

Nuclear Safety Reform Plan FY2018 – Overview of Q1 Progress Report

Q1 Progress

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

We continue to promote nuclear safety reforms and engage in activities to make the safety levels of our power stations the highest in the world.

TEPCO will move forward with the examination of detailed plans for the decommissioning of all reactors of Fukushima Daini

Having determined that a continued lack of clarity with regard to the future of Fukushima Daini would only hinder recovery efforts in Fukushima, TEPCO stated on June 14 that we will move forward with the examination of detailed plans for the decommissioning of all. As the final decision on these matters must be made in consideration of the feelings of the local community –with regard to the decommissioning of Fukushima Daini and of Fukushima Daiichi – explanations will be given to stakeholders and decisions made after securing their understanding and cooperation.

TEPCO will continue to revise internal education programs for emergency response personnel.

A report on the findings of the investigation into the problems surrounding the notification and reporting of the core meltdowns during the Fukushima Nuclear Accident was received from the TEPCO HD/Niigata Prefecture Joint Investigation Committee on May 18. We have taken to heart the “lessons to be learned” it contained and will continue to revise internal education programs for emergency response personnel, and cultivate in-house experts based upon the publicly announced “TEPCO APOLOGIZES FOR PREVIOUS LEADERSHIP'S FAILURE” document*, in an effort to further improve our ability to respond to any accidents and disseminate information.

**"Countermeasures in respect of our Failure to Notify and Report Events during the Fukushima Nuclear Accident (June 21, 2016) (available only in Japanese)"*

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Fukushima Daiichi NPS Progress of reactor decommissioning

Unlike Units 1 and 3, Unit 2 did not experience a hydrogen explosion and was spared from any damage to its reactor building. Therefore, in preparation for the removal of fuel from the spent fuel pool, **an opening was made to provide access to the operating floor** on June 21. Going forward we shall **use remotely operated robots to measure radiation levels and take photographs** primarily of the area around the opening.

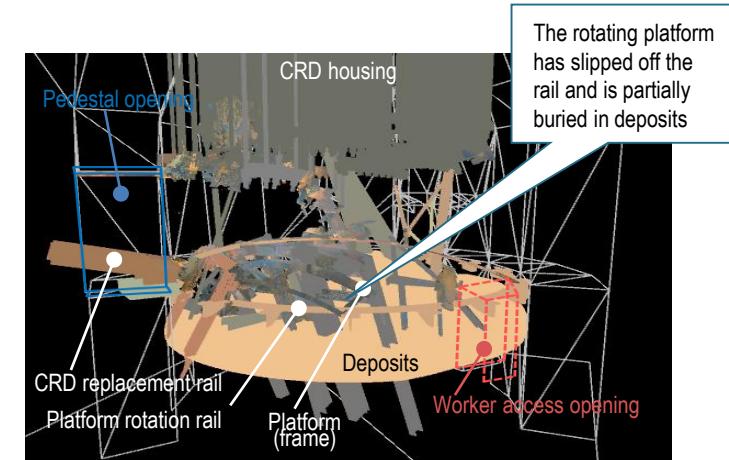
At Unit 3 we have **rendered a 3D image of the inside of the pedestal** using images taken during the Unit 3 PCV internal investigation conducted in July 2017, aimed at ascertaining conditions inside the pedestal. The rendering has provided a visual representation of the relative position of structures inside the pedestal, such as the rotating platform which appears to have slipped off its rail and is partially buried under deposits. These results will be used **to inform our continued deliberations on aspects of the fuel debris removal**, such the design of the fuel removal apparatus.

At Unit 3, we have also **completed installation of the fuel handling machine, crane and all eight sections of the domed roof** in preparation for fuel removal from the spent fuel pool, **and trial operation of the fuel handling machine has begun**.

We have determined that the crane control panel nonconformity on May 11 was caused by the tripping of surge protectors inside the control panel that were still set to factory settings of 380 volts when subjected to the 480 volts used at the power station. The failure to reset the surge protectors to match the voltages used at the power station will be subjected to root cause analysis, as will the damage to certain pieces of equipment that has occurred since March.



Opening in the west side of the Unit 2 reactor building



Rendered 3D image



Trial operation on the Unit 3 reactor buildings operating floor.

Nuclear Safety Reform Plan FY2018 – Overview of Q1 Progress Report

Kashiwazaki-Kariwa NPS Progress of safety measures

An access road of approximately 1.9km in length, from the Main Administration Building to the Unit 5 Emergency Response Center, was rebuilt in March at a height of 12 meters above sea level, high enough to make it safe from most tsunamis. **A fire break approximately 20m wide and 1.6km long was also created** to protect this newly-built access route from forest fires. To enhance its resistance to fire, **mortar was sprayed on the road and it was paved with asphalt** to prevent vegetation from growing.



Fire belt (prior to construction)



Fire belt (after construction)

On July 2, **the training assessment results for each power station for FY2017 were released by the Nuclear Regulation Authority.** Various aspects were assessed on a three-step scale, with the average achievement of an “A” rating, the highest possible, falling from 76% in FY2016 to 56% in FY2017 across all three power stations. An “A” rating was not achieved in the category of “sharing information with the Nuclear Regulation Authority”, due to a failure to fully respond to situations where plant data could not be sent from plant data systems and when explanations were not provided by TEPCO. During this fiscal year improvements will be made through the assignment of information sharing officers to ensure that during any emergency, information is shared in a timely manner between the power stations, headquarters and the Nuclear Regulation Authority.

The Unit 5 ERC simulator constructed in the Unit 5 service building for training purposes was used for the first time on May 29th. Training was conducted based on a scenario where both Unit 6 and Unit 7 were damaged by an earthquake. It was **confirmed that nuclear preparedness personnel from the power station were able to assemble, establish command in the ERC, share information and make decisions about repair plans and priorities.**

The ERC simulator in the Unit 5 service building can be used to practice assembling in times of emergency and will be proactively leveraged until construction of the Unit 5 ERC is finished.



Top left: Simulated ERC,
Bottom right: Training in the simulated ERC
(Kashiwazaki-Kariwa)

Nuclear Safety Reform Plan – Management Reform Progress

Nuclear Safety Reform Plan Progress Report (Management)

Despite the implementation of six countermeasures aimed at breaking the so-called "negative spiral" that has exacerbated structural problems in the Nuclear Power Division, the results of the FY2016 self-assessment have shown that further improvements are required; we are therefore engaged in efforts to further strengthen governance and develop internal communication in accordance with the Nuclear Safety Reform Plan.



Creation of a management model in the Nuclear Power & Plant Siting Division

As part of our efforts to strengthen governance, in June 2017 we created a Management Model in the Nuclear Power & Plant Siting Division aimed at enabling all personnel to make improvements to their duties; this was based on an awareness of safety improvements, the ability to promote dialogue and on technological capabilities as a step towards becoming an organization with the world's highest levels of safety. In FY2018 we will move forward with creating business plans based upon this Management Model and other activities aimed at promoting excellence.

TEPCO joins the Atomic Energy Association (ATENA)

In order to contribute to the improvement of not only our own safety, but also the safety of the entire nuclear power industry, in July 2018 we joined the ATENA, which was created to enable operators, manufacturers and existing organizations to cooperate and make voluntary nuclear safety improvements. This is in addition to our participation in the World Association of Nuclear Operators (WANO) and the Japan Nuclear Safety Institute (JANSI). We will continue to proactively participate in other external initiatives that aim to improve nuclear safety.

Nuclear Safety Reform Plan – Management Reform Progress

Actions to Better Align the Vectors of the Entire Organization

In order to help employees better understand and become more involved in this fiscal year's business plan, **on June 8th we arranged a staff briefing covering what we considered to be most the important issues highlighted in the business plan.** The briefing was carried out by means of a teleconference between our headquarters, each power station and the Niigata headquarters. This allowed nuclear power leaders, such as division managers and site superintendents, to directly explain to staff the important issues that the Nuclear Power Division faces in terms of work environments and the Management Model, and to talk about each organization's efforts to address these issues.



Briefing on key issues
(Headquarters)

Since April 2015, Corporate Functional Area Managers (CFAMs; headquarter leaders of activities aimed at achieving the world's highest levels of safety in each functional area) and Site Functional Area Managers (SFAMs; CFAM counterparts at power stations) have been assigned to each functional area of the Management Model in order to identify excellent working practices in overseas countries, identify issues that need addressing, and propose and implement improvements. Since FY2017, **managers trained by US experts have been closely observing field conditions in order to accurately identify problems;** in FY2018, managers in the maintenance field began coaching their subordinates in the skills of management observation. **These coaching sessions have taken place a total of 81 times at Fukushima Daini and Kashiwazaki-Kariwa,** and the skills needed to drive improvements are permeating through all levels of the company.

We have also received much valuable advice from third-party reviews conducted by WANO and other organizations concerning CFAM-focused initiatives which will contribute to future improvements. CFAM's will lead the way in making further technical improvements by proactively incorporating this external advice whenever it is appropriate.

Nuclear Safety Reform Plan – Management Reform Progress

Initiatives to Improve Safety Consciousness

Self-assessment

A self-assessment process has been introduced in order to allow employees to focus on addressing the most important issues in their respective fields. Third-party reviewers have commended us on these initiatives. At Kashiwazaki-Kariwa, a self-assessment of important issues in contaminant control was conducted by the maintenance department on May 24th and 25th, and improvement measures such as the conveying of information on case studies and the incorporation of contaminant management into management processes are underway.



Contaminant control self-assessment
(Kashiwazaki-Kariwa)

Monitoring safety

Nuclear Safety Oversight Office (NSOO) Director John Crofts has resigned from his position as Managing Executive Officer and he will now act as a Nuclear Safety Advisor. The NSOO will continue to diligently monitor safety with the passion, sense of values and methodology instilled by Director Crofts.



Report on the results of oversight to the
superintendent from the Nuclear Safety
Oversight Office (Kashiwazaki-Kariwa)

KPI Results - Safety Consciousness *

Nuclear Power Leaders: **85 points** (target: 80 points)

Entire Nuclear Power Division: **73 points** (target: 80 points)

**In addition to adding new related PI (5) (FY2017Q4 Progress Report) to the FY2018 KPIs in order to reflect the progress of safety reforms, we increased targets by 10 points over FY2017 and aim to achieve these by the end of the fiscal year.*

Nuclear Safety Reform Plan – Management Reform Progress

Initiatives to improve the Promotion of Dialogue

Distribution of “Hairomichi”

When it was first published, approximately 10,000 copies of the Fukushima Daiichi decommissioning information magazine “Hairomichi” were printed. However, we have obtained approval from surrounding cities, towns and villages to distribute the magazine to all households and are in the process of gradually expanding distribution. On April 10, 34,000 copies of issue #7 were distributed, and on June 10, 40,000 copies of issue #8 were distributed. Recipients’ comments included “the magazine is written from the perspective of the local community.”



Decommissioning info mag “Hairomichi” (Issue #7, #8)

Virtual Reality (VR) presentations

We have updated the VR software and equipment we use to explain power station safety measures in an easy-to-understand manner to those who are unable to visit the Kashiwazaki-Kariwa Nuclear Power Station. We have also added content including movies that use a combination of computer graphics, 360° panorama views and animation, as well as an overall view of the safety measures at the power station. Those that have used the VR facility commented that they now want to visit the site, and many said they felt like they were actually there.



Utilizing virtual reality to give explanations

KPI Results* - Ability to Promote Dialogue

Internal: **79 points** (target: 80 points)

External: **76 points** (target: 80 points)

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Nuclear Safety Reform Plan – Management Reform Progress

Initiatives to improve Technical Capabilities

Training on the new regulatory requirements

“Kashiwazaki-Kariwa Unit 6/7 Installation Permit Modification Permission Training” was implemented at Kashiwazaki-Kariwa and Fukushima Daini as part of training on the new regulatory requirements. In this fiscal year we have expanded training to site managers and representatives of more than 40 contractors, in addition to TEPCO employees, in order to foster an understanding of the legal basis for the updating of safety measures.

Group study sessions

At the Nuclear Human Resource Training Center, lectures are being given on specific fields of expertise, and support is being offered in various offices by means of voluntary group study sessions, in order to help those studying for the licensed reactor engineer exam to pass it with flying colors. Eight people accordingly passed the 60th licensed reactor engineer written exam in March.

KPI Results* - Technological Capability

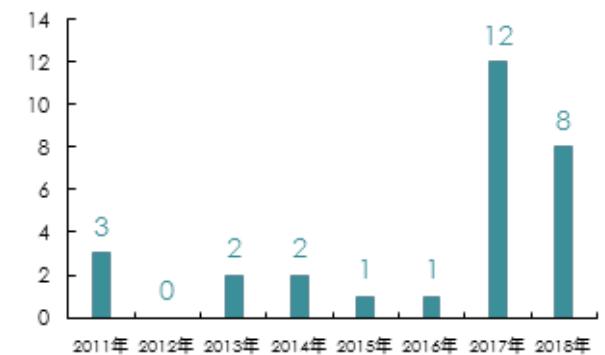
Times of non-emergency: **81 points** (target: 110 points)

Times of emergency: **81 points** (target: 110 points)

*In addition to adding new related PI (5) (FY2017Q4 Progress Report) to the FY2018 KPIs in order to reflect the progress of safety reforms, we increased targets by 10 points over FY2017 and aim to achieve these by the end of the fiscal year.



Lectures on the new regulatory requirements for contractors (Kashiwazaki-Kariwa)



Trends in the number of people that have passed the written exam for licensed reactor engineer