby to lower risk.

Fundamental Changes (cont)

- The accident has resulted in a change in focus for the regulatory system.
 - Traditional approach is to protect against radiation-induced health effects.
 - Fukushima reinforces importance of protection against broader societal and environmental harms.

Further Modifications of the Safety System

- Consider combinations of hazards, impacts on multiple units, and disruption of infrastructure.
- Upgrade off-site and on-site power and extend capacity to cope with a station blackout
- Ensure availability of ultimate heat sink
- Strengthen monitoring systems.
- Establish means to control hydrogen
- Provide off-site resources at regional, national, or international level.

Further Modifications (cont)

- Establish a clear chain of command for accident management.
- Strengthen support for new entrant countries.
- Consider both safety and security together.
- Undertake IAEA peer reviews.
- Ensure effective regulatory framework.

Concluding Thoughts

- Set priorities for action guided by risk reduction and cost-benefit considerations.
- Acknowledge that continued vigilance and a strong safety culture are indispensable.