

# Roadmap towards Restoration from the Accident at Fukushima Daiichi Nuclear Power Station

## 1. Basic Policy

By bringing the reactors and spent fuel pools to a stable cooling condition and mitigating the release of radioactive materials, we will make every effort to enable evacuees to return to their homes and for all citizens to be able to secure a sound life.

## 2. Targets

- Based on the basic policy, the following two steps are set as targets:  
 Step 1: Radiation dose is in steady decline.  
 Step 2: Release of radioactive materials is under control and radiation dose is being significantly held down.  
 (Note) Issues after Step 2 will be categorized as "Mid-term Issues"
- Target achievement dates are tentatively set as follows, although there will still be various uncertainties and risks:  
 Step 1: around 3 months  
 Step 2: around 3 to 6 months (after achieving Step 1)  
 (Note) Announcements will be made as soon as timing of step-wise target achievement or quantitative prospects are determined, as well as if revisions to the targets or achievement dates become necessary.

## 3. Immediate Actions

- In order to achieve the above targets, immediate actions were divided into 3 groups with targets set for each of the 5 issues. Various countermeasures will be implemented simultaneously (see the table in right.)
- In order to achieve Step 1, overcoming the following two issues that are currently being addressed will be critical:
  - ① Prevention of hydrogen explosion inside the primary containment vessel (hereafter, PCV) (Units 1 to 3.)
    - Cooling the reactor by injecting fresh water into the reactor increases the chance of steam condensation, leading to a concern of potentially triggering a hydrogen explosion.
  - Nitrogen gas will be injected into the PCV of each unit to keep the concentration of hydrogen and oxygen below flammability limit.
- ② Prevention of release of contaminated water with high radiation level outside of the site boundary (Unit 2.)
  - While cooling the reactor by injecting fresh water, accumulation of contaminated water with high radiation level in the turbine building is increasing (possible release to outside of the site boundary.)
- Actions will be taken against accumulated water to (1) secure several storage places and (2) install facilities to process the contaminated water and reduce the radiation dose, among others.

Roadmap for Immediate Actions

Areas	Issues	Targets and Countermeasures	
		Step 1	Step 2
I. Cooling	(1) Cooling the Reactors	① <b>Maintain stable cooling</b> <ul style="list-style-type: none"> <li>Nitrogen gas injection</li> <li>Flooding up to top of active fuel</li> <li>Examination and implementation of heat exchange function</li> </ul> ② <b>(Unit 2) Cool the reactor while controlling the increase of accumulated water until the PCV is sealed</b>	③ <b>Achieve cold shutdown condition (sufficient cooling is achieved depending on the status of each unit.)</b> <ul style="list-style-type: none"> <li>Maintain and reinforce various countermeasures in Step 1.</li> </ul>
	(2) Cooling the Spent Fuel Pools	④ <b>Maintain stable cooling</b> <ul style="list-style-type: none"> <li>Enhance reliability of water injection</li> <li>Restore coolant circulation system</li> <li>(Unit 4) Install supporting structure</li> </ul>	⑤ <b>Maintain more stable cooling function by keeping a certain level of water.</b> <ul style="list-style-type: none"> <li>Remote control of coolant injection operation</li> <li>Examination and implementation of heat exchange function</li> </ul>
II. Mitigation	(3) Containment, Storage, Processing, and Reuse of Water Contaminated by Radioactive Materials (Accumulated Water)	⑥ <b>Secure sufficient storage place to prevent water with high radiation level from being released out of the site boundary.</b> <ul style="list-style-type: none"> <li>Installation of storage / processing facilities.</li> </ul> ⑦ <b>Store and process water with low radiation level</b> <ul style="list-style-type: none"> <li>Installation of storage facilities/decontamination processing.</li> </ul>	⑧ <b>Decrease the total amount of contaminated water.</b> <ul style="list-style-type: none"> <li>Expansion of storage/processing facilities.</li> <li>Decontamination/Desalt processing (reuse), etc.</li> </ul>
	(4) Mitigation of Release of Radioactive Materials to Atmosphere and from Soil	⑨ <b>Prevent scattering of radioactive materials on buildings and ground</b> <ul style="list-style-type: none"> <li>Dispersion of inhibitor</li> <li>Removal of debris</li> <li>Installing reactor building cover</li> </ul>	⑩ <b>Cover the entire buildings (as temporary measure).</b>
III. Monitoring/Decontamination	(5) Measurement, Reduction and Announcement of Radiation Dose in Evacuation Order/Planned Evacuation/Emergency Evacuation Preparation Areas	⑪ <b>Expand/enhance monitoring and inform of results fast and accurately</b> <ul style="list-style-type: none"> <li>Examination and implementation of monitoring methods.</li> </ul>	⑫ <b>Sufficiently reduce radiation dose in evacuation order / planned evacuation / emergency evacuation preparation areas</b> <ul style="list-style-type: none"> <li>Decontamination/monitoring of homecoming residences.</li> </ul>
		(Note) With regard to radiation dose monitoring and reduction measures in evacuation order/planned evacuation/emergency evacuation preparation areas, we will take every measure through thorough coordination with the national government and by consultation with the prefectural and municipal governments.	