

**“Keep the Fukushima Nuclear Accident firmly in mind;
We should be safer today than we were yesterday, and safer tomorrow than today.”**

- In order to live up to our resolution, we continue to promote nuclear safety reforms, steadily move forward with decommissioning and engage in activities to raise our power stations to the world’s highest level of safety.

Training to improve functions for sharing information

- At Fukushima Daiichi, emergency response training was implemented based upon the emergency response improvement plan and improvements have been made in functions for providing information to the Nuclear Regulation Authority, which was an issue that needed to be addressed.
- In preparation for dismantling the Unit 1/2 exhaust stack, a mockup of the exhaust stack was constructed off-site in order to examine the planned dismantling procedure.
- In regards to Unit 3 fuel-handling-machine equipment, safety inspections were performed and preparations have steadily moved forward in preparation for the commencement of fuel removal.

Launch of TEPCO Decommissioning Archive Center

- On November 30, the TEPCO Decommissioning Archive Center was opened to enable people to learn about the facts of the Fukushima Nuclear Accident and the current state of decommissioning.

Joint training to improve power stations’ capabilities to respond to fires

- At the Kashiwazaki-Kariwa, a fire occurred in the cable service tunnel on November 1. Information sharing with the public fire department at the scene of the fire was identified as an issue that needs to be addressed, so joint training with the public fire department was implemented, aiming to improve power stations’ capabilities to respond to fires.
- Applications were submitted to the Nuclear Regulation Authority for Unit 6 and Unit 7 reactor installation modification permits and an amendment to the Unit 7 workplan.

Nuclear Safety Reform Plan FY2018Q3 Progress Report Overview

Fukushima Daiichi NPS Progress of reactor decommissioning

Emergency response training based upon assessments by the Nuclear Regulation Authority (NRA)

Measures to improve emergency response training at Fukushima Daiichi are being implemented based upon the Emergency Response Improvement Plan (announced on August 27), which was formulated in the wake of harsh criticism of FY2017 training by the NRA. Functions for sharing information with the Nuclear Regulation Authority were made during general training on December 4, so the same measures will be implemented at Fukushima Daini. Furthermore, although the Nuclear Regulation Authority representative who observed the training stated that the required information could be understood for the most part, it was pointed out that the methods for explaining predictions about how accidents might unfold need to be further examined.



Emergency Response Center

Preparations to dismantle the Unit 1/2 exhaust Stack

To ensure the seismic resistance tolerance of the Unit 1/2 exhaust stack, the top of the steel frame that supports the stack, which is damaged, will be dismantled using remotely operated equipment. To ensure that the dismantling work goes smoothly, a mockup of the major parts of the exhaust stack, which is approximately 18m high, has been built off-site in order to examine dismantling procedures. Tests showed that major hindrances to the dismantling plan are not likely, so preparations to dismantle the stack began at Fukushima Daiichi in December. Procedures will continue to be examined in this manner to move forward with decommissioning while prioritizing safety.



Exhaust stack mockup used for procedure verification

Unit 3 fuel-handling machine safety inspections

Steps were taken to identify potential nonconformance with the Unit 3 fuel handling machine when temporary repairs were completed on September 27. Also, safety inspections (operation checks and equipment inspections) were implemented and quality management was examined. A total of 14 safety nonconformance issues were identified and countermeasures were implemented during January 2019. During the quality management check, the reliability of all site products (79 pieces of equipment) was assessed based on ordering specifications and records, etc., and additional safety inspections were performed for pieces of equipment for which records could not be examined. These procedures confirmed satisfactory reliability. In preparation for the commencement of fuel removal, nonconformance issues will be addressed, function checks will be performed after repairs have been made, and preparations, such as fuel removal training, etc., will move steadily forward.



Unit 3 fuel handling machine (top), crane (bottom)

Nuclear Safety Reform Plan FY2018Q3 Progress Report Overview

Kashiwazaki-Kariwa NPS Progress of safety measures

Cable service tunnel fire

A fire occurred in a cable service tunnel on site on November 1. The fire melted a splice in the cables that provide power to the plant from emergency power generators located on high ground, so the aforementioned splice was removed and subjected to detailed inspection. Due to the clumsiness with sending batch faxes to related agencies and problems with sharing information between the TEPCO field commander and the public fire department, the procedures for sending batch faxes were revised, the people in charge of sending these faxes were educated and joint review meetings and firefighting training were conducted with the public fire department. Training will be continually repeated to improve the power station's ability to respond to fires.



Joint firefighting training (December 19)

Submission of applications for reactor installation modification permit and workplan authorization

Applications were submitted to the Nuclear Regulation Authority for Unit 6 and Unit 7 reactor installation modification permits (December 12) and an amendment to the Unit 7 workplan (December 13). Changes have been made to the reactor installation modification in conjunction with design changes made to improve safety and satisfy regulatory revisions made after the New Regulatory Requirements were issued. The changes were explained to local media outlets during superintendent press conferences held in November and December. We will continue our initiatives to implement voluntary safety improvements.



Superintendent press conference

Decommissioning Archive Center opened

On November 30, the TEPCO Decommissioning Archive Center was opened. The intent of the archive is to enable as many people as possible from Fukushima and surrounding communities, as well as people throughout Japan and overseas, to learn about the facts of the Fukushima Nuclear Accident and the current state of decommissioning, aiming to pass down lessons learned from the accident and to continually reflect upon the incident. The archive uses videos, models, and panel displays to explain how the nuclear accident unfolded and progress being achieved with the decommissioning. As of the end of December, the Archive has had approximately 3,300 visitors from within and outside the prefecture.



1st floor display (decommissioning field work)



Reviews on nuclear safety

- During the third quarter, many reviews were implemented, such as key self-assessments based upon the Management Model, internal oversight activities by the Nuclear Safety Oversight Office, and assistance from the Nuclear Safety Advisory Board.
- The progress of nuclear safety reforms was also assessed based upon issues pointed out by the Nuclear Reform Monitoring Committee.
- An inspection team comprising decommissioning experts from the International Atomic Energy Agency (IAEA) also visited the site and provided advice as well as commended the many improvements that they observed.

Weakness in external communication and technology

- A number of incidents occurred due to insufficient technological or communications capabilities, such as our inadequate response to a cable-service-tunnel fire at Kashiwazaki-Kariwa, insufficient explanations of treated water analysis results from Fukushima Daiichi, and nonconformance issues pertaining to the Unit 3 fuel-handling machine. Although countermeasures have been implemented for each of these incidents, such occurrences are not being prevented overall.
- In addition to acknowledging our weakness in external communication, including disseminating understandable information, these occurrences have been a painful reminder of our technological weaknesses in examining the quality of our equipment and work processes, and in making improvements on our own. We have now commenced initiatives to address these issues.

Nuclear Safety Reform Plan Progress Report (Management)

Key self-assessments based on the Management Model

- Managers in charge of promoting improvements in each functional area (CFAM at HQ and SFAM at power stations) are formulating key self-assessment plans (biannual) in each of the areas defined by the Management Model. These efforts are part of realizing an organization based on the world's highest levels of safety. During the third quarter, key self-assessments were performed in the areas of work management, operations, chemistry, and safety culture. Countermeasures for weaknesses identified through these assessments shall be proposed and implemented.

Internal oversight department activities

- During the third quarter, the Nuclear Safety Oversight Office, which is an independent internal oversight department, made a number of suggestions.
- It was noted that practical education and training should be provided to in-house fire brigade personnel. Duties must be clarified based on the unique circumstances of nuclear power plants and the requirements needed to perform these duties.
- In order to share knowledge between personnel working on different decommissioning projects, detailed methods should be developed for accumulating and leveraging experiences, which would help to further decommissioning efforts.

Assistance from the Nuclear Safety Advisory Board

- The nuclear leaders continues to receive advice and instruction from overseas experts, the Nuclear Safety Advisory Board, that have experience as nuclear power division general managers and site superintendents. In addition to the fourth (October; Kashiwazaki-Kariwa and headquarters), and fifth reviews (December 7: Fukushima Daini and Headquarters), improvements to emergency response training were also examined during October. During emergency response training, a certain degree of improvement was seen with the sharing of information with the Nuclear Regulation Authority, and advice was given on how to make further improvements

International Atomic Energy Agency (IAEA) review mission

- An inspection team of experts from the International Atomic Energy Agency (IAEA) visited Fukushima Daiichi from November 5 to 13 to review progress with decommissioning. In the overview of their inspection report, we were commended for "making a successful transition from a state of emergency to one of stability," and for "numerous improvements that could be seen since the last mission." The report included 17 other commendations and 21 items of advice.



Field inspection

Nuclear Safety Reform Plan Progress Report (Management)

Initiatives to Improve Safety Consciousness

To improve safety awareness, nuclear leaders are creating benchmarks based on overseas nuclear power stations that have excellent reputations and studying their organizational management.

The Fukushima Daini superintendent and operations CFAM manager (at HQ) visited the Southern Company's Vogtle Nuclear Power Station and the headquarters of Duke Energy. Organizational management and operational priorities were benchmarked. These learnings, and best practices for issue analysis, etc., will be proactively employed.

During training to learn about severe accidents both within and outside of Japan, our personnel learned about the background of the Chernobyl accident from American experts who had been dispatched to Chernobyl to investigate the accident and interview operators. During group discussions, the participants talked about what aspects should be reflected at TEPCO.



Vogtle Nuclear Power Station



Group discussion of Chernobyl accident

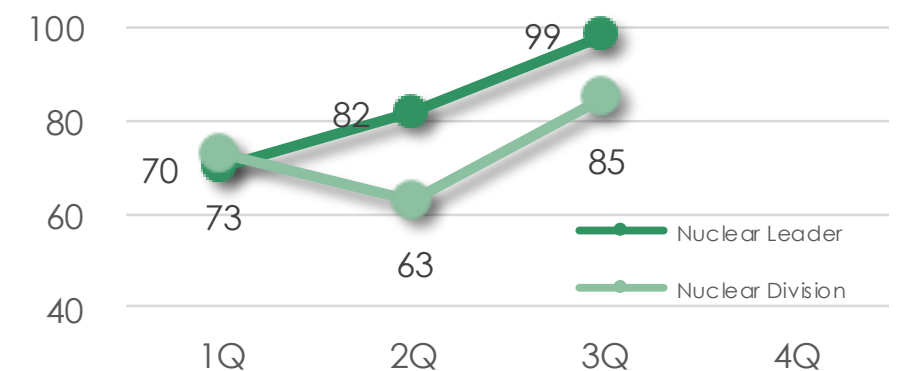
KPI Results* - Safety Consciousness

- Five KPI were added to the FY2018 KPI to reflect progress in safety reforms (reported in the FY2017Q4 progress report) and targets were raised by 10 points over FY2018 levels. We aim to achieve these targets by the end of the fiscal year.

Nuclear leaders : **99 points**

Entire Nuclear Power Division: **85 points**

(Target: 80 points)



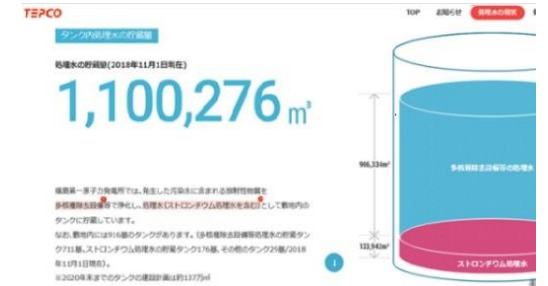
Nuclear Safety Reform Plan Progress Report (Management)

Initiatives to Improve the Ability to Promote Dialogue

Although initiatives to improve our external communication capabilities are underway, a rash of unfortunate incidents prompted us to commence initiatives to make further improvements, including to disseminate more understandable information.

When releasing the results of our analysis of water that had been purified after being contaminated with radioactive substances, the information provided was not easily understood. In light of this, a treated water portal was created on the TEPCO website (December 10). Those who have viewed the site have said that it is simple and visually easy to understand.

A meeting of the Community Council on ensuring Transparency at the Kashiwazaki-Kariwa Nuclear Power Station was held on November 21. The TEPCO president attended this annual information-sharing meeting, joining the prefectural governor and city and village mayors. TEPCO conveyed its regrets about the cable service tunnel fire and corporate communications to the council members, who responded by stating their opinions regarding insufficiencies in how information was conveyed about the fire and concerning TEPCO television commercials.



Treated water portal site



Community Council

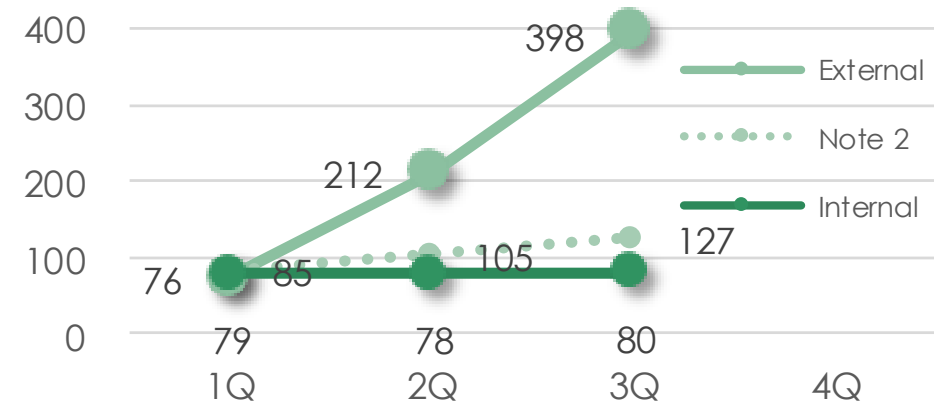
KPI Results* - Ability to Promote Dialogue

- Five KPI were added to the FY2018 KPI to reflect progress in safety reforms (reported in the FY2017Q4 progress report) and targets were raised by 10 points over FY2018 levels. We aim to achieve these targets by the end of the fiscal year.

Internal: **80 points**

External: **398 points**

(Target: 80 points)



Notes: Q3 points for Ability to Promote Dialogue (External) increased substantially due to receiving more than 50,000 opinions during visits to all homes in the Kashiwazaki-Kariwa region. Also, the dotted line for Ability to Promote Dialogue (external) is for reference and excludes points for opinions received during visits to all homes.

Nuclear Safety Reform Plan Progress Report (Management)

Initiatives to Improve Technological Capability

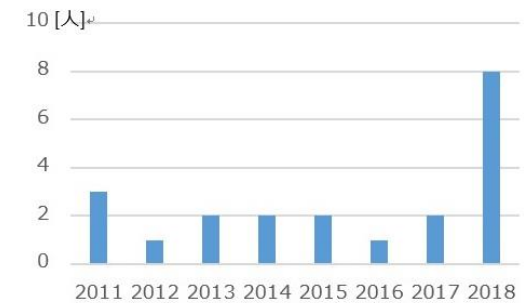
Although initiatives to improve technological capabilities are underway, we have been made painfully aware once again of our weaknesses in examining equipment and work processes and making improvements on our own. In response, efforts aimed at realizing further improvements have commenced.

As part of our adoption of Toyota-based Kaizen practices, we automated our creation of lists of power equipment to be inspected at Fukushima Daiichi, thereby reducing the risk of mistakes. Also, radiation sample pump inspections are now being performed in-house at Kashiwazaki-Kariwa, thereby reducing workload and offline time by 60%.

To support personnel taking the oral exam for senior reactor engineers (secondary exam), they were provided with examples of common problems and mock exams. As a result of this support, eight people passed this year's exam, a dramatic improvement over recent years when typically only two or three people have passed.



Kaizen Instruction



Trend in the number of people that have passed the oral exam for senior reactor engineers

KPI Results* - Technological Capability

- Five KPI were added to the FY2018 KPI to reflect progress in safety reforms (reported in the FY2017Q4 progress report) and targets were raised by 10 points over FY2018 levels. We aim to achieve these targets by the end of the fiscal year.

Times of non-emergency: **109 points**

Times of emergency: **90 points**

(Target: 110 points)

