Appendix

Third Quarter, FY2016

Nuclear Safety Reform Plan Progress Report

INCLUDING PROGRESS ON SAFETY MEASURES AT POWER STATIONS

Tokyo Electric Power Company Holdings, Inc.

February 10th, 2017

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FOREWORD

We at TEPCO would like to extend our deepest apologies for the tremendous inconvenience and anxiety that the Fukushima nuclear accident, as well as subsequent accidents and problems, have caused everyone living in communities around the Fukushima Daiichi Nuclear Power Station and throughout society as a whole. The entire TEPCO Group will continue to work to facilitate the smooth and early provision of compensation, accelerate the recovery of Fukushima, move reactor decommissioning forward steadily, and thoroughly ensure nuclear safety.

TEPCO announced its “Reassessment of Fukushima Nuclear Accident and Nuclear Safety Reform Plan” on March 29, 2013, and we are currently moving forward with nuclear safety reforms. The progress that we make is verified quarterly and the compiled results released to the public. This report details the progress made in the third quarter (October-December 2016[1]) of FY2016.

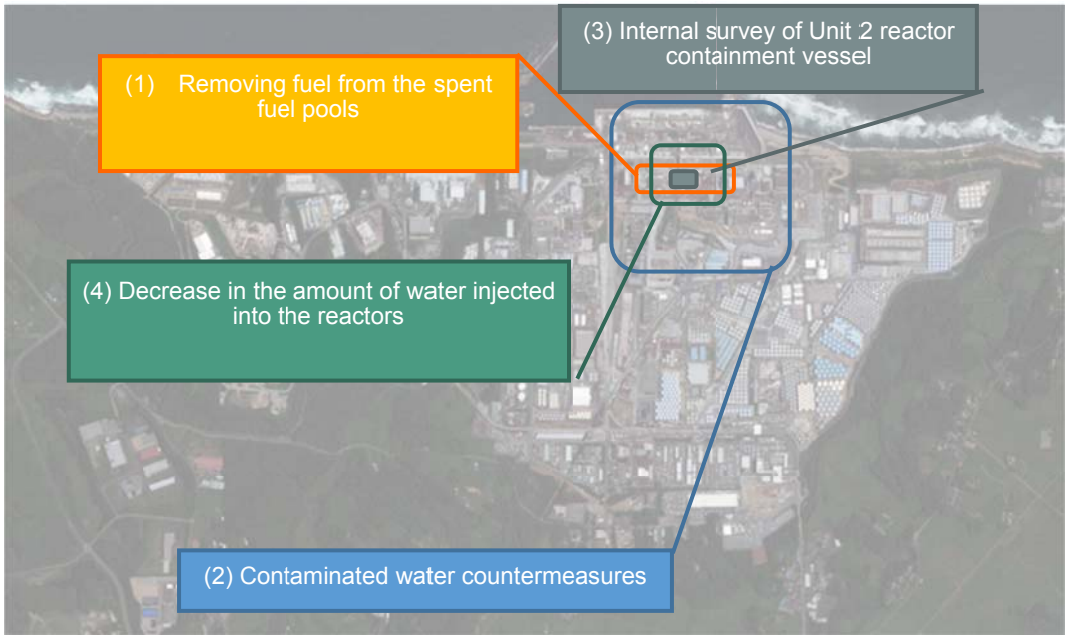
TEPCO reported on the results of its self-assessment of nuclear safety reforms implemented over the past three years to the Nuclear Reform Monitoring Committee when it met for the 11th time on September 2 and publicly released an overview of the report. Chapter 2 of this progress report explains the improvements that are being implemented in accordance with the results of the self-assessment.

[1] Dates noted hereinafter shall be for 2016 unless otherwise stated.

1. THE PROGRESS WITH SAFETY MEASURES AT POWER STATIONS

1.1 Fukushima Daiichi Nuclear Power Station

The decommissioning of TEPCO Fukushima Daiichi Nuclear Power Station (NPS) is proceeding steadily in accordance with the Mid-and-long-term Roadmap Towards Decommissioning of Fukushima Daiichi Nuclear Power Station Units 1 to 4 (June 12, 2015 revision).



Progress of primary work at the Fukushima Daiichi NPS

(1) Removing Fuel from the Spent Fuel Pools

♦Unit 1

On September 13 removal of the reactor building cover wall panels commenced as the dismantling process continues and the removal of all 18 wall panels was completed on November 10. A survey of debris on the refueling floor was conducted simultaneously with wall panel removal. During this time, no significant changes were seen in dust monitors or monitoring posts. We will carefully continue this work with the objective of beginning fuel removal during fiscal year 2020 (number of fuel assemblies stored in the spent fuel pool: 392).

Removing wall panels

After removal of all wall panels

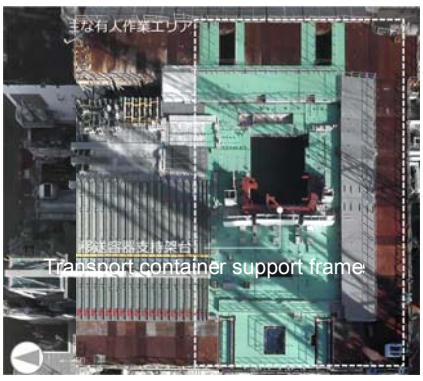
♦Unit 3

In preparation for the removal of fuel from the spent fuel pool, shielding was installed on the refueling floor (top floor of the reactor building) in order to reduce ambient dose rates in areas that workers will be accessing. The installation of all shields was completed on December 2. At the same time, a support frame for holding fuel transport containers was erected next to the pool on November 28. Going forward, we will begin construction of the fuel removal cover and install equipment for handling the fuel. We now anticipate that the commencement of the removal of fuel from the spent fuel pool will begin around the middle of FY 2018 (number of fuel assemblies stored in the spent fuel pool: 566).

Refueling floor right after accident (photo taken in March 2011)

Refueling floor at the beginning of decontamination (photo taken in March 2014)

Transport container support frame



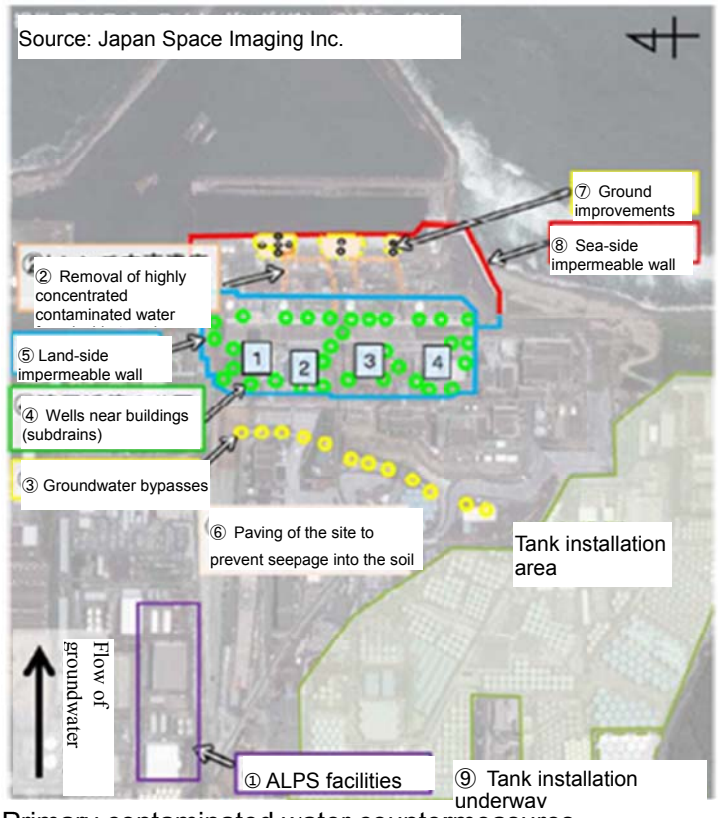
Refueling floor at present time

(photo taken on December 2016)

(2) Contaminated Water Countermeasures

Based on the three basic policies of “removing contamination sources,” “isolating water from contamination sources,” and “preventing the leakage of contaminated water,” TEPCO is continuing to implement measures to prevent the outflow of contaminated water into the power station port, and counter the problem of contaminated water leaking from tanks.

Measures to remove contamination sources		
Cleaning up contaminated water using the Advanced Liquid Processing System (ALPS)	Diagram (1)	Completed May 2015
Removal of contaminated water from inside seawater pipe trenches	Diagram (2)	Completed December 2015
Measures to isolate water from contamination sources		
Drawing up groundwater through groundwater bypasses	Diagram (3)	Operation commenced April 2014
Drawing up groundwater through wells (sub-drains) near buildings	Diagram (4)	Operation commenced September 2015
Installation of frozen-soil impermeable wall on land-side of units	Diagram (5)	Operation commenced March 2016
Paving of site to keep rainwater from permeating the soil	Diagram (6)	Completed for the most part except the area where scattered debris is stored
Measures to prevent leakage of contaminated water		
Improvement of ground with soluble glass	Diagram (7)	Completed March 2014
Installation of impermeable wall on seaside of units	Diagram (8)	Completed October 2015
Installation of tanks (replacement with welded tanks)	Diagram (9)	Work ongoing

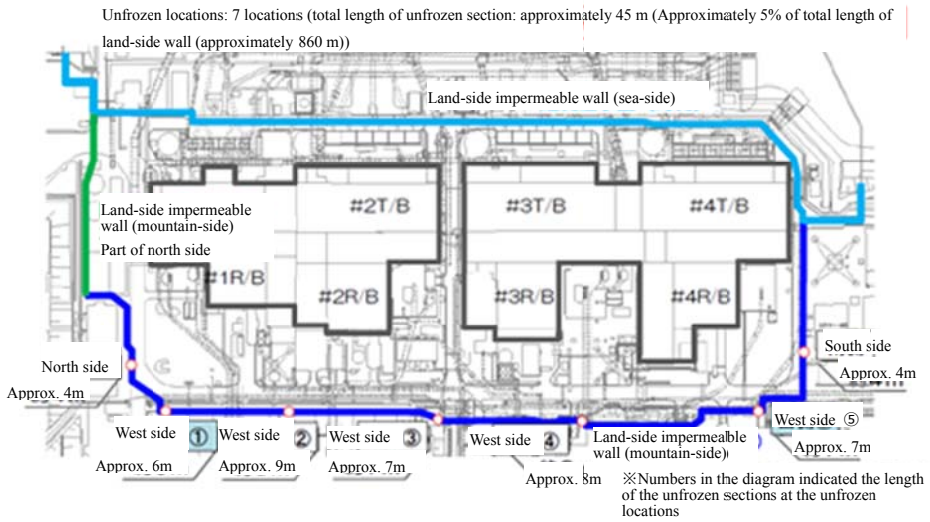


Primary contaminated water countermeasures

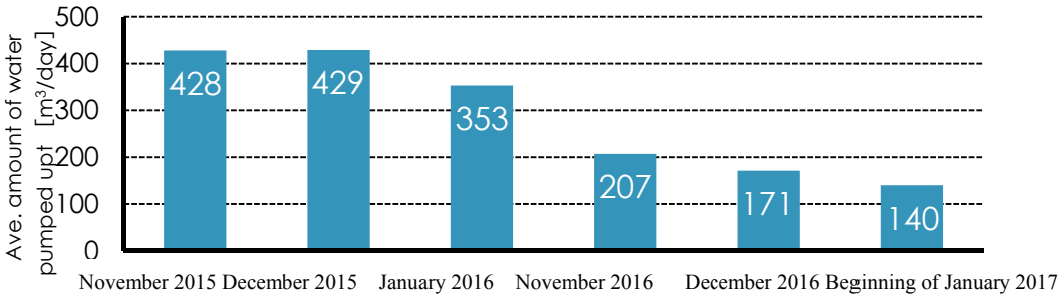
♦ Status of Freezing of the Land-Side Impermeable Wall

The work of freezing the land-side impermeable wall around Units 1-4 transitioned to Stage 1 (Phase 2) on June 6 to initiate freezing across the specified range with the exception of 7 places in mountain-side areas that have yet to be frozen (approx. 5%) (approx. 95% of the entire length along the mountains side has been frozen). In order to ascertain the extent to which the impermeable wall has frozen, we excavated to a depth of approximately 1.2 m on the south side of the land-side impermeable wall in order to directly view the ground 1.5 m away from the freezing line and confirmed that the degree of freezing is good. On December 3, we started freezing two (See diagram below: West side ①, ⑤) of the seven locations on the mountain side that have yet to be frozen.

The effect of the land-side impermeable wall is being checked by looking at changes in the amount of ground water pumped up from different kinds of pumps and also the changes in groundwater levels inside and outside the land-side impermeable wall. Before we transitioned to Stage 1 approximately 400 m³ of water was pumped up daily, but this amount has dropped to 140 m³ per day (as of January, 2017).



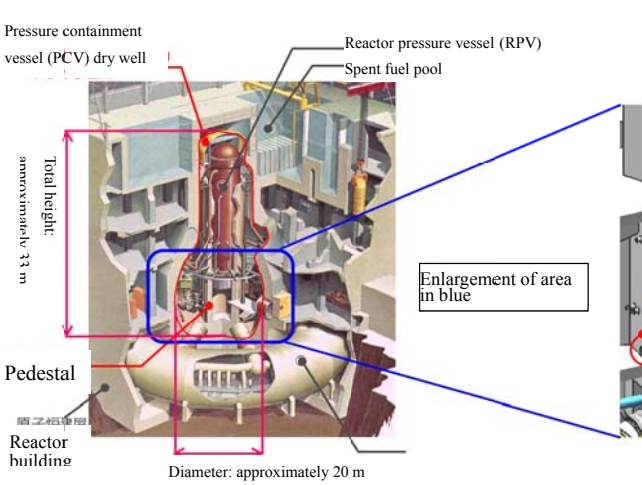
Freezing locations during Stage 1 Phase 2



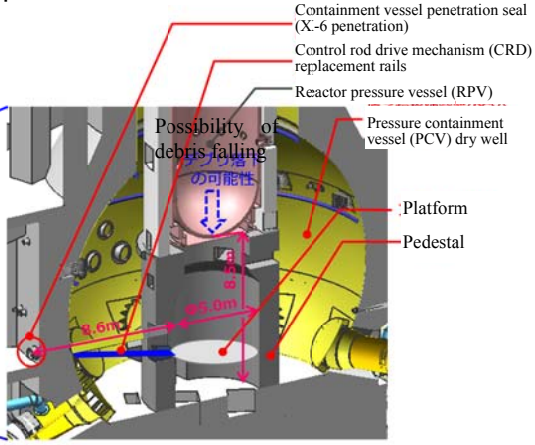
Drops in the amount of water pumped up as a result of freezing the land-side impermeable wall

(3) Internal Survey of Unit 2 Reactor Containment Vessel

In order to conduct the internal survey of the Unit 2 reactor containment vessel scheduled for January ~ February 2017, a hole was made in the X-6 containment vessel penetration seal in order to insert a robot. This work was completed on December 24.



Cross-section of reactor building



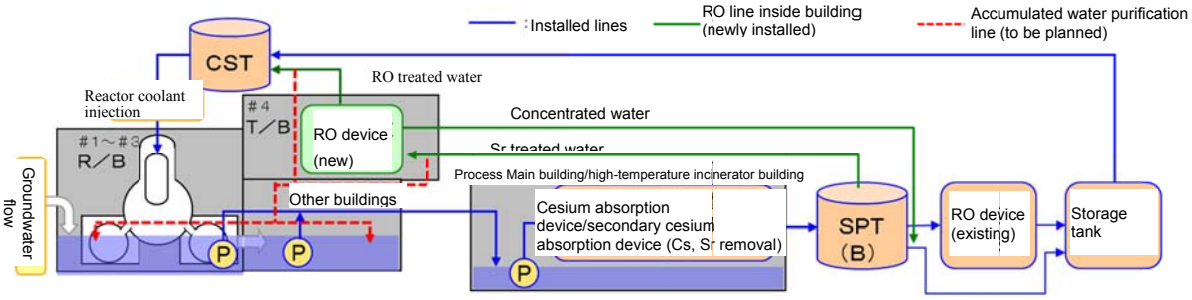
Cross-section of bottom of reactor

containment vessel

(4) Decrease in the Amount of Water Injected into Unit 1~3

At current time, secondary cesium absorption equipment can treat approximately 800 m³ of water per day, and the amount of water accumulating inside buildings is approximately 600~700 m³ a day, so we have a slight margin to work with. We plan to leverage this margin as we purify the accumulated water inside buildings. At the same time, since the amount of coolant needed to keep the reactor cool is less than controlled values, we will leverage this margin to reduce the amount of coolant injected thereby reducing the amount of water that accumulates inside buildings and as a result increase the margin we have to work with. Starting on December 14 we plan to start reducing the amount of coolant injected into the Unit 1 reactor from 4.5 m³/h to 3.0 m³/h at 0.5 m³/h increments. The same will be done at Unit 2 starting in March 2017, and at Unit 3 starting in February 2017.

Contaminated Water Circulation Loop Configuration



(5) Work Environment Improvements

♦ Work Conditions Survey

In continuation from last fiscal year, we distributed questionnaires to workers for the seventh time and disclosed the results on December 22. Questionnaire results show that whereas there is high approval of the efforts to improve the work environment, there are still issues to address in regards to off-site parking lots and rest areas. The results did not reveal any instances of work contractor fraud within the scope that the questionnaire was implemented. We will continue to use questionnaires to gather the opinions and requests of workers in our efforts to provide suitable work conditions, eliminate uneasiness about radiation and offer a workplace in which workers are motivated.

(6) Status of Discussions between TEPCO HD and the Niigata Prefecture Joint Investigative Commission

On April 11, the Technical Committee on Nuclear Power Safety Management in Niigata Prefecture (hereinafter referred to as, “Technical Committee”) requested from the Third-Party Verification Committee on Notifications/Reports Given in Connection with the Fukushima Daiichi Nuclear Power Station Accident (hereinafter referred to as, “Third-Party Verification Committee”) “issues that should be elucidated in regards to public disclosure of the meltdowns.”

During the meeting of the Technical Committee held on August 10, the status of deliberation of the request mentioned above (deliberations completed: 15, deliberation insufficient: 22, not yet deliberated: 33) as it concerns the report on the results of examination by the Third-Party Verification Committee, which was received by TEPCO on June 16, was explained by Niigata Prefecture.

During the first joint TEPCO HD and the Niigata Prefecture Joint Investigative

Commission meeting held on August 31 (hereinafter referred to as, “Joint Investigative Commission”) TEPCO explained 42 issues for which answers could be given at this point in the investigation from amongst the 55 issues that have either yet to be examined or for which examination has been insufficient. The Joint Investigative Commission will continue with its diligent investigation by conducting interviews of relevant parties, distributing questionnaires and examining documents, and TEPCO will cooperate to the utmost of its ability.

In order to gather as much information as possible, the issues examined by the Joint Investigative Commission have been put on the company’s intranet thereby allowing access by everyone in the Nuclear Power Division, and since July 7 employees have been asked to supply any related information they feel is pertinent. As of December 21, 486 pieces of information had been submitted and were passed on to the Joint Investigative Commission.

1.2 Fukushima Daini Nuclear Power Station

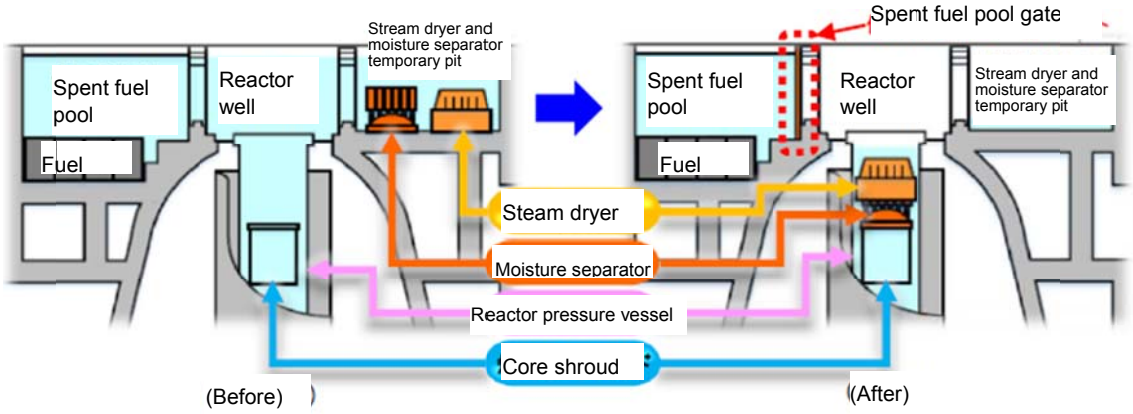
Since the accident, the TEPCO Fukushima Daini Nuclear Power Station (NPS) has implemented safety assurance measures and conducted training to maintain cold shutdown, made preparations to handle a severe accident based on the lessons learned from the Fukushima nuclear accident, and provided assistance for reactor decommissioning at Fukushima Daiichi NPS.

(1) Initiatives to Improve Safety

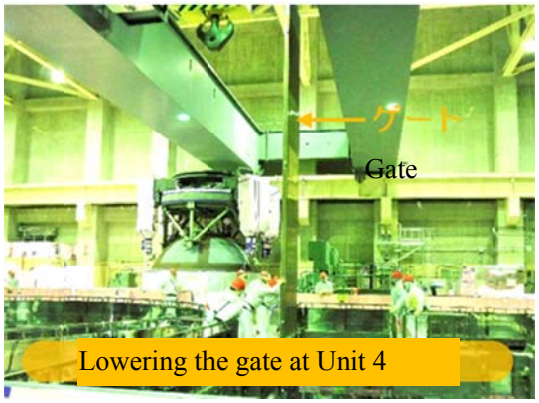
♦ Work to close the Unit 4 spent fuel pool gate[2] has been completed

The fuel that was inside of the Unit 1~4 reactors has been moved to the spent fuel pool, and work to close the Unit 4 spent fuel pool gate was completed on November 7. At all reactors, the only locations that require the cooling of fuel are the spent fuel pools, which has enabled us to better prevent cooling water leaks, and also ensure that the fuel is being cooled.

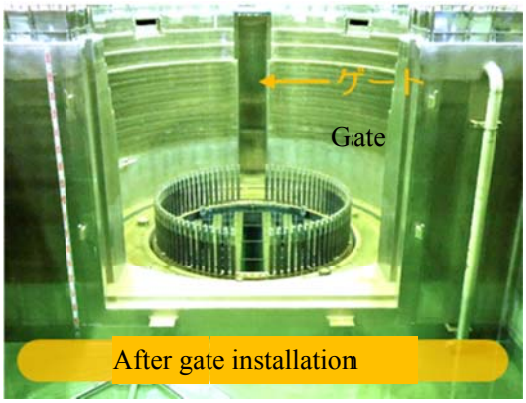
	Completion of fuel removal from reactor	Closure of spent fuel pool gates
Unit 1	July 10, 2014	November 10, 2015
Unit 2	October 16, 2013	January 22, 2016
Unit 3	March 24, 2015	September 14, 2015
Unit 4	October 24, 2012	November 7, 2016



[2] A stainless-steel plate used to separate the spent fuel pool from the reactor well



Lowering the gate at Unit 4



After gate installation

(2) Assistance with Fukushima Daiichi Decommissioning

The Fukushima Daini NPS has provided various levels of support for safely and reliably moving forward with decommissioning at the Fukushima Daiichi NPS. The following continued assistance was offered in the third quarter just as during the second quarter.

Laundering special undergarments for use in controlled areas

Temporarily storing assembled tanks for contaminated water storage (steel circular vertical tanks)

Supervising the production of sand slurry to be used in covering the seabed inside the port

1.3 Kashiwazaki-Kariwa Nuclear Power Station (NPS)

(1) Status of Implementation of Safety Measures

At the Kashiwazaki-Kariwa Nuclear Power Station ("Kashiwazaki-Kariwa NPS"), we are implementing safety measures with a focus on Units 6 and 7 for which applications have been submitted for review of reactor installation permit, based on the lessons learned from the Fukushima nuclear accident.

<Overview of Safety Measures>

Preparations for tsunami and internal inundation	・ Installation of seawalls, tidal walls, waterproof doors and other structures for protecting important facilities and equipment inside buildings from inundation caused by a tsunami that are 15m above sea level high. ・ Tsunami monitoring cameras have been set up so that the emergency response center and main control rooms are able to monitor a tsunami if one occurs ・ In order to prevent the flooding of important safety equipment in the event that the inside of a building is inundated as the result of damage to pipes, etc. inside the building, building penetration seals have been waterproofed, doors to important equipment rooms have been made watertight, and permanent sump pumps have been installed that operate using emergency power sources ・ Dikes have been built to ensure that seawater required to cool the reactor, etc., can be obtained during a tsunami (when the wave recedes)

Preparations for power loss [Augmenting power sources]	· In order to ensure power even in the case of a station blackout, power sources have been made redundant and diversified through the deployment of gas-turbine generator trucks, installation of emergency power panels, installation of alternative station internal electric facilities as well as the deployment of multiple power supply trucks, alternative DC batteries and other such equipment · In order to enhance methods for injecting cooling water into the reactors even if all power is lost, preparations have been made to ready the means for injecting cooling water into reactors by installing alternate high-pressure cooling water injection pumps (steam turbine-driven pumps), preparing alternate means for injecting cooling water into reactors using the make-up water condensate system powered by a gas turbine generator truck, dispersing fire trucks on high ground and setting up cooling water injection heads outside reactor buildings so that fire engines may be used to inject cooling water from outside the building
Preparations against damage to the reactor core or spent fuel [Augmenting heat removal and cooling functions]	· In order to provide an ultimate heat removal means as a measure to prevent a severe accident, an alternate reactor core component cooling water system (CCWS) was installed · Reservoirs have been built to secure water sources · To maintain cooling of the spent fuel pool even if a station blackout occurs, water level gauges have been mounted in the spent fuel pools (SFP) along with spray systems, etc. to cool the spent fuel pool. Cooling water injection heads have also been installed outside the reactor building so that cooling water may be injected using fire engines and a supplemental line, which is independent from the existing pool cooling system, has been added.
Preparations against damage to reactor containment vessel or reactor building [Measures to prevent damage due to excessive PCV pressure and prevent a hydrogen explosion]	· To enhance means for depressurizing the reactor pressure vessel, backup portable batteries, nitrogen cylinders and air compressors have been installed. · To prevent damage to the reactor containment vessel, above-ground filtered venting equipment has been installed that releases pressure and heat from inside the reactor containment vessel to the outside, and, in preparation for a situation where remote operation from the main control room is not possible, improvements have been made to valves that allow them to be manually operated, and these have been installed in uncontrolled areas to allow for easy access. · A system has been installed for filling the PCV from the top in order to prevent damage to the PCV top due to an excessive rise in temperature and prevent outflow into the reactor building · To prevent hydrogen from accumulating and remaining inside the reactor building, static catalytic hydrogen recombination systems, and hydrogen discharging top vents on the reactor building roof, etc. have been added · To prevent contact between molten fuel and the PCV boundary, a corium shield (zirconia refractory material) has been installed in the lower part of the PCV
Preventing the dispersion of radioactive materials	· To prevent the dispersion of radioactive materials outside the site, water sprinklers (high-capacity water cannons, etc.) have been readied so that cooling water can be injected from outside the reactor buildings

Preparations against fires [Measures against external and internal fires]	・ Firebreaks have been established to prevent forest fires from spreading to reactor facilities ・ Fire detectors have been installed in parking lots on high ground so as to quickly detect oil fires being fed by fuel in emergency vehicles ・ To prevent important safety facilities from being rendered unusable due to a fire inside a building, measures have been taken to fireproof penetrations, and different types of fire detection devices have been added as well as stationary fire extinguishing equipment, fire resistant walls, fire dampers, cable wrappings and other such measures
Addressing external hazards	・ To withstand a collision with flying debris during a tornado, building doors have been reinforced, protective nets mounted on building openings and over outdoor equipment, and light oil tanks replaced ・ As a measure to prevent flying debris during a tornado, manhole covers have been lashed down. ・ To prevent ventilation and air conditioning system filters from clogging up with ash following a volcanic eruption and rendering important safety facilities inoperable, replacement spare bag filters are kept on hand.
Improvements to main control room and response headquarters environment	・ To prevent exposure to external radiation, shielded ventilation and air conditioning systems have been added inside the main control rooms (MCR) and main anti-earthquake building ・ Shielding has been installed around the main anti-earthquake building to prevent responders from being exposed to excessive levels of radiation when a severe accident occurs
Enhancement of the emergency response	・ Communications equipment has been enhanced in order to ensure a means for notification and communication (satellite phones installed, etc.) ・ Multiple access routes have been created and the roads reinforced in order to ensure that emergency vehicles can gain access ・ In order to enhance the radiation control mechanisms during an accident, dedicated power sources have been installed for permanent monitoring posts, the number of monitoring cars has been increased, and additional radiation measurement instruments and radiation protection equipment/materials have been readied.

In addition, measures have been implemented in a systematic manner to prepare not only for earthquakes and tsunamis, but also tornadoes, volcanic eruptions, magnetic storms, cyber-terrorism and other external hazards.

The progress of safety measures during the third quarter is as follows. The Mayor of Kashiwazaki City was given a tour of safety measure equipment in the field for Units 6 and 7 on December 16.

♦ Enhancing Heat Removal and Cooling Functions

- High Pressure Substitute Coolant Injection System Installation

  In order to prevent core damage, new substitute high-pressure cooling water injection systems driven by a steam turbine have been added to the existing high-pressure coolant injection systems (Reactor Core Isolation Cooling System (RCIC)) to create multiple tiers of reactor coolant injection systems. At both Units 6 and 7, installation of

the main pump units for the substitute high-pressure cooling water injection systems has been completed. At Unit 6, pipes, support equipment, and cables are being installed. The installation work has been completed at Unit 7 and internal steam was used to test the equipment (June 2, 2016). Equipment improvements to improve the ease of maintenance and inspection, such as relocating auxiliary equipment, are being deliberated based on the results of trial operation.

Field tour for the mayor of Kashiwazaki City
(Unit 7 high-pressure alternate coolant injection system pump installation)

♦ Preventing Damage to Primary Containment Vessel (PCV) from Over Pressurization

- Installation of Above-Ground Filtered Venting Equipment

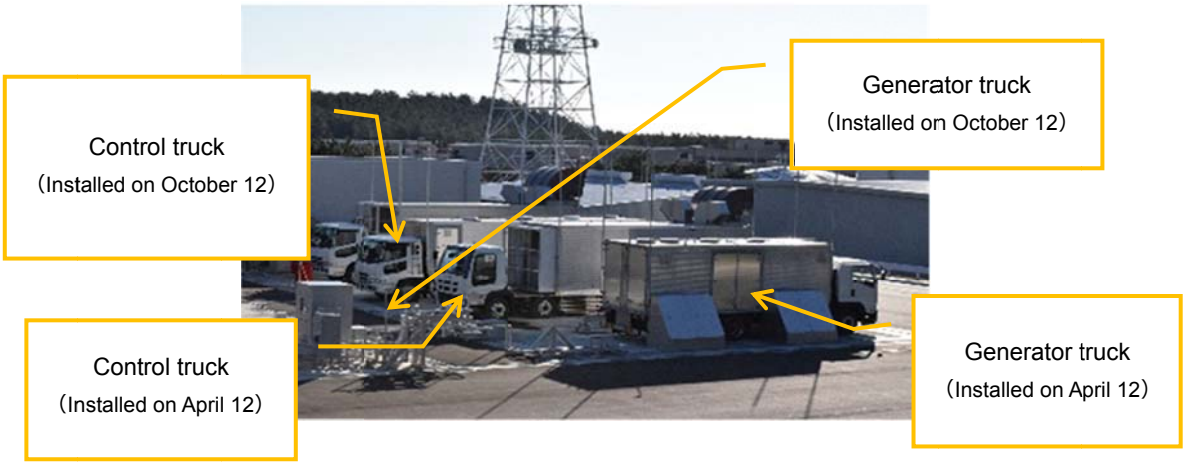
The above-ground filtered venting equipment releases pressure and heat externally to prevent damage to the reactor containment vessel. Filtered venting equipment is being installed to reduce the quantities of gaseous organic iodine and radioactive material particles released into the atmosphere at such time. At Unit 7, pressure and ventilation tests have been completed, and an iodine filter (capable of removing at least 98% of the organic iodine) has been installed (November 28, 2015). At Unit 6, the installation of iodine filters above the main filtered vent unit was completed (January 15, 2016), and pressure and ventilation tests were completed on the pipes around the iodine filter (April 9, 2016). At both Unit 6 and 7 we are currently installing other ancillary equipment and making improvements while moving ahead with the installation of frames for operating and inspecting equipment installed primarily behind shield walls and inside the reactor building.

Field tour for the mayor of Kashiwazaki City
(Equipment installation under iodine filter behind the Unit 7 filter vent shield)

♦ Enhancing Power Sources

- Installing Gas Turbine Generator Truck Equipment

In order to supply power from gas turbine generator trucks and power supply trucks in the event of a loss of power, dedicated power source facilities have been installed on high ground (21m above sea level on the Arahama side) on the Unit 1~4 side in addition to existing emergency power source facilities. The first truck was installed on April 12, and on October 12 two more trucks were installed. Furthermore, dedicated power source facilities are being built on high ground (12m above sea level) next to the Unit 7 turbine building to be used to supply power to Units 6 and 7. The foundation[3] for installing the power source equipment was started early and the concrete was poured on December 18.



Installation of gas turbine generator trucks on Arahama side
(Two sets of control trucks and generator trucks)

<Before>

<After concrete pouring>

Foundation building for gas turbine generator trucks next to the Unit 7 reactor building

♦ Preparing for a Dispersion of Radioactive Materials

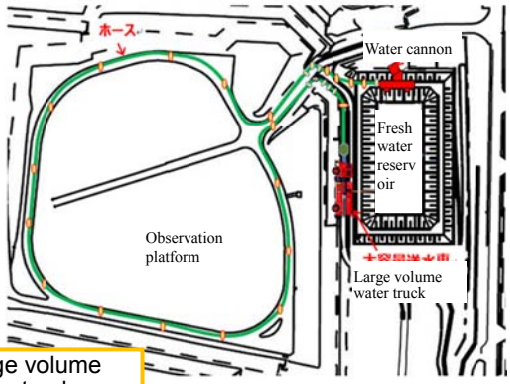
- Confirming the performance of water cannons used to spray water from outside the reactor building (large volume water trucks)

In order to suppress the dispersion of radioactive materials outside the site

[3] Steel piles were inserted into the ground down to the Nishiyama layer, which is the supporting ground layer for the reactor building, in order to ensure that the foundation is supported by stable ground.

and reduce exposure in the event of a severe accident, large volume water trucks would be used to force radioactive material to settle to the ground. Training on the use of large volume water trucks and water cannons is repeatedly implemented around the fresh water reservoir in an effort to improve operating procedures. Also, in order to enable water to be transported to near Units 6 and 7, a long hose (approximately 1000 m) has been stored near the fresh water reservoir and used to test water spraying performance. Tests have shown that pressure, flow rate, pressure loss, and the height of the sprayed water are all within prescribed performance levels, and that the hose can be laid within the timeframe stipulated on the time chart.

Tests to confirm the performance of large volume water trucks



Area diagram

♦ Preparing for Tsunamis and Internal Inundation

・ Arahama side Seawall Liquefaction Countermeasures

The Arahama Side seawall was completed on June 20, 2013. However, in the process of inspecting Kashiwazaki-Kariwa Units 6 and 7 plans were changed so that the Middle Pleistocene layer and ground layers more than 20m deep, which were originally not subject to a subgrade liquefaction assessment, would be subjected to a liquefaction assessment. Based on this policy, a seismic response analysis (effective stress analysis) was conducted and it was discovered that the steel pipe piles that are rated to resist design basis standard seismic motion and support the sides of the Arahama side seawall, which are the parts of the seawall most vulnerable to liquefaction, were insufficient for preventing the impact of liquefaction. Logical and effective seismic resistance enhancement measures (ground improvements, etc.) are being deliberated.

♦ Enhancing Emergency Response

・ Relocating the Emergency Response Center

In preparation for the case where the main anti-earthquake building cannot be used during a disaster, an emergency response center has been set up inside the Unit 3 reactor building. However, since it was determined that liquefaction of the subgrade may cause the seawall on the Arahama side to have insufficient strength, the emergency response center is being relocated from Unit 3 to Unit 5.

1.4 Insufficient Document Submissions and Inspections Related to Clause 88 of

the Industrial Safety and Health Law

(1) Incident Overview

According to Clause 88 of the Industrial Safety and Health Act (hereinafter referred to as, “IS&H Act”), when installing chemical equipment, installation plans must be submitted to the Labor Standards Inspection Office 30 days prior to the commencement of installation. Furthermore, Clause 276 of the Ordinance on Industrial Safety and Health (hereinafter referred to as, “IS&H Ordinance”) stipulates that installed chemical equipment must be subject to periodic voluntary inspections once every two years. At Kashiwazaki-Kariwa it was discovered that the diesel driven fire pump (DDFP) fuel tanks on the Ominato side were overdue for periodic volunteer inspection in accordance with Clause 276 of the IS&H Ordinance (August 5), so an investigation of the implementation status of periodic inspections in accordance with Clause 276 of the IS&H Ordinance and the submission of documents required by Clause 88 of the IS&H Act was conducted for all three power stations. The investigation revealed that each power station was in violation of Clause 88 (plan submission) of the IS&H Act and Clause 276 (periodic volunteer inspections)) of the IS&H Ordinance as follows.

Power station	Number of violations	Main Details
Fukushima Daiichi NPS	· Document submission failures: 14 · Inspection Violations: 4	· Failure to submit to the emergency nitrogen gas separator diesel driven air compressor plan · the on-site gas station portable tank (diesel) had not been subject to voluntary inspection for more than two years
Fukushima Daini NPS	· Document submission failures: 2 · Inspection Violations: 0	· Failure to submit the gas turbine underground fuel tank plan
Kashiwazaki-Kariwa	· Document submission failures: 9 · Inspection Violations: 1	· Failure to submit the Main anti-earthquake building gas turbine generator underground tank plan · The Ominato side diesel driven fire pump (DDFP) fuel tanks had not been subject to voluntary inspection for than two years

(2) Facts and Problems

- Internal manuals stipulated that chemical facilities are subject to document submissions and periodic volunteer inspections implemented based on industrial safety and health laws and ordinances, however this information had not been shared sufficiently, nor had it permeated sufficiently, throughout those departments managing the facilities, and the departments managing the facilities failed to review the manuals. (Problem A)
- Departments managing these facilities were aware of the IS&H Act, but only as it concerns “work safety,” and that awareness was limited to work done in elevated locations, hoisting work, and oxygen deficiency. These departments did not have a firm grasp of the facilities for which action had to be taken in accordance with the IS&H Act. (Problem B)

- Industrial safety and health related departments only checked the documents submitted by the departments managing the facilities to see if they were complete or not, and failed to check whether or not the departments were in compliance with industrial safety and health laws and ordinances. (Problem C)

(3) Sorting out problems and identifying lessons to learn

The problems mentioned earlier have been examined from the perspectives of safety awareness, technical capability and the ability to promote dialogue, and lessons to be learned/points for improvement were identified for management and company operation.

	Problems	Lessons learned/Points for improvement
Safety awareness	· Departments managing these facilities were aware of the IS&H Act, but only as it concerns "work safety," and did not have a firm grasp of the facilities to which the IS&H Act applies (Problem B)	· Facilities subject to the IS&H Act have been clearly noted in manuals based on the results of the investigation · Education/training related to the IS&H Act is implemented once a year in order to improve safety awareness
Technical capability	· Information on submitting documents and performing periodic voluntary inspections in accordance with the IS&H Act had not been shared sufficiently, nor had it permeated sufficiently, throughout the departments managing the facilities, and the departments managing the facilities failed to review the manuals (Problem A)	· When facilities are to be newly built or modified, the department managing the work shall review the newly created Law and Ordinance Check Chart during the work planning/implementation stages to confirm whether or not document submissions and periodic volunteer inspections are required in accordance with the IS&H Act.
Ability to promote dialogue	· Industrial safety and health related departments only checked whether or not documents submitted by the departments managing the facilities were complete or not, and was not sufficiently involved (Problem C)	· A mechanism will be introduced for enabling industrial health and safety related departments to verify the decisions made by departments managing the facilities in regards to whether or not document submissions and periodic voluntary inspections are required in accordance with the IS&H Act · Industrial health and safety related departments shall verify once a year that the mechanism mentioned above is functioning effectively.

(4) Future Plans

Corrective measures have been completed for all recommendations for corrective measures and instructions received from the Labor Standards Inspection Office, and the aforementioned countermeasures have been reported to the Labor Standards Inspection Office. The aforementioned countermeasures will be implemented without fail in order to prevent recurrence. Furthermore, an investigation of other related laws and ordinances in addition to industrial safety and health laws and ordinances shall be implemented and efforts made to enhance compliance to ensure that similar incidents do not occur.

1.5 Regarding the Shutdown of Important Safety Equipment at the Fukushima Daiichi and Fukushima Daini Nuclear Power Stations.

(1) Overview of Accidents and Troubles

During a routine patrol by operation shift team members in the spent fuel pool cooling system pump area on the third floor of the Unit 1 reactor building at the Fukushima Daiichi NPS, a worker accidentally touched a vent valve (normally closed) installed on the pump bearing cooling line thereby opening the valve slightly. As a result, the system pressure of the Unit 1~3 spent fuel pool cooling system shared secondary systems gradually decreased thereby causing an alarm to sound, so the shared secondary system pump was manually shutdown (December 4). Consequently, cooling of the Unit 1~3 spent fuel pool ceased. The system was shut down for approximately seven hours but due in part to the low external ambient temperature there was little impact on cooling of the Unit 1~3 spent fuel pools.

In the electrical components room on the second floor of the Unit 4 turbine building, when contractors were in the midst of cleaning up after performing instrument inspection of the Unit 3 CST reactor coolant injection equipment, a worker accidentally came in contact with the switch cover for the Unit 3 CST reactor coolant injection pump thereby shutting down the pump that was in operation. As a result, Unit 3 reactor coolant injection ceased for approximately one hour (December 5). No abnormalities were seen with reactor pressure vessel temperature increases or containment vessel gas management systems during this time.

At Fukushima Daini, as a result of the earthquake that occurred on November 22 (maximum intensity: 5-strong) the Unit 3 spent fuel pool cooling system pumps automatically shut down thereby shutting down spent fuel pool cooling due to temporary decrease in water levels in the skimmer surge tanks for the same system[4]. A field inspection revealed no abnormalities so the pump was manually started up and spent fuel pool cooling recommenced. The water temperature increase of the spent fuel pool was 0.2°C.

(2) Lessons Learned and Countermeasures

The shutdown of the reactor coolant injection and spent fuel pool cooling systems conjured the image of another Fukushima nuclear accident in the minds of not only the people of Fukushima Prefecture but society as a whole thereby causing great uneasiness. The facts that one human error could cause the shutdown of a system and that anticipated fluctuations in water levels in conjunction with earthquake could cause equipment to shut down revealed weaknesses in the design of the reactor coolant injection systems and spent fuel pool cooling systems, which are important systems.

Furthermore, even though shutdown of the reactor coolant injection system and the spent fuel pool cooling systems are issues of great concern to the people of Fukushima Prefecture and society as a whole, insufficient consideration was given to safety and peace of mind thereby shedding doubt on TEPCO's handling of the problems.

We are ascertaining the causes of the accident/troubles and implementing recurrence prevention measures in a planned manner[5], and we are taking serious action in

[4] Water also leaked within controlled area weirs as a result of sloshing of the Unit 2, 3, 4 spent fuel pools caused by the earthquake.

[5] http://www.tepco.co.jp/nu/fukushima-np/handouts/2016/images2/handouts_161208_04-j.pdf
http://www.tepco.co.jp/nu/fukushima-np/handouts/2016/images2/handouts_161216_04-j.pdf

accordance with the following presidential order (December 5)[6].

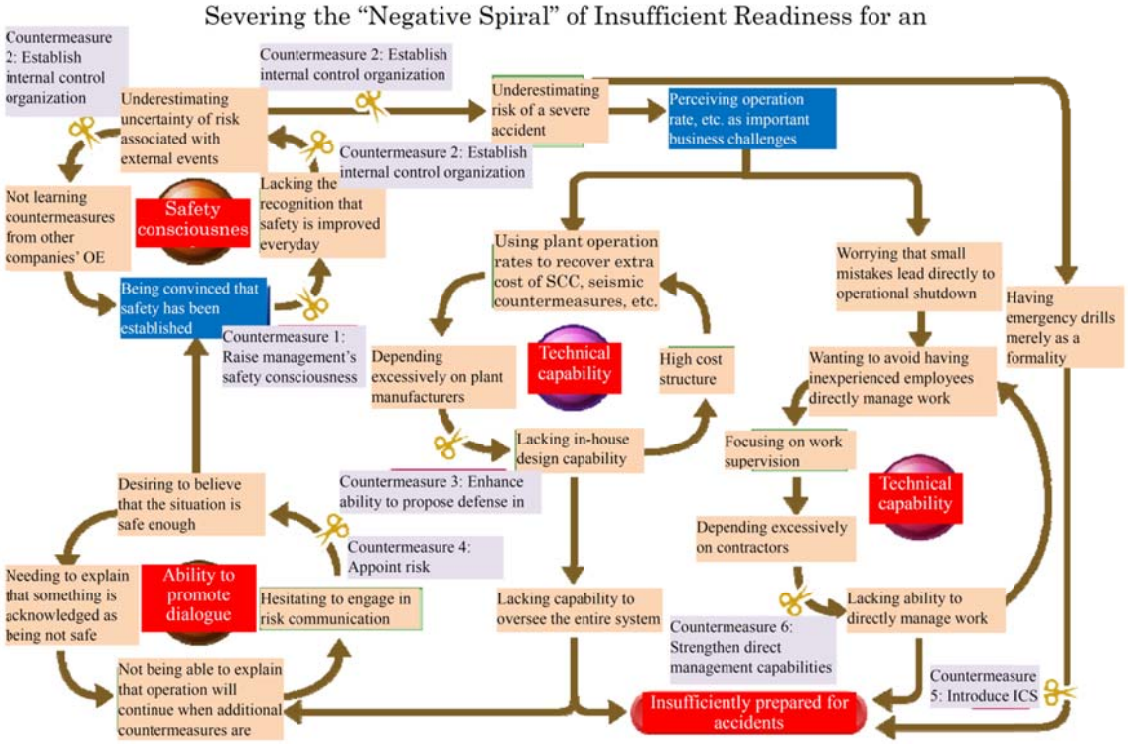
- Even though there are time margins for temperature increases and function was restored in a short amount of time, the fact that cooling shutdown caused immeasurable uneasiness amongst the regional community and society as a whole.
- TEPCO is supposed to be providing all the assistance it can to help residents return home and to help the region recover, it cannot be responsible for hindering these efforts.
- Based on this I hereby instruct the following:
  (1) It has been more than five years since the accident. The excuse that, “it can’t be helped because the equipment was only meant to be a temporary solution,” is not acceptable. Thorough countermeasures shall be implemented to prevent the shutdown of cooling systems and other important functions.
  (2) Troubles cause great uneasiness within the community and have a large impact on recovery efforts. Ensuring the safety of the Fukushima Daiichi and Daini nuclear power stations is a prerequisite for the recovery of Fukushima. We must all understand that upon our shoulders rest great expectations and responsibility.

http://www.tepco.co.jp/nu/fukushima-np/handouts/2016/images2/handouts_161216_05-j.pdf

[6] http://www.tepco.co.jp/press/news/2016/1344851_8961.html

2 IMPLEMENTATION STATUS OF IMPROVEMENTS BASED ON THE SELF-ASSESSMENT RESULTS

Six measures for stopping the "negative spiral" that has exasperated structural issues faced by the Nuclear Power Division are being implemented based on the Nuclear Safety Reform Plan announced in March 2013.



March 2016 marked three years since the Nuclear Safety Reform Plan was formulated, so we took a look back at our achievements so far in the form of a self-assessment[7] of the Nuclear Safety Reform Plan to ensure that these achievements result in future improvements.

Results of the self-assessment showed that there are weaknesses in the fields of organizational governance [Criteria 2, 3] and human resource development [Criteria 5], so the following action plans have been created in order to accelerate reforms.

a. Reforms by nuclear power leaders (enhanced governance)
   - Daily questioning by upper management
   - Enhancement of the mechanism for confirming the status of execution of instructions and commands

b. Acquiring the highest level of technical and management capability (human resource development)
   - Strengthening the framework of education and training by establishing the Nuclear Education and Training Center
   - Focused rebuilding of a systematic education and training programs from a long-term perspective

[7] http://www.tepco.co.jp/press/release/2016/1321005_8626.html

This report has not been publicly disclosed because it includes the confidential WANO PO&C (Performance Objectives & Criteria) used as standards for self-assessment.

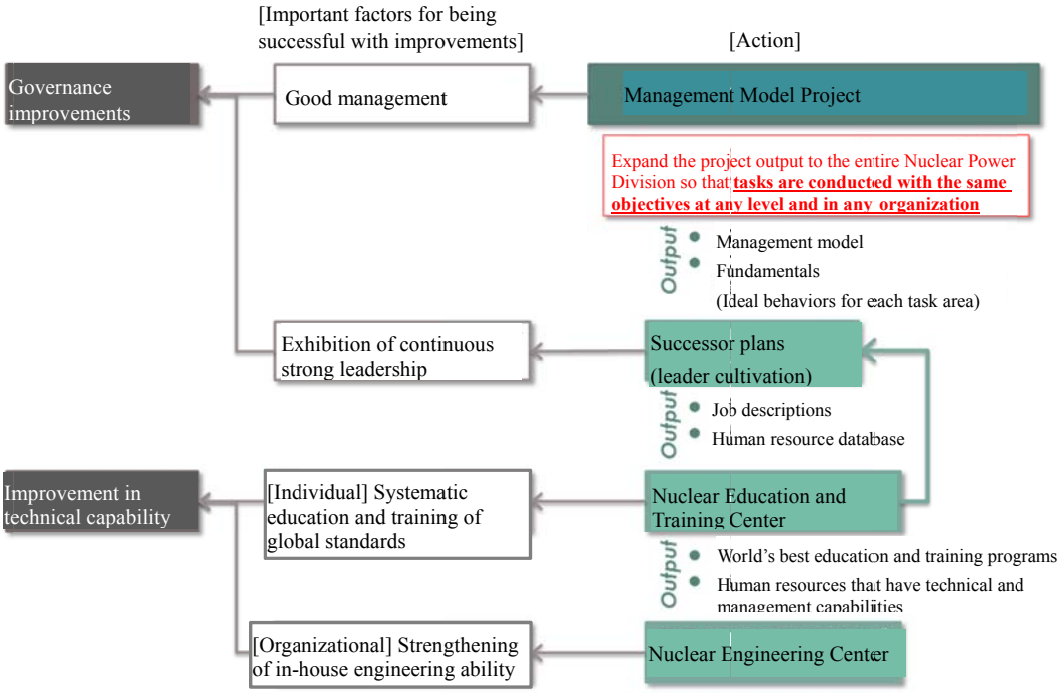
Self-Assessment Results (Comprehensive Assessment)

Nuclear Safety Reform Plan activities corresponding to goals and objectives set forth by the Nuclear Reform Monitoring Committee	Comprehensive assessment
Criteria 1: Management as well as each and every person give top priority to safety [Measure 1] Reform from top management	III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety
Criteria 2: Enhance governance Criteria 3: Continuous management of risks to nuclear safety [Measure 2] Enhancement of Oversight and Support for Management	**IV. Self-regulatory and continuous reforms need to be accelerated**
Criteria 4: Learn from failures and issues both inside and outside the company [Measure 3] Enhancement of Ability to Propose Defense-in-depth	III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety
Criteria 5: Maintain sufficient technical capabilities in-house [Measure 6] Development of Personnel for Enhancing Nuclear Safety	**IV. Self-regulatory and continuous reforms need to be accelerated**
Criteria 6: Increase emergency response capabilities [Measure 5] Enhancement of Power Station and Head Office Emergency Response Capabilities	III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety
Criteria 7: Build trust with society [Measure 4] Enhancement of Risk Communication Activities	III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety
Criteria 8: Reduce radiation exposure	III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety

The results of the self-assessment were reported to the Nuclear Reform Monitoring Committee on September 2 of last year, and the Nuclear Reform Committee is currently reviewing the results.

However, rather than wait for the results of the Nuclear Reform Monitoring Committee's review, we are focusing on implementing the following improvements[8] in the two areas in which the self-assessment revealed weaknesses.

[8] Refer to the Second Quarter, FY2016 Nuclear Safety Reform Plan Progress Report (November 2, 2016) http://www.tepco.co.jp/press/release/2016/1334452_8626.html



Actions taken in response to the self-assessment results

2.1 Reforms by Nuclear Power Leaders (Enhanced Governance)

(1) Daily questioning by upper management

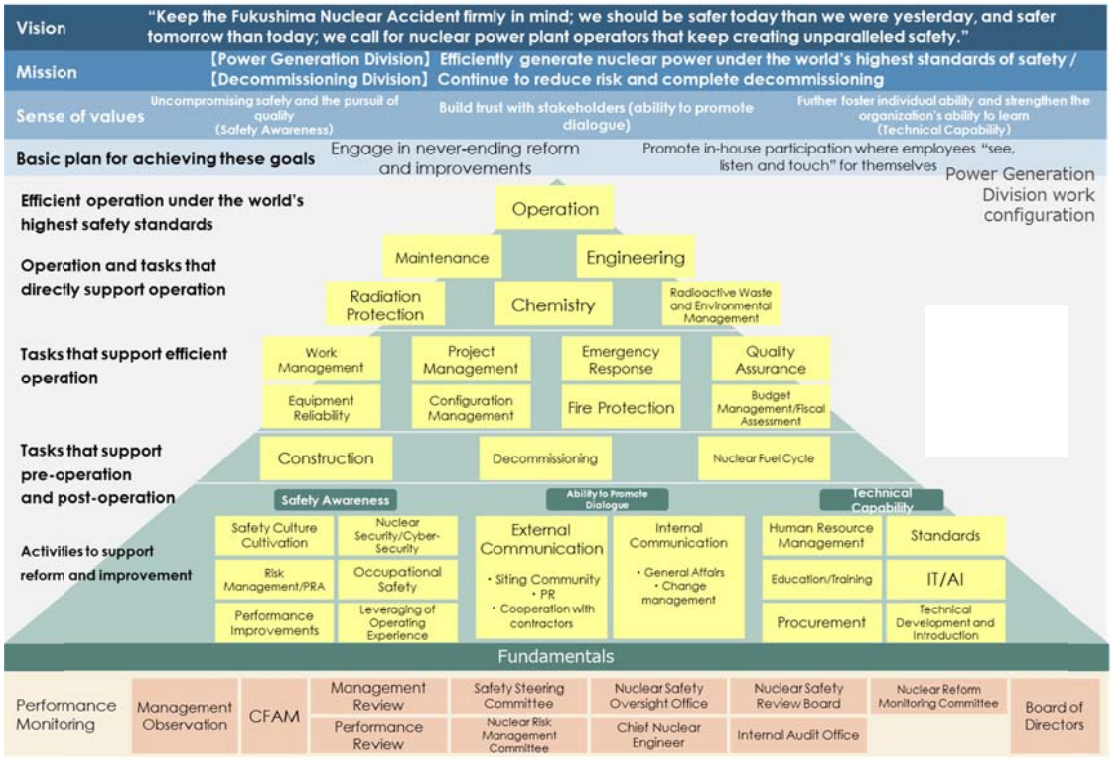
- Problem Awareness
  - Nuclear power leaders and management are not engaging in management observation as frequently as necessary, nor engaging in enough dialogue on site to promote mutual awareness of nuclear safety.
  - It is still frequently pointed out during IAEA-OSART and WANO reviews that a "questioning attitude" is lacking.
  - As a result, problems caused by a lack of governance (the status of carrying out instructions and orders is not being monitored), as stated in the next paragraph, are beginning to manifest.
- Status of Improvements
  - As part of the Management Model Project that will be discussed later we are in the midst of preparing ideal behaviors (fundamentals) for each administrative branch. By using these fundamentals to compare one's own behavior with ideal behavior we expect that each individual's awareness and actions will change and that they will start adopting a "questioning attitude." Furthermore, developing communication through adopting a "questioning attitude" has been included in the leadership fundamentals thereby encouraging nuclear leaders to proactively question.
  - During management training for managers, it is conveyed that the lack of questioning attitude is not only one of the underlying contributors to accident/troubles but also an organizational weakness, and encourage them to take the lead in adopting a "questioning attitude."
  - We are currently effectively leveraging management observation (field observation by managers) as an opportunity to engage in "questioning." In order to improve management observation skills, we have held lectures given by the INPO/WANO and invited overseas experts to act as coaches. According to the most up-to-date knowledge from these experts, "management observation focuses now more on dialogue with and coaching workers rather than observation of fieldwork," so we plan to adopt

this approach.

(2) Enhancement of the mechanism for confirming the status of execution of instructions and commands

- Problem Awareness
  - Thorough governance by nuclear power leaders is the key to accelerating nuclear safety reforms. For example, the facts that radiation concentration data for drainage channel K at the Fukushima Daiichi NPS was not disclosed for approximately 10 months (disclosed on February 2015), and that the same problems that have occurred in the past continue to occur show that the following underlying contributors still exist and that weaknesses in governance (confirming instructions and orders) have manifested.
    - Upper and middle management have not thoroughly conveyed what rules need to be followed.
    - There are workers that don't completely follow the instructions of supervisors, and supervisors that don't sufficiently monitor and follow up with the instructions given.
    - The ability to use dialogue to convey the background behind instructions and orders to the entire organization and get it carry out these instructions/orders with a sense of acceptance is lacking.
  - Furthermore, since this is not considered a problem that affects the entire organization, departments and individuals do not share the same priorities thereby preventing important problems from being solved efficiently.
- Status of Improvements
  - We benchmarked with outstanding nuclear operators in the United States and learned why it is necessary to use GOSP[9] to enable effective governance.
  - Based on this realization, in July we launched the Management Model Project for the purpose of creating a management model (management model for the entire Nuclear Power Division) for moving forward with reforms that aims for steady and efficient operation of the Nuclear Power Division. Project members are comprised of 10 full-time staff members from nine key areas, such as operations, maintenance, and engineering, as well as 11 overseas experts that have experience working at organizations with the world's highest standards. The management model positions individual tasks and explains mutual relationships to enable everyone from nuclear power leaders down to those on the front lines in the field to engage in their work with a common understanding of objectives and each other's and roles.

[9] A management model based on Governance, Oversight, Support, and Performance



Management Model (Overall task configuration) (Draft)

- The management model explicitly states a mechanism for ensuring that the progress of tasks is monitored in order to effectively achieve results.
- Ideal behaviors (fundamentals) have been created for each administrative branch.
- Job descriptions that give explicit details for each position are being created.
- Deliberation has started on the following issues to construct a mechanism for cultivating candidates for leadership positions that have the necessary qualifications in a planned manner (succession plan).
  - Creation of job descriptions that note the necessary education and qualifications for each position
  - Creation of a database for the unified management of the work history and training given to each individual
  - Creation of a process for selecting potential nuclear power leaders

2.2 Acquiring the Highest Level of Technological and Management Capability (Human Resource Development)

- Problem Awareness
  - Based on incidents that strike at the core of safety design, such as the insufficient separating of cables under the Unit 6 Main control room (MCR) at Kashiwazaki-Kariwa, it could be said that the skills we have defined and the education and training we have implemented up until now has been insufficient if we are to aim to achieve the world's highest level of safety. This is due mainly to the inadequate investment of resources in the education and training department and an overall reliance by each

managing department on OJT.

- Up until now we have moved forward as planned with the measures stipulated in the Nuclear Safety Reform Plan (Measure 6-6. Development of Personnel for Enhancing Nuclear Safety). However, in order to achieve the world's highest levels of safety we need to develop resources for implementing education and training, develop education and training programs, and improve the awareness of the entire organization in regards to the importance of education and training.
- Through benchmarking with the world's most outstanding nuclear operators, we have found that other organizations are managed in accordance with the unwavering policy of treating human resource development as one of the most important issues, and that systematic education and training is implemented based upon SAT[10]. We will improve our education and training framework so as to enable TEPCO's Nuclear Power Division to conduct systematic education and training on the knowledge and skills required to fulfill its duties.

- Status of Improvements
  - Human resource development has been put under the direct supervision of the General Manager of the Nuclear Power and Plant Siting Division and this area has become a focal point for resource distribution.
  - In July 2016 preparations for the establishment of the Nuclear Education and Training Center went into full force and the center was officially opened on December 19, 2016. The Nuclear Training Center supervises education and training to enhance the technical capability of individuals and the management skills of middle management.
  - The reconstruction of education and training programs has already commenced at the Nuclear Education and Training Center. The basic policy for constructing and carrying out education and training problems is as follows.
    i. Provide education and training programs that allow personnel in the Nuclear Power Division to continually learn.
    ii. Each managing department will cooperate with the education and training department to continually improve education and training programs.
    iii. A map will be created in order to better visualize the education and training system for the Nuclear Power Division and shared with all personnel in the Nuclear Power Division.
    iv. The quality of education and training shall be ensured by creating lesson plans that note the learning objectives, points to be touched on during lectures, and important test problems for each education and training program, and providing them to all instructors.
    v. The skills of instructors shall be improved through education and training designed to improve the instruction skills of instructors, and by promoting friendly rivalry between instructors by having them sit in on each other's lectures.
  - In order to enhance the technical capability of the organization, the establishment of a Nuclear Engineering Center (tentative name) that integrates functions for providing technical capabilities related to engineering is being deliberated (to be launched during this fiscal year). This center will be used to raise the safety (nuclear safety, radiation safety) and reliability of nuclear power stations to the world's

[10] Systematic Approach to Training: A method for constructing education and training programs proposed by the IAEA that has become the world standard

highest levels and continually improve safety and reliability. In particular, the mission of the Nuclear Engineering Center is to introduce facilities that have high reliability and optimize the maintenance of those facilities, provide technical solutions for the quick repair of a power station in the event of an emergency, and to develop and put into use cutting-edge technology.

2.3 Advice from Mr. Randall Edington[11]

When reviewing the self-assessment results, the Nuclear Reform Monitoring Committee sought the assistance of Mr. Randall Edington, vice president and chief nuclear officer of Arizona Public Service in the United States. Between October 3 and October 7, 2016, Mr. Edington conducted interviews of Chairman Sudo, President Hirose, General Manager of the Nuclear Power and Plant Siting Division Anegawa, and Fukushima Daiichi Decontamination and Decommissioning Engineering Company President Masuda, as well as power station executives, and performed field observations of the Kashiwazaki-Kariwa NPS.

Mr. Edington provided valuable advice in regards to not only the review of the self-assessment results requested by the Nuclear Reform Monitoring Committee, but also on a wide variety of topics including management and operation of TEPCO's Nuclear Power Division and the methods by which nuclear operators perform self-assessments.

(1) Advice on the Nuclear Safety Reform Plan and management and operation of TEPCO's Nuclear Power Division

After conducting interviews and performing field observation, Mr. Edington provided the following advice in regards to efforts underway in accordance with the Nuclear Safety Reform Plan and the operation and management of the Nuclear Power Division. We incorporated this advice into the aforementioned management model and are making improvements.

Advice/guidance from Mr. Edington and improvements to be made going forward

Confirmed facts and advice	Improvement plans
● There needs to be more innovation in regards to permeating nuclear safety culture - It is questionable whether or not the world's highest standards can be achieved by merely continuing current methods of action - Just because someone is promoted to a management position does not mean that they will immediately be able to coach others on nuclear safety culture	✓ Nuclear safety culture will be permeated through each and every individual through group discussions and feedback gained through dialogue with nuclear power leaders
● Cooperation within power stations and between the headquarters and power stations needs to be improved - If there is a lack of cooperation it will be difficult to achieve consistent performance, performance at high standards, and effective implementation	✓ Headquarter General Managers and the site superintendents shall lead by example when it comes to displaying cooperative attitudes ✓ Although it may be a little emotional, nuclear power leaders continually express the importance

[11] When Mr. Edington visited Japan, he was the vice president and chief nuclear operator of Arizona Public Service in the United States and had enabled the Palo Verde nuclear power station to become the safest and best-performing nuclear power station in the United States. He was also chairman of the Executive Advisory Group of the Institute of Nuclear Power Operators (INPO).

Confirmed facts and advice	Improvement plans
	of sympathizing with the person you're talking to and getting them to do the same.
● When changes are made to initiatives the change management process should be used - There are weaknesses with how important information is conveyed	✓ The scope of application of the existing change management process shall be expanded and used without fail ✓ PICO[12] will be used to confirm the status of improvements
● The operation of power stations should be "operationally-focused" - There is insufficient sharing of knowledge about operation within the organization - Only a few people in power station management positions have experience working in the Operations Department - Operators should be self-aware that nuclear safety is the basis for everything and should speak out to power station management	✓ People with operating experience are being proactively promoted to executive positions, and successor plans that force potential nuclear power leaders to gain experience with operations, are being drafted and implemented ✓ Operators, and in particular shift supervisors, should embody nuclear safety culture, be aware of their responsibility to speak out, and be promoted

(2) Advice regarding Self-Assessment Methods

Mr. Edington gave the following advice on the methods and guidelines for self-assessment used by the Secretariat of the Nuclear Reform Special Task Force. This advice will be leveraged during the next self-assessment[13].

- Addition of assessment categories

  Self-assessment categories were determined by referencing the INPO but set one rank higher than the United States. In particular, Level I is "Ideal," and whereas I can understand the concept, I assume that you will never be able to assess anything as having "achieved" this level. Therefore, underneath the current Level V, you should add a Level VI "Unacceptable for a Nuclear Operator."

- Assessment method improvements

  This self-assessment was conducted in accordance with the criteria set by the Nuclear Reform Monitoring Committee in addition to self-established guidelines for achieving nuclear safety reform. As a result, the scope of this self-assessment was very large and included awareness aspects[14]. On the other hand, in the United States it is commonplace to conduct a self-assessment that focuses on the actual actions of the organization and individuals for each administrative branch criterion stipulated by the WANO PO&C.

[12] Performance Improvement Coordinator (one coordinator assigned to each power station to serve as the key person driving improvements)

[13] In addition to self-assessments of the status of progress with the Nuclear Safety Reform Plan performed quarterly and at the end of each fiscal year, the Nuclear Reform Special Task Force Secretariat also plans to implement a self-assessment of nuclear safety reforms every three years to ascertain the degree to which goals have been achieved.

[14] Nuclear power leaders were interviewed about if they actually feel that change has occurred as a result of nuclear safety reforms, and this was added to the assessment.

- Improving the skills of evaluators

  This self-assessment was conducted by the Secretariat of the Nuclear Safety Reform Special Task Force from a standpoint independent of the Nuclear Power Division. Whereas the Secretariat implemented the self-assessment while referring to the INPO Evaluation Manual, they received no special training. If self-assessments are going to be conducted periodically, reviewers with the required training should be assigned and self-assessments conducted by nuclear operators in the United States with superior records should be benchmarked.

3 THE PROGRESS STATUS OF NUCLEAR SAFETY REFORM PLAN (MANAGEMENT)

TEPCO has been making progress on the Nuclear Safety Reform Plan (Management) with respect to six measures for stopping the “negative spiral” that has exasperated structural issues faced by the Nuclear Power Division.

3.1 Measure 1 Reform from Top Management

(1) Third-Quarter Achievements

[Measure 1-1: Increase Safety Awareness Throughout the Entire Organization and Management]

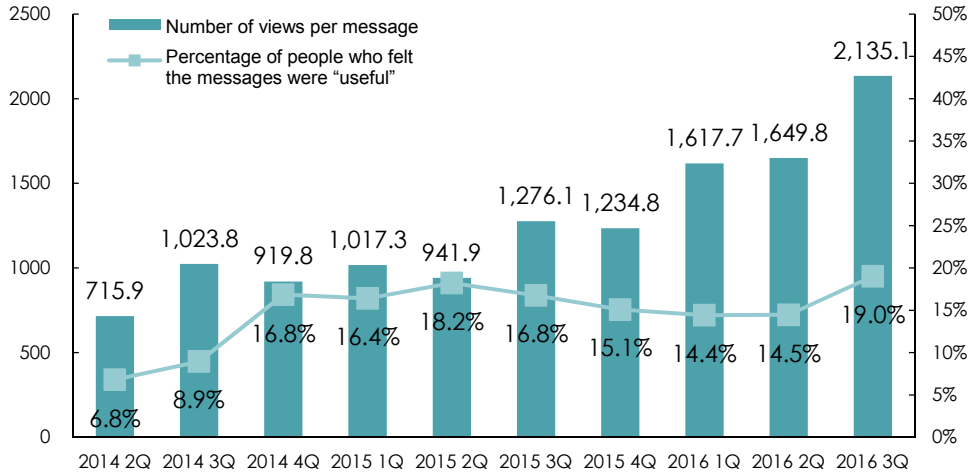
- Efforts to Enhance Governance by Nuclear Power Leaders
  - In order to advance nuclear management reforms, the gap between our standards and the world’s highest standards have been analyzed and improvement measures deliberated/drafted as part of the Management Model Project (Phase I (July through August 2016)).
  - We have currently transitioned to Phase II (September 2016~March 2017) and are in the process of implementing the improvement measures proposed during Phase I, and making improvements to organizational management methods, organizational frameworks and processes/procedures.
  - Behavioral guidelines for positions (fundamentals) have been created.
  - In the area of radiation protection, water taps inside controlled areas have been closed in order to perform strict exposure impact assessments from skin contamination.
  - In the field of performance improvements, CAP screening by PICO has begun. And, management observation training by overseas experts is being implemented.

- Direct dialogue between nuclear power leaders
  - Since the fourth quarter of FY 2015, nuclear power leaders at headquarters (General Manager of the Nuclear Power and Plant Siting Division and other General Managers) have begun visiting power stations to engage in direct dialogue with power station executives (site superintendent, unit superintendents, Nuclear Safety Center director, power station general managers). During the third quarter, headquarter nuclear power leaders continued to engage in direct dialogue with power station executives (Fukushima Daini: November 15, Kashiwazaki-Kariwa: October 19, December 21). During direct dialogue the progress of work plans and each power station were confirmed and information on issues shared thereby leading to quick resolutions and improvements. In consideration of the type of leadership that should be displayed, measures for continually improving the awareness of making improvements by each member of the organization, and TEPCO Reform Proposals compiled by the Committee for Reforming TEPCO and Overcoming 1F Challenges, discussions are being held about the roles that each should play in achieving reform.

- Conveying the expectations of nuclear power leaders
  - In order to promote nuclear safety reforms, nuclear power leaders must accurately convey their expectations and the reasons for those expectations so that they permeated throughout the entire organization. In order to do this, nuclear power leaders are leveraging video messages,

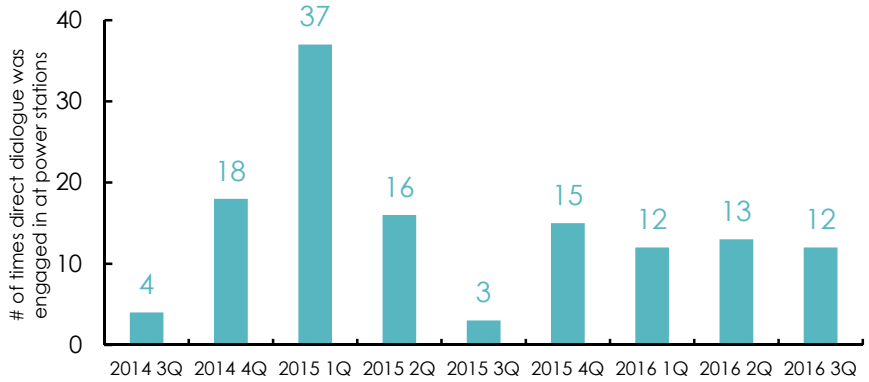
intranet messages, email, meetings and morning meetings as opportunities to convey their expectations. In particular, The General Manager of the Nuclear Power and Plant Siting Division is sending emails directly to each individual in the Nuclear Power Division.

- The following graph shows the number of times that messages by nuclear power leaders have been read by employees. During the third quarter, more than 2100 employees, or approximately two thirds of the Nuclear Power Division, read each message and the percentage of people who rated the message as “helpful” rose to 19%.



Views per message conveyed via the intranet/Percentage that thought the message “helpful”

- In order to convey “thoughts” that cannot be completely conveyed through written messages over the intranet, the General Manager of the Nuclear Power and Plant Siting Division has been engaging in direct dialogue with power station personnel and headquarter employees since February 2014.



Number of times the General Manager of the Nuclear Power and Plant Siting Division engaged in direct dialogue with workers

- Since FY 2015, the General Manager of the Nuclear Power and Plant Siting Division and the president of the Fukushima Daiichi Decontamination & Decommissioning Engineering Company have given awards to those people that have led the way and taken on great challenges, and people who have achieved high objectives in regards to the Nuclear Safety Reform

Plan and other missions. The following chart shows the number of commendations that were given.

Commendations given by the General Manager of the Nuclear Power and Plant Siting Division and the president of the Fukushima Daiichi Decontamination & Decommissioning Engineering Company

Period	Headquarters	Fukushima Daiichi	Fukushima Daini	Kashiwazaki-Kariwa
FY2015	24(2)	47	19	24
FY2016				
Q1	5	6	4	6
Q2	5	3	3	7
Q3	10(1)	8	3	7

(Numbers in parentheses indicate the number of commendations given at Higashidori)

- Enhancing information sharing about issues important to the Nuclear Power Division
  - Upon reflecting on the core meltdown issue, the site superintendents, who are responsible for each power station, and General Managers have started (July) periodically sending emails to all personnel in the Nuclear Power Division that give information on important reports to be released to the public, the status of deliberation of important issues, and background information on instructions that have been given.
  - During the third quarter, we conducted an electronic questionnaire designed to gather opinions about the messages that were conveyed and also confirm the level of understanding of these messages and whether or not they were received. The results of the questionnaire and opinions about messages are being provided as feedback to the sender in order to improve subsequent messages.
  - Averages for the response rate[15] and level of understanding[16] of the electronic questionnaire are compiled quarterly and monitored as a KPI for the ability to promote dialogue (internal 2). During the third quarter response rate was 32.7% (objective: over 75%), and the level of understanding was 2.3 points (objective: more than two points). We feel that there are a lot of people who read the email but did not fill out the questionnaire, so we are encouraging employees to fill out the questionnaire.

- Gathering information on notifications that were given an information is disclosed during the accident
  - Many facts about the accident have been revealed by the government's Investigation and Verification Committee. However, in order to improve nuclear safety going forward and contribute to improving how events are notified and disclosed to the public, employees are being encouraged to proactively report anything that they find to be missing from these reports via an intranet site that has been set up for that purpose (June 21).
  - No information or opinions were provided through the site during the third quarter.

[Measure 1-2. Developing Nuclear Power Leaders]

[15] Measures the percentage of people that responded to the questionnaire within one week after receiving the email

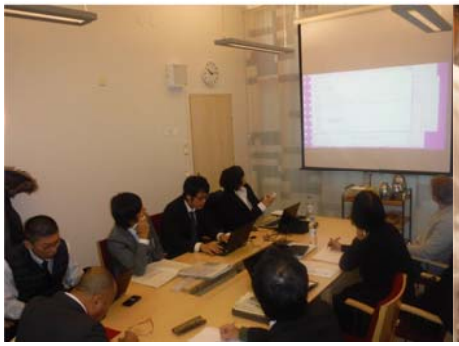
[16] Measured on a four-step scale with 1 being "well understood" and 4 being "not very well understood"

- Creating succession plans for nuclear power leaders
  - In order to train and cultivate nuclear power leader successors and ensure that the organization has the personnel it needs in the future, a process for creating succession plans is being established.
  - In particular, job descriptions that clarify the requirements for important posts, including positions vital for nuclear safety, are being created and required education/training, and OJT is being added based on the requirements noted in these job descriptions.

- Nuclear Power Leader Training
  - In order to provide the knowledge necessary for nuclear safety, at the end of September we began training at the Fukushima Daiichi for the deputy General Manager class (unit superintendent, etc.) on "understanding the current conditions of safety equipment at the Fukushima Daiichi NPS," and "Risk Communication." One complete round of training will be implemented by the end of March 2017.
  - We plan to implement the same training by the end of March 2017 at both Fukushima Daini and Kashiwazaki-Kariwa.

[Measures 1-3. Spreading Nuclear Safety Culture throughout the Organization]

- Benchmarking for nuclear power management reform
  - We are benchmarking excellence (best practices) from both within and outside of Japan and proactively incorporating these practices in order to become a nuclear operator with the world's highest level of safety
  - During the third quarter, we benchmarked the Olkiluoto nuclear power station operated by Finnish utility TVO for its superior radiation protection practices (November 8~10).
  - Based on the results of benchmarking we decided to introduce these radiation protection best practices (ALARA procedures, usage of radiation level limits[17], etc.) at TEPCO.



Explanation of the use of dose limits

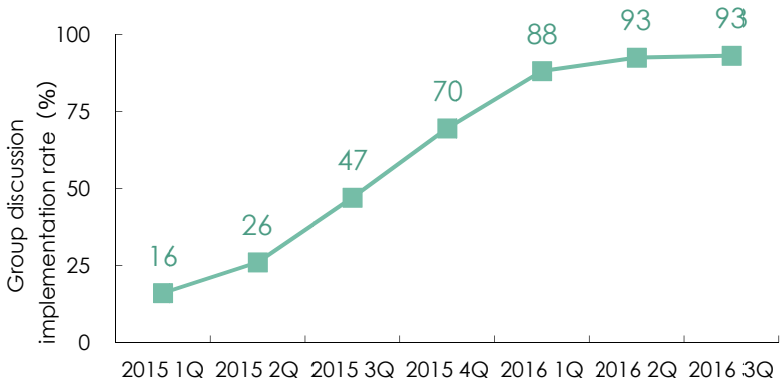
Hand and foot monitor used when exiting the refueling floor

- Permeating nuclear safety culture throughout the organization
  - In the Nuclear Power Division, we have stipulated the, "Individual, leader and organizational traits needed to embody robust nuclear safety culture (10 traits and 40 behaviors for robust nuclear safety culture)." By using these traits to reflect on and comparing one's own actions with ideal

[17] Instead of managing and reducing doses (person/Sv) for the entire organization, upper limits (objectives) are set for annual doses and lifetime doses for each individual in order to reduce radiation risks.

behavior on a daily basis we are encouraging employees to notice the differences in an effort to improve safety awareness.

- The rate of implementation of self-retrospection continues to be approximately 95% and the activity has taken root.
- The implementation rate of group discussions, which are used to share the results of individual self-retrospection, learn from each other, and take notice of new issues, is 93.1% and continuing.
- The number of opportunities for upper management to participate in these discussions is being increased in order to ascertain and improve the quality of group discussions.



Group discussion implementation rate

- Lectures on nuclear safety culture
  - In order to improve middle-management's knowledge about nuclear safety culture and their ability to lead, we are holding lectures on safety culture by instructors from both inside and outside the company. During the third quarter, we invited an internal lecturer from the TEPCO Research Institute to give a lecture on the topic of "the foundations of human performance" during which information about how human performance is approached in the United States was introduced (Fukushima Daiichi: October 7, Fukushima Daini: September 30, Kashiwazaki-Kariwa: November 11, Head Office: October 12).

Discussion about the lecture

- Safety Council meetings

- In June 2016, a Safety Council[18] was established to enable the Nuclear Power & Plant Siting Division to discuss safety with Fukushima Daiichi Decontamination & Decommissioning Engineering Company (FDEC) management, share problem awareness, and promote the quick implementation of common countermeasures.
- During the second Safety Council meeting, discussions were held about recurrence prevention measures for recent nonconformances, methods for evaluating the effectiveness of those measures, and the fact that TEPCO employees seem to have little concern for society, under the topic of "Analyzing the Current State of Nonconformances and Safety Culture, and Future Initiatives."
- In consideration of the discussions by the Safety Council, at the head office middle-management, such as group managers, gave a presentation on "recent events of great concern to society," and discussions were held on a trial basis.
- The next meeting will be held in January 2017 to discuss the topic of nuclear safety.

- Safety Steering Committee
  - In June 2014, a Safety Steering Committee[19] was established to enable a small number of managers to engage in focused discussion on one or two topics. During the third quarter, a Safety Steering Committee meeting was held on December 12. During the meeting the status of achievement of nuclear safety KPI objectives for the first half of FY 2016 was reviewed and discussions on the analysis/examination of the trends over the past two and half years were held. At the meeting, particular attention was given to the fact that the accidental shutdown of the reactor cooling water injection pump caused by accidental contact with the operation switch cover that occurred at Fukushima Daiichi Unit 3 on December 5, and the nonconformance of an alarm caused by accidental contact between an operation switch and a work panel that occurred at Kashiwazaki-Kariwa Unit 1 on November 14, have not been sufficiently leveraged as OE information.
  - Based on discussions in the meeting, use of "emergency OE information", which promptly shares important OE information, began.

- Communicating with contractors and efforts to improve understanding
  - In order to improve nuclear safety at TEPCO's nuclear power stations, contractors must have an understanding of nuclear safety reforms and cultivate nuclear safety culture. Therefore, in continuation from the second quarter, head office management have visited the offices of contractors in order to exchange opinions about nuclear safety (November 14). Mutual understanding about nuclear safety has been deepened through these activities. Going forward, opinion exchanges will be held with power station contractors based on the results of opinion exchanges engaged in by the head office.
  - On October 14, a nuclear safety information sharing meeting was held with contractor presidents. At the nuclear safety information sharing meeting, each contractor shared examples of best practices that they have implemented in order to improve nuclear safety and opinions about measures to implement in order to promote these activities were

[18] The Council is comprised of the general manager of the Nuclear Power & Plant Siting Division, FDEC President, power station site superintendents, and head office general managers

[19] The Committee is comprised of the president (Chairman), general manager of the Nuclear Power & Plant Siting Division, FDEC President, and Director of the Nuclear Safety Oversight Office (NSOO)

exchanged. As a result, there have been some contractors that have started “Measures to Convey the Importance of Rules and the Reason for Them,” based on the information shared at the meeting about initiatives at other companies.

- Assessing the Status of Nuclear Safety Culture
  - Based on the results of overseas benchmarking (implemented in December 2015), an assessment team comprised of head office representatives, the safety culture promotion offices at each power station, and licensed reactor engineers assessed the state of nuclear safety culture at the Fukushima Daini NPS while receiving guidance and advice from overseas experts (October 24~28). Through interviews with power station management, managers, and contractor employees, and observation of fieldwork, various issues were identified, such as the failure to take actions that should be taken, such as “walking close to rotating equipment without wearing safety glasses.” Going forward, improvements will be made by clarifying the behaviors that are required through the creation and communication of fundamentals, and examining the status of implementation of work through management observation.

The assessment team identifies weaknesses

(2) Primary Future Plans

[Measure 1-1. Increase Safety Awareness Throughout the Entire Organization and Management]

- As part of our Management Model Project we will benchmark with the world’s best practices, such as knowledge from overseas experts, and revise the current Nuclear Power Division Management Guidelines during this fiscal year.

[Measure 1-2. Developing Nuclear Power Leaders]

- We will use the Nuclear Power Division human resource cultivation database to move forward with the cultivation of potential successors based upon the successor plan process established to cultivate successors for leadership positions in a stable manner.

[Measure 1-3. Spreading Nuclear Safety Culture Throughout the Organization]

- In accordance with the results of benchmarking, as part of our management model project we will incorporate CAP (Measure 3-5), which will be mentioned later, to prevent delays in the commencement of improvements and guarantee

that activities are followed up with after they have begun, just as we did with the self-assessment results.

- We will continue to hold lectures on nuclear safety culture in order to improve safety awareness throughout the entire organization and spread nuclear safety culture. During the fourth quarter, we plan to hold lectures on “Engaged, Thinking Organization, Significant Operating Experience Report (SOER) 10-2,” and “Significant Operating Experience Report (SOER) 2003-02- damage to the reactor vessel lid at the Davis-Besse Power Station.”
- In regards to communication with contractors, nuclear safety information sharing meetings have been held at the Head Office and Head Office management have visited the offices of contractors. In regards to communication with power station contractors as well, visits and dialogue will continue based upon the results of the opinion exchanges held at the Head Office in order to work together with contractors to further improve safety improvement awareness.

3.2 Measure 2 Enhancement of Oversight and Support for Management

(1) Third Quarter Achievements

[Measure 2-1. Nuclear Safety Oversight Office Conducts Monitoring and Executes Improvements in Response to Indications and Proposals]

- Nuclear Safety Oversight Office Monitoring Activities

  The views of the Nuclear Safety Oversight Office based on the past several months of monitoring activities conducted the third quarter are given below. These views were reported to the Executive Committee on January 24 and the Board of Directors on January 31.

Nuclear Safety Oversight Office (NSOO) Quarterly report

Foreword

This report summarizes the Nuclear Safety Oversight Office (NSOO) assessment results for 2016, Q3 (October through December). Recommendations, advice and observations have been discussed with the management as they arose and have already been accepted and acted on (or actions are planned).

1. Safety Performance

The team reports continue to indicate steady improvement in safety in many areas. Also, wide spread improvements are gradually being achieved by the Chief Nuclear Officer (CNO) and Chief Decommissioning Officer (CDO) implementing major initiatives to improve safety capabilities as recorded in the Q2 report.

There are still areas for improvement and the following summarizes the observations made and advice given.

1.1 Team Assessment Summaries.

1.1.1 Fukushima Daiichi

- The creation of a Water Management Shift Team is an improvement, but such problems as work overload of operators have been emerging. On reorganizing the Team, evaluation of the work during the planning and verification after the implementation were not inadequate.
- There are good improvements in the safety management of the solid waste facilities

but still room for improvement in aspects of clarification of radiation control boundaries and stricter entry control on high dose zones.

- The standard of command and control in the emergency response has improved a lot during the quarter. There is still a lot to improve including particularly the planning for predictable events so that the response is proactive rather than reactive.
- Human Error led to the unplanned shutdown of safety-significant core injection system and spent fuel pool cooling system. The root causes other than human error are poor design for safety and a failure to learn from a similar event at other sites.

1.1.2 Fukushima Daini

- It is necessary to pay due attention to operation of facilities in a different mode in a long-term shutdown period. Technical documents should be developed to verify the adequacy of such mode of operation. In addition, Maintenance personnel need to recognize mode of operation at sites and modify their inspection and maintenance plan based on the status of risk.
- The site emergency training exercise was an impressive example of good command and control of a complex and demanding scenario. Work is needed to train all the people who might be involved in any emergency to the same level.
- Improvements have been made to the management of combustibles in the switch yard, but the SREs identify similar problems in other radioactive waste buildings. In the background As the background factor, there existed multiple groups in charge by specific premise, building or facility, which caused ambiguity in the management. As the measure to tighten control of switchyards, area managers have been appointed as the champion of field improvement activities and implementing corrective measures.

1.1.3 Kashiwazaki Kariwa

- There is room for consideration of changing design of fire protection measures for succeeding units in the future, such as integration to halon fire extinguishing gas from CO2-based systems based on the viewpoints of personal safety, ease in monitoring and operability of operators.
- Fundamental technical knowledge that should be understood by emergency response personnel should be given systematically under the collaboration of line departments and the Human Resource Development Center.
- Operators' performance is continuously improving. By strengthening coaching and thoroughly implementing change of management in manuals and guidance, the improvement can be accelerated.
- According to SRE's field observations, the challenge of the site for improving the safety culture is to "find the solutions on its own and making improvements on its own", and to "evolve into a team taking the actions by thinking ahead" (interdependent). To this end, the site undertake initiatives to link its reform/improvement activities and risk management to the business plan. At present, each department cascades the action down to the frontline independently, which indicates the weakness in cross-organizational collaboration.

1.1.4 Corporate Assessments

- The policy of personal dose constraint has been approved. Initiatives to roll out the policy need to be strongly promoted from now on as well.
- Emergency preparedness of the corporate offices has improved but there is still a need for more individual or site-wide training, including of the senior officers.

1.2 Response from Sites to NSOO

By making their observations NSOO teams continue to prompt sites to be more vigilant and risk aware. Our objective is also to encourage sites to aspire to achieving world-class standards of nuclear safety. As usual the site staff have responded well to our comments in this quarter.

2. NSOO / Chief Nuclear Safety Officer (CNSO) Insights from Assessments

Nuclear Safety Oversight Office staff at work

2.1 Change Management

In some cases Change Management is not being implemented with sufficient rigor and hence the safety aspects of changes are not being properly controlled. NSOO will monitor significant changes in the future closely.

We suggest that the current guidance on Change Management should be strengthened by the creation of a process or procedure to both enforce the need for change management and to require it to be monitored under the normal PDCA cycles.

2. 2 Maintenance

NSOO have identified instances where an abnormal operation condition during prolonged shutdown was not understood by maintenance. It is important to accurately grasp the operational status of facilities by maintenance to conduct appropriate maintenance. Operations and maintenance CFAMs (Corporate Functional Area Manager) should consider how to improve communication so that the maintenance plans always take account of any increased risk from non-standard operational conditions during prolonged shutdown.

2. 3 Emergency Arrangements

There have been significant improvements in emergency arrangements at all sites and at headquarters in the last quarter. Further improvements are still required and in particular, CNSO recommends;

> Recommendation: The sites, particularly 1F, should review their potential emergency risks and develop plans to deal with these risks should they occur in an emergency situation.

CNSO notes that the operational problems caused by the earthquake on November 22nd were of low safety consequence but that they caused significant public alarm. There are lessons related to communications and public understanding and trust in such situations.

2. 4 Safety Culture – Work Related Stress

CNSO is concerned at the potential for increasing levels of stress amongst TEPCO employees. Long hours are exacerbated by lack of control over work load and, more recently, uncertainty about the future. This could lead to personal damage, inefficiencies, and to safety-related mistakes. CNSO advises senior management considers the stress level in its workforce and creates policies to manage and deal with the stress.

3. Progress on some key Actions from previous NSOO Reports.

There has been progress on actions related to Learning, Safety Culture (management

style), Procedure Usage, and Staff Rotation.

3.1 Radiation Protection

As reported in the last quarter significant advances in thinking have been made in terms of Site Dose Targets, Life Time Dose Limits for individuals, and Dose Restraint Objectives for individuals. After some delay the proposals on dose restraint objectives have now been endorsed and need to be rigorously implemented to maintain downward pressure on the doses and risks to the workforce.

3.2 Nuclear Risk Assessment in Decommissioning.

CNSO has previously recommended more focus on the nuclear risk assessment and approval processes. In the Q1 report we noted that FDEC has now produced a comprehensive strategy for decommissioning which includes the need for risk management. A second level strategy has now been produced dealing with risk management. CNSO will explore the details for quantitative risk assessment of safety significant tasks within this strategy.

4. NSOO Performance – Closure of NSOO Actions

There has continued to be good performance by the line in closing out NSOO recommendations;

- Of the 127actions raised prior to this quarter, 94 are closed
- In this quarter we raised 3 new recommendations

5. Benchmarking

In this quarter NSOO learned from benchmarking with Bruce Nuclear Power Station (Canada), OECD/NEA (Europe) and Hinkley Point Power Station (UK).

We also attended a WANO Nuclear Oversight Workshop during which TEPCO's establishment of an effective NSOO was identified as "Good Practice" for its clear independent safety oversight organisation, separate from the line organisation.

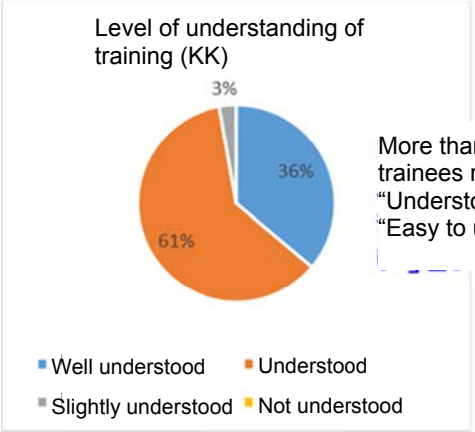
End of Document

[Measure 2-2. Improving the Roles of Middle Management]

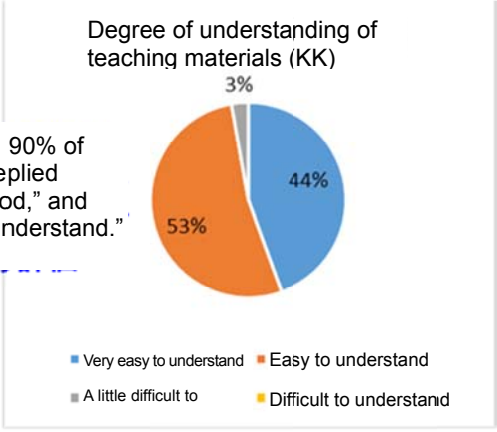
- Enhancing management observation
  - In order to promote nuclear safety reforms and enhance nuclear safety, improvements must be appropriately implemented. Accordingly, management observations (MO), which have been incorporated by outstanding nuclear operators in other countries, have been used to monitor what is happening in the field and accurately ascertain any problems.
  - During the third quarter, TEPCO continued to implement MO and quickly make improvements for issues identified.
  - In order to improve MO capabilities, training and coaching was provided by overseas experts in order to learn the finer points of observation and methods for communicating with field workers in an effort to improve MO capabilities (classroom training: Kashiwazaki-Kariwa (November 16, December 5), Fukushima Daini (December 7), Head Office (December 9)).
  - Starting in the fourth quarter skills will be enhanced by having overseas experts individually coach those engaged in MO in the field ("coach the coach").

MO Training

Coaching

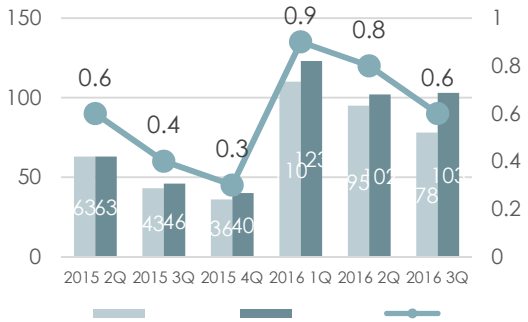


More than 90% of trainees replied "Understood," and "Easy to understand."



Q3 MO record

Item	Head Office	Fukushima Daiichi NPS	Fukushima Daini NPS	Kashiwazaki-Kariwa NPS
# of sessions※	78 0.6/month/person	423 1.0/month/person	585 2.9/month/person	644 2.2/month/person
Number of best practices/improvements identified ※	103 -2%	772 +6%	1,289 +100%	2,154 +7%



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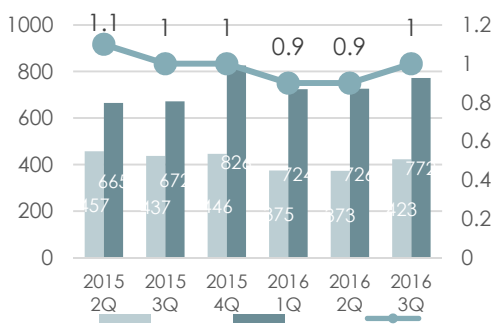

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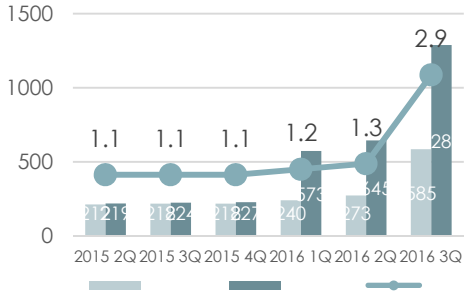

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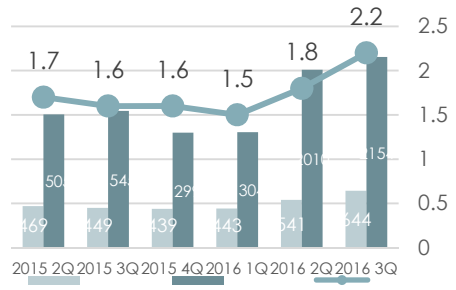

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(2) Primary Future Plans

[Measure 2-1. Nuclear Safety Oversight Office Conducts Monitoring and Executes Improvements in Response to Indications and Proposals]

- The Nuclear Safety Oversight Office will continue to monitor activities that are important for nuclear safety, point out issues to be addressed, and make suggestions as it advances improvements in nuclear safety. In addition, the results of overseas benchmarking will be applied to achieve our aim of having world-class level monitoring operations as well.
- In regards to the emergency response framework and radiation protection, which have been greatly improved, the NSOO will continue to monitor the creation of plans in advance for dealing with the identified foreseen risks that could occur during an emergency, and with the strict adherence to personal dose limit plans.

[Measure 2-2. Improving the Roles of Middle Management]

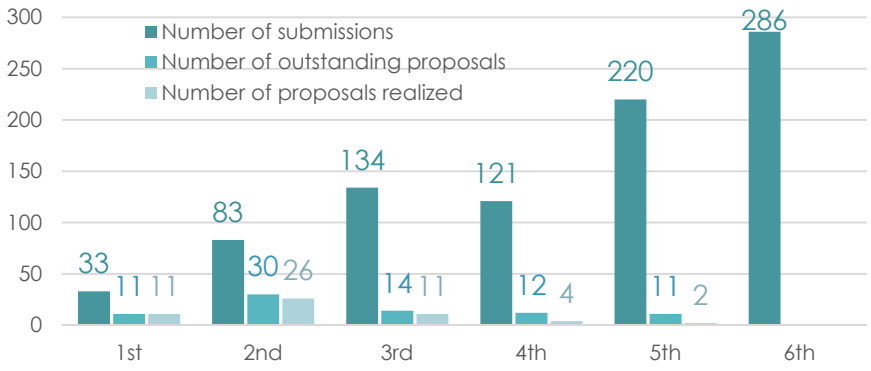
- MO has taken root but efforts will be made to revitalize the measures and gradually raise objectives.
- In addition to increasing the number of times that MO is implemented, the expectations for each field of expertise shall be clarified and the focus areas for MO stipulated in further detail to improve quality.
- Efforts will be made to improve MO capabilities by continuing to provide field coaching by overseas experts as well as INPO/WANO training. In particular, “coach the coach” training by which skill assessors (coaches) coach management observers will be implemented during the fourth quarter.

3.3 Measure 3 Enhancement of Ability to Propose Defense-in-Depth

(1) Third quarter achievements

[Measure 3-1. Hold Competitions for Strengthening the Ability to Propose Safety Improvements]

- TEPCO has been holding Safety Improvement Proposal Competitions so that personnel may, in addition to conducting multi-faceted reviews from the perspective of defense-in-depth, acquire the technical ability to propose cost-effective safety measures and have these proposals put promptly into practice. The current status of these competitions is as follows:
  - Our 6th composition started in July and we received 286 submissions, the most ever received (submission period: July 28~September 16). During the third quarter a total of 14 outstanding proposals for all three power stations were selected as a result of voting by employees in the Nuclear Power Division and an examination of the submissions by each power station and the Head Office secretariat (voting period: November 14~December 9).
  - At the Fukushima Daiichi NPS, the General Manager of the Nuclear Power and Plant Siting Division gave awards for the most outstanding proposals submitted during the 5th competition (October 11).
  - The outstanding proposals to date that were put into practice during the third quarter are as follows:
    - 2nd Competition: Out of the 30 outstanding proposals submitted, one more outstanding proposal has been put into practice since the last report (cumulative total: 26 proposals)
    - 4th Competition: Out of the 12[20] outstanding proposals submitted, one has been put into practice (cumulative total: four proposals)



Number of Safety Improvement Proposal Competition submissions, outstanding proposals, and proposals realized

<Outstanding proposals from the 2nd competition that have been put into practice>

- Materials and equipment used for removing debris generated by a tsunami is on hand. At the Fukushima Daini NPS, an engine-powered cutter has been purchased and at the Kashiwazaki-Kariwa NPS one of the two backhoes was fitted with a claw attachment. (Fukushima Daini, Kashiwazaki-Kariwa)

[20] Out of the 13 outstanding proposals submitted one proposal was employed at multiple power stations, so the total number of outstanding proposals is listed as 12.

Engine-powered cutter (Fukushima Daini)

Training on picking up debris with the claw attachment (Kashiwazaki-Kariwa)

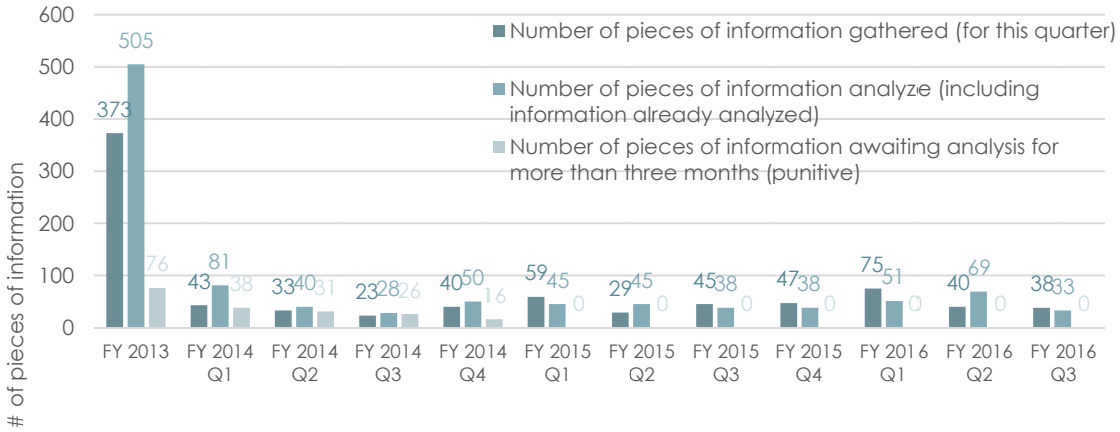
<Outstanding proposals from the 2nd competition that have been put into practice>

- Drones are on hand to be used to ascertain conditions in the field during earthquake or tsunami in the event that workers cannot go into the field. (Fukushima Daiichi NPS, Fukushima Daini NPS)

Examining the images relayed from a drone in the ERC (Fukushima Daini)

[Measure 3-2. Utilize Operation Experience (OE) Data from Inside and Outside Japan]

- One of the lessons learned from the Fukushima Nuclear Accident is that we should learn from the failures of others. Assuming that something that happened somewhere else in the world could potentially also happen at a TEPCO power station, we are identifying lessons to learn and deliberating/implementing countermeasures.
- Operating experience (OE) from both within and outside of Japan is being gathered and countermeasures are being promptly deliberated as personnel in the Nuclear Power Division attempts to leverage this information.
  - During the third quarter, 38 pieces of new OE information were gathered and 33 pieces of information, including OE information gathered in the past, were analyzed. We will continue to analyze this information in a planned manner and there is no information waiting to be analyzed for more than three months.



OE information that has been gathered and analyzed

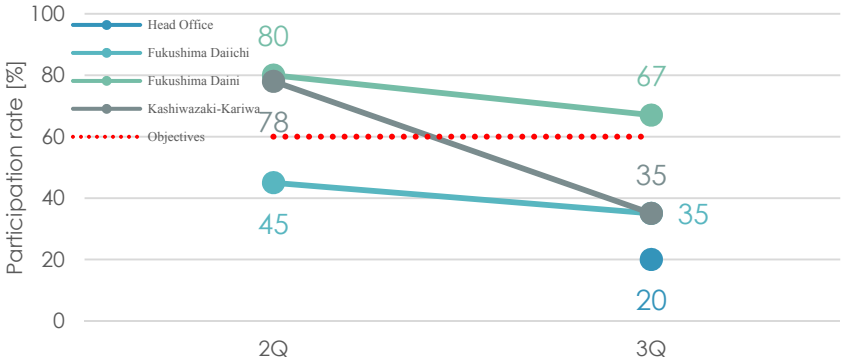
- One of the best practices obtained through the analysis of OE information by the Nuclear Power Division is the use of the company's internal television system to introduce ongoing initiatives to the entire company (November).

Examples of how OE information is being leveraged (shown on internal television systems)

- Focused study sessions are held for important OE information[21] (severe accidents that have occurred within and outside Japan and SOER[22]), as efforts are made to give overviews of these accidents and troubles and understand the lessons to be learned.
- During the third quarter a study session was held on the JCO criticality accident (Fukushima Daiichi NPS and Fukushima Daini NPS: December 26, Kashiwazaki-Kariwa: December 26, Head Office: December 21).
- The participation rate in OE training by managers since the second quarter has been set as a new performance indicator (PI) in order to "look beyond the superficial cause and proactively learned from important OE information." Measurement of this PI has commenced and the participation rate of managers during the third quarter was 20% at the Head Office, 35% at the Fukushima Daiichi NPS, 67% at the Fukushima Daini NPS, and 35% at the Kashiwazaki-Kariwa NPS>

[21] 22 accident/troubles, including the cable fire at the Browns Ferry Nuclear Power Station, were selected for discussion

[22] Significant Operating Experience Report (SOER) issued by WANO



Manager participation rate in OE training (objective value: 60%)

[Measure 3-3. Construct Processes for Improvement Based on Hazard Analyses]

- TEPCO is developing mechanisms for handling accidents and hazards that have a high potential to become “cliff-edge events” and for which the frequency of occurrence is highly uncertain under the assumption that such accidents may occur.
  - The Kashiwazaki-Kariwa NPS finished an analysis of approximately 30 hazardous events in FY2014, and is currently reviewing and implementing countermeasures in accordance with the formulated plan. During the third quarter, the hazard analysis team examined the status of use of guides that stipulate what to do when symptomatic events occur at a time when it is forecasted that external environmental conditions, such as a typhoon, may worsen.
  - At the Fukushima Daiichi NPS, tornadoes are being used as an example of natural phenomena to examine risk scenarios that involve direct exposure and a release of radioactive materials resulting from the aforementioned phenomena, in consideration of current risks and the importance level of those risks.

[Measure 3-4. Improve Processes for Periodic Evaluations of Safety (Safety Reviews)

- TEPCO’s improvement activities are not limited to addressing nonconformances, items indicated during safety inspections, or items indicated during third-party reviews. We have also carried out safety reviews to proactively and continually improve nuclear safety by delving into the causes underlying problems.
  - In order to conduct safety reviews of power stations in an effective and organized manner, we have begun deliberating the construction of a process for the systematic selection of topics to address and creating guides.
  - We examined and organized the status of achievement of objectives for the first half of FY 2016 in regards to nuclear safety KPI, which is used as input during topic selection, and performed the analysis/examination of this KPI based on trends over the past two and a half years.
  - Results showed that the number of equipment malfunction non-conformances is increasing and that there are three common causes for these non-conformances: insufficient consideration during design, the aging of air-conditioning facilities, and insufficient sharing of information with other departments.

- The results of this analysis are being used to make the topic selection process guidebook even more effective.

- The status of safety reviews at each power station is as follows:
  - Fukushima Daiichi NPS

    In order to cultivate safety culture even more effectively, a questionnaire on the “10 traits of robust nuclear safety culture” was distributed to all employees to ascertain how each individual views the cultivation of safety culture and the behaviours required for safety.

    Issues for which the results of the questionnaire showed that “actions should be improved,” or “more action is needed,” are being used to bring about improvements in each department.
  - Fukushima Daini

    A review is being performed of tasks for which in-house abilities for handling an emergency must be enhanced (debris removal, motor replacement, cable connecting, pump repair) in order to make improvements by specifying important procedures and identifying causes of failure.
  - Kashiwazaki-Kariwa

    One of the underlying causes of the insufficient separation of cables under the main control room floor that was discovered in September 2015 is the fact that there was no mechanism for checking the impact that cable laying would have on the safety of existing equipment. As a countermeasure, a mechanism by which an expert intimately familiar with technical guidelines checks whether or not work in the field will have repercussions on safety functions was established. The effectiveness of this mechanism is being examined during safety reviews.

[Measure 3-5. Promote Improvement Activities through use of the CAP[23] System]

- Of the information that contributes to improving nuclear safety, the root causes of non-conformances, the status of implementation of countermeasures, and OE information is being managed using a system. However, analyses of comprehensive weaknesses of other information and further deeper investigations into the causes are not being carried out.
- Information shall not be limited to just non-conformances and OE information, but rather all information that is beneficial for improving nuclear safety (management observation results, benchmarking results, external review results, near-miss information, etc.), and managed in a uniform manner by CAP. This will help to reduce redundant improvements and formulate fundamental countermeasures thereby leading to more effective and efficient improvements.
- Improvements to how non-conformance information is managed
  - To prevent non-conformances from recurring, TEPCO revamped the process for analyzing causes and determining the level of corrective measures (management grade) based on the degree of impact of the non-conformance, along with latent risks and the degree to which the event was learned from. This new system was put into use in July and we have started to see results, such as an increase in the number of cases where the causes of a non-conformance are looked into deeper.
  - There has been a reassessment of the processes for learning not just from non-conformances, but from a variety of improvement information, so it was decided to change the name of the Non-conformance Management Committee to the Performance Improvement Committee (initiated on October 1).

[23] Corrective Action Program

- Enhancement of Improvement Activities with Assignment of Personnel Responsible for Improvements
  - To strengthen improvement activities, performance improvement coordinators (hereinafter referred to as, “PICO”[24]) have been assigned to power station departments beginning in October. PICO personnel screen nonconformance and improvement data each day and support trend monitoring and cause analysis, thereby further preventing the recurrence of accidents and nonconformances.
  - In the future, the PICO personnel in each department will collectively handle information, which will enable an integrated analysis for identifying underlying problems and organizational issues, and share this information within and between departments and divisions in a timely manner. Furthermore, the PICO personnel in each department will exchange opinions honestly with each other in order to reliably ascertain causes and effective countermeasures.
- Additional Efforts for Improving Performance
  - In the second quarter, self-assessment was implemented on processes, such as CAP, OE information performance evaluations and benchmarking necessary for improving performance, to examine for gaps with the world’s highest standards. Some gaps identified were “appropriate assessments to determine whether or not countermeasures are being continually implemented or whether the countermeasures have been effective cannot be performed.”
  - During the third quarter, CAP screening by PICO commenced (Fukushima Daini: November 1, Kashiwazaki-Kariwa: December 19), and efforts to make process improvements, such as “gathering and assessing MO information,” and “handling issues pointed out during external reviews,” were carried out in a planned manner.

[Measure 3-6. Improve Ability to Resolve Inter-Departmental Issues (Change Management)]

- An analysis of the Nuclear Safety Reform Plan found that, when resolving issues in which multiple organizations are involved, poor project management is a cause of the slow pace of resolution and insufficiency of anticipated results.
- In order to improve these areas, TEPCO formulated a policy that provides, in principle, not only for full-time project leaders and the specifying and sharing of responsibility and authority, objectives, expectations and deadlines, as well as the provision of regular progress reports, but also enables organizational leaders to respond in a methodical manner when common issues arise.
- TEPCO examined maintenance process improvements (introduction of Maximo[25]), applied improvement plans, monitored the status of these improvements, and examined the degree of improvement to project management.
  - Preparations to introduce Maximo at the Kashiwazaki-Kariwa NPS were made and the new system was put into operation on October 24. Also, new task processes using Maximo will be put into use in April 2017 in conjunction with inspections performed based on the special maintenance plans for Kashiwazaki-Kariwa Units 1~5.
  - Even after introduction of the system we will continue to ascertain the status of use and operational issues in order to deliberate improvements. The system will be put into operation at the Fukushima Daini NPS during the second half of FY 2017.

[24] Performance Improvement Coordinator

[25] IT solution for strategic asset management

- In order to gather information on maintenance reform best practices, from December 12 through the 15 nuclear operators in the United States that have introduced Maximo were benchmarked in regard to operation and coordination between head offices and power stations. We confirmed that at nuclear operators with the world's highest levels of safety, compared to TEPCO the head offices are more aware of conditions at plants, and have a robust framework for providing support to the power stations. We will deliberate how to reflect the results of this benchmarking in TEPCO operations.

(2) Primary future plans

[Measure 3-1. Hold Competitions for Strengthening the Ability to Propose Safety Improvements]

- Beginning in the middle of January, the submission review committee, for which the site superintendent serves as chairman, will select outstanding proposals submitted during the 6th competition.
- TEPCO will continue to monitor the process for putting outstanding proposals from previously-held competitions into practice, and follow up promptly in cases where such proposals have not been brought smoothly to fruition. With regard to the competitions, we will continue to aim to increase the number of proposals submitted, improve the quality of these proposals and put outstanding proposals into practice promptly

[Measure 3-2. Utilize Operation Experience (OE) Data from Inside and Outside Japan]

- In the future, intensive courses taught by overseas experts to learn about major accidents and SOER will be offered in a systematic and planned manner, and OE training instructors at each power station will develop training courses to be offered within the power station. Through these activities TEPCO aims to have all employees of the Nuclear Power Division gain a thorough understanding of important OE data and the lessons to be learned from it.
- Furthermore, in FY2016, we will incorporate the study of OE data into education and training programs for the Nuclear Power Division.

[Measure 3-3. Construct Processes for Improvement Based on Hazard Analyses]

- TEPCO will assess the impact of hazards at Fukushima Daiichi NPS based on risk scenarios where the triggering factor is a natural phenomenon, such as a tornado. These assessments will focus on the impact of that natural phenomena as have on the functions of equipment vital for safety.

[Measure 3-4. Improve Processes for Periodic Safety Reviews]

- In order to effectively conduct safety reviews, TEPCO will create a guide for the process of selecting safety review topics, organize issues related to nuclear safety, such as nuclear safety KPI, etc., based upon this guide, and use it to select topics for the next review.

[Measure 3-5. Promote Improvement Activities through use of the CAP System]

- TEPCO will monitor whether or not CAP is being utilized so that non-conformance management leads to performance improvement, and the CAP process will be continually improved.

[Measure 3-6. Improve Ability to Resolve Inter-Departmental Issues (Change Management)

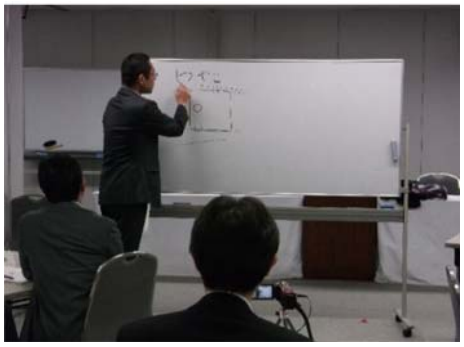
- TEPCO will measure and assess utility after operational processes have been modified and systems are operational. Also, interviews will be conducted with those involved in process modification to follow up on improvements at each operational stage after the operational processes have been modified and the system introduced

3.4 Measure 4: Enhancement of Risk Communication Activities

(1) Third-Quarter Achievements

[Measure 4-1. Systematic Appointment and Training of Risk Communicators]

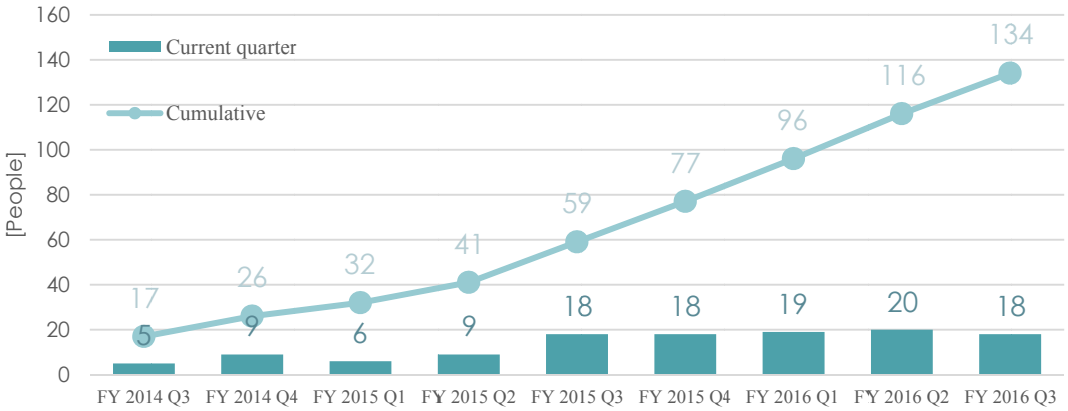
- At current time, we have 43 risk communicators (as of December 31).
- Training is continually implemented to maintain and improve the skills of risk communicators. During the third quarter, in addition to simulated press conference training and case study training, presentation training was also given by instructors from the TEPCO Energy Partner Customer Service Promotion Office.
- The Social Communication Office and risk communicators continue to give suggestions to management and the Nuclear Power Division in regards to disclosing and formulating countermeasures for risks (33 suggestions made during the third quarter for total of 83 for FY 2016)



Presentation Training

Presentation Training (Instructor Critique)

- Managers from engineering departments at the Fukushima Daiichi NPS continue to be assigned to the Fukushima Corporate Communications Department for training in order to improve awareness about external communication and promote mutual understanding and cooperation between engineering departments and the Corporate Indications Department (during the third quarter 18 engineering department managers participated in this training for total of 134 participants to date).



Number of engineering department managers assigned to the Fukushima Corporate Communications Department for training

[Measure 4-2. Risk Communication]

A: Activities in the Fukushima area

- Opportunities for dialogue with the local government, related organizations, such as fishery cooperatives, agricultural cooperatives, the Junior Chamber, and local residents are being created, such as briefings on decommissioning and contaminated water countermeasures at the Fukushima Daiichi NPS, and safety measures implemented at the Kashiwazaki-Kariwa NPS.
  - Fukushima Revitalization Headquarters President Ishizaki and FDEC President Masuda continue to engage in direct opinion exchange sessions with students about the status of Fukushima Daiichi decommissioning and recovery efforts. For the first time since the accident 13 high school students from Fukushima City were given a tour of the Fukushima Daiichi site (November 18). Some participants commented that they would, “like to pass this information down to future generations,” and that they, “would like to do what they can to help Fukushima to recover.”

Tour of the Fukushima Daiichi site

Opinion exchange session

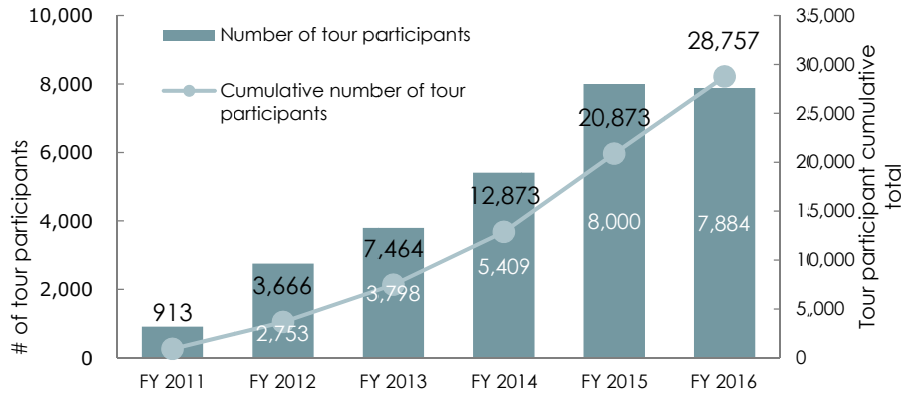
  - During the 4th Prefectural Safety Assurance Conference on Ensuring the Safety of Decommissioning of Fukushima Prefecture Nuclear Power Stations[26] (September 5), it is requested that, “an explanation be given of how waste will be managed in a stable manner for the next 10 years,” so at the 6th meeting an explanation was given on “forecasts for waste production,” “incineration and volume reduction processing,” and “storage methods.”
  - The 1st Reactor Decommissioning Robot Competition sponsored by the Ministry of Education, Culture, Sports, Science and Technology’s Counsel on Cooperation between High Schools and Vocational Schools to Cultivate Personnel to Engage in Reactor Decommissioning was held at the JAEA Naraha Remote Technology Development Center on December 3. Fukushima Revitalization Headquarters President Ishizaki, FDEC President Masuda and Fellow Komori participated as representatives of TEPCO. Students that participated in the event were given a tour of the Fukushima Daiichi NPS site on September 1 as part of advanced training (Naraha summer school) to enable them to get a grasp of what an actual reactor decommissioning site is all about and understand the restrictive conditions on the design and manufacturing of robots. A total of 15 teams (more than 40 students) from 13 high schools and vocational schools across the country, including schools in Fukushima Prefecture, competed in the contest.

[26] Established in August 2013. The Council is comprised of representatives from the 13 related cities, towns, villages, different organizations, such as commerce, agricultural, fishery and tourism-related organizations, and scholars.

Robot that won the grand prize
(Osaka Prefecture University College of Technology)

Closing ceremonies

- Tours continue to be given at the Fukushima Daiichi NPS. Since it is difficult to grasp actual conditions through only press conferences, distribute materials, and websites, efforts are being made to deepen understanding by having people see the power station with their own eyes (number of two or participants in the third quarter: 2,809)



Number of participants in tours of the Fukushima Daiichi NPS (since FY 2011)

- We've redesigned the 1 FOR ALL JAPAN website that was launched in October 2015 for the approximate 6,000 workers that work at the Fukushima Daiichi NPS and their families. In response to requests from workers we have also added new contents, such as the "My way of staying healthy" page. The website gets an average of approximately 28,000 hits per month. The website can be viewed by anybody on the Internet thereby helping to improve the transparency of information related to Fukushima Daiichi. Furthermore, every month we distribute approximately 2,000 copies of the Monthly 1F newsletter to workers on site and people that tour the Fukushima Daiichi NPS facility.

Monthly 1F newsletter (December 2016 issue)

B: Activities in the Niigata area

- The Niigata Headquarters, which was created by merging the three offices in Niigata Prefecture (Niigata Division, Kashiwazaki-Kariwa Nuclear Power Station and the Shinanogawa Power System Office), as provided tours of the power station, and visited local governments and various organizations within Niigata Prefecture to explain the safety measures that are being implemented at Kashiwazaki-Kariwa and the reactor decommissioning efforts underway at Fukushima Daiichi. In particular, in the Kashiwazaki-Kariwa region, visits have been made to the chairman of the Kashiwazaki City council and the Ward Chief of Kariwa Village, as well as many community residents, to hear their opinions and questions and invite them to tour the power station. Since the accident and until the end of December of last year, a total of 36,401 people from Niigata Prefecture had toured the power station with 13,917 of those people from the Kashiwazaki-Kariwa region.
- "*Fureai* Talk Salons" have been opened at TEPCO PR facilities (Service Hall, TEPCO Fureai Salon Ki-na-se, Energy Hall) to engage primarily women in the siting community. Through these salons, explanations are given of the safety measures be implemented at the Kashiwazaki-Kariwa NPS based upon the lessons learned from the Fukushima nuclear accident, opinions are exchanged, tours of the power station sites are offered and cultural seminars given.
- While focusing on female intellectuals in Niigata Prefecture, representatives of local companies and students are met with, given tours, and invited to participate in opinion exchange sessions. According to a post-tour questionnaire, more than 70% of people believe that the reputation of the power station has improved (third-quarter results: 58 people, cumulative total for this fiscal year: 110 people)
- Communication booths have been established in various locations within Niigata Prefecture to provide opportunities to explain the status of safety measures at Kashiwazaki-Kariwa and directly here opinions and questions (Held in Mitsuke City from November 28 through December 1 during the third quarter).
- A new commercial explaining the safety measures that have been introduced at the Kashiwazaki-Kariwa NPS began airing in December. And, another commercial showing the resolution and efforts of employees to improve safety has been on air since May.

“Safety measures” commercial

Explanations given at Kashiwazaki-Kariwa Service Hall

- The mayor of Kashiwazaki City visited both the Fukushima Daiichi NPS and the Kashiwazaki-Kariwa NPS (December 15, 16). At the Fukushima Daiichi NPS, the mayor was briefed on the current progress with decommissioning work, and at the Kashiwazaki-Kariwa NPS the mayor was briefed on safety measure equipment that has been installed in light of the accident and observed training to improve the ability to respond to emergencies. After observing training at Kashiwazaki-Kariwa, the mayor commented that, “Things aren’t 100% perfect, but you are getting there. Ultimately, it’s people that keep the equipment running. So, the skills of each and every individual are important.”

Tour given to the Mayor of Kashiwazaki City
(Left: Fukushima Daiichi NPS, Right: Kashiwazaki-Kariwa NPS)

C: Information conveyed by management through press conferences

- In the Fukushima area, Fukushima Revitalization Headquarters President Ishizaki, and FDEC President Masuda hold regular press conferences at the end of each month to give updates on the status of activities at the Fukushima Revitalization Headquarters and explain the status of progress with decommissioning and contaminated water countermeasures at the Fukushima Daiichi NPS.
- In the Niigata area, Niigata Headquarters President Kimura held a press conference in order to give reports on the initiatives engaged in by the Niigata Headquarters (December 7, cumulative total for this fiscal year: 3). At the press conference, the status of deliberations on how to support evacuations in the event of a nuclear disaster, and the initiatives engaged in by the Niigata Headquarters, such as the establishment of communication booths in different regions within the Prefecture, were explained.

D: Conveying information in an easy to understand manner, and leveraging social network services

- Movies are continually used to deepen understanding about the various technologies and initiatives related to nuclear power. The following was done

this quarter.

- Explanation given about the land-side impermeable wall mechanism and progress with the project (October 7).
- Explanation given of initiatives carried out during the past two years, such as technology developed by contractors and countermeasures implemented to prevent the dispersion of radioactive substances in conjunction with the completion of the removal of the wall panels from the Fukushima Daiichi Unit 1 reactor building cover (November 24).
- A series of movies was created in which risk communicators respond to concerns that have been voiced about Fukushima Daiichi decommissioning work.
  - The status of groundwater on the sea side (October 18)
  - Current status of the land-side impermeable wall (December 12)
- "Current Conditions at the Fukushima Daiichi Nuclear Power Station" was updated (December 27)

- The following information is being continually conveyed through the website in order to convey the current conditions at the Fukushima Daiichi NPS.
  - Fixed point photo album to visually convey the status of progress of fieldwork (continually updated).
  - In order to provide information on the environmental impact around the Fukushima Daiichi NPS, data from miscellaneous solid waste incinerator facility building exhaust stack monitors, site border dust monitors, and port entrance seawater radiation monitors is updated in real time.
- Information is continually disseminated through the TEPCO Facebook page
  - Posts are made about improvements made to the working environment and the progress with Fukushima Daiichi reactor decommissioning in order to dispel rumors that "Fukushima Daiichi NPS = dangerous worksite" (number of posts made during the third quarter: 10, cumulative total: 63)

Visual check of the status of freezing of the land-side impermeable wall (from Facebook)

- Posts made about safety measures implemented at the Kashiwazaki-Kariwa NPS (number of posts made during the third quarter: 6, cumulative total: 15)
- RC Series posts about the current state of conditions at the Fukushima Daiichi NPS (number of posts made during the third quarter: 4, cumulative total: 22).

E: Disseminating information overseas

- Information disseminated through overseas media sources

- The UK economic magazine, The Economist, published an article on Kashiwazaki-Kariwa (October 11). In the article, which targeted the United States and England, site superintendent Shitara explained the safety measures being implemented at Kashiwazaki-Kariwa that are the result of lessons learned from the Fukushima accident. Some that reacted to the article said that they feared health and environmental damage caused by the increase in the burning of fossil fuels and CO2 emissions in conjunction with the shutdown of nuclear reactors.
- An interview with Fukushima Daiichi Decontamination & Decommissioning Engineering Company President Masuda aired on NHK World, one of Japan's leading international television stations (October 24), during the interview which aired in approximately 150 countries, President Masuda explained the objectives of constructing the land-side impermeable wall and the mechanism of contaminated water generation. The details of the interview propagated through SNS and contributed to correcting mistaken information that was out there, so more opportunities like this will be created in the future.

- Leveraging SNS
  - Information continues to be conveyed to more than 700 intellectuals and representatives of the media in foreign countries via an email magazine. (Distribution during quarter three: once, cumulative total: six times)
  - Information continues to be conveyed via Facebook and Twitter. (Facebook posts during the third quarter: 23, cumulative total: 76, tweets: 124, cumulative total: 310)
  - Issues of great concern to parties overseas, such as the results of seawater sampling, the status of the land-side impermeable wall, the status of the storage and treatment of accumulated water inside buildings, and data on worker exposure, etc., continues to be disclosed on the English version of our website. Data from dust monitors near site boundaries and from seawater radiation monitors at the port entrance has been disclosed in real time on the English version of our website since November 21 and December 7, respectively
- Exchange with representatives of foreign embassies in Tokyo
  - Risk communicators continue to visit foreign embassies in Tokyo to give briefings (during the third quarter the embassies of four nations such as Russia and the Ukraine, etc., were visited).
  - A tour of the Kashiwazaki-Kariwa NPS was held for employees of foreign embassies in Tokyo in October. A total of five employees from the embassies of the United States, France, Holland, and Australia were shown safety measure equipment and observed general preparedness training thereby deepening their understanding of safety measures implemented based upon the Fukushima nuclear accident.

F: internal communication

- In order to deal with the breaking up of the company in conjunction with transitioning to a holding company system, more opportunities are being developed to provide information within the holdings company and to each core company, and also interact with the Nuclear Power Division.
  - The FDEC President is sharing information on the progress of Fukushima Daiichi decommissioning with all employees via the company's intranet. (December 7)
  - The contents of newspaper and television stories concerning TEPCO, and explanations about decommissioning work are being aired on the company's internal television system (third quarter: 20 stories, cumulative total: 40 stories). This information has been made available for viewing on the personal smart phones and home computers of employees in order to

increase viewership.

- Information on the progress of Fukushima Daiichi NPS decommissioning is also now being included in the group newsletter. The November issue included an explanation of the removal of wall panels from the Unit 1 reactor building cover.
- From December, a report entitled “Opinions of Society that You Should be Aware of” that covers issues of interest to local governments in Fukushima Prefecture and the mass media, as well as TEPCO-related issues being brought up on SNS, has been given to employees that work at the Fukushima Daiichi NPS. The report will be issued once a month.
- In December, TEPCO Fuel & Power President Sano visited the Kashiwazaki-Kariwa NPS as well as the Niigata Division. President Sano spoke with Kashiwazaki-Kariwa site superintendent Shitara and Niigata Headquarters President Kimura, and exchange opinions with employees that use to work at thermal power plants.

[Measure 4-3. Promote and Support Risk Communication Activities]

A: Gathering knowledge from overseas

- In order to provide support for decommissioning in the communications field and improve not only the information conveyed to local residents but also the ability to promote dialogue, since May we have held monthly “Fukushima-West Cumbria Study” sessions during which we mutually learn from Sellafield Ltd. in the UK.
  - 5th session (October 26)

    Sellafield Ltd. explained how they engaged in dialogue with stakeholders from British Nuclear Fuels Limited (BNFL) (government owned company that engaged in commercial nuclear reactor business in the UK). We learned that in order to improve communication it is important to consult with stakeholders during the creation of rules for the dialogue process and jointly disclose achievements.
  - 6th Session (November 24)

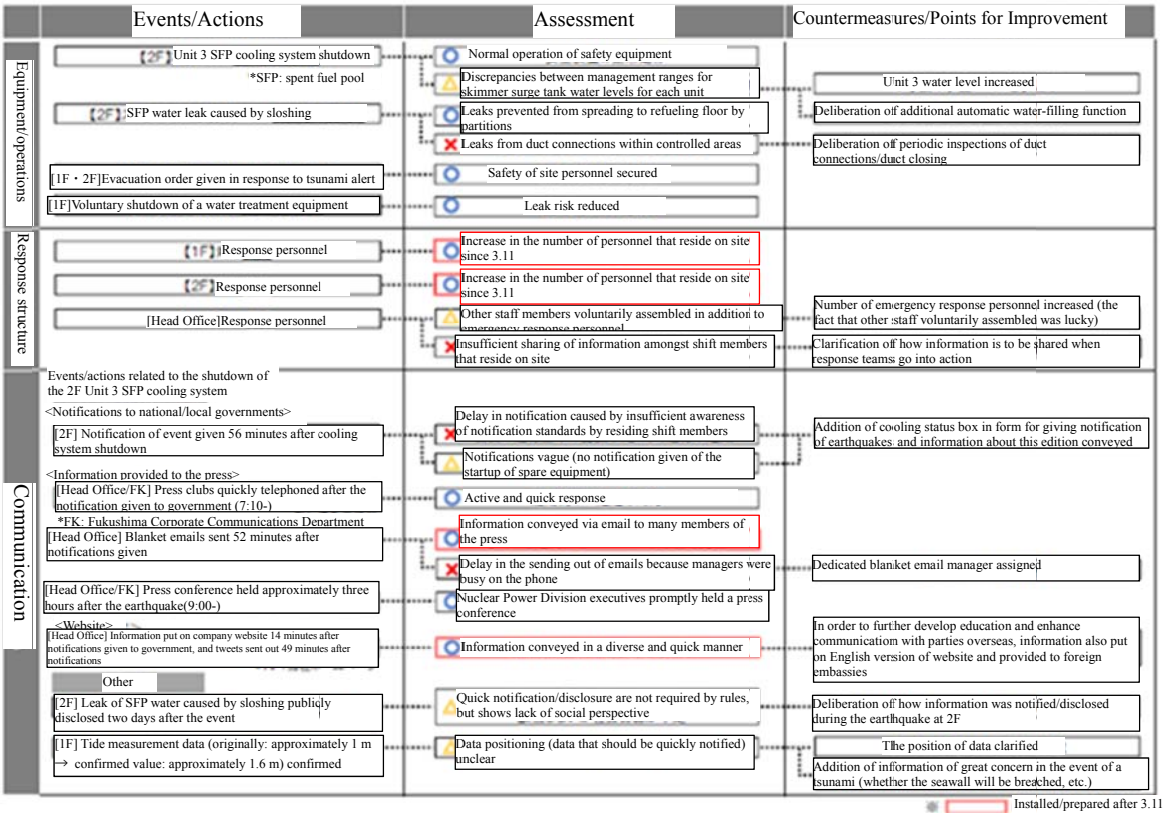
    TEPCO explained the 1 FOR ALL JAPAN website to workers at the Fukushima Daiichi NPS. Workers commented that it’s a good chance to connect workers with the local community and the knowledge on both sides should be leveraged.
- Overseas assessment of TEPCO’s partnership with Sellafield Ltd.
  - During the 5th Annual Japan-UK Nuclear Dialogue (October 31), an intergovernmental meeting, we gave a presentation on decommissioning technology and the achievements of cooperation between TEPCO and Sellafield Ltd. in the field of communication. The details of the dialogue have been put on the website of the Ministry of Foreign Affairs.
  - We have been commended for partnering with Sellafield Ltd. to share information on decommissioning technologies and waste management thereby contributing to a reduction in environmental risks, and nominated for the 2016 British Business Award-Business Partnerships Category sponsored by the British Chamber of Commerce in Japan.
- Visit to the UK and the Ukraine by Fukushima Revitalization Headquarters President Ishizaki (October 30~November 6)
  - President Ishizaki gave a media briefing in the UK. It’s the first time since the Fukushima nuclear accident that a member of management has given information directly to media outlets overseas. The president also visited Sellafield and participated in the West Cumbria Sites Stakeholder Group, a meeting between Sellafield and stakeholders in the siting community.
  - In the Ukraine, President Ishizaki was given a tour of the Chernobyl

Nuclear Power Station. The present exchange opinions with the Deputy site superintendent and received words of encouragement from workers and employees. The president also visited the Chernobyl Museums in Kiev and Slavutych where he donated a video entitled, “The Current Situation at the Fukushima Daiichi Nuclear Power Station” along with copies of Monthly 1F.

- The president exchange opinions with a total of more than 100 former workers, local residents, and related NGOs.

B. Communication during Emergencies

- At 5:59 AM on November 22, an earthquake originating off the coast of Fukushima Prefecture caused a tsunami. We reflected upon how the impact of this earthquake and tsunami on the Fukushima Daiichi NPS and the Fukushima Daini NPS was communicated, identified points for improvement, and are in the midst of implementing countermeasures.
  - Considering the fact that FDEC President Masuda explained the situation at a press conference held at 9 AM, approximately three hours after the earthquake occurred, we believe that the event was handled quickly and accurately. However, there were issues that need to be addressed in regards to how the shutdown of the Fukushima Daini Unit 3 spent fuel pool cooling system was handled, such as the delay in giving notification of the cooling shutdown, sending blanket emails to the press, and releasing information about pool leaks caused from sloshing.
  - Going forward we will add a “Cooling Status” space in the earthquake notification form, and prevent delays in giving such notifications along with the signing a dedicated manager to send blanket emails to the press in order to quickly disseminate information. Furthermore, in addition to “Cooling Status,” we will also give notification of, and disclose, events of concern to society, such as water leaks and the status of electricity being received from off-site power sources.
  - These initiatives will be verified through general training and efforts will be made to convey information promptly and in an easy-to-understand manner so as not to cause an inconvenience on the people of Fukushima Prefecture and society as a whole.



Responding to the earthquake that occurred off the coast of Fukushima Prefecture on November 22 and lessons learned (disclosed on December 8, 2016)

- In order to improve the abilities of the external party handling group, individual training was implemented on November 29. Three members of the external party handling group from the Social Communications Office ran drills on (1) situation-based training and (2) reiterating instructions. The skills refined through these drills were displayed during general training at the Fukushima Daiichi NPS on December 7 and the drills will be repeatedly conducted so as to prevent the level of competency from dropping.

C: Results of questionnaire on information disclosure

- An anonymous questionnaire was conducted on the direct communication in which TEPCO engages in regards to TEPCO's nuclear business, Fukushima recovery efforts and the decommissioning of the Fukushima Daiichi NPS (implementation period: September ~ November). The level of improvement of TEPCO's approach to communication was calculated as a KPI for the ability to promote dialogue (external).[27] News flash values are as shown below.
  - Quality/quantity of information disseminated: +0.9 points (difference from last fiscal year's results)
  - Approach to and awareness of public relations/public hearings: +1.0 points (difference from last fiscal year's results)
- A questionnaire was distributed to members of the press in regards to how press conferences are handled (November 2). Responses showed that Q&A

[27] On a seven-step scale ranging from "Has Improved: +3" to "No change: 0", to "Has Worsened: -3"

sessions and distributed materials are easy-to-understand. We will strive to make further improvements going forward.

D: Improving the ability of PR managers to handle risks through media training

- In order to improve the ability of PR managers to handle risks, instructors from outside the company are continually invited to provide training on how to handle cases of risk while referring to events that have occurred at other companies (Third quarter: 33 participants, cumulative total: 62 participants).

(2) Primary countermeasures to be implemented

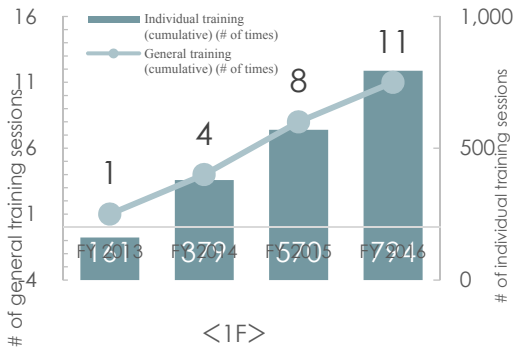
- In consideration of how the earthquake that occurred off the coast of Fukushima Prefecture on November 22 was handled, we plan to make improvements such as enhancing the framework for giving notification of, and disclosing, events that happened at the Fukushima Daini NPS as well as conveying information to overseas parties. Individual training and general training that simulates the conditions on November 22 will be implemented in order to improve skill.

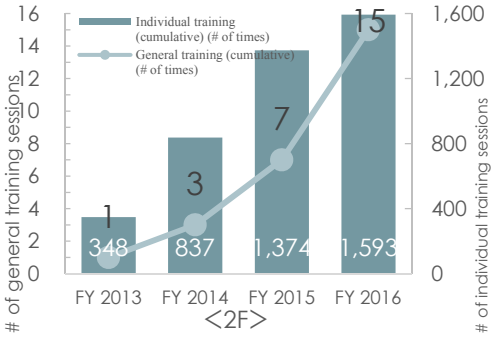
3.5 Measure 5 Enhancement of Power Station and Head Office Emergency Response Capabilities

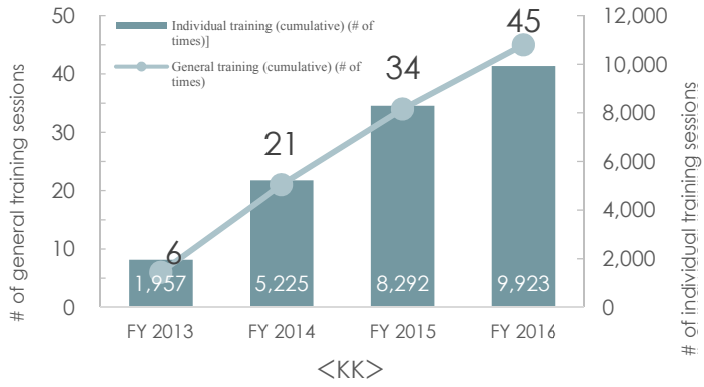
(1) Third-Quarter Achievements

[Measure 5: Enhance the Emergency Response Capabilities (Organizational) of Power Stations and the Head Office]

- In accordance with the Mid- to Long-Term Plan formulated in March of last year, TEPCO has been conducting emergency response training that addresses issues that have arisen during general training at each power station as well as how to handle shutdowns to spent fuel pool cooling systems in the event of an earthquake with an intensity that exceeds 5-weak in consideration of the earthquake that occurred off the coast of Fukushima Prefecture on November 22.
- During general training the “objective setting meetings” used at Kashiwazaki-Kariwa and the Head Office were put into practice at the Fukushima Daiichi NPS and the Fukushima Daini NPS. We aim to be able to efficiently respond to disasters by setting short-term goals and sharing information such as priorities with all emergency countermeasure personnel.
- We are continually conducting individual and general training sessions in order to improve the emergency response skills and operability of departments in times of emergency. The number of times training sessions were held at each power station are shown in the charts below.







- Fukushima Daiichi NPS
  - General training held on October 28 and December 7.
  - During general training in December, joint training was conducted at the Head Office, Minami Soma Off-Site Center and the Fukushima Division based upon a scenario where a large leak occurred from the Unit 1 spent fuel pool as a result of an earthquake with an intensity of 7 thereby causing accumulated water levels in the basement of buildings to increase. The scenario also required trainees to evacuate workers, station personnel and wounded parties, as well as deal with an off-site fire.
  - Departments were able to work together to contain the event and handle risks unique to the Fukushima Daiichi NPS, such as the exposure of spent fuel, and a leak of contaminated groundwater. However, more efforts will be made in the future to clarify the decision-making process and ensure that all personnel are aware of the same issues due to some uncertainty regarding decisions about cautionary events related to the loss of communications functions. Furthermore, improvements will be made in the form of improving the accuracy of chat input and revising the frequency by which important information is brought up.
  - Furthermore, the “objective settings meetings” held at the Kashiwazaki-Kariwa NPS and the Head Office were held on a trial basis in order to set risk priorities, determine repair plans and get them into the hands of countermeasure personnel in a smooth manner. Having the response plans for the decrease in Unit 1 spent fuel pool water level decided on, objective time frames determined and conveyed to the technical support center (TSC) allowed the event to be handled in an efficient manner
  - The large number of personnel that participated in the objective setting meeting resulted in hindering TSC operations, so improvements will be made in the form of limiting the number of participants thereby allowing a continual and uninterrupted emergency response.

Site Superintendent Uchida taking command in the power station TSC (Left)

Objective setting meeting

Training on transported contaminated or wounded parties

Training at the Minami Soma Off-Site Center

- Fukushima Daini
  - General training was held on October 26, November 24, and December 21.
  - General training held in October assumed that a cargo airplane had crashed into a reactor building in order to check whether or not emergency response departments could take action under conditions where it is difficult to predict how the accident will unfold. It was confirmed that if the conditions of spent fuel pools cannot be confirmed as a result of fires caused by the crashing of an airplane, spent fuel pool water levels can be estimated by measuring radiation levels in the surrounding area thereby enabling the cause of the radioactive substance discharged to be identified. This training tested the imagination and flexibility of trainees because the scenario consisted of rare and extremely difficult events, such as detecting radioactive substances within the power station site regardless of the fact that spent fuel pool cooling was being maintained.
  - Training was also conducted by starting with a small number of people in the TSC and gradually increasing the number of personnel under the assumption that a disaster had occurred on a holiday. The importance of sharing information as the number of people grew was reaffirmed. Improvements will be made going forward so that it is guaranteed that important information is shared with personnel that arrive at later times.
  - The general training in November assumed that a nuclear disaster was caused by a lightning strike. It was confirmed that the disaster could be responded to while ensuring the safety of employees and contract workers. In conjunction with this, the substitutes for all TSC personnel were forced to handle the initial response. It was confirmed that preparedness departments functioned as usual and the substitutes could handle the initial response until their full-time counterparts arrived thereby confirming the capability of the substitutes.
  - During the training in December, the “objective settings meetings” employed at the Kashiwazaki-Kariwa NPS and the Head Office were utilized to set repair objectives for the accident response after the need for this action was confirmed during training in October. An objective completion time was set as a short-term objective and notified to all thereby unifying the awareness of all personnel in the TSC.

Site Superintendent Ishii taking command in the power stations TSC

Spraying water on the reactor building using a fire engine

- Kashiwazaki-Kariwa NPS
  - General training was held on October 6, October 18, November 14, and December 16.
  - During general training on October 18, trainees responded to an event where simultaneous fires at multiple units resulted in the leak of radioactive substances and the flooding/inundation of buildings. In response to the deteriorating work environment caused by the leak of radioactive substances (increased radiation levels), the safety team was able to respond to field conditions and ensure the safety of personnel by giving instructions on setting dosimeter alarms and on what protective equipment to where the field. An issue that needs to be addressed in regard to actions in the TSC is how to discuss reasons and methods for preparing power supply cars and fire engines in order to restore power and inject coolant, even though it cannot be predicted when these measures will be necessary, in order to assist with repair strategies that may be implemented at a later time.
  - During general training on November 14, procedures for handling strong winds from a natural phenomenon affecting the power station were practiced. The quick decision to shut down the reactor was made based upon new internal procedures. The training scenario called for emergency diesel generators to be rendered inoperable due to loss of heat removal function caused by large debris being blown into the water intake channel by strong winds, but it was confirmed that alternative means could be selected without problem. However, weather conditions were not notified in the TSC when the wind started to die down. In consideration of the safety of workers engaged in tasks outside thereafter, weather updates should have been continually given until the weather stabilized, so this is an issue that needs to be addressed.
  - During general training on December 16, the shutdown of spent fuel pool cooling systems and leaks from the system were incorporated into the scenario in consideration of the spent fuel pool cooling pump shutdown that occurred at the Fukushima Daini NPS after the earthquake that occurred off the coast of Fukushima Prefecture on November 22. Predicted spent fuel pool water levels were conveyed throughout the TSC even though decreases in actual spent fuel pool water levels could not be confirmed using cameras, however there were instances of hesitation in regards to making decisions in accordance with EAL during an emergency in regards to spent fuel pool water levels.

Personnel at work in the power station TSC

Personnel at work in the headquarters office of the power station TSC

- Head Office
  - The Head Office engaged in joint training with the Fukushima Daini NPS on October 26 and also engaged in joint training with the Fukushima Daiichi NPS on December 7 during which general training about giving reports to the Secretariat of the Nuclear Regulatory Authority was conducted.
  - During the training with the Fukushima Daini NPS in October, training began with a small number of people in the Head Office TSC which gradually escalated into a larger response under the assumption that a disaster occurred on a holiday. In consideration of the facts that the timing for handing over tasks to replacements as the number of responding personnel increased was not suitable and that information was not collected smoothly from the power stations, improvements will be made going forward. Furthermore, even though the Head Office should be providing common assistance to people in the field faced with confused circumstances, people in the field were left waiting for instructions from the General Manager and commander.
  - Therefore, we constructed a mechanism for taking the initiative when it comes to thinking about the best way to provide assistance to a confused power station (Push assistance). A template used to provide information required by supervisors and team leaders when spontaneously taking action, or in other words, “who will report what by when?” was created (draft), and individual training using the “speaking out” template was conducted at the Head Office on December 1. During this training, videos of past training sessions at power stations were used to examine conditions that occur at power stations and training was conducted on reporting the details of assistance given to power stations and information that should be shared within the Head Office based upon the “speaking out” template.
  - During the training with the Fukushima Daiichi NPS in December improvements resulting from push assistance were seen in the form of power stations expressing the type of assistance that they required.
  - In preparation to vacate J Village, which since the Fukushima nuclear accident has been used as a base of operations for personnel and material/equipment, the base of operations for nuclear disaster countermeasures assistance (logistics support center) was moved from the J Village to TEPCO’s Hamadori Distribution Center (Hirono Town, Fukushima Prefecture) on December 19. Training on setting up this new base of operations was conducted in conjunction with training in fermented on October 26 and December 7 to enable the new base of operations to function in the same manner as the previous logistics support center.

Objective setting meeting at the Head Office TSC

Explanation being given by director at a simulated press conference (CDO Masuda)

Personnel at work at the Hamadori Distribution Center

Transporting materials and equipment to the Hamadori Distribution Center

(2) Primary Future Plans

- The Mid- Long-Term Plan created as a fiscal year plan was to be revised during the third quarter, however it was decided to make revisions during the fourth quarter upon assessing the results of training to date.
- General training at the Kashiwazaki-Kariwa NPS on given reports to the Secretariat of the Nuclear Regulatory Authority is being planned for the fourth quarter. The results of emergency response training conducted last fiscal year were disclosed[28] by the Secretariat of the Nuclear Regulatory Authority in June of last year, and the ability to respond to emergencies is being improved through our efforts to make improvements such as sharing information by using a plant information display system and providing evacuation assistance to the siting community using a system for predicting radiation levels around the nuclear power stations. Furthermore, joint training between all companies that assumes a simultaneous disaster at both the Fukushima Daiichi NPS and the Fukushima Daini NPS is being planned.

3.6 Measure 6 Development of Personnel for Enhancing Nuclear Safety

(1) Third Quarter Achievements

[Measure 6-1. Improve In-House Technical Skill to prevent Severe Accidents]

[28] Nuclear Regulatory Authority 6th Nuclear Operator Preparedness Training Report
https://www.nsr.go.jp/disclosure/committee/yuushikisya/bousai_kunren/20160622.html

- Maintenance personnel initiatives
  - Fukushima Daiichi NPS

    We are continually implementing training to develop in-house technical ability (training on the operation of power supply cars, temporary laying and connecting of hoses, and training on the use of heavy equipment, etc.) in order to improve the ability to respond to emergencies.

Training on laying temporary hoses (left: hose laying, right: connecting flanges)

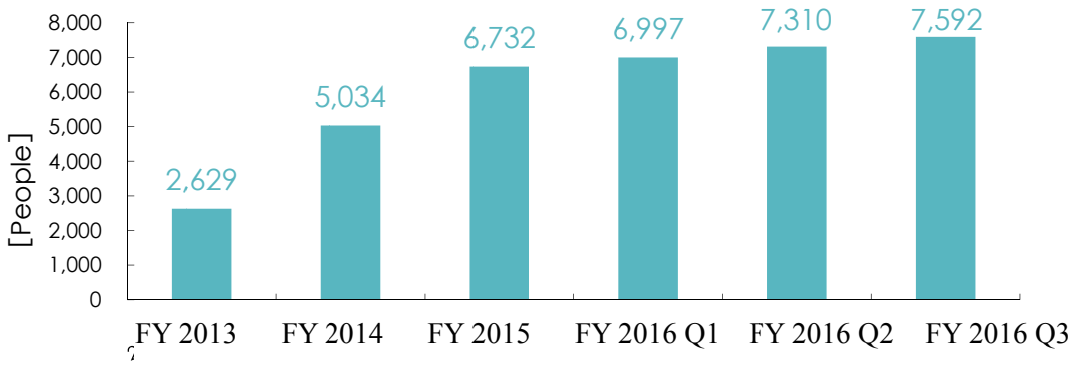
  - Fukushima Daini NPS

    In order to improve the ability to respond to emergencies we are conducting repetitive training drills with four teams (① debris removal/road repair, ② generator replacement, ③ temporary cable connecting, ④ coolant pump repair). We will continue training to develop creativity and innovation so as to be able to flexibly deal with a variety of circumstances.
  - Kashiwazaki-Kariwa

    In order to improve the ability to respond to emergencies, we are conducting training on assembling and disassembling scaffolding, welding/cutting/grinding, gas turbine generator truck/power supply car operation, and duct repair. We've also commenced new training on the operation of bucket trucks and forklifts in order to develop our ability to respond to emergencies. We will continue to implement repetitive training in order to maintain and improve technical capability.

Training on the use of bucket trucks　　Training on the use of forklifts

Training on repairing main control room air conditioning ducts
(left: cutting out repair panels, right: installing rivets)



Number of maintenance personnel participating in in-house technical skill training (Total for Fukushima Daiichi NPS, Fukushima Daini NPS, and Kashiwazaki-Kariwa NPS)

- Technical skill competitions

  We are repeatedly conducting in-house technical skill training (emergency response) in an effort to acquire technical skills and enable repairs to be conducted by TEPCO employees alone in the event of a disaster that is similar to the Fukushima Nuclear Accident based upon the lessons learned from that experience. During the third quarter a technical skill competition was held between the Fukushima Daiichi NPS, Fukushima Daini NPS, and the Kashiwazaki-Kariwa NPS in order to provide an opportunity for employees to display the skills that they have learned and also allow each individual to confirm the level of skill that they have acquired by competing with multiple teams in the same event. The events consisted of removing scattered debris from roads using multiple pieces of heavy machinery thereby simulating debris that has been scattered on roads as a result of a disaster, and also repairing roads by using gravel to create slopes to fix uneven grades and cracks in the road and thereby enable vehicles to pass.

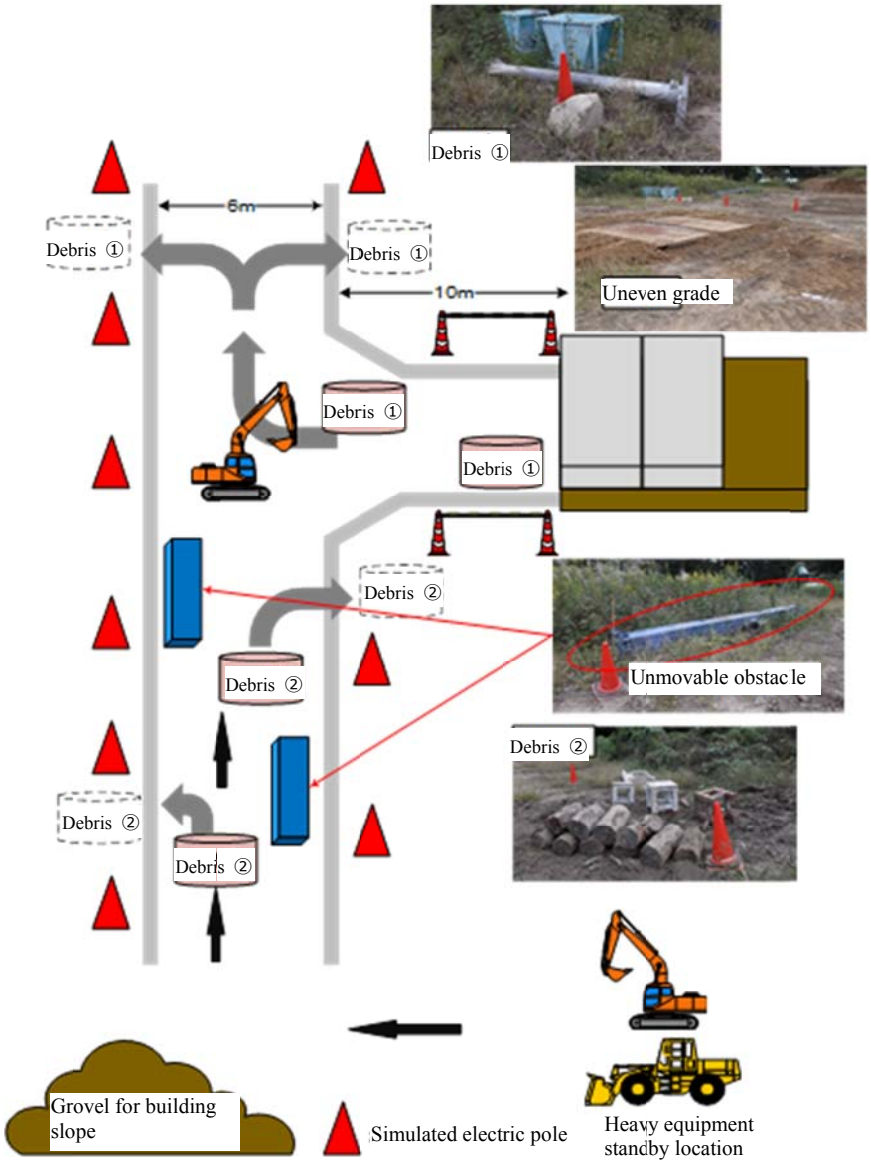


Diagram of the competition obstacle course

During the competition, participants were scored based upon how they planned work, including the clothing/equipment they chose to wear, work safety, operation and guidance of heavy equipment, work quality, and the amount of time they needed to perform the task. The scores were tallied and the Fukushima Daini NPS was shown to have the highest level of skill in regards to the operation of heavy machinery. During the competition, it was also noticed that there are differences between the same types of heavy machinery depending upon the manufacturer, such as having the steering wheel installed on the left as opposed to the right side, etc., so measures will be taken to make all heavy machinery uniform in the future.


Fukushima Daini NPS team (left: Site before work, right: Removing ② scattered debris)


Fukushima Daiichi NPS team
(left: removing scattered debris, right: Carrying gravel to repair uneven grades)


Kashiwazaki-Kariwa NPS team
(left: slope building, right: confirming the vehicles can pass over the slope after the road repair)

- Operator initiatives
  - Fukushima Daiichi NPS

    Unit 5 and 6 operators have engaged in fire engine and power supply truck training since FY 2014. As of the end of December, 40 operators have been certified on the operation of fire engines thereby exceeding our 34-operator goal (80% of the 40 operators in the field) (Fill-rate: 117%, no change from the second quarter), and 39 operators had been certified on the operation of power supply cars (fill-rate: 114%, no change from the second quarter). The priority for Unit 1~4 operators is to acquire skill in operation management, such as the use of contaminated water treatment

equipment, and spent fuel common pool equipment, etc.

- Fukushima Daini NPS

  Training on fire engines and power supply cars commenced in FY 2014. As of the end of December, 21 operators have been certified on the operation of fire engines thereby meeting our 21-operator goal (80% of the 26 operators in the field) (Fill-rate: 100%, decrease of one operator from the second quarter), and 26 operators had been certified on the operation of power supply cars (fill-rate: 124%, increase of five operators from the second quarter).

- Kashiwazaki-Kariwa NPS

  Instructors are being cultivated within operation shifts to continually provide training on the start-up of power supply cars. As of the end of December, 126 operators have been certified on the operation of fire engines thereby exceeding our 102-operator goal (80% of the 127 operators in the field) (Fill-rate: 124%, increase of nine operators from the second quarter), and 119 operators had been certified on the operation of power supply cars (fill-rate: 117%, no change from the second quarter). Furthermore, in addition to the normal start-up of power supply cars, training was also implemented on manual switching in the event of an intake exhaust damper malfunction. Efforts have also been made to cultivate certified instructors within operator training teams and as of the end of December 2016, 140 instructors (increase of 23 operators from the second quarter) had been trained. Efforts are also being made to improve the ability of not only maintenance personnel but also operators to diagnose equipment troubles in conjunction with the increase in the number of operators that has occurred in order to handle emergencies. These operators have obtained internal certification on equipment diagnostics and are now continually sampling data for approximately 140 pieces of rotating equipment at Unit 7. This has led to an improvement in the abilities of field workers, such as the acquisition of a wide variety of knowledge related to equipment and also increased interest in equipment status.

Efforts to improve the in-house technical skill of operators (number of certified operators)

Power station	Fire engines		Power supply cars	
	Number of skill certifications (QoQ)	Fill-rate※	Number of skill certifications (QoQ)	Fill-rate
Fukushima Daiichi NPS	40 (0)	117%	39 (0)	114%
Fukushima Daini NPS	21 名 (-1)	100%	26 名 (+5)	124%
Kashiwazaki-Kariwa NPS	126 (+9)	124%	119 (0)	117%

- Revising the content of education provided to the emergency response personnel
  - In order to enable emergency response personnel to respond more suitably in the event of an emergency, the content of education provided

to emergency response personnel has been revised to take into account the roles of each individual and the tasks they are to implement, and also deepen understanding about how each unit and the organization as a whole respond to an emergency. E-learning educational materials have also been revised as such. Emergency response personnel shall periodically use these educational materials to improve their technical capability.

[Measure 6-2. Improve Operational Specialization]

- Training and Assignment of System Engineers
  - In order to promptly and safely stabilize a reactor when there is an emergency, personnel need to quickly ascertain the circumstances of the accident and make accurate decisions. Therefore, engineers are being trained to be proficient in design, laws & regulations, standards, operation, maintenance and other areas pertaining to facilities important for safety.
  - System engineers formulate system monitoring programs, which stipulate monitoring targets and standards for monitoring system performance degradation, in order to monitor whether or not primary plant systems are fulfilling design requirements. These monitoring activities also serve to identify areas in which reliability can be improved, which leads to overall improvements.
  - During the third quarter, two more system engineers passed their skill certification interview thereby bringing the total number of system engineers to five. The three system engineers that had already been certified also passed their skill certification interviews to increase the number of systems they can be in charge of thereby bringing the total number of systems that these engineers are in charge of to 12[29]. Education and training will continue going forward to increase the number of systems that engineers can be in charge of with the aim of assigning five system engineers to each reactor and continue with the cultivation of personnel.

Education and training using a computer simulator

System engineers receiving certification diplomas

[29] The following six systems were added: condensate feed water system, reactor auxiliary seawater cooling system, high-pressure reactor coolant injection system, reactor pressure vessel, ventilation and air conditioning systems (local air-conditioners), ventilation and air conditioning systems (reactor zones). To date, the three existing system engineers have been in charge of the residual heat removal system, reactor isolation and cooling system, emergency gas treatment system, main control room ventilation and air conditioning system, emergency diesel generator equipment, and emergency diesel generator fuel transport system.

[Measure 6-3. Maintain and Improve Technical Skills Necessary for Operations]

- Revising Education & Training Programs for the Field Skill Certification System
  - The content of education and training to develop reactors skills (safety), which has been newly added as a skill certification category, has been developed in the following areas in order to maintain the advanced skills required in the field of nuclear safety and also cultivate personnel that can instruct younger generations. Training under these revisions will commence during the fourth quarter.
    - Nuclear safety overview, reactor principles
    - Safety design
    - The safety equipment and safety functions of nuclear power facilities
    - Probabilistic risk assessments (PRA)
    - Handling events that exceed to design standards
  - The revision of training objectives, training materials, and test problems also continues in order to implement, in a more systematic manner, training that more accurately resembles actual work in the four fields that have conventionally been subject to certification (operations, maintenance work, radiation & chemical control and fuel).
- Improvement activities by CFAMs and SFAM[30]s
  - CFAMs and SFAMs began ascertaining excellence achieved in other countries, identifying key issues to be resolved, and formulating and implementing improvements for each field of expertise (April 2015). Since mid-fiscal 2015, TEPCO has invited expert teams from overseas to provide advice and guidance about activities that permanently-posted CFAMs and SFAMs engage in, and we have been working to accelerate improvements. TEPCO's Management Model Project, which began in July, entered Phase II in September and we are engaged in action plans aimed at resolving issues in the areas of operation management, maintenance management, human resource development, radiation control, engineering, improvement promotion, etc. These action plans are carried out through cooperation between dedicated project team members and CFAM/SFAM.
  - In December, "CFAM/SFAM work guide", which organizes expectations and implementation items of activities of CFAM/SFAM, was established. Activities will be carried out along this guide after January 2017, and reports will be made to management in a timelier manner.
  -
- New employee training
  - Midterm group training for new employees assigned to the Nuclear Power Division (Fukushima Daiichi NPS: 43, Fukushima Daini NPS: 16, Kashiwazaki-Kariwa NPS: 50) was conducted from October 4 to 20 at the Fukushima stations, and from September 7 through October 7 at the Kashiwazaki-Kariwa NPS.
  - Because midterm group training consists of actually assembling scaffolding, handling heavy objects, and using radiation measurement instruments, the curriculum was configured to deepen understanding of the knowledge acquired during the previous training session and also reaffirm risks unique to nuclear power.
  - In order to assist with the acquisition of basic knowledge about work tasks, education on engineering fundamentals, such as math and electrical

[30] Site Functional Area Manager: CFAM leader at power stations

engineering, has been added. This is the first time that this type of education has been offered during new employee training.

Training on reviving victims of oxygen depletion (first-aid)

Training on hoisting heavy objects

[Measure 6-4. Understanding the Basics of Nuclear Safety]

- Deploying experts
  - As a lesson learned from the non-conformances with separating cables under the floor of the main control rooms at the Kashiwazaki-Kariwa NPS, we have deployed experts with intimate knowledge of equipment design conditions in order to perform a double check of equipment safety in addition to that performed by the managing department.
  - The skill of these experts is confirmed through interviews and reports on their knowledge pertaining to design conditions and technical guidelines as well as their experience with these guidelines, and to date experts in 28 fields, such as fire protection, lightning-resistant design, and electrical separation, etc., have been deployed (Head Office: 20, power stations: 47). During the third quarter, the skills of programming and systems 13 experts in 20 new areas were confirmed. We will continue with our efforts to deploy experts in all 71 areas.
- Learning Safety Design Rationale and Developing In-House Experts
  - As part of on-the-job training for daily operations, TEPCO has used the intranet to provide teaching materials to all personnel in the Nuclear Power Division to learn the important points of safety design as well as key information from previous operation experience ("connection between safety design and daily operations," "lessons learned from the Fukushima nuclear accident," etc.) so that personnel can study in their assigned offices.
  - TEPCO is continuing with preparations to establish the Nuclear Engineering Center (tentative name) for systematically training design engineers[31], system engineers[32] and program engineers[33] in order to increase the technical capabilities of the entire Nuclear Power Division in the field of engineering, particularly. Consideration is being given to training each type of engineer with the requirement that they also possess expert skills.

[31] Engineers responsible for planning, designing, and introducing equipment with high reliability, and for taking the lead in require design management.

[32] Engineers are responsible for maintaining and improving system performance and reliability, and for proposing and taking the lead in monitoring and maintenance activities.

[33] Engineers responsible for the integrity of operation of specific technical fields (example: managing the wall thickness of pipes subject to corrosion), and leading related activities.

[Measure 6-5. Improvement of Management Ability]

- Since FY2015, TEPCO has been providing training for middle managers from the standpoint that middle-managers need to be aware of, and have the ability to, thoroughly fulfill their responsibilities jointly with nuclear power leaders while remaining sufficiently aware of their own responsibilities to nuclear safety.
- Group Manager Training
  - Training for group managers and shift supervisors (section manager level) is provided so that they can understand and acquire the “behaviours” that embody nuclear safety culture as well as the values that are to be steadfastly maintained as a leader and necessary for improving nuclear safety. During the third quarter, training was provided to 74 current group managers and shift supervisors during October and November (total of 145 personnel have undergone the training this fiscal year)
- Training for Power Station General Managers
  - Training has been provided to power station General Managers to once again gain greater awareness of their role and mission as a “General Manager” in charge of about 250 people, and accelerate nuclear safety reforms.
  - Training for newly appointed General Managers was planned and implemented (December: 15 participants) in order to get them to understand the large expectations of power station General Managers to show leadership and improve performance. Training for General Managers who have been in their positions for two years or more was planned and implemented (October: 25 participants) in order to get them to reaffirm that they are expected to be able to solve problems that involve not only their own department but other departments, as well as problems that affect the entire power station, and take action.

[Measure 6-6. Improve Systems for Personnel Development and Education & Training]

- Status of Nuclear Education and Training Center Activities
  - On August 26, with the aim of establishing the Nuclear Education and Training Center, TEPCO filed an application with the Secretariat of the Nuclear Regulation Authority to amend the technical specifications for establishing the Nuclear Education and Training Center (announcement released on the same day[34]), received permission on December 5, and officially opened the Nuclear Education and Training Center on December 19.
  - The mission of the Nuclear Education and Training Center is to cultivate personnel that can, “contribute to continually achieving unparalleled safety by providing the world’s highest level of education, training programs and a training environment for cultivating personnel.
  - We have deliberated and completed the basic design of the human resource training database system, which will be introduced in FY 2017, that will be used for managing education and training performance results and also the individual skills and qualifications of personnel. We will continue to develop system functions, prepare data, and make preparations to transfer data.
- Status of Construction of SAT-Based Education and Training Programs
  - The Nuclear Human Resources Training Center will adopt the Systematic

[34] http://www.tepco.co.jp/press/release/2016/1319702_8626.html

Approach to Training (SAT), which is recognized as a best practice internationally, for providing education and training programs necessary for personnel development throughout the entire Nuclear Power Division.

- In the operations field, while referencing the manner in which SAT-based education and training programs are administered by nuclear operators in the United States, TEPCO has continuously worked to make improvements, such as adding data about actual equipment at each plant to the training content and clarifying which skills should be acquired through training in regards to plant equipment. Lesson plans are also being developed to educate and train operators on response operations.
- In the maintenance field, while similarly referencing the manner in which SAT-based education and training programs are administered by nuclear operators in the United States, TEPCO has created a list of training requirements that trainees should fulfill for each operation as well as an education/training system map for the maintenance field. Education and training programs are being revised so as to provide education and training that can be learned "Off-JT" about those common maintenance tasks that are covered in the training requirements and have typically been dependent upon on-the-job training in the field, such as work supervision, safety management, and work management, etc.
- With regard to nuclear safety, as mentioned in the section on the status of revamping training for technical certifications, lesson plans are being developed on "overview of nuclear safety," "risk assessments," "safety assessments (safety analysis)," and other education and training topics, and training is scheduled to begin during FY2016.
- Education and training courses for the fields of radiation control and chemical management have been revised while referencing textbooks used by nuclear operators in the United States. Lesson plans, textbooks, and test problems for each course are being prepared based on these revisions.
- In the field of fuel management, lesson plans, textbooks and test problems are being continually developed upon revising the details of education and training courses on skill certification training and task education that have been implemented to date.
- We have also commenced new education and training programs such as "English conversation classes" that aim to cultivate personnel that can function overseas, as well as "Management and Accounting Training" that aims to teach about the conditions that the Nuclear Power Division is facing from a managerial and accounting perspective.

(2) Primary Future Plans

[Measure 6-1. Improve In-House Technical Skill to prevent Severe Accidents]

- We had planned to commence e-learning for training emergency responders in the third quarter, however we have pushed back these plans in order to prioritize education and certification on FEMA[35]'s Incident Command System (ICS)[36].

[Measure 6-2. Improve Operational Specialization]

- TEPCO plans to continue training of the five system engineers so that they can be in charge of a total of 17 systems by the end of March 2017. We will continue to train personnel with the objective of having five system engineers assigned to each reactor in the future.

[35] Federal Emergency Management Agency. FEMA has an education and training program for teaching about the ICS

[36] Incident Command System: Standard field command system employed in the United States during emergencies.

[Measure 6-3. Maintain and Improve Technical Skills Necessary for Operations]

- During this fiscal year, we will finish revisions to the education and training program for field skills/certification in the areas of operations, maintenance work, radiation & chemical control and fuel. Education and training in the newly created field of “nuclear skill (safety)” will begin this fiscal year as soon as preparations have been completed.

[Measure 6-6. Improve Systems for Personnel Development and Education & Training

- In addition to revising education and training programs for each technical field, we are also planning the following new education and training programs to be provided at the Nuclear Education and Training Center.

  <Basic nuclear education>

  - Education about the rules and standards for installation permits

    Education will be provided about laws and regulations required to understand nuclear safety in consideration of incident involving the inappropriate separation of cables.

  - Education on document creation

    Education on the basic skills needed to create documents that are easy to understand.

  - Education on learning from past troubles

    Overviews on how to write trouble reports and education on past TEPCO non-conformances from which there is a lot to learn.

  <Education on severe accidents>

  - Education on important operation experience (OE) information

    Education about important operation experience from the nuclear accidents that have occurred at Browns Ferry, Chernobyl, and Three-Mile Island.

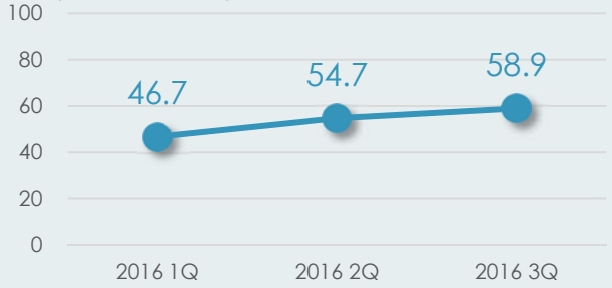
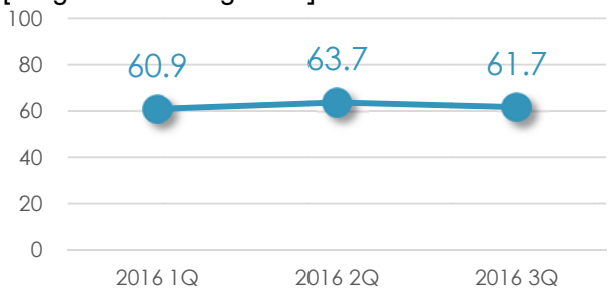
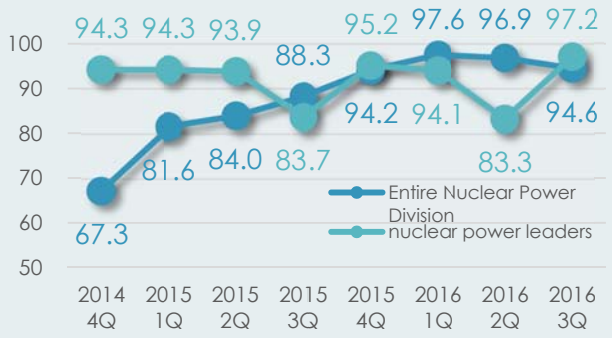
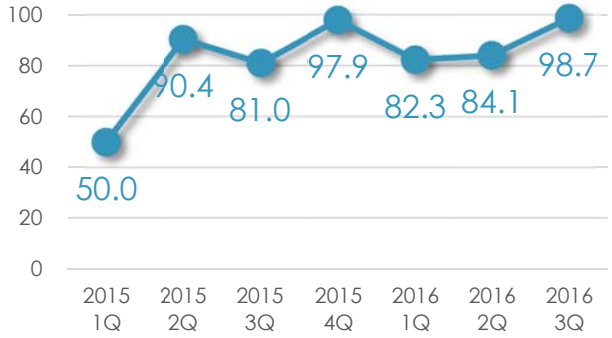
  <New employee training>

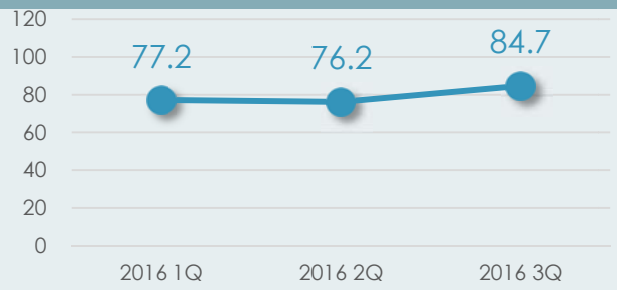
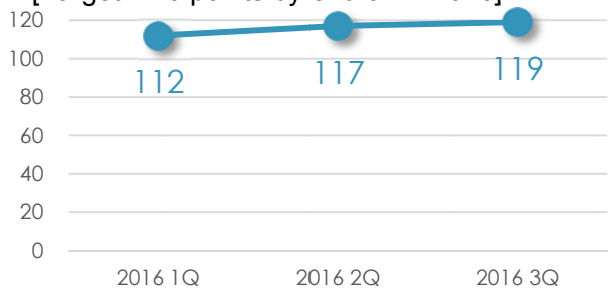
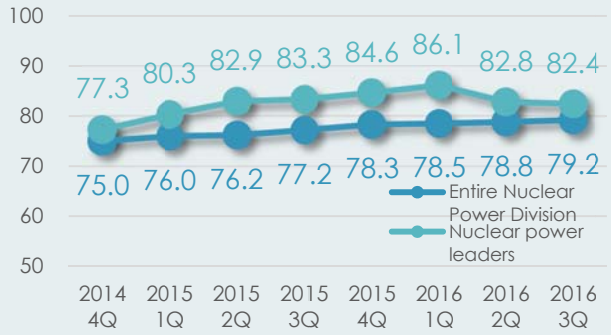
  - Education on engineering fundamentals

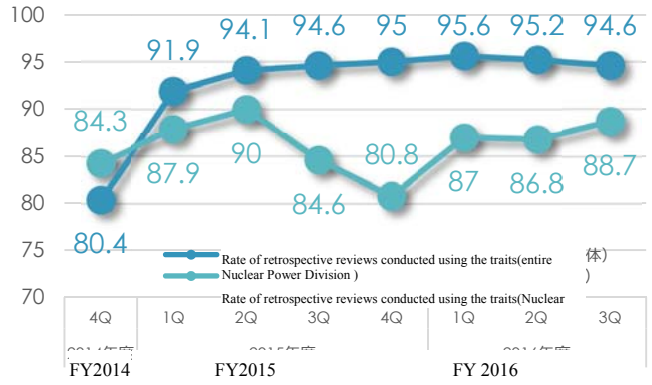
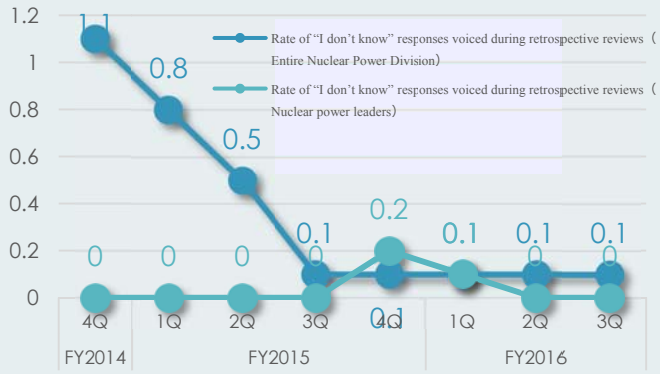
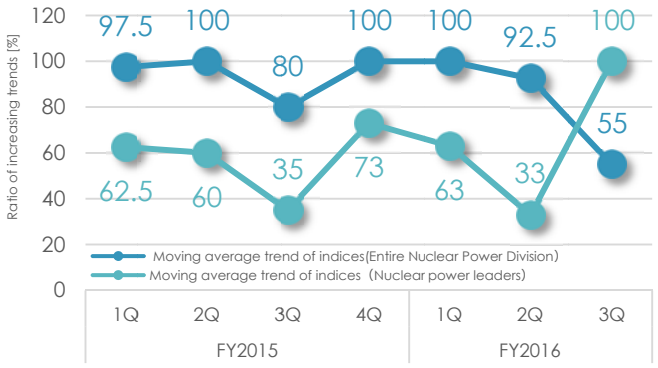
    Continuing with the math and electrical engineering education provided to new employees that joined the company during the middle of the term, education on mechanical engineering will be given to new employees that event of the company later in the term.

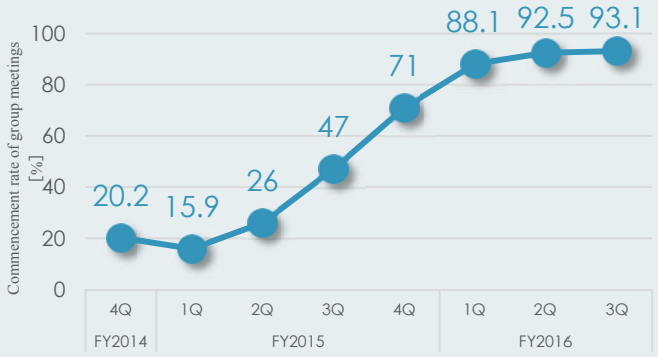
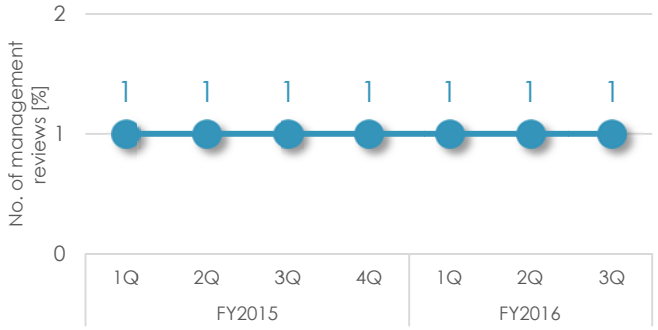
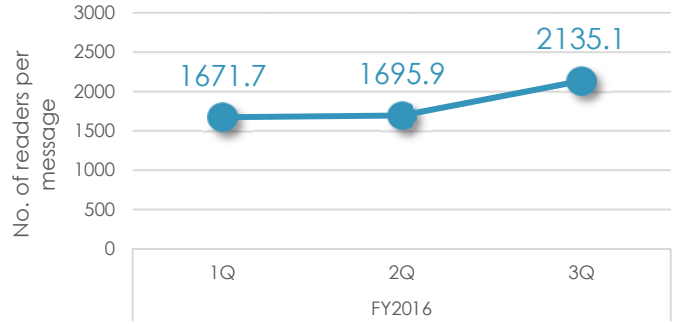
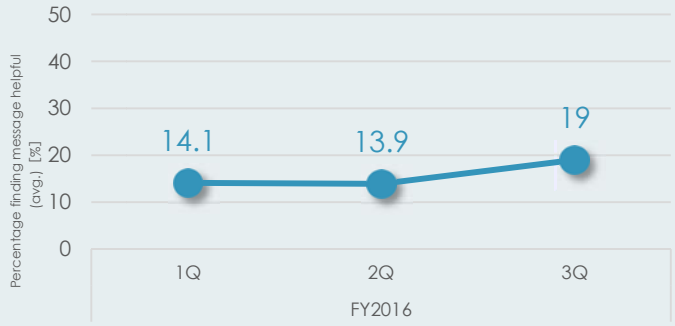
3.7 Evaluation of the Degree of Achievement of Nuclear Safety Reform

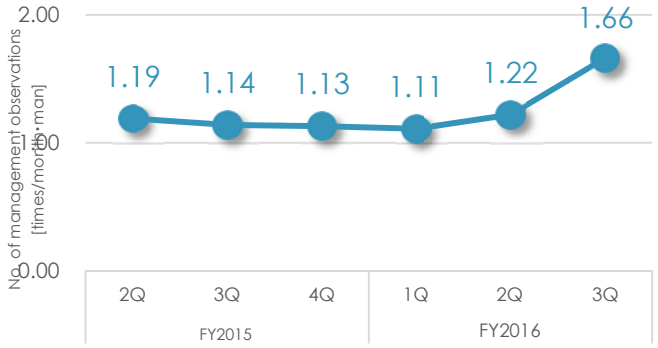
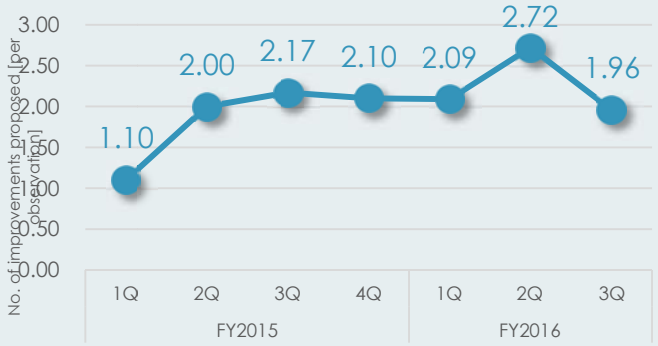
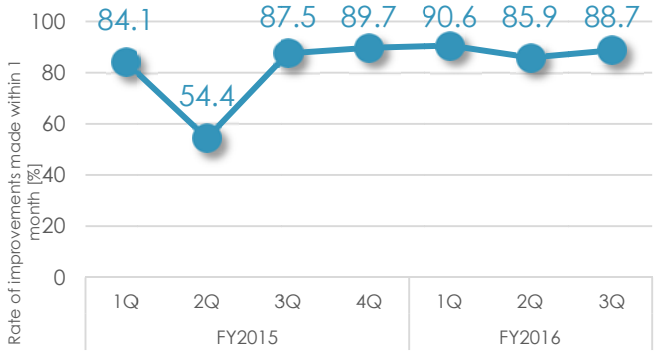
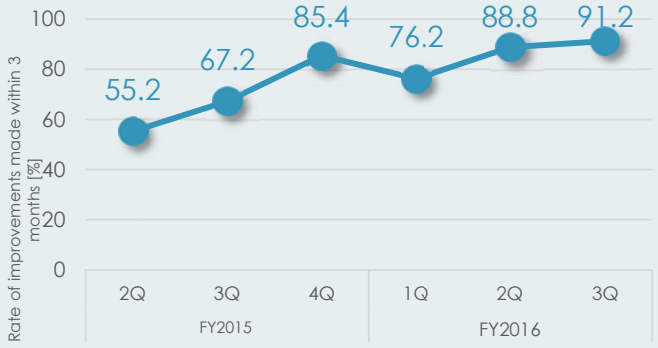
(1) Status of nuclear safety reform KPI/PI

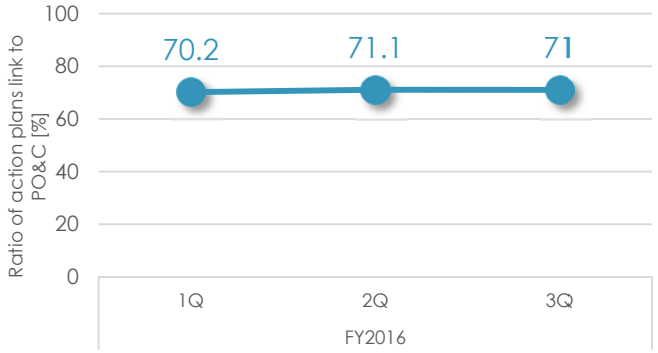
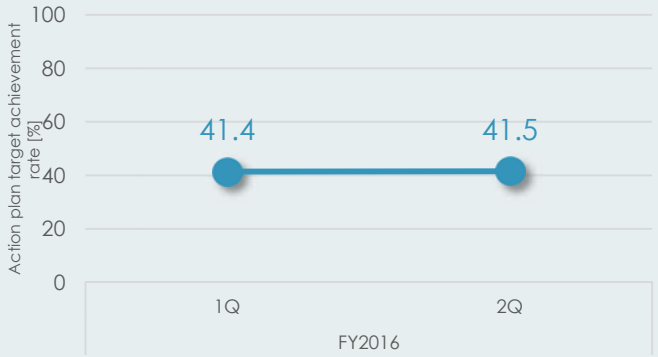
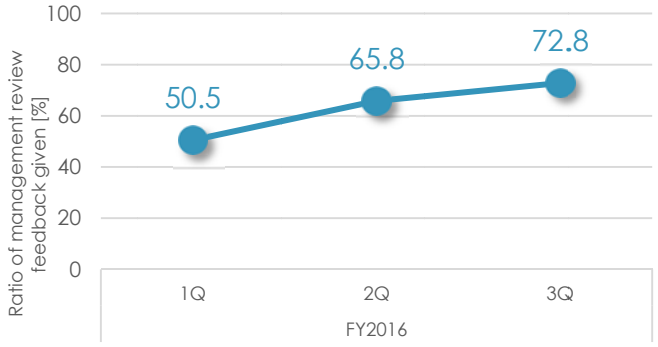
	Nuclear Safety Reform KPI	FY2016 Q3 performance
Safety awareness KPIs	Behavior of nuclear power leaders [Target: Increasing trend] 	58.9 points
	Improve safety awareness throughout the entire Nuclear Power Division [Target: Increasing trend] 	61.7 points
	REF: Traits [Target: 70 points or higher] 	94.6 points (entire Nuclear Power Division)) 97.2 points (nuclear power leaders)
	REF: M&M [Target: 70 points or higher] 	98.7 points
Technical capability KPIs	During non-emergency times [Target: 100 points or higher by end of FY2016]	84.7 points

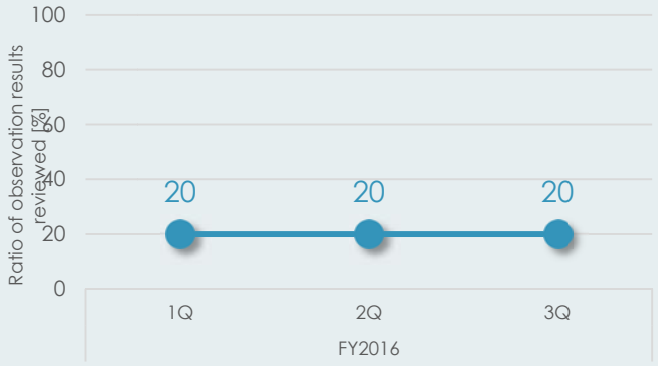
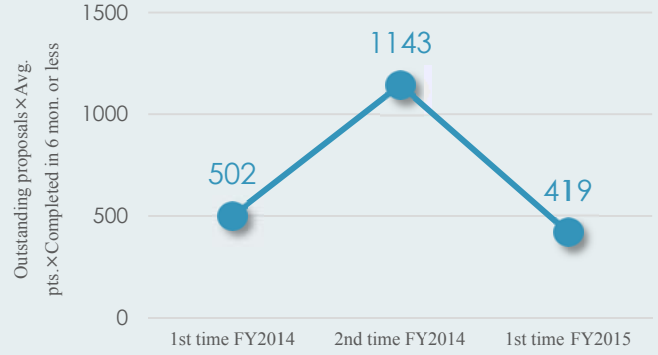
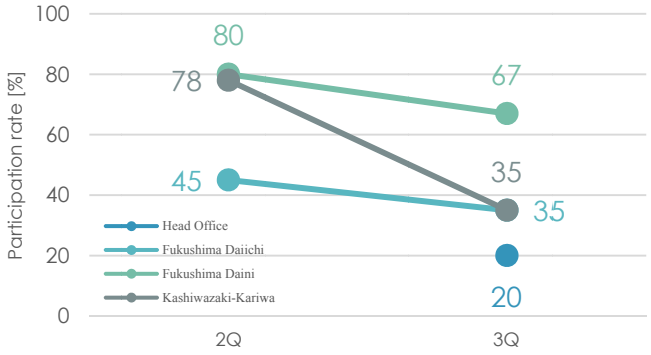
Nuclear Safety Reform KPI		FY2016 Q3 performance
		
	During emergency times [Target: 120 points by end of FY2016] 	119 points
Ability to promote dialogue KPIs	Internal [Target: Increasing trend] 	79.2 points (entire Nuclear Power Division) 82.4 points (nuclear power leaders)
	Internal 2 (Measurement commenced in Q3) Response rate【Target: More than 75%】 Degree of understanding【Target: More than 2 points】	Response rate: 32.7% Degree of understanding: 2.4 points
	External [Target: Positive in comparison to the previous year] <FY2016 (compared to FY2015)> Quality and quantity of information communicated +0.9 points Stance and awareness of listening to and providing information to the public +1.0 point	Questionnaire implemented during the third quarter (September~November). Numbers are preliminary and will be analyzed and assessed during the quarter.

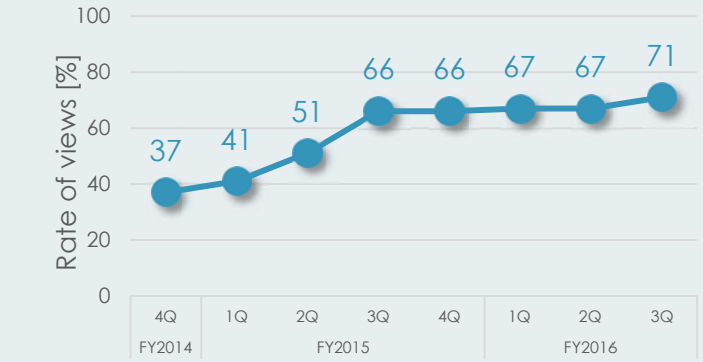
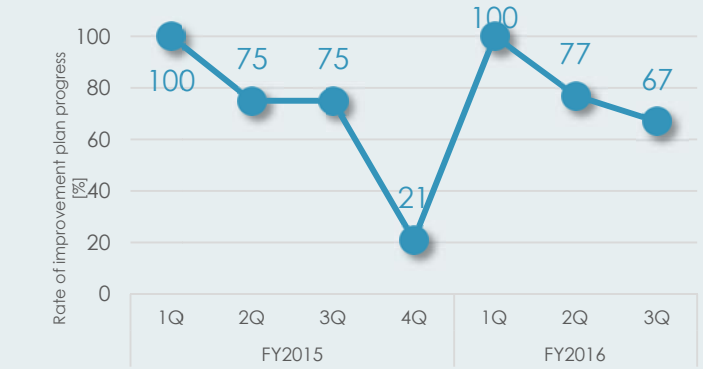
Nuclear Safety Reform PI	FY2016 Q3 Achievement※1	Target
Measures 1, 2		
1. Rate of retrospective reviews conducted using the traits 	Overall: 94.6% Nuclear power leaders: 88.7%	100% (excluding deployments, temporary transfer or long-term recuperation))
2. Rate of “I don’t know” responses voiced during retrospective reviews 	Overall: ：0.1% Nuclear power leaders: 0%	10% or less
3. Moving average trend of indices (percentage of indices showing an increasing trend) 	Overall: ：55.0% Nuclear power leaders: 100%	More than 70%

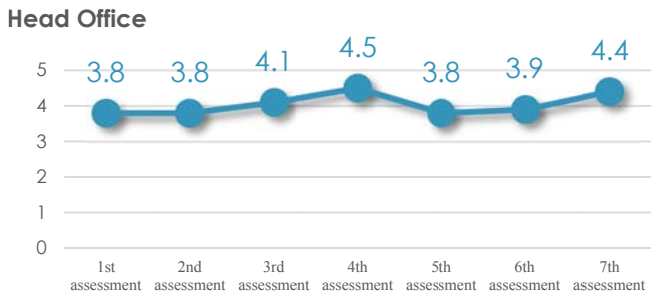
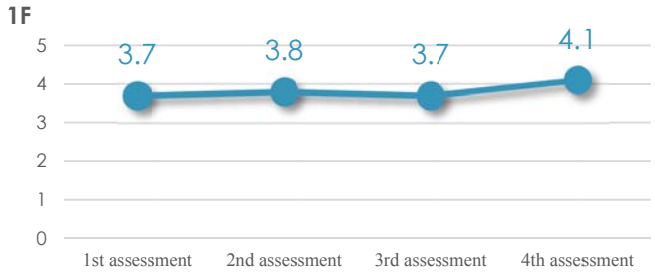
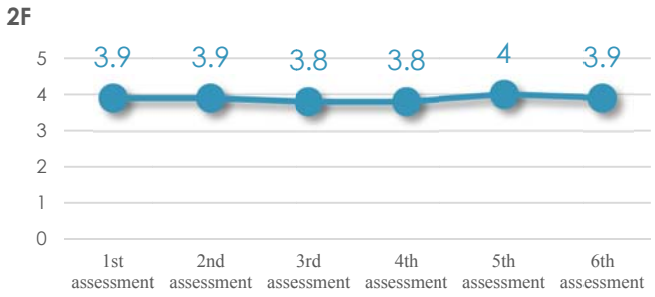
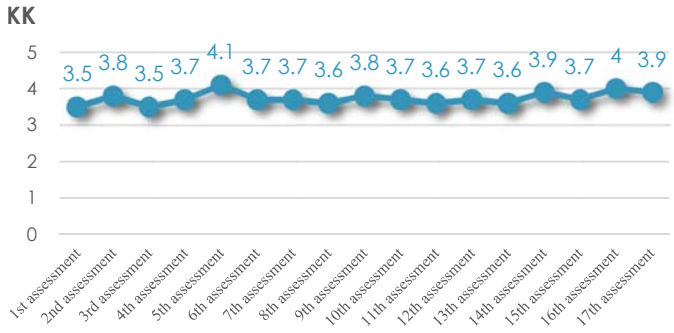
Nuclear Safety Reform PI	FY2016 Q3 Achievement※1	Target
4. Ratio of groups discussing the results of retrospective reviews 	93.1%	Increasing trend (Retrospective review results discussed once or more per cycle)
5. Number of reviews conducted by management regarding results of retrospective reviews 	1 time/quarter/department ※Q3 review conducted during management review on December 28	1 time/quarter/department (Power station unit)
6. Communication of messages about nuclear safety by nuclear power leaders	2 times or more/month	2 times or more/month
7. Number of readers per message 	Increasing trend/2135.1 (67%) (as of the end of November)	Positive increase in number of readers per message/1,600 or more
8. Average percentage of readers finding message “helpful” 	Increasing trend/19.0% (as of the end of November)	Positive increase in average percentage finding message “helpful”/50% or more

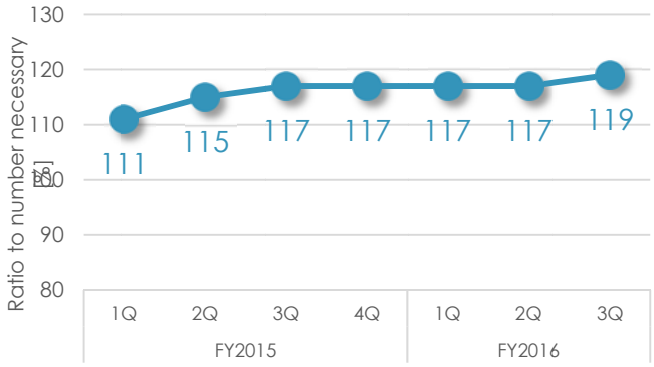
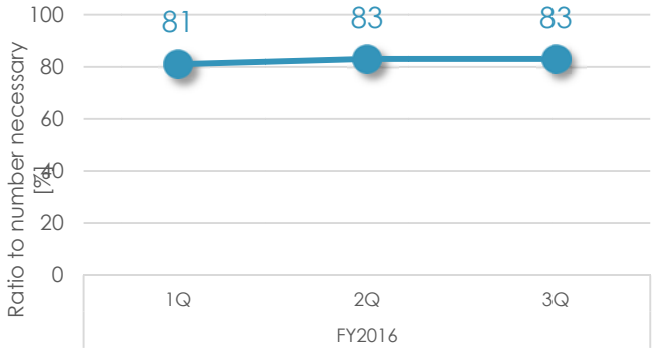
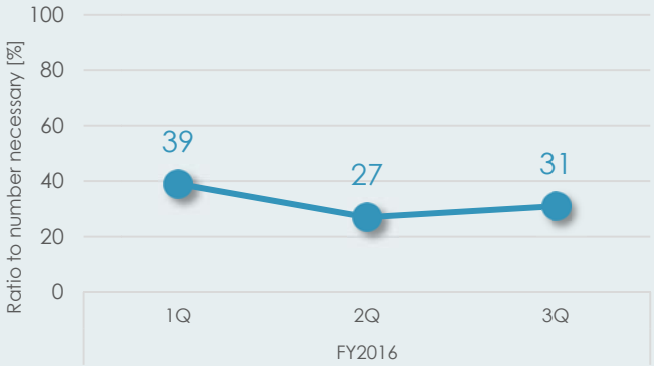
Nuclear Safety Reform PI	FY2016 Q3 Achievement※1	Target
9. Number of power station management observations conducted by management 	1.66 times	Numerical target set for each department
10. Number of good practices or key issues identified through management observations 	1.96/observation	1 or more/ observation
11. Rate of good practices extended laterally or issues improved within one month 	88.7%	70% or more
12. Rate of good practices extended laterally or issues improved within three months 	91.2%	100%

Nuclear Safety Reform PI	FY2016 Q3 Achievement※1	Target
13. Ratio of action plans under operation plans that are linked to Measures 3, 5 and 6, or PO&C and for which quarterly quantitative targets are set 	71 points	70 points or more
14. Ratio of action plan targets achieved under operation plans 	41.5 points (Q2 achievements)	50 points or more (50 points for progress as planned)
15. Ratio of MO feedback provide 	72.8%	100%

Nuclear Safety Reform PI	FY2016 Q3 Achievement※1	Target
16. Ratio of organizations reviewing observation results from management observations 	20%	1 time/quarter ・ organization (power station unit)
Measure 3		
1. Number of proposals entered in the Safety Improvement Proposal Competition times the average points assessed times the ratio of outstanding proposals completed within 6 months 	1st competition in FY2015: 419 points	1,500 points or higher
2. Rate of important OE training undergone 	Head Office: 20% Fukushima Daiichi NPS：35% Fukushima Daini NPS：67% Kashiwazaki-Kariwa NPS：35%	60% or more for management (Measurements began in second quarter)

Nuclear Safety Reform PI	FY2016 Q3 Achievement※1	Target
3. Rate of views of new OE data 	71%	60% or more
4. Implementation of hazard analyses	Completed	Complete at Kashiwazaki-Kariwa NPS (Hazard analysis begun in 2Q at Fukushima Daiichi NPS)
5. Rate of progress made in hazard improvement plans 	67%	Ratio of plan progress: 100%
Measure 4		
1. Assessment of quality and quantity of information communicated about Fukushima Daiichi NPS decommissioning work, nuclear safety reforms, accidents/problems, etc.	+0.9 points	Positive trend
2. Assessment of TEPCO's perception and stance toward public relations and public hearings	+1.0 points	Positive trend

Nuclear Safety Reform PI	FY2016 Q3 Achievement※1	Target
Measure 5		
1. Self-assessments based on PO&C emergency response areas (EP. 1-3)    	Head Office October 3.9 points December 4.4 points Fukushima Daiichi NPS： October 3.7 points December 4.1 points Fukushima Daini NPS: October 4.0 points November 3.9 points Kashiwazaki-Kariwa NPS: October 3.9 points、3.7 points November 4.0 points December 3.9 points	Average of 4 or more points assessed on a 5-tiered scale※2

Nuclear Safety Reform PI	FY2016 Q3 performance※1	Target
Measure 6		
1. Number of emergency responders acquiring in-house skill certifications for fire engines, power supply trucks, cable connecting, radiation surveying, wheel loaders, unic cranes, etc. 	119%※3	Secure 120% of number needed for each power station by end of FY2017
2. Number of system engineers (SE) certified	Assessed at end of year (currently 5)	5/reactor
3. Number of engineers trained in seismic resistance, PRA, fire protection, chemical management or other specializations	Assessed at end of year	Rate of training plans achieved: 100%
4. Number of personnel acquiring in-house skill certifications for operations, maintenance, safety, etc.	Assessed at end of year	Rate of training plans achieved: 100%
5. Number of personnel acquiring external certifications specified as essential by TEPCO, including class 1 electrician, class 4 hazardous material handling, oxygen deficiency, etc. (approx. 15 certifications) 	83%	Rate of all personnel or number needed in each field by the end of FY2017
6. Number of personnel acquiring external certifications recommended by TEPCO, including high-pressure gas production safety, construction machinery operation, etc. (approx. 15 certifications) 	31%	30% or higher for each field by the end of FY2017

	Nuclear Safety Reform PI	FY2016 Q3 performance※1	Target
7.	Number of personnel acquiring external certifications, including licensed reactor engineer, class 1 radiation senior operator, technician (reactor and radiation fields), etc.	Assessed at end of year	Rate of training plans achieved: 100%

*1: Information not specifically entered is the actual value as of the end of September 2016.

*2: Assessments corresponding to the degree of training difficulty.

*3: The difference between conditions at Fukushima Daiichi NPS and those at Fukushima Daini NPS and Kashiwazaki Kariwa NPS have been taken into account, and Fukushima Daiichi NPS is not included in this tabulation as the necessary figures are under review.

(2) Reassessment of Nuclear Safety Reform KPIs and PIs

In addition to the previously mentioned indicators (Internal 1 and External 1), it was decided to newly add two more KPI for the ability to promote dialogue in order to quickly implement improvements. During the third quarter measurement began of the ability to promote dialogue (Internal 2) (refer to measure 3.1). Moreover, the ability to promote dialogue KPI (External 2) will be handled by enhancing External 1, such as by enlarging the group of people to which it applies.

(3) Nuclear Safety Reform KPIs/PI assessment

KPIs were reassessed for FY2016. Just as before, the KPI and PI values are not only assessed as high or low, but:

- If they are high (target achieved), then our aim is to make them even higher.
- If they are low (target not achieved), then we analyze the causes and make improvements.
- In both cases, we also assess whether or not the KPI or PI is effective in measuring the degree to which nuclear safety reforms have been brought to fruition.

In addition, more effective improvement activities will be implemented, and KPIs and PIs reassessed and target values increased as necessary.

Looking at current KPIs/PIs we can see that there are some targets that have been achieved and also some indicators that show little change, so during the fourth quarter KPIs and PIs will be revised for fiscal year 2017.

CONCLUSION

March of this year will mark the sixth year since the Fukushima nuclear accident and the fourth year since the commencement of nuclear safety reforms. We have moved forward with nuclear safety reforms while decommissioning the Fukushima Daiichi NPS and continually asking ourselves whether or not we are qualified as a nuclear operator to recommence operation of the Kashiwazaki-Kariwa Nuclear Power Station.

The self-assessment results disclosed on September 2 of last year of our efforts over the past three years showed that we have weaknesses in the areas of governance and human resource development, so we are in the process of focusing on these two areas and making improvements in order to achieve excellence.

During the third quarter, we transcended the deliberation and planning stage and entered the implementation stage for these improvements. In regards to strengthening governance, we have moved forward with the management model project by focusing our resources, including overseas experts, and have seen short term results by giving thorough instructions and orders and enhancing mechanisms for confirming that they are carried out. By improving management, we are creating a ripple effect that leads to improvements in various other areas. And, we're making sure that we see mid to long-term results with initiatives that require time, such as human resource development, by creating departments and frameworks.

In the self-assessment, TEPCO rated the achievement level of each measure of the Nuclear Safety Reform Plan as either "III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety," or "IV. Self-regulatory and continuous reforms need to be accelerated." By continually making various improvements by having nuclear power leaders display leadership and lead by example, we aim to be able to give scores that are one or two ranks higher during the self-assessment planned for three years from now[37].

Through our determination 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**," TEPCO will continue to advance nuclear safety reforms while subjecting our organization to objective assessments by the Nuclear Reform Monitoring Committee.

We are more than happy to hear any comments or opinions you may have about these reforms. Visit our website for more information.

End of Document

[37] To be implemented during the first half of FY 2019