Nuclear Safety Reform Plan FY2017Q2 Progress Report Overview

Q2 progress

- In order to keep our resolution to, "keep the Fukushima Nuclear Accident firmly in mind; we should be safer today than we were yesterday, and safer tomorrow than today; we call for nuclear power plant operations that keeps creating unparalleled safety" we have been promoting nuclear safety reforms since April 2013 and we continue to engage in activities to raise our power stations to the world's highest level of safety.
- In regards to the decommissioning of the TEPCO Fukushima Daiichi Nuclear Power Station (NPS), the revised TEPCO Holdings, Inc. Mid-and-Long-Term Roadmap Towards Decommissioning of Fukushima Daiichi Nuclear Power Station Units 1 to 4 puts forth the basic approach to deciding on plans for fuel debris removal and prioritizing safety when removing fuel from spent fuel pools, and states that communication with the local community and with relevant parties both within and outside Japan should be focused on and enhanced in order to reduce social risks and damage from false rumors. We will continue to move forward steadily and safely with decommissioning based upon the revised roadmap.
- In regard to the application to revise the reactor installation permit for Kashiwazaki-Kariwa Units 6/7, the draft Assessment Report that shows the new regulatory requirements have been complied with was approved at the 41st meeting of the Nuclear Regulation Authority on October 4, and a call for scientific and technical opinions was made. We will continue to improve safety by taking independent action that goes above and beyond the regulatory requirements.

Fukushima Daiichi NPS Progress of reactor decommissioning

Unit 3 Fuel removal cover (dome roof) installation (September 6)

Survey of the bottom of the Unit 3 PCV (July 19)
[Support structure for control rod drive mechanism]

In preparation for the removal of fuel from the spent fuel pools, we are installing a domed roof on Unit 3. On September 15, we finished installation of the second out of eight segments of the domed roof.

In order to ascertain conditions inside the Unit 3 primary containment vessel, we conducted a survey using a submersible remotely operated vehicle (submersible ROV) (July 19-22) and found what we think is fuel debris that has solidified after melting.

Since March 2016 we have been freezing portions of the land-side impermeable ice wall on both the ocean side and the mountain side, and since June 2016 95% of the wall on the mountain side has been frozen. On August 22, we began freezing all of the unfrozen sections. As of the end of September the temperature had already fallen below 0°C and the process is going smoothly.

As part of the investigation into the Fukushima Nuclear Accident, Niigata Prefecture Governor Yoneyama has visited the Fukushima Daiichi NPS and directly inspected the Unit 1/2 main control room and the bottom of the Unit 5 primary containment vessel.

Visit by Governor Yoneyama to the Fukushima Daiichi NPS (Sept. 4)
[Main seismic islolation building (Left: President Kobayakawa, right: Governor Yoneyama]

During the August 2 and the September 28 events related to water level monitoring in sub drains delays in determining whether an event should be notified/disclosed were seen and information about changes made to water level gauge settings were not thoroughly conveyed. Therefore, although neither event resulted in a leak of accumulated water into groundwater, the following initiatives are underway in regards to important measurements that are monitored/managed at the power station:
- Clarify the objectives of monitoring and also the basis for determining abnormalities to eliminate gray areas when it comes to decision-making.
- Train on mechanisms for quickly and accurately conveying information in preparation for abnormal measurements

Kashiwazaki-Kariwa NPS Progress of safety measures

At Kashiwazaki-Kariwa we are moving forward with safety measures based upon the lessons learned from and the experience with the Fukushima Nuclear Accident. The safety measures are being implemented with a focus on Units 6 and 7 for which an application has been made to modify the installation permit in order to comply with the new regulatory requirements.

The new regulatory requirements require that Boiling Water Reactors (BWR) have containment vessel pressure relief mechanisms, or equipment with equal or better function, as a measure for preventing damage to the primary containment vessel from over-pressurization. At Kashiwazaki-Kariwa Unit 6/7 we are moving forward with the development and installation of a new cooling system (substitute circulated cooling system) that does not require an intentional discharge of radioactive substances and yet still cools the containment vessel thereby preventing pressure increases as part of measures to prevent containment vessel damage. During compliance inspections it was found that this system, which was conceived by TEPCO, is more effective than filter venting equipment. This new technical knowledge obtained during the course of new regulatory requirement compliance inspections will be leveraged during future regulatory reviews for other BWRs.

Furthermore, on July 27th and 28th, the Nuclear Regulation Authority conducted interviews with the site superintendent, site personnel, and contract workers as part of a survey on safety awareness at Kashiwazaki-Kariwa. Chairman Tanaka (former Chairman) commented that, "Workers in the field are positively engaging in their duties with pride and spirit. The site superintendent needs to show strong leadership."

Awareness survey by the Nuclear Regulation Authority (July 28)
[Interviewing Site Superintendent Shitara]

Promise to engage in efforts to improve safety

During the opinion exchange that occurred on July 10 between the Nuclear Regulation Authority and new TEPCO management, the Nuclear Regulation Authority commented that, "We do not see any autonomous decision-making or prioritization of the reduction of risks associated with the decommissioning of Fukushima Daiichi."

On August 25 we submitted in writing a resolution by the new management of TEPCO and its response to the discussion points brought up by the Nuclear Regulation Authority. TEPCO management then explained at the 33rd meeting of the Nuclear Regulation Authority on August 30 that, "we solemnly swear to never allow an accident such as this to occur again and will fulfill our responsibility to make decisions about, carry out and explain efforts to help Fukushima recover, decommission the Fukushima Daiichi NPS and provide compensation," and that "our efforts to improve nuclear safety will never end." The promise was also made during the 38th meeting of the Nuclear Regulation Authority held on September 20 that the aforementioned promise shall be noted in the safety regulations for nuclear reactor facilities and that the actions mentioned shall be carried out without fail into the future by TEPCO, the operator of these nuclear facilities.

TEPCO will formulate and carry out a detailed action plan that fulfills the promise. In particular, TEPCO leaders will visit to the siting community and promote dialogue with local residents in order to take their concerns into consideration and engage in independent action to fulfill our responsibilities.

TEPCO

Nuclear Safety Reform Plan Management Reform Progress

Nuclear Safety Reform Plan Progress Report (Management)

- The Nuclear Reform Monitoring Committee has suggested in regard to our nuclear safety reform that the reform/improvement activities of the entire organization be better aligned. In response to this we are promoting the use of a management model that puts forth common standards to be used to align these activities.
- The Nuclear Safety Advisory Board, which provides advice and guidance to nuclear leaders in regards to operations and management as a whole from the perspective of third-party, commenced action in August after making preparations in May.

Actions to better align the activities of the entire organization

Representatives from the power stations and the Head Office engage in discussions during performance review meetings (Fukushima Daini)

We are currently engaged in actions to promote understanding and use of the management model which was created to enable departments and individuals to engage in new duties with a common understanding of each other's roles and the ultimate objectives of the company. All personnel refer to the management model while engaging in their duties in order to achieve the final objective. By doing this they work together with an understanding of the correlation between their own duties and the duties of others which in turn cultivates a sense of unity and accelerates improvements.

At performance review meetings held at each power station, the focus of discussions is put on improvement measures for achieving the ideal states presented in the management model and not just on achieving fiscal year objectives. And, we are improving the quality of these meetings by creating a discussion environment in which all participants can frankly state their opinions to even parties in high positions about all issues, including issues that may be outside their field of expertise.

At the Fukushima Daiichi NPS, we have continued to develop internal communication and cultivate human resources, and the knowledge and lessons learned through projects and construction completed to date has been compiled into Fukushima Operating Experience Reports (FOER) based upon interviews with employees about their experience as well as created documents. These reports were then presented during a forum in order to ① share the information, ② question the work currently underway and ③ pass down knowledge to future generations.

FOER Forum (Fukushima Daiichi)

Initiatives to Improve Safety Consciousness

Field inspection by NSAB members (Fukushima Daini)

Exchange of opinions between power station executives (left) and the Nuclear Safety Oversight Office (right) (Fukushima Daiichi)

The Nuclear Safety Advisory Board (NSAB) that is comprised of five experts from overseas has commenced activities at Kashiwazaki-Kariwa and Fukushima Daini (August 21-25). The Board provided guidance and advice to nuclear power leaders in regards to the sure and steady implementation of training for emergency response personnel, how to leverage human performance tools within contracting companies and deliberating mitigation measures in accordance with the degree of risk (next meeting scheduled for December).

The Nuclear Safety Oversight Office emphasized the need for further enhancement of effective examination of improvement activities and preparations for emergency response procedures/training. Furthermore, in August we visited the headquarters of Duke Energy in the US and the McGuire power plant to engage in benchmarking as part of independent improvement activities. This made us aware of the gap that exists with our ability to logically give written accounts of problems and our processes for ascertaining behavioral trends. The excellence we learned about will be leveraged during training and to make improvement to processes.

Initiatives to Improve Technological Capability

Group manager training (Head Office)

Top: Response Center
Left: Training

Training in the Unit 5 ERC (Kashiwazaki-Kariwa)

Presentation at the Japan Society of Maintenology technology exchange session

Training for newly appointed group managers was held on September 22nd and 23rd. Training focused on leadership and expectations of management.

Training was conducted for the first time at the Unit 5 Emergency Response Center under construction at Kashiwazaki-Kariwa and it was confirmed that actions required to respond to an accident can be carried out suitably (September 28).

Kashiwazaki-Kariwa system engineers presented the achievements of system monitoring activities at a technology exchange session of the Japan Society of Maintenology which commended the efforts as helping to reduce risk.

Initiatives to improve the ability to promote dialogue

As part of countermeasures to deal with the insufficient handling of new regulatory requirement compliance inspections for Kashiwazaki-Kariwa Units 6/7 (insufficient explanations of the seismic resistance of the main anti-earthquake building, etc.), head office Nuclear Power Division managers have started participating in public hearings held in Niigata Prefecture for the purpose of directly feeling the uneasiness that the local residents harbor towards nuclear power generation and TEPCO (July 21), as of the end of September 38 managers have participated in these public hearings.

As part of continue its efforts to reform awareness, risk communicators are serving as instructors during awareness reform training for members of the head office Nuclear Power Division, Niigata Headquarters and Kashiwazaki-Kariwa that utilizes problems that have occurred at TEPCO to teach about information disclosure and communication (Started on September 11).

Public briefing by Nuclear Power Division managers (Niigata City)
[Left: Nuclear Power & Plant Siting Division Manger Makino]

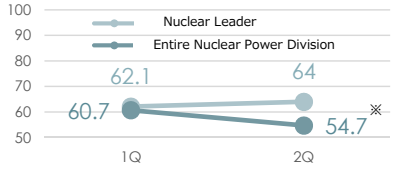
Information disclosure/communication awareness reform training (Kashiwazaki-Kariwa)

KPI Results

Safety Consciousness

Nuclear Leaders : **64.0**points

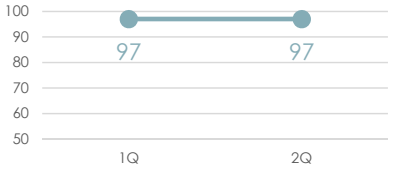
Entire Nuclear Power Division : **54.7**points



Technological Capability

Times of Non-emergency: Assessed at the end of the fiscal year

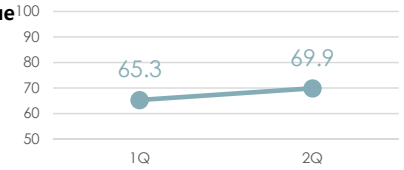
Times of emergency : **97**points



Ability to Promote Dialogue

Internal : **69.9**points

External : Assessed at the end of the fiscal year



※ Points dropped this term compared with the first quarter due to the recurrence of the same nonconformities that have occurred in the past. The effectiveness of recurrence prevention measures for the aforementioned nonconformities will be revised and improvements will be made.

TEPCO