

Nuclear Safety Reform Plan

Progress Report

(Includes the progress status for safety measures at each power station)

FY2015 Q1

August 11, 2015

Tokyo Electric Power Company, Inc.

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Foreword

We would like to once again express our sincere apologies to the community living in the vicinity of the power station and society in general for the extreme inconvenience that the Fukushima Nuclear Accident and other problems, such as contaminated water issues, have caused. All companies involved will continue to work together to achieve the smooth and quick payment of compensation, accelerate recovery efforts in Fukushima, steadily promote reactor decommissioning and thoroughly ensure nuclear safety.

On March 29, 2013, The Tokyo Electric Power Company, Inc. (TEPCO) released its Fukushima Nuclear Accident Summary and Nuclear Safety Reform Plan and nuclear safety reform is currently underway. The progress of status of these reforms are compiled quarterly and released in the form of this report.

The following is a report on the status of progress for the first quarter of FY2015 (April through June 2015¹) and of the status of activities implemented in the wake of serious personnel accidents that occurred during the fourth quarter of FY2014 and drainage channel issues at the Fukushima Daiichi Nuclear Power Station (NPS) that have come to light.

¹ Hereinafter, the year shall be 2015 unless otherwise noted.

1. Progress Status of Safety Measures at Each Power Station

1.1 Fukushima Daiichi Nuclear Power Station

At Fukushima Daiichi the work to decommission the reactors is underway in accordance with the Mid and Long-term Roadmap Toward the Decommissioning of TEPCO Fukushima Daiichi Nuclear Power Station Units 1 to 4 (June 12th revision). Compared with immediately following the accident risks have been greatly reduced throughout the entire power station by purifying a highly radioactive contaminated water (RO concentrated saltwater), sealing off seawater pipe trenches, and reducing dose rates at site borders through decontamination of the site.

However, there are still issues that require continual improvements, such as insufficient management, an issue that was brought to light when the leak from the transfer hose from the 1,000 ton notch tank to the Unit 3 turbine building was discovered on May 29th.

The Fukushima Daiichi NPS and TEPCO's Nuclear Power Division is receiving assistance from The Japan Atomic Power Company. 123 experts (as of July 1st), including Yoshikazu Murabe, have been dispatched to help TEPCO solve problems by leveraging their expansive knowledge and experience in the field of nuclear power.

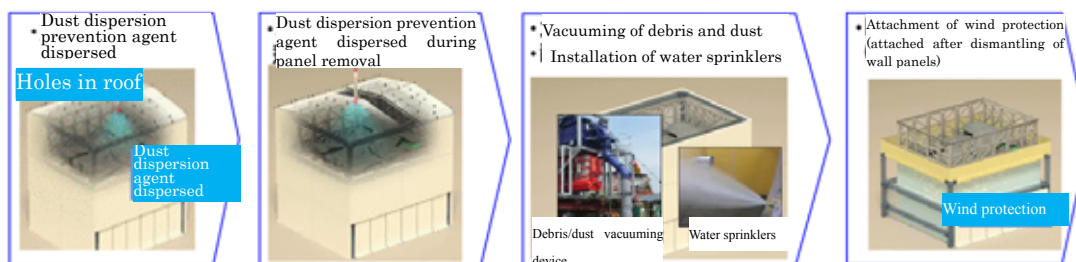
(1) Removing Fuel from the Unit 1~3 Spent Fuel Pools

The removal of fuel from the Unit 4 spent fuel pool was completed on December 22, 2014. This experience is now being leveraged as preparations are made to remove spent fuel from Units 1~3. In light of the fact that the integrity of buildings and equipment is being maintained, the spent fuel from Unit 5 and 6 will continue to be stored in the spent fuel pool. The status of work on Units 1~3 is as follows:

➤ Unit 1

The reactor building cover will be dismantled in order to remove debris that remains on the upper floors of the reactor building in which the spent fuel pool is located. On May 15th preparations to dismantle the building cover began in the form of drilling holes in the building cover panels in order to disperse a dust dispersion prevention agent, however this work was suspended on May 21st when the balloon that was installed in order to suppress discharges of radioactive substances was found to be out of line. The results of an assessment showed that the discharges of radioactive substances were low enough regardless of whether the balloon was in place or not. Therefore, the balloon was not repaired and work to remove the roof panels began

after formulating countermeasures to prevent the influx of wind. Work proceeds with the hope of commencing fuel removal during FY2020.



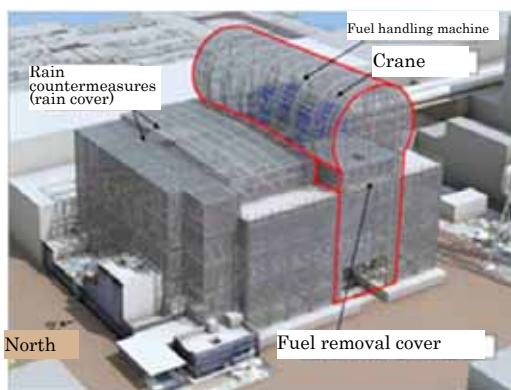
Unit 1 Building Cover Dismantling Countermeasures

➤ Unit 2

Preparations to create a work area around the reactor building are underway in order to construct a fuel removal platform and install fuel handling machines. Since it is possible that work to remove fuel from the spent fuel pools may interfere with work to remove fuel debris (melted fuel), work methods and work plans are currently being deliberated in order to avoid the risk of having to do things over.

➤ Unit 3

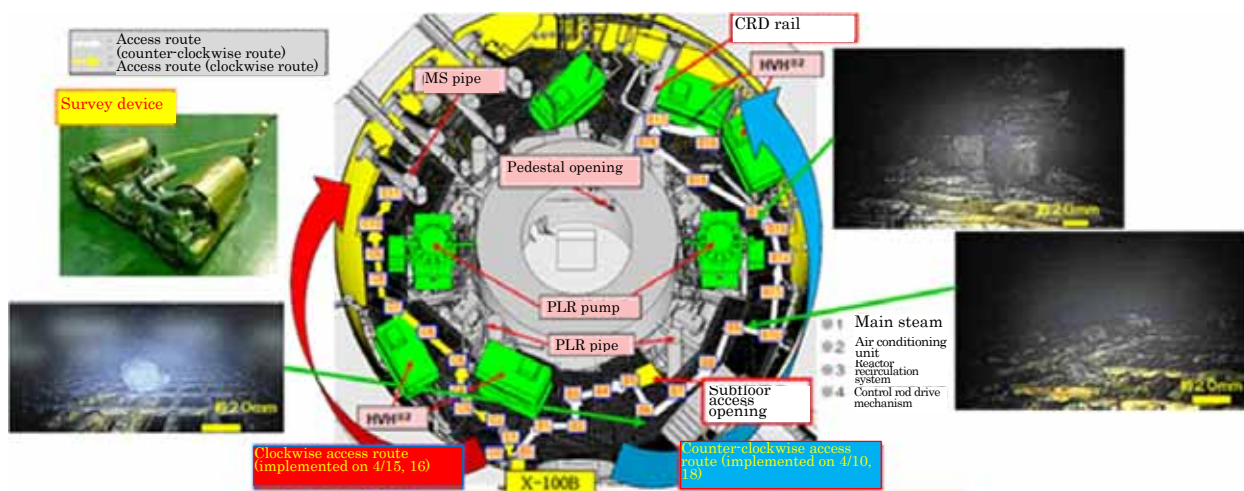
Construction of a platform to be used to construct the spent fuel removal cover and work to remove debris from the top of the reactor building was completed in FY2013. Currently decontamination and shielding countermeasures are being formulated in order to reduce exposure during the construction of the fuel removal cover and installation of fuel handling machines on the top of the reactor building, which is an important issue. At the same time work to remove large debris (fallen fuel charger, etc.) from inside the spent fuel pool continues with the hope of commencing spent fuel removal during FY2017.



Concept drawing of Unit 3 fuel removal cover

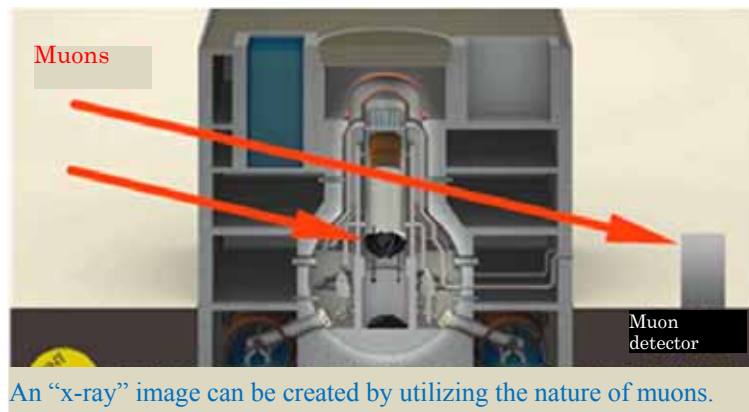
(2) Ascertaining the status of the plant and work to remove fuel debris (melted fuel)

In order to ascertain conditions inside the containment vessel, such as the location of Unit 1 fuel debris, etc., a survey was conducted (April 10th through April 20th) using a crawler robot that has a terrain-adjusting mechanism that allows it to run stably on top of grating. Video of the inside of the first floor of the containment vessel and other information, such as air doses, etc., were obtained. And, it was confirmed that there are no obstacles in the vicinity of the opening to access the subfloors which will be used for the next survey.



Unit 1 Containment Vessel Internal Survey

Furthermore, in order to ascertain the amount and location of fuel debris (information that is needed to deliberate fuel debris removal methods) a survey was conducted using muons (a subatomic particle) that originate from space (February 12th through May 19th). The data collected over approximately three months has confirmed that there is hardly any fuel remaining in the core.



Measuring muons that pass through the reactor

(Utilizing the nature of muons to pass through anything except highly dense materials, such as fuel debris)

(3) Handling contaminated water problems

At Fukushima Daiichi approximately 300 tons of contaminated water is being generated daily as groundwater flowing into the building mixes with water used to cool melted fuel during the accident. As a result countermeasures to problems, such as discharges of contaminated water into the power station ports and leaks of contaminated water from tanks, etc., are continually being implemented based on the three basic policies of eliminating sources of contamination, preventing water from coming in contact with sources of contamination, and not allowing contaminated water to leak.

In addition to these preventative and multilayered countermeasures for contaminated water, a Comprehensive Risk Inspection was implemented in order to widely identify mainly liquid and dust-related risks that may have an impact on areas beyond Fukushima Daiichi site borders in accordance with instructions given by METI Minister Takagi in the wake of the drainage channel problem. 190 risks, including those for which countermeasures have already been formulated, were identified and additional countermeasures will be implemented in accordance with priority level in an effort to further reduce risk (announced on April 28th).

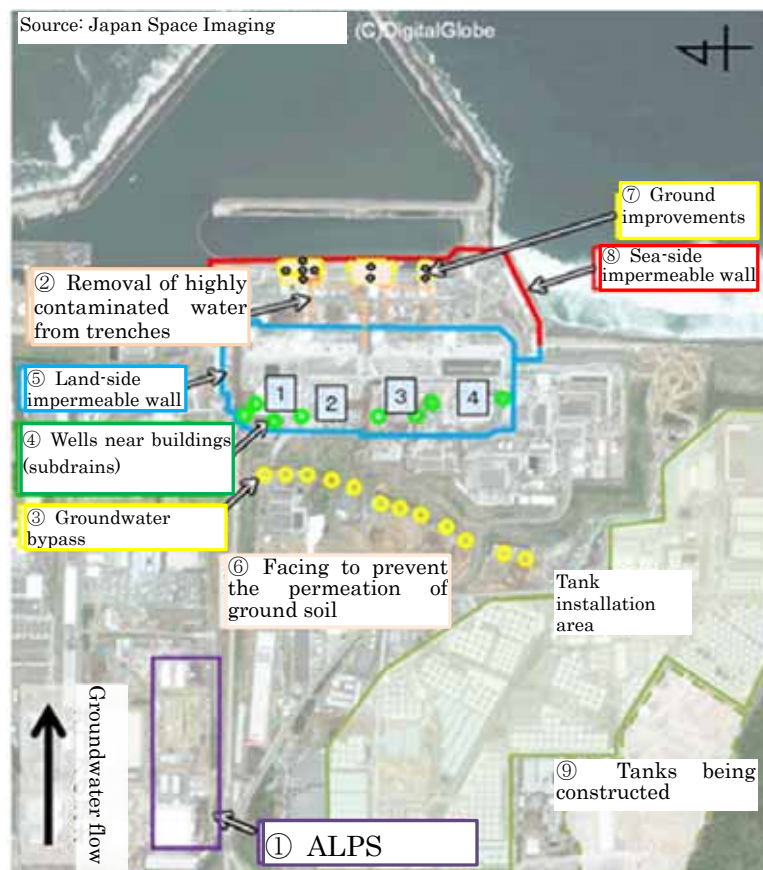
<Measures to eliminate sources of contamination>

- Purification of contaminated water using ALPS equipment (See diagram ① below)
- Removal of contaminated water from inside seawater piping trench (See diagram ② below)

<Measures to prevent water from coming in contact with sources of contamination>

- Pumping up groundwater from a groundwater bypass (See diagram ③ below)

- Pumping up groundwater from wells (subdrains) around buildings (See diagram ④ below)
- Construction of frozen soil impermeable wall on the land side (See diagram ⑤ below)
- Asphalt paving of the site to prevent the permeation of rainwater into the soil (facing) (See diagram ⑥ below)
- <Measures to prevent contaminated water from leaking>
- Ground improvements using water glass (completed in March 2014) (See diagram ⑦ below)
- Construction of impermeable wall on the ocean side (See diagram ⑧ below)
- Additional erection of tanks (replacement with welded tanks, etc.)

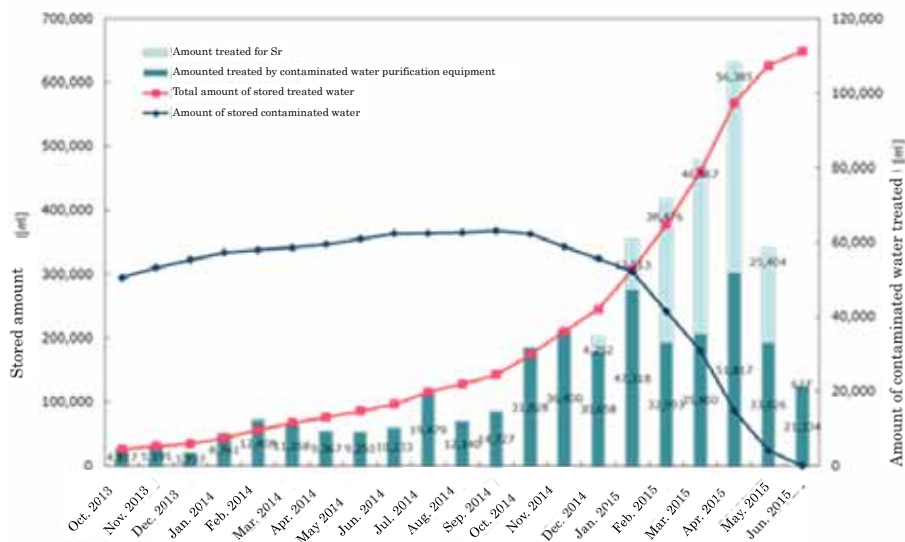


Primary contaminated water countermeasures

- Completion of the purification of highly concentrated contaminated water (RO concentrated seawater) using ALPS equipment
- Seven different types of equipment, including an Advanced Liquid Processing System (ALPS), is being used to purify highly concentrated contaminated water as quickly as possible, and as of May 27th the treatment of this water was completed with

the exception of some water remaining at the bottom of the tanks. This water remaining in the bottom of the tanks will be treated as the tanks are dismantled.

Furthermore, water that requires further purification, such as water containing strontium that was processed with equipment other than ALPS, will be treated again.



Amount of contaminated water treated with contaminated water purification equipment

➤ Removing contaminated water from seawater piping trenches

In order to reduce the risk of a discharge of highly concentrated contaminated water due to external factors (tsunami, etc.), in November 2014 work commenced to remove the contaminated water that has accumulated inside the Unit 2~4 seawater piping trenches and subsequently fill the inside of the trenches so as to prevent water from accumulating due to an influx of groundwater. Work to transfer contaminated water at Unit 2 and seal the trenches was completed on July 10th. Filling of the Unit 3 trenches will be completed during July. With the exception of the upper portion of the outlet channel, the Unit 4 trench tunnels and shafts on the turbine building side were sealed in April. Since the contaminated water inside the trenches was highly radioactive the removal of this water has had a great impact on reducing the risk of contaminated water discharges into the ocean.



Unit 2 Filling the inside of seawater piping trenches

Filling location (numbers in parentheses indicate the amount of contaminated water)		~2015.1	2015.2	2015.3	2015.4	2015.5	2015.6	2015.7
Unit 2	Tunnel (Total: Approx. 2,510m ³)	Completed						
	Shaft (Total: Approx. 1,990m ³)		Completed	Completed	Completed	Completed	Completed	
Unit 3	Tunnel (Total: Approx. 3,140m ³)		Completed	Completed	Completed			
	Shaft (Total: Approx. 2,660m ³)					Completed	Completed	
Unit 4	Tunnel (Total: Approx. 460m ³)		Completed	Completed				
	Opening (Total: Approx. 210m ³)				Completed			

▲ 130 ▲ 70 ▲ 350 ▲ 1,440
 ▲ 1,200 ▲ 1,400 ▲ 540
 ▲ 280 ▲ 2,380
 ▲ 290 ▲ 170
 ▲ 200

■ : Filling work
 ■ : Transfer work

(The implementation period for the top of the discharge channels is being scheduled)

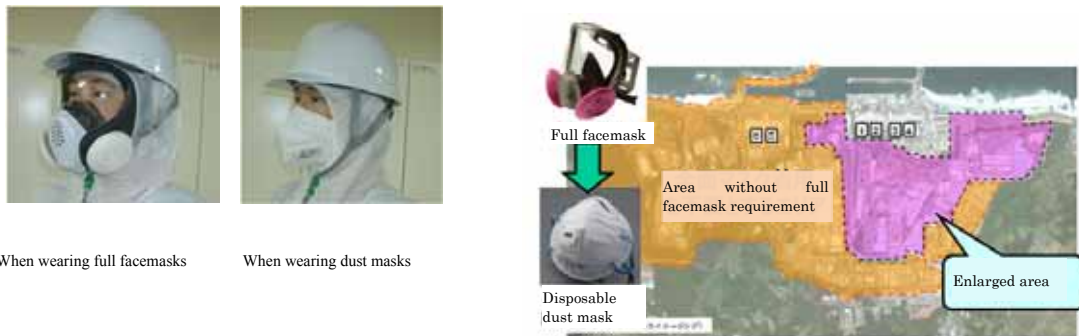
※ Removal periods may fluctuate due to scheduling
 ※ Numbers in the chart preceded by a ▲ indicate the forecasted amount of accumulated water in trenches to be removed during that month (m³)
 (if the impact on treatment equipment by the quality of the accumulated water is not considered)

Schedule for sealing and filling the seawater piping trenches

(4) Improving on-site work environments

➤ Enlargement of areas that do not require full facemasks

The area that does not require the use of full facemasks is being gradually enlarged in conjunction with decontamination of the site. The additional installation of continuous dust monitors (for a total of 10 monitors) on the Unit 3, 4 side slope and in tank areas has enabled monitoring of the concentration of radioactive substances in the air thereby allowing the area that does not require the use of full facemasks to be enlarged to 90% of the site (excluding when engaging in work with highly concentrated dust or work where there is a risk of ingesting highly concentrated seawater, etc.).



Enlargement of area that is not required the use of full facemasks

➤ Opening of large rest facility

A nine story large rest facility that can accommodate approximately 1,200 workers and that is connected to the entry/exit management facility was completed at the end of May and opened on June 1st. In addition to areas for workers to rest this large rest facility also has space to do office work as well as pre-work safety checks. Cafeterias have also been built inside the large rest facility and the new office building thereby allowing workers to get hot meals.

The cafeteria in the large rest facility will be closed temporarily from June 9th in order to perform ceiling renovations that are required to improve sanitation but it will be reopened after the renovations have been completed. While the cafeteria in the large rest facility is closed the hours of operation of the cafeteria in the new office building will be extended in an effort to improve convenience.



Large rest facility



Opening of cafeteria (in large rest facility)

(5) Leak in the transfer hose from the 1,000 ton notch tank to the Unit 3 turbine building

Since the types of work being conducted and the scope of the work environment at Fukushima Daiichi varies greatly compared to other power stations management plays a large role in contributing to preventing equipment malfunctions and personnel accidents.

A lack of management has been pointed out as a background factor leading to this leak of contaminated water. Going forward, in addition to implementing equipment countermeasures, the management of the entire decommissioning process will be improved in an effort to prevent recurrence.

<Leak overview>

On May 29th a field worker engaged in other work noticed that there was a leak coming from the transfer hose during the transfer of water² from the 1,000 ton notch tank to the Unit 3 turbine building³ and the transfer was stopped. Since the leaking water had flowed into a ditch it ultimately was discharged into the port via drainage channels. It is estimated that approximately 7~15m³ of water leaked into the port.

<Direct causes of the leak>

-The aforementioned hose (diameter: approximately 8cm) is comprised of an outer PVC pipe lined with an inner rubber pipe. The leak occurred at a point in the pipe where it was sharply bent to a radius (200~300mm) smaller than the allowed bending radius of the pipe (750mm).



Hose used for water transfer

- Since the aforementioned hose was not anchored down the weight of the water on the downstream side of an incline caused the pipe to bend sharply.
- It is hypothesized that when the aforementioned hose was bent sharply the inner pipe separated from the outer pipe and the repeated water pressure generated during transfer caused an oval-shaped crack of approximately 1cm in length by 0.2cm in width from which water leaked.

<Background and circumstances>

-The 1,000 ton notch tank was erected to collect rainwater that collects within the

² The radiation concentration of tank water sampled and analyzed on May 29th was Cs134: 4.4 x 10¹Bq/l, Cs137: 2.3 x 10²Bq/l, Gross β: 1.1 x 10⁶Bq/l.

³ Transfer was implemented on May 27th and 28th

contaminated water tank dike. The aforementioned hose was put into use in October 2013 in order to transfer the water to the Unit 3 turbine building. However, in May of this year water from the underground storage tanks, which is relatively high in terms of radiation concentration, was transferred to the 1,000 ton notch tank (approximately 170m³).

- With the knowledge that PVC hoses are highly prone to risk work to replace these hoses with polyethylene (PE) pipes began in March 2014 at Fukushima Daiichi.
- Work to replace pipes with PE pipes was suspended around October 2014 because it interfered with work to remove the Unit 2 transformer and also construction of the impermeable wall on the land side. However, the suspended work was not recommenced because the group in charge of the PE pipe replacement determined that there would be other interferences in the future even if the interfering work was completed (Total length of pipe to be replaced: 800m; Length of pipe not replaced: Approx. 30m).
- Since the aforementioned hose was only to be used temporarily it was not inspected after it was laid and the length of time that it was used was prolonged due to the suspension of PE replacement work.
- There are stipulated procedures for transferring water from the 1000 ton notch tank to the Unit 3 turbine building, however there were no details on checking for leaks after the commencement of transfer, so no check was implemented. There were also no devices installed to detect leaks.

<Background cause and management countermeasures>

Due to the circumstances mentioned above management issues that were background factors that led to the leak were identified and the following countermeasures were formulated. The implementation status of these measures is periodically checked.

Background Factor	Management Countermeasures
<p>There was a lack of consideration to reduce the risk of leak as much as possible, such as by using already installed PE pipes when transferring water containing a relatively high concentration of radiation. (Safety awareness/Communication)</p>	<ul style="list-style-type: none"> • The status of water stored within the power station site (radiation concentration, amount, location) shall be organized, treatment methods (pipes used, purification equipment, etc.) and treatment periods (schedules) stipulated, progress status checked during risk management meetings, etc., and multifaceted support/advice given. • The water will not be transferred to the turbine building (which requires transferring water over a long distance) but rather equipment for treating the water will be installed.
<p>The fact that PE pipe replacement work was suspended was not conveyed throughout the power station thereby preventing it from being prioritized appropriately. (Communication)</p>	<ul style="list-style-type: none"> • The schedule for implementing countermeasures for risks identified during the comprehensive risk inspection shall be shared at the risk management meeting, progress managed, and priorities determined if these countermeasures interferes with other work.
<p>It was decided to stipulate in procedures that leaks should be looked for after the commencement of water transfer as part of measures to laterally disseminate accident information following a leak during the transfer of water from inside the tank dike two years ago and also a leak from the rainwater transfer hose in March of this year. However these</p>	<ul style="list-style-type: none"> • Nonconformity information shall be quickly disseminated laterally. • If an emergency transfer is required enhancement measures that have been stipulated in advance shall be implemented and if necessary multifaceted advice and support shall be given by the risk management committee.

countermeasures were not carried through with and no mention of leak checks was added to the transfer procedures. (Technical skill)	<ul style="list-style-type: none"> Work shall be supervised in a manner that enhances sensitivity to leaks when conducting work that has never been done before, work for which the details have been changed, and work that has not been done in a long time.
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<Lessons Learned>

Management-related lessons to be learned were identified in three areas, safety awareness, technical ability, and communication.

	Lessons Learned
Safety awareness	Since the speed at which the accident is handled has been prioritized at Fukushima Daiichi there remains equipment in operation that was not designed for long-term use. Therefore, it is necessary to be fully aware of these weaknesses and engage in daily work while constantly pondering what can be done to reduce risk.
Technical ability	As with leak checks following the commencement of water transfer, the implementation of determined countermeasures was being left up to the department in charge of the work and the tasks were not monitored to identify problems with implementation. Just because a countermeasure has been formulated doesn't mean that it can be forgotten. The parties responsible must be designated, the countermeasures monitored and reports given to nuclear leaders by the parties in charge of the task after which advice and guidance on how to make improvements given as necessary ⁴ .
Communication	Work schedules that have large risks must be discussed at risk management meetings and schedule management meetings to verify that there is sufficient coordination between the different departments in charge of the work.

⁴ Suggested during overseas benchmarking and third-party reviews as the basic stance of nuclear leaders (“trust, but verify”)

(6) Unsolved problems

The investigation into and analysis of the Fukushima Nuclear Accident revealed many issues concerning the causes behind the accident and the manner in which it unfolded. However, the limited volume of records and opportunities for field investigations has left many unanswered questions. 52 unsolved mysteries have been identified and investigations/examinations into these issues are ongoing because solving these mysteries will help improve the safety of nuclear power stations all over the world. To date the results of these investigations/examinations have been released twice (December 13, 2013, August 6, 2014), and the third progress report was given on May 20th.

This third progress report gives details on the deliberation over whether or not the venting of the Unit 2 containment vessel was successful (whether or not the Unit 2 rupture discs ruptured) and on the investigation into the cause of site dose rate increases around March 20, 2011. In particular, investigations have shown in regards to the venting of the Unit 2 containment vessel that, “... *the ruptured discs did not rupture, so it is very likely that venting was not successful.*”

By conducting planned field investigations and analyzing simulations with the cooperation of external agencies and researchers we are striving to unravel all these mysteries and ascertain how the reactor behaved during the accident in hopes that this information will help to improve safety and make decommissioning smoother. The progress of these efforts will be publicly released in a suitable manner.

1.2 Fukushima Daini Nuclear Power Station

Since the Fukushima Nuclear Accident the Fukushima Daini Nuclear Power Station has been implementing safety measures to maintain cold shutdown and making preparations to handle severe accidents in accordance with lessons learned from the accident, and has served as a logistical support base for decommissioning work at Fukushima Daiichi.

(1) Status of safety measure implementation

➤ Implementation of danger awareness training

Danger awareness training designed to help prevent accidents before they happen by teaching participants how to identify dangers hidden in the workplace was held a total of 16 times between April and June and participated in by all work supervisors at Fukushima Daini (252 participants). During this training work conducted in the field,

such as assembling scaffolding, was actually done within the power station site and mannequins were used to represent workers to allow participants to identify dangers. This type of hands-on training, which is extremely useful for improving safety awareness and the ability to predict danger, will be continually implemented.



Reconstructing work in the field using mannequins



Danger check



All participants looking for dangers



Experience hanging from safety harness

(2) Support for decommissioning work at Fukushima Daiichi

Fukushima Daini has provided various types of assistance to make sure that the decommissioning work underway at Fukushima Daiichi is conducted safely and smoothly.

➤ Assistance provided during the first quarter

-The debris that is generated daily through the course of decommissioning Fukushima Daiichi is stored at the Fukushima Daiichi site, but the volume of this debris is increasing and another storage location is becoming necessary. This is why low-level radioactive waste transport containers at Fukushima Daini (Total: 250 containers, Weight: Approx. 1t, Storage capacity equal to eight 200 liter oil drums) are being used as debris storage containers. The transport of these containers to Fukushima Daiichi began in April (to be completed during FY 2016).



Transport of low-level radioactive waste transport containers

- Seven contaminated water storage tanks (cylindrical steel tanks) for Fukushima Daiichi that have already been assembled are being temporarily stored at the Fukushima Daini unloading wharf until preparations for installation at Fukushima Daiichi have been completed. And, assistance for managing preparations, tank arrival, and tank removal commenced in June.
- Wave dissipating blocks that are used in the course of repairing the foundation of the south tidal wall at Fukushima Daiichi are being manufactured at Fukushima Daini and shipped to Fukushima Daiichi in order to reduce exposure and improve work efficiency and the effective utilization of production areas at Fukushima Daiichi. Assistance in manufacturing the blocks and transporting them on land (within the site) commenced in June.
- Fukushima Daini also continues to provide assistance with washing undergarments worn in controlled areas at Fukushima Daiichi.

1.3 Kashiwazaki-Kariwa Nuclear Power Station

(1) Status of safety measure implementation

At Kashiwazaki-Kariwa the lessons learned from the Fukushima Nuclear Accident are being leveraged to implement safety measures centering on Unit 6 and Unit 7 for which an installation change permit has been submitted. Out of all the safety measures underway this progress report introduces renovations being implemented to increase safety while considering the possible impact of various types of accidents, such as the installation of a high pressure substitute cooling water injection system and creation of a fire belt for which progress was made during the first quarter.

➤ Flooding countermeasures

○ Internal flooding impact mitigation

Cable trays and air-conditioning ducts that go through the floor have been surrounded

with dikes made out of sheet metal to prevent water from entering rooms where equipment vital to safety is located in the event that the building is flooded. By installing these dikes in accordance with the results of inundation assessments for each area the flooding of equipment important to safety that is located on subfloors should be prevented.

- Drainage equipment installation

In order to prevent locations where important equipment is installed from being flooded by a tsunami various countermeasures have been implemented such as constructing tide embankments/seawalls, waterproofing doors on the outside of the building, waterproofing building penetration seals, and also waterproofing doors to important equipment rooms. Furthermore, drainage pumps that run off of emergency power have also been installed just in case locations where important equipment is installed are flooded.



Surrounding building the floor penetration seals with sheet metal dikes

(Cable tray penetration seals)



Permanent drainage pump in the residual heat removal system pump room (Unit 7)

- Enhancing reactor coolant injection measures

- Alternate High Pressure Coolant Injection System (HPIC)

Work to install a steam turbine-driven alternate high-pressure coolant injection system is underway to prepare for instances where the cooling system used during reactor isolation (the permanent high-pressure coolant injection system) fails to startup or malfunctions and shuts down during operation.



Installation of the alternate high-pressure coolant injection system pump

- Enhancing spent fuel pool cooling measures
 - Spent fuel pool external spray

Renovations have been made to enable coolant to be injected into pools using fire trucks in the event that all motor-driven coolant injection equipment ceases to function as a result of a loss of all AC power. Furthermore, work to install spent fuel pool external spray piping that is independent from the existing pool cooling system is underway to enable direct injection of coolant from the outside.

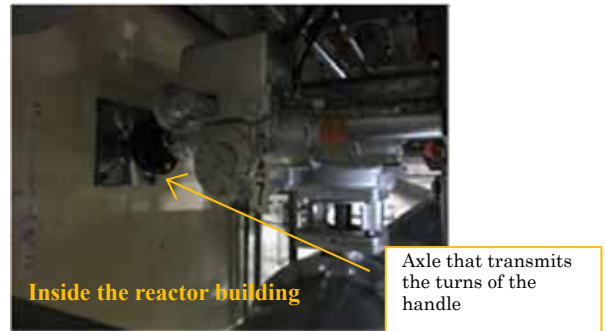


Water supplied from the outside rains down on the pool like a fountain

Installation of spray piping from the outside of the building to the spent fuel pools (Unit 2)

- Hydrogen explosion countermeasures
 - Containment vessel venting line

In order to prevent damage to the containment vessel by a hydrogen explosion or over-pressurization in the event of core damage or meltdown, the containment vessel is equipped with a pressure release device (filter vent). In order to prepare for the situation where the vents cannot be operated remotely from the main control room, the valves have been renovated to enable them to be operated manually from a location in a non-controlled area that is easy to access.



The handle to operate the vent penetrates the wall to a non-controlled area (Unit 7)

➤ Fire countermeasures

○ Fire belt creation

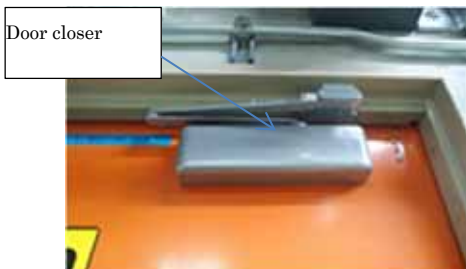
In order to prevent forest fires from spreading into the reactor facility a fire belt more than approximately 20m in width is being created around the entire reactor facility.



Creation of fire belt at the power station site

○ Fireproof doors

As a fire protection measure inside buildings the doors to zones in which equipment important to safety is installed have been equipped with automatic door closers and replaced with doors that can withstand fires for three hours.



Fire doors installed to prevent fires from spreading to areas in which equipment important safety is located

(2) Status of handling the new regulatory requirement compliance inspection

On September 27, 2013 a nuclear reactor facility change permit was submitted to the Nuclear Regulation Authority in preparation for the new regulatory requirement compliance inspection to be conducted for Kashiwazaki-Kariwa Unit 6, 7. Meetings to examine the application started on November 21, 2013 and as of the end of June of this year a total of 57 meetings have been held (five of these meetings have been held to discuss equipment installed at Kashiwazaki-Kariwa Units 1, 6 and 7 for handling specified severe accidents).

The primary matters being discussed at these meetings are as follows:

➤ Earthquakes and tsunamis

○ Activity of faults around the site

The results of boring and underground surveys conducted on the ground strata in the vicinity of the Kashiwazaki-Kariwa site have shown that there has not been any fault activity for the last 200,000 years. A boring and trench survey was also conducted on the fault in the Terao district but the conclusion was drawn that this is not an earthquake-generating fault.

○ Activity of faults under the site

The results of boring and shaft surveys conducted on faults under the power station site have shown that none of the faults have been active in the last 200,000 to 300,000 years.

○ Identifying volcanoes that may impact the site

32 of the 81 volcanoes around the power station have been deemed to have a possible impact on the facility and that impact was assessed. Due to the distance between the volcanoes and the power station, and the mountain ranges that exist between the volcanoes and the power station, it was concluded that the volcanoes would not have an impact on the safety of the power station. Furthermore, simulation have showed that in the event of an eruption [as much as] 30cm of ash fallout could be expected but this would have no impact on the buildings.

➤ Status of plant inspections

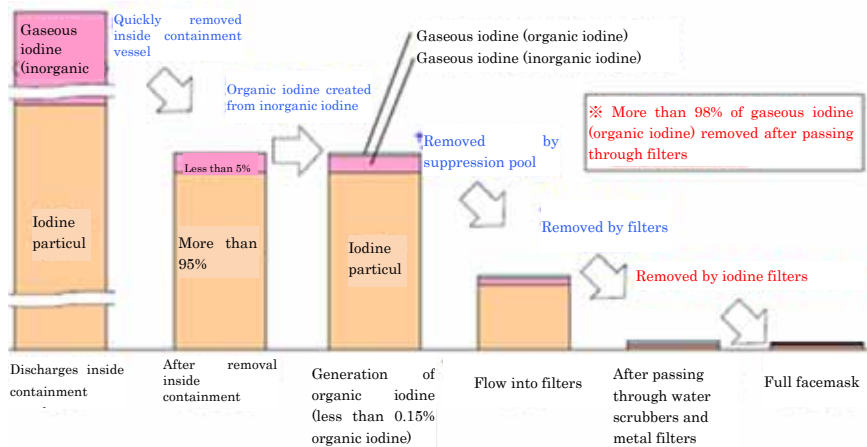
○ External fire countermeasures

In accordance with inspection results, 20m wide fire belt has been created around the plant so as to prevent an external fire from spreading into the facility and reaching equipment that is vital for safety.

○ Filter vents

In accordance with inspection results, a containment vessel pressure suppression pool alkaline water control unit and iodine filter have been added to prevent the generation

and discharge of gaseous iodine during venting of the containment vessel.



The effect of iodine suppression measures

(3) The status of briefings made to local government and the local community

① Examination of the Fukushima Nuclear Accident

In response to a request from the governor of Niigata Prefecture made on March 22, 2012, an examination of the Fukushima Nuclear Accident is being headed by the Technical Committee on Safety Management of Nuclear Power Stations in Niigata Prefecture (hereinafter referred to as, “Technical Committee”), which was created in accordance with the safety accord. From FY2013 discussions lead by two to three core members of the Technical Committee have been held of specific issues relating to the Fukushima accident for which further examination is required. As of the end of June of this year the Technical Committee has met 20 times (including field observations and field studies), and issue-based discussions have been held approximately 28 times.

[When giving briefings to the local government and local community] in addition to presenting accident reports that have been compiled to date, approximately 550 questions posed by committee members have been answered upon performing additional investigations and follow-up investigations as much as possible.

② Briefings to the local community

○ Home visits and power station facility tours

Visits are being made to local government offices and various organizations within the prefecture to explain the status of the power station. In particular, visits are made to the mayor of Kashiwazaki City and the mayor of Kariwa Village to hear their opinions and answer questions.

Furthermore, during these visits tours of the power station are being recommended. 10,544 people from the Kashiwazaki-Kariwa region and 25,774 people from Niigata

Prefecture have been given tours of the power station (total as of the end of June 2015 for the period starting after the Fukushima Nuclear Accident).

Approximately 85% of the tour participants responded through questionnaires given after they had actually seen the safety countermeasures that have been put in place that they have, “been put at ease,” or that “some concerns have been eased.”

Changes in how the power station is perceived prior to the tour versus after the tour (FY2014 questionnaire results)

<Prior to the tour>



<After the tour>



Furthermore, on April 14th heads of the Japan Chamber of Commerce and other officials (19 people) visited the power station where they observed general training and were given a tour of Unit 7.

○ Briefings

Briefings on the status of the power station are given constantly. And, the status of compliance inspections for Unit 6 and Unit 7 was reported to the Kariwa Village council on June 8th and to the Kashiwazaki City Council on June 9th.

On the same days town hall meetings were held to give a briefing to 192 members of the community from Kashiwazaki City and Kariwa Village (six briefings of this type have been given in both Kashiwazaki City and Kariwa Village since the Fukushima Nuclear Accident to which a total of 1,361 people attended).

At the briefings answers were given to many serious questions related to the performance of filter vents, evacuation plans, and the geologic underground structures both within and outside the power station site.

(4) Third-party reviews

<Domestic agencies>

In April of this year a JANSI⁵ review was conducted during which best practices and

⁵ Japan Nuclear Safety Institute: Established in November 2012 by electric companies and plant manufacturers for the purpose of assessing and giving suggestions in regards to safety countermeasures from a position independent of nuclear operators.

areas for improvement (excellent gap) were identified based on WANO-PO&C, and currently efforts are underway to enhance how operating experience (OE) information is leveraged.

We will continue to implement these reviews and also participate in training held by JANSI.

<International agencies>

The IAEA's OSART⁶ mission was implemented from June 29th through July 13th and an assessment of the level of nuclear safety culture cultivation at Kashiwazaki-Kariwa, and the management and operation of the organization as it aims to be the safest in the world, was assessed from an international and objective perspective based on IAEA safety standards.

The 12 reviewers, who are all experts in the field of nuclear power, leveraged their extensive knowledge and experience and deep insight to identify best practices and areas for improvement while comparing [Kashiwazaki-Kariwa] with the world's highest levels of safety. The areas for improvement that were pointed out included issues for which it was already recognized that further efforts are required, but also issues for which there was no awareness, thereby making this review very useful.

After the review team leader, Peter Tarren, suggested that, *“steps be taken to quickly note in the emergency procedures how additionally installed equipment is to be used during an accident,”* and that, *“whereas contamination within controlled areas is being managed sufficiently, there should be more measurement outside of controlled areas.”*

A report from the IAEA will be issued approximately three months from now based on the results of this assessment. And, improvements will be implemented as suggested as soon as preparations have been made.



Opening Meeting

⁶ Operational Safety Review Team dispatched by the IAEA (International Atomic Energy Agency)




Field check of safety countermeasures equipment (gas turbine generator trucks, substitute heat converter trucks)

Third-party reviews and technical support, and benchmarking with overseas plants are important activities. In order to make these activities even more useful it is necessary to implement self-assessments based on global standards, such as IAEA safety standards and WANO-PO&C, on a regular basis and discuss strengths and weaknesses from a common perspective.


1.4 Status of implementation of measures to prevent the recurrence of personnel accidents


In January 2015 a series of serious personnel accidents occurred. The causes of these personnel accidents were reported in the Report on the Causes of and Countermeasures for Serious Personnel Accidents that Occurred at TEPCO Power Stations and on Safety Inspections (released on February 2nd). The factors behind these incidents were compiled from the three perspectives of safety awareness, technical ability, and communication, and efforts to prevent recurrence are underway

Status of Recurrence Prevention Measure Implementation

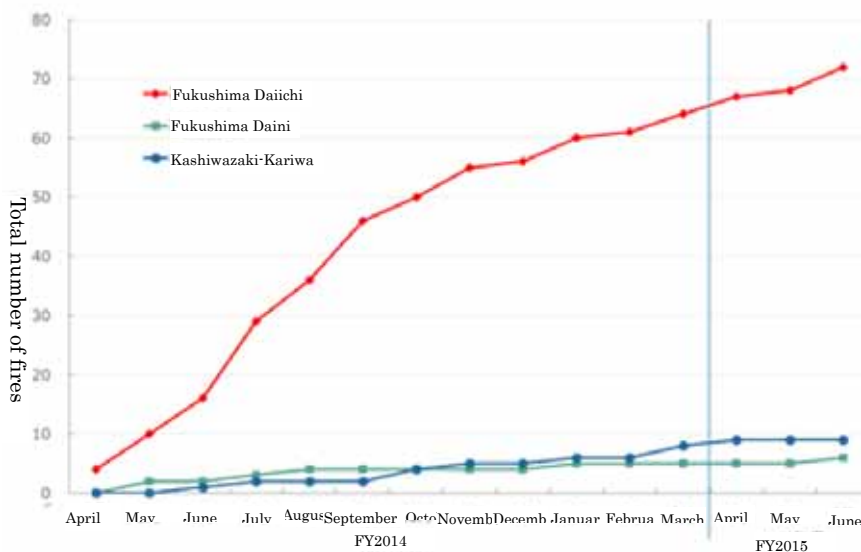
	Background Factors	Countermeasures	Implementation Status
Safety Awareness	<p>① Employees and managers alike felt that accidents at Fukushima Daiichi are unavoidable due to the field environment.</p> <p>② An overdeveloped sense of pride in the work done at Fukushima, a lack of skilled workers, overconfidence in personal safety, and a genuine desire to move forward with work led to safety rule violations. And, employees were powerless to stop these events.</p>	<p>① The Nuclear Power & Plant Siting Division general manager has been given the responsibility of overseeing safety activities. In particular, if a serious accident occurs all work is to be suspended until the cause can be ascertained and recurrence prevention countermeasures can be proposed, as was done this time.</p> <p>② Strive to cultivate a climate in which there is awareness that love and respect for one another is the origin of safety management (by carrying around pictures of loved-ones, etc.)</p>	<p>① The Nuclear Power Division's management policy was revised to reflect the fact that TEPCO, who consigns the work, also has a responsibility to improve the field work safety and reduce accidents (March 31). The creation of a general manual for overseeing safety activities in the Nuclear Power Division is also being deliberated. In the event of a serious accident the general manager of the Nuclear Power & Plant Siting Division is to be responsible for ascertaining the causes and formulating recurrence prevention measures.</p> <p>② Workers are carrying around pictures of their loved ones</p> <div style="text-align: center;">  </div> <p>Fukushima Daini⁷</p>

⁷ At Fukushima Daini workers insert pictures of loved ones behind their ID cards so that when they present it to security upon entering radiation control zones they see the picture and remember that they have to be safe for their family's sake.

<p>Technical Skill</p>	<p>① The importance of leveraging operating experience (OE) information was explained but it had not permeated sufficiently to the front lines in the field and as a result the identification of risks was not promoted</p> <p>② The organization was not conveying what risks should be discussed during advanced safety meetings and TBM-KY held by contractors.</p> <p>③ Workers were not communicating with each other about how each and every task should be done, therefore preventing them from formulating a detailed concept of the work to be done.</p>	<p>① Improve the ability to identify risks in the field by using OE information on a daily basis.</p> <p>② Make efforts to improve the ability to predict dangers through training that offers actual experience with danger and leveraging operating experience information.</p> <p>③ Increase the frequency of visits to the field by supervisors and communicate more with workers. 3H work has been identified as work that requires particular attention. Review work in the field until a concept of the aforementioned work can be formulated and create work procedures in accordance with the type of work and the level of caution.</p>	<p>① In the Nuclear Power Division OE information is being shared on a daily basis through regular meetings and activities that leverage danger prediction have started and are taking root.</p> <div data-bbox="917 515 1308 784" style="border: 1px solid black; padding: 5px;"> <p>New net for attaching safety belts</p>  </div> <p>Using safety belts when working in high locations (Fukushima Daiichi)</p> <p>② Danger prediction training has been started at Fukushima Daiichi and Fukushima Daini for work supervisors and contractor workers (to start at Kashiwazaki-Kariwa in July).</p> <p>③ At Fukushima Daiichi the frequency of field visits by supervisors, the number of unsafe actions pointed out, and the number of comments in procedures are being verified.</p>
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Communication	<p>① Related parties are interviewed when investigating the cause of an accident but the tendency to cover for colleagues prevents the issue from being sufficiently investigated.</p> <p>② There is a lack of communication between departments due to vertically divided corporate structures. And, there is a lack of leadership to alleviate this issue.</p>	<p>① A climate that allows people to speak freely, such as a climate where people who contribute to ascertaining the cause of an accident are not blamed, etc., is being created.</p> <p>② Existing trouble deliberation meetings are being made to function correctly by designating the parties responsible for cause analysis, countermeasure proposal and lateral dissemination, deadlines are set for report creation, and these deadlines are periodically checked.</p>	<p>①② At Fukushima Daiichi the status of information and dissemination of recurrence prevention countermeasures are being verified in addition to reviewing the mechanism for examining troubles and personnel accidents when they occur.</p>
			
			<p>Communicating while using the Fukushima Daiichi danger prediction book.</p>

Even though the recurrence prevention measures mentioned above are being implemented there has been a rash of personnel accidents since February of this year at Fukushima Daiichi, so it is necessary to continue to permeate and thoroughly convey these measures.

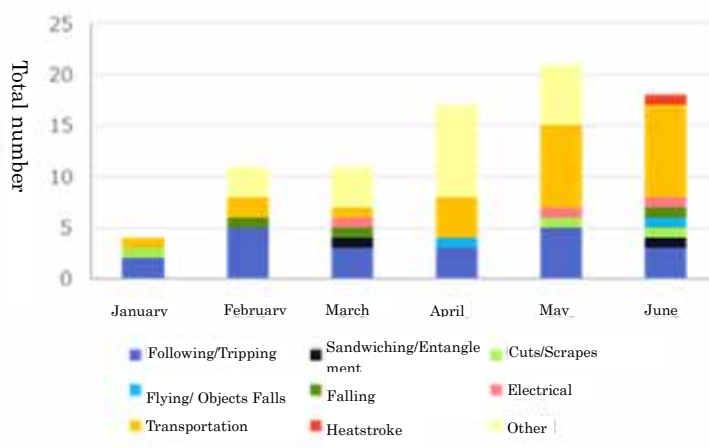


Personnel accidents since FY2014 (cumulative)

Furthermore, since it has been discovered that there was a lot of close calls

(*hiyari-hatto*) before the personnel accidents occurred, these accidents can be prevented by compiling and analyzing the nature of these close calls.

The causes of these close calls can be attributed to steps/uneven ground, worker carelessness, and insufficient procedures and mechanisms, but the analysis will be continued and corrective measures will be implemented quickly.



Close calls (*hiyari-hatto*) at Fukushima Daiichi (2015)

In order to improve the ability to predict dangers through hands-on danger simulations, which are being implemented as part of recurrence prevention measures, each power station is engaging in activities to meet upper management expectations of “*improving safety awareness through hands-on danger prediction training in order to prevent personnel accidents, which is an urgent issue.*”

Going forward the entire Nuclear Power Division must develop better countermeasures by having each power station learn from the other’s ingenuity and receive assistance as necessary.

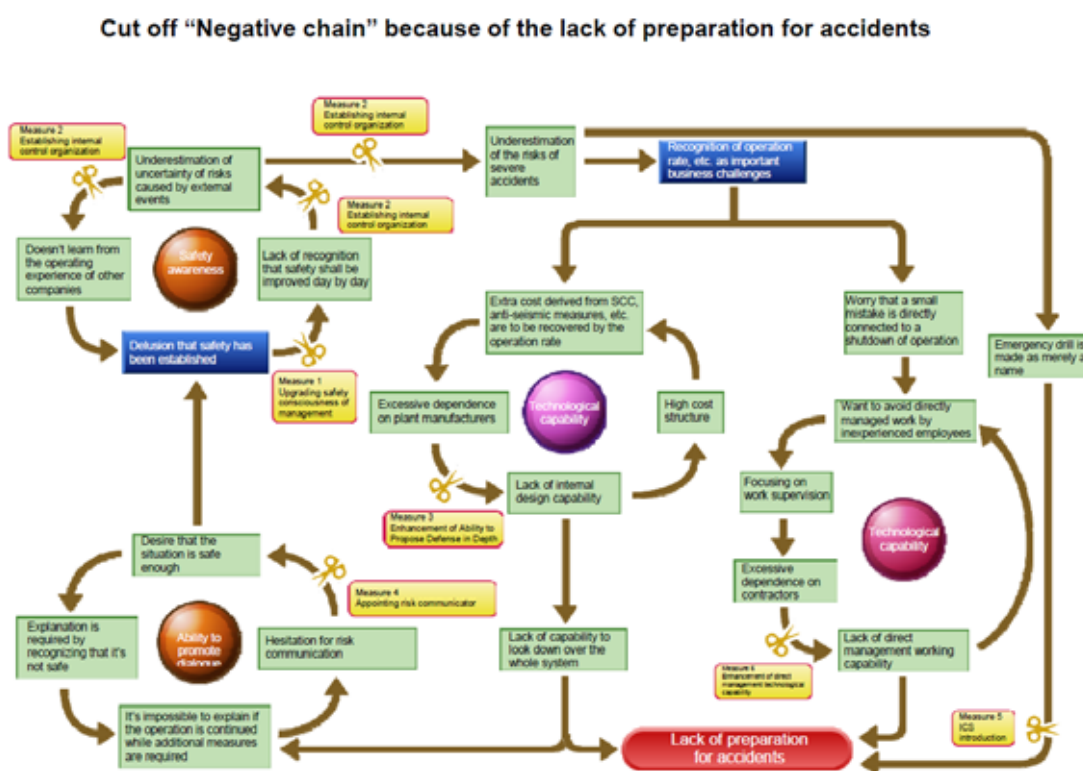
Hands-on danger prediction training implemented at each power station

	Fukushima Daiichi	Fukushima Daini	Kashiwazaki-Kariwa
Planning/Implementation	<p>-Training is being planned for TEPCO employees, including work supervisors, and contract employees (those who desire).</p> <p>-Hands-on danger prediction training is implemented using temporarily constructed facilities, such as scaffolding.</p> <p>-Training is held twice every Monday and consists of six parts: experiencing the shock from fall, experiencing the shock of falling while wearing a safety belt, hanging from a safety belt, feeling the tension of carrier cables, experiencing wearing double safety ropes and predicting danger (scaffolding).</p> <p>-As of June 134 TEPCO employees and 172 contract workers had completed all six parts of the training.</p> <p>-From the end of June training will be accelerated by adding four training sessions a day on Tuesdays through Fridays (16 times a week) that cover experiencing the shock from a fall, hanging from a safety belt, and predicting danger (scaffolding).</p> <p>-7,000 contract workers (estimate) can complete the training in 22 weeks if 320 workers completed the three-part training course each week.</p>	<p>-Training is being planned for work supervisors and contractor safety officers (in general contractors are to formulate their own danger prediction training for their workers)</p> <p>- Hands-on danger prediction training is implemented using temporarily constructed facilities, such as scaffolding.</p> <p>-The training consists of three parts: increasing awareness about falls (observing objects fall), experiencing safety belts, and predicting danger (scaffolding).</p> <p>-As of June 252 work supervisors and 32 contractor safety officers had completed the training.</p> <p>-The aforementioned facilities are currently being used for contractor training.</p>	<p>-The design of a joint training facility where hazard training, which is required for emergency response training, and hands-on danger prediction training can be implemented simultaneously, is being deliberated.</p> <p>-Equipment for hands-on danger prediction training that will be used in this facility has been purchased and will be delivered in September.</p> <p>-Until the facility is completed employees are dispatched to participate in hands-on danger prediction training implemented by contractors (within the power station site)</p>
Approach	<p><u>Take the time to have everyone experience</u> all six parts of the training. Additional training sessions may be added due to the large number of adjustments.</p>	<p><u>Focus on getting everybody to experience danger as quickly as possible</u> even if there are a lot of people participating in the training.</p>	<p><u>Propose plans that give the utmost consideration to the risk of personnel accidents by using temporary equipment to implement hands-on danger prediction training while considering the priority level of other tasks</u>, such as engaging in safety countermeasures and constructing the hazard training facility.</p>

2. Progress status of the nuclear safety reform plan (management issues)

The progress status of the nuclear safety reform plan (management issues) puts each of the six countermeasures designed to eliminate the so-called “vicious circle” that amplifies organizational problems in the Nuclear Power Division into two categories, “issues dealt with during the first quarter” and “issues to be handled in the future.”

The measurement results of the nuclear safety reform KPI determined during FY2014Q3 and an assessment of those KPI are noted in 2.7 Nuclear Safety Reform Progress Level Assessment.



2.1 Countermeasure 1 Upper Management Reforms

(1) Issues dealt with during the first quarter

- Since various activities have commenced in order to increase nuclear safety, The Nuclear Power Division has created a pamphlet for managers entitled, “How to Improve Nuclear Safety”⁸ in order to give a good picture of relation of activities (February 26). This pamphlet explains the objectives and mutual relationships between the Nuclear Safety Reform Plan, Nuclear Safety Improvement Hierarchy

⁸ One of TEPCO documents used during the 59th Nuclear Regulation Authority Special Session (February 27). Also posted on the TEPCO website.

Model, Management Model: GOSP⁹, Nuclear Power Division Management Policy, the Attributes of Individuals, Leaders, and the Organization that are Needed to Realize Robust Nuclear Safety Culture, and domestic/overseas benchmarking. Management is to deepen its understanding toward nuclear safety reform with this booklet and disseminate it throughout each workplace.



Pamphlet “How to Improve Nuclear Safety”

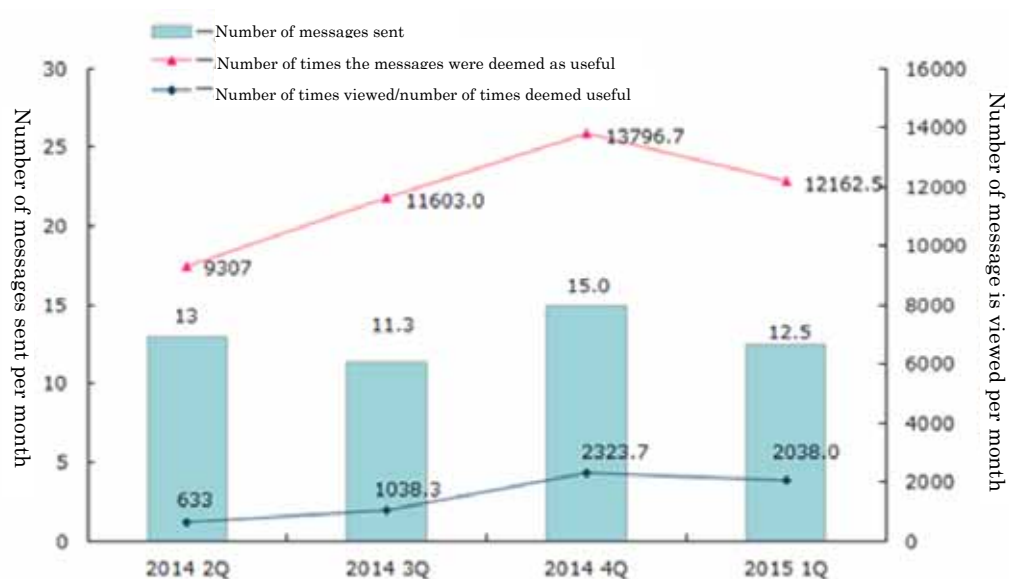
- The Nuclear Power Division Management Policy¹⁰ (enacted on October 16, 2014) was revised to explicitly stipulate fundamental policies in regards to organizing monitoring indices and the roles and responsibilities that TEPCO has in regard to work safety. In addition, revisions were made on March 30 to clarify responsibility of TEPCO, which is the ordering party, concerning work safety. Work will be carried out upon reflecting expectations of nuclear power leaders, indicated in management guideline, in the work plan and implement PDCA using PO&C¹¹ and PI, thereby improving work activities.
- Nuclear leaders transmit messages for communicating expectations, with various methods such as video message, Intranet message, e-mail, meetings and morning pep talks, in addition to management guideline. Of such methods, transmission of messages of nuclear power leaders via the Intranet and views by employees are as follows. Number of views per message is gradually increasing with 970 people, but number of people who answered “it was useful” is small at 160 people and its rate stays around 17%. Lack of appeal of messages can be presumed as a cause, but going forward the status of each PI and the contents of messages shall be analyzed

⁹ G: Governance, O: Oversight, S: Support, P: Performance

¹⁰ Established to give details on the expectations of nuclear leaders and the work processes required to fulfill these expectations.

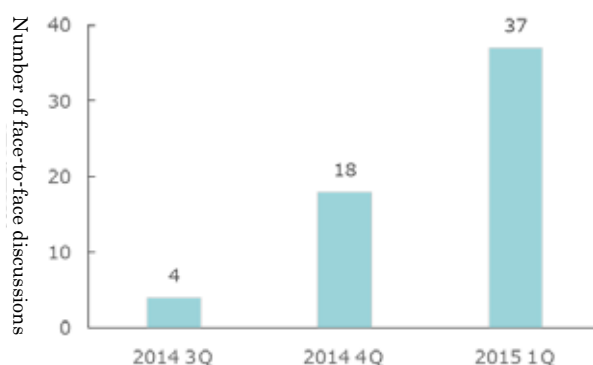
¹¹ Performance Objectives & Criteria created by WANO (not publicly disclosed)

in order to improve how these messages are conveyed.



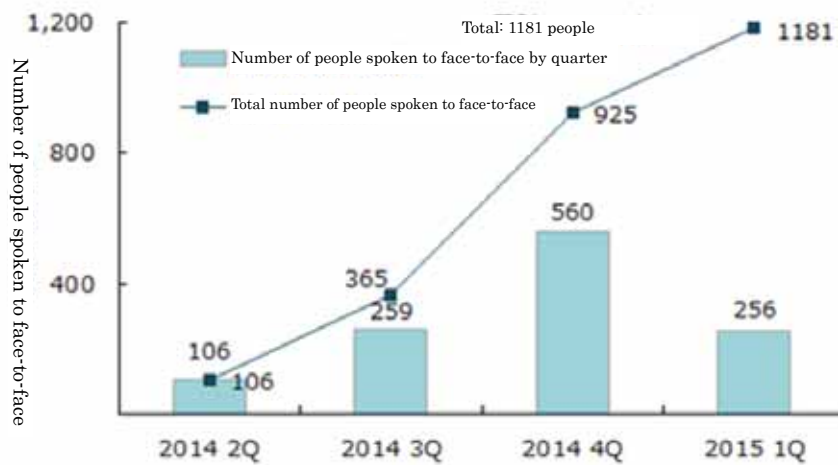
Number of times messages from nuclear leaders were conveyed via the Internet and the number of times these messages reviewed/number of times they were rated to be “Of good use” (monthly average)”

- Messages on the Intranet are useful for communicating expectations of nuclear power leaders to many employees at once, but there is a limit to feeling of agreement of the receiver. Realizing the importance of direct communication the Nuclear Power & Plant Siting Division General Manager sat down face-to-face with each power station manager (approximately 250 people) during the period from February through June 2014. This effort was expanded to include operators (350 people) from June 2014 and managers at that office and power station (approximately 470 people) from January 2015. As there was response that understanding of background and purpose of nuclear safety reform deepened with direct dialogues, it will be continued.



Number of times the Nuclear Power & Plant Siting Division General Manager sat down face-to-face with personnel

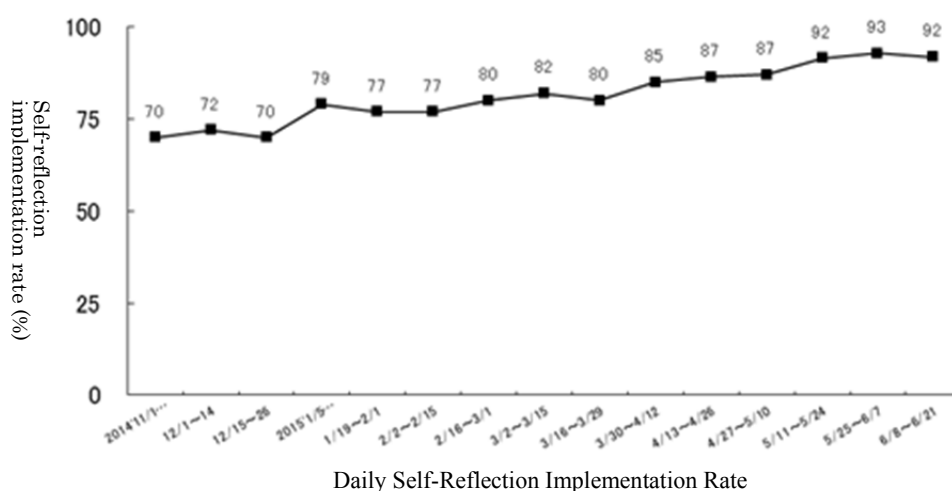
- The Nuclear Reform Special Task Force (hereinafter referred to as, “TF”) shall continue to engage in direct communication with field workers on the front lines in order to repeatedly explain the objectives of the Nuclear Safety Reform Plan and a relationship that these objectives have with daily tasks in which they engage as well as provide support for recognizing and solving problems. Through such action, work with chronic lack of resources is identified and stagnant work is promoted through concentrated support.



Number of times that the TF engage in direct communication with field workers on the front lines

- In order for the Nuclear Power Division to realize world’s highest level of performance in accordance with expectations of nuclear power leaders, CFAM (Corporate Functional Area Manager) was appointed at headquarters and SFAM (Site Functional Area Manager) was appointed at the power station, according to function area of PO&C, as a measure to enhance management. CFAM and SFAM will coordinate with each other with support from nuclear power leaders to lead activities in their responsible function areas and vigorously promote improvement of performance of the power station by implementing measures utilizing good practices in and outside Japan and enhancing training and education.
- The Nuclear Power Division has created a list of Attributes of Individuals, Leaders, and the Organization that are Needed to Realize Robust Nuclear Safety Culture (10 Traits and 40 Ways of Behaving Needed for Robust Nuclear Safety Culture) and each employee compares this list with his/her own attributes and actions on a daily basis in order to continually make an effort to improve (started on November 17, 2014). When these activities began approximately 70% of employees were

engaging in these actions, however since the fourth cycle of FY2015 (implemented on May 11th) more than 90% of employees engage in these activities thereby indicating that self-reflection has become part of the normal routine. However, implementation rate of activities for sharing one’s reflections in group discussions and enhancing effect of reflections by learning from each other is low at around 16%. In addition to activating such activities, analysis and evaluation¹² will be conducted based on accumulation of data in the past 7 months.



- In order to enhance morale and sense of satisfaction of individuals and the organization in a situation where work activities are continued in an extremely severe environment since the accident, it is important to recognize and praise good outcomes every time they are achieved. In FY2015 the Nuclear Power Division started activities to put the spotlight on “people that show great initiative” to achieve the goals of the Nuclear Safety Reform Plan and each mission, and “people who give their all to achieve high goals” by having the general manager of the Nuclear Power & Plant Siting Division and the president of the Fukushima Daiichi Decommissioning & Engineering Company (FDEC) present awards to these people.

¹² For example, what changed before and after accidents/troubles or third-party reviews

	Commended Activities
April	<p>[Fukushima Daini]</p> <ul style="list-style-type: none"> • Improvements aimed at achieving a 100% inspection rate of baggage brought into the Fukushima Daini Nuclear Power Station • -Adjusting the number of operators in accordance with the status of the Fukushima Daini Nuclear Power Station (maintaining and managing cold shutdown) • Reducing underwater sling purchase expenses by not using underwater slings when opening the Unit 1 and Unit 3 reactors, and reducing worker exposure by moving dryers and separators under water. <p>[Kashiwazaki-Kariwa]</p> <ul style="list-style-type: none"> • Precise implementation of Unit 4 turbine rotor UT • Precise handling of the Unit 6/Unit 7 New Regulatory Requirement Compliance Field Inspection by the Nuclear Regulation Authority (NRA) • Ensuring work safety during light fixture replacement by choosing work platforms suited for the work location
May	<p>[Head Office]</p> <ul style="list-style-type: none"> • KK6/7 Proposal of a S/C circulated coolant method that uses MUWC • Water shielded cask safety confirmation <p>[Fukushima Daiichi]</p> <ul style="list-style-type: none"> • Precise handling of the installation of circulation equipment inside buildings • Contributions to activities to improve safety awareness and the leveraging of field worker potential • Precise work supervision and quick handling of nonconformities • Maintenance of equipment for treating RO concentrated salt water • Creation of precise operation plans for treating RO concentrated salt water <div data-bbox="954 1267 1343 1559" data-label="Image"> </div> <p>(Awarding ceremony at Kashiwazaki-Kariwa)</p> <ul style="list-style-type: none"> • Interdepartmental cooperation aimed at promoting smooth tank construction • Precise handling of efforts to expand consignment of observation work <p>[Fukushima Daini]</p> <ul style="list-style-type: none"> • Construction of mental health support system at 1F and 2F <p>[Kashiwazaki-Kariwa]</p> <ul style="list-style-type: none"> • Quick creation of a Kashiwazaki version of the “System Notebook” • Determination of format for “weekly risk predictions” and commencement of use within the station

	<ul style="list-style-type: none"> • Leak from Unit 4 R/B exhaust treatment equipment room floor funnel avoided • Precise handling of Unit 6 RHR sealing water pump overload trip event
June	<p>[Head Office]</p> <ul style="list-style-type: none"> • In-house development of filter vent equipment <p>[Fukushima Daiichi]</p> <ul style="list-style-type: none"> • Contributions to power station status transparency through the installation of dose rate display monitors • Precise implementation of site drainage channel countermeasures • Contribution to improving the work environment through the construction of large work facilities <p>[Fukushima Daini]</p> <ul style="list-style-type: none"> • Contribution to treating contaminated water at 1F by handling authorization and permits related to the installation of mobile Sr removal equipment • Contribution to treating contaminated water at 1F by installing mobile Sr removal equipment <p>[Kashiwazaki-Kariwa]</p> <ul style="list-style-type: none"> • Improving safety by making Unit 6 RHR system changes

- The general manager of the Nuclear Power & Plant Siting Division visited The Kansai Electric Power Company (KEPCO) on June 1st to learn about the efforts of upper management to permeate nuclear safety culture and engage in benchmarking concerning communication with field workers on the front lines and contractors. In the wake of the Mihama NPS Unit 3 accident that occurred in August 2004, KEPCO has continued to promote cooperation between all departments within the company, prevent accident reoccurrence, and create nuclear safety culture under a policy of “making safety the utmost priority.” A good characteristic of KEPCO is its level of communication between the Nuclear Power Division and other departments. The status of the Nuclear Power Division is shared with other departments and plans are being made to create opportunities for discussion.
- In order to cultivate nuclear leaders one employee was sent to go through the nuclear engineering course for managers implemented by US INPOs and the Massachusetts Institute of Technology (MIT) (three weeks from May 27th through June 17th). Through group discussions and training on the operation of an actual reactor, course participants acquired management skills required of leaders and learned about nuclear safety and what it is to have a “sense of ownership” in the plant. Office executives must also have technical knowledge and skills, so this

course takes a great deal of time for high-level technical content designed to provide expert education to upper management. This type of training is invaluable and the same kind of education will continue to be conducted for candidate nuclear power leaders.



Expert lecture on reactor safety



Operations and condition determination using a reactor simulator

(2) Future plans

Expectations of management and nuclear power leaders will continue to be disseminated in the field by continuing use of Nuclear Power Division Management Guidelines and booklet “To enhance nuclear Safety” as well as transmission of information from and direct dialogues with nuclear power leaders.

Through activities of newly appointed CFAM and SFAM, realization of expectations of management nuclear power leaders will be accelerated.

The act of self-reflecting on the Attributes of Individuals, Leaders, and the Organization that are Needed to Realize Robust Nuclear Safety Culture in order to improve safety awareness has become a habit. Going forward the best practices of departments in which these activities have progressed will be compiled and shared in an effort to revitalize these activities throughout all departments.

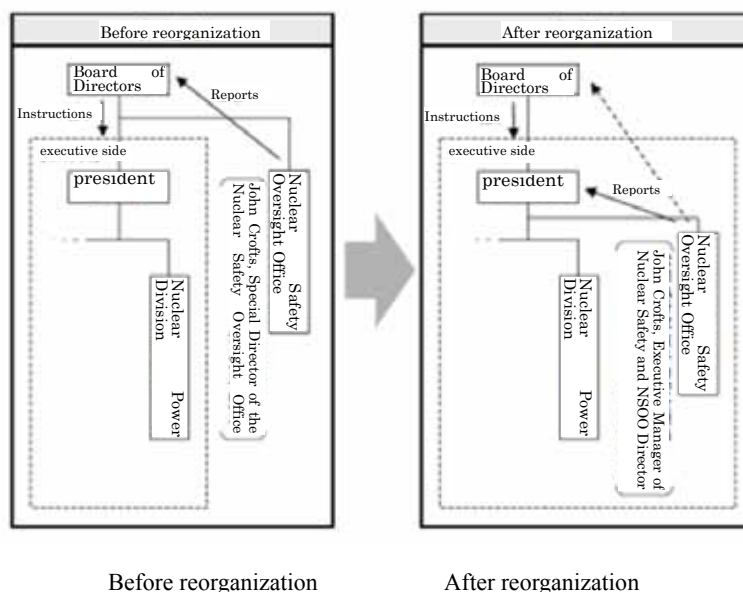
Preparations are also being made to give feedback in regards to the knowledge obtained through benchmarking with nuclear operators within and outside of Japan and other industries, as well as third-party reviews.

2.2 Countermeasure 2 Enhancing the Monitoring and Support of Upper Management

(1) Issues dealt with during the first quarter

➤ Reorganization of the Nuclear Safety Oversight Office (NSOO)

The Nuclear Safety Oversight Office (NSOO) was established in May 2013 under the direct supervision of the Board of Directors in order to monitor and give advice in regards to nuclear safety efforts from a standpoint independent of the executive side of the company and report to the Board of Directors. In order to enable the NSOO to monitor and give advice from a position closer to the front lines in the field and be directly involved in decisions on nuclear safety, the Board of Directors reorganized the NSOO to be under the direct supervision of the president (April 1st). In conjunction with this, NSOO Director Crofts was appointed as the Executive Manager of Nuclear Safety and NSOO Director (announced on March 30).



➤ NSOO activities

The following outlines the reports given to the executive directors meeting on July 14 and the Board of Directors on July 21 in regards to monitoring performed by the NSOO over the last several months, with a focus on the first quarter.

Report from the Nuclear Safety Oversight Office

1. Recent Status of Activities

- The focus at Fukushima Daiichi has been work control. A lot of good work has been done by the site management. The Site Superintendent has instituted a

comprehensive program to verify that his expectations are being implemented. However, further improvements are still required.

- Only limited assessment at Fukushima Daini has covered industrial safety. A good spirit and determination was evident. There was still room for improvement in the work practices and behaviors and management is dealing with the observations.
- The focus of assessment at Kashiwazaki-Kariwa has been on emergency preparedness and operator training. Performance is good and all recommendations are being implemented.
- The Corporate Assessments Team has focused on the implementation of the Nuclear Safety Reform Plan as an indicator for nuclear safety culture and safety governance. A marked improvement has been seen in the implementation of the Nuclear Safety Reform Plan, the self-assessment process (management reviews) and the consideration of operating experience although there is still room for improvement.

2. NSOO Director Perspective

There are still operating problems at Fukushima Daiichi requiring careful management. Verification that all the rules and actions are being implemented is key to success. The reactors are currently stable (subcritical) and cooling is becoming managed. Containment of the radioactivity is the big issue for the current state. Looking forward however these risk states may change as work proceeds. As Fukushima Daiichi comes out of the crisis situation there is a need to take a more strategic view of the nuclear safety requirements in order to meet the risk minimization requirements of the revised Road Map.

At Fukushima Daini all the fuel has been removed from the reactors and the safety of the site in cold shutdown is being adequately managed.

For Kashiwazaki-Kariwa the above assessments and the results from previous assessments continue to show that safety standards are acceptable.

Although the Nuclear Safety Reform Plan, WANO-CPR and corporate culture and governance are now being led more effectively, there is still a need to verify that the messages are being effectively communicated by middle management and implemented at the working level.

2.1 Improvements

In previous reports to the Board NSOO has identified several broad Areas For Improvement (AFI). NSOO is able to acknowledge significant improvements in many

of these areas including;

- Leadership for safety
 - The safety focus and leadership from the Board, executive, Site Superintendents and General Managers has improved. NSOO will now focus on the leadership (for safety) of middle managers.
- Renewed emphasis on safety rather than schedule
 - This major concern of the NSOO Director has been alleviated by recent leadership behavior, the new TEPCO safety policy statement, and the focus of the revised Road Map.
- Recognition that TEPCO bears a primary responsibility for the safety of its contractors on nuclear sites
 - The recent management behavior and the new clause in the company policy setting out TEPCO's responsibility are encouraging.
- Management self-assessment of safety performance
 - There have been significant improvements in the safety analysis carried out in the management reviews. NSOO will conduct a review of the totality of assessment meetings to determine to what extent they meet best practice and the safety assessment requirements of the WANO PO&Cs.
- Radiation dose management
 - The ALARA process at Fukushima Daiichi is impressive and a credit to the Fukushima Daiichi management. However, further work is required on reducing dose budgets still further, dose management at the work place and education of management and workers regarding ALARA and the risks of working with radiation.
- Key Performance Indicators (KPI)
 - KPIs have been created for safety performance and for implementation of the Nuclear Safety Reform Plan. In some areas the KPIs are still immature and NSOO will observe and stimulate their development and use in Continuous Assessment.
- Safety Management System
 - NSOO Director is also encouraged by the initiative to create Corporate Functional Area Managers (CFAM) which will in time lead to improvements in the Safety Management Systems and safety standards across all functional areas.

2.2 10 Actions from the Board

The above improvements are recognized in NSOO's assessment of the status of the 10 actions placed on the executive by the Board in March 2014. Of the 10 actions NSOO considers that;

- 2 actions may soon be considered as closed, with further monitoring and improvement becoming normal management business.
- 7 actions are nearing completion and closing actions have been discussed and agreed with the relevant leaders.
- Only 1 action is still significantly delayed and that relates to the training and certifying of the contractor work team leaders.

2.3 Management Reviews

As stated above, self-assessment of nuclear safety performance is very important and much improved in the recent rounds of Management Reviews. In these reviews the management have highlighted and set actions and programs for improvement in important areas of safety.

NSOO will pay particular attention to areas such as;

- Resource and Competence Management – NSOO Director believes that the high overtime is hiding significant under-resourcing and that there is a requirement to assess the minimum nuclear safety related manning requirements (a Nuclear Baseline).
- Governance – where and how safety related decisions are taken. Currently, the CDO is revising the roles that various councils play in decision-making.
- Learning – particularly how OE and learning messages sent out from management are implemented and how the management verify to their own satisfaction that such messages are implemented.
- Nuclear Safety Culture and the implementation of the Traits

2.4 NSOO Director's Areas For Improvement

The NSOO Director has the role to encourage, educate and thereby improve safety standards in certain areas. The areas on which he has significant concern and has been encouraging improvement are;

- The understanding amongst TEPCO managers and contractors concerning the deleterious health effects of radiation – there is a pervading belief that as long as we work within the international dose limits (to people) there is no health effect.
- The standard of nuclear risk assessment in TEPCO – Thinking of work or design in

a risk framework should be automatic in TEPCO.

○ The licensing PRA assessment at Kashiwazaki-Kariwa is good, although at the site we are not yet able to optimize our performance and maintenance using PRA. A program is being started to encourage risk informed decision making and thinking.

○ NSOO Director believes there is a shortage of resource and capability in nuclear risk assessment at Fukushima Daiichi and in the Decommissioning Business. The current revision of the Road Map puts emphasis on safety first, risk management and the need to do work in a safe, reliable and cautious manner after meticulous preparation. There needs to be a strategy to develop the analytical and management capability to meet these stringent demands.

3. Nuclear Safety Oversight Office Performance

3.1 NSOO Key Performance Indicators

The most important KPI for NSOO is to what degree recommendations from NSOO have been implemented by company executives. NSOO has made 90 recommendations and 12 more this quarter, out of which 34 have been completed, 42 have been agreed upon and are being implemented, and 2 have yet to be implemented.

	Status as of the end of FY2014 Q4		Status as of the end of FY2015 Q1		
	Prior to Q3	Q4 new recommendati ons	Prior to Q3	Q4 recommendatio ns	Q1 new recommendatio ns
Recommendations that have been completed	23	-	34	-	-
Recommendations that are being implemented	48	1	41	1	12
Recommendations for which no action has been taken	6		2	-	
Total	78		90		

3.2 Benchmarking

NSOO will continue to leverage overseas mentors in order to receive assessment team support. And, we will continue benchmarking with the monitoring functions of other operators.

- In March we attended a WANO oversight conference in Paris.
- In April we visited INPO in the US
- In April we visited the Hatch NPS in the US
- In July we visited Palo Verde in the US

Much has been learned from all of these activities.

End of Document

- The first quarter Safety Steering Council¹³ was convened on April 24 and continued discussion of “management changes made in conjunction with the establishment of the Fukushima Daiichi Decommissioning & Engineering Company” carryover from the last meeting (March 27). During this meeting it was decided that “efforts will be made to enhance the Safety Administration Group and Business Planning Group in the Operation Administration Department that handle company administration” and that “upper management shall convey safety policies to the upper management of contractors and promote improvements in safety awareness.”
- Necessity of enhancement of management observation has been pointed out in past WANO and other third-party reviews. In response, activities to extract tasks and good practices and promptly solve problems and laterally spread the issue, based on observation of on-site work and execution of work by approximately 370 people in managerial positions, will be enhanced. In order to monitor such activities, implementation status was set as PI, but since definition of management observation was unclear, status is not accurately grasped. In the future,

¹³ The Safety Steering Council consists of five members, the president (Chairman), Nuclear Power & Plant Siting Division Manager, Fukushima Daiichi Decommissioning & Engineering Company President/CDO, Safety Quality Officer (Director), Nuclear Safety Oversight Office (NSOO) Director (Observer). Furthermore, in conjunction with reorganization that puts the NSOO under the direct supervision of the president the NSOO Director shall be a member from Q2, the Safety Quality Officer shall be relieved and the Nuclear Safety & Administration Department Manager shall be the secretariat.

improvements will be made according to situation upon improving this point.

- The following two training sessions were held for group managers by the end of April of this year in order to improve the role of middle management.
- -Improving management's ability to implement reform (participants: 352)
- -Improving the ability to cultivate personnel that can carry out work safely (TWI training¹⁴) (participants: 251)

The role of middle management is vital for carryout work smoothly and achieving objectives, so resources will be allocated for education and an implementation plan (including new hires and transferees) compiled during this fiscal year to prevent these efforts from becoming transitory.

(2) Future Plans

- The Nuclear Safety Oversight Office will continue to monitor, comment and give advice on activities vital for nuclear safety in an effort to make a positive impact on nuclear safety improvements. Now that the NSOO has been reorganized to be under the direct supervision of the president from the first quarter of this year the NSOO will strive to engage in monitoring, and give comments and advice that have more of a direct impact on improving nuclear safety while also making improvements with more sense of responsibility.

Reports on monitoring activities, comments and advice, and the status of implementation of these recommendations by executives will be given to the Board of Directors by the Nuclear Safety Oversight Office on a periodic basis by which the Board of Directors shall examine the level of achievement of the objectives of reorganization.

- In regard to management observation, requirements, such as setting expectations in detail, will be determined and observation will be fixed on an area for a fixed amount of time. In particular, since insufficient implementation of determined measures is raised as a cause of cases such as continuance of personnel accidents, Fukushima Daiichi drainage channel problem and leakage from transfer hose that connects 1,000t notch tank and Unit 3 turbine building, the following process will be established and checked through management observation.

- (a) Clarify persons responsible of implementing measures and scope of responsibility

¹⁴ Training Within Industry (Primarily OJT for field supervisors. Trainees learn about how to think about work, how to handle people, how to make improvements and how to work safely. The idea that "the reason why a worker cannot perform is because his/her supervisor has not taught them how to" is emphasized.)

- (b) Check implementation status of measures
- (c) Report result to persons in higher positions
- (d) Check issues of implementation and effectiveness of measures

Furthermore, since it has been suggested that “reporting through management observation is effective since people who directly experienced near-miss cases often times do not report the case as they feel relieved on the spot” in IAEA-OSART missions for Kashiwazaki-Kariwa, activities where management directly extracts nuclear safety and personnel accident risks shall be enhanced.

2.3 Countermeasure 3 Enhancing the Ability to Propose Defense in Depth Measures

(1) Issues dealt with during the first quarter

- Competition designed to enhance the ability to propose safety improvement measures
- Call for participation in the first competition of FY2015 has been made (submission period: May 18th through July 5th). 121 submissions were made, best proposal candidates will be selected during Q2 and the best proposal will be decided during quarter three. Due to the fact that the number of submissions has decreased compared with the prior competition the number of submissions and the details will be analyzed.
- Out of the best proposals submitted during the first competition of FY2014 (30 submissions), 10 more have been newly implemented since the last report (Total: 17, as of the end of June 2015). Also, two of the 15 best proposals made during the second competition of FY2014 have been implemented.

[First competition FY2014]

- With the hope that utilizing “street view” photographs of the field will help to ascertain the location of field equipment a camera required to produce “street view” photos was purchased, a model case was created, and the lending of the camera to departments implement and work commenced. (Fukushima Daiichi)
- In order to improve visibility during night patrols works vehicles were equipped with a spotlight that can be remotely operated. (Fukushima Daiichi)
- Since the engine generator for the pump used to transfer freshwater during an accident is heavy and difficult to carry wheels were attached to the generator so that it can be towed. (Kashiwazaki-Kariwa)
- The skill training building next to the power station was equipped with communications cables for teleconferences to enable location to be used as a simple logistical support base in the event of a disaster. (Kashiwazaki-Kariwa)
- Long ladders with support frames have been constructed to prepare for instances where the buildings cannot be entered from the ground level due to a tsunami. (Fukushima Daini)
- In order to enhance the ability to secure freshwater sources during a disaster and method for supplying power from power trucks to intake pumps from the river was established. (Fukushima Daini)
- In order to enhance means of confirming conditions during a tsunami a connection was made between the computers in the emergency response center and the live feed camera operated by the Japan Coast Guard. (Fukushima Daini)
- Emergency vehicles, such as power trucks, have been dispersed throughout the site

in order to respond to natural disasters, such as those caused by a tornado.
(Fukushima Daini)

- Telephone throat microphones and hands-free transceivers have been purchased in order to improve communications when workers are wearing full facemasks.
(Fukushima Daini)
- Hands-free video cameras have also been purchased in order to aid with countermeasure proposal by sharing field video records taken during a disaster.
(Fukushima Daini)



Creation of “street view” images of the field (Fukushima Daiichi)



Hands-free video cameras

Telephone throat mic

Telephone throat mic (Fukushima Daini)



Equipping work vehicles with spotlights (Fukushima Daiichi)



Fitting engine generators with wheels (Kashiwazaki-Kariwa)

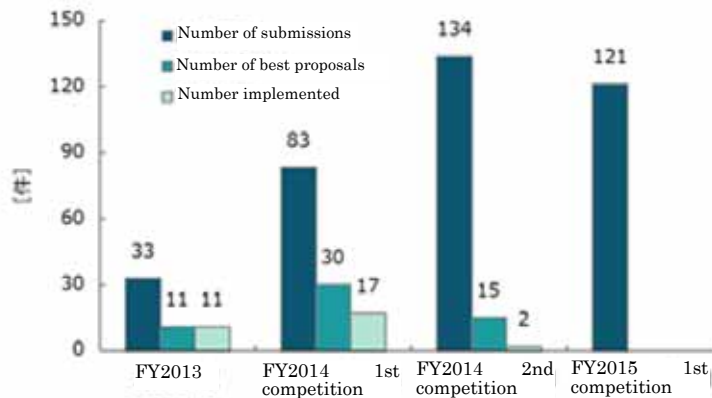
[Second competition of FY2014]

- Equipment schematics have been posted in the field in order to ensure that work to restore seawater system motors for Fukushima Daiichi Unit 5, 6 can be carried out in the event of damage by a tsunami. (Fukushima Daiichi)
- A mechanism was constructed to daily update and share information on plant status which is important to know before a disaster occurs in order to handle the disaster.
(Kashiwazaki-Kariwa)



Posting seawater system motor wiring diagrams in the field (Fukushima Daiichi)

○ The performance index for the competition to enhance the ability to propose safety improvements is calculated by multiplying the number of submissions by the average assessment points and by the percentage of best proposals that were completed within six months. Out of a total possible score of 1,000 points FY2013 scored 122 points and the first competition of FY2014 scored 502 points. By focusing on these three elements this index assesses the number of high-quality proposals for improving safety and whether or not they're being carried out quickly. Based on the results, it is particularly necessary to put more importance on improving “speed” or in other words, the percentage of good proposals that are completed within six months.



Number of submissions, number of good proposals, and of the number of proposals implemented from the competition to enhance the ability to propose safety improvements

- Leveraging operating experience (OE) information from within and outside of Japan
 - During the first quarter 59 new pieces of OE information were obtained and analyzed along with the 45 pieces of OE information obtained in the past, so there are no pieces of OE information older than three months that are waiting to be analyzed.
 - Good efforts are being made to share OE information at monthly meetings, etc., in

order to ensure that past failures are not repeated, and these activities are taking root. In order to further improve the leveraging of OE information, nuclear leaders have started to periodically convey messages about the utilization of OE information, and efforts to permeate the significance of OE information utilization have begun. Furthermore, JIT information for each job has been compiled and tools that enable this JIT information to be leveraged have been updated and provided in order to support the utilization of OE information.

○ TEPCO work together with contractors to share information on close calls and improvements, and enhance danger prediction activities.

➤ Hazard Analysis

○ Based on the results of analyzing the impact on Kashiwazaki-Kariwa of hazards that exceed design standards, a three-year plan for detailing countermeasures to handle these events has been created and is being examined by a dedicated team under the supervision of the Nuclear Risk Management Council.

○ During the first quarter three of the hazard countermeasures for Kashiwazaki-Kariwa were examined.

- The impact of a solar flare on plants handling geomagnetically-induced current was assessed and the required handling procedures confirmed.
- From FY2014 all Nuclear Power Division personnel have been subjected to education designed to improve nuclear security awareness and education that includes potential threats that have occurred during the last year began in April 2015.
- The efficacy of removing spent fuel from the power station in the event that signs of a large natural disaster are confirmed was verified.

○ Hazard analyses for Fukushima Daiichi and Fukushima Daini were to commence in a planned manner from this fiscal year but have been delayed due to Kashiwazaki-Kariwa Unit 6/7 new regulatory requirement compliance inspections.

➤ Safety Reviews

○ At Fukushima Daiichi reviews started last fiscal year will continue using the number of human errors for each department and the number of work improvement proposals as indices.

○ At Fukushima Daini the results of the emergency plan review implemented in FY2014 were compiled, issues related to deploying emergency materials and equipment, mechanisms for the long-term handling emergencies, and improvements in emergency response skill were identified, and feedback was given to related departments. Review plans will continue to be drafted in order to maintain a safe state of cold shutdown.

○ At Kashiwazaki-Kariwa a review of preparations for external events that have an extremely large impact before which the frequency of occurrence is uncertain, accident operation procedures, OE information utilization and emergency training was conducted and the results compiled. In FY2015 the review of preparations for external events that have an extremely large impact but for which the frequency of occurrence is uncertain, will continue. Furthermore, when conducting the review the use of PRA¹⁵, such as developing PRA education, will be promoted for departments that will leverage PRA results going forward since organizing review results in accordance with risk importance level based on the results of PRA has been effective.

➤ Creating resources by streamlining work

In the fourth quarter of FY2014 the FY2015 action plan and numerical objectives for creating resources was created based on the streamlining report created by the Productivity Doubling Committee (released on December 17, 2014). Each department has just begun efforts aimed at achieving these objectives and their progress will be continually monitored.

➤ Leveraging information technology for maintenance processes

○ In order to improve the ability to solve problems that affect the entire organization the way in which projects are handled is being revamped. One particular example is the introduction of MAXIMO¹⁶ (Phase 2) to streamline the entire maintenance process (introducing information technology to handle the series of tasks from inspection plan drafting and procurement to inspection and acceptance inspection, etc.) which should be completed by the end of the first half of FY2016.

○ The following countermeasures have been implemented after reflecting upon lessons learned from solutions for the entire organization that did not work well. Information is now shared and progress managed between the Head Office and power stations, and between nuclear leaders and parties deliberating these issues, in a better manner.

- The project leader is now responsible for managing the entire project and seven teams and team leaders have been designated for each issue. Parties from multiple departments from the Head Office and the power stations, including system development, are part of these teams and serve as deliberating members.
- From the first quarter periodic meetings for each decision-making level within the organization (progress meetings (weekly/for each team), project

¹⁵ Probabilistic Risk Assessment

¹⁶ IT solution for achieving strategic asset management

meetings (monthly/inter-team), steering committee (each quarter/reports given to nuclear leaders)) have been planned.

Furthermore, the power station and all parties not part of this deliberation are engaging in change management to determine to what extent reform can be permeated smoothly throughout the organization.

(2) Future Plans

Almost all measures to enhance the ability to make defense-in-depth proposals are progressing steadily and results are being seen. Improvement measures are being developed for issues that have occurred or come to light in the course of implementing these countermeasures. Areas to be enhanced are as follows.

➤ Competition for enhancing the ability to propose safety improvements

In order to improve speed (percentage of best proposals that have been completed within six months) it is necessary to analyze where problems lie in the course of best practice discussion to manifestation. Therefore, during the second competition for FY2014 several best proposals were chosen to monitor the course of development, analyze causes and propose/develop improvement measures.

Furthermore, efforts to create and disseminate materials that explain the primary points of the best proposal that has been employed (points that match the main objectives of the competition) have started. It is hoped that the number of best proposals will be increased and these best proposals developed further through the synergistic effect with the leveraging of operating experience (OE) information.

➤ Leveraging operating experience (OE) information from within and outside of Japan

Due to the fact that some serious personnel accidents and equipment troubles have occurred due to the lack of utilization of OE information during the analysis of background causes of these events, continued efforts will be made to address the following four issues.

- -Making the utilization of OE information a habit.
- -Record¹⁷ the results of efforts to utilize OE information and look back on these records so as to prevent half-measures (the act of utilizing this information in itself becomes a PDCA cycle)
- -Gather information on close calls, which are latent causes of accidents and troubles, through MO.
- -Do not just perform a superficial examination of OE information and

¹⁷ Record in detail so as to enable productive reflection

close calls, but rather analyze the background causes and make efforts to prevent these events before they occur.

➤ Safety reviews

Each power station is implementing reviews in accordance with the FY2015 plan. With this being the second year of safety reviews at Fukushima Daiichi and Fukushima Daini, and the third year of reviews at Kashiwazaki-Kariwa, methodologies are taking root. Therefore deliberations are being made to transition from “identifying review issues and making improvements,” to “identifying background causes common to all issues and implementing more drastic improvements (concentrating on areas that require more attention)”.

➤ Leveraging information technology for maintenance processes

Steady progress will continue to be managed based on new project management when moving forward with new tasks and system development. Furthermore, the utility gained from streamlining of the overall maintenance process, and the indices used to measure this utility, which are the fruits of project implementation, will be examined and developed.

2.4 Countermeasure 4 Developing Risk Communication Activities

2.4.1 External Communication

(1) Issues dealt with during the first quarter

- The Social Communication Office and risk communicators shall continue to gather risk information for the Nuclear Power Division and propose measures for explaining risk countermeasures and publicly releasing the risks to upper management and the Nuclear Power Division.
- Communication with the siting community
 - Proactive steps are being taken to communicate with local government, related organizations, and the local community through briefings to explain decommissioning and contaminated water countermeasures underway at Fukushima Daiichi and safety measures implemented at Kashiwazaki-Kariwa.
 - Reports on the current state of information/communication and decommissioning/contaminated water countermeasures was given at the Fukushima Council on Decommissioning/Contaminated Water Countermeasures¹⁸ (7th meeting: April 9th; 8th meeting: June 15th). Participants in this meeting voiced their opinion that, “they would like concerns over Fukushima Daiichi site effective dose levels to be explained in an easy-to-understand manner,” that, “not just the numbers but the meaning of data should also be explained,” that, “they would like the risks and safety measures related to the removal of fuel debris to be explained in an easy-to-understand manner,” and that “there should be more opportunities for residents to see with their own eyes what the conditions are like in the field at Fukushima Daiichi.” Based on these opinions and requests continual improvements will be made in order to make briefings more easy-to-understand and create more opportunities for tours of the Fukushima Daiichi site.
 - Along with improving cooperation between the Engineering Department and Corporate Communications Department, engineering department managers from Fukushima Daiichi will continue to be assigned to the Fukushima Corporate Communications Department to participate in training to increase the awareness of engineering employees in regards to external communication (six managers in residency during the first quarter for a to-date total of 32 people).
 - On March 18th during joint training between Fukushima Daiichi, Fukushima Daini and the Head Office the system for dispatching employees to Fukushima Prefectural

¹⁸ Launched in February 2014. Comprised of a chairman (METI Minister), and representatives from Fukushima Prefecture/local government, community organizations/experts, regulatory agencies, the decommissioning/contaminated water countermeasures team office and TEPCO.

offices, local government offices of the siting community, and surrounding cities, towns, and villages in the event of a severe accident, was examined. Improvements of information sharing tool infrastructure that can be used by employees dispatched to local government during a disaster and the methods in which plant status can be accurately ascertained when confronted with an enormous volume of information, are underway and will be examined again during the next training session.

> Communicating with the siting community and society

○ The content of the new decommissioning page added to the website last year is continually being updated and added to. The Q&A section entitled, “Let me answer your questions”, which focuses on employees in charge of contaminated water countermeasures in the field, provides an easy-to-understand explanation of the base of operations in the field, such as the labor environment, in addition to equipment countermeasures that have been implemented to date, such as improvements in the safety of work areas and the creation of environments that are easy to work in.



Hot meals provided from June 1st

○ Photographs and CG movies are being used to explain the progress of decommissioning, surveys inside the reactor containment vessel, and contaminated water treatment in easy-to-understand manner due to the difficult technical nature of these issues. During the first quarter the following three videos, which include a video that focuses on development of the work environment, were released on the website

- Fukushima Meal Center ~The quality of food offered at the Fukushima Daiichi Nuclear Power Station has changed~ (April 3rd)
- Unprecedented Challenges: What robots are telling us about the inside of the reactor containment vessel (April 30th)
- Third report on investigations into unsolved mysteries of the mechanism by

which the events unfolded after the initial Fukushima nuclear accident (May 20th)



Movie: Fukushima Meal Center ~The quality of food offered at the Fukushima Daiichi Nuclear Power Station has changed~



Movie: Unprecedented Challenges: What robots are telling us about the inside of the reactor containment vessel

- During the first quarter more than 50 educators from Fukushima Prefecture (prefectural Board of Education, Fukushima University, junior high school and high school teachers, social education facility officials, etc.) took part in tours of the Fukushima Daiichi and Fukushima Daini nuclear power stations. The aim of the tours was to deepen understanding about the status of decontamination and contaminated water treatment so that they can be discussed at various places of learning within the Prefecture.
- At lectures for external parties sponsored by branch offices risk communicators give lectures about the current status of Fukushima Daiichi (first quarter: three times).



Explanation to chief electrical engineers from other operators (Mishima branch office)

➤ Communication with other countries

○ In order to provide information to embassies in Tokyo briefings are continually given on the status of decommissioning and contaminated water measures based on individual requests from each embassy and explanatory documents from TEPCO (for visits are made to the embassies of three countries including France and Korea during the first quarter of FY2015).

○ Tours of the power station given to employees of foreign embassies in Tokyo (18 participants from nine countries including the United States, Germany, Korea, and Holland were given a tour of Fukushima Daiichi on June 25th. A total of 17 people from nine countries including Switzerland and Australia were given a tour of Kashiwazaki-Kariwa on June 29th).



Tour the power station given to employees of foreign embassies in Tokyo (Fukushima Daiichi)

(photo taken during briefing giving before entering the site)

○ In addition to the IAEA assessment of the Fukushima Daiichi review mission in February, a follow-up review conducted in the wake of drainage channel issues was conducted in April. In regards to communication it was advised that there be further efforts to disseminate information on the environment and safety at Fukushima Daiichi be made and that social media be used. The report from this review has been publicly

released on the METI website¹⁹.

○ An application was made to receive the US Nuclear Energy Institute's (NEI) Top Industry Practice Award (TIP Award: Corporate Communications Department). It was said that the activities being engaged in are extremely interesting after a presentation was given to, and opinions exchanged with, the communications officers of NEI member companies (electric companies, manufacturers, etc.) at the NEI-Communications Advisory Committee (CAC) on May 14th.

➤ The Operational Safety 2015 held by the IAEA (June 23rd through June 26th) was attended to give a report on the status of safety countermeasures implemented at Kashiwazaki-Kariwa and on the Nuclear Safety Reform Plan. The importance of leadership in regards to improving nuclear safety is being focused on by the entire world and information on the activities of each country that participated in the seminar was gathered. Many leaders take a sufficient amount of time prior to third-party reviews of nuclear safety to make preparations and leverage these opportunities to assess and improve nuclear safety. Benchmarking activities will continue not only with the IAEA but also with other nuclear operators both within and outside Japan, and other industries.



Report being made at the IAEA Operational Safety 2015

(2) Efforts to handle drainage channel problems at Fukushima Daiichi

➤ Based on the policy of releasing all radiation measurement data (announced on March 30th) the scope of data released through the website was expanded to include “Daily Radioactive Substance Analysis Results” from April 30th with the intentions of having all data released by the summer.

Previously:	Approx. 30,000 results/year
April 30 th ~:	Approx. 50,000 results/year
This summer:	Approx. 70,000 results/year

¹⁹ <http://www.meti.go.jp/press/2015/05/20150514003/20150514003.html>

<TEPCO Website>



<Decommissioning project page>

廃炉プロジェクト > 実施作業と計画 > 福島第一原子力発電所における日々の放射性物質の分析結果

福島第一原子力発電所における日々の放射性物質の分析結果

地域・社会の皆さまに放射能濃度の状況をご確認いただくため、発電所において、以下の放射線計測・放射能濃度の測定を行い、その結果をお知らせしております。データのご利用にあたっては**こちら**をご覧ください。

- 放射線データの概要(6月分)
- 用語解説
- English form

分析結果の速報版(2015年6月分)

最新のデータが掲載している日付を青色で表示しています。カレンダーをクリックすると、4pファイルがダウンロードされます。(タブレット端末等、ご利用の機器によってはダウンロードできない場合があります。)

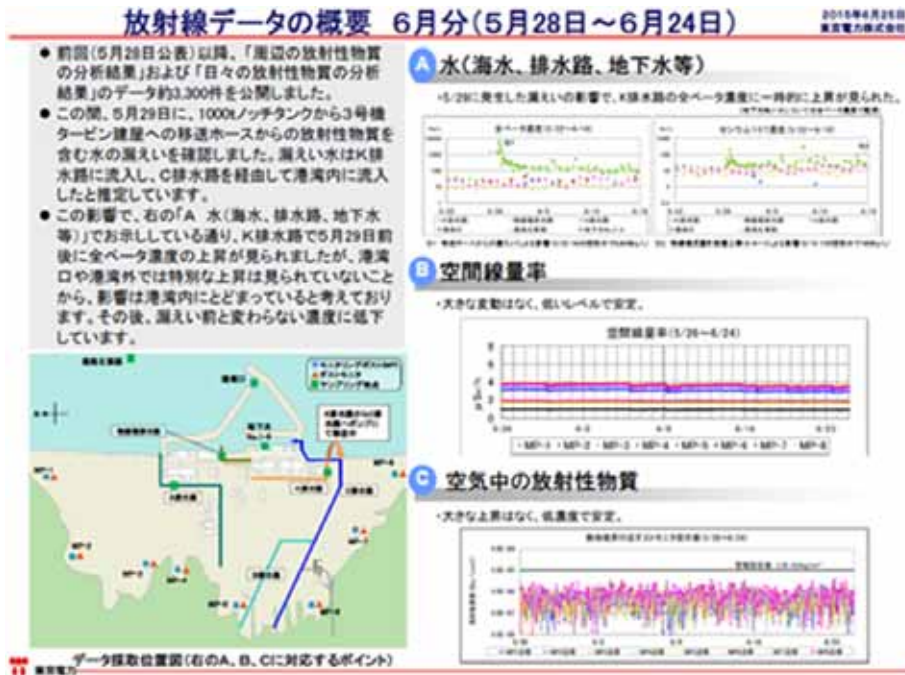
汚染水 処理設備

日	月	次	水	木	金	土
1	2	3	4	5	6	
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

構内タンク

日	月	次	水	木	金	土
1	2	3	4	5	6	
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Release of daily radioactive substance analysis results



Data for January compiled and released to show trends

Continual improvements in the way information is released shall be made based on the opinions of society.

- A Risk Communicator Supervisor was established at Fukushima Daiichi on April 1st in order to strengthen the monitoring and advisory functions of risk communicators. The number of risk communicators at Fukushima Daiichi was also increased from four to eight (as of July 1st, includes Risk Communicator Supervisor). Activities to gather risk information, give suggestions in regards to proactive information disclosure, and cultivate social sensitivity are being engaged in.
- Training was implemented for 28 risk communicators during the first quarter in order to improve their ability as risk communicators (June 9th: eight people, June 23rd: nine people, June 26th: 11 people). During the training participants acquired knowledge in regards to factors that hinder appropriate decision-making, and engaged in group work, such as the deliberation of case studies, etc., in addition to receiving explanations of the reason for the creation of risk communicators according to the Nuclear Safety Reform Plan and the importance of risk communicators in regards to creating nuclear safety culture (10 Traits and 40 behaviors).



Group discussion by risk communicators

- In order to enable the Social Communication Office and risk communicators to gather risk information from the Nuclear Power Division and provide suggestions to upper management and the Nuclear Power Division in regards to methods for explaining countermeasures and disclosing risk, it is necessary to improve the speed at which information is conveyed and shared. Therefore, the following countermeasures have been formulated.
- At Fukushima Daiichi an “Information Disclosure and Social Concerns Check Sheet” is being used by all group managers in charge of work to give weekly reports to risk communicators on new work being done, data collection, and troubles, if any. Risk communicators use these check sheets to determine whether or not information is being disclosed suitably, and group managers are developing a habit of becoming more socially sensitive to the work in which they engage.
 - Risk communicators are attending various meetings within the Fukushima Daiichi Decommissioning & Engineering Company (FDEC) to determine whether or not there are any discrepancies between the company and society in terms of the approach to issues and the ruler by which decisions are made from the perspectives of thoroughly disclosing information and ensuring transparency.
 - With the large volume of information accrued on a daily basis it is easy for important issues to get buried and for there to be discrepancies between what different parties feel is important. Therefore, the FDEC president, Social Communication Office manager and Corporate Communications Office manager²⁰ have decided to engage in face-to-face communications so as to prevent miscommunication in regards to explaining information

²⁰ Corporate Communications Office Manager from July 1st

that has been disclosed and where problems lie.

- In order to develop communication with regional stakeholders opportunities to hear opinions and receive advice from community members are being made in addition to those from the Fukushima Council on Decommissioning and Contaminated Water Countermeasures. And, more visits are being made to local administrative districts, temporary housing committees, and stakeholders in the metropolitan region in order to give briefings.

(3) Future Plans

- Various external communication tools, such as explanatory documents, videos, website content, and tour information, will continue to be improved and opportunities created to disseminate information in an easy-to-understand manner.
- All radiation measurement data from Fukushima Daiichi will be disclosed.
- Since it is important that it be clearly stipulated who's responsible and who has the authority for certain tasks, a Data Management Officer has been created in the FDEC to manage overall work processes, manage the status of data, and handle instances where action levels²¹ are exceeded. When action levels are exceeded the data management officer and risk communicator perform duplicate checks, but this task is performed manually and therefore not only puts a mental burden on the workers but also poses the risk of inappropriately handling data²².
- In order to ensure that work is done properly and mitigate this burden by this summer a system will be constructed to manage radioactive substance analysis data from measurement plan creation to data disclosure in a unified manner. After this system has been put in place monitoring of the mechanism for data disclosure will continue.

2.4.2 Internal Communication

(1) Issues dealt with during the first quarter

- In the Nuclear Power Division nuclear leaders are making an effort to convey messages regarding meeting expectations and creating nuclear safety culture (Refer to 2.1 Countermeasure 1 Upper Management Reforms). In an effort to eliminate one-sided communication plans have been developed to ascertain and improve the

²¹ Action levels have been stipulated in advance to indicate that some sort of response is necessary if normal fluctuation levels are exceeded (or if there is a danger of than being exceeded).

²² At current time tasks are being completed without error, but there is still the risk of making errors when measuring data at irregular times or manipulating data files.

state of internal communication by investigating to what extent the motivation behind instructions given by upper management and their plans and intentions are being conveyed to other members (a questionnaire system is currently being designed).

- In order to disseminate information within the company the president of the FDEC gave a briefing on decommissioning/contaminated water countermeasures during an internal open meeting (May 18). A video taken during the open meeting was uploaded to the intranet on May 28th.



Briefing on contaminated water countermeasures given by President Masuda

- Digital signs installed at nine locations including the seismic isolated building, entry/exit management building, large rest facility and J-Village, etc., are being used to convey upper management's messages about safety and show videos about contaminated water countermeasures as a way of disseminating information to contractors. Furthermore, in order to improve the field work and office environments it is necessary to gather a wide range of opinions from contract workers, which is being done through the Echo Committee. From February posters asking for opinions have been posted at approximately 30 locations within the power station site and J-Village, and to date 31 (as of May 31st) opinions have been received and all have been responded to. Responses to 30 of these opinions were given within the 30 day deadline for a response.
- Risk communicators are serving as lecturers at study sessions held for sales area communication representatives to help them understand the basics of nuclear power and the latest status of decommissioning (April 15th). And, new transferees to the power station are being continually subjected to risk communication awareness training.

(2) Future Plans

One of the background factors leading to the drainage channel problem is the fact of that “Countermeasures Implemented in the Wake of Disclosure Issues Concerning Leaks of Contaminated Water into the Power Station Port” that was created and announced in July 2013 had not permeated sufficiently throughout upper management, nuclear leaders, and the entire organization. Therefore, efforts are now being made to improve nuclear leader management of which the aforementioned development of internal communication is a part of.

Communication will be improved so that the awareness, plans, and intentions of upper management and nuclear leaders are understood accurately by field workers on the front lines. In order to do this the intranet will be used to convey messages, direct e-mails will be sent to all members of the Nuclear Power Division and the nuclear leaders will continue to engage in face-to-face discussions. However, face-to-face communication takes time, and in order to overcome this weakness these discussions will be filmed and videos uploaded to the intranet.

The conveying of information from nuclear leaders to internal departments shall be enhanced due to its importance in fulfilling the entire company's responsibility to help Fukushima recover as the transition is made to a holding company system. The perception of the Nuclear Power Division by other internal departments is important in order to help nuclear safety culture permeate throughout the entire organization, so plans are being made to create opportunities for face-to-face discussion and convey information on the status of the Nuclear Power Division and issues that it faces (implemented as a result of benchmarking with KEPCO).

2.5 Countermeasure 5 Enhancing the Emergency Response Capabilities (Structure) of the Power Stations and the Head Office

(1) Issues dealt with during the first quarter

- The Nuclear Power Division is improving the ability of the organization to respond to emergencies through repeated training. During the first quarter training was held at Fukushima Daini on June 25th, and on April 14th, May 29th, and June 29th joint training between the Head Office and Kashiwazaki-Kariwa was held. From FY2015 efforts helpful for improving the ability to respond to emergencies have commenced in the form of self-assessments based on PO&C emergency response fields (EP. 1~3)²³ that use performance indicators that indicate how much ignorance a responsibility has improved. Individual and unit-based training at power stations and the Head Office has improved the level of skill exhibited during joint training.
- On April 28th training on turning the Unit 3 technical support center (TSC)²⁴ into a crisis response headquarters was implemented at Kashiwazaki-Kariwa to prepare for situation where the seismic isolated building is rendered unusable. This training confirmed that it is possible to relocate crisis response headquarter function from the seismic isolated building to the Unit 3 TSC as well as manage the crisis from the Unit 3 TSC, notify the Nuclear Regulation Authority and local government, and share information and give instructions at the Unit 3 TSC.



Relocating from the seismic isolated building to the Unit 3 TSC



Unit 3 TSC headquarters

- On June 29th, Charles A. Casto, who was dispatched to Japan to represent the US Nuclear Regulatory Commission after the Fukushima Nuclear Accident, observed joint training at Kashiwazaki-Kariwa. Dr. Casto exchanged opinions with employees, observed safety countermeasures and gave advice saying that,

²³ The PO&C emergency response fields (EP. 1~3) stipulate international standards for personnel training and certification, facility and equipment maintenance management, the condition of leaders and personnel, and the operation and maintenance of emergency response structures.

²⁴ To be built inside the Unit 3 reactor building.

“continual third-party reviews are effective in improving safety.”



Looking over fire trucks and gas turbine generator trucks

- In-house fire brigade personnel from each power station participated in training held by the Maritime Disaster Prevention Center (26 participants over the three days from June 8th through June 10th). This training has been continually implemented since the Chuetsu-oki Earthquake in 2007 (with more than 500 people participating). Participants can learn about the threat of actual fire and acquire firefighting know-how by participating in large-scale fire training. Participation in such training shall continue since it helps to improve the ability of personnel to respond quickly to an emergency.



Training on fighting large fires

- At trial based assessment of training held at Kashiwazaki-Kariwa on February 26th and of joint training held by Fukushima Daiichi and Fukushima Daini on March 18th was conducted the Nuclear Regulation Authority (NRA). The results of this assessment were announced at the 5th Nuclear Operator Disaster Prevention Training Report Meeting held on June 15th where it was stated that *“further improvement is necessary”* in regard to *“conveying information from TEPCO to the Nuclear Facility Status Immediate Response Center (Nuclear Regulation Authority)”* and *“creating midterm disaster prevention training plans”*. The status of responding

to comments is as follows.

- During general training at Kashiwazaki-Kariwa a malfunction of the internal information sharing system prevented information on plant status from being provided sufficiently to the NRA Nuclear Facility Status Immediate Response Center at Head Quarters. The cause of a system malfunction was ascertained and countermeasures were formulated. These countermeasures were then verified during joint general training held by Fukushima Daiichi and Fukushima Daini on March 18th.
- During joint training on March 18th information was not conveyed adequately due to unfamiliarity with information sharing tools at Fukushima Daiichi, so countermeasures that include individual training on this matter will be formulated.

Continual efforts will be made to enhance emergency response capability based on how these incidents were handled and best practices at other electric companies.

(2) Future Plans

Each power station and the Head Office will repeatedly implement various types of general and individual training that includes coordination with external agencies while receiving advice from external experts. Furthermore, emergency response capabilities will be further improved by proactively identifying and improving issues pointed out by self-evaluations and third-party reviews conducted by the Nuclear Regulation Authority and the IAEA, etc.

2.6 Countermeasure 6 Enhancing Emergency Responsibility (Individual) and the Abilities of Field Workers

(1) Issues dealt with during the first quarter

a. Improving the ability to directly manage work so as to prevent severe accidents

[Maintenance Personnel Activities]

- The ability to directly manage work shall be improved so as to enable workers in the field to act as first responders during an emergency. Maintenance personnel have engaged in training through directly managed work, and training on the operation and connection of power trucks and fire trucks has been provided to operators to enable them to serve as maintenance personnel backups in the event of an emergency. The number of required emergency response personnel has been secured, however in order to maintain and improve these skills training will be continually implemented. These activities shall greatly improve the ability of personnel to directly engage in work during an emergency.
- Training to enhance the basic skills (training on annealing wire, rope work, etc.) of maintenance personnel in accordance with the situations at Fukushima Daiichi, Fukushima Daini and Kashiwazaki-Kariwa, and training through directly managed work (inspection of power trucks, gas turbine generator trucks, substitute heat converter trucks, etc., laying out temporary hoses in the event an emergency/electrical cable connection training, motor replacements, pump axle bearing disassembly/assembly, using heavy machinery to level ground, etc.) is being continually implemented.



Training on laying and connecting high-voltage cables (Fukushima Daiichi)

- From May 25th through May 27th Kashiwazaki-Kariwa workers attended a short course held at the generator truck manufacturer on the basic construction of and past malfunctions with gas turbines so as to enable them to flexibly handle gas turbine generator truck nonconformities during an emergency. Continued participation in these types of courses will be examined since it was helpful for

understanding equipment construction and nonconformities, and also improving the ability to apply knowledge.



Short course on gas turbine generator truck nonconformities

- At Fukushima Daini the four emergency response teams (debris removal/road restoration, motor replacement, temporary cable connection, cooling water pump restoration) have been subject to training to enhance the ability to engage in directly managed work. In order to enable team members to be able to respond flexibly to an emergency regardless of their original affiliation, team members were interchanged during training. This enables team members to share best practices and also help to improve technical skill. During the technical skill competition held between June 11th and June 25th (held for the second year in a row) it was confirmed that each team can perform their tasks safely and without fail.



Debris removal training



Motor replacement (transporting spare motors)

- At each power station the lessons learned through training on handling heavy objects, operating heavy machinery, and assembling/disassembling scaffolding, etc., is being leveraged during the daily task of work supervision. In particular, gaining actual experience with identifying risks, using the necessary safety equipment and tools, and basic behavior required for safety, will aid in giving precise instructions to workers and improving safety management skills.

[Operator Activities]

- Operators are being trained how to start up and connect power trucks and fire trucks in accordance with various plant conditions. Fire truck and power truck training for operators (Unit 5, 6) started during FY2014 at Fukushima Daiichi. As of the end of June 2015, 14 operators (38%) had been certified on the use of power trucks, and 46 operators (124%) had been certified on the use of fire trucks compared to the goal of certifying 37 operators (80% of field personnel (46 workers)). The Unit 1~4 operators have prioritized acquiring operation management skills in regards to contaminated water treatment equipment and spent fuel common pool equipment, and training on the operation of power trucks in the future will be examined based on conditions.
- Fukushima Daini operators began training with fire trucks in FY2014. Compared to the goal of certifying 23 operators (80% of field personnel (28 workers)), 27 operators (117%) have been certified. Power truck training will begin during the second quarter.
- At Kashiwazaki-Kariwa training on starting up power trucks and connecting fire trucks is underway in order to cultivate instructors within the shifts. As of the end of June 2015, 136 workers (119%) had been certified on the use of power trucks, and 133 workers (117%) had been certified on the use of fire trucks in contrast to the goal of certifying 114 workers (80% of field personnel (142 workers)). During the first quarter, in addition to the normal startup of power trucks training was also implemented on the manual opening and closing of intake/exhaust dampers in the event of a malfunction. Furthermore, 26 operator training team members have been certified as instructors.



Power truck startup training



Training on the manual opening/closing of power truck intake/exhaust dampers in the event of a malfunction

- At Kashiwazaki-Kariwa efforts are being made to improve the ability of operators to diagnose equipment in conjunction with improving their ability to respond to

emergencies. All field operators that handle Unit 6, 7 have acquired internal certifications and directly engage in data sampling. Furthermore, in fiscal year 2014, 35 operators (Kashiwazaki-Kariwa) were certified as technicians (machinery maintenance/equipment diagnostics). Efforts to acquire knowledge, such as by becoming certified, mixed with directly engaging in data sampling in the field will increase the ability to apply respond.

b. Improving task specialization

- In regards to system engineer functions, a system monitoring program for major systems, including systems vital for safety, has been created. Monitoring systems based on this program will improve equipment reliability. During the first quarter system integrity reports were created for each of the five systems at Kashiwazaki-Kariwa Unit 6/7. In addition to confirming integrity by monitoring and assessing whether or not system functions and performance satisfies design expectations, areas for improvement, such as the additional installation of flow meters for monitoring system performance degradation, etc., were identified. Mechanisms for enhancing system engineering functions are taking root and if personnel cultivation continues in this manner the original expectation of enhancing the technical ability of departments during emergency will be fulfilled. It was planned to increase the number of system engineers to 10 from the second quarter and expand system monitoring to 40 systems by the end of fiscal year 2015, however since personnel have been allocated to implementing countermeasures to improve the safety of Kashiwazaki-Kariwa Unit 6/7 the personnel cultivation plan needs to be revamped.
- In order to cultivate system engineers, Bradley W. Berles, director of the Plant Engineering Department at the Palo Verde nuclear power station in the United States, was invited to Kashiwazaki-Kariwa to exchange opinions with power station personnel and introduce best practices (June 9th-11th). The training education programs for assigning and cultivating system engineers was compared and this information will be used going forward to cultivate and train system engineers.



Exchanging opinions with US engineers about system engineering

- In regard to configuration management²⁵, design standard documents that clearly state design requirements have been created so as to enable TEPCO to accurately ascertain and manage the operation and management of nuclear facilities as required by design. During the first quarter design standard documents for the Kashiwazaki-Kariwa Unit 7 residual heat removal system were created and environment preparations were made for process construction (creation of lists related to equipment documents and equipment, deliberation of different levels of management for equipment configuration information).
- In regards to safety assessment technology, methods for assessing risk during the operation of multiple units commenced based on the roadmap for improving PRA assessment skills created in FY2014. Furthermore, a plan for conducting joint assessments of internal flooding and fire impact with US corporations has been made, and there are plans to have TEPCO and other group companies acquire assessment skills. During the first quarter eight workers participated in the EPRI (Electric Power Research Institute) training course in accordance with personnel training plans. Part of this plan will be revised since personnel have been temporarily allocated to the handling of countermeasures to improve the safety of Kashiwazaki-Kariwa Unit 6/7.
- In regards to seismic resistant assessment skills, pipe analysis codes are being improved so as to enable group companies to analyze pipes. Personal cultivation plans are proceeding as planned with two workers engaging in construction analysis training and two workers engaging in vibration analysis training.
- The ability of TEPCO and a group companies to procure equipment is being enhanced and during the first quarter reverse engineering of parts for Fukushima Daini air-conditioning coolers (axle bearings) (creating

²⁵ Process management for ensuring that design requirements, physical configurations, and equipment configuration information is always consistent.

manufacturing blueprints from the actual parts) was completed. Domestic and overseas benchmarking (planned for July) is being planned in order to streamline product procurement.

c. Maintaining and improving required technical skills

- Deliberations are underway to enlarge the scope of practical maintenance training underway since FY2014 and expand such training into other basic fields such as radiation and fuel. During FY2015 the skill level of individuals will be ascertained more precisely through this practical training. If a worker is not proficient in a certain area s/he will be subject to personal follow-up training in an effort to improve field power in a wide variety of fields.

d. Basic understanding of nuclear safety

- During the first quarter primarily new employees (73 workers) were subject to training²⁶. This contributed to giving engineering personnel the basic knowledge and skills required to work at power stations and ensure work safety. Practical training on various equipment and machinery at the power stations will continue so as to enable these trainees to acquire basic skills prior to being assigned to their respective departments.



Classroom education for new employees



New employee training on tool use

- Work supervisors and contractor workers involved in conducting inspections are being subjected to hands-on danger prediction training in light of recent personnel accidents. By actually experiencing the danger of falling or having body parts crushed and becoming aware of the importance of safety countermeasures the sensitivity to work safety in the field will be improved.

²⁶ Training for new employees is held for approximately 5 months from April through August.



Using a mannequin's hand to show how fingers can be crushed



Experiencing the danger of having body part crushed when handling heavy objects Feeling how hot retractable extension cords can get when used inappropriately

- Enhancing work safety is an urgent issue. Pocket manuals that compile the basic rules and knowledge related to human safety are being used during danger prediction activities at each power station.



Fukushima Daiichi danger prediction book Kashiwazaki-Kariwa system notebook

- The Nuclear Safety Training Center (temporary title) shall serve two functions, to act as a training center for new employees and mid-level employees in accordance with Countermeasure 6, and as a management school for nuclear leaders and middle management in accordance with Countermeasure 1 and Countermeasure 2. The following measures will be implemented and systems and departments established after systemizing these functions.
- Developing program facets in accordance with basic education and training program policy²⁷.

²⁷ The basic policy is as follows:

- Skilled instructors undergo training first
- Training is held completely separate from actual duties (regardless of whether the training location is in a classroom or in the field)
- The level of achievement shall be checked at the conclusion of training (through

- Ascertain the details of actual training programs by dispatching employees to training programs implemented by external agencies both within and outside of Japan and inviting instructors to give in-house training, and introducing these programs after confirming the efficacy of them.
- Benchmarking with overseas nuclear operators.

(2) Future Plans

Personnel cultivation is necessary for improving technical ability and can only be achieved not by leaving such training up to the individual, but as an organization. Efforts to achieve this goal are proceeding as planned, but personnel cultivation is an urgent issue for which attention to the following two issues must be given.

-Quickly engaging in PDCA during implementation

-Accelerate progress rather than becoming complacent with it

To cultivate personnel in order to improve technical skill time and personnel must be allocated in a planned manner. However, education plans will be changed if priorities must be revised in accordance with the status of handling new regulatory requirement compliance for Kashiwazaki-Kariwa Unit 6/7.

written tests and skill display tests)

iv. Those parties that have not achieved a certain level of proficiency or not acquired the required certifications will be deemed unfit for actual duty.

2.7 Assessment of the Level of Achievement of Nuclear Safety Reform

(1) The Status of Nuclear Safety Reform KPI/PI

- The following shows nuclear safety reform KPI for the fourth quarter of FY2014 and the first quarter of FY2015.

Nuclear Safety Reform KPI Results

Nuclear Safety Reform KPI		FY2014 Q4	FY2015 Q1
Safety awareness KPI	Traits	66.9 points (entire nuclear power division) 92.3 points (nuclear leaders)	81.6 points (entire nuclear power division) 94.3 points (nuclear leaders)
	M&M	100 points	50.0 point
Technical skill KPI	Planned	※	77.5 points
	Implemented	※	Assessed during FY2015 Q2
Communication KPI	Internal	75.3 points (entire nuclear power division) 80.6 points (nuclear leaders)	76.0 points (entire nuclear power division) 80.3 points (nuclear leaders)
	External	+ 1.3 points (quality and volume of information dissemination) + 1.2 points (public relations/public opinion awareness/posture)	※

※: Measurement of technical skill KPI will commence in FY2015 and measurement of communication KPI (external) will commence during quarter four.

- The results for countermeasure PI that comprise the nuclear safety reform KPI for FY2014 Q4 and FY2015 Q1 are as follows.

PI Results for Nuclear Safety Reform Countermeasures

Countermeasure	FY2014 Q4	FY2015 Q1	Objectives
Countermeasure 1, 2			
1. Implementation rate of self-reflection on Traits	80.4% (total) 84.3% (nuclear leaders)	91.9% (total) 87.9% (nuclear leaders)	100% (excluding employees that have been dispatched, temporarily transferred, or on long-term leave)
2. Percentage of workers that replied "I don't know" upon performing self-reflection	1.1% (total) 0% (nuclear leaders)	0.8% (total) 0% (nuclear leaders)	less than 10%
3. Average index fluctuations (quarterly)	Since FY2015	Individual percentage that indicates increases of the 40 behaviors	Increasing trend

		97.5% (total) 62.5% (nuclear leaders)	
4. Number of times group meetings or internal meetings were held to discuss the results of self-reflection	20.2%	15.9%	More than 70% of departments and groups held meetings more than twice a month
5. Number of times upper management review the results of self-reflection	To be implemented during April 2015	Once	More than once per quarter
6. Conveying the nuclear safety message of nuclear leaders	More than twice a month	More than twice a month	More than twice a month
7. Number of people that read the messages	Increasing trend	No change (as of the end of May)	Month-based totals are increasing
8. Number of people that replied that the messages "Are of use"	Increasing trend	No change (as of the end of May)	Month-based totals are increasing
9. Number of times power station management observation (MO) was conducted by managers	From FY2015	_※2	Numerical objectives will be set for each department ※2
10. Number of best practices or problems identified based on MO		1.1/MO	More than 1/MO※2
11. Rate that best practices were disseminated laterally or issues improved within one month		84.1%	More than 70%
12. Rate that best practices were disseminated laterally or issues improved within three months		Assessed starting Q2	100%
13. Percentage of task action plans related to countermeasures 3, 5, and 6 or PO&C and for which quantitative goals have been set for each quarter	From FY2015	77.5 points	More than 50 points (original) more than 70 points (until Q3)
14. Percentage of achievement of each action plan		Assessed during Q2	More than 50 points
Countermeasure 3			
1. (Number of submissions) x (Average assessment points) x (Percentage of best proposals that were completed within six months)	First competition of FY2014: 502 points	Assessed during Q2	Over 1000 points (FY2014) over 1500 points (from FY2015)
2. Number of pieces of OE information waiting for analysis (OE information screening percentage completed within objective deadline)	100% (two months) 100% (three months)	93% (within two months) 100% (within three months)	more than 90% (within two months) 100% (within three months)
3. Number of times newly arrived OE information was viewed	37%	41%	More than 20% (FY2014) more than 50% (from FY2015)
4. Hazard analysis implementation	Completed	-	Completed at the end of FY2014
5. Hazard improvement plan progress rate	From FY2015	100%	Plan progress rate: 100%
Countermeasure 4			
1. Assessment of the quality and volume of information disseminated about Fukushima Daiichi decommissioning, nuclear safety reform, and accidents/troubles	+ 1.3 points	Year-end assessment	Chronological changes in comprehensive assessment points for questionnaires given to external evaluators show positive trends

2. Assessment of the awareness and position of TEPCO public relations/public opinion gathering activities	+ 1.2 points		
Countermeasure 5			
1. Self-assessments based on PO&C emergency response feels (EP. 1~3)	From FY2015	3.8 points (Head Office) ※3	Average of more than four points for the five-step self-evaluation conducted by team leaders and above once every quarter or after a general training
Countermeasure 6			
1. Number of emergency responders internally certified to operate fire trucks, power trucks, perform cable connections, perform radiation surveys, operator wheel loaders and UNIC trucks	From FY2015	111%※4	120% of the power station's required number three years from now
2. Number of system engineer (SE) certifications	Created	Year-end assessment	Training program creation (FY2014) 5 people/reactor (from FY2015)
3. Number of engineers that have been educated to have expertise in seismic resistance, PRA, fire protection, and chemistry management, etc.	Created	Year-end assessment	Education plan creation (FY2014) education plan achievement rate: 100% (fromFY2015)
4. Number of workers certified in operations, maintenance, and security	From FY2015	Year-end assessment	Education plan achievement rate: 100%.
5. Number of workers certified externally in areas deemed necessary by the company, such as Type 2 Chief Electrical Engineer Certification, certification for handling ignitable liquids (<i>otsu 4</i>), hypoxia, etc.	From FY2015	Year-end assessment	All personnel or the required number for each field three years from now
6. Number of workers certified externally in areas recommended by the company such as high pressure gas manufacturing safety and construction equipment operation (Approx. 15 certifications)	From FY2015	Year-end assessment	More than 30% for each field in three years
7. Number of workers certified externally as chief reactor engineers, type I chief radiation handling engineers, engineers (nuclear/radiation)	From FY2015	Year-end assessment	Education plan achievement rate: 100%

※1: Results are as of the end of June 2015 unless noted otherwise

※2: After clarifying definition of MO and accurately grasping the situation, objective values will be changed from a uniform more than once per month per person to two goals that fit the tasks of each department. In conjunction with this, these PIs will be assessed by the achievement level of these objectives for each department.

※3: Assessment mechanisms will be deliberated depending on difficulty level since assessment points change in accordance with the level of difficulty of training.

※4: Not included because the required number for Fukushima Daiichi is being revised due to the differences in conditions compared to Fukushima Daini and Kashiwazaki-Kariwa.

(2) Nuclear Safety Reform KPI/PI Assessment

KPIs and PIs for safety awareness, technical skill and communication are all good. However, using KPI and PI to implement the PDCA cycle is more important than assessing whether these values are high or low.

Nuclear leaders must display leadership in improvement activities to determine to what extent these KPI and PI can be improved through nuclear safety reform plan activities, and in activities to determine whether or not KPI and PI improvements match the objectives of nuclear safety reform.

First quarter measurement results show that there issues with the implementation of self-reflection using traits (nuclear leaders), the number of times that group discussions and internal meetings were held to discuss the results of reflecting on traits, the implementation rate of management observation (MO) and the quick implementation of best proposals from the competition to improve the ability to propose safety improvements. So, the causes of these issues will be analyzed and improvements made.

In regards to the number of pieces of operating experience (OE) information that are waiting to be analyzed, goals continue to be achieved (analysis of information is not being table), and work implementation methods and management are starting to take root. Therefore, this PI has been deemed to meet objectives, and revising this PI to put more importance on the use of operating experience (OE) information will be deliberated.

What is required above all to accelerate these nuclear safety reform activities is for nuclear leaders to take the initiative, convey their expectations and instructions, and monitor the implementation of them.

Conclusion

FY2015 is the third year of nuclear safety reform. To date management and nuclear leaders have promoted nuclear safety reform with a focus on six countermeasures and have engaged in the PDCA cycle with the aim of achieving the world highest level of safety.

As of the end of last fiscal year in addition to steadily moving forward with the six countermeasures, a mechanism for enhancing and accelerating nuclear safety reform has been created through the creation of the Nuclear Power Division Management Plan and the setting of key performance indicators (KPI).

We must start seeing the fruits of this nuclear safety reform this fiscal year. We will improve safety awareness, technical skill and communication to the point where society generally feels that “TEPCO has changed,” while seizing all opportunities to convey the status of these endeavors through this progress report, our website, power station tours, and various types of briefings.

With the determination not to forget the Fukushima Nuclear Accident and become a nuclear operator that continues to create an unparalleled level of safety by making each day safer than the last, we will continue to move forward with nuclear safety reform while undergoing objective assessments by the Nuclear Reform Monitoring Committee.

If you have any opinions or thoughts in regards to this reform please feel free to convey them to us through our website.

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