

# Nuclear Safety Reform Plan: Overview of Progress in Q4 Fiscal 2017 (ended March 2018)

- TEPCO continues to implement nuclear safety reforms and initiatives, aiming at raising its power stations to the world's highest levels of safety. These efforts are in keeping with TEPCO's commitment 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."
- On April 1, the Fukushima Daiichi D&D Engineering welcomed Akira Ono as a new president, who is determined to engage stakeholders and address the concerns of the local community while continuing to fulfill the company's responsibilities as the main entity in charge of decommissioning.
- On March 30, the Niigata Headquarters created the "Mamoru (protect), Sonaeru (prepare), Kotaeru (respond) Action Plan" (hereinafter "Action Plan") to convey the company's desire to become even more involved with the people of the Kashiwazaki-Kariwa region and Niigata Prefecture. The five tenants of this Action Plan are to improve safety, build management structures, assist with preparedness, contribute to the community, and listen and engage in dialogue.

## Fukushima Daiichi NPS Progress in reactor decommissioning

Preparations continued to remove the fuel from the spent fuel pools at Unit 1 and Unit 3.

At Unit 1, we started removing rubble on the north side of the reactor building's operating floor using a suction device. (January 22)

At Unit 3, we installed all eight sections of the domed roof (completed on February 23) and will start removing fuel in the middle of FY2018. To prepare for emergencies, we began training on how to use a concrete pump truck to inject coolant into the spent fuel pool, confirming that such operations can be performed quickly. (March 20)



Start of rubble removal from top floor of Unit 1 reactor building (Jan. 22)



Completing domed roof of Unit 3 fuel removal cover (Feb. 23)



Training in using concrete pump trucks to inject coolant into Unit 3 (March 20)

An internal investigation of the Unit 2 primary containment vessel (PCV) was conducted in preparation for fuel debris removal. (January 19)

The investigation found that parts of fuel assemblies within the reactor had fallen and that there are pebble- and clay-like deposits at the bottom of the pedestal. It is hypothesized that molten fuel damaged the reactor pressure vessel and fell to the bottom (inside the pedestal), and that the deposits are fuel debris.



Deposits and parts of fuel assemblies observed during internal investigation of Unit 2 PCV (Jan. 19)

## Kashiwazaki-Kariwa NPS Progress in safety measures

Having learned much from responding to the Fukushima Nuclear Accident, the Niigata Chuetsu-Oki Earthquake, equipment trouble and worker accidents, we decided to apply these lessons by constructing a two-story, "Industry Safety Training Center" where workers can experience simulated emergency-like conditions and observe actual equipment that failed or was damaged. The first floor is used for emergency simulations under controlled conditions to help worker recognize, predict, and avoid worker-related risks. The second floor has movies, information panels, actual pieces of equipment and models to teach workers about safety awareness and help them to prevent similar accidents from happening again.



1st floor Industry Safety Training Center. Left: Training to anticipate dangers when working in high places. Right: Workers experiencing hanging from safety belts

2nd floor exhibition space. Left: Power distribution panel that caught on fire as a result of an electrical short. Right: Part of a transformer that was damaged in the Niigata Chuetsu-Oki Earthquake



Under the Action Plan announced on March 30, the function of the Niigata Headquarters to assist with evacuations was expanded on April 1. Work related to preparedness and evacuation support, which had been handled by the Niigata Headquarters (in Niigata city), was moved to the *Mamoru, Sonaeru, Kotaeru* office in Kashiwazaki, which is undertaking Action Plan initiatives.

Also, a cooperative network linking TEPCO offices in Niigata and neighboring prefectures with the Niigata HQ and KK offices was created to increase the number of first responders from approximately 50 to 140. The increase, in addition to supporting the rapid drafting of detailed evacuation plans in emergencies, will also enable us to better engage community residents in dialog and then appropriately reflect their concerns in our preparedness and evacuation-assistance initiatives.

# Nuclear Safety Reform Plan: Progress in Management Areas

- To better align conditions throughout our organization for nuclear safety reform and improvement, we are promoting better understanding of the management model that underpins these activities and the ideal behaviors for each field of operation ("Fundamentals").
- Following the 14th Nuclear Reform Monitoring Committee's recognition that the practice of self assessment is of extreme importance, we have launched internal reviews of five issues deemed to be of vital importance: Strengthening the Organization and Governance, Strengthening Education & Training, Improving Communication, Strengthening Nuclear Safety Culture, and Improving Internal Oversight Functions. Through self assessment, we aim to strengthen our ability to make improvements and foster a stronger "learning attitude" throughout our organization.



## Assessment of risk management and human error

Since 2015, Corporate Functional Area Managers (CFAMs; headquarters-based leaders of activities aimed at achieving global top-level performance in each functional area) and Site Functional Area Managers (SFAMs; CFAM counterparts at power stations) have been responsible for identifying gaps and planning/implementing actions. In Q3, the CFAM/SFAMs were reorganized, new goals and key success factors were established, and various initiatives were undertaken to enhance consistency with the company's management model.

In Q4, follow-up activities were reflected in plans for FY2018, which began in April. In addition, CFAM/SFAM teams assessed risk management and common factors in human errors to raise each functional unit's performance to top global levels.

Comparisons were made with best practices adopted in the global nuclear industry and follow-up analysis was conducted to examine issues concerning risk-management processes and procedures that had been identified in previous reviews. It was determined that improvements are needed in regard to the classification and quantification of risk.

Also, Performance Improvement CFAM worked with representatives from operations, maintenance, radiological protection, etc. to analyze common factors involved in human errors. As a result, it was found that performance tools created to prevent human errors have not been fully leveraged nor have they been fully adopted throughout the organization.

TEPCO employees and contractors are now taking concrete steps to implement improvements in these areas.



Risk management self-assessment (Fukushima Daini)

### Initiatives to Improve Safety Awareness



Dialogue with contractors about nuclear safety culture (Feb. 9)



NSOO Director reporting oversight findings to superintendents (Kashiwazaki-Kariwa)

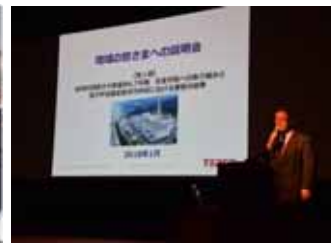
We continued to engage in dialogue with contractors to cultivate a stronger nuclear-safety culture and emphasize that performing high-quality work leads to nuclear safety. Our nuclear leaders met for an internal safety meeting (March 6) to reflect on the state of nuclear safety culture within their own departments and to share best practices.

To maintain and improve nuclear safety, the Nuclear Safety Oversight Office oversees and assesses organizational change management, emergency training, and design management at Headquarters and each power station. Recommendations are made as needed based upon the results of this oversight and assessment, and subsequent implementation is confirmed.

### Initiatives to Better Promote Dialogue



Communication event (HQ)



Briefing for Kashiwazaki community (Jan. 30)

An internal communication event was held so employees in different departments could become better acquainted (Feb. 26). A member of the TEPCO Engineering Strategy Research Center taught participants about effective communication and how to recognize personal strengths/weaknesses and communication styles of themselves and their counterparts.

Briefings were held for local residents in Kashiwazaki (Jan. 30) and Kariwa (Jan. 31), attracting a total of 150 residents. Reports were given about safety measures underway at KK's units 6 and 7 and the results of the regulatory review of reactor installation permit application. Opinions expressed during the briefings will be carefully considered for incorporation by the power station.

### Initiatives to Improve Technical Capabilities



Pilot training for design engineers (HQ)



Training on event reporting in emergency response drill (HQ)

At Headquarters, a pilot training program for engineers engaged in design work got underway. Takeaways from the program will be used to revise educational materials and finalize the program, aiming at launching training for power station workers within 2018.

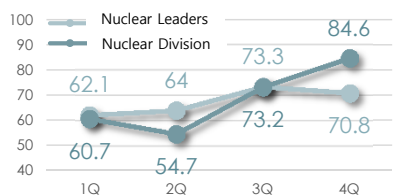
Comprehensive emergency response drill was held at Fukushima Daini (Feb. 2) and Kashiwazaki-Kariwa (Mar. 2). Information sharing, which has been identified as an issue in the past, improved noticeably the drill. However, other issues were identified, such as responding to scenarios uncommon to Fukushima Daini and sharing information when the Kashiwazaki-Kariwa plant is experiencing a crisis, which require the implementation of remedial measures without fail.

## KPI Results

### Safety Awareness

Nuclear Leaders: **70.8** points (Target: 70 points)

Nuclear Division: **84.6** points (Target: 70 points)

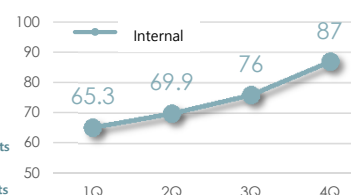


### Ability to Promote Dialogue

Internal: **87** points (Target: 70 points)

External: (Target: YoY increase)

Quality/quantity of disseminated information: **+1.0** points  
Approach/awareness re corporate comms and listening to society: **+1.0** points



### Technical Capabilities

Non-emergencies: **83** points (FY2017 avg.) (Target: 100 points)

Emergencies: **97** points (Target: 100 points)

