FY2019 Q3 Progress Report on Nuclear Safety Reform Plan

Q3 Progress Summary

Keeping the Fukushima Nuclear Accident firmly in mind:
Be safer today than yesterday, and safer tomorrow than today.

- To live up to the above resolution, TEPCO is implementing nuclear safety reforms, steadily moving forward with decommissioning and engaging in activities designed to raise TEPCO's power stations to the world's highest levels of safety.

Revision of Decommissioning Roadmap

- The Mid/Long-term Roadmap for the Decommissioning of the Fukushima Daiichi Nuclear Power Station was revised to further reduce risks while prioritizing safety based on TEPCO's policy of balancing recovery and decommissioning.
- Progress in decommissioning included the removal of seven new fuel assemblies from the Unit 3 spent fuel pool and the dismantling of the sixth block of the Unit 1/2 exhaust stack. Both tasks were unprecedented challenges, but were overcome by analyzing what had occurred, identifying the problems and then formulating suitable measures. These measures also will be applied in future activities to ascertain the conditions of other equipment/structures, etc.

New agreement regarding Fukushima Daini

- At Fukushima Daini, TEPCO signed a new agreement with 11 cities, towns and villages in the surrounding region, as well as Fukushima Prefecture, Naraha Town and Tomioka Town, to ensure the safety of the surrounding region as TEPCO decommissions the plant.

Dr. Klein visits Kashiwazaki-Kariwa

- Nuclear Reform Monitoring Committee Chairman Klein visited Kashiwazaki-Kariwa to observe the progress of safety measure renovations.

Nuclear preparedness training in Niigata

- Some 150 TEPCO employees participated in nuclear preparedness training held by Niigata Prefecture. In addition to relaying information about the power station to the Niigata Prefecture Disaster Response Center, trainees helped evacuate residents from within a 5km radius of the power station and took radiation measurements in areas surrounding the power station.

Revision of Fukushima Daiichi Mid/Long-Term Roadmap

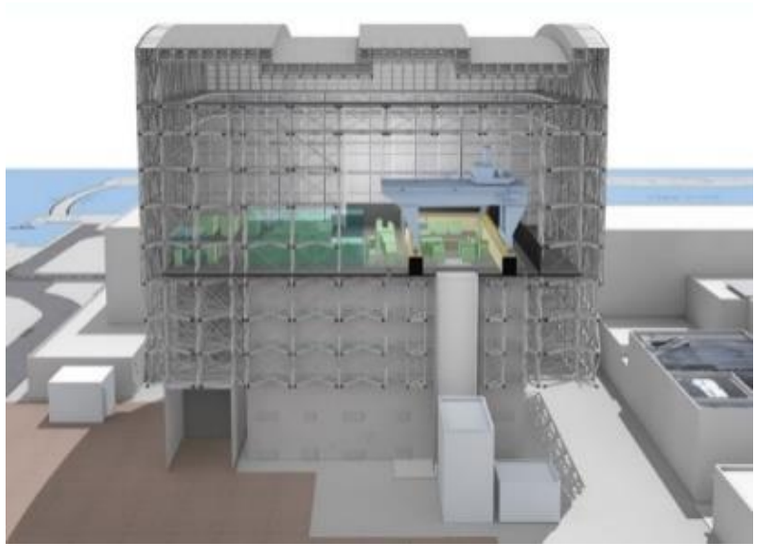
The Mid/Long-term Roadmap for the Decommissioning of Fukushima Daiichi was revised at the fourth gathering of the Cabinet Meeting on Decommissioning and Contaminated Water Countermeasures, which was held on December 27.

It was decided that fuel debris will be removed from Unit 2 during 2021, after which the scale of removal will be gradually enlarged to optimize the entire decommissioning process in terms of safety, achievability and speed, making sure not to interfere with the ongoing removal of spent fuel.

The method for removing fuel from the spent-fuel pool at units 1 and 2 was adjusted to better suppress dust dispersion, keeping safety as the first priority. Work proceeded at units 5 and 6, targeting complete fuel removal from all units by the end of 2031.

Multifaceted measures, such as a landside-impermeable wall, continued to be implemented to reduce the generation of contaminated water.

As recovery in the surrounding region progresses and residents return to their homes, TEPCO intends to further reduce risks and prioritize safety based upon its policy of balancing recovery and decommissioning.



Rendition of Unit 1 removal operation

Fukushima Daiichi NPS: Progress with Reactor Decommissioning

Removing Fuel from Unit 3 Spent-fuel Pool

Work to remove fuel from the Unit 3 spent-fuel pool continued despite problems with fuel-handling equipment that required parts replacement, operational testing and procedural revisions. Seven assemblies of new fuel were removed during the third quarter. The Unit 3 spent-fuel pool originally held 514 spent-fuel assemblies and 52 new-fuel assemblies (total: 566), but as of January 20 all new fuel had been removed, so the removal of spent fuel commenced and is expected to finish by March 2021 (end of FY2020).

Fuel removal work

Dismantling of Unit 1/2 Exhaust Stack

Part of the steel frame supporting the Unit 1/2 exhaust stack was found to be damaged in multiple places, so the top part of the stack (height: approx. 60m) is being cut into 23 blocks and dismantled with the help of a local contractor (ABLE Co., Ltd.) to keep the stack within required seismic-resistance margins. During the third quarter, we began dismantling the third block and completed dismantling of the sixth block on December 24. In the middle of December, based on dismantling work performed to date, revisions were made in the cutting procedures to enhance safety. Thereafter, dismantling of everything up to and including the 11th block was completed as of February 1. Based on the pace of overall process and what has been achieved so far, the anticipated completion date for dismantling was changed to May 2020.

Lowering part of exhaust stack

Agreement with Regional Community on Decommissioning Fukushima Daini

To safely and steadily advance the long process of decommissioning Fukushima Daini, during Q3 TEPCO signed a new agreement with 11 cities, towns and villages in the surrounding region, plus Fukushima Prefecture, Naraha Town and Tomioka Town. The “Agreement Ensuring the Safety of the Surrounding Cities, Towns and Villages during the Decommissioning of the Fukushima Daini Nuclear Power Station” was signed on December 26. Under the plan, TEPCO shall move forward with procedures to start the actual decommissioning while steadily working to ensure the understanding and cooperation of regional residents, including by disclosing information required by the local community.

Fukushima Daini

Kashiwazaki-Kariwa: Progress with Safety Measures

Doctor Dale Klein, chairman of the Nuclear Reform Monitoring Committee (NRMC), which monitors and supervises the progress of nuclear safety reforms, visited Kashiwazaki-Kariwa on December 3 to observe TEPCO's progress with revised safety renovations. Chairman Klein was shown a large freight entrance that is undergoing seismic enhancement and a newly installed aboveground filter vent machine, both at Unit 7. After the tour, he commented: “TEPCO continues to make good progress on the safety enhancements at KK addressing additional seismic improvements and operational considerations. These enhancements will add significant safety margins to normal operations and to a variety of hypothetical accident scenarios. While the safety enhancements are underway, TEPCO is also focused on worker safety during the construction phase." TEPCO will continue to steadily revise its safety measures based on its safety-first priority and respect for the NRMC’s opinions.

Chairman Klein observing revised safety measures

Nuclear Preparedness Training in Niigata

During nuclear preparedness training organized by Niigata Prefecture on November 8 and 9, approximately 600 residents participated in a mock evacuation under the scenario of an accident at Kashiwazaki-Kariwa Unit 7. The purpose was to strengthen the coordination abilities and preparedness of personnel from Niigata Prefecture, cities, towns and villages, including Kashiwazaki City and Kariwa Village, along with some 55 agencies, including local governments and the Japan Self-defense Force. Approximately 150 TEPCO employees supported the evacuation of residents living within a 5km radius of the power station, made off-site radiation measurements and conveyed information about the power station to the Niigata Prefecture Disaster Response Center. TEPCO will continue to engage in training to strengthen its ability to cooperate as a nuclear-power utility when providing evacuation assistance in the event of a real emergency.

Niigata Prefecture nuclear preparedness training

Management

- During the third quarter, foreign-material-exclusion initiatives that TEPCO has implemented for improved safety were awarded a Power Station Special Award by the Japan Nuclear Safety Institute (JANSI).

- To further improve external relations, TEPCO engaged in various communication activities by sending personnel from the Aomori Head Office and the Niigata Headquarters into the field to speak with people. TEPCO is committed to listening carefully to the opinions of local residents and then responding with improvements to its internal and external communications as well as power station operations.

- To strengthen technological capabilities, TEPCO established the Fukushima Skill Training Center in the contractor administration building of Fukushima Daini. Various research and kaizen (improvement) initiatives were launched, including to significantly upgrade the company’s education and training environment.

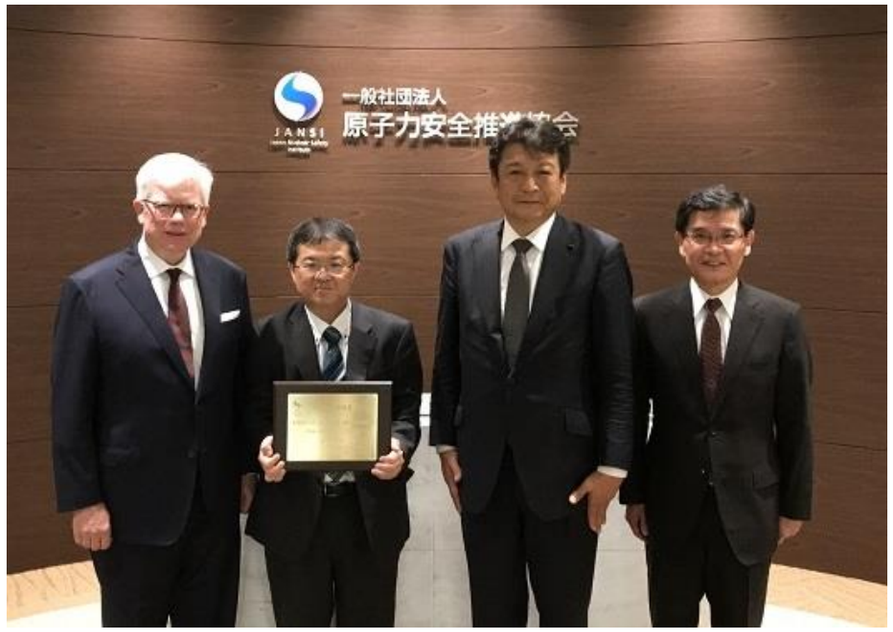
- At the Nuclear Reform Monitoring Committee on February 4, TEPCO delivered reports on the progress of nuclear safety reforms and the status of internal assessments. The Committee complimented TEPCO for its great progress in conducting stricter internal assessments and strengthening its organization and governance. TEPCO will continue to innovate nuclear safety reforms for next-generation employees, including by identifying internal weaknesses and other issues proactively before external experts point them out.

Nuclear Safety Reforms for Next-generation Employees

TEPCO has made extensive improvements since launching its Nuclear Safety Reform Plan in 2013, including by introducing its Management Model, in parallel with decommissioning efforts. In the meantime, the number of employees who joined the company after the Fukushima nuclear accident continues to increase. TEPCO's internal and external environments have thus changed greatly. While adapting to these changes, TEPCO has been compiling and systemizing nuclear safety reform initiatives for use by next-generation employees to ensure that the regrets as well as the lessons concerning the Fukushima nuclear accident are passed on. TEPCO continues working to reflect its Nuclear Safety Reform Plan, Management Model, Decommissioning Promotion Strategy, Group Business Plan and overall Business Plan in nuclear safety reforms targeting new and future employees.

Initiatives for Improved Safety

At Kashiwazaki-Kariwa, TEPCO has introduced improvements to thoroughly implement foreign-material-exclusion (FME) measures by preventing foreign contaminants from entering the spent-fuel pools, thereby raising safety. As part of this process, TEPCO personnel examined advanced FME activities at various facilities in the United States and at nuclear power stations in Japan to identify and adopt best practices. Thereafter, more than 5,000 contractors were educated about these practices to enable them to thoroughly implement new FME measures, including using special covers for pipes. In light of such initiatives, TEPCO was presented a Power Station Special Award by the Japan Nuclear Safety Institute (JANSI) on November 14 in recognition of its remarkable efforts to improve safety throughout the nuclear power industry.



Power Station Special Award ceremony

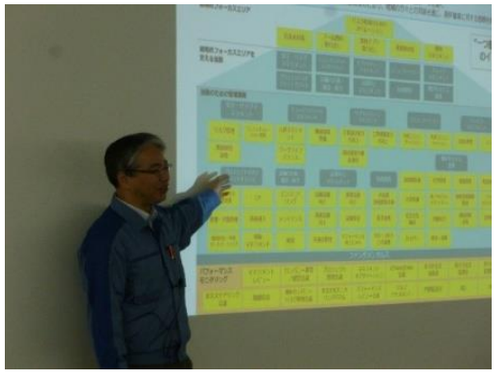
Internal Regulatory Department Activities

The Nuclear Safety Oversight Office, which is an internal regulatory department independent of TEPCO's executive branch that was created to strengthen support for, as well as the monitoring of, management personnel, issued the following suggestions for pursuing excellence:

- Areas where waste is permitted to accumulate temporarily should be limited to better protect workers and equipment (Kashiwazaki-Kariwa, Fukushima Daini).
- The change management process should be strictly adhered to, and all employees should be educated about the importance of change management (Fukushima Daiichi).
- Industrywide recommendations from the United States should be referenced when assessing and addressing potential issues in order to raise operator competence (Kashiwazaki-Kariwa).

Initiatives to Improve Safety Awareness

The Fukushima Decontamination & Decommissioning Engineering Company (FDEC) decided to construct a Decommissioning Management Model to strengthen corporate governance. The model incorporates the vision and values of the Nuclear Safety Reform Plan while also maintaining commonality with the Nuclear Power & Plant Siting Division's Management Model. Innovations have been made to clarify the relationship between individuals' duties and overall goals, particularly in light of the fact that the model covers tasks that are unique to the FDEC, such as contaminated-water prevention and fuel-debris removal.



Explaining the Decommissioning Management Model

Competitions to propose safety improvements are being held to improve safety awareness and abilities to promote defense-in-depth measures. Notably, outstanding proposals are put into practice quickly. During the third quarter, two outstanding proposals submitted during the 8th Safety Improvement Proposal Competition were put into practice, thereby helping to reduce risks in the field.

Changing procedures for filling the lubricating oil tank

KPI Results: Safety Awareness

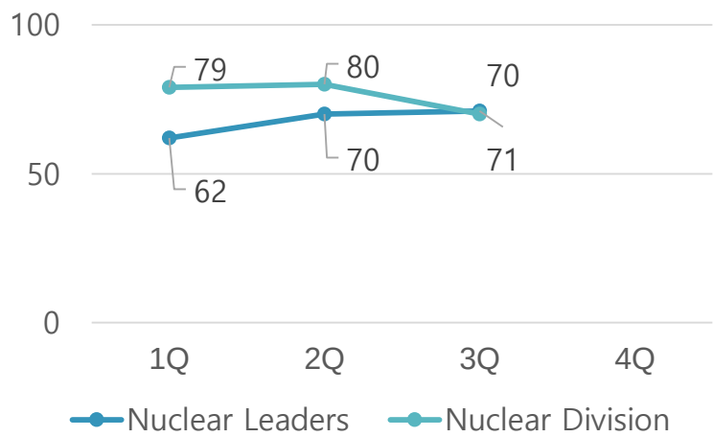
Four new key performance indicators (KPI) have been added in FY2019 based on policy changes (mentioned in the FY2018 Q4 progress report) implemented in response to performance in FY2018. These new KPI are now being monitored to help achieve FY2019 targets.

Nuclear leaders: **71 points**

(Target: 90 points)

Entire Nuclear Power Division: **70 points**

(Target: 80 points)



Initiatives to Improve External Communication

The Aomori Head Office implemented an external-communication initiative during which office personnel visited all homes in Higashidori Village and some 2,300 companies in the region between November 5 and 28. Residents were provided with an overview of the Aomori Head Office and information about geological surveys, and many said that they look forward to further communication efforts by the Office.

Communicating with resident in Aomori region

Representatives from Niigata Headquarters visited 33,000 homes in Kashiwazaki City and Kariwa Village between August 28 and December 8, receiving more than 16,000 valuable opinions. Intermixed with these opinions were questions about troubles and safety measures at the site. Going forward, the company shall continue to listen carefully to local residents and respond to their requests for improved communication, both internal and external, as well as enhanced operation of power stations.

As of December 1, more than 50,000 people have visited the TEPCO Decommissioning Archives site, which opened on November 30, 2018, greatly exceeding TEPCO's prediction of 20,000 visitors annually. TEPCO will continue to improve the exhibits and provide better explanations based on visitors suggestions.

Decommissioning Archives

KPI Results: Promoting Dialogue

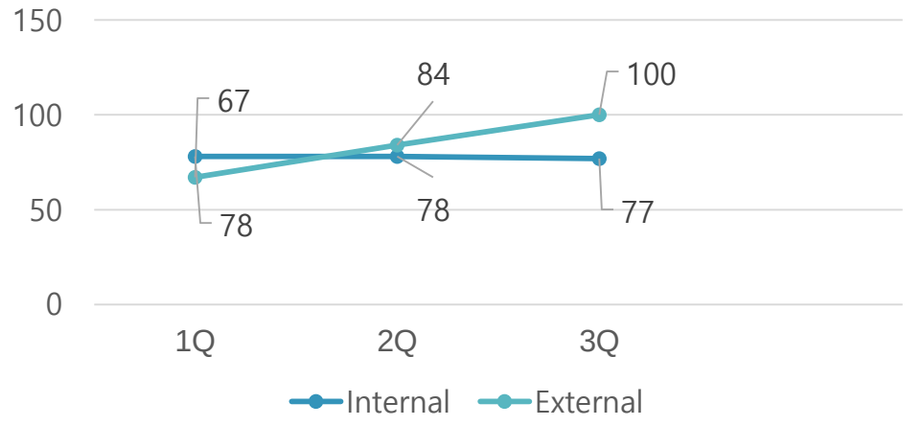
Four new key performance indicators (KPI) have been added in FY2019 based on policy changes (mentioned in the FY2018 Q4 progress report) implemented in response to performance in FY2018. These new KPI are now being monitored to help achieve FY2019 targets.

Internal: **77 points**

(Target: 80 points)

External: **100 points**

(Target: 100 points)



Initiatives to Improve Technical Capabilities

A skill-training facility at Fukushima Daiichi was rendered unusable by the Fukushima nuclear accident, so TEPCO opened the new Fukushima Skill Training Center inside the Fukushima Daini contractor administration building on October 10. TEPCO has begun use the Center to greatly upgrade education and training aimed at improving employee skills and technical capabilities.

In-house maintenance personnel require technical skills to respond quickly and effectively to accidents before outside assistance arrives. The Maintenance Division implements in-house training to improve such skills. During the third quarter, training on how to deal with gas turbine generator malfunctions was conducted at Kashiwazaki-Kariwa, aiming to realize faster and more efficient repairs. TEPCO will continue to implement such training to further improve in-house technical capabilities.

Training in calibrating instruments at the new Center

Training in handling gas turbine generator malfunctions

KPI Results: Technical Capabilities

Four new KPI were added to FY2019 have been added in FY2019 based on policy changes (mentioned in the FY2018 Q4 progress report) implemented in response to performance in FY2018. These new KPI are now being monitored to help achieve FY2019 targets.

Non-emergencies: **113 points**

(Target: 110 points)

Emergencies: **102 points**

(Target: 110 points)