Nuclear Safety Reform Plan Progress Report

(Including Progress on Safety Measure at Power Stations)

(4th Quarter, FY2015)

May 30, 2016

Tokyo Electric Power Company Holdings, Inc.

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Foreword

We would like to extend our deepest apologies for the tremendous inconvenience and anxiety that the Fukushima nuclear accident and contaminated water problems have caused everyone living in the surrounding communities and society as a whole. The entire TEPCO Group will continue to work to facilitate the smooth and early provision of compensation, accelerate the recovery of Fukushima, move forward steadily with reactor decommissioning, and thoroughly ensure nuclear safety.

Tokyo Electric Power Company Holdings released the “Reassessment of Fukushima Nuclear Accident and Nuclear Safety Reform Plan” on March 29, 2013, and we are currently proceeding with nuclear safety reforms. The progress made is verified quarterly and the compiled results made public.

This report focuses progress made in the fourth quarter (January-March 2016[1]) of FY2015, assesses the progress made during FY2015 and includes planned improvements for FY2016.

As confirmed some time ago, the Third-Party Verification Committee has been set up and begun to investigate issues related to notifications and reports about core meltdowns at Fukushima Daiichi Nuclear Power Station Units 1-3 as well as the erroneous explanations given to the Niigata Prefecture Technical Commission. Meanwhile, everyone witin the organization as been reminded of the criteria for determining and reporting emergency situations at the power station that are mentioned in the current manual.

With regard to the causes as to why core meltdowns at Fukushima Daiichi Nuclear Power Station Units 1-3 were not able to be promptly announced at the outset of the Fukushima nuclear accident, we have revised our emergency response structure and training and are verifying improvements through training on issuing notifications and public announcements as was reported in the “Reassessment of Fukushima Nuclear Accident and Nuclear Safety Reform Plan” (March 29, 2013). Nevertheless, because we did not sufficiently confirm that standards for determining a core meltdown were provided in our internal manuals and there was insufficient sharing of such information among the relevant parties internally, we provided an erroneous explanation to the Niigata Prefecture Technical Commission that “there was no basis for determining a core meltdown.”

We would once again like to profoundly apologize for creating a situation in this case that brought great inconvenience and anxiety to the people of Fukushima Prefecture and Niigata Prefecture as well as society at large.

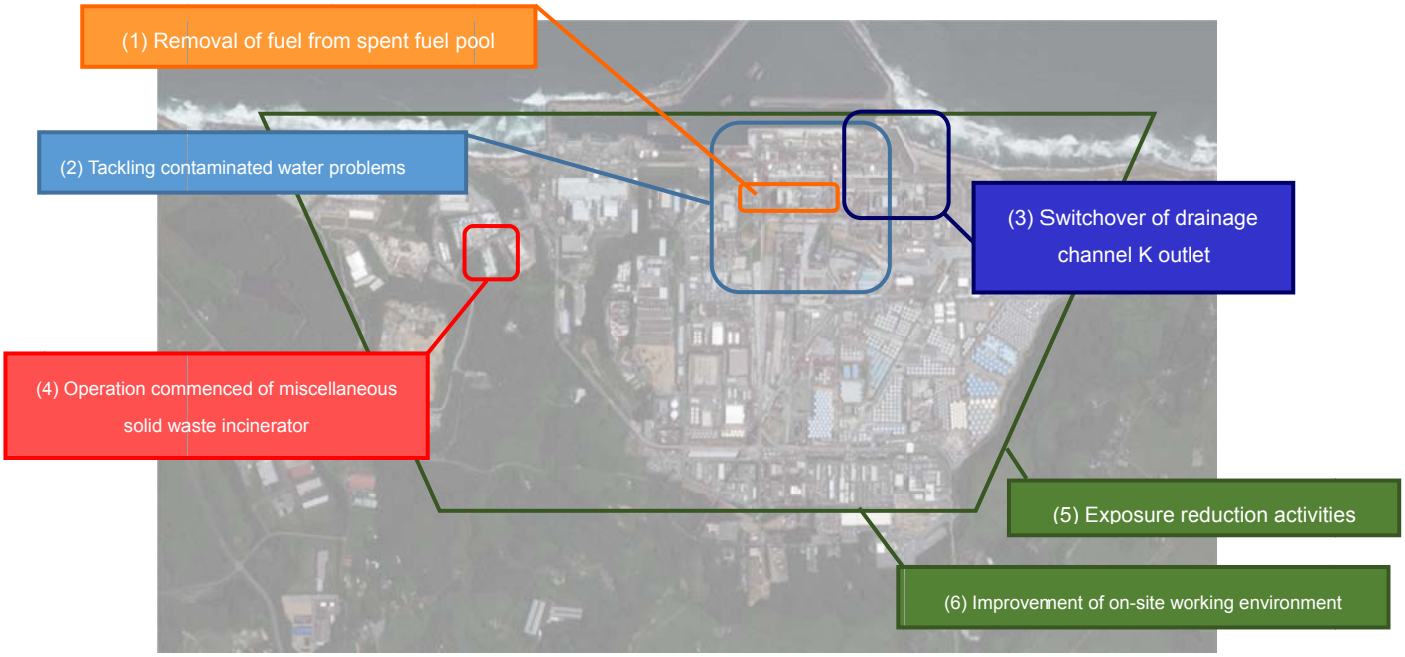
Based on the results of the investigation by the Third-Party Verification Committee, we will steadily implement measures to prevent any such recurrence and work to restore trust in our company.

[1] Calendar dates in this report refer to 2016 unless otherwise noted.

1. Progress on Safety Measures at Power Stations

1.1. Fukushima Daiichi Nuclear Power Station

Progress has steadily been made on decommissioning the reactors at Fukushima Daiichi Nuclear Power Station (“Fukushima Daiichi NPS”) in accordance with the Mid-and-Long-Term Roadmap Towards Decommissioning of Fukushima Daiichi Nuclear Power Station Units 1 to 4 (revised June 12, 2015). In FY2015, we made substantial improvements in enhancing the working environment on site, addressing the problem of contaminated water, and other issues.



Progress made on the principal work at Fukushima Daiichi NPS

(1) Removal of Fuel from Spent Fuel Pools

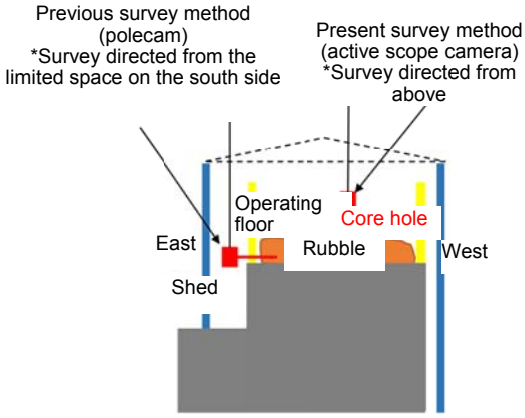
- Unit 1

  Work began on the installation of a sprinkler system to control dust dispersion accompanying dismantlement of the reactor building cover (February 4). Since this work was started, there have been no significant fluctuations in measured values indicated at dust monitors or monitoring posts. Also, a preliminary survey was initiated of the condition of rubble on the reactor building operating floor (March 28). Based on the survey results, a plan will be formulated for investigating rubble under the collapsed roof.

  Preparations are continuing with the aim of beginning the work of fuel removal in FY2020 (fuel rod bundles stored in the spent fuel pool: 392).

Spraying anti-scattering agent on rubble

Steel plates fitted for installation of pipes extending to spray nozzles



Survey methods and devices

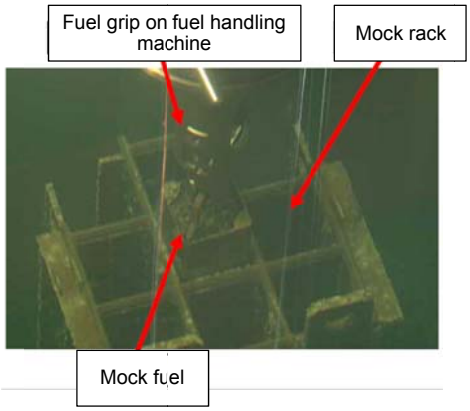
Active scope camera

(Around two openings approx. 200mm were made in the concrete of the collapsed roof, and active scope cameras inserted to check the range of visual confirmation below the collapsed roof, visibility and operation time.)

- Unit 3

Exposure dose reduction measures, such as decontamination and shielding installation, have been implemented with the aim of reducing exposure dose in areas entered by workers on the reactor building operating floor. With the exception of some areas (fresh fuel storage shed area), decontamination was completed on March 7. Since April, shielding has been placed on the upper part of the reactor building. Also, a mock fuel pool was erected at a manufacture's plant so that realistic training might be carried out to prepare personnel for remotely operating devices to remove fuel (February-December 2015).

The removal of fuel from the spent fuel pool is scheduled to begin in FY2017 after a fuel removal cover and new fuel handling machinery have been mounted (fuel rod bundles stored in the spent fuel pool: 566).

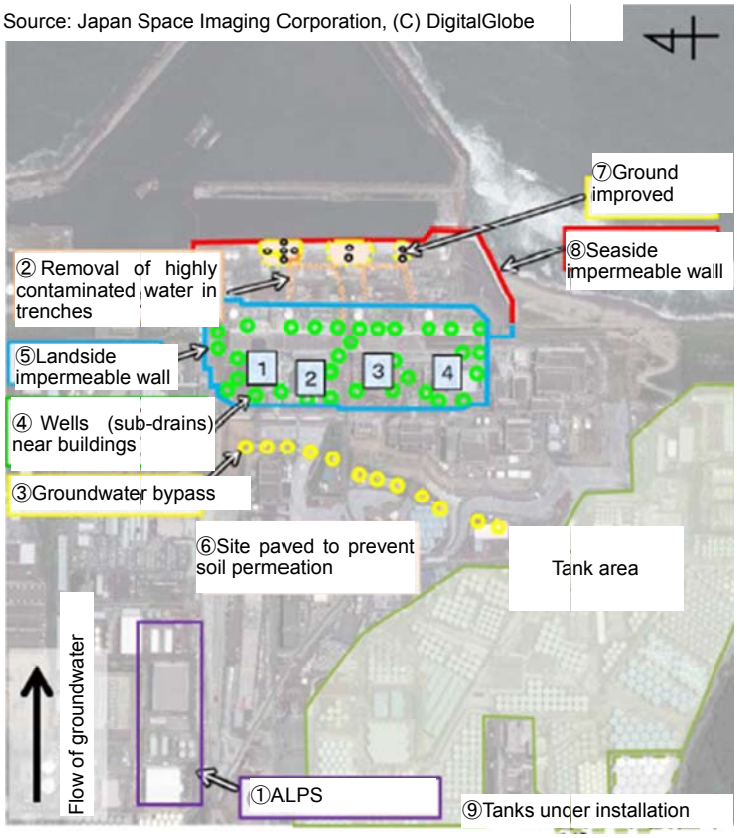


Training with remotely operated devices (remote operation room) Remote training operation (fuel removal)

(2) Addressing the Problem of Contaminated Water

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

Measures to remove contamination sources		
Cleaning up contaminated water using the Advanced Liquid Processing System (ALPS)	Figure①	Completed May 2015
Removal of contaminated water from inside seawater pipe trenches	Figure②	Completed December 2015
Measures to isolate water from contamination sources		
Drawing up groundwater through groundwater bypasses	Figure③	Operation commenced April 2014
Drawing up groundwater through wells (sub-drains) near buildings	Figure④	Operation commenced September 2015
Installation of frozen-soil impermeable wall on land side of units	Figure⑤	Operation commenced March 2016
Pavement of site to keep rainwater from permeating the soil	Figure⑥	Work ongoing
Measures to prevent leakage of contaminated water		
Improvement of ground with soluble glass	Figure⑦	Completed March 2014
Installation of impermeable wall on seaside of units	Figure⑧	Completed October 2015
Installation of tanks (replacement with welded tanks)	Figure⑨	Work ongoing



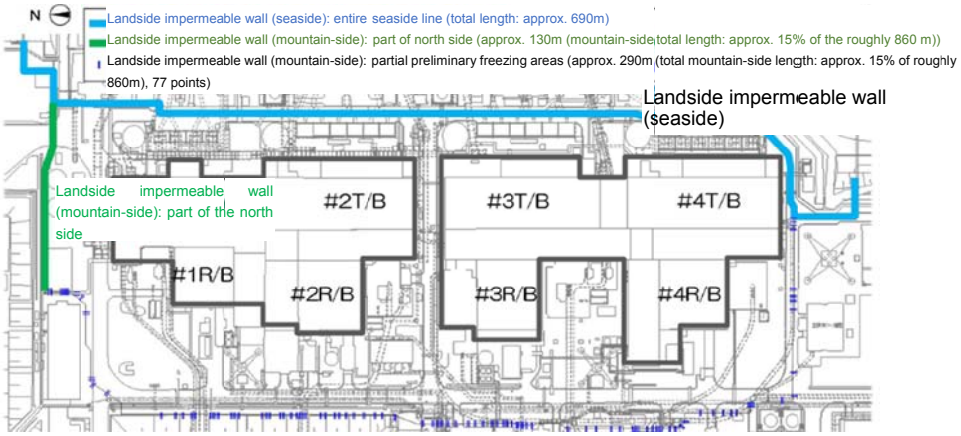
Principle work items related to contaminated water countermeasures

- Freezing Initiated for Landside Impermeable Wall

  On February 9, preparations were completed for freezing the landside impermeable wall surrounding Units 1-4 and approval was given on March 30 to execute the implementation plan for the landside impermeable wall (first stage). On March 31, freezing was initiated across the range set for the first stage (Phase 1) (entire seaside line along with preliminary freezing of some areas to the north and on the mountainside (areas where there is significant space between freezing pipes and thus more difficult to freeze, etc.)).

Freezing pipes (west side of buildings at Units 2-4)

Conditions after freezing initiated



Closure of landside impermeable wall in the first stage (Phase 1)

- Isolation of Water Accumulated inside Unit 1 Turbine Building from Circulating Cooling Water Injection Line

  In order to prevent contaminated water that has accumulated inside buildings from flowing outside the buildings, water levels have been managed so that the water level inside a building is brought down below the level of groundwater around the buildings. The accumulated water inside the buildings had been sent to a contaminated water treatment facility by means of a transfer pump set up in the turbine building. However, in August 2015, additional transfer pumps were installed in each building and more water level gauges were mounted in addition to other measures that enhanced system reliability and monitoring. These measures have brought water levels down incrementally. Also, from the standpoint of dramatically reducing the quantity of groundwater flowing into the turbine building, subdrains have been operational since September 2015, which have also gradually lowered the groundwater level and hindered production of contaminated water.

  On March 7, these efforts resulted in bringing the water level inside the reactor building, which is a source of contaminated water, below the level of the connections to the turbine building. We have verified that the water levels are being stably maintained. On March 16, TEPCO determined that channels had been severed through which accumulated water had flowed between the reactor and turbine buildings.

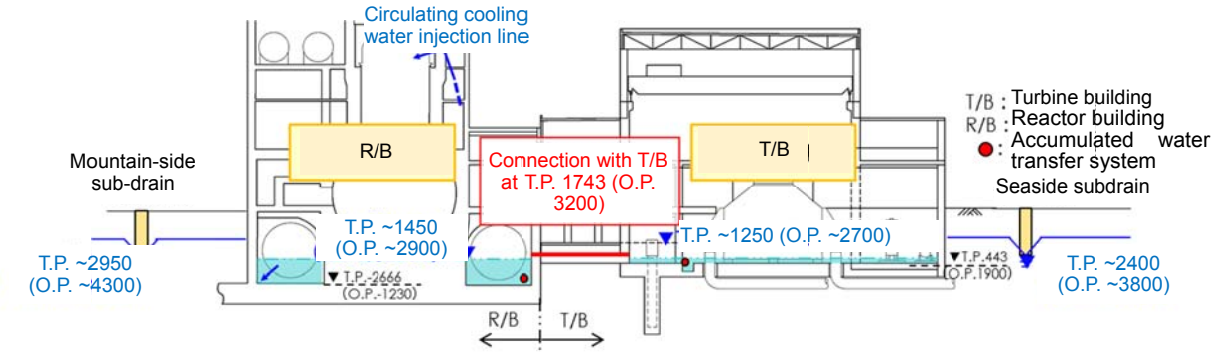
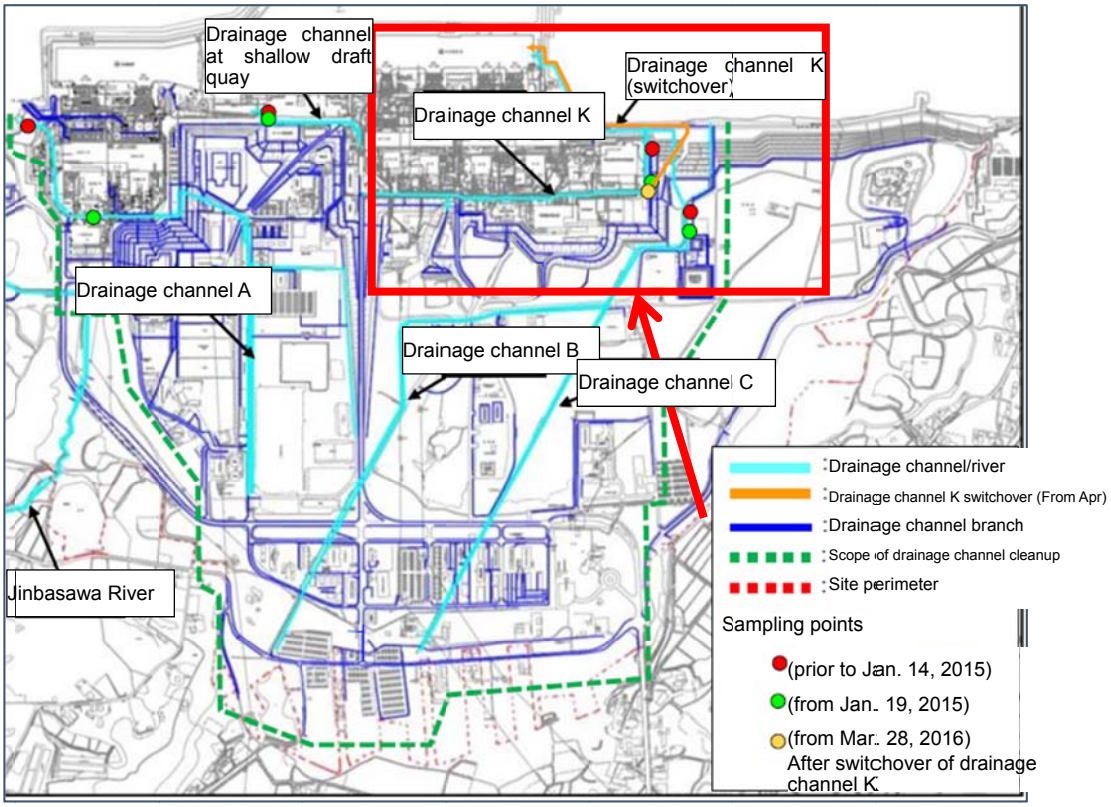


Diagram showing water levels at Unit 1

(3) Shifting the Drainage Channel K Outlet to Inside the Port

Work was completed on shifting the outlet of drainage channel K, which discharges rainwater from around buildings at Units 1-4, from outside the port to inside the port. Rainwater began to be discharged from the revised outlet into the port on March 27. On March 28, a cut-off wall was erected along the existing route, thereby completing the switchover.

Outlet for drainage channel K after switchover



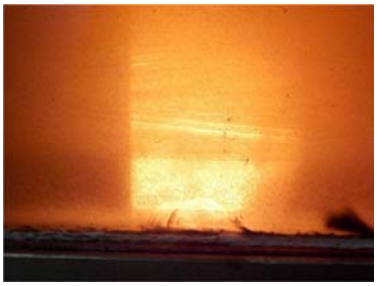
Location of drainage channel K

(4) Commencement of Operation of Miscellaneous Solid Waste Incinerator

Testing was conducted to verify function and performance of the miscellaneous solid waste incinerator, which incinerates spent protective clothing and other articles temporarily stored within the Fukushima Daiichi NPS premises, thereafter the system went into operation on March 18.

Waste material loading area

Control room



Inside the incinerator

(5) Activities for Reducing Radiation Exposure

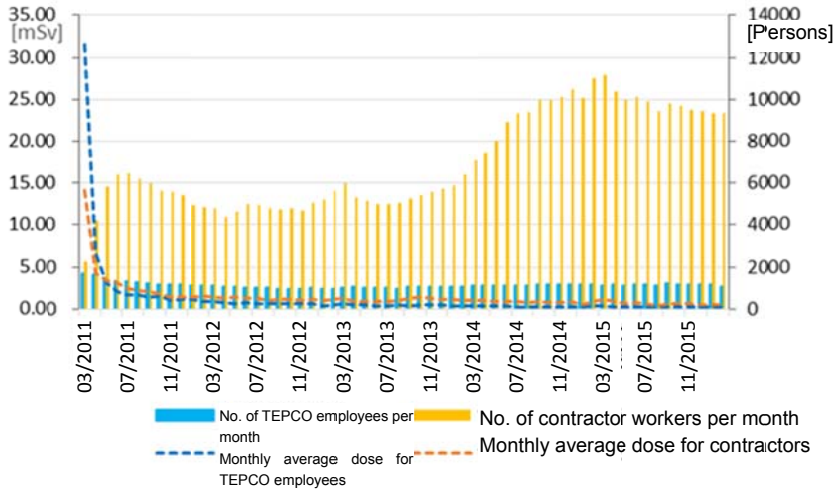
Right after the accident, radiation dose rates and contamination levels within the power station were high as was radiation exposure (individual and group). Consequently, the impact of the accident did not allow for the use of systems to manage radiation exposure, thereby obligating the manual collection of data to record individuals' exposure to radiation.

Also, because service buildings were damaged by the tsunami, electronic personal dosimeters, which had been kept on hand inside these buildings for such situations, were no longer usable, so not enough personal dosimeters were available until the end of March 2011, and some of the recording work was done by having work crew representatives wear dosimeters in lieu of all personnel.

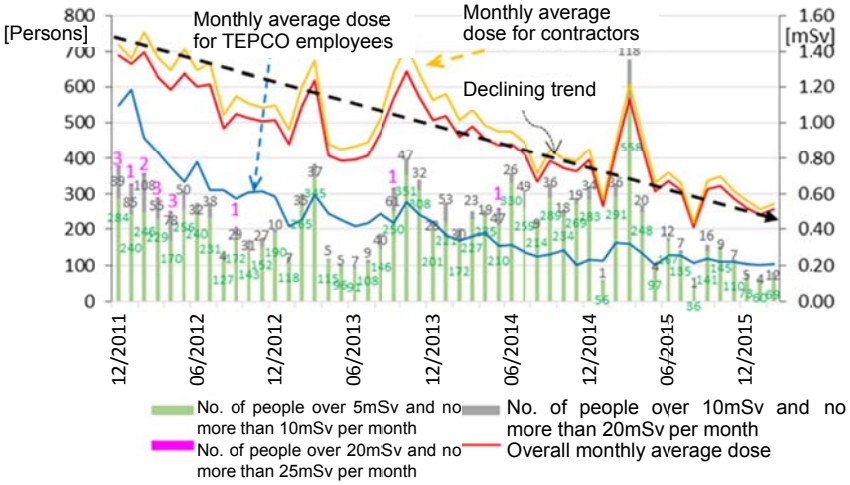
TEPCO continues to work to address these issues and make improvements such as those described below.

- Personal Dose Reduction

  The exposure dose in March 2011 (monthly average) was 31.53mSv for TEPCO employees and 14.16mSv for contractor workers. However, these levels were reduced to 0.18mSv for TEPCO employees and 0.56mSv for contractor workers by March 2016.



Monthly average exposure dose and monthly number of workers since the accident



Monthly average exposure dose and monthly number of people with exposure dose exceeding 5mSv since December 2011

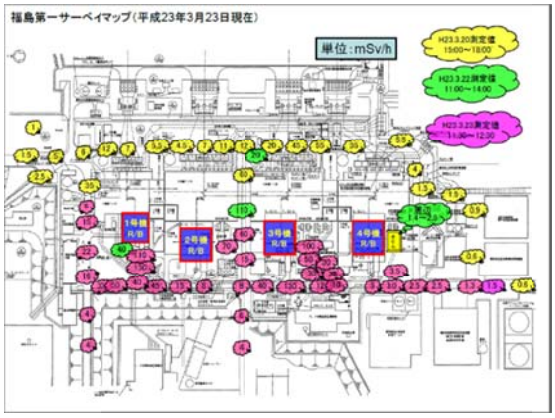
- On-Site Dose Reduction

  As a result of advances made in decontaminating areas which had been contaminated by fallout[2], means were employed for removing high-level rubble including topsoil removal, roadbed paving, gunite shooting and other techniques (facing, etc.). As of the end of FY2015, the targeted dose rate of 5μSv/h was achieved (pre-decontamination level: max. 3mSv/h) for all areas with the exception of the areas around Units 1-4 and waste storage areas.

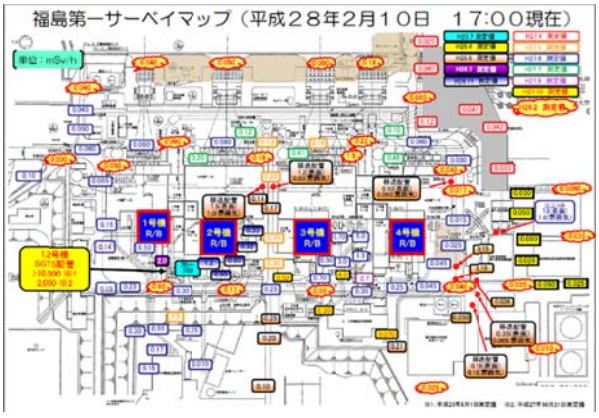
  Also, dose rate monitors have been set up in the field and values displayed in real time so that workers within the station premises are able to check the dose rate at their worksite (total of 86 units).

  Moreover, large-screen displays have been placed in easy-to-view locations within the Main Anti-Earthquake Building and access control building so that on-site dose rates (atb86 points) and dust concentrations (atb10 points) may be checked prior to going out in the field.

[2] Dust and other fallen rubble contaminated with radioactive materials.



Map of radiation levels within the station in March 2011



Map of radiation levels within the station in February 2016

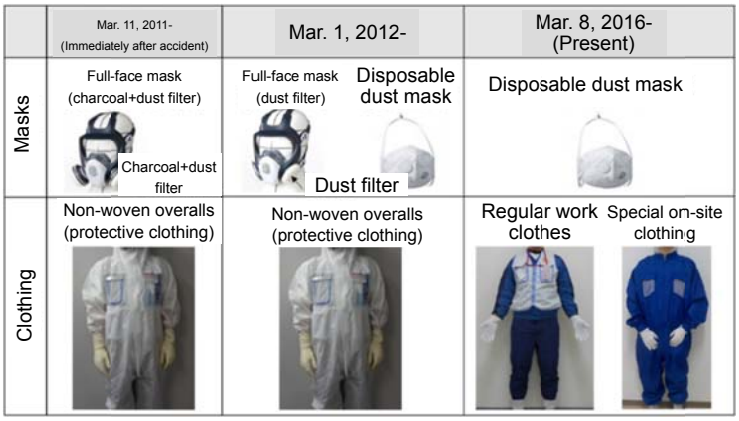
Dose rate monitor setup

Image shown on a large-screen display

- Changing of Protective Gear to Reduce Load on Workers

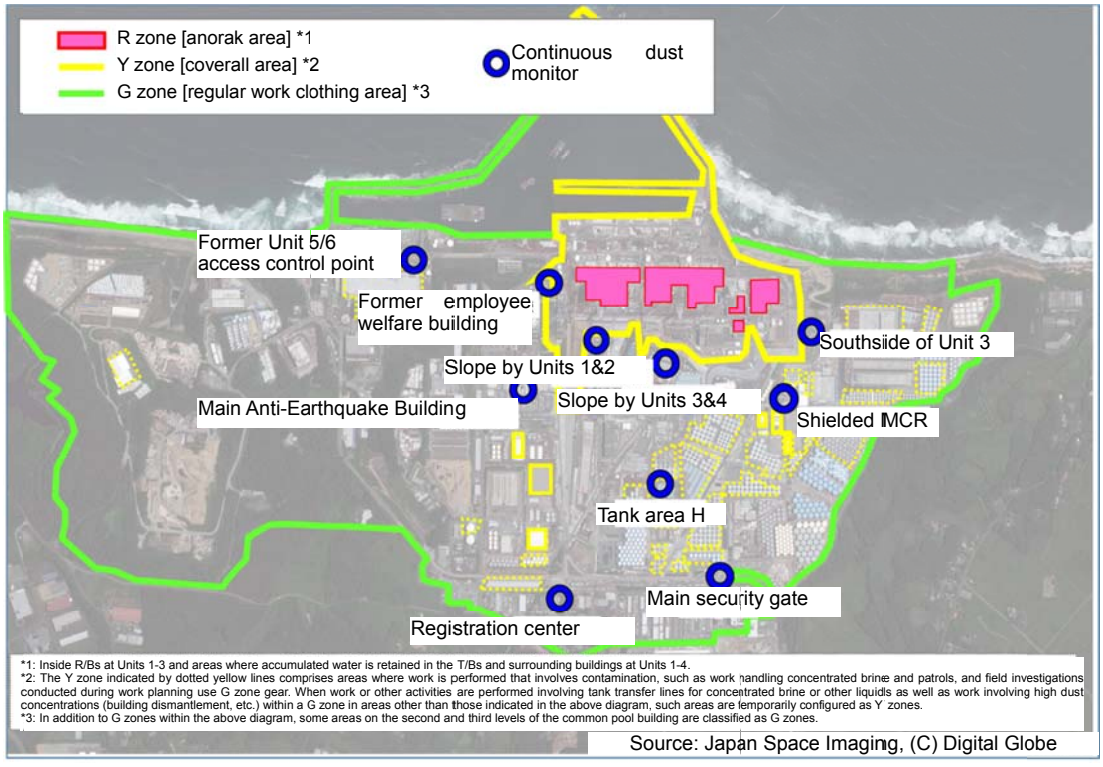
  Immediately after the accident occurred, atmospheric concentration of radioactive materials on site was high, so workers had to perform their tasks while wearing full-face masks equipped with charcoal filters. However, a decrease in the iodine-131 concentration was verified, thereby allowing a change to be made in March 2012 from full-face masks with charcoal filters to full-face masks with dust filters.

  Also, we are continuing to promote measures to reduce ambient dose. In areas where it has been confirmed that the concentration of radioactive materials in the air is below the level set in guidelines for wearing masks, work practices are being successively modified so that full-face masks no longer need to be worn and workers may wear disposable dust masks. In May 2015, the range of such areas was extended to approximately 90% of the site premises.



Major transitions in protective gear

On March 8, 2016, a classification was instituted dividing the site into “high contamination areas,” which includes the areas around the buildings at Units 1-4 and those where tanks are being dismantled, and “other areas.” We reassessed the protective gear required for such areas, revising our practices so that work may be performed in regular work clothes or special on-site clothing across approximately 90% of the station premises. We will continue to make improvements in the working environment within the power station, and endeavor to alleviate the burden placed on workers and improve workability through the employment of protective gear that corresponds to the radiation environment.



Management of contamination-based area classifications and locations of rooms for switching protective gear

R zone (Anorak area)	Y zone (Coverall area)	G zone (Regular work clothes area)
Full-face mask 	Full-face mask or half-face mask  	Disposable dust mask 
Anorak over coveralls  or double-layer coveralls	Coveralls 	Regular work clothes*3 Special on-site clothing  

*1: For work inside buildings including water treatment systems (ALPS, etc.) (excluding inspections or other observations), full-face masks are worn.
*2: Full-face masks are worn during work in areas where tanks are located that contain concentrated brine or Sr treated water (excluding work not handling concentrated brine, etc., patrols, field surveys during work planning, observations or other such activities) and during work involving tank transfer lines.
*3: Designated light work (patrols, monitoring operations, transporting particles brought in from off-site, etc.)

Main Protective Gear for Each Zone

- Reduction of Exposure Doses Resulting from Work

  TEPCO has specified basic rules to eliminate non-conformances related to radiation protection. In August 2013, we restarted on-site observations of TEPCO radiation control personnel for the purpose of providing advice which might lead to improvements reducing exposure. Moreover, in February 2014, we once again began to prepare radiation control plans prior to initiating work.

  Additionally, in October 2014, we launched the ALARA Council (chair: Power Station Deputy General Manager) which conducts early reviews and makes proposals on engineering measures (measures applying physical steps for reduction including remote operation, shielding installation and removal of radiation sources) to optimize exposure dose reduction.

  As a result of these efforts, the initial estimated exposure dose during work on the landside impermeable wall, which was approximately 68 man-Sv, was revised down to a planned dose of 40 man-Sv thanks to a variety of engineering measures implemented, including rubble removal and erection of a concrete wall. Actual levels measured during installation of the landside impermeable wall have been around 34 man-Sv (as of March 6, 2016).

Meeting of contractor radiation protection personnel and
TEPCO radiation protection personnel

- Improvement of Tabulation of Individual and Group Exposure Doses
  When the accident initially occurred, the system for managing exposure doses was rendered inoperable, so the exposure dose for each worker was managed manually. Since April 14, 2011, workers have been issued badges and a simplified system instituted for compiling dosimeter and worker badge data, which has eliminated the work of manually managing such data. Moreover, on February 13, 2012, the individual exposure dose management system went into operation, linking together personal data, dosimeter data, and project job data. This has made it possible to check actual records of group dose levels in project units.

(6) Improvement of On-Site Working Environment

- Opening of Convenience Store in Large Rest Center
  A convenience store was opened on the second level of the large rest center (March 1). TEPCO will continue to take into account the wishes of everyone working at Fukushima Daiichi NPS in working to improve selection and quality of the products available.

Convenience store opening day (March 1)

➢ Enhancing Communication with Everyone Working at Fukushima Daiichi NPS

○ Website “1 For All Japan”

In October 2015, a website opened for all of the approximately 7,000 workers at Fukushima Daiichi NPS and their families. Since the website was launched, it has garnered an average of 28,000 views monthly. TEPCO will continue to work to enhance website content.

○ “1F Monthly”

In conjunction with the website “1 For All Japan,” the newsletter “1F Monthly” is being distributed throughout J-Village and the Fukushima Daiichi NPS site (approx. 2,000 copies circulated). The March edition features an interview with Kazuto Tatsuta[3] and messages of support from various fields for everyone working at Fukushima Daiichi NPS.

Website

“1F Monthly” (March edition)

1.2. Fukushima Daini Nuclear Power Station

Since the accident, TEPCO has implemented safety assurance measures to maintain the cold shutdown, conducted training, made preparations for a severe accident based on the lessons learned from the Fukushima nuclear accident, and undertaken activities to support reactor decommissioning at Fukushima Daiichi NPS.

(1) Progress in Implementing Safety Measures

➢ Closure of Spent Fuel Pool Gates

At Fukushima Daini NPS, fuel in reactors at all units had been moved to spent fuel pools by the end of FY2014. It is being comprehensively managed in the spent

[3] Author of the manga “1F: Account of Working at Fukushima Daiichi NPS,” which is based on the author's own actual experiences.

fuel pools from the perspective of streamlining maintenance and management of facilities and equipment. Also, beginning in FY2015, we implemented work to close the gates between the spent fuel pools and reactor wells[4]. In conjunction with this task, a steam dryer and steam-water separator, which had been stored in a temporary storage pit, were moved into the reactor, and work gradually moved forward to drain water from the reactor well and the pit where such equipment was temporarily placed. In FY2015, this work was completed at Units 1, 2 and 3.

<Record of work performed at each unit>

・Unit 3: Gate closed on September 14, 2015 and well drainage completed on September 30, 2015

・Unit 1: Gate closed on November 10, 2015 and well drainage completed on November 26, 2015

・Unit 2: Gate closed on January 22, 2016 and well drainage completed on February 3, 2016

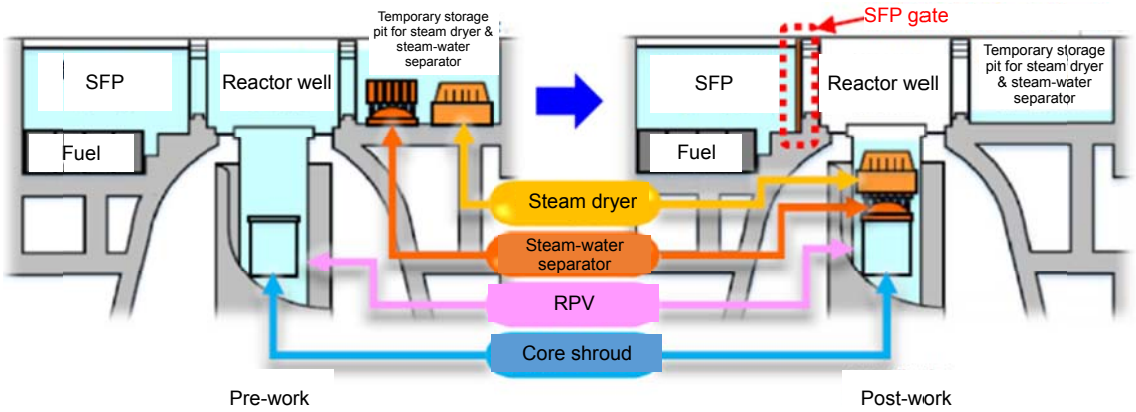
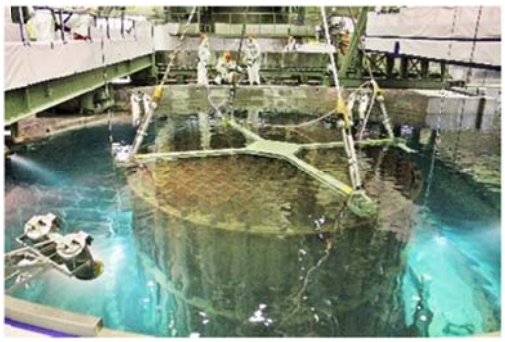


Illustration of work process for closing pool gate



Work of moving steam-water separator into reactor

➢ Anti-Siphoning Measures for Spent Fuel Pool Cooling Pipes

In the spent fuel pools, the spent fuel is cooled by injecting cooling water from a pipe inserted at a point near the pool bottom from above the pool to reclaim water from the top layer of the pool. A valve has been installed to prevent pool water from flowing backward into the pipe if this cooling water injection pipe ruptures at a level lower than the pool water surface which would trigger a siphoning phenomenon.

[4] Because the control area is limited to the spent fuel pool, the risk of leakage due to damage, operation execution or other failure of pipes or machinery connected to the reactor may be avoided.

Just in case this valve does not function, the pipe has been perforated to improve reliability of spent fuel cooling.

<Record of work performed at each unit>

・Unit 3: Measure completed on January 7

・Unit 1: Measure completed on February 3

・Unit 4: Measure completed on March 2

・Unit 2: Measure completed on March 25

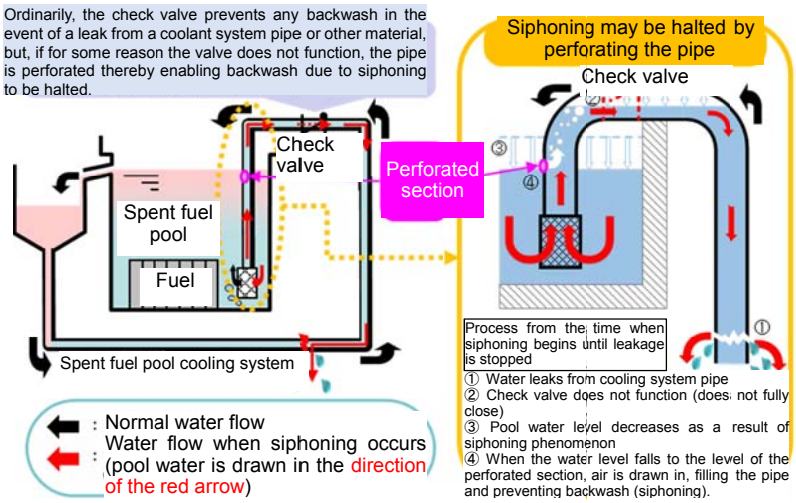
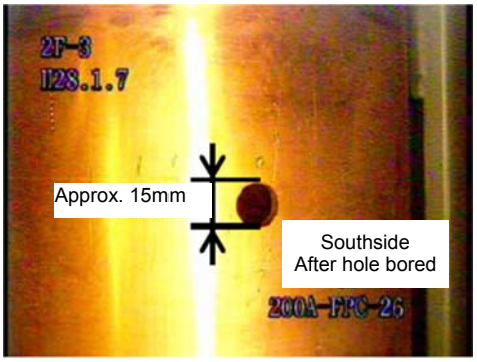


Illustration of siphoning phenomenon in spent fuel pool



Perforated pipe (Unit 3)

(2) Status of Education and Training Conducted to Maintain Cold Shutdown

➢ Status of Training Conducted to Enhance Technical Skills for Direct Management of Work

The training, which was launched based on the lessons learned from the Fukushima nuclear accident and has been conducted by dividing employees into

four teams[5] to enhance their technical skills to directly manage work, has entered its third year, bringing the process to a new step in aiming for these teams to be able to "resolve an emergency situation by exercising the practical skills they have gained through daily training even if an unexpected event develops into an emergency."

As part of this effort, to further develop basic technical capabilities, training is conducted assuming a high radiation level and high contamination work environment where trainees where full-face masks, coveralls and other such protective gear. Training is also conducted in performing such work at night. TEPCO will continue to provide such training as we work to enhance our employees' technical skills for directly managing projects.

Signaler issuing cues to load a cable reel

Unloading a cable reel

Laying cable

Splicing a cable

TEPCO personnel wearing coveralls and full-face masks during training to improve their direct-management technical skills

➢ Practical and Experience-Based Training

Practical and experience-based training have been conducted to raise safety awareness in the workplace.

○ Risk Simulation Training

Two sessions of risk simulation training were conducted over the year to

[5] In case the equipment needed for a cold shutdown was destroyed by a large scale disaster, four teams (rubble removal, motor replacement, cable connection and pump restoration) are to be formed of only TEPCO employees, who worked to respond to the accident and restore facilities and equipment for first three days of the accident.

enable trainees to actually experience potential risks in the workplace. The two training sessions in FY2015 were held for three days each in September and March, during which a total of approximately 550 station employees and contract workers participated.

Steel pipe piercing a helmet

Experience simulating what it is like to be caught between blocks

Experience simulating what it is like to be entangled by a rotating tool

Experience simulating what it is like to be hanging by a safety belt

○ Hazard Anticipation Training

Hazard anticipation training was conducted to teach personnel to foresee hazards hidden in the workplace so as to prevent accidents before they occur. Facilities were set up re-creating worksites, such as actually assembling scaffolding within the power station premises. Approximately 360 station employees and contractor personnel participated in this training in FY2015.

Checking for hazards at a worksite where open flame is used

➢ Machine Shop Opened and Machinist Training Provided

As part of TEPCO's efforts to strengthen our capability to undertake recovery work during an emergency, a machine shop was opened on June 9, 2015 so that personnel may learn welding, cutting and other basic techniques through actual work experiences on the power station premises. At this facility, under the instruction of contractor personnel possessing a wealth of such work experience, trainees learn how to handle welders, power tools and other implements as well as the precautions to be aware of when doing so. They use machine tools to acquire skills for working with steel, such as cutting, polishing and welding. In FY2015, 15 station personnel underwent training for a total of 27 days. Experience in performing such work leads to a heightened awareness of work safety and this experience can also be put to use when supervising work in the field.

Machine shop opened at Fukushima Daiichi NPS

Using a machine tool to process steel

Welding steel under an instructor's guidance

Demonstration by a contractor worker

(3) Assistance with Fukushima Daiichi NPS Reactor Decommissioning

Fukushima Daini NPS has provided various levels of support for safely and reliably implementing the reactor decommissioning work at Fukushima Daiichi NPS.

<Support operations carried out in the 4th quarter (all support currently ongoing)>

- Transporting Fukushima Daini NPS low-level radioactive waste transport containers to Fukushima Daiichi NPS
- Laundering special undergarments for use in control zones

- Temporarily storing assembled tanks for contaminated water storage (steel circular tanks)
- Supervising sand slurry production to be used in covering the seabed inside the port

1.3. Kashiwazaki-Kariwa Nuclear Power Station

(1) Progress in Implementing Safety Measures

At Kashiwazaki-Kariwa Nuclear Power Station ("Kashiwazaki-Kariwa NPS"), we are advancing safety measures principally at Units 6 and 7, for which applications have been presented to amend the reactor establishment licenses, based on the lessons learned from the experience of the Fukushima nuclear accident.

<Overview of Safety Measures>

Preparations for tsunami and interior inundation	• Installation of 15m high seawalls, tidal walls, waterproof doors and other structures for protecting important facilities and equipment inside buildings from inundation caused by a tsunami • Tsunami monitoring cameras have been set up so that the emergency response headquarters and main control rooms are able to monitor a tsunami if one strikes • In order to prevent the inundation of important safety facilities in cases where the interior of a building is flooded as the result of damage to equipment inside the building, building penetrations have been waterproofed, doors to important equipment rooms have been made watertight and permanent sump pumps have been installed that operate using emergency power sources
Preparation for power loss [Augmenting power sources]	• In order to ensure power even in cases of a station blackout, power sources have been multiplexed and diversified through the deployment of gas-turbine generating vehicles, installation of emergency power panels, as well as the deployment of multiple power supply cars, alternative DC batteries and other such equipment • In order to augment means for injecting cooling water into the reactors even if all power is lost, preparations have been made to ready the means for injecting cooling water into reactors by installing alternate high-pressure cooling water injection pumps (steam turbine driven pumps), preparing alternate means for injecting cooling water into reactors using the make-up water condensate system powered by a gas turbine generating vehicle, and setting up cooling water injection heads outside reactor buildings so that fire engines may be used to inject cooling water from outside the building

Preparations against damage to the reactor core or spent fuel [Augmenting heat removal and cooling functions]	• In order to provide an ultimate heat removal means as a measure to prevent a severe accident, an alternate reactor core component cooling system was installed • Reservoirs have been built to ensure water sources • To maintain cooling of the spent fuel pool, cooling water injection heads have been installed outside the reactor building so that cooling water may be injected using fire engines and a supplemental line has been added, which is independent from the existing pool cooling system
Preparations against damage to reactor containment vessel or reactor building [Measures to prevent damage due to excessive PCV pressure and counter hydrogen explosions]	• To augment the means for depressurizing the reactor pressure vessel, backup portable batteries, nitrogen cylinders and air compressors have been deployed • To prevent hydrogen from accumulating and remaining inside the reactor building, static catalytic hydrogen recombination systems, hydrogen discharging top vents and other equipment have been added
Preparations against dispersion of radioactive materials	• To curb the dispersion of radioactive materials outside the site, water sprinklers (high-capacity water cannons, etc.) have been deployed so that cooling water can be injected from outside the reactor buildings
Preparations against fires [Measures against external and internal fires]	• Fire belts have been established to prevent forest fires from spreading to the reactor facility • To prevent important safety facilities from being rendered unusable due to a fire inside a building, measures have been taken to fireproof penetrations, and different types of fire detection devices have been added as well as stationary fire extinguishing equipment, refractory walls, fire dampers, cable wrappings and other such measures[6]
Enhancing the emergency response	• Communications equipment has been augmented in order to ensure the means for notification and communication (satellite phones installed, etc.) • Multiple access routes have been readied and the roads reinforced in order to ensure emergency vehicle access

[6] Cable trays and other equipment are enclosed in fire-resistant wrappings having resistance duration of three hours or longer.

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

The status of progress made on projects during the fourth quarter is described below.

- Enhancement of Heat Removal and Cooling Functions
  - ○ Installation of Alternate High-Pressure Cooling Water Injection System

    In order to prevent core damage, a new alternate high-pressure cooling water injection system driven by a steam turbine has been added to the existing high-pressure coolant injection system, which is the reactor core isolation cooling system, to create multiple tiers of reactor coolant injection systems. At both Units 6 and 7, installation has been completed of the main pump unit for the alternate high-pressure cooling water injection systems. At Unit 6, installation of pipes and supports as well as laying cables is still ongoing. The installation work has been completed at Unit 7 and trial operation of the system is in the planning stage.

DC125V switchboard for alternate high-pressure cooling water injection system pump (Unit 7)

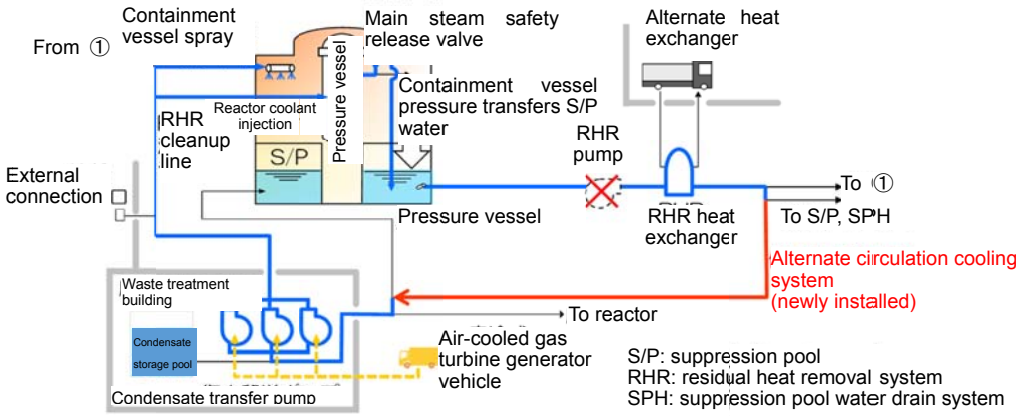
- Preventing Damage to Pressure Containment Vessel (PCV) from Over Pressurization
  - ○ Installation of Above-Ground Filtered Venting Equipment

    Filtered vents will be installed so that, when pressure or heat are released externally to prevent damage to the reactor containment vessel, gaseous organic iodine and particle radioactive materials released into the atmosphere are filtered to reduce such quantities, and work is currently underway on installing such equipment at Units 6 and 7. At Unit 7, pressure and ventilation tests have been completed, and the iodine filters (capable of removing over 98% of the organic iodine) have been fitted (on November 28, 2015), and work is currently underway on a drain transfer system and other peripheral

engineering work. At Unit 6, the fitting of iodine filters above the main filtered vent unit was completed on January 15, and peripheral engineering work is currently underway.

Pipes fitted around an iodine filter (Unit 7)

○ Work is proceeding on installation of an alternate circulation cooling water injection system in order to control a rise in pressure by cooling the inside of a reactor containment vessel where the alternate circulation cooling system is mounted and to prevent damage to the reactor containment vessel as well as to avoid having to resort to reactor containment vessel venting. The installation work began on October 5 at Unit 7 and on February 25 at Unit 6.



Overview of the alternate circulation cooling water injection system

➢ Augmentation of Power Sources

○ Installation of New Alternate Station Electrical System

A dedicated power facility is to be installed which is separate from the existing emergency power facility so that power may be supplied from gas-turbine generators, power supply cars and other such power sources to equipment for cooling the reactor and injecting cooling water at times when an accident arises that involves a loss of power. The work of mounting the transformer and

switchboard at Unit 7 was completed on February 16, and conduits and cables are currently being laid out.

Transformer and switchboard added for station electrical system (Unit 7)

- Measures for Countering External Fires
  - ○ Installation of Sensors at Elevated Parking Areas

    Vehicles which are used as part of emergency measures fall within the category of severe accident response equipment, so the installation of two types of detectors is required in order to ensure early detection of any sort of fire. Anticipated fires include oil fires originating from fuel in emergency response vehicles. The characteristics of oil fires and outdoor installation environment were taken into consideration when mounting flame alarms and thermo-cameras (equipped with surveillance cameras and detection function), the work of which was completed on March 31. Additional work is scheduled for installation of accessory equipment (earthquake-proof receivers, etc.).

    (Ominato-side: flame alarms at 7 locations and thermos-cameras at 7 locations)

    (Arahama-side: flame alarms at 7 locations and thermos-cameras at 8 locations)

Detector installed at elevated parking area

➢ Reinforcement of TEPCO's Emergency Response

○ Preparations at the Elevated Parking Area on the Ominato Side

New regulatory requirements call for emergency response vehicles to be arranged in a decentralized manner, so a parking area was constructed on an elevated area near Ominato. Paving was completed on March 25 and construction on ancillary equipment (guardrails, etc.) is currently underway.

Elevated parking area constructed on the Ominato side (paved area)

➢ Tornado Countermeasures

○ Protection of Light Oil Tanks

Light oil tanks, which are set up outside and may be affected by a tornado, are currently being replaced with tanks having a thicker grade of steel so that they will be able to withstand collisions with flying objects (Unit 6: 2 units; Unit 7: 2 units). At both Units 6 and 7, one unit has passed the completion inspection conducted in the presence of the fire department, and the remaining unit is scheduled to undergo a completion inspection.

Replacing light oil tanks (Unit 7) (left: tank being lifted; right rear: installed tanks)

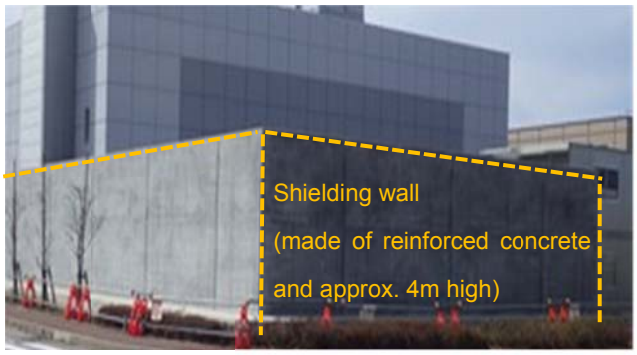
➢ Improvement of Main Anti-Earthquake Building Environment

○ Reinforced Radiation Protection at Main Anti-Earthquake Building

In order to prevent responders from excessive exposure[7] if a severe accident

[7] Designed so that exposure to workers would not exceed 100mSv even if they were to remain in the building for seven days after an accident. This shield wall would reduce exposure from radioactive fallout on the ground to approximately 1/100.

occurs, shielding walls have been erected around the Main Anti-Earthquake Building (work completed on March 31).



Shielding wall around main base-isolated building

(2) Status of Response to New Regulatory Requirement Compliance Inspections

In September 2013, TEPCO filed an application for a compliance examination of Kashiwazaki-Kariwa NPS Units 6 and 7 to be conducted based on the new regulatory requirements, and the Nuclear Regulation Authority has been directing this examination.

At the 62nd meeting of the Nuclear Regulation Authority (NRA) held on March 23, the NRA provided the following comments.

- When the examination was initiated to go over the seismic design policy, TEPCO had not yet prepared the necessary documents and other data so that the examination could proceed. Hence, it is expected that these preparations will require a considerable amount of time.
- With the exception of the seismic design policy and some other items, the documentation and data for examination of Kashiwazaki-Kariwa NPS Units 6 and 7 are in order and this material may be used as a model for examinations of other plants. Therefore, the examination will proceed while, at the same time, taking into account the examination status of earthquakes and tsunamis at other plants.

In response to these statements, TEPCO believes:

- With regard to some of the seismic design-related items the details of which TEPCO had thought would be discussed during the examination of plan for construction works which are to be executed after permission of changes in reactor installation in accordance with the “Examination Guideline for Seismic Design,” it turned out that these items will be discussed during the examination of changes in reactor installation, so TEPCO would like to be given a certain amount of time to prepare the explanation materials.
- With regard to using the examination materials for Kashiwazaki-Kariwa NPS Units 6 and 7 as a model for examinations of other plants, with the

exception of the seismic design policy and some other items, the Nuclear Regulation Authority has a general understanding of the content of previous examinations.

(3) Status of Explanations Provided to the People of Niigata Prefecture

- Community Visits and Power Station Tours

  Representatives from the Niigata Headquarters (Niigata Division, Kashiwazaki-Kariwa NPS and Shinanogawa Power Station) have been visiting local governments and organizations in Niigata Prefecture in order to explain the safety measures currently being implemented at the power stations as well as the status of decommissioning efforts at Fukushima Daiichi NPS. In particular, in the Kashiwazaki-Kariwa region, we have visited the presidents of neighborhood associations in Kashiwazaki City and Kariwa Village to develop a dialogue so that we may hear their opinions and answer any questions. During these sessions, we have been proactive in recommending that people tour the power station.

  So far, 13,039 people from the Kashiwazaki and Kariwa communities and 32,707 people from Niigata Prefecture have participated in these power station tours (totals are for the period from the Fukushima nuclear accident through March 2016).

- Explanatory Meetings and Briefings

  In order to create opportunities for us to explain the status of safety measures at Kashiwazaki-Kariwa NPS to the people of Niigata Prefecture, TEPCO has set up an explanation booth in Nagaoka City (March 4-13). This event was announced in newspaper inserts, radio commercials and postings on our website. Approximately 300 people visited the explanation booth.

- Public Relations Activities Through the Media and Other Outlets

  As part of our activities to promote understanding of TEPCO's commitment to improve safety, we have run commercials on television and radio as well as posted announcements and other messages in community newsletters and on buses traveling regular routes not only in the siting communities but also throughout Niigata Prefecture.

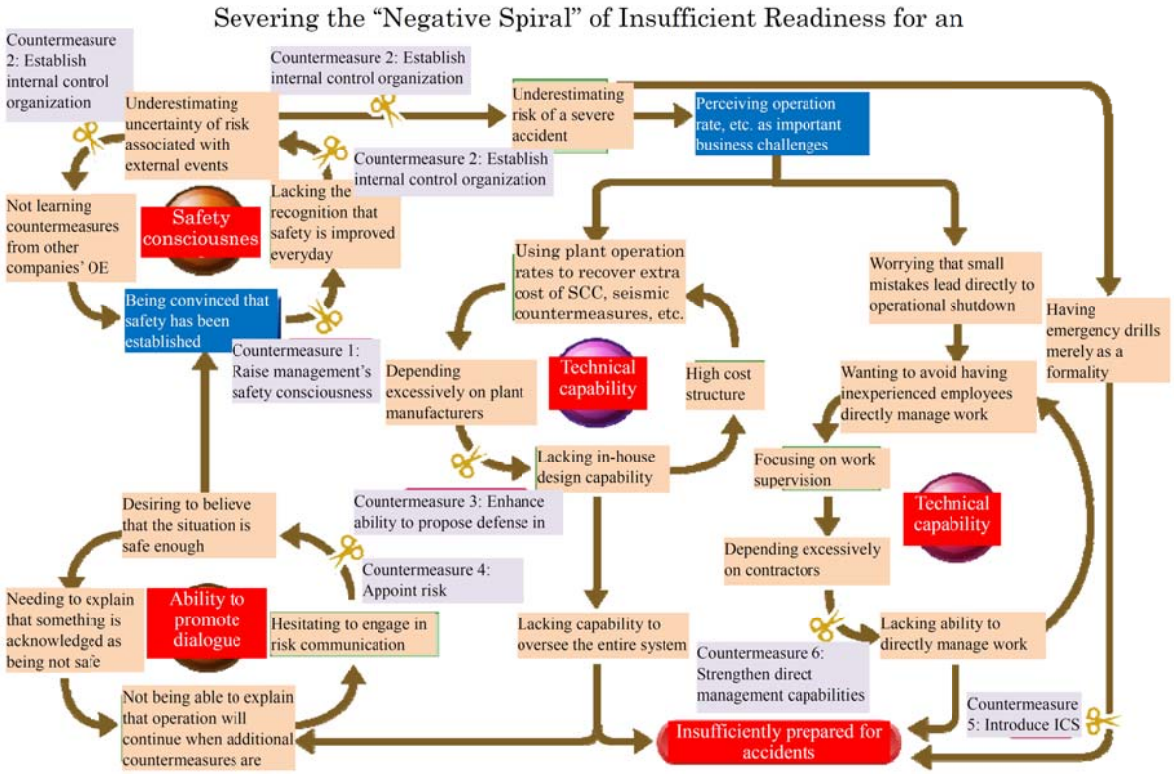
Explanation booth in Nagaoka City

Publicity poster on a bus

2. Progress on Nuclear Safety Reform Plan (Management)

The progress made on the Nuclear Safety Reform Plan (Management) is summarized according to the achievements made in the fourth quarter and assessments are given of FY2015 for each of the six measures for severing the "negative spiral" that has exasperated structural issues facing the Nuclear Power Division.

In addition, the measurements of nuclear safety reform KPIs, which were established in the third quarter of 2014, and assessments of these indicators are provided in section 2.7 "Evaluation of Progress on Nuclear Safety Reform."



2.1. Measure 1: Reform from Top Management

(1) Fourth Quarter Achievements

【Direct Dialogue among Nuclear Power Leaders】

- In order to enhance mutual understanding among nuclear power leaders[8] (team building), nuclear power leaders have gathered together at the Head Office to hold off-site meetings. Also, Head Office nuclear power leaders (Nuclear Power and Plant Siting Division General Manager and division general managers) and

[8] Nuclear Power & Plant Siting Division General Manager, Deputy General Manager, Station Director, construction office directors, Head Office division general managers, etc.

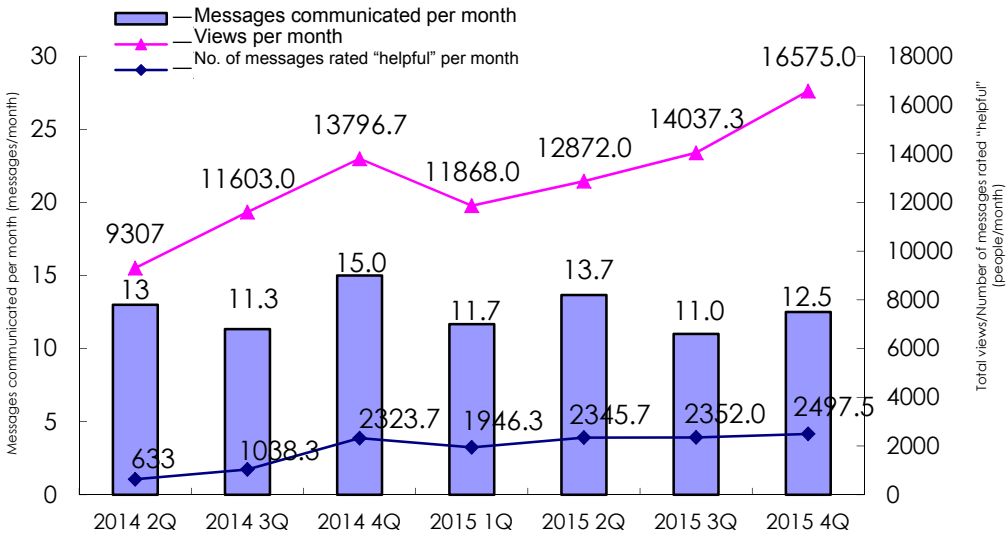
power station executives (station director, plant managers, Nuclear Safety Center Director, power station general managers) have initiated activities for conducting direct dialogues. In the future as well, such meetings will be regularly held.

- Through these direct dialogues, nuclear power leaders have been able to once again share information about the Fukushima nuclear accident, which is the starting point for TEPCO's nuclear safety reforms, as well as the aims to be achieved by these nuclear safety reforms. They have been able to confirm with each other from their respective loci of responsibility which are powerful drivers of nuclear safety reform.

Nuclear Power Leaders engaged in direct dialogue (Fukushima Daini NPS)

【Communication of Expectations by Nuclear Power Leaders】

- To further nuclear safety reform, the expectations of nuclear power leaders, and the reasons for them, need to be appropriately conveyed throughout the organization. Therefore, nuclear power leaders have communicated messages to convey these expectations using video messages, intranet messages, email, meeting forums, talks during morning meetings and other such means in addition to stating these expectations in management policy.
- The communication of messages by nuclear power leaders over the intranet and the status of views by employees are given below. The number of views by employees has tended to rise along with a number of people rating these messages as "helpful." However, when converted to the number of views per message, the figure has gradually increased and now tops 1,600, a number which is equivalent to approximately half of the Nuclear Power Division personnel. However, the number of messages rated as "helpful" has leveled off at around 200.

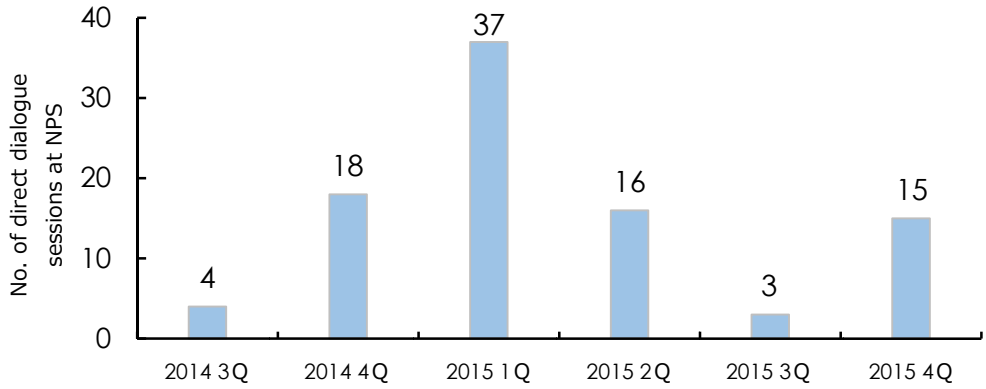


Number of nuclear power leader intranet messages communicated & viewed/number of messages rated "helpful" (monthly averages)

- In order to communicate "feelings" that are unable to be included in messages transmitted over the intranet, the General Manager of Nuclear Power and Plant Siting Division has been holding direct dialogues with Head Office employees since February 2014.

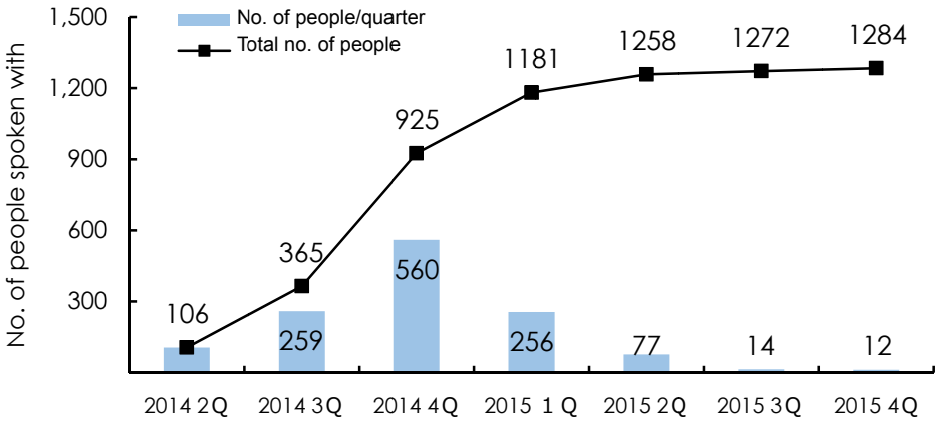
  During this quarter, the five-year mark since the Fukushima nuclear accident was reached, so an open meeting was once again held between the Head Office employees and the General Manager of Nuclear Power and Plant Siting Division. These direct dialogues with employees on the front lines have furthered improvements by sharing thoughts shaped toward continually improving nuclear safety and confirming the extent to which the basic policy toward nuclear safety Reform has taken hold.

  In addition, the Secretariat of the Nuclear Reform Special Task Force ("Secretariat") has also continued to engage in direct dialogue with personnel on the front lines and has repeatedly explained the aims of the Nuclear Safety Reform Plan and their relevance to daily operations. These measures have been completed at the Fukushima Daini NPS and the Kashiwazaki-Kariwa NPS, but have yet to be completed at Fukushima Daiichi, so engaging in these actions at the Fukushima Daiichi NPS has been deemed a priority for FY2016.



Number of direct dialogue sessions between the General Manager of Nuclear Power and Plant Siting Division and personnel in the workplace

Open meetings with the General Manager of Nuclear Power and Plant Siting Division (Left: Fukushima Daini NPS, right: Kashiwazaki-Kariwa NPS)



Number of people on the front lines with whom the TF Secretariat has engaged in direct dialogue

- Since FY2015, the General Manager of the Nuclear Power and Plant Siting Division and the President of Fukushima Daiichi Decontamination & Decommissioning Engineering Company (FDEC) have presented awards to people that have strived to achieve high objectives as well as people that have

taken the initiative in undertaking significant challenges pertaining to the completion of TEPCO's various missions. Details on the number of awards given during third quarter are as follows.

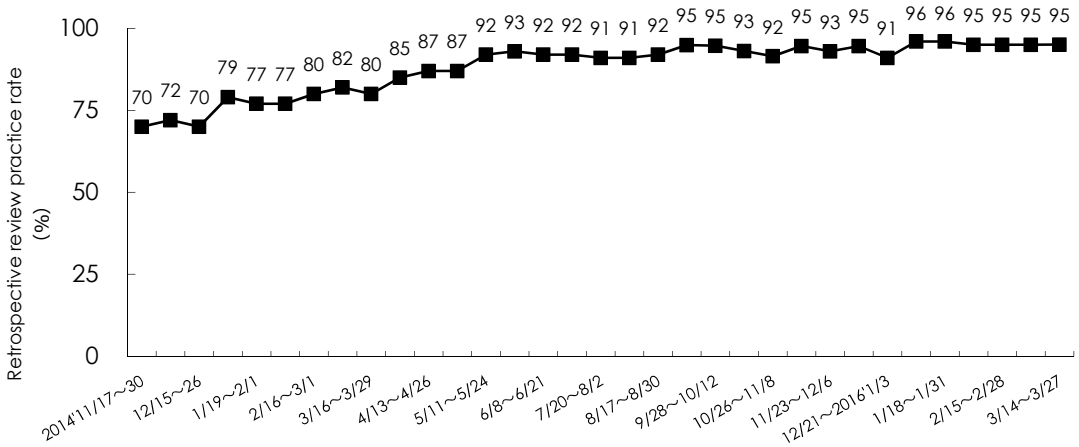
Number of awards presented by the General Manager of the Nuclear Power and Plant Siting Division, and President of the Fukushima Daiichi Decontamination & Decommissioning Engineering Company (FDEC)

Quarter	Head Office	Fukushima Daiichi NPS	Fukushima Daini NPS	Kashiwazaki-Kariwa NPS
Q1	3	11	6	8
Q2	8 (1)	13	4	4
Q3	5	9	6	5
Q4	8 (1)	14	3	7

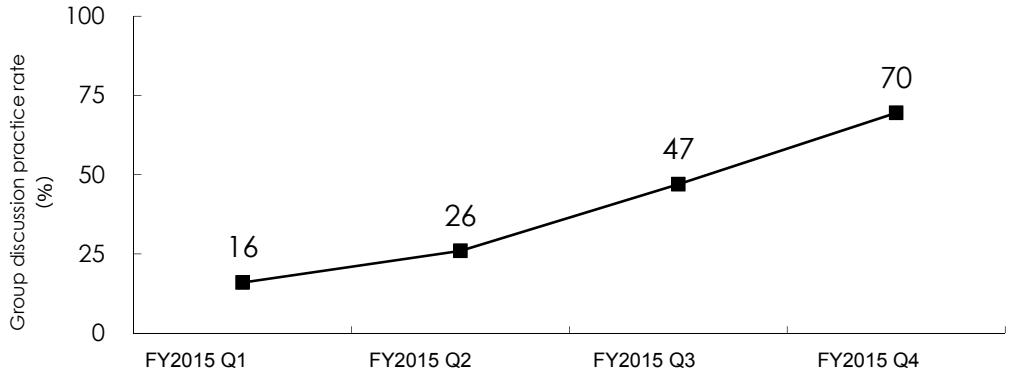
Numbers in parenthesis indicate the quantity for Higashi-Dori within the stated quantity

【Prevalence of Nuclear Safety Culture Throughout Organizations】

- The Nuclear Power Division has established the "Characteristics of People, Leaders and Organizations Embodying a Healthy Nuclear Safety Culture (10 Traits and 40 Behaviors of a Healthy Nuclear Safety Culture)." The Division has urged personnel to become aware of these characteristics by conducting retrospective reviews through which they compare daily their own actions to these characteristics, and has engaged in activities which endeavor constantly to raise safety awareness. The rate at which these retrospective reviews have been practiced has largely remained 95% or higher (90% or higher in a cycle that includes New Year's holidays), and these retrospective reviews have taken hold among individuals.
- The rate for group discussions practiced has risen to 70%. Members are gaining new insights as a result of individual retrospective reviews and learning from each other. In these group discussions, participants use the 10 Traits and 40 Behaviors of a Healthy Nuclear Safety Culture to look back on the operations and work performed. Some groups have begun to connect these retrospective reviews to embodying desirable behaviors. On the other hand, there are still groups that find it difficult to connect the "10 Traits and 40 Behaviors" to their own work. The differences between these two clusters are being analyzed so that the Secretariat may provide better assistance for groups whose retrospective reviews are not so productive.



Practice Rate of Daily Retrospective Reviews



Group discussion practice rate

【Assessment of State of the Nuclear Safety Culture】

- The achievements and results of activities asking personnel to conduct retrospective reviews according to the "10 Traits and 40 Behaviors" have been represented numerically and trends managed, but the issue remains that this would not allow organizational weak points in the nuclear safety culture to be identified.
- As a result of benchmarking based on overseas standards which was conducted in the third quarter, knowledge has been gained for assessing the state of the nuclear safety culture, which is effective for combining qualitative assessments to ascertain actual conditions through interviews and observations in addition to analyses based on numerical figures.
- For this reason, nuclear safety culture assessment & promotion teams (10 members) have been established, which are led by the CFAM[9] or SFAM[10]

[9] Corporate Functional Area Manager: Leaders at Head Office that aim to achieve the world's highest level of excellence for each area of work at the power station

[10] Site Functional Area Manager: CFAM counterpart at the power station

responsible for coordinating nuclear safety culture. These teams conducted assessments of the state of the nuclear safety culture at Kashiwazaki-Kariwa NPS as they received guidance and advice from a team of overseas experts during a period of time from February 1 to 5.

- Through this assessment, the Nuclear Safety Culture Assessment and Promotion Team was able to experience the INPO process for assessments thereby gaining experience viewing the assessment from the perspective of the reviewer, such as:
    - Conducting preparations approximately one month prior to arranging the details of interviews and observations on the basis of the results of past questionnaires, third-party reviews and other data
    - Conducting interviews and observations
    - Linking these results to the “10 traits and 40 behaviors” and compiling such information into a report

  In the future, it is expected that the nuclear safety culture assessment and promotion teams will accumulate more of these sorts of experiences and improve their assessment skills, thereby promoting improvement activities as they independently and frequently conduct assessments of the state of the nuclear safety culture to identify weaknesses, in addition to the work performed in third-party reviews.

【Benchmarking Based on Overseas’ Standards】

- Benchmarks are being set based on excellence (best practices) demonstrated in other countries and TEPCO has been proactively incorporating these so that we may achieve the world's highest levels of safety.
- During the fourth quarter, in order to research good practices in the operation of the systematic approach to training (SAT[11]), an international standard and effective training method, proposed by the IAEA, benchmarking was conducted vis-à-vis the Sequoyah Nuclear Generating Station in the United States during the period of January 17-23. The expectations of supervisors and the motivation of participants was found to be much higher than TEPCO and there was not a sense that the education and training being carried out was “routine.”
- Prior to the Fukushima nuclear accident, TEPCO had introduced SAT. However, through benchmarking we learned that improvements need to be made, such as reviewing the curriculum, teaching materials and instructors of education and training programs that were not revised after the introduction of SAT from the standpoint of whether or not the education and training being implemented is

[11] Abbreviation of “Systematic Approach to Training”

actually useful for operations (Refer to Countermeasure 6), and constructing a mechanism for revising education and training program content.

- Accordingly, CFAMs and SFAMs, who are in charge of personal development, have taken the lead in working to rebuild education and training programs using SAT as well as periodically assess and review such programs while being guided and advised by teams of experts from other countries.

Explanation of education and training programs

Inspection of training facility (diesel generator)

(2) Assessment of FY2015

The expectations of management and nuclear power leaders have been communicated using a variety of methods and we are working to make these more pervasive and have them take root. The number of people who have found intranet messages to be “helpful” has remained roughly flat, which suggest there is room for improving the content of such messages and methods to achieve even better distribution.

Even though progress has been made as planned on specific training prepared for nuclear power leaders, we have taken new steps by inviting top personnel from nuclear power operators in the United States to provide coaching on leadership, management and other such areas. Programs to cultivate future nuclear leaders and executives shall be established due to the need to enhance leadership education for these future leaders.

With regard to improving safety awareness throughout the entire organization and making the nuclear safety culture more pervasive, we have more firmly established daily retrospective reviews, which utilize the “10 Traits and 40 Behaviors,” and group discussions and other such activities are also continuing to take root. On the other hand, variation exists among organizations in the extent to which the “10 Traits and 40 Behaviors” have become embodied in specific behaviors. We are working to raise our overall basic levels. In particular, in order to improve nuclear safety at power stations, it is essential that a nuclear safety culture be fostered within contractors’ organizations as well, so TEPCO is striving to serve as a model and be able to provide appropriate guidance and advice through meetings during the design stage

and project supervision.

With regard to organizational administration and management, we have undergone third-party reviews and are developing benchmarks vis-à-vis demonstrated standards both in Japan and abroad in our aim to achieve the world's highest standards. However, there have been cases where it has taken time to actually implement improvements and where follow-ups after the commencement of improvement activities have been insufficient, we need to accelerate improvements.

2.2. Measure 2: Enhancement of Oversight and Support for Management

(1) Fourth Quarter Achievements

➢ Activities of Nuclear Safety Oversight Office (NSOO)

Insights gained through observations by Nuclear Safety Oversight Office (NSOO) over the last several months mainly in the fourth quarter are as follows. These items were reported in the Executive Officers' Meeting on May 18, and in Board of Directors' Meeting on May 24.

Nuclear Safety Oversight Office (NSOO) Quarterly Report
(Executive Summary)

Foreword

This report summarizes the Nuclear Safety Oversight Office (NSOO) assessment results for 2016 Q4 (January through March). The recommendations, advice and observations have been discussed with the management as they arose and have already been accepted and acted on (or actions are planned).

In the Q3 report we said we should focus more on the nuclear safety risks which we categorized as;

- High Consequence / Low Probability (HCLP) such as core damage relevant to KK,
- Medium Consequence/Medium Probability (MCMP) such as radioactivity spread or release at Fukushima, and
- Low Consequence / High Probability (LCHP) such as high radiation doses to workers.

Our work in Q4 has focused on these aspects and this is indicated in the text as appropriate.

1. Fukushima Daiichi (1F)

We continue to monitor the management of the residual nuclear risk (MCMP) and

of radiation protection (LCHP) at 1F;

1.1 Maintenance Management

In this quarter we have continued our focus on the maintenance management of the water treatment facilities, (KURION, SARRY, RO and associated hoses). NSOO have raised some concerns regarding spare parts storage, hose inspection, and shortage of drawings and manuals (configuration control). However, in general we are satisfied with the management control of the maintenance of these water treatment facilities and the improvements being implemented.

1.2 Reducing Nuclear Risks – Unit 3 Spent Fuel Removal Operation (MCMP)

NSOO observed three aspects of this work; on site rubble removal, exposure mitigation management, and education and training of operators. Standards were good in all three areas. NSOO are pleased to see the continuing effort to reduce the dose from the project (ALARA). We still have concerns regarding the risk assessment process.

1.3 Radioactive Contamination Control (LCHP)

NSOO have observed good progress at 1F to improve both Dust Monitoring (radioactive material concentration in the air) and Area and Access Control (surface contamination management). However there is still a lot to do, stricter contamination control is required and there is insufficient Radiation Protection resource. NSOO has recommended that there should be increased monitoring and management oversight to ensure the areas are maintained.

1F Summary; - These assessments, observations of emergency training and other works, are very encouraging but still show a continuing need to focus on and improve;

- Safe behavior in the field
- Radioactive contamination control and dust monitoring
- Rigorously assessing and managing the nuclear risk.

2. Fukushima Daini (2F)

We continue to monitor aspects of nuclear safety during shutdown (MCMP). At Daini we have assessed;

- Treatment of Accumulated Water in Suppression Pool Header Tank (SPH)
- 2F2 Reactor Temporary Restoration (Moving of the separator and dryer)

In this current assessment we observed good improvements in both industrial and nuclear safety although there is still need for improvement.

In particular we observed that “Procedure Place Keeping” for safety significant work was not adhered to. We have seen similar behavior at 1F this quarter. CNSO suggests that this attitude to place keeping might indicate a wider poor attitude towards following procedures and has recommended that CNO and CDO should review this problem.

3. Kashiwazaki Kariwa (KK)

In this quarter we have continued to assess nuclear safety aspects of the preparations for restart at KK Units 6 & 7, focusing on the prevention of core damage events (HCLP);

3.1 The Enhancement of Safety Equipment

We have assessed;

- Measures for preventing internal flooding of ventilation ducting.
- The Filtered Containment Venting System (FCVS) project.
- The remedial measures with respect to the KK Safety Systems cable segregation issues.

In these areas we found similar problems with respect to;

- Poor design process and configuration management
- Poor procurement and control by TEPCO
- Lack of knowledge regarding reactor key safety system requirements.

It would be premature based on these results alone to infer that there is an underlying problem with following the design process. NSOO see other examples of good use of the design process and good leadership toward improvement by the Design Authority*.

As observed in the Q3 report, management recognize the need to resolve all these issues before restart of KK Units 6&7.

* Experts who are deeply versed in the design condition of safety equipment, technical standards and etc..

3.2 Emergency Response Capabilities

We have assessed;

- Response capabilities of TSC personnel
- Response Capabilities of KK6/7 Operating Teams

The site continues to hold regular drills and monthly site emergency exercises and continues to learn and improve, positively receiving comments from internal observations and advise from external observers. NSOO consider that two of the challenges in the near future are;

- To develop the TSC guidelines as early as possible and validate them through monthly emergency exercises.
- To expand the current excellent level of performance and knowledge of the best and most rehearsed TSC and Operating teams to all the teams.

4. Corporate

We have focused on Nuclear Safety Cultivation of Contractors. Only limited assessment has been possible this quarter, however, there are weaknesses in the development of nuclear safety culture of our contractors. We are aware that the CNO is working an improved Safety Culture Development Strategy. However, NSOO has recommended that there should be a company-wide strategy and consistent implementation policy on how to cultivate a nuclear safety culture in our contractors.

5. CNSO Perspective

As this is the 4th Quarter report, and so an end of year report, I have reviewed some of the more important recommendations made by the CNSO/NSOO.

5.1 Radiation Protection (LCHP)

In summary there have been significant improvements with respect to ALARA, executive involvement and contamination control. However, more work is required to achieve the necessary standards. There is little real progress as yet on personal dose constraints although there are encouraging proposals by the CFAM and commitments by the CDO.

5.2 Nuclear Risk Assessment at 1F (MCMP)

Previous recommendation; Develop a strategy to meet the risk assessment requirements of the revised Decommissioning Road Map, the IAEA recommendations and best practice.

A multi factorial technique has been adopted for decision making processes. This is a useful first step but there has been no progress on developing a strategy for improving the rigour of the nuclear risk analysis and approval requirements. In my view this is an important shortfall.

5.3 Emergency Arrangements (HCLP at KK & HQ; MCMP at 1F & 2F)

Previous Recommendation; Improve/increase frequency of Emergency exercises at 1F and 2F.

Regular site exercises are now held at 1F and 2F. Further program improvements are now driven by the NRA request for each site to have a 3 year exercise and training programme. Standards at KK continue to be high but significant improvements are still required at 1F, 2F and the HQ support centre.

5.4 Nuclear Safety Management System (All risks)

Previous Recommendation; There is not a clear (Nuclear) Safety Management System (SMS) in TEPCO.

For instance, clear policies and process in important areas such as nuclear risk assessment, management of chance, etc. needs to be provided.

There was initially little progress in this area. However, the CNO set up a system of Corporate Functional area Managers (CFAMs) supported by SFAMs (Site) and US advisers. When fully implemented this will be a very powerful tool and will also deliver an SMS.

However progress has been slow. The US advisers have made significant observations regarding the role and authority of the CFAMs and the CNO and CDO need to consider and act on that advice appropriately if the system is to work.

5.5 Nuclear Baseline – Knowledge Base (HCLP and MCMP)

Previous Recommendation; TEPCO should develop a Nuclear Baseline (NB).

The NB is a tool to ensure we maintain the necessary competence to manage our nuclear business safely. It defines all the necessary (safety significant) posts and the qualifications, experience and training required by the post holder. TEPCO has no such system, to install one is a significant commitment, and to date the recommendation has not been implemented.

Recent events such as the cable problems at KK have highlighted significant lack of knowledge in technical and engineering posts. As a result the CNO is setting up a Human Resource Centre and implementing the Systematic Approach to Training (SAT). He is also identifying key experts and CFAMs and SFAMs.

These initiatives will create something similar to a NB and it is important it is managed in the same rigorous way.

CNSO has always been concerned at the effects of the annual Staff Rotation on our knowledge base and has recommended that in the imminent staff rotation (July) nothing should be done which will degrade our Nuclear Knowledge Base. For example, people should not be rotated out of nuclear safety significant posts unless the replacement has suitable experience, qualifications, and competence to hold the post.

5.6 Nuclear Safety Culture – The cement in the safety wall (All risks)

Previous Recommendation; When pursuing improvements in nuclear safety culture we should also focus on the cement in the safety wall; the values, commitment and passion.

TEPCO suffered a major crisis which has persisted for several years and TEPCO has had to manage accordingly. In crisis mode, management is more direction than leadership, is more delegation than empowerment and is unsympathetic to the plight of the workforce. I believe we are no longer in a crisis. It is important to move from a crisis mode to a risk management mode. A lot of good work is being done on Nuclear Safety Culture with respect to the motivation of and by the senior leadership, the use of the Traits, the setting up of the Human Resource Centre etc. However, we recognize that the middle management are not controlling or motivating the workforce regarding safety to the necessary extent. I suggest that this situation will persist for as long as we continue to operate in a crisis mode. People are tired of being in a crisis and no longer motivated by its demands.

5.7 KK Re-Start (HCLP)

Previous recommendation; TEPCO should define the mechanism and evidence needed for approving restart of KK 6&7.

The problems of start-up are very dependent on regulators, politicians and stakeholders. However such people are not responsible nor accountable for the safety of the reactors, only TEPCO is. A lot of effort has been expended in these areas and whereas a lot if it has a direct bearing on safety, I am still concerned to know by what mechanism and based on what data and criteria TEPCO will itself approve the (safety of) the restart of KK 6&7.

5.8 Corporate Governance (All nuclear risks)

Previous observation; Neither the Executive Team nor the Board had sufficient nuclear ability to manage the nuclear risks.

Both the executive team and the non-executive board members now have sufficient nuclear ability to manage the nuclear risks.

6. NSOO Performance - Close out of Actions and Recommendations

6.1 Status of 10 Actions from the Board (April 2014)

The remaining 3 actions have now been progressed to the point where they are

now the routine business of the CNO and CDO, and NSOO will not monitor them further.

6.2 Recommendations from NSOO in 2015 Quarterly reports

These actions were reviewed in the Q3 report and in Section 5 of this report. In general progress is slow against many of these actions as TEPCO's focus is still on the immediate problems of KK re-start and 1F stabilization.

6.3 Closure of Recommendations from NSOO Team Assessments

The data are summarized in the following Table;

	Status as of the end of FY2015 Q3		Status as of the end of FY2015 Q4		
	Prior to FY2015 Q2	FY2015 Q3 new recommend ations	Prior to FY2015 Q2	FY2015 Q3 recommend ations	FY2015 Q4 new recommend ations
Recommendations that have been completed	67	-	71	3	-
Recommendations that are being implemented	24※1	10	22	7	9
Recommendations for which no action has been taken	3		1※2	-	
Total	104		113		

※1 There was "25" in the Q3 report but two similar recommendations were merged in this report.
※2 (December 2014) Further improvement to the Nuclear Safety Committee. This is a further part of the concern about inadequate nuclear risk assessment as discussed in section 5.2 of this report.

Once again good progress has been made, with closure of a further 7 actions. This leaves the total outstanding as only 30. A further 10 actions have been raised in the Q4 assessments and this report.

7. Benchmarking

In Q4 we invited INPO to oversee the TEPCO Nuclear Oversight Office under their Nuclear Industry Evaluation Programme (NIEP). They sent a strong team of 5 senior nuclear safety and quality oversight professionals. A preliminary report was made on March 4th and the final report has just been received.

They made many observations and recommendations regarding organizational structure, effective use of resources, standard of procedures and effective trending of data. NSOO has accepted the report and is constructing a response and action plan. We will visit INPO in late April to discuss the proposals.

End

【Safety Steering Council Meetings】

- In February of this year, the Safety Steering Council held a meeting at which the President and a small number of top management[12] deliberated the priority and status of implementation of a variety of measures aimed at improving nuclear safety.
- At this meeting, the council members once again looked back at cases of accidents, which occurred over the past few years in the Nuclear Power Division, their causes and measures instituted to prevent any reoccurrence. The meeting confirmed the importance of managers observing the work performed in the field and of doing so through management observations which provide guidance for improvements, analyses of near-miss accidents and operation experience (OE) information gained both inside and outside of TEPCO, and the enhancement/improvement of a system for utilizing such data in a centralized manner to improve safety.
- The necessity was also confirmed for transitioning from management in a crisis mode, which has been ongoing since immediately after the Fukushima nuclear accident, to an ordinary mode of management. The ideas provided by employees will be used along with other efforts to rebuild fundamental operational processes (structure for cooridinating with contractors, structure for developing personnel systematically in keeping with operations to be performed, etc.).

【Enhancement of Management Observations】

- In order to promote nuclear safety reform and improve nuclear safety, improvements must be appropriately implemented. Accordingly, management observations (MO), which have been incorporated by outstanding nuclear operators in other countries, are used to monitor what is happening in the field and accurately ascertain any problems.
- TEPCO is working to enhance the substance of our management observations in accordance with the Common Management Observation Guidelines (established December 17, 2015).
- In conjunction with management observations management observation skills need to be improved. Improvements to skill have been underway since Q3 and INPO training and field coaching were provided at Kashiwazaki-Kariwa during Q4 (January 21). At Fukushima Daiichi NPS, WANO offered field coaching

[12] The council is comprised of four members: the President (who serves as chairman), General Manager of the Nuclear Power Plant Siting Division, FDEC President, and Director of the NSOO (General Manager of the Nuclear Safety and Supervision Department serves as secretariat).

(January 25 and 26). Although specific results are not expected to appear immediately, we will monitor any correlation according to the following chart.

- MO results for the fourth quarter are given below. When compared with those for the third quarter, the number of management observations conducted decreased 0.7% and the number of good practices and areas for improvement identified were down 3.8% with the result that management observation achievements have leveled off.

Category	Head Office	Fukushima Daiichi NPS	Fukushima Daini NPS	Kashiwazaki-Kariwa NPS
No. of MOs conducted	36 0.3 times per man month	446 1.0 times per man month	218 1.1 times per man month	439 1.6 times per man month
No. of good practices and areas for improvement identified	40 ▲13%	826 +23%	227 +1.3%	1299 ▲16%

(2) Assessment of FY2015

The Nuclear Safety Oversight Office has continued to monitor activities important for nuclear safety as well as provide comments and suggestions, and has advanced improvements in nuclear safety. TEPCO's Board of Directors continues to receive regular reports about the Nuclear Safety Oversight Office's monitoring activities as well as its comments and proposals along with the status of activities related to execution, and the Board has been verifying nuclear safety conditions. Also, the Nuclear Safety Oversight Office has been working to improve the level of its monitoring activities with the assistance of coaching and third-party reviews of its activities. The Nuclear Safety Oversight Office has found that the results of such activities have contributed to improving TEPCO's nuclear safety.

Meanwhile, the implementation of some items has been delayed in response to guidance and suggestions provided by the Nuclear Safety Oversight Office. Nuclear power leaders will accelerate improvements by better understanding the status of improvement activities and providing assistance to resolve problems encountered.

2.3. Measure 3: Enhancement of Ability to Propose Defense in Depth

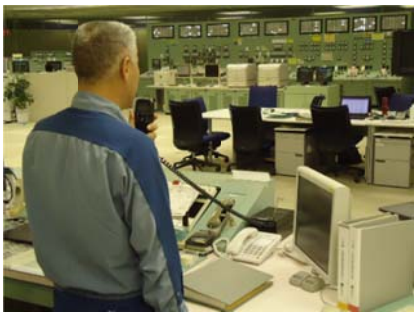
(1) Fourth Quarter Achievements

【Improvement of Technical Capabilities with Competitions to Enhance Ability to Propose Safety Improvements】

- TEPCO has been holding Safety Improvement Proposal Competitions so that personnel may, in addition to conducting multi-faceted reviews from the perspective of defense in depth, acquire the technical ability to propose cost-effective safety measures and realize these proposals promptly. The current status of these competitions is as follows.
  - ○ Since January, the second competition of FY2015 has been underway. Total submissions topped 220, the highest number since the competitions began. TEPCO has encouraged superiors to actively call on personnel in positions of responsibility to put forward proposals and we have set targets for the number of proposals, efforts which have resulted in an increase in the number of proposals submitted. In the first quarter of FY2016, the judging committee will meet and employees of the Nuclear Power Division vote.
  - ○ Of the outstanding proposals (30) from the first competition in 2014, three have been realized since the previous report (total of 24 so far). Of the outstanding proposals (15) from the second competition in 2014, three have been newly realized since the previous report (total of 10 so far).

    <First competition of 2014>

    - Only cables had been used for communicating between the main control rooms and the emergency response headquarters during an emergency, but new wireless equipment has been introduced to diversify the communication tools available. (Fukushima Daini NPS)
    - Lead batteries for vehicles have been deployed as a preparation for a case where the power source is lost for operating the safety relief valve to depressurize the reactor. However, at times when such equipment is to be used, it takes time to transport the batteries from the place where they have been deployed to the place where they are to be connected. So, along with setting up storage batteries next to the connections, additional lithium batteries have been deployed, which have a greater charging capacity (longer use time). (Kashiwazaki-Kariwa NPS)
    - The way in which communication cables have been used and the routes along which they have been laid within the power station premises have not been uniformly managed. In order to promptly ensure communication lines during an accident and their early restoration, the communication cable route lines have been consolidated and diagrammed, and such equipment has begun to be managed based on this system.



Wireless system adopted connecting MCR and Emergency Response Headquarters (Fukushima Daini NPS)

High-performance lithium batteries deployed in control zones (Kashiwazaki-Kariwa NPS)

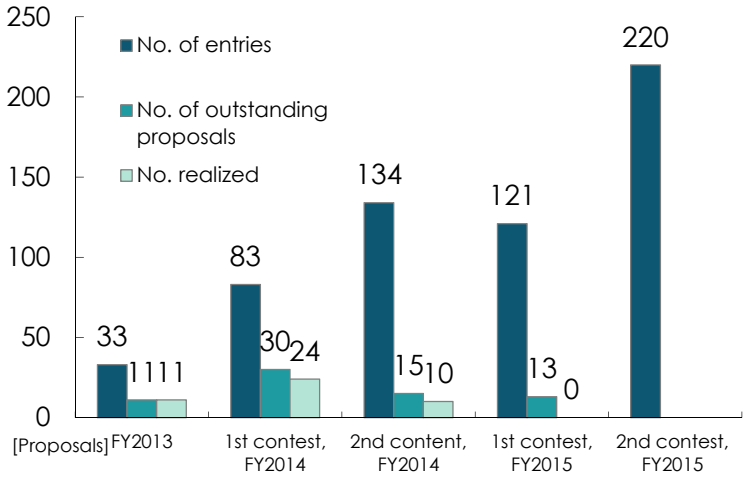
<Second Competition of FY2014>

- Fire hose connections have been installed on pipes near filtered water tank[13] systems so that a diverse range of water sources may be secured and cooling water injected promptly when a large tsunami strikes. In addition, procedures have been formulated for deploying fire hoses and supplying water to fire engines for cooling injection from these points. (Fukushima Daiichi NPS)
- So that power may be quickly restored by means of power supply cars when a power source is lost, connection terminals have been modified from the screw-plate type to plug-type (the same as at Kashiwzaki-Kariwa), which has reduced the time required for connection from around 20 minutes to about 5 minutes. (Fukushima Daini NPS)

Ensuring a means for fire engines to inject cooling water (Fukushima Daiichi NPS)

Improved power cable connection terminalls from power supply cars (Fukushima Daini NPS)

[13] Tank used for domestic use at the power station, whose source is the Sakashita Dam in Okuma Town, Futaba District.



Number of Safety Improvement Proposal Competition entries, outstanding proposals and proposals implemented

- An issue that has emerged from the competitions is the considerable time being required to implement outstanding proposals. To ascertain what factors are at play, we monitored the process through the realization of outstanding proposals. From these results, we have identified several factors including low involvement by superiors in implementing proposals as well as overly optimistic perceptions about the accuracy of formulated plans. Improvements have been made so that during the second competition of FY2015, when outstanding proposals are identified in the first quarter of FY2016, implementation plans will also be confirmed. Going forward, we will continue to monitor these processes to check on the status of implementation of countermeasures, and, if measures are not implemented smoothly, we will provide prompt follow-up.

【Utilization of Operation Experience (OE) Data】

- One of the lessons learned from the Fukushima nuclear accident is that we should learn from other companies' failures. TEPCO believes that something that occurred somewhere in the world could also happen at one of our power stations, and we are reviewing and implementing appropriate countermeasures.
- Operational processes employed prior to the Fukushima nuclear accident have been improved. Operation experience (OE) data has been collected from both inside and outside Japan and countermeasure reviews accelerated, and all personnel in the Nuclear Power Division have been working to utilize this information.

○ During the fourth quarter, 47 pieces of OE data were newly collected and analyses completed of 38 items, this figure includes previously collected OE data. These items continue to be processed in a systematic manner and no

pieces of data have been waiting to be analyzed for longer than three months.

○ TEPCO has initiated intensive study sessions to focus on important OE data (severe accidents and SOER[14] from both inside and outside Japan), and we are working to improve synopses of these accidents and other problems as well as increase understanding of the lessons learned. In the fourth quarter, personnel responsible for nuclear safety at power stations and licensed reactor engineers were appointed to serve as OE training instructors, thereby strengthening the system that enables personnel to learn from OE data. Also, the OE training instructors have undergone SOER training provided by JANSI (Fukushima Daiichi NPS: March 24; Fukushima Daini NPS: March 9; Kashiwazaki-Kariwa NPS: March 2), and have attended intensive lectures on severe accidents given by teams of experts from overseas so as to improve their skills. In the future, through OE training instructors, we will expand SOER training at power stations in our aim to achieve a situation where all employees of the Nuclear Power Division have a thorough understanding of important OE data summaries and the lessons learned. Furthermore, in FY2016, we plan to incorporate lessons about such OE data into education and training programs provided by the Nuclear Power Division.

Lecture for OE training instructors on severe accidents by overseas team of experts
(On cable fire at Browns Ferry Nuclear Power Station in the US)

○ In July 2015, TEPCO and our contractors started to collect information about near-miss accidents. The collection methods, which were first used at Fukushima Daiichi NPS, are being successively expanded to Fukushima Daini NPS and Kashiwazaki-Kariwa NPS. So far, 10,280 pieces of data about near-miss accidents have been gathered at Fukushima Daiichi NPS, 90 pieces of data at Fukushima Daini NPS, and 212 at Kashiwazaki-Kariwa NPS. Also, so that such data is effectively utilized, contractors and TEPCO have been collaborating to analyze the data and are considering formulating improvement

[14] SOER: Significant Operating Experience Report

measures.

【Hazard Analyses】

- TEPCO is developing approaches and systems in preparation for accidents and hazards which entail a high potential cliff-edge effect and substantial uncertainty about the frequency of their occurrence, and we are formulating and implementing countermeasures on the assumption of such accidents occurring.
- At Kashiwazaki-Kariwa NPS, the analysis of approximately 30 hazard items was finished in 2014, and we are currently reviewing and implementing countermeasures in accordance with our plan. This quarter, we consolidated the preconditions necessary for preparing operational procedures to respond to the impact of electromagnetic waves resulting from solar flares or other causes.
- Although work on hazard analyses was first pursued at Kashiwazaki-Kariwa NPS, TEPCO is planning to initiate the identification and analysis of hazards at Fukushima Daiichi NPS and Fukushima Daini NPS in FY2016.

【Safety Reviews】

- TEPCO's improvement activities are not limited to addressing non-conformances, items indicated during safety inspections and items indicated during third-party reviews. We have carried out safety reviews so that, on our own accord, we are continually and actively improving nuclear safety by delving into the underlying causes of problems.
- The status of safety reviews at our power stations is as follows.

○ Fukushima Daiichi NPS

At monthly performance review meetings, reviews have been conducted from the standpoint of station personnel awareness of nuclear safety, using as indicators the number of human errors that have occurred in each organization and the number of proposals for improving operations. Although the rate of human errors has tended to decrease, our assessment is that severe personal accidents continue to occur. We continue to strive to make improvements in terms of facilities, equipment and quality, and we are moving ahead with analyses of near-miss accident data and working to prevent accidents before they happen.

○ Fukushima Daini NPS

With regard to "accident operating procedures and facilities for emergency safety measure facilities (portable facilities)," TEPCO has been checking procedural documents and conducting reviews using interviews with personnel assigned to relevant offices. Based on results of these reviews, we have identified risks such as the hazard involving power supply cars coming into

contact with each other due to an earthquake, and have adopted countermeasures, including isolating such vehicles at an appropriate distance.

○ Kashiwazaki-Kariwa NPS

In preparation for external events whose frequency of occurrence is not well defined but whose impact is very large, we are conducting a review, assuming a massive tsunami following the fall of a meteorite into the surrounding sea to determine the extent of damage to facilities as well as the facilities which are still usable when such a tsunami rises over the seawalls and the power station site damaged and inundated. The results of these efforts will be verified in classroom training for implementing emergency responses as well as during actual training.

In addition, reviewers act as third parties to check each and every procedural flow and operation during emergency response training and advice is given on identifying risks and improving them. In this quarter, we have proceeded to reflect such results in operating procedures pertaining to previously reviewed improvements.

- Although safety reviews are conducted in accordance with annual plans at each of the power stations, differences between these reviews and other improvement activities continue to be eliminated. Therefore, safety reviews shall be improved so that:
  - A comprehensive analyses of the status of nuclear safety achievements is conducted based upon the results of various PIs, management observations, third-party reviews, etc.
  - Weaknesses in organization operation and management are identifiedbased on the analysis results and subjected to review.

【Improvement of Ability to Solve Issues Traversing Organizations】

- An analysis of the Nuclear Safety Reform Plan found that, when resolving issues in which multiple organizations are involved, poor project management is a cause of slow resolution speeds and the insufficiency of anticipated results. In order to improve these, TEPCO formulated a policy that provides not only for full-time project leaders, in principle, and the specifying and sharing of responsibilities, authorities, targets, expectations and deadlines as well as the provision of regular progress reports, but also the maintenance of organizational leaders responding in a systematic manner when shared issues arise.
- In order to verify any effects, TEPCO has made “improvements in maintenance operation processes (introduction of Maximo[15]),” applied improvement policies,

[15] IT solution for realizing strategic asset management.

monitored the situation, and verified the extent of any improvements in project management.

- For improvements in maintenance operation processes (introduction of Maximo), TEPCO has pursued a review that focuses on Kashiwazaki-Kariwa NPS. A detailed design for system development was completed in March, and the programming and operational tests are underway. Decisions on the important specifications and other matters have been deliberated and decided in the Project Steering Council (Chair: General Manager of the Nuclear Power Plant Management Department), and TEPCO has steadily move the project forward while rendering decisions at each critical juncture in accordance with the improvement policy.

  Furthermore, in the fourth quarter, we studied indices for measuring and assessing the effects of project implementation. We reviewed assessment indices from two perspectives, the “number of operational hours for preparing maintenance plans” as well as another indices that measure the effect achieved through informatization, and the “number of recurring nonconformances” as well as other indices for measuring the extent to which nuclear safety, work safety and facility reliability have improved, and the interim results were reported to the Project Steering Council. We will continue to study these indices so as to specify the matters to be defined (calculation method, assessment standards, assessment frequency, etc.).
- Through this project, we plan to overcome weaknesses in our capability to resolve cross-organizational issues and to have the system operational in the fall as planned. In the future, as we continue to provide explanations to relevant parties related to process modifications at Kashiwazaki-Kariwa NPS and Fukushima Daini NPS, we will analyze causes and other factors leading to success from among the opinions expressed at explanatory meetings, and reflect these in future change management initiatives (activities necessary for efficiently and effectively implementing changes).

(2) Assessment of FY2015

With regard to strengthening TEPCO’s capability for proposing defense-in-depth, we are continuing to make good progress on each of our action plans and also producing results. In addition, we have adopted measures to improve each of the issues, which have arisen or been identified, in keeping with the progress made on the respective measures.

Overall, there are many items for which good progress has been made in each of the action plans for Measure 3. Identifying problems and increasing the speed at which improvements are made is fundamental. It is presumed that if factors are

analyzed it will be found that the reasons why certain action plans are progressing well are:

- A high degree of organizational and personal satisfaction about the necessity of each action plan and the results they aim to achieve.
- Instructions given by nuclear power leaders and the examples they set
- Awareness that the agent for action is oneself and carrying out of these actions upon clearly understanding the details of the action.

And, effort will be made to manifest these factors in other measures.

2.4. Measure 4: Enhancement of Risk Communication Activities

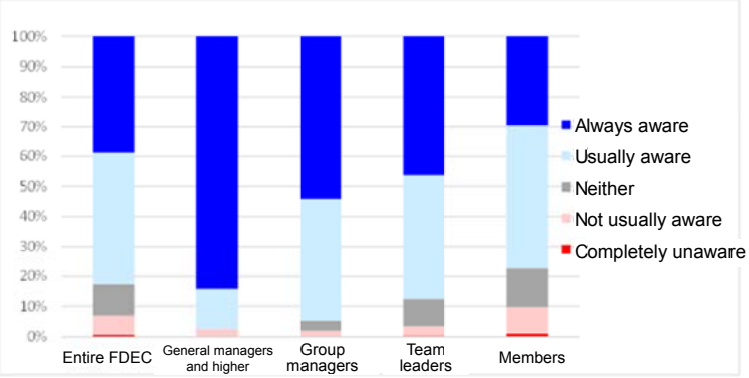
(1) Fourth Quarter Achievements

【General Activities】

- The Social Communication Office and risk communicators have continued to collect risk information that pertains to the Nuclear Power Division, and propose to management and the Nuclear Power Division policies guiding explanations about countermeasures and announcements about risks.
- At Fukushima Daiichi NPS, as part of our commitment to information disclosure that evolved out of the drainage channel problems in February of last year, a senior risk communicator leading a team of eight risk communicators has taken charge of collecting information about risks and raising awareness about information disclosure, and the team has put forth proposals to prevent the manifestation of information disclosure leaks or risks.

  <Questionnaires on Information Disclosure>

  - A questionnaire survey was conducted of all employees at the Fukushima Daiichi Decontamination & Decommissioning Engineering Company to acquire information about employees' awareness and actions related to the disclosure of information to society.
  - The results confirmed that the majority of the employees conducted their own operations with an awareness of society's concerns and information disclosure. So that this situation is not ephemeral but extends into the long term, executives and managers at Fukushima Daiichi NPS will constantly endeavor to raise awareness.



Response broken down by position to the question of whether or not individuals are engaging in their duties while remaining aware of the need for information disclosure

<Practice of Using Checklists at Fukushima Daiichi Decontamination & Decommissioning Engineering Company>

- The Social Communication Office has prepared checklists to help clarify the risks associated with new work plans, work performance, measurement data, etc.
- All group managers at Fukushima Daiichi NPS submit reports weekly to risk communicators about the results of any checks they have conducted for risks.
- Risk communicators confirm whether or not there have any leaks in information that is to be provided to the public, and their activities over the past six months have also contributed to raising awareness about information disclosure.

➢ In the Niigata area, the Niigata Headquarters' risk communicator, Kashiwazaki-Kariwa risk communicator and the Social Communication Office have held weekly information liaison meetings and been working to collect and verify any information about risks, proactively disclose information and initiate activities that foster social sensibility.

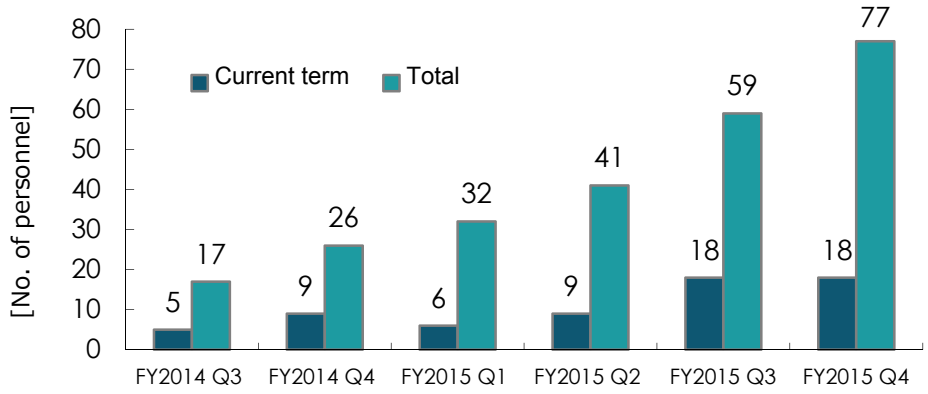
【Communication in Siting Communities】

<Status of Activities in the Fukushima Area>

➢ TEPCO is holding briefings and other events to proactively communicate with local governments, relevant organizations and people in the community about decommissioning and contaminated water countermeasures adopted at Fukushima Daiichi NPS as well as safety measures implemented at Kashiwazaki-Kariwa NPS.

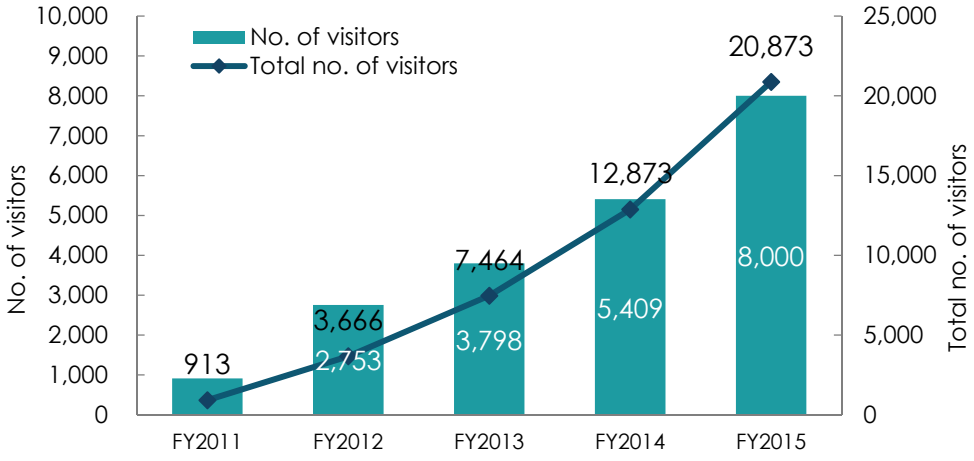
➢ TEPCO continues to detail engineering managers from Fukushima Daiichi NPS to short-term assignments in the Fukushima Corporate Communications Department for training in order to strengthen cooperation between the

Engineering Department and Corporate Communications Department as well as raise awareness among engineering employees about external communication (18 managers were assigned during the fourth quarter for a cumulative total of 77 managers).



Number of Fukushima Daiichi engineering managers that have been assigned to the Fukushima Corporate Communications Department for training

- Because progress has been made in improving the on-site environment, the number of visitors touring the facility has increased. Many people have commented that actually seeing the power station has given them a greater understanding. Nevertheless, because conditions at Fukushima Daiichi NPS have not been sufficiently communicated in press conferences, we need to improve this situation through our website or other means.



Change in the number of visitors touring Fukushima Daiichi NPS (total of 20,873 since FY2011 (as of March 31))

- The pamphlet “Important Talk about Reactor Decommissioning: Fukushima Daiichi Nuclear Power Station Today and Tomorrow” has been used to

communicate to the general public in an easy-to-understand way the current conditions at Fukushima Daiichi NPS as well as provide an overview of what the reactor decommissioning project will entail in the future. This pamphlet has been distributed to all households in the Hamadori district (including areas to which people have evacuated) through the local governments, and it has been distributed by TEPCO as well to our service centers, compensation departments, power system offices, power stations and other offices where there are many opportunities for a direct dialogue with residents in Fukushima Prefecture, the Greater Tokyo Metropolitan Area, Niigata Prefecture and other locations. In the future as well, TEPCO will proceed with expanding the use of communication tools in cooperation with external organizations.

"Important Talk about Reactor Decommissioning (Agency for Natural Resources and Energy)"
(Published in February 2016)

- At the meeting of the Prefectural Council on Safety Assurance during Decommissioning of Nuclear Power Stations in Fukushima Prefecture[16] which is sponsored by Fukushima Prefecture (6th meeting of FY2015 held on February 3, 2016), opinions were voiced, such as "We would like thorough measures to be put in place to prevent the dispersion of any dust when the entire Unit 2 reactor building operating floor or the Unit 1 wall panels are being dismantled" and "We want a system to be established to provide prompt notification when there is some sort of problem." TEPCO will take these comments into account in reliably implementing measures to curb the dispersal of radioactive materials such as sprinkling anti-scattering agent over the area, and we will thoroughly endeavor to provide prompt notification when abnormalities are detected.

[16] Launched in August 2013. Membership is comprised of 13 relevant municipalities, chambers of commerce, agricultural, forestry, fishery, tourism and various other organizations as well as academic scholars.

Prefectural Council on Safety Assurance during Decommissioning of Nuclear Power Stations in Fukushima Prefecture

- Our interactive dialogue with the people of Niigata Prefecture includes the traditional community briefings. We have also held sessions for exchanging opinions with women experts in the prefecture (14 sessions with a total of 87 people) as well as conducting tours of Kashiwazaki-Kariwa NPS (7 sessions with a total of 36 people) (numbers represent actual records for FY2015).

Opinion exchange meeting with women experts

【Enhancement of Communication Leveraging the Internet】

- TEPCO continues to produce videos showing photographs and computer graphics as a way to communicate information in an easy-to-understand manner. The following eight new videos were released during fourth quarter. Also, with regard to Fukushima Daiichi NPS, we have launched activities with an awareness of the necessity of communicating information to the public. For example, we have been showing a video entitled “Field Reports by Risk Communicators” at our regular press conferences held in J-Village.

<Videos about Fukushima Daiichi NPS> Release date given in parentheses

- Monitoring groundwater inside and outside the port at Fukushima Daiichi Nuclear Power Station: sample analysis (January 14)
- Completion of drilling by tunneling equipment for constructing a replacement for

drainage channel K (February 18)

- Daily life recently at Fukushima Daiichi Nuclear Power Station (February 18)
- Running dry-ice blasting decontamination equipment at high heights, etc. (February 23)
- Decontamination using dry-ice blasting decontamination equipment at high heights (February 23)
- Miscellaneous solid waste incinerator (February 25)
- Opening of Lawson convenience store at the large rest center at Fukushima Daiichi Nuclear Power Station (March 1)

<Videos about Kashiwazaki-Kariwa NPS> Release date given in parentheses

- Training in the operation of large-capacity water cannons: Kashiwazaki-Kariwa Nuclear Power Station (February 12)

➢ TEPCO continues to use SNS (social network services) to communicate information

- Fukushima Revitalization Headquarters Director Ishizaki, Niigata Headquarters Director Kimura and Nuclear Safety Oversight Office Executive Director Crofts continue to post comments and information on Facebook.
- "RC Series" continues to be posted on TEPCO's Facebook page. Risk communicators are directly posting articles in an effort to communicate a broad range of information about TEPCO's nuclear power, including information about risks related to Fukushima Daiichi NPS and our dialogue with society (Facebook posts in fourth quarter: 6)

【Communication with Other Countries】

➢ In order to share the lessons learned from the Fukshima nuclear accident and contribute to improving nuclear safety as well as decommissioning activities all over the world the US Nuclear Energy Institute (NEI) held a panel discussion at the National Press Club in Washington DC in February of this year. Writer, producer and director of a documentary on the Fukushima nuclear accident aired on the Public Broadcasting Station (PBS), Miles O'Brien, COO of the US Nuclear Energy Institute, Maria Korsnick, and TEPCO Nuclear Reform Monitoring Committee Chairman, Dale E. Klein (former Chairman of the US Nuclear Regulatory Commission), participated on the panel. At the event Nuclear Power & Plant Siting Division Deputy General Manager, Takafumi Anegawa, conveyed gratitude for technical assistance provided by the US Department of Energy and the nuclear power industry, and reported on the progress that has been made at Fukushima Daiichi ovr the last five years, during which he mentioned the importance of communication and cooperation with the local

community.

- In order to deepen international understanding about and convey information on the efforts underway in the world's nuclear power industry to improve nuclear safety the 4th Fukushima Forum was held in Tokyo in March (in cooperation with JANSI, INPO, and WANO).[17] Approximately 110 representatives from the US, Canada, Europe, China, Korea and Japan participated in the event. Fukushima Decommissioning & Decontamination Company President, Naohiro Masuda, and Nuclear Power & Plant Siting Division Deputy General Manager, Takafumi Anegawa, gave presentations on the current conditions at Fukushima Daiichi and efforst underway to improve safety based on the lessons learned from the Fukushima nuclear accident, respectively, and engaged in Q&A with participants.

Lecture being given by Takafumi Anegawa at the National Press Club

Lecture being given by Naohiro Masuda at the Fukushima Forum

- TEPCO has provided briefings at embassies in Tokyo about the status of reactor decommissioning and contaminated water (4 countries and 1 region: British Embassy, South Korean Embassy, United States Embassy, Delegation of the European Union to Japan and French Embassy). The diplomatic missions have shown an increased interest in changes in water levels inside buildings since the landside frozen-soil impermeable wall was placed into operation, as well as the changes in the quantity of groundwater being drawn up due to closure of the impermeable wall on the seaside.
- Last year, TEPCO participated in the "PIME[18] Award for Communications

[17] 1st: November 2011 in Atlanta, US; 2nd: October, 2012 in Charlotte, US; 3rd: September2013in Toronto, Canada

[18] Public Information Material Exchange: an international workshop which is sponsored by the European Nuclear Society and held each year to provide training and exchange information

Excellence 2016" sponsored by the European Nuclear Society[19] so that we could have our communication activities assessed by experts from around the world in the nuclear industry. Our activities for communicating with Fukushima Daiichi NPS workers and their families were evaluated.

PIME exhibition booth (Bucharest, Romania)

- TEPCO has held sessions to exchange views with the Nuclear Energy Institute in the United States, women executives from Exelon Corporation in the United States and people in the siting communities in Niigata and Fukushima. Based on cases focusing on activities in the United States, TEPCO received comments such as a "trusting relationship, in which people feel that the 'power station will always provide us with information' leads to peace of mind among community residents" and "opportunities for the operator and residents to exchange views face-to-face are very important." TEPCO will continue to proactively utilize knowledge and experience gained from other countries in areas such as our dialogues with siting communities.

Dialogue with former Niigata nuclear monitors

Dialogue with Fukushima Happy Road

principally among public relations professionals involved with nuclear power.

[19] Established in April 1975. The membership comprises 60 organizations from 20 countries mainly in Europe. Its principal activities include the provision of information to the general public, holding meetings promoting scientific and technical exchange, and promoting education and training.

【Improvement of Risk Communicators' Skills】

- To enhance knowledge about decision-making methods and consider case studies pertaining to reputation risk[20], group training has been held for risk communicators (total of four sessions with 39 participants). Comments conveying the impressions of participants include "the group discussions allowed me to share different ways of viewing situations, which I had not previously thought of" and "the multi-criteria decision and analysis technique[21] and review of cases studies from our own and other companies were very helpful for changing my way of looking at things."

Group discussion during review of case study

- From the standpoint of broadening the perception of nuclear safety, TEPCO encourages risk communicators to share their knowledge outside their base. Because we have emphasized sharing knowledge about the decommissioning of Fukushima Daiichi NPS, risk communicators themselves served as instructors and held study sessions on the topic of safety measures at Kashiwazaki-Kariwa NPS during the fourth quarter. Because these study sessions took into account the concerns of the public, attendees rated them highly. We plan to hold more such sessions in the coming fiscal year and beyond.

【Other Activities】

- When we talk about "communication," we tend to think of communicating through conversations, but much of our communication takes place in writing as well.

[20] The spread of negative evaluations and criticisms about a company decreases trust and brand value of the company such that there is the risk of losses being incurred by the company; reputation risk.

[21] Method whereby multiple effects arising from a project are standardized using respective measures of the effects themselves and assessed.

While we have worked to provide easy to understand materials for external consumption over our website and by other means, there have also been comments that internal documents and reports submitted to the national and local governments, which are prepared by the Nuclear Power Division, have been “difficult to understand.” So, training has been provided using actual case studies related to the Nuclear Power Division from the perspectives of “why are documents difficult to understand?” and “what is easy to understand writing?” (March 18). We will continue to work on achieving this goal because, if easy to understand documents are able to be prepared, then this will enhance mutual understanding and reduce the labor involved in revising such documents. Such improvements are also expected to have the secondary effect of contributing to streamlining operations.

(2) Assessment of FY2015

So that an objective assessment of TEPCO’s communication activities could be obtained from the public, we conducted a questionnaire survey of people in the three different areas that are the focus of our communication activities (local governments, commerce associations and consumer organizations in the Tokyo Metropolitan Area, Fukushima, Niigata) and employees of embassies in Japan.

<Survey Summary>

- Questionnaire was anonymous
- Response period: December 14, 2015-February 8, 2016
- Number of responses: 164

【Quantitative Assessment Results】

The respondents were requested to assess the “degree to which TEPCO’s stance[22] toward communication has improved” through its various communication activities.

Respondents’ answers evaluated the degree of improvement on a seven-tier scale ranging from -3 to +3 (0 is assessed if there is no change) in comparison to TEPCO’s situation one year prior.

a. The results of the assessment on the quality and quantity of information communicated about accidents and other such problems, nuclear safety reforms and reactor decommissioning at Fukushima Daiichi NPS showed on average value of +0.9 for all areas, which signifies a “tendency toward improvement.”

[22] Overall assessment of TEPCO’s three stances which include the stance toward understanding what the public is saying, stance toward disclosing information and stances toward communicating in an easy to understand way

	Tokyo Metropolis	Fukushima	Niigata	Overseas	All areas
Overall assessment	+0.6	+1.4	+0.8	+0.6	**+0.9**
No. of respondents	42	60	55	7	164

b. The results of the assessment of TEPCO's awareness and stance toward public relations and public hearings showed an average value of +1.0 for all areas, which signifies a "tendency toward improvement."

	Tokyo Metropolis	Fukushima	Niigata	Overseas	All areas
Overall assessment	+0.9	+1.1	+1.1	+0.6	**+1.0**
No. of respondents	42	60	55	7	164

【Qualitative Assessment Results】

Positive opinions expressed about TEPCO are given below.

- Diagrams and photos have been used, and wording has become easier to understand than it was previously.
- Videos posted on the website are helpful for understanding the topics. I was able to understand robots and other new technology better when I first saw the video.
- There does not seem to be any sort of stance toward concealing information to be disclosed.
- The website "1 For All Japan" is very good, and I look at it all the time.

Below are some opinions voiced that were critical of TEPCO.

- Although explanations are being given to the government, those for residents are lacking.
- A large quantity of information is being communicated, but it is impossible to determine what is important.
- Even though information is enumerated in detail, the overall picture is not visible. The goals aimed at, the degree to which they have been achieved and issues to be addressed should be shown.
- Although it is praiseworthy that all measured data is being released to the

public, the significance of this public release is halved because figures are simply listed. The information should be given in the form of commentary that includes trends and other significant information.

- Unless the receiver specifically goes out to get information, it is not available.

Based on these comments, the assessment of TEPCO's communication activities is as follows.

- The communication of information using diagrams, photos, videos and other such means has made it easier to understand, and the evaluation is that TEPCO's communication activities have "improved" compared to a year prior.
- In order to make further improvements, it is necessary to add additional value to the information by indicating the degree of its importance, providing commentary or other such means.

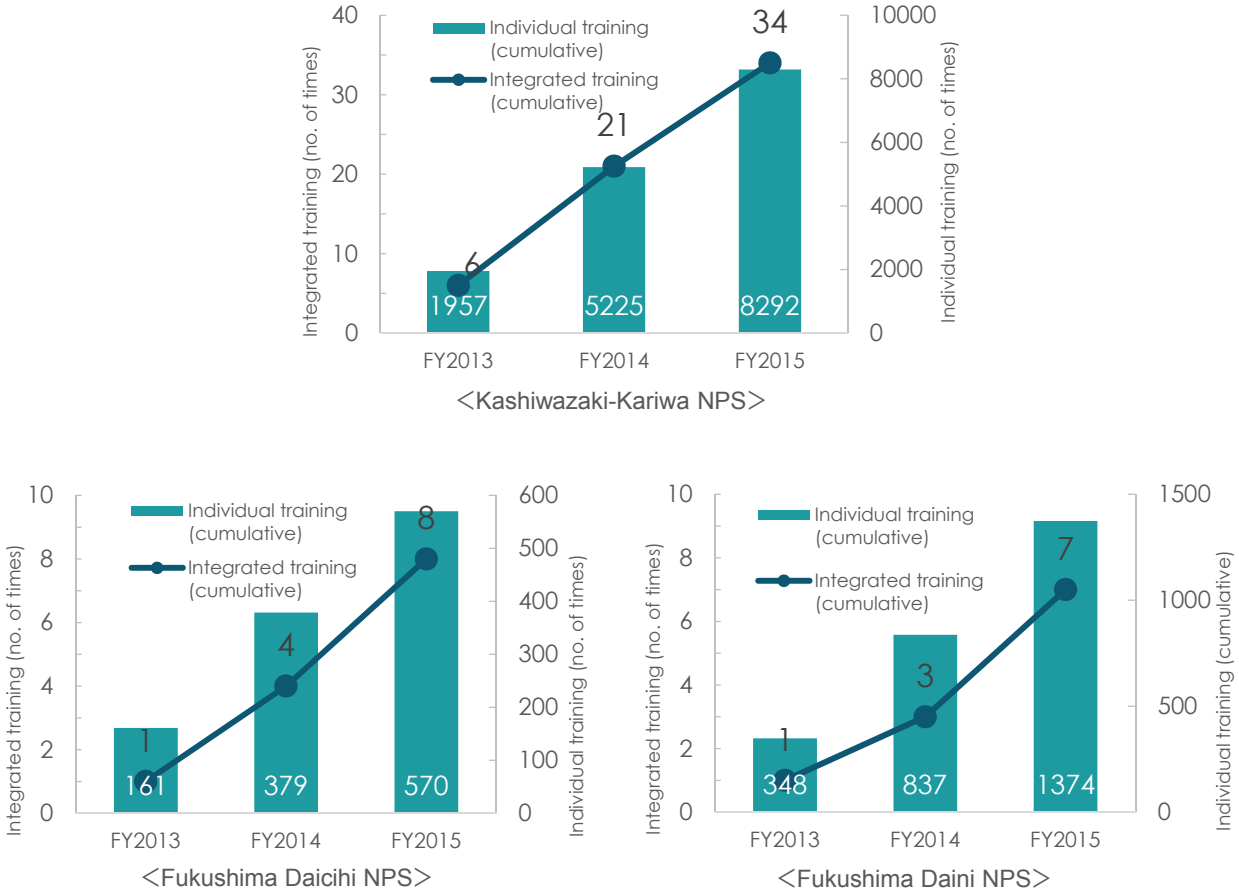
Also, this survey has been effective in understanding general impressions and trends compared to the situation one year ago, but its weakness is that it is difficult to link to prompt improvements by specifying specific issues to be addressed. For this reason, we will directly ask more detailed inquires of the parties receiving our communications about their awareness of any issues involving TEPCO and we will work to better define these issues.

2.5. Measure 5: Enhancement of Power Station and Head Office Emergency Response Capabilities

(1) Fourth Quarter Achievements

- TEPCO has repeatedly conducted individual and integrated training so that we may improve the emergency response capabilities and operational abilities of our emergency response organizations. A listing of training and achievements at each power station is given below.

Record of individual and integrated training (by power station)



【Fukushima Daiichi NPS】

- An integrated training drill was conducted at Fukushima Daiichi NPS on February 26. The drill assumed that a fire had broken out in the Unit 6 diesel generator causing a partial loss of safety equipment and other facilities. The surrounding roads were unusable, on-site communications were lost, and personnel had to move between the new administrative building and the Main Anti-Earthquake Building.
- In this training session, as personnel actually moved from the new administrative building to the Main Anti-Earthquake Building, issues were

identified such as clarifying the timing and methods for transferring operations between the personnel who had been responding in the Main Anti-Earthquake Building since immediately after the accident and the personnel who came over from the new administrative building. Also, with regard to the issue of the necessity for improving the sharing of information within the emergency response headquarters as well as within teams, we are considering modifying the layout of the emergency response headquarters and other measures. The viability of these measures will be verified during the following and future training sessions.

Executives responding to the situation in the Main Anti-Earthquake Building

Sharing information around a round table

【Fukushima Daini NPS】

- An integrated training drill was conducted at Fukushima Daini NPS on February 25. The training was conducted on the assumption that a level 6 earthquake had occurred and a warning issued about a large tsunami[23], so the emergency response center at the Main Anti-Earthquake Building (12m above sea level) was unusable and all personnel had to evacuate from the main administrative building (18m above sea level). Personnel actually moved to an alternate command center (on elevated ground 46m above sea level) to confirm the capability to respond to such an emergency.
- Through training the evacuation of all personnel from the administrative building to high ground and the effectiveness of notifications, information sharing and other communications between the alternate command center and the surrounding area were verified. As a result, the community fire brigade deemed that the evacuation of all personnel had been carried out smoothly. On the other hand, when confirming the conditions in the field at the alternate command center, issues came to light, such as the lack of wireless phone communication lines and the failure of some communications. In the future, we will work to provide the infrastructure needed for communications as well as provide other preparations, and verify improvement measures in the next and future training sessions.

[23] The warning did not estimate the specific height of the tsunami.

Container used as alternate command center

Teams gathering information outdoors

【Kashiwazaki-Kariwa NPS】

- At Kashiwazaki-Kariwa NPS, integrated training sessions were conducted on January 15, February 15, March 11 and March 31.
- At the February 15 integrated training session information sharing had been made smoother through improvements to the method in which information is shared between the Head Office and the Nuclear Regulatory Agency's Emergency Support Center, which had emerged as an issue during integrated training conducted last year, by assigning liaisons well-versed in plant data and using conversation recordings and diagrams showing the status of the power station's response when giving explanations.
- Personnel was dispatched to TEPCO's Kashiwazaki Energy Hall (logistics support center), Niigata Prefecture's Kashiwazaki-Kariwa Nuclear Disaster Prevention Center (OFC: Off-Site Center), and the Kariwa Village Office and it was confirmed that information was being shared in a timely manner.

  At the Kashiwazaki Energy Hall (logistics support center), personnel from the Japan Atomic Power Company's Nuclear Emergency Support Center (in Tsuruga City, Fukui Prefecture) actually transported decontamination equipment and materials from the center so that training could be conducted to become more proficient in such delivery and receipt. The training confirmed that TEPCO employees were able to use the decontamination equipment and materials.
- Also, so that the Niigata Headquarters, which is close to the power station, is able to act independently in lieu of the Head Office to convey information to local governments and respond to requests, the division of responsibilities was revised in October 2015. Through training it was verified that information about the local response is initially gathered by the Niigata Headquarters, so the Head Office has to make inquiries to the Niigata Headquarters to obtain such information. Going forward we will leverage training to ascertain what information is required by the Head Office and make improvements to the manner in which it is shared.

- The lessons learned from the Fukushima nuclear accident will be taken into account to clarify the people responsible for making decisions as to whether or not the power station is in a state of emergency, as well as who is responsible for providing such notifications and reports.

Training at Kashiwazaki-Kariwa NPS (February 15)

Gathering information in the Main Anti-Earthquake Building

Meeting to set objectives in a room at headquarters

Preparing the decontamination area at a logistics base

Briefing on conditions to a joint meeting on countermeasures at the OFC

Communicating information from the Niigata Headquarters to local governments

【Head Office】

- On March 11, Head Office management participated in training on situation assessment in conjunction with training conducted at the Kashiwazaki-Kariwa NPS. The roles that the Head Office should play and its actions were reaffirmed based on the lessons learned from the Fukushima nuclear accident. However, during training the same confusion was seen when sharing information with the power station due to a lack of individual training at the Head Office. So, we need to address the methods by which information required by the Head Office is obtained, verify thos methods during individual training and deliberate improvements during future integrated training sessions.
- In cases where the Head Office requires information from Kashiwazaki-Kariwa NPS, systems have been constructed so that such requirements do not interfere with power station activities, such as “phone calls are not directly made to power station executives and engineers while they are responding to the situation” and “video conferencing is interactive only when necessary.” Furthermore, when

sharing information within the power station as well, improvements have been developed so that personnel are able to concentrate on responding to the accident, such as limiting calls within the emergency response headquarters according to the importance of the information to be conveyed[24]. On the other hand, it may be possible that information, which the Head Office needs for understanding conditions at the power station and providing support over the medium and long term, may not be able to be acquired. Accordingly, TEPCO will move forward to improve the methods enabling the Head Office to reliably obtain such information.

- In FY2016, we will aim to further improve the response capabilities of Head Office function teams by steadily implementing individual training and developing response procedures in a planned manner.

Head Office management participating in emergency response training

【Common Matters】

- In March, for the power stations and Head Office, a medium and long-term plan was formulated that consolidates the basic training policy and risks inherent for each power station. In this plan, the goal was set to have TEPCO's emergency response organizations realize their ideal. The plans were laid so that strengthening of our emergency response capabilities would proceed in a more specific and reliable manner. This plan is not inclined only towards accidents involving a loss of all power at multiple units triggered by an earthquake or tsunami as has previously been assumed, but also anticipates a variety of risks including meteors, volcanoes and tornadoes. Additionally, we have constructed scenarios for accident that may occur along with such risks, and we have formulated plans to reflect such scenarios in training. In the future, as we verify training implementation and results, we will continue to revise these plans as necessary and strive to further improve our emergency response capabilities.

[24] Methods of sharing information using information technology, whiteboards and other such instruments are being developed separately.

- TEPCO has been proactive about engaging in mutual observation and opinion exchange with nuclear operators both within and outside of Japan about integrated training (opinions were exchanged with seven domestic operators during Q4). During the February 15 training session at Kashiwazaki-Kariwa NPS, the use of barrier status boards (chart that allows the status of containment of radioactive materials to be grasped at a glance), which are utilized by Exelon Corporation in the United States, was commenced. This is an effective method for making decisions because extremely important information is constantly being posted thereby eliminating the need to make repeated inquiries about such information. Going forward, we will work to improve our operations by actively instituting benchmarks and proactively adopting good practices.

Good practices reflected in operations (barrier status board)

This whiteboard enables the status of radioactive material containment functions, such as fuel cladding tubes, reactor cooling systems and the containment vessel, to be verified at a glance.

(2) Assessment of FY2015

Both the power stations and Head Office conducted systematic training while collaborating with the relevant parties both inside and outside of Japan. We have improved our emergency response capabilities by repeatedly identifying issues to be addressed and responding to them. Nevertheless, issues remain that need to be addressed soon, such as improving methods by which the Head Office acquires information from power stations as well as improving disparities in the quality and quantity of integrated training among the power stations. In FY2016, as we continue to increase the speed at which we resolve these issues, we will redouble our efforts to identify additional issues to be addressed and make such improvements as we strive to increase our capabilities.

2.6. Measure 6: Development of Personnel for Enhancing Nuclear Safety[25]

Measure 6 addresses improvements in the technical capabilities of each and every person within the Nuclear Power Division. These technical capability improvements comprise the following four elements.

a. Improving technical capabilities for directly managing work so that severe accidents do not result
b. Improving operational specialization
c. Maintaining and improving technical capabilities necessary for operations
d. Understanding the fundamentals of nuclear safety

(1) Fourth Quarter Achievements

a. Improving Technical Capabilities for Directly Managing Work so that Severe Accidents do not Result

【Activities of Maintenance Personnel】

- Fukushima Daiichi NPS

  In order to improve emergency response capabilities, TEPCO has continued to work to provide training that enables personnel to acquire practical skills through direct management of projects (operating power supply cars, training in connecting electrical cables, training in operating mobile cranes, etc.).

Training on connecting spent fuel pool cooling water injection equipment (Fukushima Daiichi) (The photo on the left shows the air cooling unit)

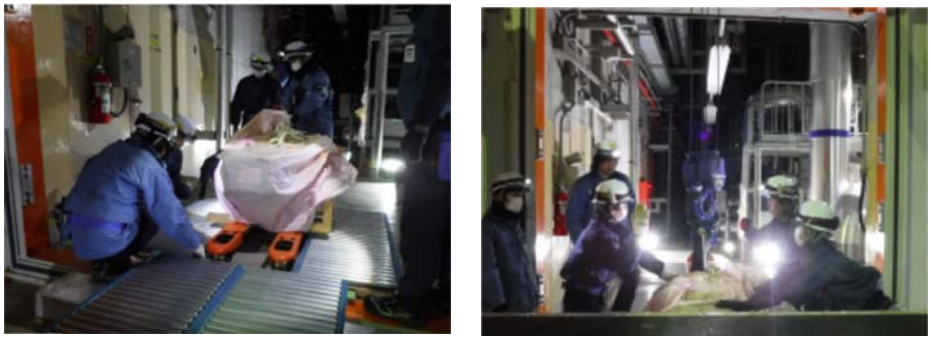
[25] Section heading revised from “Enhancement of (Individual) Emergency Response Abilities and Field Capabilities” in the previous Progress Report.

Training in mobile crane operation (Fukushima Daiichi NPS (training conducted in J-Village))

- Fukushima Daini NPS

  In order to improve emergency response capabilities at Fukushima Daini NPS, personnel have been assigned to one of four teams (1: Rubble Removal and Road Restoration Team, 2: Power Generator Switchover Team, 3: Temporary Cable Connection Team, and 4: Cooling Water Pump Restoration Team), and have been constantly practicing to improve their skills. In addition, training is used to develop new field commanders in order to bolster the number of personnel capable of commanding field operations. Also, training has been conducted as responders wear full-face masks and at night with the aim of further enhancing their technical capabilities. We are continuing to conduct training while exercising originality and ingenuity so that a flexible response may be executed under any variety of conditions.

Training in removing rubble and connecting temporary cables while wearing full-face masks (Fukushima Daini NPS)



Training in replacing electric motors at night (Fukushima Daini NPS)

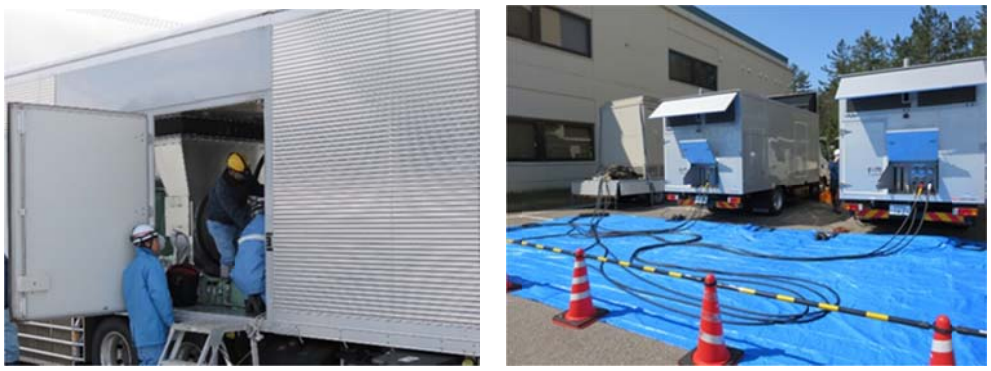
- Kashiwazaki-Kariwa NPS

In order to improve emergency response capabilities, Kashiwazaki-Kariwa NPS has continued to conduct training through direct management of projects. Moreover, in preparation for cases where a ventilation system duct cracks or is otherwise damaged following an earthquake or other natural disaster, training is currently being conducted so that personnel are able to repair such equipment through direct management of the work, even if ventilation performance has decreased. So that personnel are able to handle whatever sort of damage may result in whatever location it may result, they have been constantly training in environments that simulate the field, including setting up scaffolding and other such tasks. In addition, TEPCO has been providing training so that our employees are even able to directly manage the disassembly and reassembly of pumps and electric motors as well as replacement of vertical pump electric motors. They are continually practicing performing overhauls, repairs and maintenance as well as conducing operation tests of safety valves on the assumption of valve seat leakage.

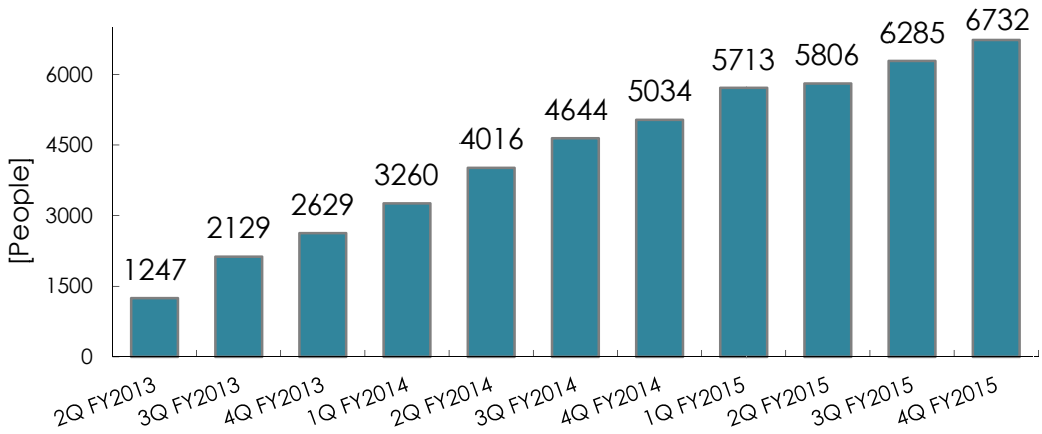
Furthermore, in the fourth quarter, training has been conducted on repairing auxiliary components so that personnel are able to handle a minor failure of a gas-turbine power generating vehicle, and, in an effort to provide more hands-on training, training exercises have been conducted in which gas turbine generator trucks were actually connected to electric motors and operations performed to increase power output.

Training in operating gas-turbine power generating vehicles (Kashiwazaki-Kariwa NPS)


Training in repairing ventilation system ducts (Kashiwazaki-Kariwa NPS)
(Left: material processing; right: repairing a duct at a high height)



Training in repairing a gas-turbine generator vehicle (left)
Training in lining up and operating power supply cars (right)
(Kashiwazaki-Kariwa NPS)



Change in the number of maintenance personnel undergoing direct-management training
(Total for Fukushima Daiichi NPS, Fukushima Daini NPS and Kashiwazaki-Kariwa NPS)

【Operators' Activities】

- Fukushima Daiichi NPS

  In 2014, operators at Units 5 and 6 started fire engine and power supply car training. As of the end of March 2016, in contrast to the goal of 34 personnel (80% of the 42 field personnel), 41 (enrollment ratio: 120% or a decrease of 2 trainees compared to 3Q) in operating fire engines and 40 (enrollment ratio: 117% or an increase of 18 trainees over 3Q) have been trained and certified as skilled in operating power supply cars. Operators at Units 1-4 have prioritized the acquisition of skills related to operation management for facilities such as the contaminated water treatment facility and spent fuel common pool, and, in the current quarter, results have been shown demonstrating enhanced training in the operation of power supply cars.

- Fukushima Daini NPS

  Fire engine training began in 2014. As of the end of March 2016, in contrast to the goal of 23 personnel (80% of the 28 field personnel), 28 (enrollment ratio: 121% or a decrease of 1 trainee compared to 3Q) have acquired such skills. Training in operating power supply cars began in the second quarter and 27 personnel (enrollment ratio: 117% or an increase of 4 trainees over 3Q) out of a goal of 23 personnel have acquired these skills.

- Kashiwazaki-Kariwa NPS
  - ○ Mentors have been fostered within operation shift organizations, and training has been ongoing in starting up power supply cars and connecting fire engines. As of the end of March 2016, in contrast to the goal of 105 personnel (80% of the 131 field personnel), 131 (enrollment ratio: 124% or a decrease of 1 trainee compared to 3Q) in fire engines and 124 (enrollment ratio: 118% which signifies no change since 3Q) have been trained and certified in operating power supply cars. In addition to ordinary startup of power supply cars, training has also been conducted in manually opening and closing air intake and exhaust dampers when such equipment has failed. Furthermore, within operator training teams, TEPCO has also worked to foster leaders with skill certifications, and 66 personnel (increase of 6 over 3Q) have been so trained as of the end of March 2016.
  - ○ Along with augmenting (increasing) operators for emergency response, TEPCO has strived to improve the skills of not only maintenance personnel, but also operators so that they are able to diagnose equipment. These personnel have been acquiring in-house certification and qualifications in equipment diagnosis, and are in the process of collecting data through direct management of such tasks for approximately 140 pieces of rotating equipment at Unit 7. This is improving our field capabilities through the acquisition of a broad range of knowledge about equipment and facilities and a heightened interest in equipment status. In addition, we are working also to have personnel acquire nationally-recognized certifications of technical skills (machinery maintenance, facility diagnosis), and 21 operators passed such certification exams in FY2015.

Activities for improving the skill of operators to directly manage tasks (number of personnel certified)

Power station	Fire engine		Power supply cars	
	No. of personnel certified (increase/decrease from previous quarter)	Certification rate	No. of personnel certified (increase/decrease from previous quarter)	Certification rate
Fukushima Daiichi NPS	41 (-2)	120%	40 (+18)	117%
Fukushima Daini NPS	28 (-1)	121%	27 (+4)	117%
Kashiwazaki-Kariwa NPS	131 (-1)	124%	124 (0)	118%

Enrollment ratio: Certification rate when the objective is to get 80% of field personnel certified.

b. Improvement of Operations Expertise

【Training and Assignment of System Engineers】

- In order to promptly and safely stabilize a reactor when there is an emergency, personnel need to quickly understand the accident circumstances and make appropriate determinations. For this reason, engineers are being trained to be proficient in design, laws & regulations, standards, operation, maintenance and other areas pertaining to facilities important for safety.
- System engineers create monitoring programs for important plant systems and use these systems to monitor whether or not system performance and functions satisfy design requirements. While confirming the reliability of facilities, they are also expected to identify areas for further upgrade and make such improvements.
- In the fourth quarter, the results of monitoring of 12 systems each at Kashiwazaki-Kariwa NPS Units 6 and 7 were compiled in a system soundness report, which confirmed that there were no issues with performance or function. Also, in order to expand the range of systems monitored, a new system monitoring program was prepared for seven systems. Adding these to the programs already in place for 15 systems, system monitoring programs have been completed for 22 systems each at Units 6 and 7. In the future, the number of programs is scheduled to be expanded to 40 per reactor unit.
- Also, three personnel completed the system engineering training program (each individual acquired certification in one system[26]). Power station and Head Office managers in the fields of operations, safety and maintenance interviewed the three personnel who completed the necessary education and training curriculum. They confirmed that these personnel possess system

[26] Emergency diesel generator system, reactor core isolation cooling system and standby gas treatment system.

engineer skills. In the future, TEPCO will continue to move forward systematically to educate and train system engineers (including expanding the systems covered).



(from left) System engineer training, skill confirmation interviews, awarding of certificate of completion

c. Maintenance and Improvement of Technical Capabilities Necessary for Operations

【Improvement of Skill Certification Training】

- Since FY2014, we have been committed to improving the technical capabilities of our personnel with the aim of having practical training that is closely related to operations. Currently, we are expanding the activities covered from maintenance to technical systems in the fields of radiation protection, fuel and safety. In the fourth quarter, we conducted exercises that were closely tailored to field operations. During their classroom training, after personnel understood the principal points for anticipating hazards in the workplace, we had them conduct field exercises so that they may point out unsafe and inappropriate points in the field during construction work. These practice exercises verified the degree to which trainees have gained an understanding and allow for follow-up if they have not achieved the requisite level of expertise. Additionally, in order to raise awareness about the necessity for work safety, we are also continuing to provide training that provides simulated experiences of hazards. All employees engaged in work supervision participate in this training and these field exercises and danger experience training will be repeatedly implemented on a periodic basis for personnel newly transferred.

FY2015 Danger Experience and Prediction Training Results

Power station	Employees	Contractor workers
Fukushima Daiichi NPS	780	5,490
Fukushima Daini NPS	197	718
Kashiwazaki-Kariwa NPS	1,186	1,694
Total	2,163	7,902

Simulated hazard training using elevated work on a stepladder (Kashiwazaki-Kariwa NPS)

【Applying PC Simulators to New Employee Training】

- During the second half of group training for new employees, 71 personnel underwent training using PC simulators. The aim was to have the new employees gain an even better understanding by having them ascertain plant operating states and predicting plant behavior during an accident or problem and then verifying their actions using a simulator.
  Also, not only new employees, but also early and mid-career employees will have an opportunity to reconfirm their understanding of how plants behave during accidents and problems.

Training using a PC simulator

【Improvement Activities by CFAMs & SFAMs】

- In April last year, CFAMs and SFAMs began conducting activities in their areas of specialization whereby they ascertain excellence achieved in other countries, identify key issues to be resolved, formulate improvement measures and implement them. Beginnig in Q2 TEPCO has invited expert teams (2 teams totaling 8 people) from overseas, which have been permanently stationed at TEPCO since January of this year. During this time they have been providing advice and guidance about operations that CFAMs

and SFAMs perform, such as monitoring, problem-solving and personal development.

- In addition, these teams of overseas experts provide coaching and engage in debate with TEPCO employees about nuclear safety culture, operation management, maintenance management and labor safety while observing actual work being done at the power stations. This coaching has been helpful for identifying problems and making improvements.

Overseas expert team providing guidance and advice to CFAMs (on facility diagnosis) (Head Office)

d. Understanding the Basics of Nuclear Safety

- In December of last year, training was conducted using the lessons learned from the non-conformance that resulted in a failure to separate cables properly under the floor of the main control room at Kashiwazaki-Kariwa NPS Unit 6. With regard to understanding nuclear safety design, which was also an objective of this training, basic matters were laid out such as the content of training that should be continually implemented and the frequency of such training, and education and training programs commenced.
- While improving the skill of each and every worker through the activities mentioned above, experts intimately familiar with safety equipment design conditions and technical standards have been dispatched to oversee safety during the new installation and renovation of equipment in addition to the supervision provided by the department in charge of the aforementioned equipment. Before dispatching these experts interviews were conducted to confirm that they have knowledge about special permission requirements and technical standards and have experience using them. To date experts in 20 fields, such as fire protection, lightning protection design, electrical separation and main control rooms, etc., have been dispatched to the Head Office (18 experts) and power stations (44 experts) (in some cases one expert may be responsible for multiple areas). During this fiscal year experts in approximately 50 fields will be additionally dispatched and an expert cultivation plan formulated while confirming skill.

(2) Assessment of FY2015

Since FY2015, TEPCO has viewed personal development as pivotal for improving our technical capabilities and we have moved forward with such activities methodically. Although these activities have generally progressed as planned, we need to further enhance education and training when we consider the personnel accidents that have occurred as well as the failure to separate cables under the floor of the main control rooms.

TEPCO is currently planning to establish the Nuclear Personnel Development Center (provisional name) to strengthen personal development as well as education and training, and this institute will be central as we endeavor to make improvements in the future. In particular, conventional TEPCO SAT[27] programs will be improved during this fiscal year for the operation and maintenance fields

2.7. Evaluation of Progress on Nuclear Safety Reform

(1) Status of Nuclear Safety Reform KPIs and PIs

- The results achieved in nuclear safety reform KPIs during the fourth quarter of FY2015 are as follows.

Nuclear Safety Reform KPI Results

Nuclear safety reform KPI		4th quarter FY2015
Safety awareness KPIs	Traits[28]	94.2 points (Nuclear Power Division overall) 95.2 points (nuclear power leaders)
	M&M[29]	97.9 points
Technical capability KPIs	Planned	75.5 points
	Result	42.0 points (end of 3rd quarter)
Ability to promote dialogue KPIs	Internal	78.3 points (Nuclear Power Division overall) 84.6 points (nuclear power leaders)
	External	+0.9 points (quality and quantity of information communicated) +1.0 points (perception and stance towards public relations and hearings)

[27] Abbreviation of Systematic Approach to Training

[28] Refers to the 10 traits of a Healthy Nuclear Safety Culture, and calculated based on PI-1 to 5 of Measures 1 and 2.

[29] Combination of the first letters of “message” and “management observation,” and calculated based on PI-1 to 6 of Measures 1 and 2.

- The PI results for each measure comprising nuclear safety reform KPIs are as follows for the fourth quarter.

PI results for each nuclear safety reform measure

Measure	4th quarter FY2015[*1]	Target
Measures 1, 2		
1. Rate of retrospective reviews using the traits	95.0% (overall) 80.8% (nuclear power leaders)	100% (excluding deployments, temporary transfer or long-term recuperation)
2. Rate of "I don't know" responses voiced during retrospective reviews	0.1% (overall) 0.2% (nuclear power leaders)	10% or less
3. Moving average trend of indices (quarterly)	Ratio of indices for the 40 behaviors that are tending to increase 100% (overall) 73% (nuclear power leaders)	70% or higher for behaviors tending to increase (because the number of behaviors showing a tendency to increase is counted, there is a tendency for nuclear power leaders, who already scale high, to be lower)
4. Number of group meetings and department-internal meetings held to discuss the results of retrospective reviews	71%	70% or higher for departments or groups holding two or more meetings per month
5. Number of reviews conducted by management regarding the results of retrospective reviews	1 time or more	1 or more per quarter
6. Communication of messages about nuclear safety by nuclear power leaders	2 or more per month	2 or more per month
7. Number of messages read	Increasing trend (until end of February)	Positive increase in the total number monthly
8. Number of messages rated "helpful"	Leveled off (until end of February)	Positive increase in the total number monthly
9. Number of power station management observations conducted by management	1.13 times per man-month	Numerical targets set by each organization[*2]
10. Number of good practices or key issues identified through	2.1 items/observation	1 or more items/observation[*2]

Measure	4th quarter FY2015*1	Target
management observations		
11. Ratio of good practices extended laterally or key issues improved within one month	89.7% (of amount deduced during December-February)	70% or more
12. Ratio of good practices extended laterally or key issues improved within three months	85.4% (of amount deduced during October-December)	100%
13. Ratio of action plans for operation plans that are linked to Measures 3, 4 or 6, or PO&C and for which quarterly quantitative targets are set	75.5 points	50 points or more (initially) 70 points or more (through 3Q)
14. Ratio of action plan goals achieved	42.0 points (Result as of end of 3Q)	50 points or more
Measure 3		
1. Number of proposals entered in the Safety Improvement Proposal Competition times the average points assessed times the ratio of outstanding proposals completed within 6 months	2Q 2014: 1,143 points	1,500 points or higher
2. Ratio of OE data utilized (Ratio of OE data utilization at daily meetings, etc.)	96%	100% (monthly for organizational units)
3. Ratio of views of new OE data	66%	50% or higher
4. Implementation of hazard analyses	Completed (Kashiwazaki-Kariwa NPS)	Completed by end of 2014 (postponed for Fukushima Daiichi NPS and Fukushima Daini NPS)
5. Ratio of progress made in hazard improvement plans	21% (4Q) 40% (FY2015)	Plan progress rate of 100%
Measure 4		
1. Assessment of quality and quantity of information communicated about Fukushima Daiichi NPS	+0.9 points	Increasing trend chronologically for overall points assessed in surveys of external

Measure	4th quarter FY2015[*1]	Target
decommissioning work, nuclear safety reforms, accidents/problems, etc.		evaluators
2. Assessment of TEPCO's awareness and stance in public relations and public hearings	+1.0 points	
Measure 5		
1. Self-assessment based on PO&C areas pertaining to emergency response (EP. 1 to 3)	(Head Office) Feb: 4.5 points (Fukushima Daiichi NPS) Feb: 3.7 points (Fukushima Daini NPS) No assessment conducted (Kashiwazaki-Kariwa NPS) Jan: 3.7 points Feb: 4.1 points Mar: 3.7 points	Average of 4 points or higher for 5-tier self assessments completed once per quarter or after comprehensive training by a team leader or higher ranking personnel[*3]
Measure 6		
1. Number of emergency responders acquiring in-house skill certifications for fire engines, power supply cars, cable connecting, radiation surveying, wheel loaders, unic cranes, etc.	117%[*4]	Secure 120% of the number needed for each power station by the end of 2017
2. Number of system engineers certified	3 people	5/reactor
3. Number of engineers trained in seismic resistance, PRA, fire protection, chemical management or other specializations	75% (PRA engineer)[*5]	Ratio of development plan achieved: 100%
4. Number of personnel acquiring in-house skill certifications for operations, maintenance, safety, etc.	106%	Ratio of development plan achieved: 100%
5. Number of personnel acquiring external certifications specified as	76%	All personnel or the number necessary for each field by the end of

Measure	4th quarter FY2015*1	Target
essential by TEPCO, including first class electrician, class B group 4 hazardous materials officer, operation chief of oxygen deficient danger, etc. (approx. 15 certifications)		FY2017
6. Number of personnel acquiring external certifications recommended by TEPCO, including high-pressure gas production safety, construction machinery operation, etc. (approx. 15 certifications)	70%	30% or higher for each field by the end of FY2017
7. Number of personnel acquiring external certifications, including licensed reactor engineer, first class radiation protection supervisor, technician (reactor and radiation fields), etc.	85%	Ratio of development plan achieved: 100%

*1: Information not specifically entered is the actual value as of March 31, 2016.
*2: Because targets are uniform (1 time or more/man-month), they can be enhanced into a pattern corresponding to each organization's operations. A management observantion implementation plan (including targets) is currently being formulated and assessments of the degree to which targets have been achieved has not been conducted.
*3: Changed to system of assessments corresponding to the degree of training difficulty.
*4: The differences between conditions at Fukushima Daiichi NPS and those at Fukushima Daini NPS and Kashiwazaki Kariwa NPS have been taken into account, and Fukushima Daiichi NPS is not included in this tabulation as the necessary figures are under review.
*5: Training plans are being reviewed for specialized engineers other than PRA engineers (safety assessment engineers).

(2) Assessment of Nuclear Safety Reform KPIs and PIs

Following on our efforts in the third quarter, all of the KPIs and PIs pertaining to safety awareness, technical capability and ability to promote dialogue have been for the most part favorable. These values are not only assessed as high or low, but:

- If they are high (target achieved), then our aim is to make them even higher.
- If they are low (target not achieved), then we analyze the causes and make improvements.
- In either case, we also assess whether or not the KPI or PI is effective for measuring the degree to which nuclear safety reforms are realized.

By doing so, more effective improvement activities will be carried out, and KPIs and PIs modified and target values raised as necessary. Here, one year has passed since TEPCO started practicing nuclear safety reform KPIs and PIs, and we have once again reviewed the nuclear safety reform KPIs and PIs in light of the initially intended objectives.

a. Safety Awareness KPIs & PIs

Safety awareness KPIs and PIs have been set on the assumption that organizations and individuals that have a high safety awareness actively engage in retrospective reviews using the “10 Traits and 40 Behaviors” (hereinafter, 10 Traits”), transmit and receive messages from nuclear power leaders, and proactively utilize management observations. Safety awareness KPIs and PIs are set using the following two types, and the respective assessments and issues to be addressed are given in the following table.

	Configuration method	Assessment & issues
Safety awareness KPI (Traits)	• KPIs are created by totaling the degree to which the five PI targets are achieved in order to measure the extent of improvement in behavior through retrospective reviews, prevalence of understanding achieved of the 10 Traits and formation of the habits of taking a retrospective review using the 10 Traits. • Assessments of two types, the Nuclear Power Division overall and nuclear power leaders, are conducted quarterly. The target is to attain a score of 70 points or higher.	• KPIs have risen to high numerical values and targets have been achieved. • The KPI for the Nuclear Power Division as a whole has increased over the past year to reach 94.2 points. • The KPI for nuclear power leaders has been over 90 points since the initial sampling and leveled off for the most part. In the third quarter, the indicator temporarily fell below 90 points and it is assumed that assessments of each indicator of the 10 Traits will continue to be high, but monitoring continues to be conducted.
Safety awareness KPI (M&M)	• This KPI is set to measure whether or not the expectations about nuclear safety as communicated by nuclear power leaders are being realized in the field. The target is to attain a score of 70 points or higher. • This KPI is established as a total of the extent to which four PIs have been achieved that measure the	• The KPI reached 97.8 points, achieving the target.

	performance of management observations conducted by managers and three PIs measuring the transmission and receipt of leaders' messages.	

Each KPI has reached an overall high value, so it has become difficult to specify the next issues to be addressed. In order to aim to achieve further increases, the following revisions will be implemented.

KPI modifications	
Safety awareness KPI (Traits)	• Two PIs indicating the rate of retrospective reviews conducted using the 10 Traits and the rate of people responding "I don't know" when looking back have continued to remain at a high level, such that it is able to be determined that a habit has been formed of conducting retrospective reviews and the understanding and prevalence of the 10 Traits have improved. Accordingly, these two PIs will be excluded from the KPI calculation and the focus will be on whether or not desirable behaviors are being embodied in daily operations, thus establishing a KPI of the remaining three PIs to check for any trends. • Trends pertaining to the two PIs which are to be excluded from the KPI calculation will be checked within the scope of daily operational management.
Safety awareness KPI (M&M)	• The number of messages about nuclear safety communicated by nuclear power leaders has continued to achieve the target and will be deleted from the PI. • In order to measure qualitative changes in the messages, the number of messages read and the number of personnel finding the message "helpful" will be changed from the total numbers each month to the average number per message. • With regard to management observations, we have begun to strengthen such activities in accordance with the "Common Guide for Management Observations," so a change will be made to a PI that is in accord with operational processes described in the Guide (number of observation reports, etc.)

b. Technical Capability KPIs & PIs

Two types of technical capability KPIs have been configured for operational plans in the aim of achieving world-class levels and a track record of executing such plans. Assessments and issues to be addressed for each are given in the following table.

	Configuration method	Assessment & issues
Technical capability KPI (planning) / technical capability KPI (achievements)	• In the aim of achieving world-class levels and so that technical capabilities improve, in addition to Measures 3, 5 and 6, KPIs have been developed for the state of the analysis of vulnerabilities based on PO&C and operational plans formulated for such improvement (planning) and the progress made in executing such plans (achievements). • These KPIs have been set as indirect and comprehensive indicators whereby the respective activities for improving technical capabilities are appropriately planned and carried out. • Quarterly assessments are made of the Head Office, Fukushima Daini NPS and Kashiwazaki-Kariwa NPS. The targets are “planning: 70 points or higher” and “achievement: 50 points or higher.”	• For the fourth quarter, planning was 75.5 points and achievement was 42.0 points, and the former achieved its target while the latter was below its target, but still within an acceptable range. • The subordinate PIs comprising “technical capability” includes the “number of emergency personnel holding in-house skill certifications” and “number of different types of specialized engineers trained” as well as multiple other items directly related to technical capabilities. Even though these PIs have improved, they are not directly expressed in the KPIs. Because KPIs have been set to comprehensively indicate technical capabilities, there is an issue in the lack of sensitivity vis-à-vis actual activities.

The technical capability KPIs are not directly linked to PIs managing progress on Measures 3, 5 and 6, but are configured in an attempt to monitor overall activity from a broad perspective taking a comprehensive view in order to promote activities that aim to achieve the world’s highest levels (analysis of weaknesses based on PO&C and such improvements). Based on the results from FY2015, we have been able to confirm that operational plans for improvements based on PO&C are showing progress to a certain extent. For this reason, the focus will be placed on “people” who possess technical capabilities, and skills will be separated into those for non-emergency times and those for emergency times, and these will be managed as a KPI for whether or not the necessary personnel have been trained and their skills maintained. This will enable improvements to be made by connecting actual activity results (PIs) and the technical capability KPIs, which consolidate these, so that situations may be promptly ascertained and feedback provided.

KPI modifications	
Technical capability KPI (non-emergency)	Ratio of non-emergency personnel possessing skills Confirmation will be made as to whether or not personnel hold the necessary skills within their pursuit of daily operations, and whether not training of personnel to that end is proceeding in a planned manner.

	During the first quarter, personnel definitions, skill levels, number of personnel needed and other such aspects will be reviewed and set.
Technical capability KPI (emergency)	Ratio of emergency personnel possessing skills Confirmation will be made as to whether or not personnel hold the necessary skills for times of emergency, and whether or not training of personnel to that end is proceeding in a planned manner. During the first quarter, personnel definitions, skill levels, number of personnel needed and other such aspects will be reviewed and set.

The (planned) percentage of operational plans linked to previously implemented PO&C and other such aspects and the (recorded) percentage of targets achieved will continue to be confirmed as one PI.

c. Ability to Promote Dialogue KPIs & PIs

The ability-to-promote-dialogue KPI will be separated into communication within the company (internal) and communication outside the company (external), and configured according to the following two types, for which the respective assessments and issues are given in the table below.

	Configuration method	Assessment & issues
Ability to promote dialogue KPI (internal)	• From among the retrospective review activities concerning the 10 Traits, four measured values related to communication will comprise the KPI. • Assessments of two types, the Nuclear Power Division overall and nuclear power leaders, will be conducted quarterly. The target will be to have an increasing trend in the KPI.	• Over the past year, the KPI tended to increase, and the assessment was that there was a high awareness about communication. • On the other hand, the fourth question checked for the “desired result: sincere attitude toward information disclosure,” from which it was found that the content was less direct. Accordingly, there is a weakness in that it is difficult to specify other issues or link this KPI to prompt improvements.
Ability to promote dialogue KPI (external)	• An “assessment of the quality and quantity of information communicated by TEPCO” and “assessment of TEPCO’s awareness and stance toward public relations and hearings.” • Assessors are selected by TEPCO from four groups: Fukushima community, Niigata community, TEPCO supply area and personnel	• Assessments have been conducted in FY2014 and FY2015, and both assessments showed that there had been improvement from a year prior. • The KPI measurement cycle is one full year, and it is effective in ascertaining general trends using the comparison of a year prior. • On the other hand, it has a

	posted at foreign embassies in Japan. • In the fourth quarter, using a questionnaire format, assessments are conducted quarterly to evaluate whether there has been improvement or worsening compared to a year prior using a seven-tier scale ranging from -3 to +3 (0 is assessed when there is no change).	weakness in that it is difficult to specify other issues or link this KPI to prompt improvements.

Although the both KPIs are effective in ascertaining overall trends, it is difficult to link these so as to specify issues and make prompt improvements, and the following reassessment will be carried out.

KPI modifications	
Ability to promote dialogue KPI (internal)	【Ongoing】 From among the retrospective review activities concerning the 10 Traits, four measured values related to communication will continue to comprise the KPI and trends will be confirmed quarterly. 【New】 Activities will be conducted to specify specific issues by asking for comments using surveys or direct dialogue, conducting reviews of cases pertaining to drainage channel issues at Fukushima Daiichi NPS. The creation of PIs about these activities will be reviewed and determined in the first quarter (number of improvement proposals, etc.)
Ability to promote dialogue KPI (external)	【Ongoing】 An “assessment of the quality and quantity of information communicated by TEPCO” and “assessment of TEPCO’s awareness and stance toward public relations and hearings” will continue to be carried out in the fourth quarter of FY2016. However, target respondents, questions (particularly, activities regarding freely expressed opinions, etc.) and other items will be reviewed once again while taking into consideration data continuity. 【New】 Activities will be conducted to specify specific issues by asking for comments using surveys or direct dialogue, conducting reviews of cases pertaining to cable laying issues at Kashiwazaki-Kariwa NPS. The creation of PIs about these activities will be reviewed and determined in the first quarter (number of improvement proposals, etc.)

3. Review and Improvement of Nuclear Safety Reform Plan Measures

3.1. Review and Improvement Policy

Based on the FY2015 assessment and separately-conducted self-assessments the results of three years, a compilation has been arranged in the table below of assessments and issues to be addressed as regards action plans.

- Progress as planned (satisfactory) or steady progress while issues are resolved
- Issues to be addressed
- Major problems (not covered in this assessment)

Current action plan		Assessment and issues
Measure 1	Measure 1-1 Increase safety awareness throughout the entire organization and among management	From the results of monitoring and communication of expectations by management and nuclear power leaders, safety awareness has taken on an increased prevalence. However, there is room for improvement in message content and thoroughness.
	Measure 1-2 Develop nuclear power leaders	Prescribed training for nuclear power leaders has proceeded as planned. A training program needs to be established for future nuclear power leaders and upper management candidates.
	Measure 1-3 Spread a safety culture throughout the organization	Daily retrospective reviews, group discussions and other activities utilizing the 10 Traits have taken hold. Meanwhile, the 10 Traits need to be embodied in specific behaviors.
Measure 2	Measure 2-1 Nuclear Safety Oversight Office conducts monitoring and improvements are made in response to indications and proposals	【Nuclear Safety Oversight Office】 The Nuclear Safety Oversight Office has continued to provide indications and proposals to management executives through its monitoring activities, and has contributed to improving nuclear safety.
		【Management executives】 The Nuclear Safety Oversight Office has presented indications and suggestions to management executives, including that some of their activities are delayed. The involvement of nuclear power leaders needs

Current action plan		Assessment and issues
		to be strengthened and improvements accelerated.
	Measure 2-2 Enhance the role of middle management	With the enactment of the MO Guide, management observations have begun to be augmented. The results of management observations will need to be directed through a system linking them to improvements.
Measure 3	Measure 3-1 Hold competitions for strengthening the ability to propose safety improvements	The number of proposals and outstanding proposals has increased as this activity has taken root. Improvement activities, which are not directly related to the competition, have also been encouraged.
	Measure 3-2 Utilize operation experience (OE) data from inside and outside Japan	The habit of utilizing OE data has taken hold. In the future, an emphasis will be placed also on learning about SOERs as well as collecting and analyzing cases involving near-miss accidents.
		On the other hand, opportunities for improvement need to be organized and consolidated, overlapping eliminated, and efforts made toward more fundamental improvements.
	Measure 3-3 Construct processes for improvement based on hazard analyses	Measures to address hazards are being implemented according to plan (Kashiwazaki-Kariwa NPS). Beginning in FY2016, these efforts will need to be extended to Fukushima Daiichi NPS and Fukushima Daini NPS.
	Measure 3-4 Improve processes for periodic evaluations of safety (safety reviews)	Because differences among reviews continue to be eliminated, the status of nuclear safety improvement is scheduled to be reassessed in a comprehensive analysis and assessment review.
	Measure 3-5 Inventory work and reduce overtime by half	Because of the ever-increasing issues to be resolved, the streamlining of operations has not kept pace nor has it resulted in the creation of resources. We have determined that a different approach is necessary.

	Measure 3-6 Manage assessments of achievements involving nuclear safety in an integrated manner	Items related to nuclear safety have been incorporated into achievement assessments, which are being centrally managed along with personnel transfers. A system capable of assessing results contributing to safety improvements has been constructed and taken hold. Consequently, this action plan is regarded as completed.
	Measure 3-7 Improve the ability to resolve issues traversing organizations	The development of IT for maintenance operation processes (introduction of Maximo) has progressed as planned with the aim of full-scale operation in the third quarter of FY2016. In the coming fiscal year, the topic of “change management,” which is considered effective for resolving issues that traverse organizations, will be raised and progress managed.
	Measure 3-8 Reassess personnel transfers involving exchanges between departments	Personnel need to be secured in order to resolve the many issues in the Nuclear Power Division, and personnel transfers that are exchanges between departments have been temporarily suspended. This measure will be assessed after exchanges among departments are restarted.
Measure 4	Measure 4-1 Systematic appointment and training of risk communicators (RC)	The appointment and rotation of RC personnel have proceeded as planned. It is necessary to strengthen systematic training for RC candidates (particularly, women).
	Measure 4-2 Practice risk communication	With the advent of the drainage channel issue at Fukushima Daiichi NPS, the stance toward information disclosure has improved. The ability to promote dialogue KPI has been assessed as positive and improved since last fiscal year. However, the value needs to be added to information, such as prioritizing data and adding commentary.
	Measure 4-3 Promote and support risk communication activities	Training for RCs to improve their abilities has proceeded as planned, and RC skills have been organized and clarified. Beginning in the coming fiscal year, outside training and other such programs will also be employed.

Current action plan		Assessment and issues
Measure 5	Measure 5 Strengthen the emergency response capabilities (organizational) of power stations and the Head Office	While repeatedly implementing individual and integrated trainings, emergency response capabilities have steadily been enhanced. At the end of FY2015, a “mid- to long-term plan” was formulated, which will be put into practice in FY2016.
Measure 6	Measure 6-1 Improve technical capabilities for direct management so that severe accidents do not result	Improvement of operators’ and maintenance personnel’s skills have proceeded as planned. At each power station, the use of creativity and ingenuity has increased training variations.
	Measure 6-2 Improve operational specialization	With regard to the development of system engineering, configuration management and other special skills, progress has been made in a cycle that comprises requirement configuration, plan formulation, implementation and skill confirmation.
	Measure 6-3 Maintain and improve technical skills necessary for operations	The review of skill certifications and other such activities have proceeded as planned. In the future, the SAT-based education and training program will be accelerated.
	Measure 6-4 Understand the basics of nuclear safety	PC simulator training and other such programs have proceeded as planned. Training in safety design has been carried out, which stems from the problem of how cables were laid. In the future, a complete picture will be laid out of a curriculum on the basics of nuclear safety.

Based on the aforementioned assessment results, the following two priority issues are related to reassessment and improvement of measures for FY2016.

a. In the third quarter of this fiscal year, the maintenance operation processes will be informatized (introduction of Maximo). In conjunction with this, system operation, which has mainly been managing non-conformances, will be revised, Along with non-conformances, a variety of information will be input which leads to improvements that enhance nuclear safety, such as lessons learned from operation experience (OE) data, benchmarks set in both Japan and other countries, items indicated and proposals made by third-party reviewers, recommendations put forth by the Nuclear Safety

Oversight Office, matters noticed during management observations and other such data. In this way, system operation will be revised to manage “improvement activities.” This will consolidate and manage improvement activities, which have previously been carried out separately, and provide a comprehensive view of such activities as a whole, thereby assessing and improving organizational operation and management issues as well. In addition, nuclear power leaders will be able to utilize the system to directly check their own progress in improvement activities, thereby accelerating improvements and recovering from delays.

b. Personnel development is key for improving technical capabilities, and the assessment is that TEPCO has worked and made steady improvement on Measure 6. Nevertheless, in accordance with the prepared action plans, personnel development is in the operating stage, and there is a significant gap in contrast to the levels expected for world-class excellence. For this reason, the Nuclear Personnel Training Center (provisional name) will be central in making improvements by constructing and revising education and training based on SAT, and implementing such training in a systematic manner as well as continually improving education and training.

3.2. Reassessment and Improvement of Measures

(1) Measure 1: Reform from Top Management

It has been five years since the Fukushima nuclear accident occurred and three years since the Reassessment of Fukushima Nuclear Accident and Nuclear Safety Reform Plan was compiled, and the starting point for TEPCO’s nuclear safety culture is to once again have the lessons learned from the Fukushima nuclear accident thoroughly understood throughout TEPCO management and among all personnel within the Nuclear Power Division.

In addition, we have implemented activities to have the “10 Traits and 40 Behaviors” be prevalent and take root throughout the entire organization. In the future, to further enhance nuclear safety, it is important that we actually embody these characteristics and that they be verified through management observations and other assessments.

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

Monitoring by the Nuclear Safety Oversight Office has been assessed as bringing about positive changes in improving TEPCO’s nuclear safety, and this monitoring will continue to be carried out.

At the same time, although many recommendations have been put forth by the

Nuclear Safety Oversight Office, activities have been slow to be executed, and nuclear power leaders need to exercise leadership. In accelerating the execution of activities, it will be effective to utilize the CAP System (provisional name) based on the modified Measure 3-5 activities, and have nuclear power leaders themselves confirm the status of improvement activities.

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

In order to enhance the ability to propose defense in depth, Measure 3 aims to improve technical capabilities through both:

- Activities that contribute directly to nuclear safety, such as making this approach more widespread through the embodiment of this ability in competitions, learning from operational experience (OE) data from other companies, etc.
- Activities that underpin nuclear safety improvements, such as improving the ability to resolve issues traversing organizations and enhancing the efficiency of operations for creating resources

On the other hand, of the information that contributes to improving nuclear safety, only the causes of non-conformances and the implementation of measures to address these (including OE information that TEPCO needs to respond to) is practiced and managed in the system, and although information other than non-conformances (Nuclear Safety Oversight Office and third-party review recommendations, etc.) is managed by the recipients of such indications or proposals, a weakness has been confirmed in that such information is not managed organizationally or systematically by the Nuclear Power Division.

In order to resolve this issue and promote improvement, any useful information, which need not be limited to non-conformances, should be managed centrally and the following actions realized:

- Reduce any overlapping of improvement activities
- Delve into and analyze underlying factors and adopt more fundamental countermeasures, thereby raising the efficiency of improvement activities

Accordingly, lessons learned from operation experience (OE), results of benchmarks set both inside and outside Japan, matters indicated and proposed by third-party reviewers, Nuclear Safety Oversight Office recommendations, items noticed during management observations, information about near-miss accidents and a broad range of information will be centrally input into an IT system developed for maintenance operation processes (introduction of Maximo), which will go into full-scale operation in the third quarter of FY2016, and TEPCO will switch its operation to one that leads to improvements which raise the level of nuclear safety.

In addition, under the current Measure 3-5, TEPCO has endeavored to “inventory

work and reduce overtime by half (based on proposals from the Productivity Doubling Committee)" with the objective of creating resources for improving nuclear safety. However, the achievements made in reducing overtime in FY2015 were limited to a 5.5% reduction compared with the latter half of FY2014 (overall average for the Nuclear Power Division), and the streamlining of operations is not kept pace due to the ever-increasing issues to be resolved. In other words, in order to achieve the objective of "creating resources," another approach is necessary. For example, it is anticipated that the aforementioned centralized management of useful information will prevent organizations from repeating the same mistakes and wasting resources and provide substantial effect with the commitment of fewer resources.

In addition, for Measure 3-6 "manage assessments of achievements involving nuclear safety in an integrated manner," a system has been constructed and been established so this measure has been completed. With regard to Measure 3-7 "improve the ability to resolve issues traversing organizations," progress has been verified through projects such as the creation of an IT system for maintenance operation processes (introduction of Maximo), and Maximo is expected to commence full-scale operation this coming fall, so, in the future, "change management[30]" will be verified.

Based on these, Measure 3 will be rearranged as follows for FY2016.

Measure 3-1: Hold competitions for strengthening the ability to propose safety improvements

Measure 3-2: Utilize operation experience (OE) data from inside and outside Japan

Measure 3-3: Construct processes for improvement based on hazard analyses

Measure 3-4: Improve processes for periodic evaluations of safety (safety reviews)

Measure 3-5: (Amended) Promote improvement activities through operation of the CAP system (provisional name)

Measure 3-6: (Amended) Improve ability to resolve issues traversing organizations (change management)

(4) Measure 4: Enhancement of Risk Communication Activities

In both FY2014 and FY2015, the assessments conducted by the receivers of TEPCO communications were that improvement had been made over the year prior. On the other hand, there is a strong desire for value to be added to such information through prioritization and commentary, and TEPCO will endeavor to improve our communications in the future.

Also, using currently-implemented surveys, TEPCO will directly ask for comments

[30] In organizational changes and project implementation (including improvement activities), activities for anticipating risks and formulating countermeasures in advance, and assessing their effectiveness thereafter.

and conduct reviews of cases in order to pinpoint issues in risk communication and overcome the weakness which is that it is difficult to link these results to prompt improvements, and we will review the development of PIs to focus on these objectives.

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

Emergency response capabilities have steadily improved through repeated individual and integrated training. TEPCO will continue to make improvements by conducting training in accordance with the mid-to long-term plan.

(6) Measure 6: Development of Personnel for Enhancing Nuclear Safety

Since FY2015, Measure 6 has been comprised of four elements: “Measure 6-1: Technical capabilities for direct management of work,” “Measure 6-2: Operational specialization,” “Measure 6-3: Technical capabilities necessary for operations” and “Measure 6-4: Understand the basics of nuclear safety,” and TEPCO has been carrying out activities for comprehensively improving overall technical capabilities.

In addition to these, we have endeavored to enhance training for managers in order to improve the awareness and ability of middle management to act in order to promote nuclear safety reform as well as strengthen education and training for improving management abilities needed to improve work safety while taking into account severe personal accidents that have occurred (TWI training, etc.). So that these efforts are not ephemeral, we will add a new measure “Measure 6-5: Improvement of management ability,” the progress of which we will manage under the Nuclear Safety Reform Plan.

Also, based on a recognition that we should take a comprehensive view of personal development as well as education and training related to organizations and their roles, and organize this overall structure to give priority to strengthening inadequate points, TEPCO has proceeded to review the establishment of the Nuclear Personnel Training Center (provisional name). On the other hand, taking into account the failure to separate cables under the floors of the main control rooms, we need to reassess education and training programs, and immediately strengthen and develop systems so that we are continuously making improvements. Therefore, we have added “Measure 6-6: Improve systems for personnel development and education & training” in response to the activities for fundamentally reassessing the framework of personal development as well as education and training throughout the entire Nuclear Power Division including Measures 6-1 to 5, and we will manage this progress under the Nuclear Safety Reform Plan.

Along with this, we will separate training for management (including TWI training)

from “Measure 2-2: Enhance the role of middle management,” and Measure 2-2 will focus on management observations.

Based on the aforementioned, beginning with this quarterly report, the designation of Measure 6 will be changed from “Enhancement of (Individual) Emergency Response Abilities and Field Capabilities” to “Development of Personnel for Enhancing Nuclear Safety.”

Closing Remarks

In FY2015, TEPCO reduced the risk of any outflow of contaminated water with the completion of highly contaminated water processing (using the Advanced Liquid Processing System (ALPS)), closure of the impermeable wall on the ocean side and other measures. We have made steady progress in controlling the quantity of contaminated water generated by drawing up groundwater through subdrains and initiating freezing of an ice wall on the landside. Fukushima Daiichi NPS is continuing to emerge from a state in which stopgap facilities were formed and had to operate within time constraints and a severe work environment at the time when the accident occurred. TEPCO is committed to enhancing nuclear safety in the future.

Also, we have made advances in constructing safety measures at both the Fukushima Daini NPS and the Kashiwazaki-Kariwa NPS. We have embraced the mindset of nuclear safety reform and are not just satisfying regulatory requirements, but rather independently implementing emergency response training and reconfiguring equipment in order to achieve ever higher levels of nuclear safety.

We also believe that our activities under the Nuclear Safety Reform Plan (management) are progressing satisfactorily overall. However, at the same time, the results of the FY2015 assessment indicate that accelerating improvement activities and enhancing personal development are pressing issues, and we will endeavor to prioritize these two points in FY2016.

In our determination to be a “nuclear operator than continuously improves safety to unparalleled levels by enhancing safety levels on a daily basis while always keeping the Fukushima Nuclear Accident firmly in mind,” TEPCO will continue to advance nuclear safety reforms while subjecting our organizations to objective assessments by the Nuclear Reform Monitoring Committee.

We are more than happy to hear any comments and opinions about these reforms and hope that you will forward them to us through our website.

End