

- In order 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 operators that keep creating unparalleled safety.” we continue to move forward with the Nuclear Safety Reform Plan as we aim to make our power stations the safest in the world.
- At the meeting of the Nuclear Reform Monitoring Committee held on September 2, we reported the results of our self-assessment of the Nuclear Safety Reform Plan. Whereas reforms are moving forward, such as increased awareness of nuclear safety, there still needs to be further improvement in regards to governance enhancement and human asset cultivation if we are to achieve the world’s highest level of safety. Moving forward we shall make sure nuclear power leaders are proactively making their intentions known and that the instructions they are giving are being carried out (governance improvements) as we enhance our technical and management skills through training mainly at nuclear human resource development center .

1. Progress status of safety measures at power stations

- ◆ At Fukushima Daiichi, removal of the Unit 1 Reactor Building wall panels has begun, the cooling loop within recirculated cooling water injection system has been shortened and put into use, and incidents of heat stroke have been greatly reduced through effective heat stroke countermeasures.
- ◆ At Fukushima Daini, core security awareness and overall management are being enhanced in light of the incident by which we became aware of insufficiencies in regards to security monitoring.
- ◆ At Kashiwazaki-Kariwa we are moving steadily forward with the implementation of safety measures for every type of hazard

Fukushima Daiichi Nuclear Power Station

Commencement of removal of wall panels as part of Unit 1 reactor building cover dismantling

- Now that vacuuming of small debris (May 30 through August 2) and the application of dispersion prevention agents (August 4 through September 3) has been completed, the removal of wall panels has commenced (September 13).
- Removal of the upper wall panels has been completed (October 7)
- Work will continue with the objective of commencing removal of fuel from the pool during FY 2020

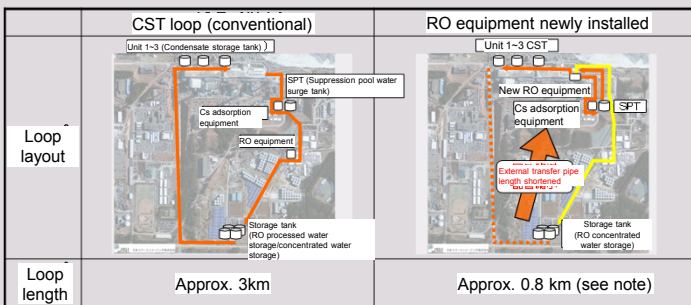


Lowering wall panels

Removal of upper wall panels completed

Shortening of the cooling loop within recirculated cooling water injection system has been completed (put into use on October 7)

- This project resulted in shortening of the length of the outdoor transfer pipes from approximately 3 km to approximately 0.8 km.
- By installing RO equipment (reverse osmosis membrane desalination system), which is part of the recirculated cooling water injection loop that is used to transfer/manage contaminated water and inject cooling water into the reactor, into the Unit 4 turbine building the length of this loop has been shortened thereby reducing the risk of leaks from outdoor transfer pipes



(Note) The length of external transfer pipes is approximately 2.1km is transfer lines for water accumulated in buildings is included.

The opening of the new main office building now enables the new office wing to be used as office space for contractors

- In conjunction with opening of the new main office building, the new office wing, which had been used for TEPCO offices, will be used by contractors starting in February of next year.
- This will enable contractors to manage work from a location close to the field and also keep in close contact and communication with TEPCO



New office wing (to be used by contractors)

New main office building



Trends in the number of incidents of heat stroke

incidents of heat stroke have been greatly reduced through effective countermeasures

- As a result of improving the on-site work environment, workers can now engage in work in approximately 90% of the area wearing only dust masks and general work clothes thereby greatly reducing the burden on workers.
- The effectiveness of heat stroke prevention measures has been enhanced through such measures as engaging in work in the early morning and at night rather than working under the hot blazing sun, posting WBGT values/times in the field, and using mobile water dispensers in the field.

Fukushima Daini Nuclear Power Station

A warning was received from the Nuclear Regulation Authority for failure to comply with core material protection regulations (September 12)

- Monitoring equipment is in operation 24 hours a day at our nuclear power stations but at the Fukushima Daini Nuclear Power Station intruder alarms had been shut off and were replaced with substitute measures due to the frequent occurrence of false alarms.
- However, these substitute measures were deemed insufficient by the Nuclear Regulation Authority
- Since this was the result of a lack of awareness in regards to core security on behalf of core material protection officers, including core material protection managers, and insufficient efforts/mechanisms by the organization to implement drastic countermeasures to prevent false alarms, Efforts are underway to improve the awareness of those involved with core material protection and enhance the function of the organization to perform checks.

Kashiwazaki-Kariwa Nuclear Power Station

As a lesson learned from the Fukushima Nuclear Accident safety measures are being steadily implemented for not just earthquakes and tsunamis, but all hazards that have the potential to result in a severe accident

- In order to further reduce the amount of radioactive substances discharged during venting of the Primary Containment Vessel, containment vessel pH control equipment is being installed in order to catch iodine by maintaining the acidity of suppression pool water (Units 6 and 7)
- In order to prevent the excessive exposure of emergency response personnel, lead shield plates have been installed (completed on August 31) on the outside of the main anti-earthquake building in addition to the shielding walls that have already been installed (completed on March 31)
- On July 22, the Nuclear Regulation Authority conducted an on-site inspection to confirm compliance with the new safety regulations at Units 6 and 7 and inspect safety countermeasure equipment installed after the last inspection (December 12, 2014)
 - The Nuclear Regulation Authority commented that, “Progress has been seen with new safety measure equipment. We believe that during the inspection discussions can be held about the details of these measures.”



Shielding material installed on the outside walls of the main anti-earthquake building in order to prevent excessive exposure to emergency response personnel



On-site inspection by the Nuclear Regulation Authority (above-ground filter events)

2. Nuclear Safety Reform Plan (Management) Progress Status

- ◆ In order to clarify the chain of command, enhance mechanisms for confirming that orders have been carried out and accelerate performance improvements, we are making sure that all employees retain a questioning attitude and are establishing new management models based on knowledge gained from the world's leading nuclear operators.
- ◆ At the Nuclear Human Resource Training Center the reconstruction of education and training programs based on the results of overseas benchmarking has commenced. New training programs are being developed, such as safety field certification training, and training on engineering fundamentals, etc., has begun.
- ◆ Preparations to build an engineering center in order to improve the technical skill of the organization are underway. Reconstruction of the organization in accordance with those functions that are required, such as enhanced work management function, which has been a weakness of TEPCO, is being deliberated.

Countermeasure 1: Reform instigated by top management

- Commencement of the Management Model Project, a nuclear management reform project (July)
 - Commencement of the creation of "action guidelines" that provide details on nuclear management principles and rules
 - Commencement of improvements to KPI upon analyzing management gaps that need to be filled
 - Commencement of deliberation of best management practices in order to fill these gaps

- Benchmarking for nuclear management reforms
 - Benchmarking performed after inviting 11 external experts to participate in the reform project
 - Best practices obtained from nuclear operators in the United States during quarter one (corrective action program, benchmarking efforts) shared with upper management (July)
- In light of the problems with the reporting and notification of core meltdowns the sharing of information concerning important issues between employees and departments is being enhanced
 - Important issues reported to external parties and common issues are now conveyed to all the personnel in the Nuclear Power Division by the site superintendent and Headquarter department managers via email. (began in July)



Overseas experts participate in TEPCO project team meeting



Reporting on the results of benchmarking with the United States

Countermeasure 2: Enhancing oversight of and support for management

- Oversight and assessments by the Nuclear Safety Oversight Office
 - With 91 improvements made out of the 123 site recommendations given, reforms are steadily progressing.
 - With the establishment of the nuclear human resource development center and the creation of strategies to move forward with decommissioning, nuclear power leaders are promoting reforms on a wide scale.
 - However, since we have yet to achieve the world's highest level of nuclear safety, we will continue to identify problems and make further improvements.

- Management observation by managers, including upper management
 - Efforts have begun to enhance management observation by managers after coaching by overseas experts on best practices related to having a questioning attitude and feedback

Leader behavior-related KPI for improving safety awareness

54.7 Points (YoY +8.0)

The messages sent by nuclear power leaders are being read by many members of the Nuclear Power Division, however there needs to be more messages that make personnel feel that reading them is worthwhile.

[Objective: Increasing trend]

KPI related to the degree of improvement of safety awareness throughout the entire Nuclear Power Division

63.7 Points (YoY +2.8)

Nuclear safety-related retrospection activities are taking root. And, managers are making efforts to engage in on-site observation (management observation).

[Objective: Increasing trend]

safety awareness

Countermeasure 3: Enhancing the Ability to Make Defense-in-Depth Proposals

- Holding of safety improvement proposal skill enhancement competitions in order to revitalize activities to voluntarily improve safety improvements
 - The number of submissions continues to increase with a record high 286 submissions made during the sixth competition
 - Five outstanding proposals were put into action by having the Secretariat provide advice in regards to locations where the proposals could be put into practice and reaching out to upper management.



Putting into practice outstanding proposals from the safety improvement proposals skill enhancement competition (Erection of signs showing height above sea level and evacuation routes: Fukushima Daiichi NPS)

- Mechanisms for managing information useful for improving nuclear safety in a unified manner and enhancing the improvement implementation process is being constructed
 - Performance improvement coordinators have been assigned to each department in the power stations in order to analyze and assess information managed in a unified manner and promote improvements.

Countermeasure 5: Enhancing the Emergency Response Capabilities of Power Stations and the Head Office

- Comprehensive training based on more demanding scenarios
 - At Kashiwazaki-Kariwa, response personnel are subject to training based on undisclosed scenarios in which multiple units are damaged by the earthquake and the plant is on the brink of a core meltdown, which is the most serious accident that could happen.

- Training on getting supplies from the head office to power stations
 - Training has been implemented on flying in auxiliary relays needed to restore power by helicopter and transporting small generators by vehicle



Comprehensive training (Kashiwazaki-Kariwa)



Training on flying in supplies using helicopters

Countermeasure 6: Training Personnel in Order to Improve Nuclear Safety

- The reconstruction of education and training programs has begun at the nuclear human resource training center.
 - Reconstruction is underway in each field, such as operation and maintenance, etc., based on the results of benchmarking with overseas operators
 - We are engaged in efforts to develop education and training programs, such as nuclear safety certification training, training aimed at increasing the number of workers that have obtained certifications required for operating a power station, and basic engineering training for new employees (math/electrical engineering)

- Improving in-house technical skill so as to prevent severe accidents
 - Training is being implemented on erecting/dismantling scaffolding, welding/cutting/grinding, and the pump/generator disassembly/assembly so as to enable employees to respond regardless of the extent of the damage or the location.



Welding Training



Grinding Training

KPI related to technical skill during times of normalcy

76.2 Points (YoY -1.0)

More effort will be putting into the Nuclear Training Center project in order to cultivate personnel in a planned manner in order to improve nuclear safety.

[Objective: More than 100 points by the end of FY2016]

KPI related to technical skill during times of emergency

117 Points (YoY +5.0)

We will continue to secure personnel that have the skills necessary to respond to an emergency

[Objective: 120 points by the end of FY2016]

KPI for the ability to promote dialogue (external)

<FY2015 performance (compared to FY2014) >
+0.9 Points (Quality and quantity of messages sent)
+1.0 Points (PR/Public opinion listening awareness/attitude)

[Objective: Positive over last fiscal year]

Has been deemed as "improved" over last fiscal year

Countermeasure 4: Enhancing Risk Communication Activities

- Examination of the effectiveness of public communications (public communications/siting community related managers) during an emergency response
 - The effectiveness of public communications based on the management guide and the process to disclose information on core meltdowns was confirmed

- Information on safety measures at Kashiwazaki-Kariwa and the decommissioning of Fukushima Daiichi proactively disclosed
 - In Niigata Prefecture communication activities are being developed by providing briefings to community members, opening the Talk Salon, holding energy-related events in service halls, and providing tours of the power station for kids' clubs
 - In Fukushima Prefecture communication is being developed through meetings of prefectural residence and the continual publication of the monthly newsletter "Monthly 1F"



Public communications supervision training



Tours provided for kids' clubs

KPI for the ability to promote dialogue (internal)

Entire Nuclear Power Division: 78.8 Points (YoY +0.3)
Nuclear power leaders: 82.8 Points (YoY -3.3)

[Objective: Increasing trend]

We will continue to improve internal communication

Ability to promote dialogue