Nuclear Safety Reform Plan
Progress Report
(4th Quarter, FY2014)

March 30, 2015

Tokyo Electric Power Company, Incorporated

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Introduction

We would like to take this opportunity to deeply apologize again for the Fukushima Nuclear Accident and the contaminated water problems that have followed. These events have caused a tremendous inconvenience on, and been a source of anxiety for, the residents in the vicinity of the power stations and society as a whole. At TEPCO, we remain committed at all levels to do our very best to "provide compensation in a prompt and smooth manner," "accelerate the recovery of Fukushima," "move steadily forward with decommissioning" and "thoroughly implement nuclear safety."

On March 29, 2013 we released the "Summary of the Fukushima Nuclear Accident and Nuclear Safety Reform Plan", and we are promoting Nuclear Safety Reform as planned. It is our policy to publicly disclose the status of our progress each quarter. The current report includes progress reports[1] for the 4th quarter of FY2014 (January[2] - March 2015), assessment of two years efforts since Nuclear Safety Reform Plan Progress Report was published, as well as improvements to be made in FY2015.

In the 4th quarter, two fatal accidents and one accident resulting in serious injury occurred at the Fukushima Daiichi NPS, the Fukushima Daini NPS, and the Kashiwazaki Kariwa NPS. We have not taken these incidents lightly. The causes of these incidents have been identified and steps are being taken to thoroughly execute preventative measures.

It was recently discovered that the results of radiation concentration measurements in drainage channels at Fukushima Daiichi NPS were not publicly disclosed for about ten months. We would like to deeply apologize for raising doubts about TEPCO's attitude toward information disclosure. We have implemented measures to prevent the contamination of rainwater, installed purification materials in drainage channels, and altered the discharge destination into the port while reassessing risks from the perspective of the local communities and society. Furthermore, we are striving to improve our policy on information disclosure in order to restore society's trust in us.

[1] This report was compiled before the end of the 4th quarter in order to report to the Nuclear Reform Monitoring Committee to be held on March 30. Some of the content is described as forecasts. The actual results of all the figures in the 4th quarter will be announced in the report of 1st quarter of FY2015.

[2] Calendar dates in this report refer to 2015 unless noted otherwise.

1. Progress of Safety Measures at Each NPS

1.1 Fukushima Daiichi NPS

(1) Removal of fuel debris and spent fuels

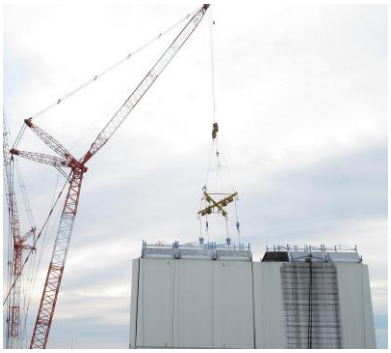
<Unit 1>

The reactor in Unit 1 went automatic shutdown during the operation when the Tohoku-Pacific Ocean Earthquake hit. It is assumed that the Unit 1 lost all the power due to the following tsunamis, and then the function to inject cooling water to the reactor went down, resulting in the damage to the reactor core. The chemical reaction of the fuel cladding (zirconium) and water vapor resulting from the damage to the reactor core generated massive quantity of hydrogen. This caused the hydrogen explosion and destruction of the reactor building.

Currently, the operating floor of the reactor building is littered with debris which constitutes an obstacle to remove fuels and fuel debris from the spend fuel pool. In order to remove the scattered debris, we are planning to dismantle the cover of the reactor building that has been installed to prevent radioactive materials from scattering. In order to find the conditions of the operating floor, we removed two of the roof panels of the cover from the building (restored after the inspection) and checked inside the building. The investigation did not find any dust dispersion and other conditions that would immediately damage the fuels in the spent fuel pool. These panels will be removed again in or after March to proceed dismantling the building cover.

Reactor building immediately after the explosion

Covered reactor building



Recovering the cover of the reactor building

In order to determine the method of removing the fuel debris, we also plan to measure debris by the fluoroscopy technique using Muons (one of the elementary particles) derived from cosmic-ray radiation so that we can understand the locations and the quantity of the fuel debris. A detector has been installed in the north-west of outside the reactor building and the measurement using the muon permeation method has been commenced.

Installing the measuring equipment

PC for accumulating data

<Unit 2>

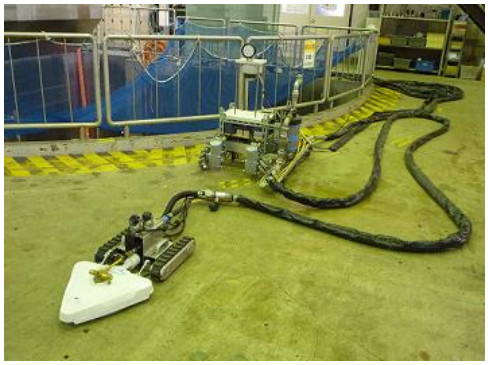
The reactor in Unit 2 went automatic shutdown during the operation when the Tohoku-Pacific Ocean Earthquake hit. Then, the Unit 2 lost all the power due to the following tsunamis but the reactor core isolation cooling system, which had been activated before the DC power sources were cut-off, managed to continue to inject cooling water into the reactor. Then, the reactor depressurization and fire engines for injecting more cooling water were prepared. However, the function of injecting cooling water into the reactor was lost because the hydrogen explosion in Unit 3 disabled the injection line and the DC power batteries were depleted. This is how the reactor was assumed to be lead to the core damage. Massive amount of hydrogen was presumably generated as in Unit 1. However, hydrogen explosion did not occur at Unit 2. The generated hydrogen was likely emitted into outside air because the impact of the hydrogen explosion of Unit 1 opened the blow out panel on the top level of the reactor building.

At the moment, the blow out panel, which was the major aperture of the reactor building, is closed to suppress the release of radioactive materials. At the same time, exhaust equipment was installed in an effort to improve the environment inside the reactor building. In order to further improve the environment, we have initiated decontaminating the floor of the first level of the reactor building as a preliminary step toward the full-blown decontamination work inside the building. The decontamination work is carried out by the remote decontamination equipment RACCOON that can supply water on the floor surface while vacuuming up discharged water. We will check the effect of decontamination and atmospheric dose reduction to further examine the decontamination of the entire reactor building.

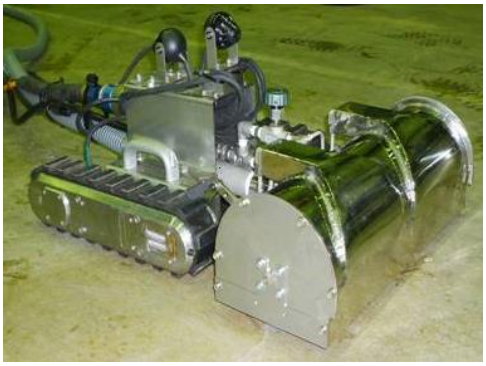
In addition, in Unit 2, a thermometer installed on the bottom of the reactor pressure vessel after the Fukushima Nuclear Accident broke down in February 2014, and we attempted to replace it in April 2014 but the thermometer could not be pulled out due to rust. The operation was suspended accordingly. Afterwards, we injected the derusting agent that does not generate hydrogen and finished pulling out the broken thermometer on January 19, 2015. A new thermometer will soon be installed.

Reactor building with the blow out panel opened immediately after the accident

Aperture of the closed blow out panel



The remote decontamination equipment
RACCOON
with a jet head



The remote decontamination equipment
RACCOON
with a brush head

<Unit 3>

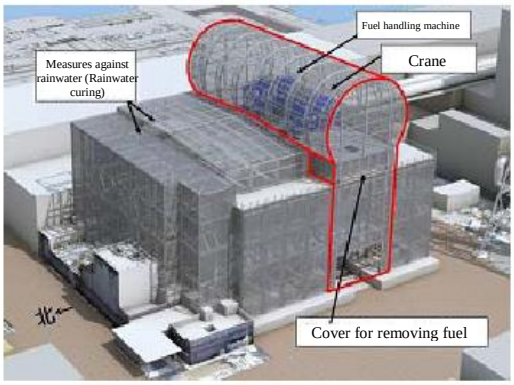
The reactor in Unit 3 went automatic shutdown during the operation when the Tohoku-Pacific Ocean Earthquake hit. Then, the Unit 3 lost all the AC power sources due to the following tsunamis but it survived from losing the DC power sources in contrast to Units 1 and 2. The reactor core isolation cooling system and high pressure coolant injection system that can be operated only by DC power sources continued to inject cooling water into the reactor while keeping the DC power alive. Then we decided that it was difficult to continue to inject cooling water through the HPCI system because the reduction in the reactor pressure was observed. Although we tried to depressurize the reactor and used fire pumps as an alternative measure, the safety relief valve did not work and the function to inject cooling water into the reactor became disabled that resulted in the reactor core damage. As in Unit 1, massive amount of hydrogen was generated in Unit 3 due to the damage to the reactor core and the following hydrogen explosion destroyed the reactor building.

In order to remove spent fuel from the fuel pool, we have completed the removal of large debris from the top level of the operating floor in the reactor building. Currently, we are taking measures to reduce radiation levels in order to install the cover for removing fuels and equipment that handles fuels on the operating floor. We suspended the operation after the operating console and overhanging pedestal of the fuel-handling machine that was planned to be removed from the spend fuel pool had dropped during the operation (on August 29, 2014). On December 17, 2014, we resumed the operation. We added an extra wall guard as a countermeasure against the drop. We will continue to remove the trolley of the fuel-handling machine sunk in the fuel pool.

White smoke coming out of the reactor building immediately after the explosion

Reactor building before major debris was removed

Reactor building after major debris was removed



How the cover for removing fuels is installed.

<Unit 4>

Unit 4 was under periodic inspection when the earthquake hit. All the fuels had been transferred from the reactor to the spent fuel pool for the shroud replacement work. There were 1,535 fuel assemblies stored in the spent fuel pool. The following tsunamis caused the loss of all the DC and AC power sources as well as the cooling function of the spent fuel pool and the make-up water function. Following the hydrogen explosion in the Units 1 and 3, another explosion in Unit 4 damaged the top of the reactor building. Thus, damage to the fuel was concerned resulting from the leakage of the spent fuel pool. However, based on the observation from above the building, we confirmed that the pool was filled with water and the fuels were not exposed. After injecting cooling water by water cannon trucks, concrete pumping trucks, and the temporary equipment for injecting cooling water, we initiated to cool down the reactor by the alternative cooling system on July 31, 2011.

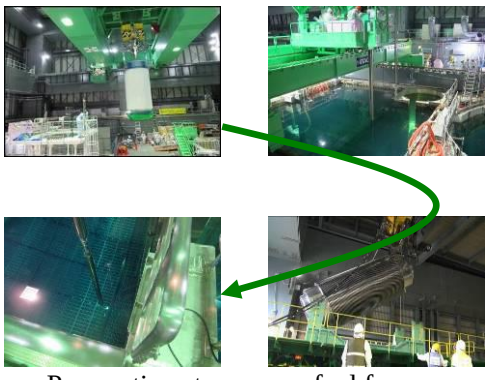
The following investigation revealed the cause of explosion of the reactor building. Hydrogen from the PCV in Unit 3 was considered to have gone through the merging part of the exhaust stacks and to have been accumulated in the reactor building in Unit 4, constituting the cause of explosion of the reactor building.

At present, the debris on top of the reactor building has been removed, the cover for removing the fuel has been installed, the 1,331 of the used fuel assemblies have been transferred from the spent fuel pool to the shared pool, and the remaining new fuel assemblies has been transferred to the spent fuel pool in Unit 6.

A concrete pumping truck injecting cooling water into the fuel pool immediately after the accident

Reactor building after debris was removed

Reactor building after installing the fuel removal cover



Preparations to remove fuel from the spent fuel pool

(2) Approaches to address contaminated water problem

At Fukushima Daiichi NPS, approximately 300 tons of ground water[3] is flowing into buildings and becoming contaminated.

Based on the three basic policies of "Removing the contamination source," "Isolating water from the contamination source," and "Preventing the leakage of contaminated water," we are implementing the following countermeasures in order to stop contaminated water flowing into the power station port and stop tank leaks

- Expansion of the contaminated water purification facility
- Improvement of the tank area used for storing contaminated water
- Underground water bypass
- Pumping of underground water by a sub drains
- Frozen soil water sealing wall
- Removal of retained water from the seawater piping trenches of Units 2, 3 and 4, etc.

<Expansion of the facility for purifying contaminated water >

In order to promptly process the contaminated water stored in Fukushima Daiichi NPS, we have installed the extended multi-nuclide removal equipment and high-performance multi-nuclide removal equipment in addition to the existing multi-nuclide removal equipment. The trial run using contaminated water has been operated smoothly since the start of the system test (hot test).

In addition, in order to decrease the level of strontium in the stored contaminated water, we installed the mobile-type strontium removal equipment and RO concentrated water purification facility as well as modifying the cesium adsorption equipment (KURION) and the second cesium absorption equipment (SARRY) into the equipment for strontium removal in an effort to reduce risk of possible leak, the on-site boundary dose and radiation exposure of the workers on patrol.

We had been working hard in processing contaminated water with high morale by setting the self-imposed target of "completion of processing contaminated water before the end of this fiscal year." However, the completion before the year end has become difficult. In regard to the multi-nuclide removal equipment, we have examined various measures that can raise the operating rate by taking on unprecedented technical challenges. However, based on the fact that the initially targeted operating rate was hard to achieve as well as the series of personnel accidents, we have concluded that we should review the processes once again. We plan to complete decontaminating the contaminated water at approximately 600 thousand tons in total by the end of May, excluding approximately 20 thousand tons of contaminated water that was produced at the initial stage of the accident and that was affected by sea water.

As for the requirement[4] from the Nuclear Regulatory Authority regarding the tanks to store contaminated water, we will strive to achieve it by the end of this fiscal year by processing contaminated water using the multi-nuclide removal equipment and multiple risk reduction measures.

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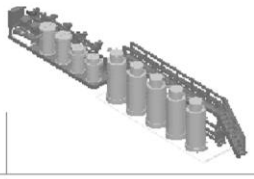
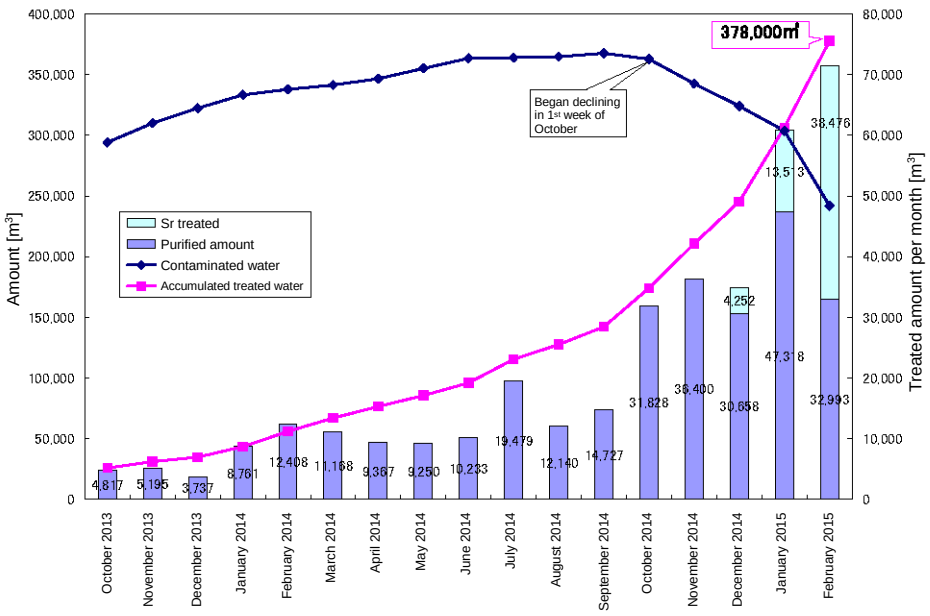
[3] At first, about 400 tons of ground water was initially flowing into buildings. The efforts such as bypassing groundwater decreased the amount at about 100 tons.

[4] The effective on-site boundary dose that arose from the tanks of contaminated water shall be reduced to less than 1 mSv/ year by the end of this fiscal year.

Contaminated water treatment facility	1 Multi-nuclide removal equipment	2 Extended multi-nuclide removal equipment	3 High-performance multi-nuclide removal equipment
			
Removal capability	Applicable to 62 nuclides, down to less than announced density limit		
Treatment capability	250 m^3/day x 3 systems	250 m^3/day x 3 systems	500 m^3/day
Current state	Test run (from March 30)	Test run (from September 17)	Test run (from October 18)

4 Mobile-type Sr removal	5 RO concentrated water treatment system	6 Sr removal by KURION	7 Sr removal by SARRY
			
Strontium (Sr) amount: 1/100 to 1/1000			
300 m^3/day x 2 systems 480 m^3/day x 4 units	500-900 m^3/day	600 m^3/day	1,200 m^3/day
Operation (from October 2)	Operation (from January 10, 2015)	Operation (from January 6, 2015)	Operation (from December 26)

The amount of contaminated water (accumulated amount of processed water) processed by the contaminated water purification facilities reaches about 378,000 m^3 as shown in the figure below.



Transition of amount of contaminated water processed by the water purification facilities

<Improvement of the tank area where contaminated water is stored>

Regarding the storage tanks for contaminated water, cylindrical welded tanks made of steel that have lower risk of leakage were installed on the south side of the premise. In addition, the tanks in the area with lower rate of utilization were removed and the welded tanks were installed (improvement status [1]). In order to suppress rainwater from flowing into the weir, rainwater guttering and a weir cover (roof material) were installed on the top panel of the tanks to prevent contaminated rainwater from leaking (improvement status [2]). Furthermore, in preparation for the leakage of contaminated water from the storage tank, the weir of the tank was doubled and extra coating was applied inside the weir (improvement status [3]).

Improvement status [1]: The way tanks were installed before the improvement of H1 area

Improvement status [1]: Welded tanks installed in the H1 area

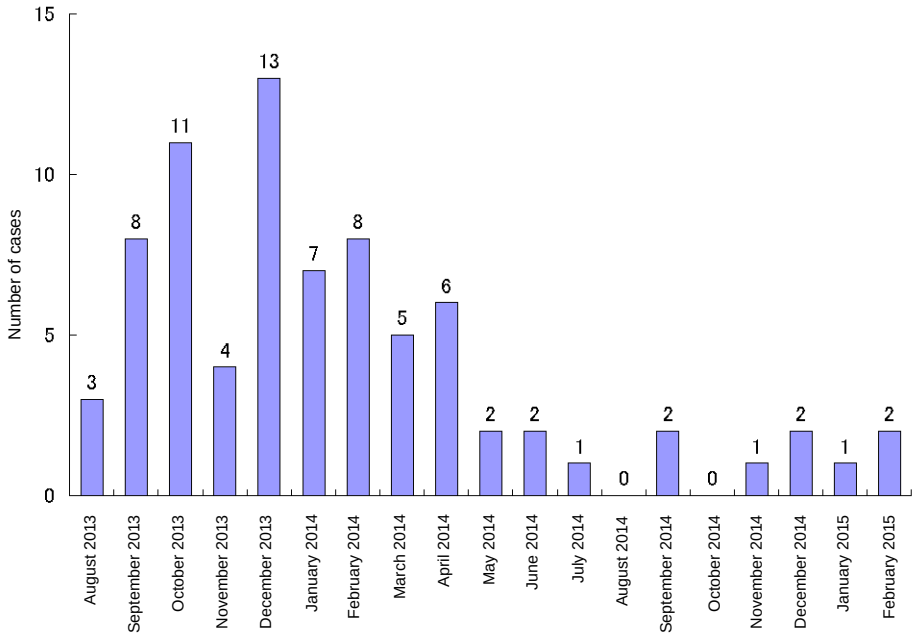
Improvement status [2]: Flange type tanks before the improvement

Improvement status [2]: Flange type tanks after the weir covers were installed

Improvement status [3]: Circumference of weir of flange type tanks before the improvement

Improvement status [3]: Doubling the weir of flange type tanks and applying coating in the weir.

In an effort to improve the environment of the area that stores contaminated water tanks, we, as an entire company, have been reinforcing the measures to prevent contaminated water from leaking since “the leakage of approximately 300 tons of contaminated water from the flange type tanks in the H4 tank area” was identified on August 19, 2013. When we decided to close the drain valve of the tank weir as a preventative measure, leakage to the outside of the weir occurred as the rainwater process in the weir was insufficient. However, the leakage is currently suppressed by measures taken against the inflow of rainwater into the weir.



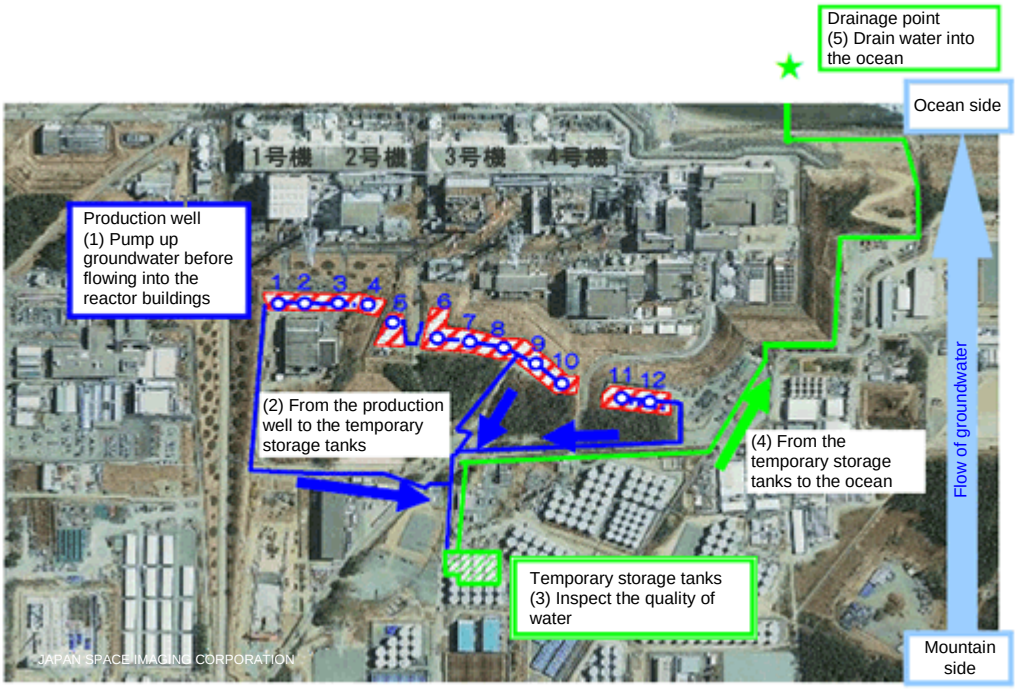
Transition of the number of water leakage problems

<Underground water bypass>

Underground water bypass is an approach to reduce underground water flowing into the building by pumping up the underground water flowing from the mountain side (west) to the ocean side (east) on the power station site before it enters into the buildings and by lowering the level of underground water.

Since May 21 in 2014, underground water pumped up on the mountainside of the building has been discharged intermittently and the water level of groundwater has been decreased gradually. Before discharging the water, a stringent operation target (tritium level of 1500 Bq/L versus the 60,000 Bq/L based on regulatory announcement) was established. The pumped up underground water was discharged 51 times before February 28 after confirming that the tritium level was lower than this operation target (Total amount of discharged water: Approximately 83,800 t).

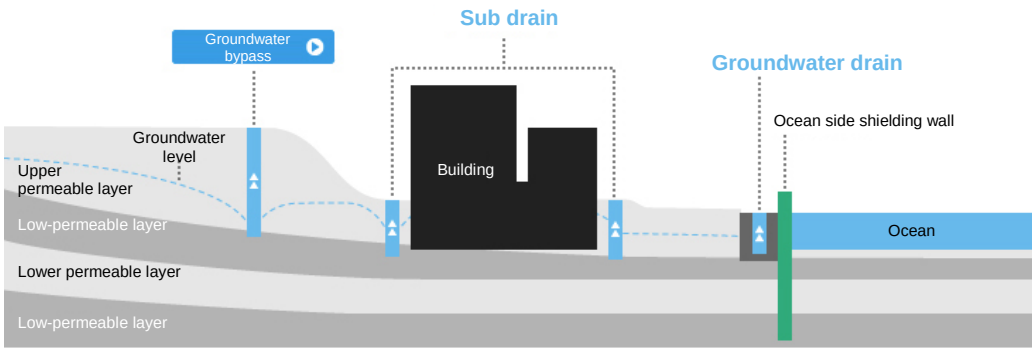
Currently, 300 to 350 m^3 per day of underground water are pumped by bypassing the underground water. The water level of the observation pit was confirmed to be lowered (approximately 15 to 20 cm) after about 2 to 3 months from the start of the operation, and the flow of underground water into the building is gradually decreasing. The evaluation based on the data we have obtained so far revealed that the flow of underground water into the building decreases about 100 m^3 per day compared to the previous figures.



Operating Flow of Underground Water

<Pumping of underground water by sub drains>

An approach has been made to reduce the amount of underground water flowing into buildings by lowering the underground water level around the building by bypassing the underground water. However, in order to reduce the flow further, we plan to pump up the underground water from the well (sub drain) near the building to lower the level of underground water around the building in a more direct manner. The underground water from the sub drain contains radioactive materials derived from the rainwater in contact with the debris, etc. on the contaminated ground surface. Therefore, a special purification facility was installed to reduce the concentration of the radioactive materials to about 1/1,000 to 1/10,000. The underground water processed in the purification facility will be drained to the port after it is checked to satisfy the established water quality standards. Note that the draining will be carried out after we obtain an understanding of the relevant authorities, the parties concerning fishery, etc.



Overview of Sub Drain

<Frozen soil water sealing wall>

The frozen soil water sealing wall is a technology to prevent the intrusion of underground water into buildings by generating frozen water sealing walls around the building by freezing underground water using chiller piping (depth: approximately 30 m). Chiller pipes are installed at approximately 1 meter intervals surrounding the reactor buildings and turbine buildings of Units 1-4. We started the demonstration test (freezing test) on March 14, 2014 and confirmed satisfactory freezing.

In the northwest area of Unit 1, excavation work for installing the chiller pipes was started on June 2, 2014, and the excavation work for 1,225 pipes and the installation of 749 pipes out of 1,264 chiller pipes has been completed aiming to begin prior freezing from April. Further, we have completed installing 30 freezers to freeze the ground on November 26, 2014.

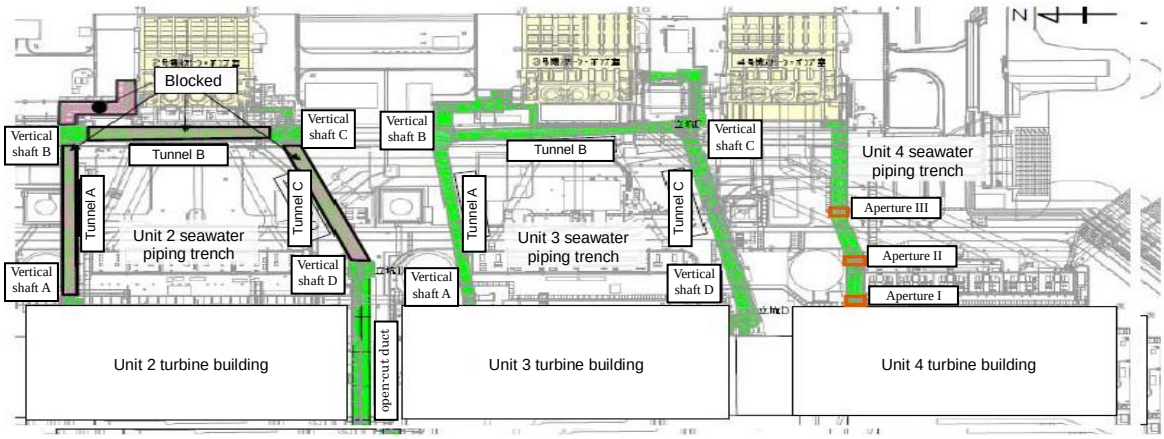
The underground water flowing from upstream to the peripheral of Units 1 to 4 takes a detour by the frozen soil water sealing wall on the land side and flows out to the ocean. With this, significant decrease in the amount of flowing underground water is expected.

Freezer plant building where freezers are installed

Freezers for frozen soil

<Removal of retained water from seawater piping trench in Units 2, 3 and 4>

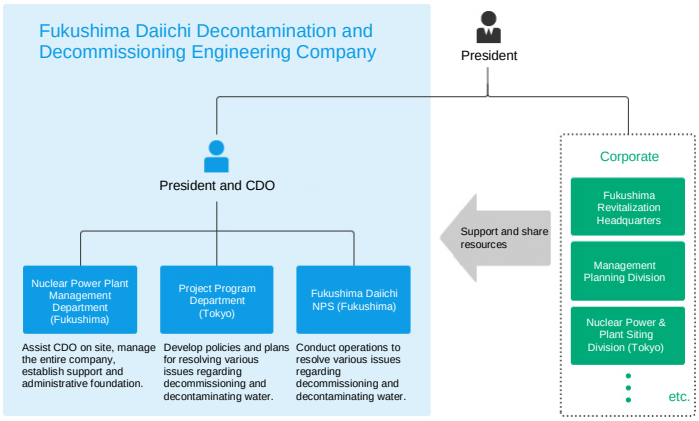
In order to reduce the risk of highly contaminated water flowing out due to such external factors as tsunamis, we are removing contaminated water retained in the seawater piping trenches in Units 2, 3 and 4. At the same time, we have started the operation to fill up the tunnels to prevent ground water from retaining in the tunnel again. In the trench of Unit 2, the tunnel A, B and C have been already filled up and the vertical shafts A and D on the turbine building side will be filled up and closed. After filling up the shafts, the condition will be tested by the pumping test before proceeding to fill up the vertical shafts B and D as well as the open-cut duct. In the trench of Unit 3, we have started filling up the tunnels on February 5. The operation will be carried out effectively based on the prior experience at Unit 2. In the trench of Unit 4, we are investigating the apertures and preparing for executing the work. Once prepared, we will start filling up inside the trench.



Overview of Blockage Locations in the Seawater Piping Trenches

(3) Improvement of organization and management

In Fukushima Daiichi NPS, while committed to address the long-term measures against decommissioning of the reactors and against decontaminating water, we set up a company "Fukushima Daiichi Decontamination and Decommissioning Engineering Company (herein after referred to as the Decommissioning Company)" on April 1, 2014 to establish a robust framework in which efforts are made on the basis of field, reality and reality. The Decommissioning Company is an organization with stronger framework backed up by the quicker decision-making system resulting from the clearer attribution of responsibilities and authority regarding measures against decommissioning and decontamination. In addition, in order to overcome the difficult challenges of decommissioning and decontamination that nobody in the word have yet achieved, we invited three personnel as vice presidents from atomic power plant manufacturers. Furthermore, we set up 15 projects in the five different fields (water decontamination, removal of fuel assemblies from the pools, cooling and removal of fuel debris, waste management, infrastructure maintenance) in order to flexibly deal with a variety of challenges that may arise in the process of the decommissioning operation. As a result of these efforts, trends are shifting. Issues are resolved more in a cross sectoral manner and the management is more involved in sharing issues and giving directions, and the removal of fuel rods in Unit 4 was steadily performed and completed as planned.

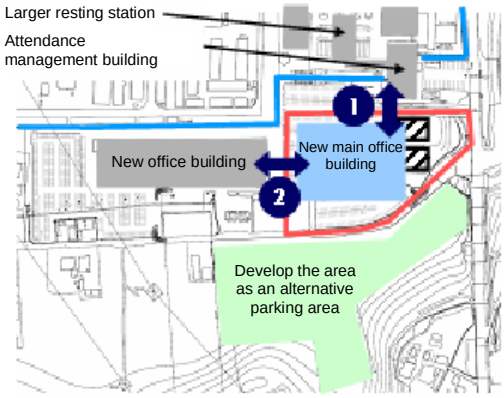


Organization chart of the Fukushima Daiichi D & D Engineering Company (Simplified)

(4) Improvement of working environment

In order to improve the working environment where full face masks were required all over the area, we have set up the area where disposable dust respirators can be worn instead of full face masks. The area is gradually expanding as the decontamination operations finish. The survey of workers on the general working environment revealed many requests for improving the field environment as well as food catering. The feeding center will be established in the town of Okuma to provide meals in a larger resting station (nine stories above the ground that can accommodate about 1200 people). Regarding the working environment of office workers, the new office building was completed and they have all moved to the new building in October 2014, which significantly reduced the time to travel to the fields. The new main office building will be built on a further expanded scale in the area adjacent to the new office building and attendance maintenance building, in order to enhance the interactions between surrounding buildings and encourage effective administrative operation as well as facilitating effective use of the site.

The Areas where Full Face Masks are Not Required



Layout Plan of the new main office building

(5) Benchmarking of overseas cases

In order to promote decommissioning and decontamination measures adequately, it is effective to utilize overseas experts who have extensive experience in decontamination technology and radiation management. Thus, we have agreed with Sellafield Ltd in the UK, which is working on decommissioning its nuclear reactors and radioactive waste-related facilities, to exchange information on both operational and technological aspects, and concluded the information exchange agreement. In December 2014, we visited the power stations owned by Sellafield Ltd. and the Chernobyl Nuclear Power Plant in Ukraine in order to benchmark measures to decrease radiation levels and specific methods to control radiation through discussions and field inspections.

We also visited nuclear power stations that receive high evaluations to facilitate better internal communications and create better safety culture, and provided a benchmark for higher safety awareness. In October 2014, we visited the Bruce Nuclear Generating Station in Canada where the internal communication is ranked as “excellent” by WANO. In December 2014, we visited the Palo Verde Nuclear Generating Station in the U.S. that has a good record in creating safety culture and organizational operation. In each visit, we set benchmarks through observation of various meetings and training as well as discussion with key players in each department. We will consider to introducing the obtained insight to the decommissioning operations and our nuclear power stations. At the same time, we will effectively utilize the knowledge to achieve the Nuclear Safety Reform.

Visit to a training session
(Palo Verde Nuclear Generating Station in the U.S.)

At the meeting that checks the performance of the power station
(Palo Verde Nuclear Generating Station in the U.S.)

(6) Problems that have not been resolved

Even though ongoing investigation and analysis on the Fukushima Nuclear Accident clarified most of the causes and the progresses of the accident, there still are some items yet to be verified and resolved because the remaining records and the field investigation were limited. It is effective to figure out such issues in order to improve the safety of nuclear power stations all over the world including ours. Thus, we extracted 52 unverified or unsolved issues and have publicized the results twice so far.

In the first progress report (December 13, 2013), out of 52 items, five issues that are considered to be critical in understanding the accident were reported such as "Is it the earthquake that caused the loss of cooling function?" and "Did the water in the reactor building of Unit 1 leak from an important facility due to the earthquake?"

In the second progress report (August 6, 2014), four issues that have higher priority over other unverified items were reported such as the cause of shutdown of reactor core isolation cooling system in Unit 3 and operational condition of high-pressure coolant injection system in Unit 3 and evaluation of its influence over the progress to the accident. The obtained insight will be utilized for the safety measures in the Kashiwazaki Kariwa NPS as well as the operation of removing fuel debris in the Fukushima Daiichi NPS.

We will continue to collaborate with external institutions and researchers in order to figure out the entire picture of the accident such as understanding the behavior of the reactors following the accident based on the systematic field investigation and analysis of simulations. We will publicize the progress as needed while contributing to improve safety as well as the progress in decommissioning operation.

1.2 Fukushima Daini NPS

In the Fukushima Daini NPS, all Units from 1 to 4 were operating when Tohoku-Pacific Ocean Earthquake hit the area, and all units went automatic shutdown. The following tsunamis hit the units in the midst of cold shutdown processes. As a result, the emergency diesel generators, seawater pumps, etc. were damaged. However, the internal power supply was secured from the off-site power source (transmission line). Thus, the injection of cooling water to each reactor was continued while recovering the seawater pumps with a unified effort by the entire station to restore the residual heat removal function. Consequently, all the units were successfully went cold shutdown. After the Fukushima Nuclear Accident, we instituted measures to secure safety to maintain the state of cold shutdown, preparation for severe accidents based on the lessons learned from the accidents, and efforts to function as a logistic support base of the decommissioning operation in the Fukushima Daiichi NPS.

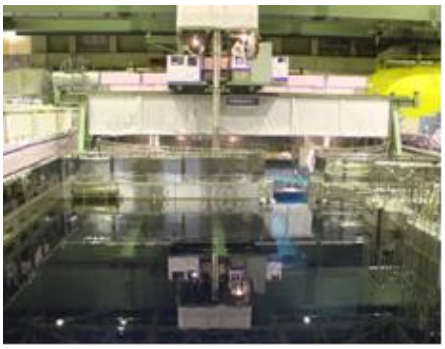
(1) Securing safety to maintain the state of cold shutdown

- Transfer of fuel from the reactors to the spent fuel pools and inspection of the reactor

With the objective of simplify the maintenance and management of the facility once it

reached to a cold shutdown, our policy is to transfer the fuel in the reactor to the spent fuel pool and manage it collectively.

We have completed transferring fuel from the reactors in Units 4, 2 and 1 to the spent fuel pools. We opened the reactor of Unit 3 from February 13 to 26 and initiated transferring the fuel in total of 764 assemblies to the spent fuel pools from February 27. After completing the transfer in Unit 1, 2 and 4, we carried out inspections on the structure of the reactors and confirmed there was no abnormality.



Transferring fuels in Unit 3

- Inspections on important facilities for the cold shutdown

In order to ensure maintaining the cold shutdown, we continue to carry out inspections on facilities that are necessary to cool down the reactors and the spent fuel pools.

In planning the inspections, we repeat systematic discussions in the process meetings or other conferences held in each facility assuming the situations where “accidents or troubles occurred at another facility when inspecting a particular equipment,” in order to maintain and improve the safety of the entire power station. The major topics are: securing power sources by emergency diesel generators, gas turbines generators and power supply cars; securing personnel for the accidents and troubles; and reinforcing communication networks.

For the important equipment, we actively carry out various types of diagnosis (ex. measuring vibration and temperature of rotating equipment and lubrication oil on bearings) under our direct supervision to avoid troubles and improve reliability of equipment by recognizing signs of abnormality in an early stage, estimating the root causes, and taking necessary measures.

A meeting held before equipment inspection to improve safety through multilateral discussions

- Technical evaluation of the aging of the equipment maintaining the cold shutdown state.

For Unit 3, we applied for the approval of changing technical specifications regarding the aging of the equipment maintaining the cold shutdown state on June 20, 2014. In response to the application, the Nuclear Regulatory Authority carried out on-site investigation on January 21 and 22. The Nuclear Regulatory Commission already approved the technical evaluation for aging on April 19, 2012 for Unit 1 and on January 22, 2014 for Unit 2.

(2) Improvement of capabilities to cope with emergencies

➢ Status of training for emergencies conducted by employees

At Fukushima Daini NPS, learning from the experience of the Fukushima Nuclear Accident, four different teams (debris removal, motor replacement, cable connection and pump recovery) were formed on July 2013 to train technological capabilities to be able to cope with broken equipment solely by the employees of TEPCO. As one year has passed since we started the training, we carried out the "Integrated training of skills and techniques" from June 10 to 26, 2014 with the purpose of ensuring necessary actions for maintaining the cold shutdown state in emergencies and improving skills and techniques by sharing good examples. We confirmed that all the four teams are capable of carrying out required actions safety without fail. In the second year, we are repeating the training after switching each team member to expand their capabilities and raise the level of comprehensive strength as an entire project team. In addition, as an effort of keeping the cooling of fuel in emergencies, we tested the actual operation of cooling facilities by using a gas turbine generator on April 22, 2014 and by using a power supply car on October 24, 2014.

We confirmed that we are able to operate the equipment needed to maintain the steady cold shutdown state even in the case where off-site power supply and emergency diesel generators are shutdown.

Conducting a startup test on a gas turbine generator

Conducting training in the main control room

Pulling out cables from the power supply car

Connecting cables to the power panel

Starting up a power supply car

➢ Efforts to improve safety awareness

At Fukushima Daini NPS, we implement efforts to improve safety awareness with the objective of improving safety of nuclear power and the working environment through the equipment inspection and construction to maintain the steady cold shutdown state.

- We are making progress on improving safety of field operations through gaining insight from the objective observation of the Nuclear Safety Oversight Office as well as through evaluation of working safety on a basis of PO & C[5].
- We plan to implement the effort to improve safety awareness by utilizing the insight we gained through benchmarking the overseas facility (Palo Verde Nuclear Generating Station in the U.S.), such as creating the culture of praising.
- As a part of utilizing operating experience (OE) of other facilities in and outside Japan, a Special Executive introduce the OE information provided by the Institute of Nuclear Power Operations (INPO) everyday in an office meeting. The OE information is shared with the entire power station. We try to create an opportunity of learning based on a standpoint of "What happened to somewhere in the world could happen in Fukushima Daini NPS." Each group member also shares the information JIT (Just in Time)[6] to increase awareness of learning from their own experience.

Introducing OE information from around the world on the bulletin board

(3) Support for decommissioning Fukushima Daiichi NPS

Fukushima Daini NPS has been supporting the Fukushima Daiichi NPS in promoting safe and steady decommissioning operations.

➢ The support provided so far

- As measures of preventing radioactive substances from spreading, we started preparing for the construction of covering ocean soil in the port such as installing a plant to manufacture a covering material and manufacturing the cover to be laid on the seabed in the port. The preparation was started in the premise of Fukushima Daini NPS in October 2014.
- The training of workers and a demonstration test (mock-up) were performed from June until December in 2014 for repairing the connection surface at the bottom of the tank, which had been considered to be the countermeasure for the leakage from the assembly-type flange type tanks, using the same type of tank that is installed at

[5] Performance Objectives and Criteria: Established by the World Association of Nuclear Operators (WANO) with the aim of promoting the highest level of standards in the fields of operation, maintenance, support and governance of commercial nuclear power stations.

[6] A particular case in the OE information that includes important lessons for the operation of the day. The overview of the accident or trouble and the lessons are summarized within a page.

Fukushima Daini NPS.

- ○ We manufactured the tanks (welded-type tanks) for storing contaminated water of Fukushima Daiichi NPS from October 2 to December 13 in 2014 (Created 10 tanks in total).
- ○ Workers of Fukushima Daini NPS cooperated with Fukushima Daiichi NPS as construction supervisors to remove fuel from the spent fuel pool in Unit 4. We plan to dispatch our workers to support the field of Fukushima Daiichi NPS in removing fuel from the spent fuel pool in Unit 3.

➢ The support to be provided in the fourth quarter

○ Installation of mobile-type strontium removal equipment

Among those critical issues in decontaminating water for decommissioning Fukushima Daiichi NPS, we are constructing two sets of mobile-type equipment to remove strontium from the contaminated water stored in the tanks.

Fourteen workers from Fukushima Daini NPS fully took over the following operations of the equipment from September 2014: reviewing design, managing manufacturing and processes, processing licenses and approval and test operations.

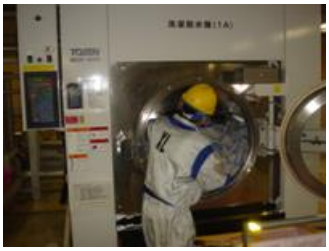
Installing mobile-type strontium removal equipment (At Fukushima Daiichi NPS)

○ Support for laundering the protective underwear for the use in the control area

As the number of workers increase in Fukushima Daiichi NPS, about 8,000 sets of protective clothing are used per day in the control area. Large quantities of laundry are produced accordingly. We bring the underwear to Fukushima Daini NPS of which the radioactive survey determined to be cleared from the radioactive contamination and do the laundry.

Receiving protective clothing that needs laundry

Checking inclusion of foreign substances before laundry



Laundering protective clothing

Carrying clean protective clothing out of the room

1.3 Kashiwazaki Kariwa NPS

(1) Progress in implementing safety measures

At Kashiwazaki Kariwa NPS, learning from the experience of the Fukushima Nuclear Accident, we implemented the following safety measures focusing on Units 6 and 7 where application of modifying the establishing permit is underway.

○ Countermeasures against flooding

In the Fukushima Nuclear Accident, tsunamis entered into buildings and disabled facilities such as emergency diesel generators, accumulators and power panels which are crucial to securing safety of the nuclear power station.

Kashiwazaki Kariwa NPS implemented the following measures to prevent tsunamis from entering into the facility.

[1] Establishing flooding embankments (15 meters high) to prevent flooding of the premises caused by tsunamis, and increasing water tightness in openings of the premises.

[2] Establishing tidal walls to prevent water from entering into buildings and increase water tightness of outdoor doors even in the case where the premises are flooded.

[3] Increasing water tightness of the rooms where important-to-safety facilities are equipped to prepare for the worst scenario where water enters in the buildings.

[4] Installing drainage facilities, etc.

Fukushima Daiichi NPS (when the accident happened)

Unloading wharf when the tsunamis arrived

Flooding inside the building (Power room in Unit 6)

Kashiwazaki Kariwa NPS

Flooding embankment (15 m high) (Oominato side)

Improving water tightness of the intake channel hatches (Unit 2)

Water-tight door inside a building (Unit 7)

○ Measures to enhance the function to inject cooling water to the reactors

After the Fukushima Nuclear Accident, we were not able to recover the facility immediately due to the flooding inside the building as it caused the total loss of power and prevented us from using the pumps for driving motors. In contrast, at Units 2 and 3, we were able to cool down the reactor cores for few days because the steam turbine-driven cooling pumps were still working. However, the pumps soon stopped operating and the function of cooling water injection disabled accordingly. Thus, we sprayed water over all the Unit of 1, 2 and 3 by fire engines.

Kashiwazaki Kariwa NPS implemented the following measures to ensure the function of injecting cooling water into reactors even when motor driven pumps are unavailable.

[1] Deploying gas turbine generators and power supply cars in advance and installing cables that allow supplying power from a height free from the impact of tsunamis

[2] Installing an additional high-pressure alternate water injection system (steam turbine drive pumps) and reinforcing DC batteries

[3] Enhancing the function of cooling water injection from fire engines

[4] Installing an additional diesel-driven fire pumps, etc.

Fukushima Daiichi NPS (when the accident happened)

Leading the power source wires

Installing submerged pumps for cooling water

Kashiwazaki Kariwa NPS

Deploying a gas turbine generator

High-pressure alternate water injection pumps

Installing batteries on an upper floor

Deploying fire engines and power supply cars on a hill

○ Measures for enhancing the cooling function of the spent fuel pools

In the Fukushima Nuclear Accident, we were not able to monitor and cool down the spent fuel pools due to the power loss. In order to secure the quantity of water in the spent fuel pools, we injected water from the openings of the buildings, which were made by the force of the hydrogen explosions, by using a water cannon truck intended for the use at higher locations and a concrete pumping vehicle. Then, we installed the regenerative cooling facility for the spend fuel pools.

In addition to installing the above mentioned "power supply lines from a height free from the impact of tsunamis using gas turbine generators and power supply cars" to ensure the early recovery of the cooling function, Kashiwazaki Kariwa NPS implemented the following measures.

[1] Establishing supply lines to spent fuel pools by fire engines
[2] Deploying water cannon trucks intended for the use at higher locations in advance
[3] Installing additional water level meters in spent fuel pools, etc.

Fukushima Daiichi NPS (when the accident happened)

Injecting cooling water by a concrete pumping truck prepared after the accident (Unit 4)

Kashiwazaki Kariwa NPS

Deploying a water cannon truck intended for the use at higher locations

Installing an additional water level meter

Connections to the SFP spray lines

(Pictures are taken in Unit 7)

Installing spray nozzles for SFP (conceptual image)

Deploying fire engines to spray water over SFP

○ Measures against hydrogen explosions

At the Fukushima Nuclear Accident, hydrogen generated by the damage of reactor core caused the explosion of the reactor buildings. As a result, debris of various sizes scattered in and around the buildings and a wide range of areas are contaminated by radioactive materials. This caused a tremendous impact on the following recovery operations.

In addition to implementing aforementioned "measures for enhancing the cooling function of the spent fuel pools" to prevent damage on reactor core and significantly decrease the possibility of hydrogen generation, Kashiwazaki Kariwa NPS implemented the following measures.

[1] Applying backed up sealants and installing equipment for cooling down the exterior wall around the top head of the reactor well in order to prevent leaks from the top head flange of PCV so that hydrogen can be contained in the PCV in the event of an accident

[2] Installing a passive autocatalytic recombiner (PAR) with an objective of recombining leaked hydrogen and reducing the concentration

[3] Pumping hydrogen by filtered vents in order to prevent PCV from being destroyed

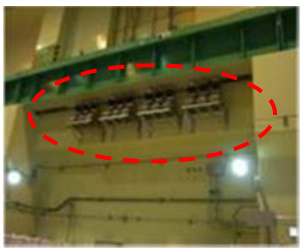
[4] Installing vents on top of the reactors to prevent building explosion in the case where the buildings still have a risk of going beyond the flammability limit, etc.

Fukushima Daiichi NPS (when the accident happened)

Reactor buildings of Units 3 and 4 after the hydrogen explosions

Kashiwazaki Kariwa NPS

Cooling facility of PCV top head (Unit 7)



Static catalyst (hydrogen) recombiner (Unit 7)

Top vent for pumping hydrogen from the reactor building (Unit 6)

Filtered vent equipment (Unit 6)

○ Other measures to improve safety

Kashiwazaki Kariwa NPS implemented the following measures to prepare for additional phenomena in addition to large scale tsunamis.

[1] Measures against fire in the plant (Preventative measures, detecting and extinguishing fire, alleviating the impact of fires)

[2] Measures against forest fires as measures for outside the plant

[3] Measures against flying objects that tornado would bring

[4] Measures against ash produced by a volcanic eruption

[5] Enhancing lighting when the AC power source is lost, etc.

Kashiwazaki Kariwa NPS

Trees are cut down to alleviate the impact of forest fires (after cut down)

Installing different types of fire alarms (smoke detector and heat detector)

Making the cable tray fire-resistant

Installing an additional lighting in case the AC power source is lost

(2) Improvement of capabilities to cope with emergencies

In the Fukushima Nuclear Accident, we were not well prepared for the disastrous and severe accident and the simultaneous disasters over several reactors and so forth. Therefore, we were forced to cope with problems in a flexible manner. Thus, we particularly introduced the ICS[7] for the better decision-making process and the chain of command, which were the matters of concern after the accident happened and refined our capabilities to manage the system.

[7] Incident Command System

At Kashiwazaki Kariwa NPS, learning from the experience of the Fukushima Nuclear Accident, we repeat trainings considering different factors such as nighttime and bad weather. We are making efforts in identifying major issues and improving the processes through the trainings. We also try to nurture application skills to prepare for the situations where things do not go as planned or designed as well as for the case where ambiguities are found in training scenarios.

○ Securing power source by gas turbine generators and power supply cars

In order to immediately secure power source in case where the emergency power supply equipment is unavailable, we deploy an air-cooled gas turbine generators and a power supply car on a hill and regularly conduct trainings of the startup operation and connecting the power cables (Number of trainings conducted: 176 times [for gas turbine generator], 445 times [for power supply cars] [cumulative total as of the end of February]).

In addition, we provide trainings for identifying a location of failure and repairing the vehicle in the case of failure in the gas turbine generator.


Training of power supply car operation

○ Injecting water to the reactors and spent fuel pools

We deployed a fire engine on a hill to be able to inject (spray) water into reactors and spent fuel pools even when the station goes blacked out. We regularly conduct training of connecting the horse and injecting or spraying water (Number of training conducted: 466 times [cumulative total as of the end of February]).


Training of fire horse connection for spraying water

○ Removing debris by heavy machinery

Assuming a situation where the scattered debris generated or brought by earthquake and tsunamis and accumulated snow would constitute an obstacle for the restoration operations,

we regularly conduct trainings of removing debris by using heavy machinery (Number of training conducted: 1,702 times [cumulative total as of the end of February]).


Training of obstacles removal using heavy machinery

○ Cooling down the reactors and spent fuel pools

We deployed an alternative heat removal facility to prepare for the situation where existing cooling facilities are unavailable for cooling down the reactors and spent fuel pools steadily. We regularly conduct trainings of parking a vehicle near the plant and connecting pipes properly (Number of trainings conducted: 193 times [cumulative total as of the end of February]).


Training of connecting the alternative heat exchanger vehicle

○ Fueling the emergency vehicles

We store about 150 thousand liters of diesel fuel on a hill for such emergency vehicles as power supply cars and fire engines. We regularly conduct trainings of supplying fuel to a fuel filler vehicle and then to the emergency vehicles (Number of trainings conducted: 389 times [cumulative total as of the end of February]).


Fueling the emergency vehicles

(3) Status of conformance test for the new regulatory standards

For Units 6 and 7 at Kashiwazaki Kariwa NPS, we applied for the approval in installation

and modification of reactors to the Nuclear Regulatory Commission on September 27, 2013, in order to undergo the test to verity the conformance to the new regulatory standards. The board of review started on November 21, 2013 and has been held 31 times in total as of the end of February. TEPCO will continue to accept the result of the review with sincerity to obtain their approval.

Record of the meetings for conformance test for the new regulatory standards

Agenda		Date of Meeting
1	Overview of the application of establishing and modifying a reactor	November 21, 2013
2	Major points of discussion regarding the application	November 28, 2013
3	Regarding "Additional Investigation Plan of Premises of Kashiwazaki Kariwa NPS and Adjacent Areas (Draft)"	January 24, 2014
4	Evaluation of probabilistic risk at Units 6 and 7 of Kashiwazaki Kariwa NPS (Internal event)	July 22, 2014
5	Single failure of static equipment	August 5, 2014
6	Equipment that prevents PCV in the reactors from being destroyed due to overpressure (PCV pressure relief equipment)	August 26, 2014
7	Equipment that prevents PCV in the reactors from being destroyed due to overpressure (PCV pressure relief equipment)	September 2, 2014
8	Evaluation of probabilistic risk (Earthquake as an external event and tsunami PRA)	September 30, 2014
9	Selection of accident sequence groups and accident sequences, etc.	October 2, 2014
10	Additional investigation on geological condition	October 3, 2014
11	Evaluation of validity of measures against serious accidents (measures to prevent reactor core damage)	October 14, 2014
12	Evaluation of validity of measures against serious accidents (measures to prevent reactor core damage)	October 16, 2014
13	Evaluation of tsunamis	October 17, 2014
14	Evaluation of impact of external fires	October 23, 2014
15	Evaluation of impact of interior flooding	October 28, 2014
16	Evaluation of impact of external fires	November 6, 2014
17	Storage locations and access routes of transportable equipment for the use in serious accidents	November 13, 2014
18	Evaluation of validity of measures against serious accidents (measures to prevent reactor core damage)	November 20, 2014
19	Protection from fires	December 4, 2014
20	Evaluation of validity of measures against serious accidents (measures to prevent PCV damage)	December 9, 2014

Agenda		Date of Meeting
21	Evaluation of validity of measures against serious accidents (measures to prevent damage to PCV and reactor core)	January 15, 2015
22	Response to the comments about tsunamis	January 23, 2015
23	Equipment that prevents PCV in the reactors from being destroyed due to overpressure (PCV pressure relief equipment)	January 27, 2015
24	Evaluation of validity of measures against serious accidents (measures to prevent PCV damage)	January 27, 2015
25	Evaluation of impact of tornadoes (setting standard and designed tornadoes)	February 3, 2015
26	Office to cope with emergencies of Units 6 and 7 at Kashiwazaki Kariwa NPS	February 10, 2015
27	Amplifying characteristic of seismic waves in the premises	February 13, 2015
28	Prevention of malfunction, safe evacuation passages, etc. and safety protection circuits	February 19, 2015
29	Designing consideration regarding pressure boundary valves for the reactor coolants.	February 24, 2015
30	Reactor PCV pressure relief equipment (Constitutions of major lines and valves)	February 26, 2015
31	Additional investigation on geological condition	February 27, 2015

The examination regarding the facilities to cope with serious accidents, etc. in Units 1, 6 and 7 at Kashiwazaki Kariwa NPS was conducted twice so far (on January 20 and February 17).

(4) Explanation to the local governments and communities

[1] Verification of the Fukushima Nuclear Accident

In Niigata Prefecture, the verification of the Fukushima Nuclear Accident has been conducted in response to a request from the Governor of Niigata Prefecture on March 22, 2012 mainly among the "Technical Committee Regarding the Safe Management of Nuclear Power Stations in Niigata Prefecture (herein after referred to as the Technical Committee)" established based on the safety agreement between Niigata Prefecture and TEPCO. In this verification, we clarified issues based on the explanations given by various investigation and verification committees from the diet, government and private sectors as well as TEPCO in FY2012. From FY2013, we implemented "discussion sessions of each issue" for the issues that need continuous examination by the lead of a few core members from the Technical Committee. Discussion sessions of each issue are prompted based on six different themes. The Technical Committee continues to verify these issues while sharing the information and

status of discussion one another. The following is the discussion sessions of each issue held so far.

Records of Technical Committee

Major agenda	Date of the Committee	
The way to promote verification of the Accident at the Fukushima Daiichi Nuclear Power Station (Niigata Prefecture) Comment based on the experience of Independent Investigation Commission on Fukushima Daiichi Nuclear Accident (Koichi Kitazawa, Independent Investigation Commission on Fukushima Daiichi Nuclear Accident)	2012	July 8
National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission (NAIIC) (Digest version)		August 24
Organizing the verification of the Fukushima Accident Government's Investigation and Verification Committee on the Accident at the Fukushima Nuclear Power Station of TEPCO - Final Report - The final report of Government's Investigation and Verification Committee on the Accident at the Fukushima Nuclear Power Station of TEPCO - Keys of the accident causes -		October 30
Report of the Accident at the Fukushima Daiichi Nuclear Power Station (TEPCO) How to move toward with nuclear reform (TEPCO)		December 14
Visitation of Fukushima Daiichi and Daini NPSs [On-site review]		December 21
Organizing the verification of the Fukushima Accident (Draft)	2013	February 1
Measures at Kashiwazaki Kariwa NPS based on the lessons from the Accident at the Daiichi NPS [On-site review]		February 19
Challenges based on the Fukushima Accident (Draft) - Organizing discussions in FY 2012 - Status of response to the verification items of the Fukushima Accident (Draft) (TEPCO)		February 19
Challenges based on the Fukushima Accident (Draft) - Organizing discussions in FY 2012 -		March 14
How to promote the Technical Committee Regarding the Safe Management of Nuclear Power Stations in FY 2013.		June 1
Simulation of verification hearings of the Fukushima Accident Verification of the Fukushima Accident (TEPCO)		September 14
Organizing issues and questions of discussion sessions of the Fukushima Accidents		December 19
Discussion session of each issue Issue 1 Issue 5 Issue 6	2014	February 11
Discussion session of each issue Issue 2 Issue 3 Issue 4		March 24

Major agenda	Date of the Committee	
Verification of the Fukushima Accident -Status of discussions in FY 2013 - (Draft)		
Organizing issues and point of discussions for the discussion session of each issue		May 22
Status of discussion session of each issue		August 27
Proposal of operation under high radiation levels (Draft)		October 7
Visitation of Fukushima Daiichi NPS [On-site review]	2015	February 21
Verification of the Fukushima Accident Verification of filtered venting equipment		March 24

Record of Discussion Sessions for Each Issue

Discussions sessions of each issue		Date of the Committee	
1	Impact of seismic vibration on important equipment	2013	November 7
		2014	January 14 April 28 August 20
2	Making decisions on important issues such as injecting seawater, etc.	2013	November 19
		2014	January 31 May 19 August 4
		2015	January 8
3	TEPCO's management for responding to accidents	2013	November 14
		2014	February 4 April 26 July 28 December 25
4	The way how the information (ex. meltdown) should be addressed.	2013	November 14
		2014	February 4 April 26 September 2 December 25
5	Operation under high radiation levels	2013	November 30
		2014	January 18 May 8 June 19
6	Measures against severe accidents	2013	October 31
		2014	January 25 June 13 August 8

In these Technical Committee and discussions of each issue, TEPCO provides explanation based on documentation. At the same time, we sincerely answers questions, etc. from committees (Documents TEPCO provided at the Technical Committee and the Discussions Session are publicized on the website of Niigata Prefecture).

When explaining, we do not just report the content described in the existing accident reports. In response to the questions from committees, we have answered about 550 questions that need verification after carrying out the re-investigation and additional investigation as much as we can. Furthermore, our President received the questions (163 questions) from the Governor of Niigata Prefecture when visited for the New Year greeting. Although some are already resolved by the explanation and discussions we had so far, we will continue to engage in investigation in order to answer all of them.

Moreover, we explained about the points that the Governor sees as problems through the Discussion Sessions of each issue such as the "judgment on PCV vents," "decision of seawater injection," and the "decision on publicizing the meltdown." In particular, regarding the "decision on publicizing the meltdown," we are providing the following explanation with back-up documents while holding interview with people involved.

- Regarding the state of the reactor core when the accident happened, we have not confirmed the fact that the central government specifically instructed us "not to use the expression of meltdown" or "to use the expression of reactor core damage." Meanwhile, we have become required to obtain prior approval from the official residence and supervisory government agencies for the content of press releases. Thus, we started avoiding explanations based on speculation and guess as much as possible and refraining from using terms of which definitions were not clearly defined. This formed a kind of "atmosphere" where we could not use the term meltdown which we explained we were placed under pressure (Every time on and after February 4, 2014).
- Therefore, after the accident happened, we were not able to publicize the meltdown in the situation where there were no sufficient data to prove it. It was May, after two months from the accident, when we admitted the fact of the meltdown after obtaining the results of analyses of MAAP, etc. This needs to be regretted because if a reactor core could not be cooled down for few hours, all nuclear engineers should have been able to recognize the meltdown as a fact rather than speculation (February 4, 2014).
- When TEPCO directly visited the Governor of Niigata Prefecture for explanation on March 18, 2011, one of TEPCO's engineers allegedly stated to the Governor that "zirconium melts but a pellet remains like this." We explained that it was the explanation about the principle of hydrogen generation resulting from zirconium-water reaction, submitting all the 20 sheets of documents actually used in the presentation on the day (April 26, 2014).

[2] Explanation to the local communities

○ Carrying out local communities visitation activities and inspection tours of power stations

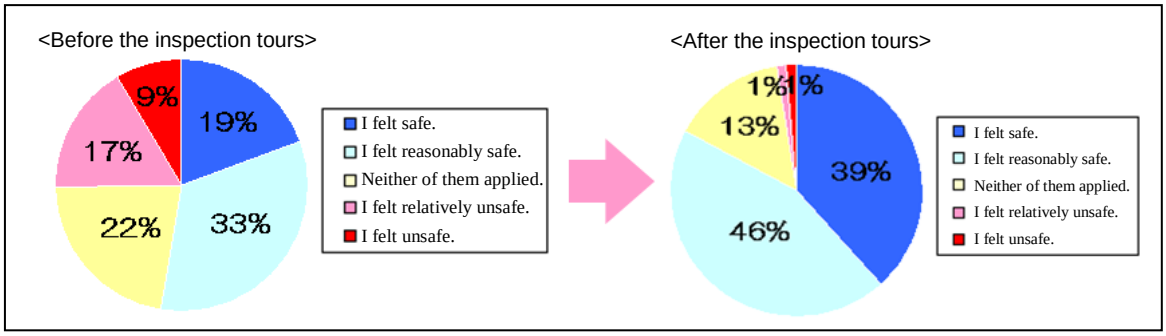
We visit local governments, various organizations and the like as necessary to explain the status of our power stations. In the area of Kashiwazaki Kariwa, in particular, we visit chairmen of residents associations in Kashiwazaki City and the Ward Mayors in Kariwa Village to listen to their opinions and questions.

In addition, in the course of these interactions, we recommend them to participate in the inspection tours of power stations.

9,485 people from the Kashiwazaki-Kariwa region and 23,188 people from Niigata Prefecture participated in the inspection tours of power stations (Cumulative total from after the Fukushima Accident to the end of January 2015).

As people could take a close look at our safety measures, about 85% of them evaluated our efforts saying “I feel safe.” or “I feel safe to some extent” in the survey after the inspection tours.

[Reference] Change of impression on our power stations before and after the inspection tour



On January 29, 19 people from the Japan Association of Corporate Executives visited the power stations and observed Unit 7 and the integrated training.

Members of the Japan Association of Corporate Executives participating in the inspection tour of the power stations

○ Holding explanatory meetings

We explain the status of our power stations as necessary.

We explained the situation of conformance test of Units 6 and 7 to the assemblies of

Kashiwazaki City and Kariwa Village on January 22 and 23 respectively.

On the same days, we held the “explanatory meetings for local communities” in Kashiwazaki City and Kariwa Village and the total of 206 people visited the meetings. (We have held the explanatory meeting six times in each area of Kashiwazaki City and Kariwa Village after the Fukushima Accident. A total of 1,169 people visited the meetings)

In the meetings, we took many questions and opinions about the situation of safety measures, such as evacuation plans for emergencies and performance of filtered vent facilities, as well as the cause of the Fukushima Accident. We answered these questions one by one.

Explanatory meeting for local communities (Kashiwazaki Venue)

Explanatory meeting for local communities (Kariwa Venue)

At the power station, we hold various explanatory meetings as needed such as explanatory meetings for participants of the inspection tours (Service Hall) and people from local communities to inform the progress of implementing safety measures in the power station.

Explanatory meetings held for the inspection tours of the power stations (Service Hall)

○ Addressing various information

We address information using various means such as press releases, news conference by Superintendents, website, SNS (facebook), PR hall at the power station and newspaper advertising, in order to inform people in the society including residents of the Kashiwazaki-Kariwa region and Niigata Prefecture about the status of the power station.

The website of the power station has just had a major redesign in January this year. It

explains about the safety measures we have in the power station using graphics and shows the videos of training for emergencies.

In the Kashiwazaki-Kariwa region, we issue a public relation magazine News Atom (Distributed about 37,000 copies by newspaper inserts). We publish special issues featuring “explanatory meetings for local communities” and the like in addition to the monthly issues where we regularly announce the progress of our efforts on safety measures for the power station.

The public relations magazine News Atom and newspaper advertisements are updated to our website and are further promoted through a media mix.

"News Atom" the public relations magazine
(February Issue)

Advertisement in a local newspaper of
Niigata Prefecture (Published on February 5)

(5) Third-party review

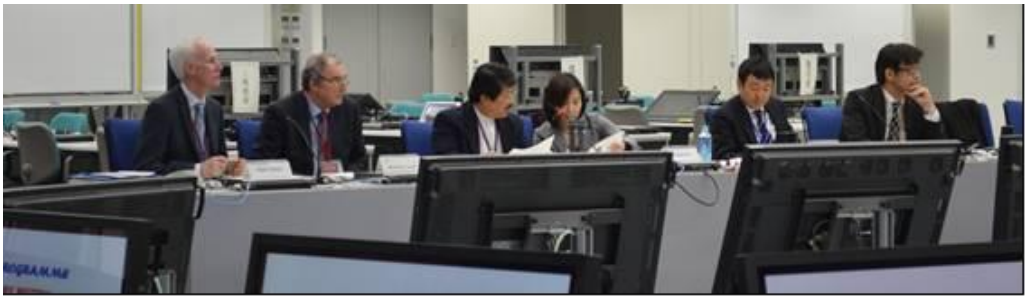
The OSART[8] mission of IAEA will be carried out from June 29 to July 13, 2015. Prior to this review, we conducted meetings for subcommittee preparations at the headquarters on February 2 and at Kashiwazaki Kariwa NPS from February 3 to 5.

IAEA attendees
Mr. Miroslav Lipar (on the left)
Mr. Peter Tarren, Team leader (on the right)

Meeting for subcommittee preparations (Headquarters)

In the headquarters, IAEA gave us a presentation about overview of the OSART mission whereas TEPCO presented the overview of the Fukushima Accident and lessons learned from the accident, the overview of the Kashiwazaki Kariwa NPS, the content of safety measures under development, as well as expectation we have to the mission.

[8] The Operational Safety Review Team dispatched by the International Atomic Energy Agency (IAEA).



IAEA giving presentation at Kashiwazaki Kariwa NPS

During the meetings of subcommittee preparations at Kashiwazaki Kariwa NPS, which spanned three days, IAEA presented the basic concepts in conducting safety standards and review as well as the mutual roles over the review.

Practice run of the review

Closing meeting

In the closing meeting, Mr. Peter Tarren, the team leader stated that "I consider that we have built a foundation to make the necessary preparations for this mission as we explained how the OSART is conducted, the methodology of leading the points of the review and so on."

(6) Status of response to various investigation and verification committees of the diet, government and other private sectors

In addition to TEPCO's Internal Accident Analysis Report, the following reports are released regarding the Fukushima Nuclear Accident. We understand that they include valuable proposals that we have to address.

- Technical Findings about Accident of Tokyo Electric Power Company, Inc. at Fukushima Daiichi Nuclear Power Station (Nuclear and Industrial Safety Agency)
- Report of National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission (NAIIC)
- Final Report of Government's Investigation and Verification Committee on the Accident at the Fukushima Nuclear Power Station of TEPCO (Government's Investigation and Verification Committee)
- Investigation and Verification Report of Independent Investigation Commission on

the Fukushima Daiichi Nuclear Accident (Independent Investigation Commission)

- Lessons Learned from the Nuclear Accident at the Fukushima Daiichi Nuclear Power Station (INPO)
- Final Report/Interim Report of Verification Project on the Accident of Fukushima Daiichi NPS (Kenichi Ohmae)

When summarizing the Nuclear Safety Reform Plan, we confirmed that proposals of each report have been covered by the Nuclear Safety Reform Plan in addition to the measures for the accident already in practice at each power station (See the summary of the Fukushima Nuclear Accident, Section 4.7 in the body of the Nuclear Safety Reform Plan, as well as 4-5 and 4-6 in the attached document [released on March 29, 2013]). As a result of checking the status of the follow-up actions on the unsupported items, we confirmed all of them are now in progress. No items are left untouched.

Status of Follow-Up Actions on Unsupported Items (○: Completed, △: Partly under review)

Reports	Content of Proposals and Lessons	<Status at the time> and the following status of response (as of February 2015)	Response
NAIIC	"Establishing management methods to maintain the function of SFP and improving the measures of injection, etc." In the U.S., when storing the fuel in SFP immediately after the removal, operators are required to store the spent fuel rods checkerwise to alleviate overheating in case the cooling water is lost (p. 142).	<To be considered> → As measures against overheating, we introduced a multiplexing cooling water injection system and a spraying method. The construction is underway. Moreover, we changed our process so that the first cycle of the spent fuels are stored checkerwise in order to reduce thermal load.	○
	"Real-time Severe Accident (SA) evolution prediction tool" It describes that a SA evolution prediction tool with real-time updates would have been useful to share information (p 193).	<Under review (Reviewing concept)> → As for predicting the plant behavior in accidents, we determined that it is more important to improve capabilities of personnel in predicting the accident progress rather than relying on a tool that provides real-time accident evolution. Therefore, we conduct training in an effort to improve the prediction skills by analyzing accident analysis codes of severe accidents (MAAP) assuming various situations.	○
Proposal for Verification Project on the Accident of Fukushima Daiichi NPS (Final Report)	Examination of the structure of safety relief valves that do not relay on batteries (p. 108) To examine several measures of depressurizing reactors (Safety relief valves do not rely only on DC power sources) (p. 151)	<Measures are not taken> → In order to further ensure the operation of safety relief valves (SRV) in emergencies, we reinforce DC power sources (ex. Spreading reserve batteries, deploying chargers) and deploy reserve nitrogen cylinders. In addition, to diversify the means of depressurization, we equipped three-way self-pressure regulating valves in the exhaust line of the solenoid valves for driving SRV. Construction is currently underway to enable opening and closing of SRV in case the solenoid valves do not work.	○
	Injection of nitrogen into PCVs during venting (p. 159)	<Under review towards implementation> → We plan to install N2 supply equipment in order to purge flammable gases generated in FVs by separating the filtered vents (FV) systems after completed venting PCV. In addition, we continue to examine injecting nitrogen into PCVs including go or no-go decision of the implementation.	△
	Establishing the framework where lessons learned from the field operations of Fukushima Daiichi NPS can be addressed to all electricity business administrators and power stations in Japan (and the world). (p. 134)	<Under review towards implementation> → We summarized lessons learned from the Fukushima Accident and other related accidents in TEPCO's reports. We also present such information at places across the world. We received a review from the Institute of Nuclear Power Operations (INPO) and share our insight with domestic and foreign businesses through reports. In addition, while steadily execute the measures developed from learned lessons, we made a structure where we can regularly report the progress of the measures and status of examination on unverified and unresolved issues to people inside and outside the company.	○
Proposal for Verification Project on the Accident of Fukushima Daiichi NPS (Interim Report)	Improving masking effect of the MCR in order to avoid impact of radiation in emergencies (p. 149)	<Under review towards implementation> → After evaluating the radiation levels, we started construction for pressurizing a part of MCR and installing shields.	○
	To consider reinforcing the concrete and installing debris catchers, etc., assuming the debris-concrete reaction on the pedestal that may occur if debris passed through the pressure vessel. (p. 154)	<Under review towards implementation> → As a measure against melt-through, we plan to install corium shields on the pedestal at the bottom of the pressure vessel.	○

1.4 Analysis of Causes of Personnel Accidents and the Preventative Measures

(1) Efforts at TEPCO

Upon a series of personnel accidents at Fukushima Daiichi NPS, we implemented safety activities to eradicate accidents (See "Progress Report of Third Quarter FY 2014 [released on February 3, 2015]"). However on January 19, an employee of one of our contractors fell from the top of a tank for holding rainwater (about 10 m high) and passed away. On the same day at Kashiwazaki Kariwa NPS, an employee of a contractor fell from the height of about 3.5 m in the IPB shaft room[9] outside the turbine building of Unit 2 and was severely injured requiring three months to heal completely. Furthermore, on the following day on January 20 at Fukushima Daini NPS, an employee of a contractor got his head caught in the concentrator inspection jig on the fifth floor of the Units 1 and 2 waste disposal building and passed away.

Taking these incidents seriously, we immediately suspended all the operations[10] in our power stations to start safety inspections. At the same time, the President of the Fukushima Daiichi D & D Engineering Company checked the accident site in Fukushima Daiichi NPS on January 20 and the General Manager of Nuclear Power and Plant Siting Division checked the sites in Fukushima Daiichi and Daini NPSs on January 21 and the site in Kashiwazaki Kariwa NPS on January 24.

The safety inspections were conducted by both parties of TEPCO and contractors focusing on the following perspectives.

- We examined each case of the three personnel accidents and reconfirm the rules and basic actions as well as the use of protective gears such as safety belt.
- We inspected for dangerous locations in operating fields from the viewpoint of heavy load, opening, heights, darkness, etc. and took corrective actions accordingly.
- We checked for ensuring safe and sure operating procedures in the light of the situation of each field.

[9] A room where electric wires that connect power generators and major transformers are installed in metal boxes.
[10] Excludes the operations of which due is required by laws, Technical Specifications, etc. and that were necessary for securing and maintaining the safety of power stations.

Before corrective actions

After corrective actions (Installed a barricade over the aperture)

After completed the safety inspections, Kashiwazaki Kariwa NPS resumed operations on January 26, Fukushima Daini NPS resumed operations on January 28, and Fukushima Daiichi NPS resume operations on February 3 after the field inspection by the General Manager of Nuclear Power and Plant Siting Division.

(2) Preventative measures

We are working on implementing the preventative measures in accordance with "Causes and Countermeasures of Serious Personnel Accidents Occurred in Our Nuclear Power Stations and Safety Inspections in Response to the Accidents [released on February 2]" After the severe accidents occurred, we suspended all the operations then resumed the operations only after the superintendents confirmed the progress of implementing safety measures in each power station.

At Fukushima Daiichi NPS, as measures against the direct cause, we designed a new structure of the tank so that the lid of the hatch does not fall. For existing tanks, we are working on taking certain measures in the process before opening the hatch to prevent workers from falling.

At Fukushima Daini NPS, we modified the pedestal as a measure against the direct cause of the accident. We replaced the fastening bolts on the cradle with longer bolts so that the fastening bolts can be tightened or loosened without a worker going under the cradle. At the same time, we implemented warning signs for attention to prevent people from entering in the dangerous locations of the pedestal and cradle.

At Kashiwazaki Kariwa NPS, as a measure against the direct cause, we installed an anti-drop mechanism in the opening of the relevant location. At the same time, we extracted all the locations where anti-drop equipment was not equipped in the opening. We are working on taking necessary measures for these parts.

Lid of the tank with the anti-drop structure
(Fukushima Daiichi NPS)

Anti-drop measure against the aperture of the hatch (Fukushima Daiichi NPS)

In addition to the direct causes, we also analyzed underlying contributors. We will implement preventative measures against the following underlying contributors and start developing horizontally in a prompt manner: Insufficient utilization of information about operational experiences and horizontal development (Fukushima Daiichi NPS), insufficient involvement of TEPCO and inadequacy of TEPCO (Fukushima Daiichi NPS), insufficient management in designing and managing (Fukushima Daini NPS), insufficient risk assessment in operating management (Fukushima Daini and Kashiwazaki Kariwa NPSs), insufficient safety education (Kashiwazaki Kariwa NPS). In particular, as a starter, we will work on "unifying the awareness about TEPCO's roles and responsibilities from front-line employees to the management by stipulating the basic policies" as a revision of the "Management Guidelines of Nuclear Power Division" and work hard on implementing the guidelines.

(3) Underlying contributors of the accidents and the countermeasures

The causes of the three personnel accidents are described in the "Causes and Countermeasures of Serious Personnel Accidents Occurred in Our Nuclear Power Stations and Safety Inspections in Response to the Accidents [released on February 2]." Based on its content, we organized the causes from the three perspectives of "safety awareness," "technological capability," and "ability to promote dialogue."

[Safety Awareness]

- Even after experiencing some accidents of falling and getting caught, we did not implemented continued and systemic efforts to thoroughly eradicate such accidents (Headquarters and Fukushima Daiichi NPS)

[Technological capability]

- We could not draw lessons from the similar accidents. In addition, we did not thoroughly implement horizontal deployment of the countermeasures and we narrowed down the range of implementation. Furthermore, we did not monitor the progress well enough whether valuable lessons can be derived from the accident

cases (Each power station).

- For a long period of time, many of us struggled to cope with administrative work with little time to take extra moment and visit the field. As a result, we became inadequate of detecting risk in the field and pointing out unsafe behaviors (Fukushima Daiichi NPS).
- We are not well aware of the situation of actual fields, the content of the operation, the operating procedures, etc. Thus, we could not implement the effective TBM-KY as well as measures from the hardware side (Each power station).

[Ability to promote dialogue]

- We could not develop effective measures because we did not analyze about the accidents deeply enough.
- Responsibilities of deeply analyzing the causes of the accidents, developing preventative measures, and implementing horizontal and the schedule of such matters remained uncertain for a while, which caused the delay in creating the necessary reports (Fukushima Daiichi NPS). We could not develop and enforce effective plans of improvement as we were not able to monitor such situations properly (Nuclear power leaders).

We will analyze the underlying contributors of these three perspectives in order to consider substantiating and enforcing countermeasures in the future.

	Underlying Contributors	Countermeasures
Safety Awareness	[1] Among TEPCO's employees including ones in a management position, there was an attitude where accidents were inevitable in the working environment of Fukushima Daiichi NPS.	[1] Structure of responsibilities regarding safety activities will be clarified under the responsibility of the General Manager of Nuclear Power and Plant Siting Division. When severe accidents occurs, in particular, we will suspend the operations as we did this time in order to pursue the cause and develop preventative measures.
	[2] Combining with workers' goodwill of concerning progress of operations and excessive enthusiasm for the operation in Fukushima, lack of competent workers and the belief of being the exception of the rules, the safety rules were sometimes violated. In addition, TEPCO's employees did not have control over such behavior.	[2] We will try to create awareness and the culture where human love is the origin of safety management, for instance, by carrying around a photograph of important someone.

Technological capability	[1] We talked about the importance of utilizing OE information. However, it did not thoroughly become prevalent to the front-line employees. As result, extraction of risks lost the substance.	[1] We will improve the ability of extracting risks in the field by going through OE information everyday.
	[2] Risks that should have been discussed at contractors' advance safety meetings and TBM-KY, etc. were not shared in an organizational level.	[2] We will make efforts to improve our competence of predicting danger by installing and utilizing a hands-on facility to experiencing danger as well as utilizing operational experiences information, etc.
	[3] We did not have specific pictures of the actual operations as we did not communicated with workers well enough about the actual steps in detail.	[3] TEPCO's supervisors will visit the fields more frequently to facilitate communication with workers. Especially when the operation is implemented for the first time and when the change was applied to the content of construction (3 hours of work), TEPCO's supervisors will check the operation until he can understand the actual processes and create operating procedures depending on the type of the operation and the degree of attention it requires.
Ability to promote dialogue	[1] When conducting investigation of an accident, we conduct hearings to people involved in the accident but it did not go well due to the psychological action where people try to protect the person(s) responsible for the accident.	[1] We will establish a structure where hearings would function well; for example, by establishing the culture where contributors of information are not blamed.
	[2] Administrative functions were vertically divided so that communication between organizations was not sufficient. In addition, there was a lack of leadership to resolve this issue.	[2] We will help the existing trouble meetings function more effectively, in order to clarify the person in charge of analyzing causes, developing countermeasures and implementing horizontal deployment, as well as clarifying deadlines for accident reports and regular confirmation.

2. Progress Status of Nuclear Power Safety Reform Plan (Management Side)

2.1 Verification and Summary on Fukushima Nuclear Power Plant Accident (Edited and added to “Summary on Fukushima Nuclear Power Plant Accident and Nuclear Power Safety Reform Plan” (published on March 29, 2013))

In this progress report, the following issues are reviewed upon the evaluation on the achievements done in 2 years’ period after the publishing of the Nuclear Power Safety Reform Plan:

- Was it really impossible for TEPCO to avoid the occurrence of the Fukushima nuclear power plant accident? What were the underlying contributors that prevented the efforts to avoid this accident?
- What did TEPCO learn as lessons from the analysis results of the underlying contributors? And why does it require the 6 countermeasures as its Nuclear Power Safety Reform Plan?

(1) Review on Fukushima Nuclear Power Plant Accident

The direct cause of the Fukushima nuclear power plant accident was that the countermeasures against common-factor failures (cliff-edge nature) caused by a massive tsunami which went beyond the expectation at that time by far, led to all power source loss including the direct current power source. During that time, the accident was reviewed from the following three points of view:

- The preparation against severe accidents
- The preparation against tsunamis
- The preparation against failures

And they were sorted out for the safety awareness, the technological capability and the communication skills.

[1] The root causes of the reason why the expectation and the countermeasures against severe accidents were not sufficient

[The problems in the safety awareness]

- While the “utilization rate” was positioned as one of management agenda and it was dispersed to the organization, the agenda to “improve the safety level continuously” was not positioned as one of the important items of the management agenda and it was not selected for common recognition for the entire organization.
- The measures for accident management which had been implemented in the past were treated as sufficient as the measures against any severe accidents. And we strongly opposed the move by regulating bodies to select them as one of the regulation items, because we were afraid that we were forced to implement any

measures which were not reasonable from the viewpoint of cost.

- The above-mentioned attitude of the managing executives in the former nuclear power sector influenced the process for the preparation and implementation of countermeasures in the sites, making it difficult to secure the budget and to implement them in an appropriate manner.

[The problems in the technological capability]

- Even after reviewing the operation experiences and terrorism information gained from other countries, we were not able to think that the risk of any incident was not ignorable, in which all power source loss would occur from any external incidents (natural phenomenon or terrorism) and it would lead to any severe accident.
- We lacked the engineering capacity to find out any problem from the overseas information and the information gained from the operation in other power plants and to find beneficial countermeasures by ourselves.
- We stuck to the method development of PRA[11] against external incidents, and the proposal of concrete countermeasures was delayed.
- We lacked the capability to think about the utilization of limited resources and to prepare reasonable safety measures within a shorter period.
- Our attitude toward research became passive, because the proposal of any countermeasures would increase new tasks to do.

[The problems in the ability to promote dialogue]

- We believed that it would have an adverse influence on the lawsuits demanding the cancellation of nuclear power plant installation, if we recognized the necessity of safety actions against any severe accidents, because it would become difficult to explain that nuclear power plants were sufficiently safe in the current state by doing so.
- We did not feel the necessity to disclose any risk to the society.
- We lacked the ability to promote dialogue to hold any discussions with regulatory bodies on safety issues in open forums.

By summarizing them, we concluded that the root cause of why the expectation and the countermeasures against any severe accidents were not sufficient is that "because we were held to the decisions of the past, and we believed that the possibility of the occurrence of any severe accidents from all power source loss or any other reasons were sufficiently small and that the necessity to improve the safety level further was low, leading to the stagnation of the improvement of the measures against any severe accident."

[11] Probabilistic Risk Assessment

[2] The root causes of the reason why the expectation of the height of the tsunami and the countermeasure against any tsunami disaster were not sufficient

[The problems in safety awareness]

- Even though the former management executives in the nuclear power sector recognized that the records on natural phenomena were limited and largely uncertain, they lacked the attitude to implement countermeasures actively with the emphasis on safety.
- Those former management executives in the nuclear power sector downplayed the reliability of the calculation on tsunami height, and just examined the first layer actions of the deep layer protection such as the flood barrier constructions. And they lacked the attitude to provide the third and fourth layer actions of that deep layer protection such as the provision of portable power sources and the water injection function, even when the possibility of accident occurrence was still low.
- Those former management executives in the nuclear power sector disrespected the opinion of professionals at HERP claiming that the occurrence of any major earthquake (meaning major tsunami) along the ocean trench between northern Sanriku to Bohsoh including the offshore of Fukushima Prefecture was not undeniable.

[The problems at the technological capability]

- Those former management executives in the nuclear power sector were too dependent on the decision by the Japan Society of Civil Engineers, and they lacked the attitude to thoroughly examine the conditions and decide by themselves.
- The staff in the sections that worked for Safety and Facility Design did not think that the contents of "Tsunami Assessment Methodology for Nuclear Power Plants in Japan" did not guarantee the notion that there is no source of tsunami along the oceanic trench offshore of Fukushima Prefecture.
- Those staff in the sections that worked for Safety and Facility Design did not pay enough attention to the fact that the evaluation result would change significantly depending on the setting of a wave source model in "Tsunami Assessment Methodology for Nuclear Power Plants in Japan" issued by Japan Society of Civil Engineers.
- Those staff in the sections that worked for Safety and Facility Design lacked the flexible ideas to plan any cost-effective and practical measures in a shorter time.
- Any education on the risks and severe accidents in nuclear power plants was not provided for Civil engineering and Construction sections. And the Tsunami evaluation section lacked the sense of crisis on tsunami while it could spread its influence in the cliff-edge matter.

[The problems in ability to promote dialogue]

- They lacked the technical capability to explain any reasonable actions against tsunami to regulating bodies, and believed that they would be forced to implement excessive actions.
- Because they feared to be demanded to implement excessive actions, they lacked the attitude to establish good communication with the site locations and the regulating bodies.

Summarizing them, we concluded that the root cause of why the expectation of the tsunami height and the measures against it were insufficient is that "we decided that the possibility of tsunami occurrence which would go beyond the expectation was low although our knowledge on tsunami was not sufficient, and we lacked the attitude to provide deep-level protection swiftly after considering the measures by ourselves."

[3] The root cause of the reason why the preparation against any accident was insufficient

We reviewed the major turning points of the accident progress for each unit: the function cessation of the emergency condenser for Unit 1, the loss of the water injection function for Unit 2 and the loss of the water injection for Unit 3. And we can sort them out as having a common situation, as below:

- Any alternative methods during total power loss were not prepared well.
- The actions against the accident itself were very difficult because of the rubble left by the tsunami, hydrogen explosions in the nuclear reactor buildings and other factors.
- The staff in the Nuclear power section were not trained to take necessary actions for recovery in an emergency situation, and it took time to take individual actions.
- It was not able to encourage gathering necessary information effectively from various stations to estimate the status of the reactor cores, and to forecast the situation precisely by utilizing fragmented information on hand well.
- From the organizational structure, it was impossible to handle severe accidents and the disasters that occurred in more than one unit at the Emergency Response Center at the NPS (the numerical limit of locations for supervision was exceeded).
- Information sharing on the status of the emergency condensers and other critical equipment was not made, and various information was provided to the Emergency Response Center at the NPS, regardless of their level of importance. As a result, the swift and precise decision making was obstructed, leading to the confusion in directions and orders.

[The problems in the safety awareness]

- From the false belief that there would be no severe accident, the training plan was insufficient and training was merely a formality.
- In a similar fashion, the provision of necessary materials and facilities was insufficient.

[The problems in the technological capability]

- Because the works required in any emergency situations were not defined as skills to be achieved by ourselves, those works were not implemented swiftly by ourselves ("It took a long time before the start of water injection into Unit 2," etc.).
- Because it was expected that the information on the plant status could be obtained even during any severe accident, it was not possible to estimate the plant condition when that information was not obtained. And it was not possible to plan the actions against the situation based on those estimates ("Erroneous recognition on the water injection status into Unit 1," etc.).
- Because the preparation and the training on the information sharing system were insufficient, it was not possible to carry out smooth information sharing.
- The head office was not able to coordinate the inquiries and directions from the outside, leading to the confusion in the command system to the power plant.
- The head office was not able to give support sufficiently in the preparation, transportation and delivery of necessary materials.

[The problems in the ability to promote dialogue]

- It was not able to communicate the progress of the accident swiftly and precisely to concerned organizations and local municipalities.

By summarizing those problems, the conclusion is that the root cause of the reason why the preparation against any accident was not sufficient is that "the training against any accident in the site and the provision of materials and facilities were insufficient, because it was not considered that any severe accident would occur and more than one unit would be damaged at the same time. As a result, it was not possible to share information on the critical plant status and to make necessary actions swiftly and precisely, such as the depressurization operations."

(2) Review on the Organizational Problems and Efforts by the Nuclear Power Division

In the past, when any misconduct was found, a top management resigned and an officer from another section was assigned as a head of the Nuclear Power Division. And the staff in

the Nuclear Power Division made a lot of reform activities, and there were several efforts that realized a certain level of effect. However, we could not prevent the occurrence of the Fukushima nuclear power plant accident. And we sorted out its causes as below:

a) We believed that the safety of nuclear power had already been achieved sufficiently, and we did not consider any misconduct related to nuclear power as a sign of the deterioration of the safety culture. But we recognized them just as a lack of ability to promote dialogue or problem solving methods. So, as an organization, the action to improve the safety awareness was insufficient.
b) For “safety awareness,” although the former top management for the nuclear power section should have improved the safety awareness of their own organization with unflagging resolution, there was no concrete plan for the reform presented to the former top management for nuclear plants, based on the belief that the cause of misconduct was the problem among the middle- management level or site organizations.
c) Although the vagueness of authority and responsibility allotment in the organization became exposed in the emergency situation, the authority and responsibility of the management was evidently ambiguous in a similar way even during normal times.

(3) Structural Problem of Nuclear Power Division and Responsibility of Management

From the viewpoints of "safety awareness," "technological capability" and "ability to promote dialogue" sorted out from the review on the Fukushima nuclear plant accident and other problems, we made a further deep analysis. It is true that no officer among the former management of the nuclear power section ignored the slogan of "the highest priority on safety" but that is the essence of the problems of "why the organization that puts the highest priority on safety as its vision could not prevent the occurrence of the Fukushima power plant accident."

The management environment surrounding electric power business has changed significantly in the last decade. In the case of TEPCO, there were a series of misconducts. And it suffered a disaster called the Niigata Prefecture Chuetsu Offshore Earthquake in 2007, which cast a significant influence on the operation rate. The demand on the Nuclear Power Division from the management to improve that operating rate was quite strong. On the other hand, even though "top priority on safety" was carried as a vision, the resources were spent on injury accidents and fires, which actually occurred frequently. After a certain level of protection against severe accidents was implemented, they believed that the safety level was well established, and recognized the operation rate and other factors as important items on the management agenda.

For this reason, the actions to avoid any prolonged nuclear reactor stoppage (the improvement of the operation rate) was selected as one of the evaluation measures in the risk map to define the priority of operation. And the implementation of those items, for which the effect of the action was difficult to evaluate, was postponed, such as the measures against any severe accidents. For example, shrouds were replaced by spending several billion yen, because it was feared that the cracks on those shrouds might become a cause of long-term stoppage, although it would not significantly contribute to the improvement of the safety level. On the other hand, the water-tight work of the battery rooms and other actions were not implemented, because it would not contribute the improvement of plant operation rate directly.

Under such a circumstance, SCC and the actions against earthquakes were implemented as they were considered as work to secure and improve the operation rate, because cost would be recovered if the operation rate would improve even though those measures were expensive. Through this process, the dependency on the manufacturer was deepened, leading to the deterioration of the technological capability of TEPCO itself and to the resulting high-cost structure. And we can consider that the characteristic of nuclear power generation promoted this chain reaction in which, as long as the operation rate improved, a certain level of higher cost could be recovered. And this deterioration of the technological capability became a factor in the deterioration of the capability to seriously discuss engineering works with regulating bodies and that of the capability to disclose the remaining risks in nuclear power technology. The hesitation in risk communication further promoted the deterioration

of ability to promote dialogue.

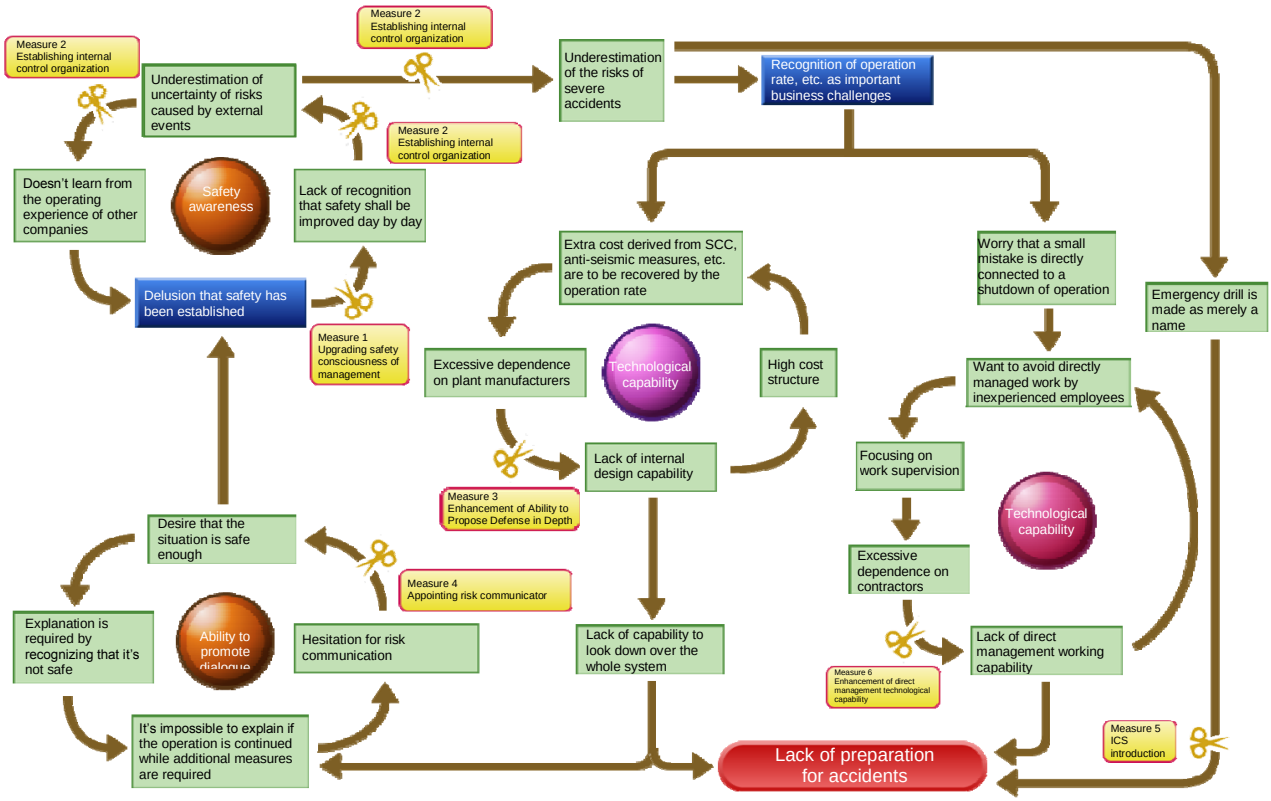
And as an action against the problem cover-up in 2002, the company introduced QMS, and actively worked for the improvement of operation quality through manual preparation and other measures, as well as the security inspection by the Nuclear and Industry Safety Agency. However, the reduction of small nonconformance contributed to the improvement of quality, but just a higher awareness for the quality improvement through the reduction of non-conformance did not establish and maintain the strong safety awareness required for the operator of nuclear power plants (especially deep-level protections) because it handled a special kind of risk called nuclear power.

(4) Structural Problems of the Organization (Negative Chain Reactions)

Not limited to tsunami, to avoid any severe accident caused by various factors in the future, it was necessary to reveal any problems hidden in the organization that lacked the preparation against accidents, and to solve these problems. As a result of the root cause analysis, for the underlying contributors of the accident, there were the problems of the lack of "safety awareness," "technological capability" and "ability to promote dialogue." And there was a structure in the Nuclear Power Division where they believed that "the safety level has already been established and set the operation rate as a critical management agenda item, leading to the lack of preparation against accidents" (See the figure below). We set it as a summary of this accident.

It means that it can be considered that there was a structure of a "negative chain reaction" that promoted the structural problems in the organization that were the lack of "safety awareness," "technological capability" and "ability to promote dialogue" that stayed firmly in the organization.

Cut off "Negative chain" because of the lack of preparation for accidents



(5) The Summary of the Fukushima Nuclear Power Plant Accident

TEPCO summarized the Fukushima nuclear power plant accident as below through the above-mentioned reviews and considerations.

[1] Re-checking of the stance as a nuclear power plant operator

Because any nuclear power generations contain special risks, the operators who are responsible for the operation of these facilities are in a position in which they must have safety awareness that goes far beyond any other ordinary industries, must open their eyes to the operation experiences in the world and the progress of technologies, gain established engineering skills and continue their efforts to reduce any risks day by day.

[2] Summary of that Accident

We must not simply summarize the cause of the accident as a natural disaster for the reason that it was difficult to expect the occurrence of a massive tsunami. We must admit that we could not prevent an accident that must be prevented by the preparation of our sufficient efforts.

And we decided that it is necessary to block the "negative chain reaction" that has promoted the structural problems in the organization so that any severe accident will never happen, and we decided to implement six measures as below.

Measure 1: Reform of Top Management

The management must strongly recognize the special risks in nuclear power, understand that the operators of nuclear power facilities must assume the responsibilities on safety, exercise their leadership to improve the safety awareness of entire organization and also make efforts for human resource development. To satisfy these conditions, management must work for the items below:

- To hold training sessions to improve nuclear safety awareness.
- To implement periodical and objective evaluations on nuclear safety awareness to utilize them for continuous improvement.

To establish a system in which the discussion on safety can be continued across the organization in multi-layered ways, to improve safety awareness as a united organization.

And the nuclear power leaders will not just receive this training, but also act for the following works:

- To improve their own safety awareness by acting in accordance with the safety awareness on nuclear power (embodiment), as a result, to improve the safety awareness in the entire organization (to enact “10 characteristics and 40 behaviors of a healthy nuclear power safety culture”), as well as to periodically check the status of the safety culture for the nuclear power usage of the nuclear leaders and the organization.
- To clarify the items of expectation on the nuclear power leaders and to improve the governance for nuclear safety (to enact “Nuclear Power Division Management Policy”)
- To strengthen the monitoring works, such as the usage of WANO-PO&C, the benchmarks utilized by overseas operators, the setting of key performance indicators (KPI).

Measure 2: Enhancement of Oversight and Support for Management

For the purpose of strengthening the risk management for nuclear safety by the Board of Directors, a Nuclear Safety Oversight Office will be established as an internal regulating organization reporting directly to the Board of Directors. The Nuclear Safety Oversight Office will effectively utilize the professional knowledge of third-parties independent from the executive body, evaluate the operation of the nuclear power business by the executive body and report this to the Board of Directors. The executive body will accept the monitoring and advice on nuclear safety from the Nuclear Safety Oversight Office.

Measure 3: Enhancement of Ability to Propose Defense in Depth

It is necessary to repeat the build-up of the measures to improve safety continuously, to reduce the remaining risks to a level acceptable in the society. To do so, it is necessary to establish a system to train the technology capability to propose the build-up of safety

improvement measures with a high cost-effectiveness level suitable for defense in depth (the safety improvement proposal capability build-up competition).

It is necessary to establish a system to utilize the information on operation experiences, including those in any foreign countries and other industries (the utilization of operation experiences inside and outside of Japan), on the awareness that any accidents or troubles that have occurred elsewhere in the world may occur in our own power plants. And it will also establish the improvement process through hazard analysis, improve the process of periodical safety level evaluation (safety review) and implement other works.

Measure 4: Enhancement of Risk Communication Activities

There was a "brain freezing through false belief" that the local governments and the regulation bodies would demand excessive countermeasures, and further on, it might be inevitable to stop nuclear reactors for a longer period, if we would disclose any new risk. To exit from this brain freezing status from now on, as a unanimous opinion of our company, we adopt the principle of "there is no absolute safety (zero risk) in nuclear power utilization" to disclose the risks actively, to communicate with the local areas of the sites, the society, and the regulating bodies on the measures to reduce any risks and to promote the risk communication to develop trusted relations. To implement this risk communication with certainty, we will assign risk communicators who have a high level of technological knowledge and have received a certain level of training as professionals in the PR section and the local site section in our company to let them work in risk communication activities.

And in the risk communications, it is necessary to check whether the vision and the scale for decisions of the entire company (especially the Nuclear Power Division) are deviating from those in the society or not, and if so, to correct it, not limited to the risk communication related to nuclear safety, so that the organization and individuals will become enlightened through these activities. To do so, we will establish a Social Communication (SC) Office with the participation of external professionals to gather and analyze risk information in a centralized manner to act as a consulting office for the organization as well as to provide necessary directions for actions. In the beginning, this SC Office will facilitate the cooperation and support among staff and among organizations in the Nuclear Power Division so that they will be able to act in accordance with the standards in the society, not limited to the observation of rules and regulations, by utilizing risk communicators.

Any data must be handled correctly to answer the lessons in "The problems in the disclosure of outflow of contaminated water into the port area in the power plant" in July 2013 and "The delay in the disclosure of the analysis result of Strontium 90 and the omission of all beta nucleus analysis result" in February 2014. For data disclosure, we need;

1) to disclose swiftly,
2) to add the meanings and interpretations of data.
3) If it is necessary to spend time to examine the meanings and interpretation of data, it

is necessary to disclose its reason and its expected risk, without spending time unnecessarily.

These basic policies must be understood fully.

Measure 5: Reorganization of Power Station and Head Office Emergency Organizations (“Enhancement of Power Station and Head Office Emergency Response Ability (Organizations)” (from May 1, 2014))

The reasons why there was confusion in the actions on-site during the Fukushima nuclear power plant accident were as below:

- The command system was unclear
- Information sharing was not done smoothly, etc.

We consider that the reason why this happened is that the design of the emergency organizations was not sufficient enough to handle any actual severe accident or the simultaneous disasters of more than one unit. For this reason, we will reorganize them into an emergency action organization equipped with the following characteristics, imitating the ICS (Incident Command System) which has been introduced in firefighting and other organizations in US.

- To limit the number of staff to be managed by one supervisor
- To clarify the command system
- To clarify the role allocations
- Flexible organizational structure which will be able to shrink/expand in accordance with the scale of a disaster
- The preparation and utilization of formats and tools to share information efficiently across organizations.
- Clarification of skill level and requirements and thorough implementation of training

And training will be repeated so that this emergency action organization itself and its safety improvement measures will be utilized effectively in any actual situations.

And as the reorganization of emergency action organizations in power plants and head offices with the introduction of ICS had been completed in FY2013, the problem-finding and improvement through training were continued in FY2014 to strengthen our emergency action capability (organization).

Measure 6: Review of the Power Plant Organizations in Normal Operation and the Strengthening of Direct-Management Skills (“Enhancement of (individual) Emergency Response Abilities and On-Site Capabilities” (from May 1, 2014))

A nuclear power safety center was established to strengthen the bird’s-eye view function related to nuclear power safety in power plants and other works (completed in FY2013). And it is also necessary to increase the number of staff who are capable to operate and install the power supply vehicles, fire trucks and the temporary equipment which are necessary in any

emergency situations. And to act against any situations beyond our expectations, to understand the damage situation of critical facilities related to the stable cooling of nuclear reactors and other factors, and to develop the capability to act swiftly, it is necessary to select the works that are effective for the capacity improvement among the operations that have been implemented entirely by subcontractors in the past, so that the staff in our company themselves will be able to implement the works through their improvement of engineering skills.

And from FY2014, from the reflection on the frequent accidents and troubles in the First Fukushima Plant, “enhancement of on-site capabilities” and “enhancement of engineering skills” were added. This is not limited to “the direct work to strengthen the emergency action capabilities” mentioned above, and the following two actions were added to build up a wide range of engineering skills.

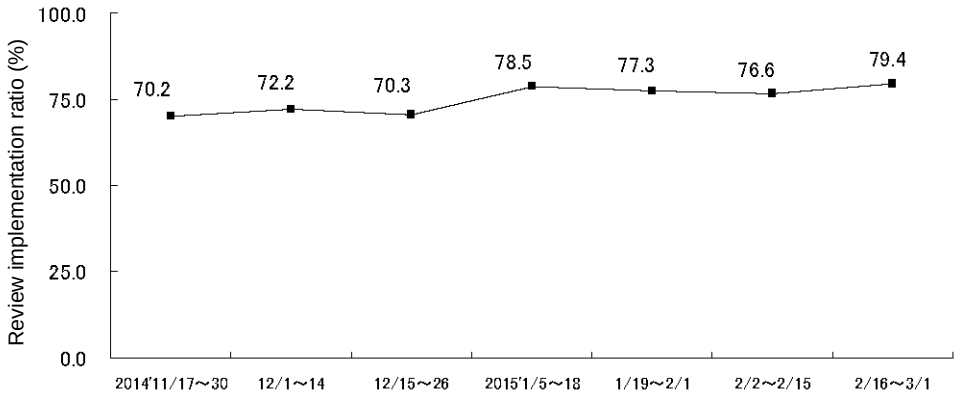
- To improve the skills to understand a facility and staff well, to faithfully examine a site, an actual facility and a reality, to grasp the key points in safety management and to find any items for improvement in a facility and work procedure, in a series of works such as design, construction, operation and maintenance of facilities.
- To build up the management capability as our own skill to carry out our operation precisely while maintaining design capability, analysis and evaluation capability and a constant level of operation quality, without depending excessively on any plant manufacturers, as our own engineering skills, which require comprehensive capability across knowledge, experience, organization and other elements.

Based on the process to establish the nuclear power safety reform plan, the evaluation on the progress situation of each countermeasure in the 4th quarter and in FY2014 is given in the following sections.

2.2 Measure 1: Reform of Top Management

(1) Implemented items in the 4th quarter

- In the Nuclear Power Division, we started a system to compare our own activities with the contents of "the characteristics of individuals, leaders, and organizations which exemplify a healthy nuclear power safety culture[12] (10 characteristics and 40 behaviors in a healthy nuclear power safety culture)" (enacted on November 11, 2014)[13] to try to improve continuously (its operation started on November 17, 2014). The implementation ratio of the reviews was approximately 70% in the 3rd quarter, but it increased to a little less than 80% in the 4th quarter. From now on, it will be necessary to promote the reviews in each organizational unit to work for the understanding and permeation continuously, as well as to work to connect those reviews to improvements by those individuals and organizations that have gained advanced understanding.



Implementation rate of daily reviews

- From August to November in 2014, self-evaluations were made by using PO&C for the administrative staff at the Fukushima Daini and Kashiwazaki Kariwa plants. In the 4th quarter, that result was sorted out, and the work to reflect it into the establishment of the operation plan for FY2015 was done. This was made on the expectation that the operators of nuclear power plants find any items for improvement or any weakness from their own current status against the ideal targets and the standard level shown in the PO&C, so that they would notice any agenda or finding which must be worked on seriously. Based on the result of the self-evaluations, our own operation plan was prepared on the recognition of the difference from the targets or standard levels and on the consideration of the effective measures to approach them. These efforts are considered as a comprehensive representation of the efforts to improve technical

[12] The reference document is "Traits of a Healthy Nuclear Safety Culture (INPO/WANO)" and it is called "Traits."

[13] For example, among those 40 behaviors, a self -estimate must be made in 10 grades for the item in PA.1 "Each person must understand the importance to observe the standard to maintain the nuclear power safety and fulfill his/her own responsibilities to satisfy that standard." These checks must be implemented for all of 40 behaviors to aggregate in each organization to understand its weakness.

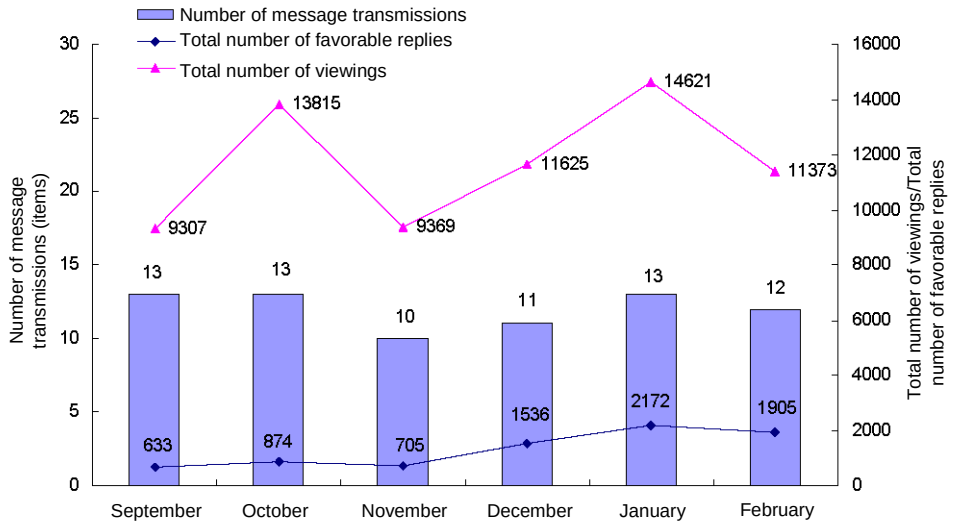
capabilities. And as mentioned in the 3rd quarter report, it will be monitored as a technical capability KPI.

- The briefing sessions of "Management policy for the Nuclear Power Division"[14] (enacted on October 16, 2014) was held for the management in the Nuclear Power Division to implement promotion activities for the expected items for management and the system of management. Currently, an annual review on the expected items in "Management policy for the Nuclear Power Division" has been implemented. And it will be revised in the beginning of FY 2015 with the sorting out of various monitoring indicators and the clarification of the basic policy for the responsibilities and duties that TEPCO has to fulfill for work safety.
- And in the addition to the Nuclear Power Safety Reform Plan, because the daily review activities utilizing "Management policy for the Nuclear Power Division," "Characteristics of individuals, leaders and organizations that exemplify a healthy nuclear power safety culture," the works utilizing overseas benchmarks and other activities have been started, and a leaflet that explains the objectives of these activities and the relation among them was prepared with the title of "To improve nuclear power safety" (February 26) to utilize it in the promotion of the nuclear power safety reform from now on.
- The nuclear power leaders has been sending messages for the realization of expected items and for the embodiment of the nuclear power safety culture, through various means such as video, intranet, mail, meetings[15], morning meetings. Among them, the status of message transmissions by the nuclear power leaders[16] through intranet and their viewing by staff are shown below, showing the tendency of increase for the number of viewings and the evaluation of "It was useful as a reference." However, the ratio of the readers who evaluated it as "It was useful as a reference" is around 15%. So it is necessary to send the messages that are evaluated as "It was useful as a reference."

[14] It is enacted to show the expected items for nuclear power leaders and the correct operation process to realize those expected items more concretely.

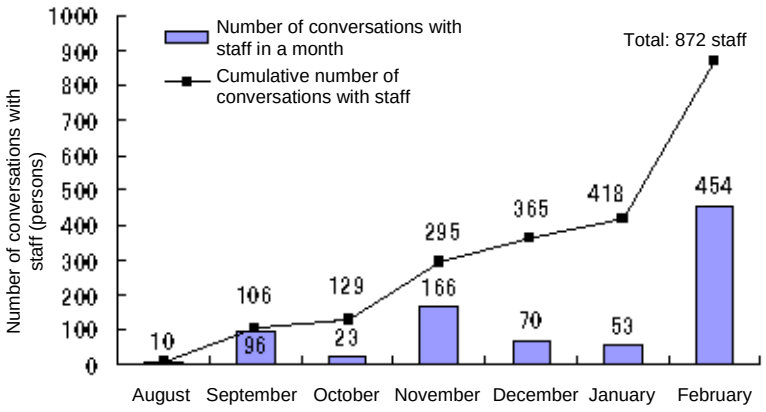
[15] We started the activity called "Safety Minutes" where 2 or 3 minutes at the beginning of a meeting is spent to talk about the nuclear power safety culture or other themes. The nuclear power leaders do not only talk, but they also facilitate opinion statements from participants.

[16] Because the messages from the President contain various contents, and their viewers include those who are outside of the Nuclear Power Division, they are excluded from the aggregation.



The number of message transmissions from the nuclear power leaders through intranet and the total number of viewings/total number of useful viewings (aggregated on March 4, 2015)

- Among nuclear power leaders, the General Manager of Nuclear and Plant Siting Division, the President for the Fukushima Daiichi Plant Decommission and Decontamination Engineering Company and the Chief of each power plant held short briefings every morning to share the work achievement of the previous days and the scheduled work for each day, as well as to check the action against any risks in each power plant.
- For the power plant management and observation by the management, we decided to implement the works focused on the prevention of fatal accidents in the beginning. And we conducted the safety work management (TWI) training for the group managers in power plants in FY2014 (At the end of February, 141 managers among about 250 managers. It will be completed in this fiscal year).
- The General Manager of Nuclear and Plant Siting Division carried out direct conversations with middle-management staff in each power plant (about 250 officers) from February to June 2014. And he also expanded the scope of these direct conversations to site operators (approximately 350 staff) from June 2014, and to the concerned staff in the head office and the power plants (approximately 70 staff) from January 2015 so that they would be able to understand the thoughts and intentions of the management.
- The secretariat of Nuclear Reform Special Taskforce (“TF Secretariat”) will continue its activities for direct conversations with the site staff working on the front line, and repeat the explanation of the targets of the Nuclear Power Safety Reform Plan and its relation with the day-to-day operations, as well as problem-checking and the extension of the support to solve them.



The number of site staff on the front line with whom the TF secretariat talked directly

- For the eligible staff in the Fukushima Daiichi Plant Decommission and Decontamination Engineering Company, training sessions were held to provide the knowledge on safety matters necessary for nuclear power leaders (about rules and regulations, report items required in the implementation plan, the understanding on reported incidents, and emergency actions during accident occurrence, etc.) (January 1, January 16, February 6, and February 9).


Trainings on the report items, reported incidents and emergency actions during the accident occurrence (the nuclear power leader training in the First Fukushima Daiichi Plant)

- The training for the eligible staff at the Fukushima Daini Plant to enhance the knowledge on safety necessary for nuclear power leaders (risk communication) (February 27)

The training on risk communication (the nuclear leader training at the Fukushima Daini Plant)

- The training session was held for the purpose of improving the ability to promote dialogue of nuclear power leaders on nuclear power risks. The lecture was held by inviting an external lecturer, a researcher on sensitivity communications. Active exchange of opinion occurred between the lecturer and the participants on the background of the social acceptance of nuclear power risks and the importance of the "sympathy" in the beginning of conversation. (February 20)


The training on risk communication (the nuclear leader training at the head office)

(2) Self-evaluation in FY2014

In FY2014, we have added various activities such as the daily review activities utilizing "Management policy for the Nuclear Power Division" and "Characteristics of individuals, leaders and organizations that embody a healthy nuclear power safety culture," overseas benchmarks, in addition to the previous Nuclear Power Safety Reform Plan, to strengthen the initiatives and leadership by the management.

Also, the key performance indicators (KPI) were set to measure the level of realization of the nuclear power safety reform. With this setup, it becomes possible to measure the results of various activities quantitatively and employ a PDCA cycle precisely from now on.

However, the problems related to the non-disclosure of information on a critical disaster occurrence and on a drainage route occurred. It is a problem for the management to precisely realize the awareness, plan and intention of management and nuclear power leaders at sites.

2.3 Measure 2: Enhancement of Oversight and Support for Management

(1) Implemented items in the 4th quarter

➢ Activities of Nuclear Safety Oversight Office

Opinions based on the monitoring activities of the Nuclear Safety Oversight Office for the last several months, mainly of the 4th quarter, are as described below and those were reported to the Board of Directors on March 6.

1. Recent work status

In January, serious personnel accidents happened at all the nuclear power stations of TEPCO. The Nuclear Safety Oversight Office visited each accident site to conduct dialogues with related people and monitor activities for the prevention of recurrence. Top management of TEPCO takes the series of accidents seriously and makes suitable efforts to determine the causes, learn the lessons and prevent recurrence. Also the Nuclear Safety Oversight Office is continuing monitoring in future.

However, the Nuclear Safety Oversight Office worries that a mindset which defines human errors as the cause of the accidents is prominent. Even an excellent worker can make a mistake and TEPCO's responsibility is to provide a safe working environment where a human error is not connected to a serious result. To achieve that, the Nuclear Safety Oversight Office proposed as follows at a disaster review.

○ A philosophy of defense in depth shall also be applied to working safety.
  - Defense at the 1st layer: It is necessary to design equipment to eliminate hazards as much as possible.
  - Defense at the 2nd layer: There might be some cases where the safety can't perfectly be secured. For those cases, a risk assessment shall be executed to install protection devices, defense devices, warning signs, etc.
  - Defense at the 3rd layer: Risk management. Procedures shall be defined and processes shall be arranged to secure a situation where only trained workers are involved in the work.
  - Defense at the 4th layer: Personal safety gear: It is necessary that the personal safety gear is specified as required and always worn.
  - Fundamental defense: Safety culture and risk awareness.

○ The Nuclear Safety Oversight Office has a concern about the long-term sustainability of the improvement effect. Even before the series of accidents, serious accidents have happened. TEPCO has not been able to learn lessons from past accidents quickly and efficiently. The Nuclear Safety Oversight Office has recommended the following content by now.
  - Top management revisits the learning process to secure sufficient effectiveness. This learning can be a foundation for excellent safety.

- Line management shall build and reinforce a mechanism which enables self-monitoring and self-confirmation of the learning of lessons. Though the managers should provide instructions to subordinates with a certain trust, more than that, it is necessary to confirm that the instructions are executed. Confirmation of execution status made by TEPCO and contractors is also included here.

○ Many factors connected to the accidents this time have been objects pointed to or related to recommendations by the Nuclear Safety Oversight Office. (Ex: Pressure for the process, work management, risk assessment and failure of learning) Thus, the Nuclear Safety Oversight Office itself has analyzed why the series of the accidents were not prevented, then reached a conclusion that the strength and clarity of setting and following-up the countermeasures were insufficient.

2. External evaluation of the Nuclear Safety Oversight Office

The Nuclear Safety Oversight Office always requests advice from external world- class experts to benchmark its own work level and to supplement resources.

2.1 The Nuclear Safety Taskforce[17] (NSTF) reviewed the booklet "To upgrade Nuclear Safety" issued by TEPCO recently and provided advice.

The NSTF evaluated that the booklet was well made as a strategic booklet and the contents were connected to safety upgrades if implemented. The NSTF also evaluated that the introduction of CFAM (The Corporate Functional Area Manager), utilization of KPI (Key Performance Indicator), as well as utilization of "Performance Objectives and Criteria" and (Traits of a Healthy Nuclear Safety Culture) by WANO (World Association of Nuclear Operators) were excellent activities. In addition to those, it is advised that it is necessary to carry out the plan steadily under a strong leadership and project management rules.

2.2 NSTF advised about activities and recent self-evaluations from the Nuclear Safety Oversight Office.

Activities of the Nuclear Safety Oversight Office entered into the 2nd year and it is considered to upgrade the level of work. Therefore, the NSTF was invited and requested to provide advice about improvement. The NSTF highly evaluated that the Nuclear Safety Oversight Office arranged the organization in such a short period and that this was accepted within the company. Key advice is as follows.

1. It is necessary to continue training for members and expand the range of skills of the team as a whole.
2. The scope of activities expanded too much and it is necessary to reconfirm priority

[17] The NSTF is organized with 6 domestic and overseas experts on nuclear safety and Lady Barbara Judge CBE works as chairman other than those. It provides advice related to nuclear safety to TEPCO via the Nuclear Safety Oversight Office. It had a 2-day meeting on February 7 and 8.

items.

3. Recommended items shall be more concrete. Also, an escalation system shall be confirmed to let indicated matters be effective quickly.

2.3 The Nuclear Safety Oversight Office arranged an invitation of nuclear security experts from IAEA to have a review about material (nuclear material) protection at TEPCO.

As a total evaluation, it is "TEPCO basically satisfies No. 13 of the IAEA Nuclear Security Series (Material protection of nuclear material and nuclear facility)." However, several threats were commented on and advice on reinforcement was provided.

2.4 External mentor of the Nuclear Safety Oversight Office

The Nuclear Safety Oversight Office continues to utilize external mentors. Mentors from the U.K. have a lot of knowledge and experience regarding the regulation of nuclear facilities such as Sellafield and Aldermaston and provided precious insight about working safety and radiation protection at Fukushima Daiichi on the latest visit. Also, an American mentor was newly added recently who has a lot of experience with the monitoring of nuclear reactors in operation.

Inspection accompanied by U.K. mentors

Inspection accompanied by U.S. mentors

2.5 Benchmark of Nuclear Safety Oversight Office

The Nuclear Safety Oversight Office has participated in European and American workshops related to Nuclear Safety Oversight and obtained useful knowledge and training through recent meetings. It is planned to visit INPO (The Institute of Nuclear Power Operations, USA) and the Hatch nuclear power station to benchmark the Nuclear Safety Oversight Office itself in April.

3 Performance of the Nuclear Safety Oversight Office

3.1 KPI (Key Performance Indicator) of the Nuclear Safety Oversight Office

The most important KPI of the Nuclear Safety Oversight Office is the execution status of recommended items. At the time this report was generated, the latest evaluation results were

not summarized and the total number of the recommended items was 77, not changed from that of the last time. Current response status to the 77 recommended items is shown in the table below.

Execution status of recommended items by the Nuclear Safety Oversight Office

	Status up to the 3rd quarter		Status in the 4th quarter		
	Up to the 2nd quarter	New items in the 3rd quarter	Up to the 2nd quarter	3rd quarter	Total
The recommended items were accepted and actions were completed.	14	-	16	7	23
The recommended items were accepted and actions are ongoing.	22	37	22	26	48
Actions are not processed.	4		2	4	6
Total number	77		40	37	77

In addition, the Nuclear Safety Oversight office is also monitoring the progress of actions for 10 safety items presented by the board of directors in April 2014. As far as the introduction of KPI and benchmarking are concerned, there is an outstanding improvement. However, in several areas such as organization change management, safety assurance, evaluation of long-term safety risk related to decommissioning roadmap, etc., progress is not sufficient yet.

The Nuclear Safety Oversight Office is processing reviews of all past recommended items and their action status. It is for concentration on the highest priority items and clarification of expected items. Among important items that are to be followed-up on in the future, the following are included: critical control at Fukushima Daiichi, learning including monitoring or confirmation by line, work management, contractor management, organization change management, capability management of personnel transferred or appointed to positions related to safety.

3.2 Future activity plan of the Nuclear Safety Oversight Office

The Nuclear Safety Oversight Office summarized its activity plan for the coming year. Major objects of evaluation are as follows.

Fukushima Daiichi: Safety culture, work management, countermeasures against hazards (response to new regulations, response to emergencies), safety management of projects including spent fuel removal from Unit 3, construction of the frozen wall and improvement of core cooling.

Kashiwazaki Kariwa: Safety reinforcement measures (Unit 6 and 7, then 1 and 5),

training of workers related to maintenance and safety, response to emergency, safety culture and the execution of the Nuclear Safety Reform Plan.

Fukushima Daini: Work management, response to emergency and safety during cold shutdown.

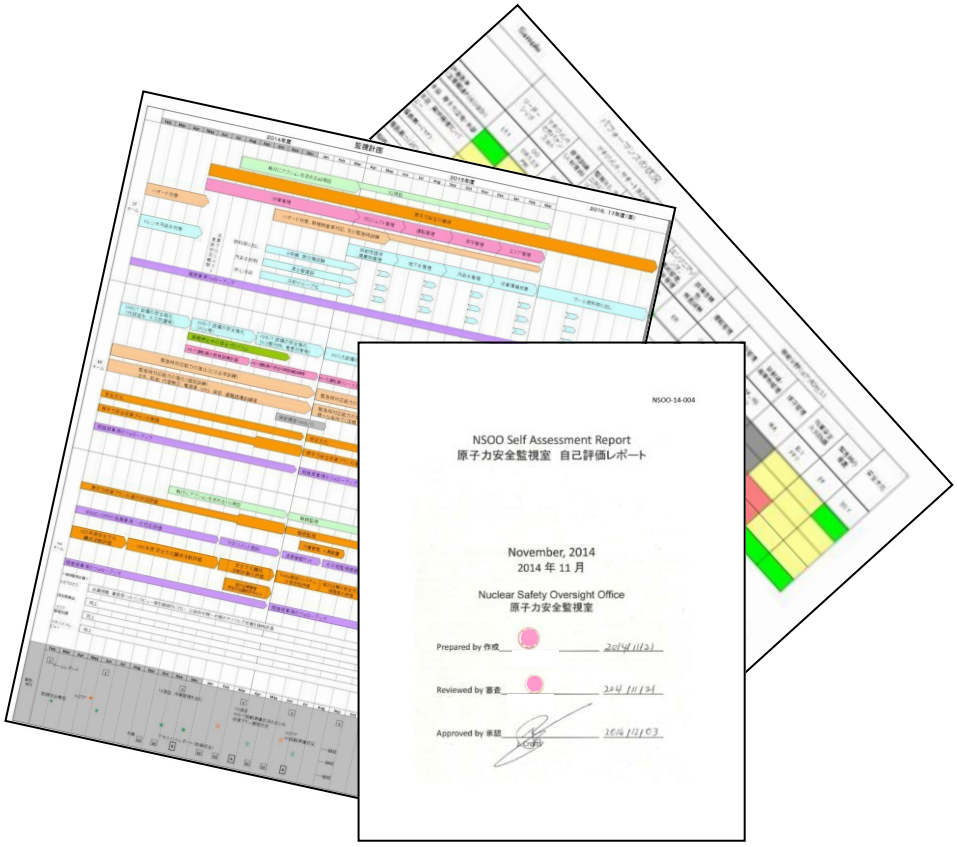
Headquarters: Execution of Nuclear Safety Reform Plan, safety culture, WANO - Corporate Peer Review, contractor management and governance.

3.3 Self-evaluation of the Nuclear Safety Oversight Office

The Nuclear Safety Oversight Office has executed a self-evaluation based on WANO PO&C and also received an external evaluation by the Nuclear Safety Taskforce. Though it is natural for a department with a short history since its establishment, there's a gap between its current performance and that of a world top- level oversight function shown in PO&C (training, quality assurance, role of chief engineer of reactors, escalation process, etc.). Action plans are to be generated and efforts for improvement are to be made.

3.4 List of monitoring results related to safety

The Nuclear Safety Oversight Office presents color coded monitoring results for plants, processes, culture governance, etc. (Blue = world top class, Green = Good, Yellow = improvement required, Red = problems are there.) The list is updated every quarter and evaluated by each division of headquarters (Nuclear Power & Plant Siting Division, Decommissioning & Decontamination Engineering Company) and by site, referring to standards such as safety processes and PO&C, etc. The list enables visual understanding of performance related to safety and it helps managers confirm the areas requiring action and also the Nuclear Safety Oversight Office's confirmation of the areas requiring evaluation, respectively. The color-coding is subjectively made and its reliability is getting upgraded by the accumulation of the database concerning evaluation results. The Nuclear Safety Oversight Office has collected data for the last year and the list is getting to be useful information.



- Improvement status on the administration side versus the monitoring results of the Nuclear Safety Oversight Office
  - "Appointment of fire protection supervisor" and "Enactment of fire protection policy and governance based on that" were proposed by the Nuclear Safety Oversight Office in the 3rd quarter. The administration side also regarded those as important issues and generating a "Fire protection plan" was started first and it is to be completed in March. This fire protection plan is generated referring to new regulations, overseas benchmarking results, PO&C, etc. and defined as an ideal state. In parallel with that, areas where TEPCO is not good enough versus the ideal state are picked up and those are incorporated into an improvement plan (fire protection action program), and execution of that started from FY2015.
  - Other than the above, the list of monitoring results has been shared with the administration side and a quick improvement is to be pursued. Sufficient communication is to be made with mutual discussion with the Nuclear Safety Oversight Office, particularly for aims and intentions of indicated matters and intentions, and by the administration side, particularly for improvement plans and their progress status.

➢ Activity status of the Safety Steering Committee Meeting[18]

- The "Safety Steering Committee Meeting" in the 4th quarter is scheduled for March 27 and it is planned to discuss change management according to the establishment of the Fukushima Daiichi Decommissioning & Decontamination Engineering Company. As for the results of the discussion, it is to be described in the progress report of the 1st quarter, FY2015.
- At Fukushima Daiichi, risk assessment is executed at each step of the works based on the discussion at the Safety Steering Committee Meeting. Also an exposure reduction process is independently investigated, for example, improvement, such as having an ALARA[19] meeting where an optimization of a technological exposure reduction measure is investigated in an initial phase by cooperation between the construction division and the radiation management division.

➢ Upgrading the role of middle management

○ Group manager (Manager) class

For the middle management of the group manager (Manager) class, capability reinforcement from two aspects as shown below was started in December of last year. (The training for the targeted people is planned to be completed by April of this year.) The actual status as of the end of February is as follows.

- Upgrading management capability toward the realization of reform. (180 completed out of about 370 objects).
- Upgrading capability of developing human resources that can accomplish the work safely. (TWI training[20]) (141 completed out of about 250 objects.)

Other than the above training, middle management is dealing with daily review activity utilizing "Traits of each individual, leader and organization to embody a healthy nuclear safety culture," power station management observation, confirmation of daily OE information, etc.

➢ Review of positioning the role of the chief engineer of reactors

○ Outline of the measures

In the Nuclear Safety Reform Plan, the chief engineer of reactors is defined as "The chief engineer of reactors shall work in cooperation with resident members of the Nuclear Safety Oversight Office that are subsequently appointed at a power station based on the aspects to

[18] The members of the Safety Steering Committee total five as President (Chairman of the committee), General Manager of Nuclear Power and Plant Siting Division, President and CEO of Fukushima Daiichi Decontamination and Decommissioning Engineering Company, Safety and Quality Officer (Corporate officer) and the Head of the Nuclear Safety Oversight Office (Observer).

[19] As Low As Reasonably Achievable

[20] Training Within Industry (A practical training mainly for shop floor supervisors. Methods for teaching works, handling people, executing improvement, executing safe works, etc. are to be learned.)

support top management and enhance staying power, and it is clearly defined that they shall be selected from the executive class of human resources. (Basically those experienced as general managers or deputy general managers of a unit, or candidates for those (general manager class).) The status is to be evaluated at the end of the FY.

○ Evaluation results

After generating the Nuclear Safety Reform Plan, by the enactment of the new regulating standard, the appointment of a chief engineer of reactors by each plant was defined as a legal requirement (Previously, a person was allowed to cover multiple plants of an identical type); thus, 3 chief engineers of reactors at Fukushima Daiichi (Unit No. 1 – 4 can be covered by one person), 4 at Fukushima Daini and 7 at Kashiwazaki Kariwa were appointed. To enhance independence of those chief engineers of reactors from the power station organization, they were assigned to the Nuclear Safety Oversight Office.

Because of the responses to the new regulating standard (appointment by each plant) and the proposal of the Nuclear Safety Reform Plan (selection from executive human resources with saying power), the organization involving the chief engineers of reactors is evaluated as enhanced more than ever before. However, the issues to be solved as shown below were extracted and those shall be improved and their function shall be enhanced.

- At Fukushima Daiichi, Units No. 1 – 4, which have a lot of technological difficulties and a high work volume are taken care of by one chief engineer of reactors, thus the workload is increasing. The number of chief engineers of reactors at Fukushima Daiichi shall be increased to eliminate such a situation and also to execute a finer supervision of security.
- To select and appoint the chief engineers of reactors from those having saying power (executive class human resources) and capability (such as great experience at power stations), and then use them flexibly after this, more candidates are required. To achieve that, qualified people for the chief engineer of reactors shall systematically be increased through recommendation of obtaining certificates as well as extension of employment, and the like.
- Besides, since it is evaluated that there are issues to be solved in the performance evaluation method for the chief engineers of reactors (selection of evaluators, etc.) as well as capability management and training of the chief engineer of reactors (further enrichment of knowledge, etc.), those shall be improved appropriately.

(2) Self-evaluation of FY2014

The Nuclear Safety Oversight Office continuously executes monitoring, indications and proposals about important activities related to Nuclear Safety and provides positive changes over TEPCO's nuclear safety improvement. Also, the Nuclear Safety Oversight Office executed a self-evaluation of its own activity status in the 2nd quarter, then received a verification of that at a committee comprised of overseas experts on nuclear safety in the 4th quarter. As mentioned in 3.3 Self-evaluation of the Nuclear Safety Oversight Office, the result showed a gap from the world's top level; thus, an action plan shall be generated to improve after this.

The Board of Directors indicates necessary responses to the Nuclear Safety Oversight Office and the administration side based on the monitoring activities as well as indications/proposals and also receives reports about action status from the administration side. In this manner, the Board of Directors, Nuclear Safety Oversight Office and the administration side fulfill the responsibility for upgrading nuclear safety in a unified fashion.

However, since the execution of concrete measures on the administration side corresponding to indication/proposal, etc. of the Nuclear Safety Oversight Office was slow, it is necessary to increase the speed of improvement. Particularly, nuclear leaders shall thoroughly keep an attitude to ask about the actual status on-site to accelerate reforms of consciousness and behavior of middle management, and also the middle management shall improve themselves to realize the reform of consciousness and behavior through multiple means, such as various trainings as well as management observation, etc.

2.4 Measure 3: Enhancement of Ability to Propose Defense in Depth

(1) Implemented items in the 4th quarter

- Competition to Enhance Capability to Propose Safety Improvement
  - Out of excellent proposals (11 items) in FY 2013, the last remaining excellent item had been completed in the 4th quarter, then all proposals were materialized. Also, out of excellent proposals (30 items) at the 1st competition of FY 2014, four excellent items have been materialized in the 4th quarter. (Cumulatively, seven items as of the end of February 2015)
  - As for the performance indicator of the Competition to Enhance Capability to Propose Safety Improvement (Number of proposals × average rated score × execution ratio of the excellent proposals within half a year), the actual score in FY2013 was 122 points[21], and 320 points[22] at the first competition in FY2014 against 1,000 as target (as of the end of February). The purpose of the indicators related to this activity is to evaluate if there are many high quality proposals for safety improvement and if those are materialized quickly. Based on the analysis so far, improvement of "Quickness (execution ratio of the excellent proposals within half a year)" is considered as important.

    (Competition in FY2013)

    - As a reinforcement measure of information and communication tools for logistics support sites, etc. at a nuclear disaster, emergency disaster vehicles combined with an on-vehicle station for satellite communication were deployed. With this arrangement, information communication was made possible even when office buildings and/or information communication infrastructure at logistics support sites were damaged. (Fukushima Daiichi, Fukushima Daini, Kashiwazaki Kariwa)

Deployment of emergency disaster vehicles aimed at the reinforcement of information tools for logistics support sites at a nuclear disaster

(1st competition in FY2014)

- Engine cutters were prepared as cutting tools in cases where large steel debris is left from floating items by tsunami or entering into a seawater heat exchanger

[21] Temporarily calculated evaluation score applying the method this time compared with activities before the PI were set.
[22] Number of proposals × average score was 1,374 and 7 out of 30 excellent items were executed as of the end of February. Thus, the target is expected to be achieved if 15 more items are materialized within this month.

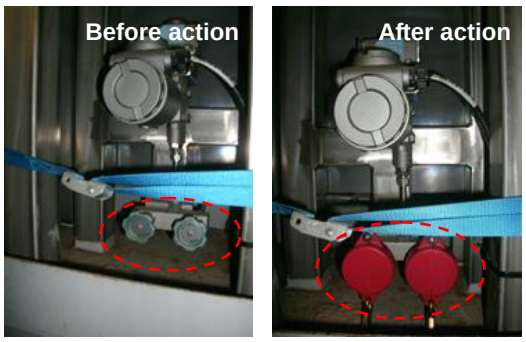
building is impossible. (Fukushima Daini)

- Jigs to connect existing water supply lines and fire hoses were prepared to upgrade reliability of the water supply from a fresh water reservoir as a source of water injection to nuclear reactors, etc. (Kashiwazaki Kariwa)
- Dust respirators and helmets were prepared in the new office building for human protection. (Fukushima Daiichi)
- Covers were attached over the operating portion of valves for instruments to avoid inadvertent operations. (Fukushima Daiichi)

Engine cutter preparation to cut large debris
(Fukushima Daini)

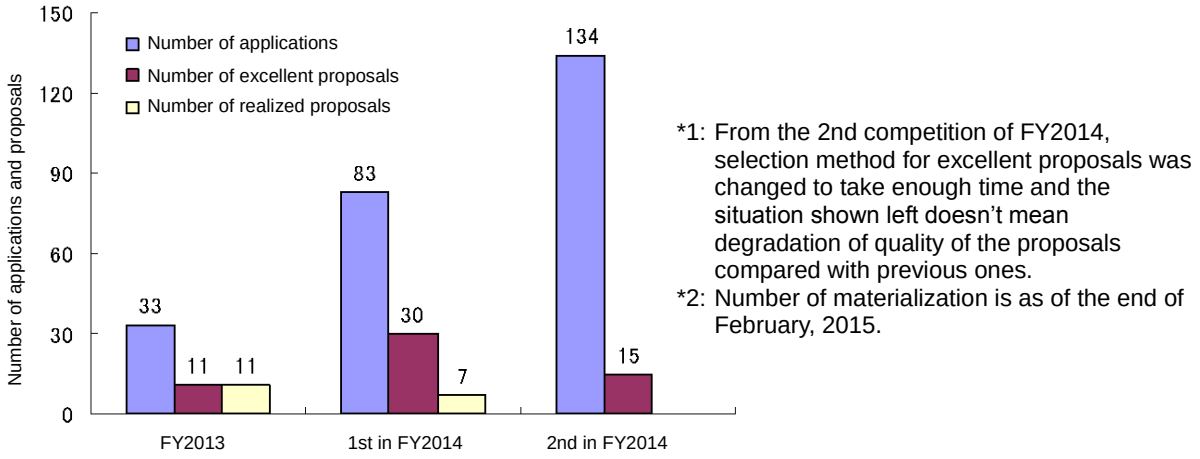
Fire hose to supply water to nuclear reactors
(Kashiwazaki Kariwa)

Helmet and dust respirator preparation in new office building
(Fukushima Daiichi)



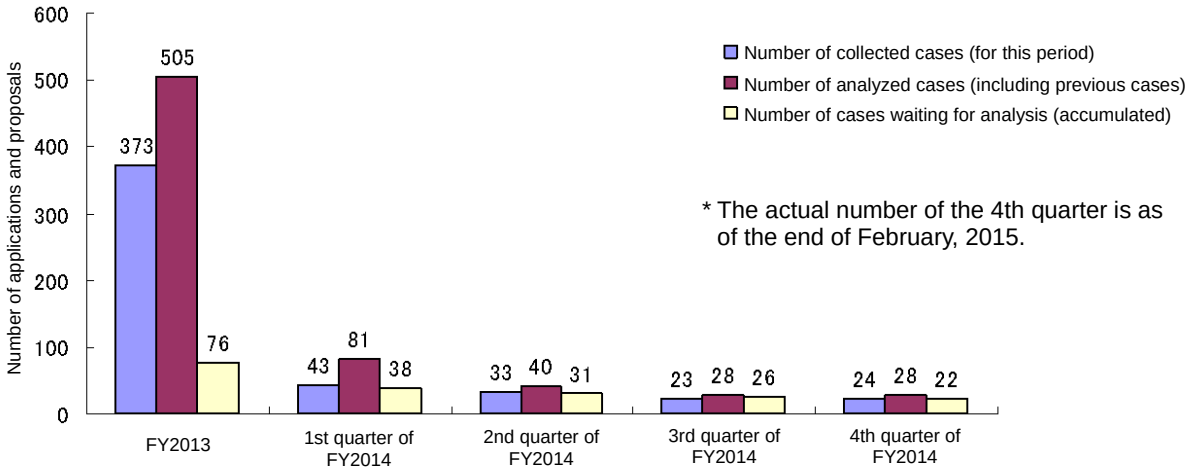
Attaching valve covers for instrument to avoid wrong operations
(Fukushima Daiichi)

○ At the 2nd competition of FY2014, 15 excellent proposals were selected out of a total of 134 applications.



Numbers of application, excellent proposals and materialized proposals at the Competition to Enhance Capability to Propose Safety Improvement

- Utilization of domestic and overseas OE (Operating Experience) information
  - In the 4th quarter of FY2014 (Up to the end of February), 24 cases of new OE information were collected and 28 cases of analysis including OE information collected in the past have been completed. Three cases of the OE information were judged as requiring evaluation of influence. By the way, 10 cases (cumulative) of the OE information out of those judged as requiring evaluation of influence have not been completed; processing those shall be accelerated.
  - The analysis of the OE information including accumulated ones from the past is being processed in the 4th quarter and the number of those waiting for the analysis is smoothly decreasing.

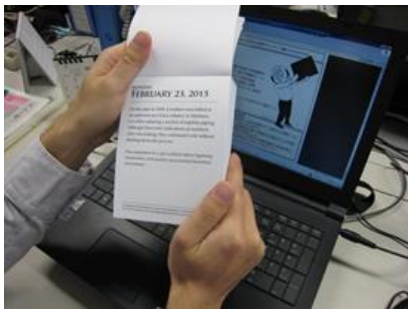


Collection/analysis status of OE information

  - In the beginning of this FY, the viewing rate of newly arrived OE information was several %, though it has improved to 38% as of the end of February as a result of improvement measures such as access easiness, refining titles, creating information summary pages, etc. (20% as this FY target was achieved)

- To prevent facility accident troubles and personnel accidents, an activity of sharing information of risks and measures included in works extracted by utilization of various information sources (nonconformance information, JIT information, etc.) including OE information at daily regular meetings was started. By incorporating mechanisms of daily utilization of OE information as work, the attitude to learn from others and improve one's own works is expected to be established. Also, as a tool of this activity, an OE daily pad calendar[23] created by INPO is used and efforts are to be made to develop similar tools.

Announcement and sharing of OE information at a meeting
(Kashiwazaki Kariwa)



Utilization of INPO OE daily pad calendar
(Headquarters)

- When benchmarking was executed at Palo Verde nuclear power station in the U.S., it was observed that a booklet titled "Standards and Expectations" was issued and it is carried by all staffs of the plant; also, the content of the booklet was referred to for confirmation any time something happened. The situation was as if "safety" was always on hand and TEPCO is following this manner by creating a similar booklet at Fukushima Daiichi and Kashiwazaki Kariwa to further utilize OE information.

➢ Hazard analysis
- At Kashiwazaki Kariwa, about 30 events were extracted as objects of analysis, and those were analyzed sequentially for influence and the like over nuclear power generation facilities at an occurrence of hazard exceeding design standards. In the 4th quarter, 12 cases were newly analyzed, then the analysis of all events were completed. (Target of this FY was achieved.)
- In addition, measures were sorted including those that completed the analysis this time, and now action-taking policy is being discussed by a team of experts placed under the "Nuclear Power Risk Management Committee." In the 4th quarter (as of the end of February), the team held 2 meetings and decided action-taking policies for

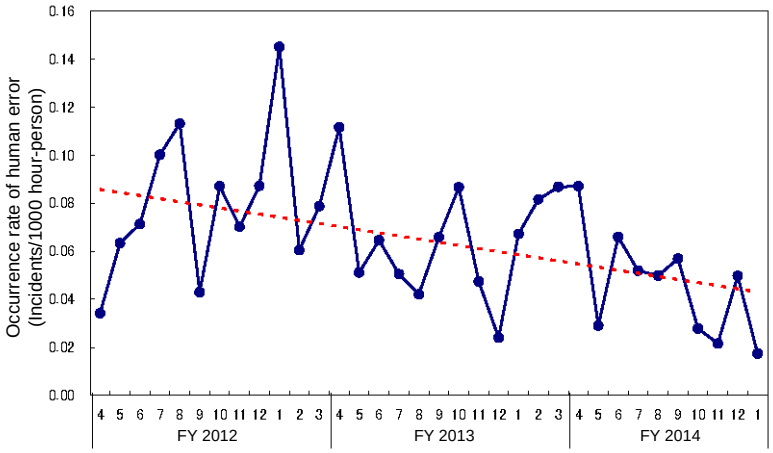
[23] It is a daily pad calendar for 365 days with a case including useful lesson every day selected from world wide OE information by INPO (US Institute of Nuclear Power Operations).

20 cases (cumulatively 30 cases) such as forest fire, tsunami, etc. Major examples of analysis and measures are as follows.

- ○ As for forest fire, it is estimated that it is less likely to be a cliff edge, even a spread of fire in the forest within the power station site because of the new construction of a fire belt, and also that it is distant from the reactor building to the neighboring forest edges. On the other hand, investigation of fire extinguishing methods was arranged to be executed in case of the occurrence of a forest fire.
- ○ As for tsunami, it is estimated that it can be a cliff edge when the tsunami spills over a flooding embankment and, in addition to that, exceeds designed waterproofing measures of reactor buildings, etc., to make a function loss of permanent water injection equipment within the building. Investigation about reinforcement of drainage measures from the site and buildings within the flooding embankment and utilization of portable equipment was arranged to be executed.
- ○ Activity policies of hazard analysis at Fukushima Daiichi and Daini were decided. As for Fukushima Daini, screening of hazards as objects of the analysis was completed.

➢ Safety review

At Fukushima Daiichi, with a purpose of improving nuclear safety consciousness, which was an important point at the power station, a review of occurrence status for human errors by organization was executed. Based on the result, a campaign to eliminate human errors was deployed and a proposal was made to improve safety consciousness. The occurrence rate of the human error has gradually been decreasing, although it is necessary to make further efforts relentlessly because a serious personnel accident occurred in January.



Transition of occurrence rate of human errors (High grade)

At Fukushima Daini in FY2014, safety reviews were executed by selecting emergency drills as objects, then issues to be solved were extracted through hearings, etc. with each group of emergency response organization and the reviews were made about actual response status at actual drills.

At Kashiwazaki Kariwa, investigation of securing further methods of cooling for a spent fuel pool was executed and a concrete measure was proposed. Also, making utilization of risk information within the power station a goal, training curriculum were defined for organizations to utilize PRA results in future. At Kashiwazaki Kariwa where the review had been started from last FY, reviewers are investigating the extraction of issues to be solved and improvement measures from a nuclear safety improvement viewpoint to make the review more effective then the value of the activity is being upgraded.

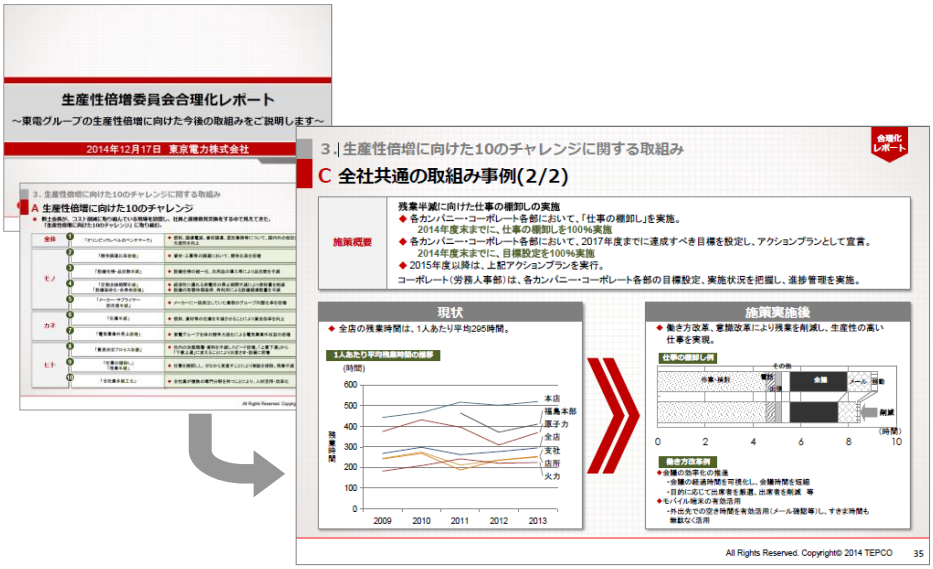
Besides, though the selection of theme for the review has not been systematic up to now, the theme for the FY2015 review shall be selected based on weakness analysis from actual implementation of a defined work plan in addition to the result of the review in this FY.

- Review of the role of manuals for Headquarters and power stations

To make a distinction between the requirements to be complied with (Headquarters) and the know-how/procedures (power stations) and make the reflection of know-how and change of procedure in the manuals easier at power stations where the work is actually carried out, improvement of the manuals for five major business areas[24] were started and are expected to be completed by the end of this year as planned.

Up to now, starting from "Improvement from overemphasis of work evidence," the improvement had been focused around manuals defining execution methods of work. However, from the viewpoint of resource creation as the major purpose of this theme, a more challenging improvement was required against continuously increasing works. In the midst of investigation of the measures to take care of the above situations for creating resources from wider areas not only limited to manuals but also of the whole works, a "Productivity Doubling Committee" formulated a rationalization report (announced on December 17, 2014). Within the report, activities related to whole inspection of costs and 10 challenges toward productivity doubling were presented. Particularly "Inventory check of works" and "Making overtime work half" as the ninth challenge was just directly connected to resource creation, thus those were to be aggressively promoted. In the 4th quarter, an inventory check of works was executed at each organization and action plans and numerical target values of FY2015 were set.

[24] Five areas as operation management, radiation management, radioactive waste management, fuel management and disaster prevention (Emergency response).



Rationalization report of Productivity Doubling Committee (Announced on December 17, 2014)

Out of activities related to 10 challenges toward productivity doubling, the 9th challenge as "By checking work inventory and reviewing those from zero, waste shall be eliminated. Overtime shall be made half."

➢ Introduction of IT to maintenance work process

To realize the introduction of MAXIMO[25] (Phase 2), a system for rationalization of the entire maintenance process (IT introduction to a series of works, such as development of a checking plan, procurement, inspection, acceptance and the like) by the end of the 1st half of FY2016, a detailed investigation of each process is being processed.

A new process based on U.S. standard work process was investigated by the investigation project. In the 4th quarter, a scenario simulating actual works was prepared for a newly generated work flow of the process and, at the same time, the validity of the work flow was verified by using an IT system (MAXIMO) which was investigated for introduction.

In addition to the activities as described above, a further investigation was executed to judge if a maintenance reform plan was achieving its original purpose compared with the reform target[26]; also, future actions were investigated by clarifying challenging issues with obstacles if there are any. As a result, the feature that shall be materialized by the end of the 1st half of FY2016 while looking ahead to a future ideal form was made concrete, and then execution attempts were arranged starting from the area of processes where applicable at any time.

Besides, since the operation of this system shall be started from the 2nd half of FY2016, the following results are expected to be achieved by the modification of work processes, introduction of the IT system and establishment of the organization; thus, the results shall be verified after starting the operation.

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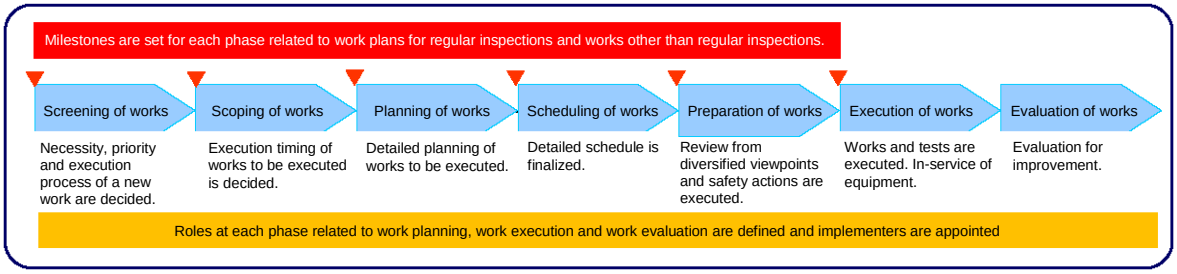
[25] IT solution for achieving a strategic asset management

[26] Reform targets were set with three subjects as [1] Optimization of maintenance criteria, [2] Execution of PDCA based on the maintenance criteria and [3] Possession and enhancement of improvement capability on-site and engineering capability for direct management within one's own company.

- ✓ Upgrading maintenance work quality and making the work efficient at the planning phase.
- ✓ Preparation and management of the works, visualization of progress and status of the works and improvement of site management by introducing a work management process.
- ✓ Process accuracy improvement by early investigation of design and construction processes.
- ✓ Making procurement work efficient by multiple-year contracts.
- ✓ Certain management of planning and execution of works under project organizations comprised of TEPCO and contractors.

By the way, the work management process that is introduced as a new work process is aiming for safe and efficient execution of the works at power generation plants. It has expanded to seven phases as shown in the diagram below and it is a process to surely execute work planning, work execution and work evaluation as well as improvement by setting milestones and roles for each phase.



7 phases at the work management process

This activity was picked up as an actual example of revisiting project organization pursuing a cross organizational upgrade of issue solving capability, and dedicated project leaders were appointed and a project organization including both headquarters and power stations was constructed for joint issue solving. It can be evaluated that there's a certain extent of achievement because a feature that shall be materialized by the end of the 1st half of FY2016 was concretely defined. On the other hand, points required to promote further progress of the activity were clarified, such as more clarification for definitions of decision making processes, meetings and projects. Investigation of system development and starting data arrangement from April 2015 is to be processed as scheduled while necessary improvements are continuously executed.

(2) Self evaluation of FY2014

As for the reinforcement for defense in-depth proposal capability, it has been evaluated that each measure made basically a smooth progress and achievement was being made. Also, for issues to be solved that were clarified or generated corresponding to the progress of the measures, actions for improvement were arranged for each.

Steady activities shall be made continuously accompanied with the improvement of each measure itself. Besides, by not descending into self-satisfaction, benchmarking of domestic and overseas nuclear operators and other industries are to be aggressively executed to absorb the best practices.

2.5 Measure 4: Enrichment of Risk Communication Activities

(1) Implemented items in the 4th quarter

- In continuation from the previous quarter risk information from the Nuclear Power Division was collected and recommendations were made to top management and the Nuclear Power Division about publicly disclosing risks and explaining the details of countermeasures. However, in light of the recent failure to disclose information on drainage channels at the Fukushima Daiichi NPS it is apparent that TEPCO's policies on disclosing risk information has not permeated through Nuclear Power Division leaders, nor the organization as a whole. This will be discussed in the following pages.
- Communication with siting communities
  - Positive communications were executed about the decommissioning and measures for contaminated water at Fukushima Daiichi, as well as safety measures at Kashiwazaki-Kariwa to local governments, related organizations and residents of siting communities through explanatory meetings, etc.

Explanation about treatment status of contaminated water, etc. at Fukushima prefecture community meeting

  - As a part of this activity, information/communication matters as well as the current status of decommissioning and measures for contaminated water were reported in the Decommissioning/Contaminated Water Countermeasure Fukushima Council[27] (6th meeting on January 7). There are comments from attending local governments expecting the national government and TEPCO to provide information to the residents of local communities in addition to the efforts of local governments. Also opinions were provided that request timely transmission of specific and easily

[27] Launched in February, 2014. Members are: the chairperson (Senior Vice Minister of Economy, Trade and Industry), Fukushima Prefecture and surrounding local governments, relevant local groups and experts, regulatory authorities, Secretariat of Decommissioning/Contaminated Water Countermeasure Team, and TEPCO.

understandable information connected to safety and the peace of mind of residents. Based on those opinions, it is planned to circulate a revised version of a material "Current status of [Fukushima Daiichi Nuclear Power station] and activities toward decommissioning," aimed toward easy understanding for 13 local communities with the cooperation of the national government. Also, a paper, the so-called "Wall newspaper," which announced the situation of decommissioning and contaminated water, being inserted into community papers of local governments up to now, has been planned to be distributed to each household after revisions reflecting the input of various opinions.

- ○ To enhance cooperation between the Technical Division and Public Relations Division and to upgrade the external communication consciousness of technical staffs at the same time, resident training at the Fukushima Public Relations department for managers of technical departments at Fukushima Daiichi were consecutively executed. (The number of resident trainees in the 4th quarter was nine, cumulatively 26.)

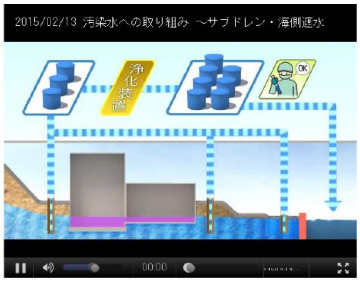
➢ Communication with siting communities and people in the society

- ○ In the special section about decommissioning on TEPCO's homepage, which was newly arranged in the 3rd quarter, a page featuring "Robots related to technology development for decommissioning" was also newly added. Other than that, "I'll respond," a collection of Q&A, was added which focused on staffs working for measures regarding contaminated water on site.

- ○ The progress of the decommissioning activities and contaminated water processing, which is too technical and difficult to understand, was explained in an easy-to-understand manner by means of photos and CG videos. In the 4th quarter,

three video were posted as follows.

- Activities for contaminated water – Sub drain/Sea side leak isolation wall -
- Survey of fuel debris locations using cosmic ray muons
- Fukushima Daini Nuclear Power station “3.11” a 100-hour battle (Planned)



Examples of posted CG (Right: Activities for contaminated water, Left: Survey of fuel debris locations using muons)

○ In the 4th quarter, more than 40 people related to education, etc. in Fukushima prefecture (from the Fukushima office of Education, universities, school teachers, social educational facilities, etc.) made site tours and information about the actual situation of decommissioning and contaminated water treatment at Fukushima Daiichi, specifically responding to the situation regarding the accident at Fukushima Daini, etc. was presented for utilization at educational sites in the prefecture. Also, with those visitors from educational fields, risk communicators (RC) executed dialogue activities (6 occasions) to deepen understanding. Besides, a model of Fukushima Daiichi was made and it has been highly evaluated from the educational field. It has been utilized at various dialogue opportunities not limited to the educational field.

Talk between a risk communicator and university students

Model of Fukushima Daiichi Nuclear Power station

➢ Communication with relevant parties overseas

○ Reinforcement of information provision to foreign embassies in Tokyo

Explaining the situation of decommissioning and contaminated water effort was executed continuously by notification from TEPCO and individual requests from embassies. (In the 4th quarter, a total of seven countries and eight times, twice for Korea and once each for

China, Russia, Singapore, Taiwan (Taipei Representative Office) and Slovakia) Also, on March 4, an explanation about the issue of the water drainage path, completion of fuel removal from Unit 4, etc. was provided to resident staffs of 31 embassies at a briefing for diplomatic corps sponsored by the Ministry of Foreign Affairs.

At a drill for information delivery to overseas, which was executed with a comprehensive drill by Kashiwazaki Kariwa and headquarters on February 26, the International Affairs Department, Corporate Communication Department and Social Communications Office ("SC Office" hereinafter) constructed a team and it joined the drill with some devices, such as preparing some types of sample statements (formatted sentences) for an efficient translation of domestic press releases generated by the Corporate Communications Department to English beforehand, etc. After the drill, though some achievements, such as a quick generation of press releases in English, etc. were confirmed, it has been clarified that there is space for more improvement in responding to inquiries from overseas, including embassies. In future, activities shall be made for improving timely and accurate information delivery to overseas while adding more devices, such as executing drills actually involving embassies, etc.

Besides, at the comprehensive drill as mentioned above, eight embassy staffs of seven countries, U.S., France, Germany, Italy, Russia, Brazil and Korea, were invited to the headquarters to observe the drill. Situations of instructions and power station supports by the Emergency Response Center at the headquarters were observed and situations at drills for information delivery to overseas as mentioned above were also observed at the same time. Though there are comments evaluating TEPCO's serious activities from the visitors, it is pointed out that the accident scenario of the drill was difficult to understand on the other hand. It shall be improved as an issue to be solved corresponding to drill observation in future.

Observation at emergency drill

Drill supposing inquiries from embassies

- At a 1F review mission by IAEA executed in January, communication was also evaluated. A draft version of the report is posted on the homepage of the Ministry of Economy, Trade and Industry.
- We submitted an entry for the "PIME (Public Information Material Exchange) Award

for Communication Excellence 2015" sponsored by the European Nuclear Society (Co-sponsored by IAEA). We remained in the list of final candidates for the award for excellence and gave a presentation in Slovakia on March 2. The messages conveyed by TEPCO were commended for being transparent and open. And, our internal communication was also praised for its stance on efforts related to company morals and beliefs, and the quantifying of these efforts. We will continue to study efforts abroad and gather advice from third-parties.

- Internal communication
  - Inspired by a fatal accident that occurred in January, top messages were displayed utilizing electronic information bulletin boards that were installed at nine places, such as Important anti-seismic buildings, access control buildings, J village, etc. to be broadly transferred to workers and staffs working at Fukushima Daiichi. (Started in January)
  - It is necessary to widely collect opinions from workers of contractors for the improvement of the work environment on site as well as the office environment. As a contact for the collection such opinions, the "Echo Committee" has already been established. However, it was found that the Committee was not highly recognized by a questionnaire with workers, thus a poster provided an impact by utilizing a newly created cartoon-like character and it was posted at about 30 locations within the site. (Started in February) So far, 108 opinions were provided in this FY (as of February 28), and 107 cases were answered. By broad announcements and collection of more opinions, those shall be connected to the improvement of the environment.

Poster announcing the Echo Committee to workers

○ Internal training by Risk Communicators (RC)

Workshops were carried out by risk communicators (“RC” hereinafter) as instructors for the employees responsible for the communication with communities. Their understanding of the basics about nuclear power and the updated status of the decommissioning effort were supported. (Actual result: January 23, February 18) Also, at each power station, trainings to enlighten awareness for risk communication were consecutively executed for transferred staffs, etc.

Workshop by a risk communicator for TEPCO staffs (Kawasaki Service center)

○ Emergency response drill

At a comprehensive drill by Fukushima Daiichi, Fukushima Daini and Headquarters on March 18, an organization to dispatch staffs to Fukushima prefecture, siting local governments and surrounding communities were examined. The result of the examination will be announced in the progress report of the 1st quarter, FY2015.

(2) Information disclosure problem about the Fukushima Daiichi water drainage path

➢ Background of disclosure delays

○ As a measure to prevent the recurrence of problems such as the failure to disclose information on contaminated water leaking into the bay in July 2013, the position of radiation measurement control officer was created. In March 2014, TEPCO gave an explanation of drainage channel cleaning and radiation concentration measurements to the Nuclear Regulatory Committee’s Specified Nuclear Power Facility Monitoring and Assessment Review Meeting (Open Meeting). At this time Nuclear Power leaders were aware of this work plan but did not monitor the actual progress status of work and the status of disclosure of measurement data.

○ Meanwhile, middle management that was in charge of the actual work “*knew that it had already been disclosed that water containing radioactive substances was present in the drainage channel and that there were plans to clean and measure the radiation levels in the drainage channel; and, that the primary objective of cleaning was to reduce the radiation concentration levels in the drainage channel*” (in other words,

they wanted to focus on that task), and felt that "*it was not necessary to take special steps to disclose measurement data every time it was taken and the data could be disclosed after cleaning to show how radiation concentration levels had been reduced.*"

- ○ Risk information, such as radiation measurement data was not shared within the Fukushima Daiichi NPS or with RCs, nor was it shared within the entire TEPCO organization, including the SC Offce. As a result, RCs and the SC Office were not able to fulfill their role of "*viewing and handling risk information from the perspective of society*."

➢ Measures

- ○ All radiation data of Fukushima Daiichi taken by TEPCO shall be disclosed.
- ○ Data will be disclosed via the TEPCO website and explanations of data of particular concern will be given at press conferences.
- ○ External parties shall continually monitor and assess the new information disclosure rules and adherence to these rules in order to maintain transparency and reliability.
- ○ Management improvements, starting with Nuclear Power Division leaders, will be implemented in order to accurately implement plans in the field that indicate the awareness, plans and intentions of upper management and Nuclear Power Division leaders, which is an underlying cause of the disclosure delay.

(3) Self evaluation of FY2014

To have an objective evaluation over TEPCO's communication activities from the general public as its objective, a survey by questionnaires was executed with four types of stakeholders (Fukushima, Niigata, Metropolitan and Embassy staffs in Japan) and those were objects of communication regarding nuclear power and decommissioning.

<Outline of the questionnaire>

- Answers were filled in on a sheet of the questionnaire or on a special page on the Web.
- The questionnaire was anonymous.
- Period of answering was from February 9 to March 2.
- The total number of answer was 114.

As a prompt report, both a quantitative evaluation result and qualitative evaluation result are shown as follows.

[Quantitative evaluation result]

The evaluation was requested from the viewpoint of "How was TEPCO's attitude toward communication improved?" through various communication activities. Compared with the

status of 1 year ago, it was requested to answer about the extent of improvement with 7-grade scores from -3 to + 3. (If there's no change, it should be rated as 0.)

[1] The result of evaluation for quality and quantity of information delivery about decommissioning at Fukushima Daiichi, Nuclear Safety Reform, accidents and troubles, etc. was +1.3 as average value for whole areas and the result was "It has an improving trend" .

	Metropolitan area	Fukushima	Niigata	Overseas	All areas
Total evaluation score	**+1.6**	**+0.2**	**+1.5**	**+1.0**	**+1.3**
Number of respondents	25	15	66	7	113

[2] Also the result of evaluation for consciousness and attitude of TEPCO's public relations and public hearing activities was + 1.2 as average value for whole areas and the result was concluded as "It had an improving trend."

	Metropolitan area	Fukushima	Niigata	Overseas	All areas
Total evaluation score	**+1.6**	**+0.4**	**+1.2**	**+1.1**	**+1.2**
Number of respondents	24	15	66	7	112

[Qualitative evaluation result]

From those evaluated at +2 or more for the each item of the questionnaire, the following input was made.

- Frequency of explanations increased. (Regular explanations were provided.)
- Explanations were easy to understand. (Utilizing figures and photos.)
- Duty staffs faced and explained sincerely.
- Negative information was also disclosed.

There's no difference observed between areas.

On the other hand, from answerers putting 0 or less, the following input was made.

- Sources of information were limited to general media (Newspaper, TV, etc.) and no real voices of employees were heard. (Metropolitan)
- Information delivery was getting slower recently. (Fukushima)
- During troubles, response to the media was prior to that to the communities. (Fukushima)
- The water drainage path issue occurred just when I thought it was getting better and the culture was not changed. (Fukushima)
- Opportunities to explain to the general public should also be arranged. (Fukushima)

From the above results, although there were various activities to realize "Outreach for public relations" (such as generating materials easy to understand, making movies etc.) and

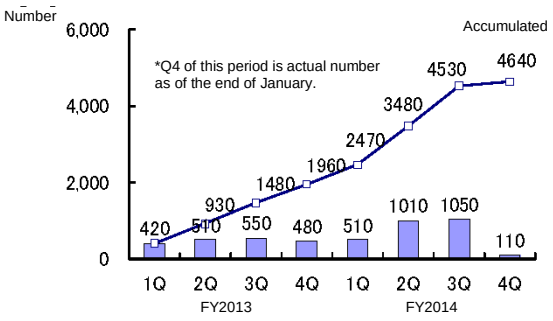
that were positively recognized, there were bitter evaluations after the occurrence of the information disclosure problem regarding the water drainage path at Fukushima Daiichi. The situation is that assured trust has not been provided yet.

As for the results of questionnaire, analysis in detail shall be executed continuously to connect to improvement of risk communication activities in the future.

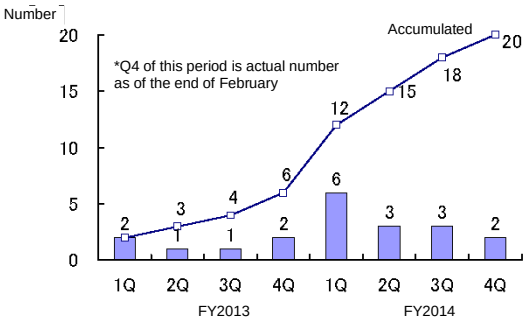
2.6 Measure 5: Enhancement of Power Station and Head Office Emergency Response Ability (Organizations)

(1) Implemented items in the 4th quarter

- In Kashiwazaki Kariwa, a comprehensive drill was carried out on February 26 with headquarters and individual drills were also implemented on a continuous basis for the improvement of on-site response capabilities. The improvement of the capability for emergency response and the operational capability for the emergency response organization were confirmed by repeated comprehensive drills and individual drills.
- The comprehensive drill on February 26 was carried out with the participation of the Secretariat of the Nuclear Regulation Authority as an emergency drill to totally verify emergency response capability. It is important to share information quickly and to decide appropriate response policies at an accident response and it is confirmed that on site response functioned effectively by setting clear accident response policies and providing appropriate instructions to the site from the Emergency Response Center at the power station. Also, to confirm response capability outside of the plant, staffs carrying information sharing tools (personal computer, smart phone, tablet, etc.) were dispatched to administrative bodies and an off-site center, and then an information sharing drill was carried out. As a result, it was confirmed that the information sharing with dispatched staffs and the information transfer to the destinations were possible both smoothly and quickly. Besides, at the drill, it was confirmed that information such as plant information, etc. was not sufficiently transferred from TEPCO to the response center of the Secretariat of the Nuclear Regulation Authority and there's an issue to be solved in information sharing. Therefore, measures for improvement were investigated and their validity should be verified by emergency drills carried out at Fukushima Daiichi and Fukushima Daini on March 18. Since many comprehensive drills were carried out in FY2014 to improve information sharing tools as well as operations for accident response policies, the emergency response capability of organizations in the power station and Headquarters was considered to have made a dramatic improvement. In FY2015, comprehensive drills with various scenarios are to be carried out and the response capability of emergency organization shall continuously be improved.



Number of individual drills at Kashiwazaki Kariwa



Number of comprehensive drills at Kashiwazaki Kariwa

Kashiwazaki Kariwa (Emergency Response Center) Instruction of Site Superintendent

Headquarters (Emergency Response Center) Instruction of General Manager

Water feed drill to cool down reactors by fire brigades

Power supply sharing drill by a power supply car

- Since there was confusion at the Headquarters Emergency Response Center to sort power station information provided from two locations, Fukushima Daiichi and Fukushima Daini, when a comprehensive drill was carried out by Fukushima Daiichi, Fukushima Daini and Headquarters on December 11 last year, a layout change at the Headquarter Response Center was executed and the operation method of information sharing tools was improved. A similar comprehensive drill is to be carried out on March 18 to verify the effects of those actions.
- As a performance indicator (PI) to show the improvement of emergency response capability, a self-evaluation based on emergency response areas of PO&C (EP.1 – 3) was defined. A self-evaluation sheet reflecting PO&C criteria is being arranged at the moment and it is to be applied from the next FY.

(2) Evaluation of FY2014

In order to improve the emergency response capability based on ICS, each power station, as well as headquarters, repeated comprehensive drills and individual drills under the guidance of external experts to extract the challenges and execute improvements. By those activities, the emergency response capability as an organization is considered to be substantially improved compared with that at the Fukushima nuclear accident. Besides, from the viewpoint that a Phonetic code[28] is effective to prevent miscommunication, a development was made to use it not only in an emergency but also during a normal period.

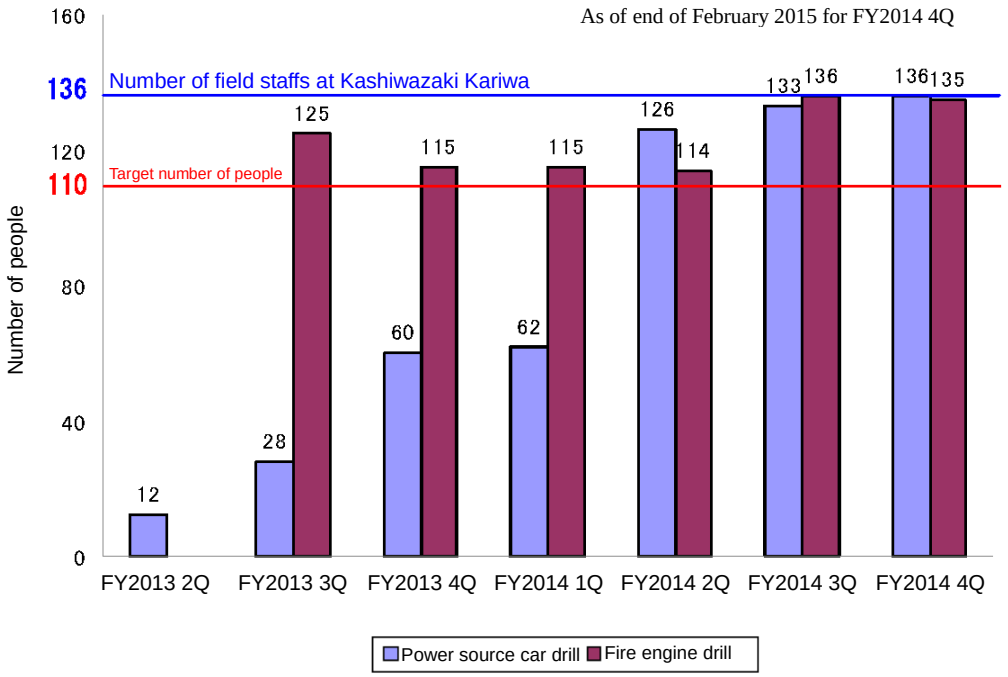
A self-evaluation based on PO&C is to be started in FY2015 in addition to a PDCA cycle, which drives the extraction of challenges and improvement through drills; thus, a more objective PDCA cycle shall be realized aiming at the world's top level.

2.7 Measure 6: Enhancement of (Individual) Emergency Response Abilities and On-Site Capabilities

(1) Implemented items in the 4th quarter

- Enhancement of Emergency Response Capability
  - Operators in Kashiwazaki Kariwa participated to power supply car connection drills executed by emergency response organizations since July, 2013 and leaders increased in the operation management department from FY2014 (as of the end of February 15 staffs were qualified). Also, a power supply car start-up drill was started by the direct management of the operation management department. As of the end of February, the actual number of site personnel of Unit 1 – 7 that received the training was 136 against 110 as the target (80% of site personnel). As for the fire engine connection drill, it started in October 2013 and the actual number of site personnel of Unit 1 – 7 that received the training was 135 against 110 as the target (80% of site personnel) as of the end of February. Besides, since the number of site personnel in Kashiwazaki Kariwa was 136, thus the capability obtaining rate of those site personnel were 100% for the power supply car drill and 99% for the fire engine drill. The situation was that all personnel obtained capability for the power supply car drill and almost all personnel obtained capability for the fire engine drill.
  - As for the drills of power supply car connection and fire engine connection for Kashiwazaki Kariwa operators, most of site personnel obtained capability; thus, high quality training shall be realized after this to enrich the content of training and to extend to application skills in addition to maintaining personnel with capability. Also, investigation about deployment to operators in Fukushima Daiichi and Fukushima Daini shall be executed.

[28] For example, pronouncing "A" as "Alpha" to eliminate wrong hearing.



Transition of the number of operators participating in training sessions directly operated by the Operation Management department at Kashiwazaki Kariwa (Unit 1 - 7)

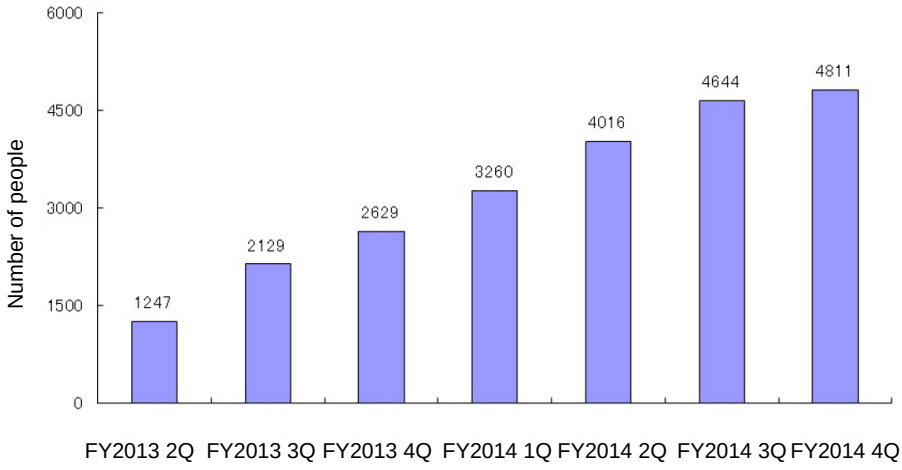
Drills with power supply car and fire engine. (Left: Examining operational state of power supply car. Right: Starting water feed with fire engine.)

Also about facility diagnosis personnel, operators were trained to be able to diagnose, and data collection by the direct management of operators of about 260 for the equipment in Unit 7 was ongoing. As for the facility diagnosis executed by operators in Kashiwazaki Kariwa, all operators performing on-site response for Unit 6 and 7 received required training and obtained an internal certificate of facility diagnosis. Actual data collection by direct management was ongoing with Unit 7 and achievements, such as obtaining broad knowledge about facilities, upgrading consciousness about facility status, improvement of on-site capability, etc. were made.

Data collection by direct management of operator (Diagnosis of motor vibration)

○ For maintenance personnel, enhancement of basic technologies (annealed wire/rope handling training and the like), and training through direct management of work (inspection of power supply cars/gas turbine generator cars/alternative heat exchanger cars, training of temporary hose pull out of emergency action and electric cable connection training, replacement of electric motor, pump bearing disassembly/assembly, ground leveling by heavy machinery and the like) was carried out from July 2013 at each power station. These drills were continued in the 4th quarter (as of the end of February, a total of 4,811 members at 3 power stations have attended the training: 193 at Fukushima Daiichi, 2,885 at Fukushima Daini, 1,733 at Kashiwazaki Kariwa).

As of end of February 2015 for FY2014 4Q



Transition of the number of maintenance personnel participating in training through direct management of work

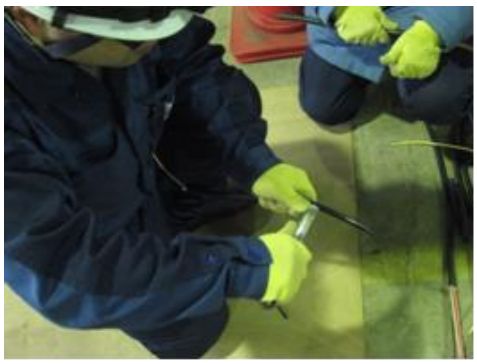
○ At Fukushima Daini, training of the loaded operation of a power supply car connected to a simulated load (Load car) was executed to improve operating skills for a power supply car. At the training, understanding power supply car behavior during a loaded operation and parallel operation and the like were executed.


Loaded power supply car training at Fukushima Daini.
(Left: Measurement of cable insulation resistance and connection to load car.
Right: Parallel operation of power supply cars.)

○ At Kashiwazaki Kariwa, repair training of the air-conditioner duct was executed to enable emergency repair only by TEPCO employees, even at the occurrence of an event such as deterioration of system performance caused by a crack generated at disasters such as earthquake, etc. At the training, it was confirmed that a firm repair was possible to block cracks and holes of the duct with reinforcing plates and duct tape.


Training of air-conditioner duct emergency repair at Kashiwazaki Kariwa.
(Left: Attaching reinforcing plate to cracked portion.
Right: Making periphery of the reinforcing plate airtight with repair tape.)

○ Additionally, at Kashiwazaki Kariwa, training for handling terminals was executed under the supervision of qualified personnel to obtain, maintain and upgrade handling skills of low-tension and high-tension cable terminals. At a training for handling high-tension cable terminals, Fukushima Daini jointly participated to obtain the skills.




Training for handling low-tension and high-tension cable terminals at Kashiwazaki Kariwa.
(Left: Sheath removal from low-tension cable. Right: Sheath removal from high-tension cable.)

- Enhancement of on-site capability
  - At Kashiwazaki Kariwa, a more practical exercise training for younger employees was started from early March to reinforce capability for safe execution of works as a judgment of the health of facilities. Exercises were executed to judge the health of facility status using actual facility inspection records and to confirm capability to appropriately point out unsafe points by reproducing important sites such as hot work as well as high-place work within the training center with intentionally buried unsafe points. As for the basic on-site capability, it shall properly be grasped and a further upgrade of the capability and enrichment of training and exercises should be pursued.


Practical exercise training related to work supervision.

  - As a method to objectively confirm knowledge and skill required for reinforcement of on-site capability, a target number to be achieved as an organization was set regarding obtaining internal skill certificates and public qualification. The situation of obtaining these certificates and qualifications is to be monitored as a performance indicator (PI) to measure technological capability.
- Enhancement of engineering capability
  - The system engineers have developed their approaches to improve reliability by monitoring not only from the component level viewpoint but also from the wider system level viewpoint. Monitoring activities for 5 major systems were started up to now and system health reports were added with input from operation management,

maintenance management, nonconformance management, etc. for those five systems were generated and examined in the 4th quarter. In addition, monitoring program for five more systems were generated to make major monitored systems total 10. (It is planned to expand up to 40 systems in FY2015.)

○ Education and qualification programs for system engineers were formulated with reference to those in the U.S. The following items were incorporated into the programs.

- Basic items of engineering
  Electrical engineering, thermal hydraulics, reactor physics, nuclear materials, civil engineering, architecture, laws and regulations, etc.
- Basic items related to major systems/apparatuses of a nuclear power plant
  Function and purpose of the system, apparatus layout, operation mode, design standards, safety regulations (Limit for safety and its reason), etc.
- Basic items for executing works as a system engineer
  Each parameter's behavior at plant operation (At normal state, at accident/transition, event development status at a severe accident and operation procedure that time), nuclear safety (Risk information, safety design, request for installation permission, safety regulations, etc.), health evaluation of system function, etc.

In addition to the above, a training for plant operation to confirm behaviors of various parameters at a normal start-up of the plant by using a simulator, and a training for basic items of major systems with monitoring activities that had already been started were executed.

System engineer education

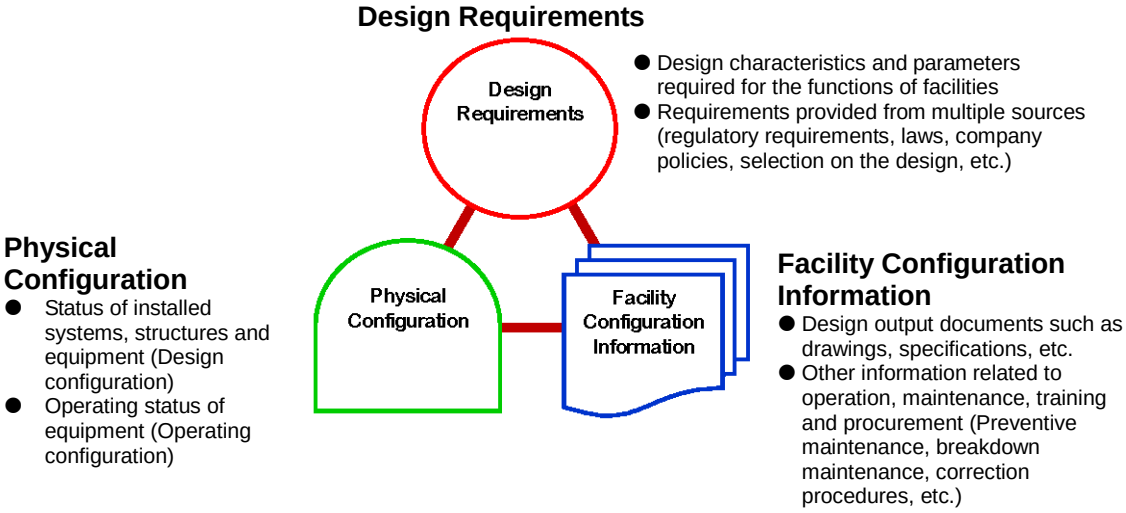
(Left: Operation exercise using a simulator Right: Training of basic items related to major items.)

○ Investigation toward constructing the mechanism of configuration management was being executed continuously. In the 4th quarter, the following studies were made.

- Placing a representing system (standby liquid control system) as an object, a design standard document which newly clarified design requirements that have

to be grasped and managed by our company. In the course of generating it, though it is found that further surveys were required about the reasoning of the designs such as regulatory requirements not clearly described in system design specification, commercial standards, etc., items to be arranged as TEPCO were defined and a framework of the design standard was fixed. After that, there were design standards for a reactor containment vessel and ground level filtered vent facility. From now, it is planned that the design standard generation shall be started from those of newly installed facilities to handle serious accidents, then extended to those for existing facilities.

- Also, referring preceding cases in the U.S. and based on domestic regulatory systems as well as practices of power stations, a detailed change management step was formulated based on actual operation management at power stations for change management processes at changes of facilities by modification or at confirmation of a mismatch between facilities on site and facility configuration information.



Concept of configuration management

○ Requirements for engineers with expertise were selected to pursue reinforcement and direct management of individual technologies such as anti-seismic technology, safety evaluation technology (PRA utilization), etc., as important areas of expertise to improve safety.

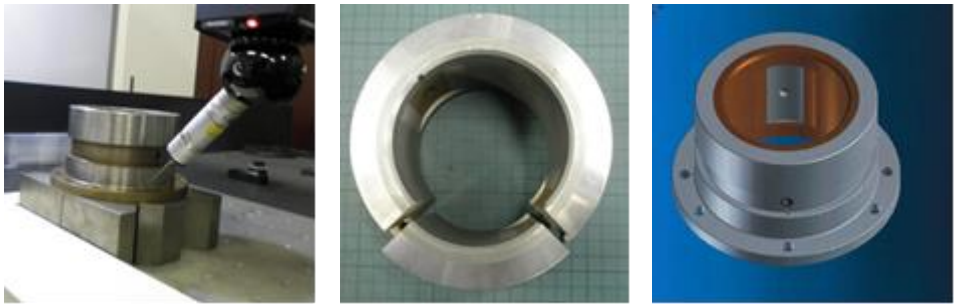
Specifically, improvement of knowledge and skill should be pursued for requirements of actual work of anti-seismic evaluation engineering utilizing an anti-seismic design code, education of risk evaluation method, requirements of actual work of safety evaluation, engineering utilizing PRA tools that evaluate plant safety, and the like.

Also, as an action plan for human resource development, human resource development plans for anti-seismic evaluation engineers and safety evaluation engineers were formulated.

○ As for anti-seismic evaluation technology, a human resource development plan for engineers involved in sorting design information required for anti-seismic analysis also in anti-seismic design was formulated in FY2014 to upgrade direct management capability within the TEPCO group. In FY2015, through an improvement in the piping analysis code utilized by TEPCO up to now to make the analysis within group companies possible, anti-seismic design evaluation as an actual unit project is planned under the leadership of TEPCO. Besides, an investigation is to be made for methods to acquire information that have not been possessed by TEPCO from design information required for anti-seismic analysis. Moreover, education and training are to be started according to the human resource development plan already formulated.

○ In the area of facility procurement, to quickly process safety improvement, procurement capability of parts and facilities was reinforced. As for items

discontinued or those manufacturers withdrawn, basic design by reverse engineering was executed. Establishment of basic methods of parts and facility procurement related to a used parts survey, design policy, securing and maintaining quality of manufacturing, etc. is to be pursued, including participation of TEPCO's engineers in that design. In FY2015 and later, performance and reliability are to be confirmed by trial installation to actual units. Also, clarification of procurement specification and expansion of suppliers by that are to be investigated with analysis and evaluation of domestic and overseas procurement measures to process further rational procurement.



Design and manufacturing of air conditioner parts (bearing) by reverse engineering.
(From left: 3 dimensional measurement, survey by cutting, generated 3 dimensional drawing after survey.)

(2) Self evaluation of FY2014

As for reinforcements of emergency response capability (Individual) and on-site capability, it has been evaluated that each measure was being processed smoothly and achievement was being made. However, the core of the enhancement of technological capability represented by emergency response capability (Individual) and on-site capability is human resource development. Thus, it is important to steadily proceed with each development plan formulated up to the 4th quarter and to rotate PDCA based on performance indicators (PI).

To arrange education and training programs for appropriate execution of human resource development, the following four points are set as basic policies.

i. The training shall be provided from lecturers that those capabilities are well managed.
ii. The training shall be executed by sure separation from actual works. (Classroom or on-site doesn't matter as location of the training)
iii. Confirmation of the level reached (by paper test or practical test) shall be executed at the completion of the training.
iv. Actual works shall not be assigned to those who do not reach a predetermined level or do not have required qualifications.

2.8 Evaluation of the Degree of Achievement of the Nuclear Safety Reform Plan

(1) Evaluation based on the measurement results of the Nuclear Safety Reform KPI

As was indicated in the 3rd quarter progress report, the degree of achievement of the Nuclear Safety Reform Plan has been evaluated quantitatively using key performance indicators (KPI). There are some items that have only recently started being tracked and evaluated in FY2015. For these items, performance has been based off of the data that could be collected at this time.

- Safety Awareness KPI

This time the safety awareness KPI is being reported as a reference value using the PI that is measureable as of February which has been converted to a 100 point KPI scale.

Safety Awareness KPI (Traits): 67.3 points (Overall nuclear power division) (PI1, 2, 4)
94.3 points (Nuclear power leaders) (PI1, 2)

In regards to the PI which makes up the KPI, we will work on revitalizing retrospects in organizational units through the sharing of good case examples, etc. due to the number of group meetings and internal meetings to discuss 4. retrospective details being significantly below the target goal.

Safety Awareness KPI (M&M): 100 points (PI6, 7 , 8)

The safety awareness KPI (M&M) reached the maximum score of 100 points as a result of calculating the KPI only with the PI related to the message from nuclear power leaders. The number of people who read the message and thought it was helpful has been trending up. However, around 15% of readers feel that it was helpful and we will continue to aim to deliver a message that is helpful for readers.

The maximum score indicates that sufficient messages have been received and delivered, however, it also indicates that, in terms of issues on serious accidents and the information disclosure of drainage path, there have been management issues that the intention and plans nuclear power leaders had with the messages and daily instructions have not penetrated into the front line of the sites. Thus, we will need to make effort on this matter.

- Technological Capability KPI

The technological capability KPI will be notified of starting with the FY2015 1st quarter progress report because of formulation of the FY2015 operational plan and progress results.

- Ability to Promote Dialog KPI

Ability to Promote Dialog KPI (Internal): 75.0 points (Overall Nuclear Power Division)
77.3 points (Nuclear power leaders)

The internal communication evaluation for the overall Nuclear Power Division and nuclear power leaders was comparatively good. The nuclear power leader's evaluation for the four total components was better than the evaluation for the overall Nuclear Power Division and the difference was especially significant for the "C0.4: Emphasis of expectations" and "C0.3: Flow of free information" which shows a gap in the perception between nuclear power leaders and the overall Nuclear Power Division. More detailed analysis and improvement measures will be studied.

Ability to Promote Dialog KPI (External)[29]: +1.3 points (Quality and amount of information dissemination)
+1.2 points (press releases, awareness and attitude at public hearings)

In regards to external communication, the evaluation given to how the quality and amount of information disseminated was improved as +1.3 (the upper and lower limit of improvement was evaluated in 7 grades from -3 to +3, and a 0 rating was given when there was no improvement) and we believe this result was enabled through the creation of easy-to-understand materials, improvements to the website, creation of movies, etc. A rating of +1.2 was given in regards to how TEPCO's stance toward press releases and public hearings has improved. However, we will continue to confirm the effects of further improvement efforts and the implementation of recurrence prevention measures, in regards to problems related to the disclosure of information on drainage path.

[29] In the 2014 3rd Quarter Progress Report, the point system was supposed to be standardized with 100 point, but the actual points of the questionnaires are now treated as the indicator.

PI and Results of Each Measure

Measure	Results Value[*1]	Target Value
Measures 1 and 2		
1. Implementation rate of retrospect efforts using Traits	79.4% (Overall) 88.6% (nuclear power leaders)	100% (Excluding dispatches, transfers and those in long-term medical care)
2. Ratio of "We don't know" answers in the retrospect	1.1% (Overall) 0% (nuclear power leaders)	Less than 10%
3. Moving average trend of each indicator (Quarterly)	After FY2015	Increasing trend
4. No. of times group meetings, internal meetings, etc. are held to discuss the results of retrospects	22.5%	Twice or more a month / the implemented department or group is over 70%
5. No. of times reviews were performed of retrospective results	Scheduled in April 2015	Once or more a quarter
6. Delivery of messages related to nuclear power safety from nuclear power leaders	Twice or more a month	Twice or more a month
7. No. of people who have read the message	Positive trend[*2]	Monthly total no. of people is increasing
8. No. of "It was helpful" answers	Positive trend[*2]	Monthly total no. of people is increasing
9. No. of power plant management observations (MO) by administrators	After FY2015	Once or more a month
10. No. of extracted good case examples and issues based on MO		One or more cases each time
11. Horizontal development of good case examples and implementation rate of problem improvements within one month		70% or more
12. Horizontal development of good case examples and implementation rate of		100%

Measure	Results Value[*1]	Target Value
problem improvements within three months		
13. Measures 3, 5 and 6 are tied together with PO&C and the ratio of the action plan within the operation plan that sets quantitative goals per quarter	After FY2015	50 points or more (initially) 70 points or more (until the 3rd quarter)
14. Ratio of targets achieved in each action plan		50 points or more
Measure 3		
1. No. of competition proposals for enhancing the ability to propose safety improvements × Average evaluation score × Completion rate within six months of good proposals	1st FY2014 Competition: 320 points (Ongoing)	1,000 points or more (FY2014) 1,500 points or more (After FY2015)
2. No. of cases waiting for OE information analysis (Processing rate of OE information screening within the target period)	45% (two months) 50% (three months)	90% or more (within two months) 100% (within three months)
3. Viewing rate of newly arrived OE information	38%	20% or more (FY2014) 50% or more (FY2015)
4. Implementation of hazard analysis	Complete	Completed at the end of FY2014
5. Progress rate of hazard improvement plans	After FY2015	100% progress rate
Measure 4		
1. Evaluation regarding the quality and amount of information disseminated on work at the Fukushima Daiichi reactor, nuclear power safety reforms, accidents, etc.	+1.3 point	The change over time in the total evaluation of the questionnaire given to a group for four different external evaluators (Including people from 1. Fukushima region, 2. Niigata region, and 3. Tokyo power supply area, 4. Residing ambassadors) has been trending positive.
2. Evaluation regarding the awareness and stance of TEPCO press releases and public hearings	+1.2 point	
Measure 5		
1. Self-evaluation of PO&C's emergency	After FY2015	An average of 4 points or

Measure	Results Value[*1]	Target Value
response (EP. 1- 3)		higher in the 5 tiered self-evaluation performed once a quarter or after the general training given by a team leader or party in a higher position.
Measure 6		
1. No. of in-house competent personnel during emergencies, including the use of fire engines, power supply cars, cable connectors, radiation surveys, loaders, Unic, etc.	After FY2015	120% of the amount required at each power plan after three years
2. No. of certified system engineers (SE)	Design complete	Formulation of a training development program (FY2014) 5 people for each nuclear reactor (After FY2015)
3. No. of trained specialized engineers including seismic activity, PRA, fire protection, chemical management, etc.	Design complete	Formulation of a training plan (FY2014) 100% training plan achievement rate (After FY2015)
4. No. of certified in-house drivers, maintenance, safety, etc. personnel.	After FY2015	100% achievement rate of the training plan
5. No. of externally qualified personnel specifically required by the company, including chief engineers, hazardous materials engineers, supervisor of hazardous work due to insufficient oxygen, etc. (Approximately 15 different certifications)	After FY2015	The necessary number of personnel or personnel in each field after three years
6. No. of external qualified personnel recommended by the company including, high pressure gas manufacturing and security, operation of construction equipment, etc. (Approximately 15 different certifications)	After FY2015	30% or more in each field after three years

Measure	Results Value[*1]	Target Value
7. No. of personnel with external qualifications such as Chief Engineer of Reactors, Type 1 Radiation Protection Supervisor, engineer (nuclear power and radiation division), etc.	After FY2015	100% achievement rate of the training plan

*1: The results values which do not have a designated date are from the end of February 2015.

*2: The viewing and evaluation of messages was based off of those sent as of January 2015.

(2) Two Year Evaluation After Announcing the Nuclear Safety Reform Plan

Since the Nuclear Power Safety Reform Plan was summarized and announced on March 29, 2013, we have been involved in nuclear safety reforms, including reforms from management.

As a result of focusing our efforts on steadily implementing measures 1 through 6 of the Nuclear Safety Reform Plan, we have achieved results in specific areas such as improving press releases and the website, improving our ability to respond during emergencies and improving the technical capabilities of operations under our direct control. However, we have not yet reached a point where we have produced specific results related to the creation of leadership and a safety culture throughout our organization and we have also received external evaluations that point out our inadequacies related to leadership, a safety culture and goal management.

That is why starting in FY2014 we have been involved in creating a system that helps promote nuclear safety reforms in addition to measures in the Nuclear Safety Report Plan such as clarifying expectations of our organization in regards to nuclear safety at the top of management, changes to efforts to develop a safety culture and evaluation of reform performance and level of achievement. As a result, we have established the "Nuclear Division Management Guidelines" and "Characteristics of People, Leaders and Organizations that Embody a Sound Nuclear Safety Culture." Management has taken the initiative in setting an example of nuclear safety and enhanced efforts to spread this thinking throughout the organization. We have also established the Nuclear Safety Reform KPI to quantitatively evaluate the performance and state of achievement of reforms and put in place a system of properly following through with PDCA.

In regards to the various measures of the reform plan, there are some areas where we have seen significant results compared to before the Fukushima accident, such as enhancing our ability to propose defense in depth and our ability to handle emergencies. We estimate that there have been a certain amount of results in improving the "technical capabilities" of TEPCO through the two years the company has been involved in the Nuclear Safety Reform Plan.

However, TEPCO was not able to prevent the recurrence of serious accidents and the issue of disclosure of information on the drainage path occurred. These concerns have the following characteristics.

	Serious Accident	Disclosure of Information
Nuclear power leaders	• After the accident and deaths at Fukushima Daiichi in March 2014, TEPCO indicated that it would make safety its top priority and utilize its operational experience as measures to	• After the problems surrounding the disclosure of information related to the flow of contaminated water into the harbor of the power plant in July 2013, TEPCO indicated as recurrence prevention measures

	prevent the recurrence of accidents.	that it would thoroughly make public all information, put in place a management representative and promote cross-sectional organizational management.
Onsite administrators and support organizations	• In addition to the above, middle management such as the construction supervisors and superintendents were responsible for overseeing and guiding operations by contractors. • Work was done by onsite contractors. These worksites received instructions by construction supervisors and middle management supervisors of TEPCO, but there were no specific measures implemented to ensure safety and prevent an accident.	• In addition to the above, the Social Communication Office and RC which were in charge of the disclosure of information and communication reforms were responsible for supporting the disclosure of information on the front lines. • The onsite representative and middle management were responsible for radiation measurement data. Field workers concentrated on the work to be done and the information was not shared with RCs or the SC Office. As a result the information was not disclosed suitably.

We believe there are common points between these underlined areas as follows.

- The governance by management and nuclear power leaders was not strong enough and the management structure (especially monitoring) was not sufficient. Onsite middle management did not fully understand plans that stipulate the mindset, intentions, plans, etc. of upper management and Nuclear Power Division leaders and they were not monitored to see if actions were being taken to achieve the right goals.
- There was a gap in the level of ability of middle management, such as the onsite principal administrators and the Social Communication Office and the mindset, intentions, planning, etc. of management and nuclear power leaders. Middle management and the Social Communication Office was not able to grasp the situation onsite, directly offer guidance to workers or establish appropriate operational processes.

The issue of middle management and the Social Communication Office not being able to perform governance or monitoring accurately according to the mindset, planning, intentions, etc. of management and nuclear power leaders is because the following 1 - 4 change management basics are inadequate. The following four items must be focused on in the future.

1. Management and nuclear power leaders should accurately convey their objectives, plans and intentions to those implementing them.
2. Management and nuclear power leaders must clarify who is responsible for what at that time.
3. Management, nuclear power leaders and those undertaking the tasks should envision the risks in advance and take necessary measures before giving instructions.
4. Management and nuclear power leaders shall monitor the implementation status and results of those receiving instruction and make improvements when needed.

Based on the above the assessment of the two years since the announcement of the Nuclear Safety Reform Plan has been summarized below. The general summary is followed by a more detailed summary of specific efforts.

[General Summary]

- Upper management and Nuclear Power Division executives are increasing their safety awareness and forcing the permeation of nuclear safety culture throughout the organization.
- The organization is not settling for merely fulfilling regulatory requirements but rather searching for problems, proactively proposing solutions and bringing them to fruition.
- The Incident Command System (ICS) has been introduced thereby enabling the chain of command to function even in the event of simultaneous damage to multiple units, as well as enabling TEPCO to be able to handle an accident without outside assistance for as long as 72 hours after an accident has occurred.
- The Social Communication (SC) Office was created and risk communicators (RC) dispatched in order to build confidence in the society.

[Specific] Two Year Evaluation of Nuclear Safety Reforms

	Before	After
Safety Awareness	• A predominantly naive view towards nuclear safety ran through the entire organization ✓ Management already assumed that nuclear safety was established and did not put into place efforts that would continually increase safety within the organization. ✓ Management acknowledged the accident and problems with the Nuclear Power Division as onsite problems separate from management. • Insufficient risk management by the management as a company that handles special risk of nuclear power. ✓ Detailed risk scenario studied by Nuclear Power Division and re-evaluation from other viewpoint was insufficient.	• Management and nuclear leaders are in the middle of improving their safety consciousness, but there are management issues. ✓ Management and nuclear executives are taking the initiative in personifying nuclear power safety by establishing time at the start of meetings to discuss safety, etc. but are still in the middle of reforming safety awareness. ✓ On the other hand, monitoring is insufficient to find how safety consciousness, plan and intention of the management and nuclear leaders are realized on site. • Started efforts to promote safety awareness throughout the entire organization ✓ Each employee is actively engaged in thinking about nuclear power safety each day to improve safety throughout the entire organization. • Strengthening Nuclear Power Division governance ✓ An organization has been established to monitor the Nuclear Power Division and overseas nuclear power safety experts have been appointed to top positions. Monitoring results are being reported and recommended to management and the Nuclear Power Division is implementing improvements.
Technical Capability	• Only the bare minimum safety measures were implemented ✓ We were reluctant to gather and analyze information both inside and outside Japan that would contribute to	• We are discovering issues on our own and have established a system for proposing necessary safety measures ✓ We are actively collecting and promptly analyzing information gathered outside the company, such as operational experience inside and outside Japan and determining

	improved safety and only implemented measures required by regulations, laws, etc. • Lack of ability of the company to respond to emergencies ✓ There was a mere shell of support for emergency training and the chain of command was in chaos. ✓ The extent to which the company could take immediate action to combat an accident was limited.	the necessary measures in a timely manner. ✓ Introduced a competition for proposing safety improvements and quickly implemented good case examples. • Ability for only TEPCO to handle accidents within the first 72 hours ✓ We introduced the emergency support system (ICS) which is standard in the United States and made improvements to the chain of command. We are also helping individuals improve their skills through multiple training sessions and implementing continuous improvements.
Ability to Promote Dialog	• Diverged from the common mindset of society ✓ The Nuclear Power Division's thinking and judgments diverged from the common mindset of society. • Formed safety myths inside and outside the company ✓ The company was of the mindset that everything was absolutely safe (zero risk) and was reluctant to disclose risk information.	• The company is in the middle of realigning their mindset and regaining the trust of society ✓ The Social Communication Office was established and employees from outside the company were appointed to top positions. By collaborating with Nuclear Power Division, the company is working on closing the gap between the mindset of society and the thinking at TEPCO, but the company has not yet regained their trust. • Started a campaign reinforcing the idea there is no "absolute safety" ✓ Professional were trained and assigned for creating a direct dialog with society and these professionals are engaged in explaining risk information and information society is interested all while reinforcing the concept that there is no "absolute safety."

(3) Setting Milestones for the Nuclear Safety Reform KPI After FY2015

This finds the initial value for the Nuclear Safety Reform KPI. The following sets the milestones for FY2015.

Nuclear Safety Reform KPI and Milestones

KPI	Milestones
Safety Awareness KPI (Traits)	• In the 3rd quarter of FY2015, the target for the number of group meetings and internal meetings to discuss retrospects (PI4) is achieved and the improvements based on the retrospects are implemented.
Safety Awareness KPI (M&M)	• Starting in the 1st quarter of FY2015, the PI concerning messages from nuclear power leaders all meet their target goals. (PI6, 7 and 8) • Starting in the 1st quarter of FY2015 the MO is started and all of the related PI concerning quarterly evaluations are better than the previous quarter. (PI9, 10, 11 and 12).
Technical Capability KPI (Planning)	• In the FY2015 3rd quarter evaluation, 70% or more of the action plans in the operation plan are tied to measures 3, 5 and 6 or PO&C and quantitative goals have been established. • 70% or more of the action plans in the FY2016 operation plan are tied to measures 3, 5 and 6 or PO&C and quantitative goals have been established.
Technical Capability KPI (Results)	• Of the action plans that are tied to measures 3, 5 and 6 or PO&C in the FY2015 operation plan, the ratio that achieve the goal set for each quarter is 50 points or higher each month (progress is according to plan).
Ability to Promote Dialog KPI (Internally)	• The self-evaluation of the four behaviors in the “CO: Communication for Enhancing Safety” have improved over the previous quarter.
Ability to Promote Dialog KPI (Externally)	• The ratio of people that answer “Better than one year ago” is more than answered “Worsened.”

In the 2nd and 4th quarters the Nuclear Safety Reform KPI itself and revisions are evaluated.

The various PI milestones which comprise the KPI are stipulated separately in order to achieve the KPI goals.

2.9 External Evaluation

(1) Evaluation Up To the 3rd Quarter Progress Report

As one of the efforts toward nuclear safety reform, we have had the Nuclear Reform Monitoring Committee conduct monitoring and evaluations up to FY2014 from a third-party perspective. The following are the most recent results from the Nuclear Reform m Monitoring Committee (December 1, 2014), comments from Chairman Klein (February 3) and our response to these results.

Topic	Nuclear Reform Monitoring Committee Monitoring Results and Comments from Chairman Klein	TEPCO Response
Nuclear Safety Culture	[Monitoring Results] • It is vital that TEPCO permeates safety culture throughout the entire organization, from upper management to first line managers in the field, and aims to constantly maintain higher standards. In pursuit of this goal, it is evident that TEPCO has commenced activities to compare and assess the behavior and best practices of organizations and their employees that exhibit the world's highest level of nuclear safety. • TEPCO has drafted "Key Performance Indicators (KPI) for quantifying the progress of nuclear safety reform" as recommended by this committee. It was reported that going forward, TEPCO will quickly finalize the KPIs based on the opinions of experts and workers in the field, quantify current progress, set goals and formulate a schedule to achieve these goals. KPI itself is not the objective, but an important means to achieve the objective, and we expect TEPCO to follow through with this initiative and provide a progress report during the next committee meeting.	• 2.8 explains the setting and evaluation of key performance indicators (KPI). • TEPCO will utilize the KPI to make future improvements. • 1.4 explains the cause analysis and recurrence prevention measures for personnel accidents.
	[Comments] • TEPCO is making good progress on setting KPIs. We do understand that measuring the extent to which the company has implemented the various safety-related aspects of the Nuclear Safety Reform Plan is difficult. We will continue to watch KPIs, the metrics and performance of the metrics. • It is important that to penetrate safety culture to the front-line workers and their supervisors. It is critically important that TEPCO fully investigates and understands the root causes of the recent deaths in January to avoid a reoccurrence of similar accidents. • TEPCO needs to demonstrate to front-line workers that schedule does not come before safety.	

Topic	Nuclear Reform Monitoring Committee Monitoring Results and Comments from Chairman Klein	TEPCO Response
Nuclear Safety Oversight Office	[Monitoring Results] • The Nuclear Safety Oversight Office engages in the multifaceted and vigorous monitoring of TEPCO's nuclear safety-related activities and offers advice to the Board of Directors as appropriate. The Board of Directors instructs management to make improvements based on this advice and periodically confirms the status of progress of these efforts thereby enhancing nuclear safety governance, culture and performance. • However, out of the advice offered by the Nuclear Safety Oversight Office, there is still room for improvement and development in regard to items such as nuclear safety assurance and training, so further effort is required in regard to this and other matters. A report on further progress is expected to be heard at the next committee meeting.	• The internal regulatory organization will continue to monitor those executing tasks. • The improvement status of the executing side is as shown in 2.3.
Communication	[Monitoring Results] • The Social Communication Office and risk communicators are making effort to communicate in ways that consider the parties receiving the information, such as using easy-to-understand visuals (photographs and CG animation etc.) to effectively convey complex technical information to siting community. • TEPCO is providing information more timely and with better accuracy, particularly in connection with unexpected events and it is also conducting crisis communication drills such as mock press conferences. • In regards to international communication TEPCO is conveying information on the lessons learned from the Fukushima nuclear accident and the progress of decommissioning and decontamination at Fukushima Daiichi, as well as visiting the embassies of various nations in Japan to provide briefings on these issues. • Communication during times of normalcy as well as during times of emergency has improved from the perspectives of transparency, speed and ease-of-understanding, but the committee would like to see further improvement as well as an external assessment by a third party.	• Continue risk communication activities with the various stakeholders in mind. • In regards to the external evaluation of risk communication, the 1st questionnaire will be held in the 4th quarter and then improvements will be made. • Information on the "Problem Related to the Disclosure of Information Concerning Drainage Path at Fukushima Daiichi" are explained later.

Topic	Nuclear Reform Monitoring Committee Monitoring Results and Comments from Chairman Klein	TEPCO Response
Fukushima Daiichi	[Monitoring Results] • The completion of spent fuel removal from the Fukushima Daiichi Unit 4 is a big step forward. • Work to remove the Unit 1 building cover is being done carefully by implementing radioactive substance dispersion prevention measures and monitoring mechanisms that reflect the lessons learned from the removal of debris from Unit 3 during which there was a dispersion of dust containing radioactive substances. Contaminated water management is improving, such as by performing root cause analysis of troubles that have occurred to date and making efforts to improve/enhance operation, but further effort and improvement is required. • "Reactor decommissioning" differs from "commercial reactor operation" and it is a completely new challenge with which TEPCO has little experience. With the awareness that there will be many difficulties to overcome in the future this committee would like TEPCO to strive to reduce risks associated with the entire site while prioritizing "safety" over "schedule". [Comments] • We view the fact that TEPCO announced it won't meet the target to treat whole contaminated water stored in tanks as positive, because it indicates that the company is looking at safety, not artificial schedule. • TEPCO deserves praise for the successful conclusion of fuel removal from Unit 4. The approach there, to sacrifice meeting an arbitrary schedule so that safety needs could be addressed exactly shows that "safety culture" has been penetrated.	• The spent fuel was removed from Unit 4 without incident and according to plan, and the careful preparations made in advance are an accomplishment that can be applied horizontally to other areas as a good case example. • Processing of all contaminated water[30] is expected to be completed by the end of May. We will continue our efforts to reduce overall risk o the power station.
Kashiwazaki Kariwa	[Monitoring Results] • At Kashiwazaki-Kariwa nuclear power station safety measures based on the lessons learned from the Fukushima Daiichi accident are being steadily implemented. The fact that emergency response training now incorporates various scenarios and is being implemented jointly with external parties as suggested by this committee is a big step forward. • This committee hopes that training details and implementation methods will continue to be revised while TEPCO repeatedly implements training, identifies problems and makes improvements to ensure that training is even more effective, and that the status of these efforts will be conveyed both within and outside of the company.	• We are actively aiming to improve our training so it is at the world's top level. • We are moving forward with a plan to accept IAEA-OSART at the end of June and we will be carefully explaining our efforts while seriously listening

[30] Excludes approximately 20 thousand tons of contaminated water that was produced at the initial stage of the accident and that was affected by sea water among the total amount of 600 thousand tons.

Topic	Nuclear Reform Monitoring Committee Monitoring Results and Comments from Chairman Klein	TEPCO Response
	[Comment] • TEPCO makes physical improvements based on the concept of defense-in-depth including the water system management. For example, the company built a lake above the reactors to keep cores and spent fuels cooled because gravity still works even when everything fails. • It is important TEPCO to benchmark worldwide best practices, and to share its improvements based on the lessons learned from Fukushima accident with international communities. Japan needs to learn from the world and the world needs to learn from Japan.	to the guidance and recommendations from the IAEA.

In regards to external evaluations in FY2015, we are expected to receive a third-party review from not only the Nuclear Reform Monitoring Committee, but also IAEA-OSART, the Japan Nuclear Safety Institute (JANSI) and WANO.

(2) Evaluations During the 4th Quarter

We have received the following recommendation from the Nuclear Reform Monitoring Committee in regards to the "Problem Concerning the Disclosure of Information on Drainage Path" (Announced March 6).

The Nuclear Reform Monitoring Committee provided the following recommendation regarding the state of TEPCO's organization and communication:

- Evaluate whether the Social Communication Office is accomplishing the end desired while also reconsidering the organization, separation of roles, coordination and control between the Social Communication Office, Communication Departments, Fukushima Daiichi Decontamination and Decommissioning Engineering Company, etc.
- Consider the allocation of those in charge of senior communication and other staff at the Fukushima Daiichi Decontamination and Decommissioning Engineering Company.

The examination results will be reported at the Nuclear Reform Monitoring Committee meeting on March 30.

Upon receiving these recommendations, TEPCO has decided to not stop at just recomposing internal resources for recurrence prevention measures, but to switch its basic policy while receiving monitoring and evaluations from outside the company. The company believes it must convert its stance on information disclosure to, "make a policy of disclosing all radiation data related to water and dust which has a direct effect on the surrounding environment and have it checked by experts inside and outside Japan." (Announced March 6)

3. Improvements for FY2015

3.1 Improvement Policy

In regards to our evaluation in FY2014 and the two years since the announcement of the Nuclear Safety Reform Plan we have not only seen results in our ability to propose defense in depth and our emergency response capabilities, but also in our progress in developing tools, etc. such as Nuclear Power Division Management Guidelines. We must steadily make further progress in these areas to solidify these results in the future. On the other hand, we received an inadequate evaluation in regards to change management and this will be improved (Refer to "2.8 Evaluation of the Degree of Achievement of the Nuclear Safety Reform Plan")

The following table describes the evaluation and issues with each action plan.

- Progress according to plan (favorable) or steadily moving forward while solving issues
- Issues present
- Serious problems present

Current Action Plan		FY2014 Evaluation and Issues
Measure 1	Measure 1-1 Improving the safety awareness of management and the entire organization	The "Nuclear Division Management Guidelines" and "Characteristics of People, Leaders and Organizations that Embody a Sound Nuclear Safety Culture" have been established. Management has taken the initiative in setting an example of nuclear safety and enhanced efforts to spread this thinking throughout the organization. Through the implementation of overseas benchmarks and setting the KPI we are actively engaged in accelerating the PDCA and among other efforts. Due to the occurrence of problems related to the disclosure of information on major accidents and drainage path, problems still remain with management to accurately achieve the mindset, planning and intentions of management and nuclear power leaders and it is important that we thoroughly follow through with change management.
	Measure 1-2 Developing nuclear power leaders	Progress is being made according to plan for the prescribed training.
	Measure 1-3 Extending the safety culture	Utilizing the "Characteristics of People, Leaders and Organizations that Embody a Sound Nuclear

Current Action Plan		FY2014 Evaluation and Issues
	throughout the entire organization	Safety Culture" each employee is taking a retrospective look back daily at their own actions and behavior. More enhancements will be made to tying improvements to the data and charts obtained.
Measure 2	Measure 2-1 Implementing monitoring by the Nuclear Safety Oversight Office and improvements through guidance and recommendations	Monitoring by the Nuclear Safety Oversight Office has brought positive improvements to nuclear safety at TEPCO.
		TEPCO has been slow in making improvements on the executive side and even stronger leadership is required.
	Measure 2-2 Improving the role of middle management	We are implementing training to increase management capabilities, work safety, etc. to supplement our weak areas. We need to take a closer look at continuous enhancement measures in the future.
	Measure 2-3 Revising the positioning of Senior Reactor Engineers	Since supporting new regulation standards and recommendations in the Nuclear Safety Reform Plan (appointed from executive level employees) we have strengthened our system for senior reactor engineers and completed this action plan.
Measure 3	Measure 3-1 Implementing competitions to enhance the ability to propose safety improvements	The number of proposals, proposal details (evaluation results) and the ability to achieve them has been improved.
	Measure 3-2 Utilizing operational experience (OE) information both inside and outside Japan	TEPCO has made progress in improving the process from obtaining OE information to screening. A process is underway of steadily resolving delays in the processing of some OE information. OE information has also started being shared in daily operations. Meanwhile, TEPCO is strengthening the process of extracting lessons learned from OE information and applying it laterally across the organization in operations.
	Measure 3-3 Establishing improvement processes through hazard analysis	Thirty hazard analysis have been completed according to plan. Improvements will start according to the plan in the future.
	Measure 3-4 Improvements to periodic safety evaluation processes (safety reviews)	A safety review will be held for Fukushima Daiichi and Daini after Kashiwazaki Kariwa.

Current Action Plan		FY2014 Evaluation and Issues
	Measure 3-5 Revising the separation of roles regarding the manual between the Headquarters and power stations	Although we are finishing revisions to the manual which were planned, we must find even more challenging resources. We will not formulate and implement different measures as new improvement measures, but will work on "inventory check of work" and "cut overtime by half" based on the streamlining report by the Productivity Doubling Committee.
	Measure 3-6 Unified management of results evaluations related to nuclear safety	This has taken root as a method of evaluating operation results. However, validation is required to confirm whether great efforts and results which contribute to improving nuclear safety do in fact lead to actual operation evaluation results and advancement.
	Measure 3-7 Improve the organization's ability to solve issues in cross-section	Progress is being made on introducing IT (MAXIMO development) to maintenance operation processes in the first half of 2016. However, necessary improvements will be made to promote further efforts.
	Measure 3-8 Revise the transfer of personnel between divisions	Additional personnel are required in order to solve issues in the Nuclear Power Division and in the meantime job transfers between divisions is on hold. This measure will be evaluated once personnel changes between divisions is reestablished.
Measure 4	Measure 4-1 Systematic promotion and development of risk communicators (RC)	A list of potential RC candidates has been completed.
	Measure 4-2 Implement risk communication	Evaluations by various stakeholders of risk communication has started. On the other hand, for the drainage path problem, whether the Social Communication Office are accomplishing the initial purpose will be evaluated, and related organization, roles and responsibility, coordination and unification will be reviewed. (recommendation from the Nuclear Reform Monitoring Committee).
	Measure 4-3 Promote and support risk communication activities	Progress is moving forward as planned on improving the capabilities of RC through training and support activities through RC at each location.

Current Action Plan		FY2014 Evaluation and Issues
		The role of RC will be thoroughly worked out through the training of RC in regard to the drainage path problem.
Measure 5	Measure 5-1 Emergency organization restructuring (Introduction of ICS)	Completed in FY2013. In the future this item will be handled as Measure 5 without differentiating between 5-1 and 5-2.
	Measure 5-2 Enhance the ability of power stations and Headquarters to handle emergencies (organization)	Confirm improvement in ability to handle emergencies (organization). Continued improvements will be made through training exercises.
Measure 6	Measure 6-1 Revise power station organization during non-emergencies	Revisions to power station organization during non-emergencies were completed in FY2013. A plan has also been formulated for developing system engineers.
	Measure 6-2 Expand directly managed work to handle emergencies	Directly managed work has achieved its target goals and maintained them. Additionally, we have taken an overall look at measures to improve technical capabilities and arranged Measures 6-2, 6-3 and 6-4. Although the FY2015 Development Plan has been formed, issues still remain such as the location of training, the curriculum, finding competent instructors, etc. and it is important that we steadily follow through with this plan.
	Measure 6-3 Enhance onsite capabilities	
	Measure 6-4 Enhance engineering capabilities within onsite capabilities	

Accordingly, in FY2015 the following improvement policy will be put into effect to revise and improve upon various measures.

1. Key performance indicators (KPI) have proved to be handy for monitoring and the PDCA for various measures will be handled promptly based on this. Milestones, especially will be set quarterly, semi-annually and annually according to how frequently PI and KPI are measured and according to their application (speed up of improvement activities).
2. A change management system will be implemented and focused on in order to fill the gap between the mindset, planning, intentions, etc. of management and nuclear power leaders, middle management who are major administrators in the field and the ability of the Social Communication Office to achieve results.

3.2 Revisions and Improvements to Various Measures

(1) Measure 1: Reforms of Top Management

In FY2014 a variety of efforts were put into full force such as the establishment of the

"Nuclear Power Division Management Policy," daily retrospect activities which utilize the "Characteristics of People, Leaders and Organizations that Embody a Sound Nuclear Safety Culture," overseas benchmarks and other initiatives. For this reason, in addition to these efforts will be continued in FY2015, a review will be performed by management quarterly based on the obtained KPI and PI data to enhance the CA of PDCA and speed up improvements.

Change management and benchmark methods will be utilized to help speed up improvements and improvements will be made on the management side in order to achieve the instruction, etc. that will achieve the mindset, planning, intentions, etc. of management and nuclear power leaders. This includes:

- Clarifying who does what by when and who confirms their work.
- Disassembling large issues into smaller tasks systematically to visualize the issues and results. This will shorten the PDCA cycle.
- In addition to the above, other industries will be used as a benchmark for management and good case examples will actively be incorporated.

(2) Measure 2: Enhancement of Oversight and Support for Management

Monitoring by the Nuclear Safety Oversight Office has brought positive improvements to nuclear safety at TEPCO and this monitoring will continue in the future.

On the other hand, efforts on the executive side in regards to proposals and recommendations by the Nuclear Safety Oversight Office have been slow coming and nuclear power leaders must exhibit leadership in this area. A method of accelerating this effort would be actively utilizing the above change management methods.

(3) Measure 3: Enhancement of Ability to Propose Defense in Depth

Of the action plans in Measure 3, the following especially need enhanced improvement starting in FY2015.

[Revisions to Measure 3-2]

OE information is being utilized and confirmed in specific activities such as an increased viewing rate of newly arrived OE information and the confirmation of OE information in the daily MM[31], etc. (called "Daily OE"). Meanwhile, we must extract the lessons learned, its horizontal development and fixation of OE information due to the repeated personnel accidents, examples of UE information not being thoroughly utilized and similar indications from the Nuclear Safety Oversight Office.

Additionally, in the future just these efforts are seen as inadequate and the combination of multiple other initiatives will be effective. OE information especially is more about learning

[31] It stands for Morning Meeting. Operation details are confirmed daily in a group.

from mistakes and not repeating them. Therefore, in the future we will take the challenge of imitating other nuclear power operators both inside and outside Japan in order to improve our own performance through overseas benchmarks, peer reviews, etc.

[Revisions to Measure 3-5]

In regards to our efforts over the past two years, it is difficult to say our improvements have been adequate on the resource creation side and more challenging improvements were necessary for the increasing number of operations. Meanwhile, the numerical targets for each organization and the action plans for taking inventory check of work and reducing overtime by half have been set based on the Productivity Doubling Committee Streamlining Report put together for all of TEPCO. Because it is unreasonable to implement these efforts and the revisions of Measure 3-5 separately, strongly promoting the doubling of productivity will make it possible to contribute to the creation of reasons which was the initial objective of Measure 3-5. Therefore, the efforts for FY2015 concerning Measure 3-5 will be "taking inventory check of work and reducing overtime by half." The Secretariat of the Nuclear Reform Special Taskforce will provide necessary support in the formulation and execution in streamlining the Nuclear Power Division's side.

(4) Measure 4: Enhancement of Risk Communication Activities

Starting in the 4th quarter of FY2014 each stakeholder will evaluate risk communication. This data will be utilized for looking back on past activities and to continue with improvements. This evaluation is scheduled to occur once a year, but is not limited to this and we will engage in necessary improvements by listening to the opinions, etc. of stakeholders in a number of contact opportunities.

Measures to handle the "problem concerning the disclosure of information on drainage path at Fukushima Daiichi" will be faithfully implemented after a report is made on March 30 to the Nuclear Reform Monitoring Committee.

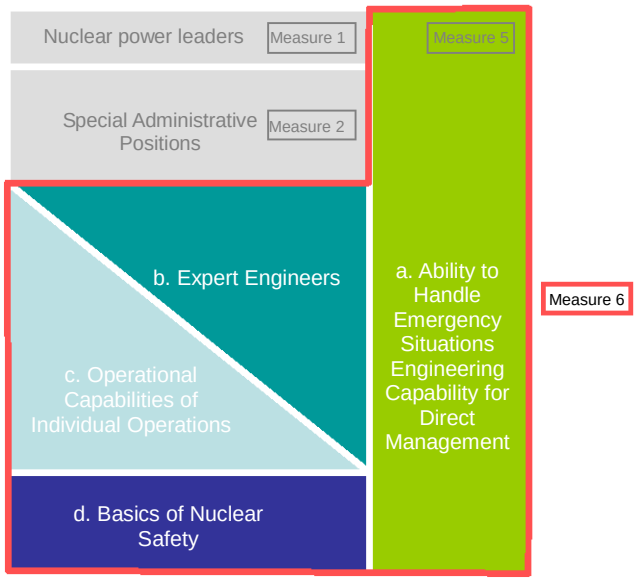
(5) Measure 5: Enhancement of Power Station and Head Office Emergency Response Ability (Organizations)

We will continue to hold repeated individual training and general training to extract issues and make improvements. Issues will be extracted by using the self-evaluation based on PO&C as a reference with the world's top standard as our goal.

(6) Measure 6: Enhancement of (individual) Emergency Response Abilities and On-Site Capabilities

Measure 6 will start with "Establishing System Engineers [Previously Measure 6-1]" and "Direct Work for Support During Emergencies [Previously Measure 6-2]" based on lessons learned from the Fukushima nuclear accident. After that it has been determined necessary to

raise the level of overall technical capabilities and starting in FY2014 we added “Enhancing Onsite Capabilities [Previously Measures 6-3 and 6-4].” The improvements to technical capabilities aimed for in past efforts and the Nuclear Safety Reform Plan (Overall) have been revised into items “a. through d.” in the area handled by Measure 6 as follows.



a. Improvements to Engineering Capabilities for Direct Management to Avoid a Severe Accident [New Measure 6-1]
   We will learn the skills necessary to handle emergency situations on our own initially, such as operating power supply cars, cable terminal connections, etc. (Measure 5 covers the organizations overall emergency support capabilities).
b. Improving Operational Expertise [New Measure 6-2]
   Increase the expertise of operations, such as system engineer capabilities, safety evaluation techniques (PRA), earthquake-proof evaluation techniques, etc.
c. Maintain and Improve the Required Technical Capabilities for Operations [New Measure 6-3]
   Improve the preservation of the required technical capabilities by expanding upon certification training proper for each operational division, promoting the acquisition of certifications, etc.
d. Understanding the Basics of Nuclear Safety [New Measure 6-4]
   Learn general nuclear power knowledge, basic plant information, etc. so that all power plant employees understand the basics of nuclear power safety as a nuclear power operator.

Development plans will be created for each item and performance indicators (PI) set to promote them. The utilization of PI will lead to specific actions, such as helping set development locations, revising curriculums, putting into place educational materials and certifying the competency of instructors.

Furthermore, existing employee development and training related organizations will be looked at and reorganized and the establishment of a Nuclear Safety Training Center (tentative title) will be considered in order to focus on fortifying inadequate areas. Taking a look at the above chart, the Nuclear Safety Training Center (tentative title) will be considered for the follow two features.

- Focusing on Measure 6, the site will function as a training center for new and mid-level employees.
- Focusing on Measures 1 and 2, the site will function as a management school for nuclear power leaders and middle management (including middle management candidates).

Last Statement

During the 4th quarter we experienced a serious accident and problems concerning the disclosure of information regarding drainage path at Fukushima Daiichi which has caused the siting community and the general society much concern and trouble. We sincerely regret any problems these events have caused.

Since starting nuclear safety reforms two years ago with management reforms at the forefront, we still remain in the middle of these reforms and are keenly aware of our need to quickly and strongly move forward with nuclear safety reforms.

The responsibilities of management and nuclear power leaders is especially significant and recognize the need to steadily execute the following.

- The need to exemplify a sound nuclear safety culture through our own actions and behavior and monitor the situation onsite.
- The need to reform the awareness and behavior of middle management that plays a role as missionaries in spreading a nuclear safety culture throughout the frontlines.

Meanwhile, there are areas where we have made significant strides compared to before the Fukushima nuclear accident during our two years of being involved in nuclear safety reforms to make sure a serious accident never occurs again, such as enhancing the ability to propose defense in depth, enhancing emergency support capabilities and more.

Management and nuclear power leaders are promoting nuclear safety reforms and the PDCA cycle with the aim of reaching the world's highest standards for nuclear safety. That is why we will be actively utilizing change management methods.

Under the strong determination of "Keep the Fukushima Nuclear Accident firmly in mind; we should be safer today than we were yesterday, and safer tomorrow than today; we call for nuclear power plant operators that keep creating unparalleled safety," we shall keep addressing nuclear safety reform, while receiving objective evaluations from the Nuclear Reform Monitoring Committee.

We would be more than happy to receive your valuable opinions and comments on our website or directly to us about our ongoing reform.

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