

## Summary of Step 2 Completion of “Roadmap towards Settlement of the Accident at Fukushima Daiichi Nuclear Power Station, TEPCO”

## 1. Basic policy

By bringing the reactors and the spent fuel pools to a stable cooling condition and suppressing 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. Summary of Step 2

Achieved that the reactors were brought to a condition equivalent to “cold shutdown”, and in case an accident occurs, we will be able to keep the radiation dose at the site boundaries at a sufficiently low level. Confirmed the reactors are stabilized and the accident in the station was settled.

- 1) Keep RPV bottom temperatures and temperatures inside PCV below approx. 100 degree centigrade.
- 2) Suppress steam generation from the PCVs via controlling water injection, and which also suppress the release of radioactive materials from the PCVs.

As a result, the radiation exposure at the site boundaries due to the current release of radioactive materials from the PCVs is 0.1 mSv/ y which is below the 1 mSv/ y target.

- 3) Confirmed that the mid-term safety of the circulating water cooling system is secured.

- Secured the reliability of facilities via redundant backups as preparation for troubles and accidents.
- Secured the detection system of abnormality, and restoration measures and alternative measures in case of outage of facilities.

- Confirmed that the radiation dose at the site boundaries at a sufficiently low level in case an accident occurs. (Ex. Installed 9 water injection pumps including 6 pumps at the upland. Even if all water injection facilities are not available, it is possible to resume water injection via a fire engine in approx. 3 hours. Besides, even if water injection stops at Units 1-3 simultaneously for a consecutive 12 hours, the radiation dose at the site boundaries will be lower than 1 mSv/ y.)

Although we have to work in a difficult environment in the site, the targets for each issue other than reactors have been achieved. Hence, the completion of the Step 2 target “Release of radioactive materials is under control and radiation doses are being significantly held down” has been confirmed.

## 3. Action plan hereafter

After Step 2 completion, we will close Government-TEPCO Integrated Response Office and set up a new organization, which will develop a mid and long term roadmap, and implement on-site work as well as R&D towards decommissioning. Progress status will be disclosed regularly.

## Summary of “Roadmap towards Restoration from the Accident”

Issues		Step 1 (Upper: targets, lower: work implemented)	Step 2 (Upper: targets, lower: work implemented)
I. Cooling	(1) Reactor	<ul style="list-style-type: none"> <li>○ Stable cooling</li> <li>• Started circulating water cooling</li> <li>• Started nitrogen gas injection into the PCV</li> </ul>	<ul style="list-style-type: none"> <li>○ Condition equivalent to cold shutdown</li> <li>• RPV bottom temperature and temperature inside PCV are, in general, below 100 °C.</li> <li>• Release of radioactive materials from PCV is under control and public radiation exposure by additional release is being significantly held down. (0.1 mSv/ y at the site boundaries, which is below 1 mSv/ y target.)</li> <li>• The mid-term safety of the circulating water cooling system is secured</li> </ul>
	(2) Spent Fuel Pool	<ul style="list-style-type: none"> <li>○ Stable cooling</li> <li>• Improved reliability of injection operation</li> <li>• (Units 2 and 3) Started circulating cooling system by installing heat exchanger</li> </ul>	<ul style="list-style-type: none"> <li>○ More stable cooling</li> <li>• (Units 1 and 4) Started circulating cooling by installing heat exchanger</li> </ul>
II. Mitigation	(3) Accumulated Radioactive Water	<ul style="list-style-type: none"> <li>○ Secure storage place</li> <li>• Installed storage/ processing facilities</li> </ul>	<ul style="list-style-type: none"> <li>○ Reduction of total amount of accumulated radioactive water</li> <li>• The accumulated water level has been reduced at the level where it is able to withstand heavy rains as well as long-term processing facility outages.</li> </ul>
	(4) Ground Water	<ul style="list-style-type: none"> <li>○ Mitigate contamination in the ocean (Considered method of ground water shielding wall etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Started installation work of ground water shielding wall</li> </ul>
	(5) Atmosphere / Soil	<ul style="list-style-type: none"> <li>○ Mitigate scattering radioactive materials (Sprayed dust inhibitor etc.)</li> </ul>	<ul style="list-style-type: none"> <li>• Completed the installation of the Unit 1 reactor building cover (Continuing removal of debris at the upper part of the reactor buildings of Units 3 and 4)</li> </ul>
III. Monitoring / Decontamination	(6) Measurement, Reduction and Disclosure	<ul style="list-style-type: none"> <li>○ Sufficient reduction of radiation exposure</li> <li>• Monitoring by government, prefectures, municipalities and TEPCO, and expansion and enhancement of the monitoring, and disclosure</li> </ul>	
IV. Countermeasures against aftershocks, etc.	(7) Tsunami, Reinforcement, etc	<ul style="list-style-type: none"> <li>○ Mitigation of further disasters</li> <li>• Installed support structures at the bottom of Spent Fuel Pool of Unit 4</li> </ul>	
V. Environment Improvement	(8) Living/ Working Environment	<ul style="list-style-type: none"> <li>○ Enhancement of environment improvement</li> <li>• Installed temporary dormitories and on-site rest stations etc</li> </ul>	
	(9) Radiation Control/ Medical Care	<ul style="list-style-type: none"> <li>○ Enhancement of healthcare</li> <li>• Improved radiation control and medical system etc</li> </ul>	
	(10) Staff Training/ Personnel	<ul style="list-style-type: none"> <li>○ Exhaustive radiation exposure dose control</li> <li>• Implemented systematic staff training and personnel allocation</li> </ul>	
Action plan for mid and long term issues		<ul style="list-style-type: none"> <li>• TEPCO reported on the mid-term operating plan and safety assessment results regarding circulating water cooling system. NISA evaluated and confirmed that mid-term safety of circulating water cooling system was secured.</li> </ul>	

