Nuclear Safety Reform Plan
Progress Report

(Including Progress on Safety Measures at Power Stations)

(3rd Quarter, FY2015)

February 9, 2016

Tokyo Electric Power Company, Inc.

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Foreword

We would like to once again apologize for the terrible inconveniences and concern that the Fukushima nuclear accident and contaminated water problems have caused for the local communities living around the power station and society as a whole. All companies involved will continue to work together to smoothly provide compensation as early as possible, accelerate recovery efforts in Fukushima, move forward with reactor decommissioning, and ensure nuclear safety.

TEPCO is currently moving forward with nuclear safety reform in accordance with the Reassessment of the Fukushima Nuclear Accident and Nuclear Safety Reform Plan put forth in March 29, 2013. Reports on the progress status of this plan are compiled quarterly.

This progress status report is for the third quarter of FY2015[1] (October through December 2015). With March of this year will marking the third year since the commencement of nuclear safety reforms, a plan has been put together to confirm the achievements of nuclear safety reform (percentage of achievement of targeted goals).

[1] All dates here on in shall be 2015 unless otherwise stated

1. The progress of safety measures at each power station

1.1 Fukushima Daiichi Nuclear Power Station

(1) Removing fuel from the spent fuel pools

➢ Unit 1

Dismantling of the reactor building cover, which was done in order to remove debris remaining on the top floor of the reactor building and construct a fuel removal cover, was completed without incident on October 5. In preparation for dismantling work in the future, and actual size training facility that partially re-creates the top floor of the operating floor of the Unit 1 reactor building will be constructed in Hirono Town in order to train personnel on how to operate equipment for removing steel trusses, and water dispersal units used as part of countermeasures to suppress dust dispersion.

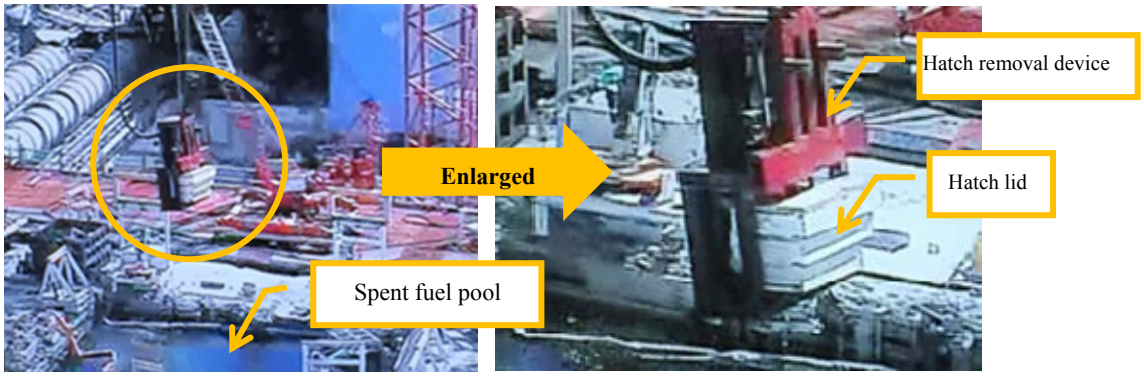
These preparations will continue with the objective of commencing fuel removal during 2020 (number of fuel assemblies stored in the spent fuel pool: 392).

Conditions on the 5th floor of the Unit 1 reactor building
(locating trusses that will hinder dismantling work)

Training facility built in Hirono Town to train personnel on using equipment for removing obstructing steel trusses (began on December 3)

➢ Unit 3

Large debris is being removed in preparation for removing the fuel from the spent fuel pool. The hatch[2] for the reactor water cleanup system infiltration and desalination equipment was removed and large debris was removed from the top of the fuel rack on October 15.



Work to remove the hatch from the reactor water cleanup system filtration and desalination equipment

With obstructions to fuel removal out of the way work can proceed on construction of the fuel removal cover. After a new fuel handling machine has been installed, removal of the fuel currently being stored in the spent fuel pool will commence during FY2017. (Number of fuel assemblies stored in the spent fuel pool: 566)

(2) Efforts to combat contaminated water problems

Countermeasures to handle leaks of contaminated water from tanks and leaks of contaminated water into the power station port are underway based on the basic policy of removing contamination sources, not allowing water to come in contact with contamination sources, and not allowing contaminated water to leak.

<Countermeasures to remove contamination sources>

- Purification of contaminated water using ALPS (Figure ①)
- Removal of contaminated water from seawater piping trench (Figure ②)

<Countermeasures for preventing water from coming in contact with contamination sources>

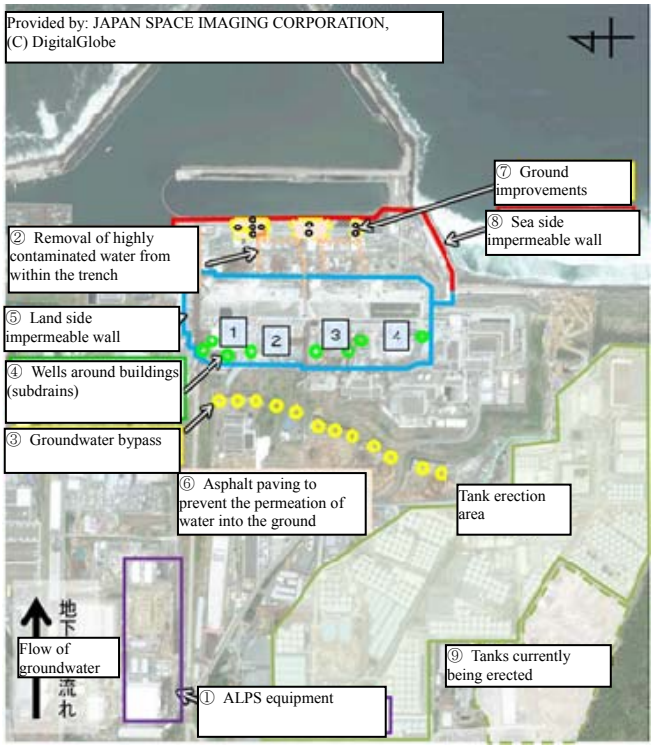
- Pumping up groundwater using the groundwater bypass (Figure ③)
- Pumping up groundwater from the wells around buildings (subdrains) (Figure ④)

[2] Approx. 1m x Approx. 1m x Approx. 2m concrete structure weighing 2.6 tons when submerged

- Construction of frozen soil impermeable wall on the land side (Figure ⑤)
- Asphalt paving of the site in order to prevent rainwater from permeating into the soil (Figure ⑥)

<Countermeasures for preventing contaminated water leaks>

- Ground improvements using soluble glass (completed in March 2014) (Figure ⑦)
- Construction of impermeable wall on the sea side (Figure ⑧)
- Additional installation of tanks (replacement of existing tanks with welded tanks, etc.)



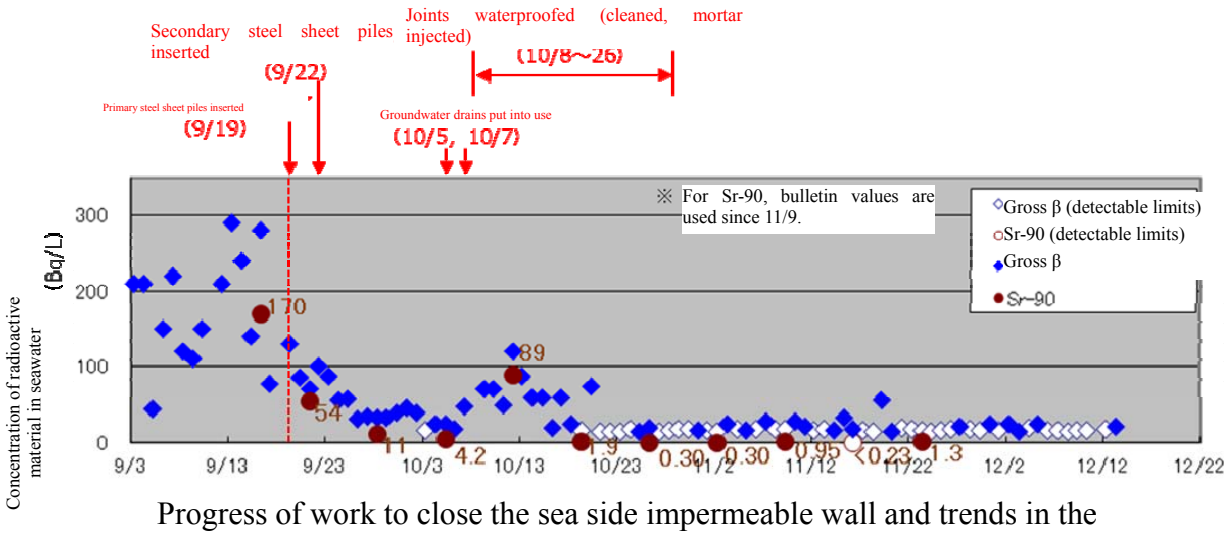
Primary contaminated water countermeasures

➢ Completion of closure of Sea side impermeable wall

An impermeable wall was constructed on the sea side in order to prevent contaminated groundwater from leaking into the port. The installation of steel sheet piles concluded on September 22 (594 in total), and waterproofing of the joints of the sea side impermeable wall concluded on October 26 thereby completely sealing the wall (total length: approximately 780m). The groundwater held back by this wall will be pumped up using subdrains and then discharged into the port after confirming that the concentration of radioactive materials has been reduced to levels acceptable for

discharge. Water that does not conform to these standards shall be transferred to the turbine building. After closure of the impermeable wall the concentration of radioactive materials in the seawater in the port gradually decreased and remains low.

Closure of the sea side impermeable wall

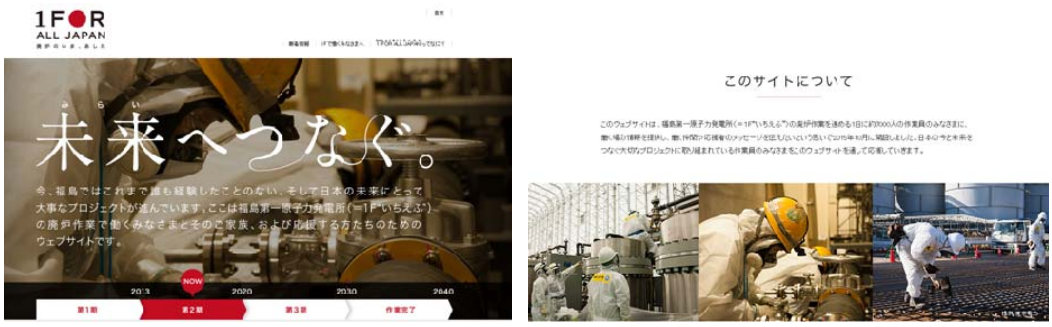


Progress of work to close the sea side impermeable wall and trends in the concentration of radioactive materials in the seawater

(3) Improvements to work environments on-site

- Construction of a website to keep the families of those working at the Fukushima Daiichi NPS informed.

  A website (1 For All Japan (http://1f-all.jp/)) has been launched (October 15) to keep the families of those working at the Fukushima Daiichi NPS informed. In addition to information helpful for workers, such as radiation data for the site, the food menu at large rest areas, and bus schedules, etc., the website also offers contents such as interviews and messages of support.



"1 For All Japan" website launched

- Efforts to reduce radiation exposure

  In October 2015, the case of leukemia of a worker that had worked at the plant was approved as a work-related illness. In response to advice from The Ministry of Health, Labour, and Welfare and Fukushima Prefecture, information on exposure is provided to all those that work at the Fukushima Daiichi NPS on the 1 For All Japan website along with information on criteria for having illnesses approved as work-related and TEPCO's policy on the matter.

- Results from questionnaires about improving work environments

  In order to help improve work environments, all those that work at Fukushima Daiichi NPS were asked to fill out a questionnaire (6th questionnaire of its kind). Those that responded said that work environments have improved through such efforts as the construction of large rest areas and the opening of the cafeteria, the reduction of radiation levels in work areas through asphalt paving, and the expansion of areas in which full facemasks need not be worn. Requests for more parking spaces and the installation of showers, etc., were also received, so continuing efforts will be made to further improve work environments and create a safe and worker-friendly workplace.

- "1F Monthly" newsletter

  The "1F Monthly" is a free newsletter for those that work at the Fukushima Daiichi NPS and their families. Distribution of the newsletter began on November 10 at large rest areas and J Village.


福島第一原子力発電所で働くみなさんへのお知らせ

月刊 いちえふ。 創刊号

1 FOR ALL JAPAN 事務局

とびっくす

インフルエンザの予防接種 ただ今、受け付け中！

インフルエンザの発症の予防と感染拡大防止に向けて、予防接種がスタートしました。予防接種が受けられる場所と日時については、各診療の担当の方にご確認ください。

11月の重点基本行動 遂行前の車両点検 ヨシッ！

11月9日から15日まで、「秋の全国火災予防運動」が実施されます。車両からの出火は火災のおそれがありますので、火災予防の徹底を図め、出火ゼロを目指しましょう。

天神岬温泉の「しおかぜ荘」が営業再開しました

9月16日から、天神岬スポーツ公園内の天神岬温泉「しおかぜ荘」が営業再開しました。営業時間や利用料については、「しおかぜ荘」にご確認ください。電話：0240-25-5726

1F を守る匠たち 01

「廃炉をやり遂げよう」とする みなさんの心意気を感じます

濱村 悠文さん

鹿島建設株式会社 東京土木支店 福島第一廃炉工事事務所 所属

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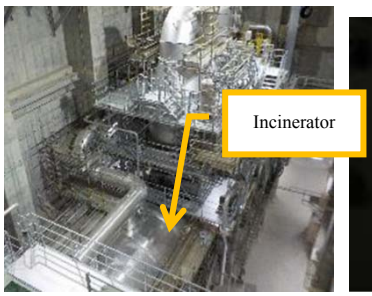
The first issue of "1F Monthly" (November)

(4) Construction of solid waste incineration facilities

A solid waste incinerator facility is being built at the Fukushima Daiichi NPS in order to incinerate used clothing, etc. that is being temporarily stored on-site. Tests of the facility using uncontaminated, simulated waste began on November 25. The incinerator will be put into operation this fiscal year after pre-operation inspections have concluded.

Outside of facility



Incinerator facility

Incinerator in operation

(5) Smoke emanating from Main Anti-Earthquake Building power panels

During the third quarter buried high-voltage power cables were accidentally damaged (November 19). This is the second time such an accident occurred this fiscal year, since power cables inside an Eflex tubes were damaged causing smoke in the second quarter

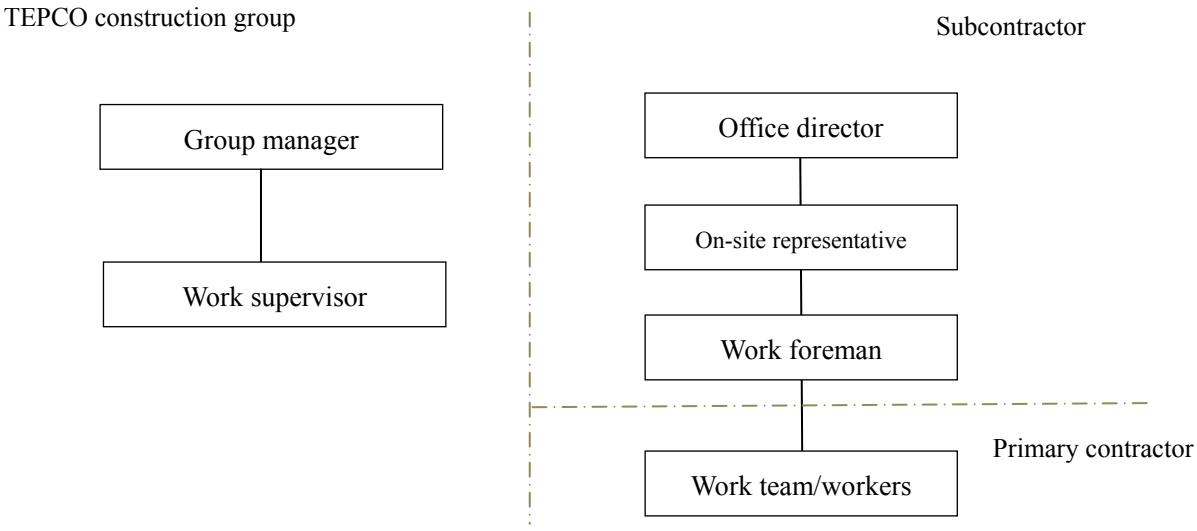
(July 28). Both incidents could have caused serious injury to personnel through electric shock or burns, etc.

- Accident overview

  When engaging in construction to install a new drainage channel behind the power station's old main building/information wing (North Side), high-voltage power cables buried in the ground were damaged when a metal pin (diameter: 13mm, length: 1,500mm) was sunk into the ground in order to hang a demarcation rope in order to secure a safe passage way around the construction-site. As a result, the "On-site Common Metal Clad Switch Gear[3] 1A Bus Ground" alarm that indicates a short circuit of the on-site common power bus, sounded and smoke emanated from the System A transformer primary high-voltage panel (grounded current limiting resistor) in the power room on the first floor of the Main Anti-Earthquake Building.

Work area

Location of damage to high voltage power cables



[3] 6.9kV enclosed switchboard

Organizational framework by which this construction was conducted

- Facts and problems

① Work planning stage

The TEPCO work supervisor had orally received information from the company that had paved the work area with asphalt prior to the construction in question, about the type and location of power cables in the area, and had subsequently passed that information on to the on-site representative from the subcontractor (the work supervisor had provided the subcontractor with documents showing objects buried in the ground, such as power cables, in March of last year).

The on-site representative was given an explanation of the condition of power cables by the work foreman of the company that had paved the area with asphalt at the work area. At this time it was assumed that the power cables were running along the top of the ground and that they would be noticeable when they came into view, so the location of all lines was not checked. (The cables that were damaged had been buried because they interfered with other construction) (Problem A)

It became evident that the safety passage that had been constructed during asphalt paving was going to hinder the construction of scaffolding for this construction, so the existing safety passage had to be moved. Work to relocate the existing safety passage was not in the original work plans, and, the TEPCO group in charge of such work was not notified that the aforementioned passage was to be relocated. (Problem B)

② Work implementation stage

The work office director of the subcontractor (supervisor of the on-site representative) performed a general site inspection on the morning of November 19 (the day of the accident). The inspection revealed a difference in grade at the end of the relocated safety passage that could result in someone tripping, so during the meeting held in the afternoon, the site representative, work foreman and work teams were instructed to construct a slope to eliminate the difference in grade.

Without sufficiently ascertaining site conditions, the work foreman decided on the location for the first steel spike and told the worker to insert it into the ground. When this was done the steel spike punctured the high-voltage power cable and created a short circuit in the “On-site Common Metal Clad Switch Gear 1A”. (Problem C)

Since November 19 (the day of the accident) was the first day of construction, the TEPCO group manager overseeing the work and the TEPCO work supervisor attended TBM-KY on the morning of the same day but were not notified of work to relocate the safety passage after the general site inspection had concluded and were therefore not aware that metal spikes were to be inserted into the ground. (Problem D)

③ Status of implementation of countermeasures to prevent the recurrence of past accident/troubles

TEPCO had created materials for educating personnel about basic electricity that include information on the dangers associated with live power cables in Eflex tubes. These materials were used to educate TEPCO and subcontractor personnel (all workers participated in the education). However, the workers failed to realize that the same risks and dangers lurked amidst the work they were engaged in (Problem E).

High-voltage power cables at the power station are labeled with warnings that say, "Live high-voltage 6.9kV cable," and such signs were posted in the vicinity of the accident location, but neither the subcontractor work foreman nor the workers thought that there was any danger to their work (Problem F).

- Problems and lessons learned

The aforementioned problems were examined from the perspectives of safety awareness, skill, and communication in order to identify lessons to be learned and areas for improvement. Since this accident was a reoccurrence of the "Eflex tube power cable damage and smoking (July 28)" incident, understanding[4] of the unique environment at Fukushima Daiichi and the leveraging of operating experience needs to be further enhanced/accelerated.

	Problems	Lessons to be learned/areas for improvement
Safety Awareness	Even for on-site works which is intended to enhance safety such as posting signs of safety passage, workers still need to be vigilant about new risks it may lead to (Problems B, C). Even though there are signs warning of live cables, the work foreman decided on the location for the steel spike without sufficiently checking the conditions of the surrounding area and the workers inserted the spike into the ground as instructed (Problems C, E, F).	-The TEPCO work supervisor, subcontractor on-site representative, chief engineer, accident prevention officer, and work foreman should use a hazard map to inspect the site and mutually confirm dangers. -Ultimately, TEPCO needs to continually tell each and every worker that they have to protect themselves and stop what they're doing if they sense danger.
	It is necessary to remember that	Any work involving drilling, scraping, or the insertion of objects into the ground shall require permit in order to prevent buried objects from being overlooked due to

[4] Equipment that was used during the emergency response to the accident still exists thereby presenting hidden risks for work that would be simple under ordinary circumstances.

	countermeasures cannot be implemented if people work under certain assumptions (Problem A)	carelessness or assumptions.
Technological Capability	Workers need to be thoroughly informed of accidents that occurred in the past and be aware that signs such as “Live power cables” may not fully convey the dangers that they are meant to, which is “if the cable is damaged you will suffer electric shock”) (Problems E, F)	-In order to understand and be fully aware of the dangers associated with power cables, teaching materials, such as videos, should be created and leveraged and warning signs shall be changed to those that emphasize the dangers. -The objectives, plans, and intentions of recurrence prevention measures that have been proposed in the wake of other troubles in the past need to be fully conveyed.
Dialogue-Promoting Capability	TEPCO needs to sufficiently communicate the risks involved with work that would ordinarily be simple under normal conditions, such as the construction and posting of a safety passageway. (Problems B, D)	-When engaging in any work that is not mentioned on the “work schedule/protective instructions[5]” or engaging in work in areas other than those shown on the hazard map, this work should be treated as unanticipated work and the construction should be suspended in order to give a report to the TEPCO work supervisor. Work should recommence after the work supervisor has been consulted. -Management observation should be used to confirm that the aforementioned rules are being followed.

Furthermore, since accidents involving damage to live power cables occurred twice during this fiscal year and continue to occur, it has been deemed that recurrence prevention countermeasures are insufficient. So, from the perspective of defense-in-depth, even if the accident only resulted in a short circuit, fire and electric shock prevention countermeasures should be implemented. In particular, if a short circuit occurs at a normal power station the power supply is not cut off even if an alarm sounds. However, in consideration of this accident, measures shall be deliberated to

[5] The report contains work details and the safety countermeasures for each day that work was performed and submitted to TEPCO by subcontractors

have the power supply be automatically cut off if a short circuit is detected at Fukushima Daiichi.

(6) Results of the investigation/examination of unsolved issues

Investigations and analysis performed to date of the of the Fukushima nuclear accident have shed much light on how the accident escalated and the causes behind it, but unanswered questions still remain due to a lack of records or the inability to perform field investigations. Whereas unraveling these mysteries is important for improving the safety of nuclear power stations all over the world, 52 items that have been deemed vital for this cause have been identified for continued investigation and deliberation. The results of these investigations and deliberations have been publicly disclosed three times to date (December 13, 2013, August 6, 2014, May 20, 2015), and the 4th progress report was released on December 17[6].

The 4th progress report provided the results of investigations into the six following issues:

- Issues vital for understanding the details of the mechanism by which the accident unfolded.

① Examination of the behavior of the safety relief valve immediately after core damage.
② Behavior of melted fuel as it migrated to the bottom of the core
③ Thermal stratification of the Unit 3 pressure suppression pool
④ Radiation hotspots around specific pipes in the Unit 1 reactor building

- Issues useful for understanding the details of the mechanism by which the accident unfolded.

⑤ Leaks from the Unit 3 containment vessel and large volume steam discharges
⑥ Estimated migration path of radioactive materials based on measurement data from the Unit 2 containment vessel atmospheric monitors

The report also offers a conclusion for 10 issues that have been deemed important for understanding the details of the mechanism by which the accident unfolded. Issues for which a conclusion has yet to be drawn will be continually deliberated and reports on these matters shall be publicly disclosed as suitable.

1.2 Fukushima Daini Nuclear Power Station

(1) Status of implementation of safety measures

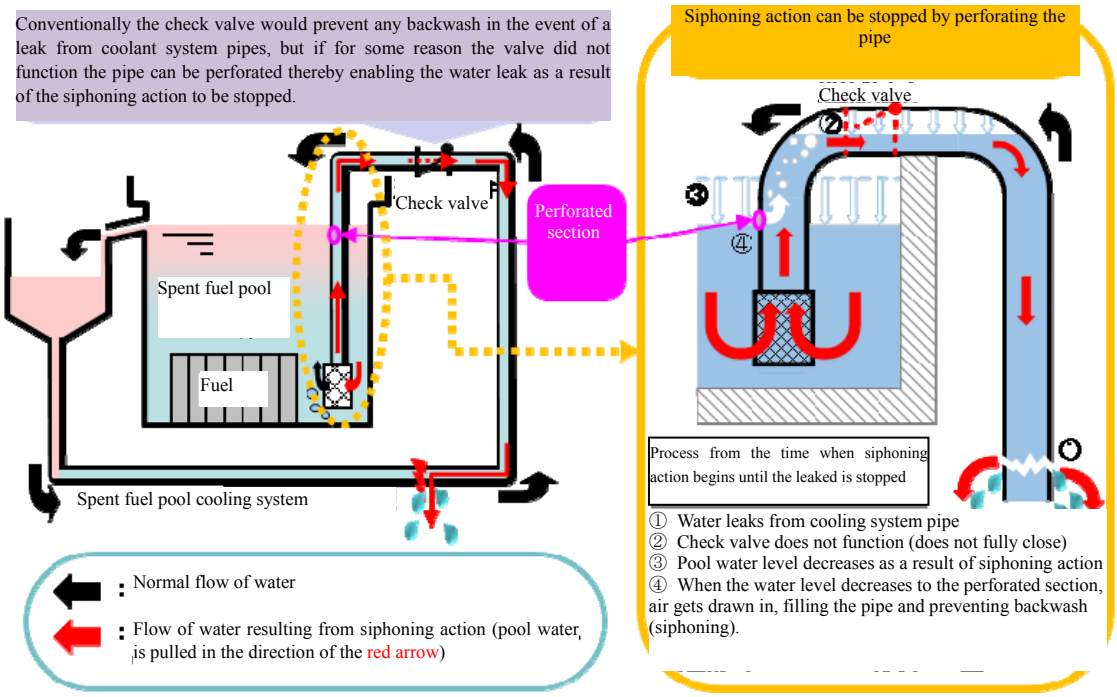
[6] http://www.tepco.co.jp/cc/press/2015/1264445_6818.html

➢ Countermeasures for preventing siphoning action in the Unit 3 spent fuel pool cooling pipes[7].

In order to simplify equipment maintenance management, at Fukushima Daini the fuel from all of the reactors has been moved to the spent fuel pools to be managed in a unified manner. The spent fuel pools are constructed as follows:

- Since the pool is a steel reinforced concrete structure aligned with stainless steel that has no pipes connected directly to it, the risk of a water leak from the pool is extremely small.
- Circulating coolant for the pool water is injected from pipes inserted to the bottom of the pool from the top as the top layer of water of the pool is reclaimed. If this pipework to rupture at a location lower than the surface of the pool water, the resulting siphoning action would cause the pool water to overflow, but this is prevented by the installation of a check valve.

However, in order to be prepared for the unlikely case that the check valve does not close completely, the aforementioned pipe has been perforated in order to prevent pool water levels from decreasing due to siphoning action in the event that a leak from the cooling pipe occurs. Work to implement this measure was completed on January 7 at Unit 3 and the same measures will be implemented for Units 1, 2 and 4.



Preventing siphoning action in spent fuel pools

[7] Implemented through lateral dissemination of improvement proposals for Kashiwazaki-Kariwa

➢ Status of implementation of education and training

At Fukushima Daini various kinds of training are underway in order to improve safety awareness and maintain/improve technical skill.

○ New employee training

All new employees at Fukushima Daiichi and Fukushima Daini were subjected to new employee training (September 18-October 6).

Classroom study

Scaffolding erection

Hoisting of heavy materials

○ Training on connecting power supply trucks in order to ensure that power is maintained during an emergency (December 14)

Moving power supply trucks close to plants

Pulling cables out of power supply trucks

Connecting cables

Adjusting voltage and frequency after starting up the power supply truck

(2) Assistance for the decommissioning of Fukushima Daiichi

Fukushima Daini has continued to provide various forms of assistance to help the decommissioning of Fukushima Daiichi proceed safely and smoothly, and one of these measures was completed during this quarter.

- Manufacturing and transport of wave breaking blocks used to repair the foundation of the south sea wall at Fukushima Daiichi

In order to reduce exposure, work efficiently, and utilize space more effectively the wave breaking blocks used to repair the foundation of the sea wall on the south side of Fukushima Daiichi were manufactured at Fukushima Daini. Transport of these wave breaking blocks to Fukushima Daiichi has concluded (November 6-December 1).

1.3 Kashiwazaki-Kariwa Nuclear Power Station

(1) Status of implementation of safety measures

At Kashiwazaki-Kariwa, the experience and lessons learned from the Fukushima nuclear accident are being leveraged to move forward with safety measures for primarily Unit 6 and Unit 7 for which facility modification permit applications have been submitted.

<Overview of safety measures>

- A 15m high sea wall has been built and waterproof doors have been installed in order to protect vital equipment inside buildings from flooding caused by a tsunami.
- Tsunami monitoring cameras have been installed to enable a tsunami to be monitored from the main control rooms and emergency response center in the event of a tsunami.
- In order to ensure that cooling water can be injected into the reactors even in the event of a loss of all AC power, power sources have been made redundant and diverse by having several of each of the following on hand: gas turbine generator trucks, steam turbine driven pumps, fire truck/power supply trucks, substitute DC batteries, etc.
- Diesel fuel tanks have been installed under the power station in order to provide fuel for gas turbine generator trucks as they generate electricity.
- A replenishing line has been additionally installed and fire trucks are available on-site in order to maintain spent fuel pool cooling and monitoring functions.
- In order to prevent hydrogen from accumulating inside the reactor buildings static catalytic hydrogen recombinators and hydrogen discharge top vents have been

additionally installed.

- A reservoir has been built in order to secure a water source.
- Communications equipment have been enhanced in order to ensure methods for notification and communication (installation of satellite phones, etc.)
- Multiple access roads have been made and reinforced in order to secure access routes for emergency vehicles.

Furthermore, countermeasures are being implemented in a planned manner to prepare for not only earthquakes and tsunami, but other external hazards such as tornadoes, volcanoes, magnetic storms, and cyber-terrorism.

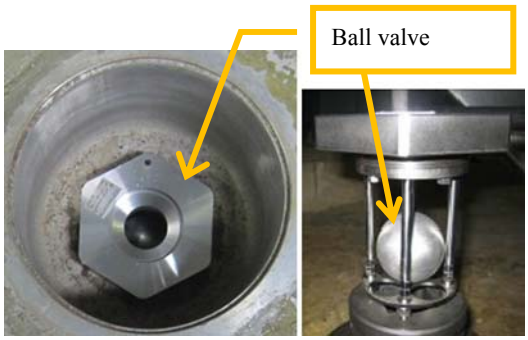
This progress report gives an update on the progress of construction underway during the third quarter.

➢ Preventing the inundation of buildings

○ Internal flooding countermeasures

In order to protect equipment vital for safety from being flooded in the event of a water leak from broken equipment inside the buildings or sprinkler/fire hose water discharged in order to extinguish a fire, the openings in the walls, floors, and buildings for cable trays, air-conditioning ducts, pipes and wire conduits are being waterproofed by covering the openings and surrounding them with sluice enclosures (Approximately 1,350 openings have been waterproofed as of the end of December). Furthermore, in order to prevent overflowing from backwash in floor drain lines, areas in which equipment vital for safety is located are being fitted with equipment to seal off funnels or prevent backwash in funnel[8] drains.

Funnel plugs



Funnel backwash prevention jig

➢ Enhancing heat removal/cooling functions

○ Installation of high-pressure alternate coolant injection system

[8] Small drainage cesspools installed in the building floor

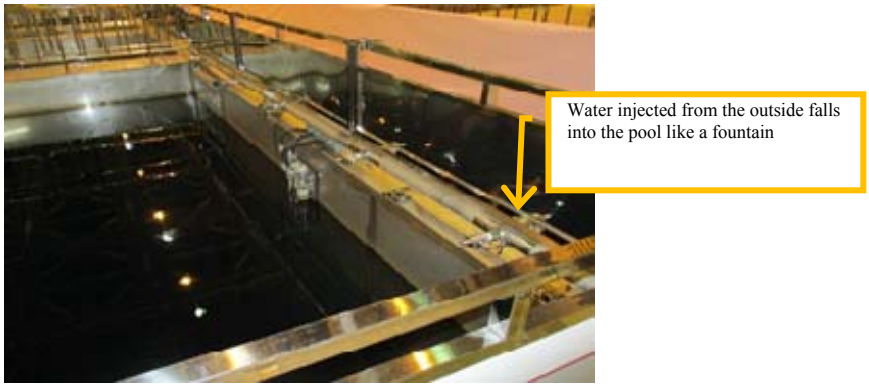
In order to further improve safety and reliability a new steam turbine driven high-pressure alternate coolant injection system has been installed in addition to the Reactor Core Isolation Cooling System (RCIC), the existing high-pressure coolant injection system for preventing reactor core damage, thereby making equipment that can inject coolant into the reactor redundant. At Units 6 and 7 as well, high-pressure alternate coolant injection system pumps have been installed and installation of pipes, supports and cables is underway.

High-pressure alternate coolant injection system pump installation (Unit 7) (work is being observed by Nuclear Reform Monitoring Committee members (right))

➢ Enhancing the cooling function of spent fuel pools (SFP)

○ Spent fuel pool external spray

In order to ensure that spent fuel pools can be cooled in the event of a loss of function of all electrically-powered cooling water injection equipment caused by a station blackout (SBO), a cooling water injection port has been installed on the outside of the reactor building to enable coolant to be injected from outside the building using a fire engine, along with external cooling water injection pipes that lead to the spent fuel pool and are independent from the existing pool cooling system. Installation was completed at Unit 7 and Unit 6 on August 12 and December 21, respectively.



Spent fuel pool external spray pipe installation (Unit 6)

➢ Preventing damage to the pressure containment vessel (PCV) from over-pressurization

○ Installation of above-ground filtered venting equipment

In the event of a serious accident pressure and heat from inside the reactor containment vessel is discharged externally to prevent damage to the reactor containment vessel. Work to install above-ground filtered venting equipment in the vicinity of the Unit 6/7 reactor building that would suppress the discharge of radioactive material into the atmosphere in this scenario is underway. The filtered venting equipment has already been subjected to pressure resistance and air flow tests. At Unit 7 the installation of iodine filters (capable of removing more than 90% of organic iodine) was completed on October 21, and work in the vicinity on drain transport equipment, etc., is underway. At Unit 6 work to install iodine filters on top of the filtered venting equipment is underway.

Above-ground filter venting equipment installation (Unit 7)

➢ Power supply

○ Preparation of the alternate DC power sources (batteries, etc.)

New 125V DC storage batteries and recharging generators have been additionally installed as alternate DC power sources in order to prevent reactor core damage caused

by a loss of function to the existing power source equipment. The equipment has been installed high within the building (aboveground floors) so that it is independent an dispersed from the existing power source equipment (located underground) so as to prevent all equipment from being rendered unusable by a common cause, such as flooding. Furthermore, work to increase the capacity of existing DC power sources is underway. The enhanced capacity of existing DC power sources coupled with the capability of additionally installed DC power sources means that electricity can be supplied for over 24 hours (more than three times what it was).

Alternate DC power sources (Left: recharging generator, Center: recharging panel, Right: storage batteries)

➢ Fire countermeasures

○ Creation of a firebreak

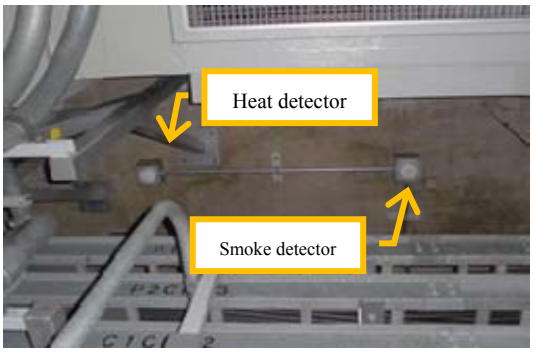
In order to prevent the reactor facility from being affected by a forest fire, a 20m wide firebreak around the entire facility (total length: approximately 4km) was constructed and up and functioning on April 22. In order to further improve the fire resistance of the firebreak the entire firebreak was sprayed with mortar and paved with asphalt (completed on November 6) to prevent plant life from growing on it.

Power station facility firebreak (Unit 5-7 side) (Left: prior to construction, Right: after construction)

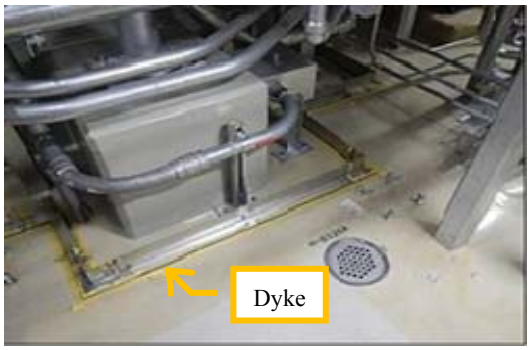
○ Fire resistant barriers

In order to prevent equipment vital for safety from being rendered unusable due to a fire inside the buildings, cables and materials used for the interior of the buildings have been checked to confirm that they are flame retardant or incombustible, different types of smoke detectors have been newly installed in addition to existing smoke detectors (approximately 740 in total at Unit 6 and Unit 7), and fixed automatic water sprinkling equipment has been additionally installed (approximately 130 locations at each plant) as measures to prevent fires, detect and extinguish fires quickly, and mitigate the impact of fires.

Furthermore, in order to prevent a simultaneous loss of function of equipment vital for safety due to a spreading fire, measures to mitigate the impact of fire, such as the new installation of fire resistant walls, the fireproofing of penetration seals, installation of fire prevention dampers, and cable wrapping, etc. are underway in order to enable a fire to be resisted for more than three hours in accordance with the requirements of the new safety regulations.



Fire detectors installed on the ceiling (smoke + heat detectors)



Dyke (to prevent oil leaks from spreading)

➢ Suppressing the dispersion of radioactive cereals outside the site

○ Installation of equipment to inject coolant from outside the reactor building (large volume water discharge equipment, etc.)

Concrete pump trucks and water discharge trucks with extendable arms for reaching elevated locations are on-site in order to inject coolant from outside of the reactor building, but in the event of large-scale building damage in conjunction with the escalation of an accident or the crash an airplane, etc., it may be difficult to approach the building or the scene of the crash. In preparation for these events, large volume water discharge equipment that is cable of spraying large amounts of water (approximately 7.5-20m^3/min.) over large distances (approximately 100 m) are on-site (5 sets of water transfer trucks, water cannons, foam liquid transport, etc.) Additionally,

containers to store hoses for discharging water have also been installed (61). This equipment would enable exposure reduction and improve the ability to wet down and forcibly deposit radioactive materials in the air in the event of a serious accident.
Water discharge training at the freshwater reservoir using large volume water discharge equipment began in November.

Hose containers

Water discharge training using large volume water discharge equipment
(Nuclear Reform Monitoring Committee Members (right) observing training)

➢ Countermeasures to enhance emergency response capabilities

○ Creation of redundant access roads and road reinforcement

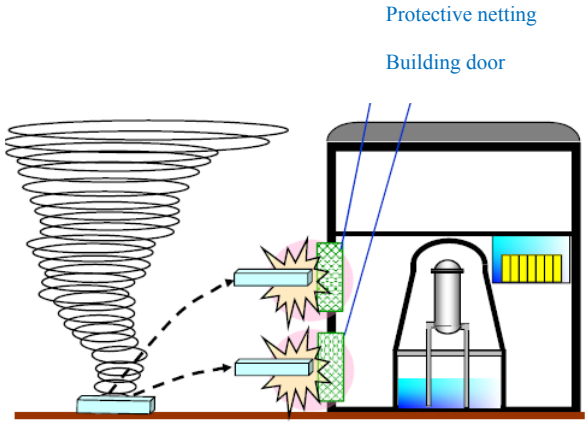
Multiple access roads have been built in order to secure access routes for emergency vehicles, such as power supply cars and fire engines, in the event of a serious accident. In order to secure access routes heavy machinery has been used to eliminate grade differences in roads and remove obstacles, and countermeasures have been implemented to prevent the uneven subsidence of roads. In order to create redundant access routes, two additional access roads have been built in addition to the existing road that connects the emergency vehicle parking lot on the Unit 1-4 side to the Unit 5-7 side, for a total of three access routes. The access routes from the sea side of Units 5-7 were completed on April 28, and the access routes from the mountainside of Units 5-7 were open for use on December 7.

Access routes additionally built on the mountain side of Units 5-7

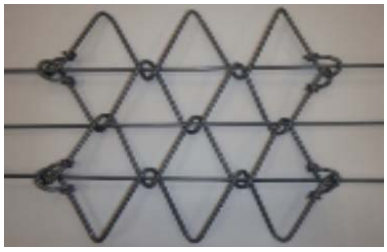
➢ Tornado countermeasures

○ Building door reinforcement and installation of protective netting

Facilities that may be affected by a design basis tornado have been identified and the doors on these buildings are being replaced with doors that are thick enough to withstand collisions from flying debris (Unit 6: 8 doors, Unit 7: 6 doors), while building openings and equipment located outside are being covered with protective netting (Unit 6: 6 locations, Unit 7: 12 locations (including control buildings)).



Concept drawing of collisions with flying debris turned up by tornado



Protective netting installed over openings

Building doors (conventional)

Building doors

(Door structure reinforced to withstand collisions with flying tornado debris traveling at 92m/s (construction underway))

(2) Status of handling new regulatory requirement compliance inspections

In September 2013, an application was made to have Kashiwazaki-Kariwa Units 6 and 7 subjected to new regulatory requirement compliance inspections, and these inspections have been continually implemented by the Nuclear Regulation Authority since then. During the third quarter the 16th inspection meeting was held (96 times in total).

➢ Status of inspections related to earthquakes and tsunami

○ Overview of the review for Design basis ground motion

The new regulatory requirements require that design basis ground motion be determined more precisely. Identifying active faults (source fault) that could impact the site and ascertaining the impact on the site of subterranean ground structures is being done by analyzing observed seismic ground motion records as well as conducting geological surveys and analyses in order to determinate design basis ground motion. During the review the following two things were discussed:

① Improving the ability to reproduce the Niigata-Chuetsu-Oki Earthquake that occurred due to the F-B fault

② Ground motion by unspecified source (blind faults)

In regard to ①, since it was required that the ability to reproduce the characteristics seen during the Niigata-Chuetsu-Oki Earthquake the accuracy of evaluating ground motion that reach the Arahama side (Units 1-4 side) was improved thereby resulting in a partial revision of Ss-2. In regard to ②, after examining the impact that the subterranean structure under the site has on seismic ground motion that is difficult to correlate with active faults (like the earthquake that occurred in the southern part of Rumoishichou, Hokkaido in 2004), it was found that conventional design basis ground motion was partially exceeded, so a new Ss-8 was set.

Furthermore, additional boring is being done voluntarily to supplement boring cores that do not currently exist, since it was determined that further data is required in light of the unclear photos of the F5 fault on-site.[9]

[9] Located near Unit 4

Determining maximum acceleration (Gal) for design basis ground motion

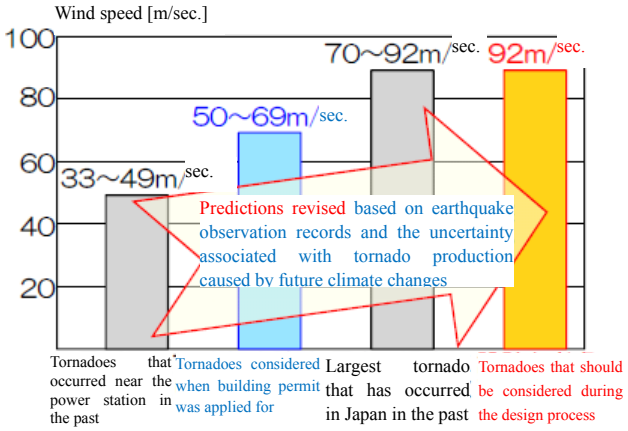
Design basis ground motion	Earthquake	Arahama side (Unit 1-4 side)			Ominato Side (Units 5-7 side)		
		North-South direction	East-West direction	Vertical direction	North-South direction	East-West direction	Vertical direction
Ss−1	Ocean area: Earthquake caused by F-B fault	2300		1050	1050		650
Ss−2		847→1240	1703	510→711	848	1209	466
Ss−3	Land side: Earthquake caused by Nagaoka-heiya-sei en Fault Zone	600		400	600		400
Ss−4		589	574	314	428	826	332
Ss−5		553	554	266	426	664	346
Ss−6		510	583	313	434	864	361
Ss−7		570	557	319	389	780	349
Ss−8	Ground motion by unspecified source (Rumoishichou southern earthquake)	−	−	−	650		330

··· Changed/Added

○ Tornado inspection overview

The new regulatory requirements require that protection be enhanced so as to prevent safety functions from being affected by a tornado. During the inspection it was determined based on observation records and tornado history that it would be difficult for a large tornado to form on the Japan Sea side of the site compared to on the Pacific Ocean side due to the regional attributes. However, TEPCO has revised the maximum tornado speed that should be considered for design to 92m/sec. in consideration of the uncertainty associated with tornado formation that may be caused by future climate fluctuations.

Furthermore, facilities that may be affected by such a tornado have been identified (building openings and equipment located outside, etc.) and protective countermeasures are underway.



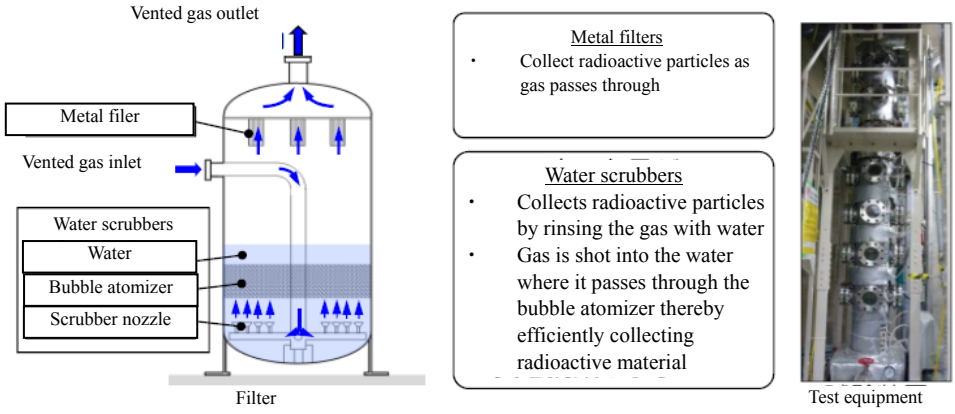
Revisions to predicted tornadoes in consideration of uncertainty

➢ Status of plant inspections

○ Filtered venting equipment structure and performance

The new regulatory requirements require that Cesium 137 discharge volumes be lower than 100TBq[10]. In conjunction with improvements to skill made through training, the time from the occurrence of an accident until venting is required has been extended from 25 hours, as originally stated in the application, to 38 hours due to shortening of the time required to start generating electricity using gas turbine generators and an increase in the amount of water that can be used to replenish condensate storage tanks from the freshwater reservoir (time shortening). As a result, even in the event that the PCV is vented following reactor core damage, the amount of Cesium 137 that would be discharged into the surrounding environment would only be approximately 0.0014TBq (approximately 1/70,000 that of the new regulatory requirements).

Filtered venting equipment is designed to remove more than 99.9% of particulate radioactive material by cleaning the gas from the reactor containment vessel using water scrubbers and metal filters. During the inspections the radioactive material removal performance of filter equipment was discussed, and it was confirmed that it has been examined in detail using test equipment that simulates actual equipment.



Filtered venting equipment structure and performance

○ Countermeasures for reducing iodine discharges during PCV venting

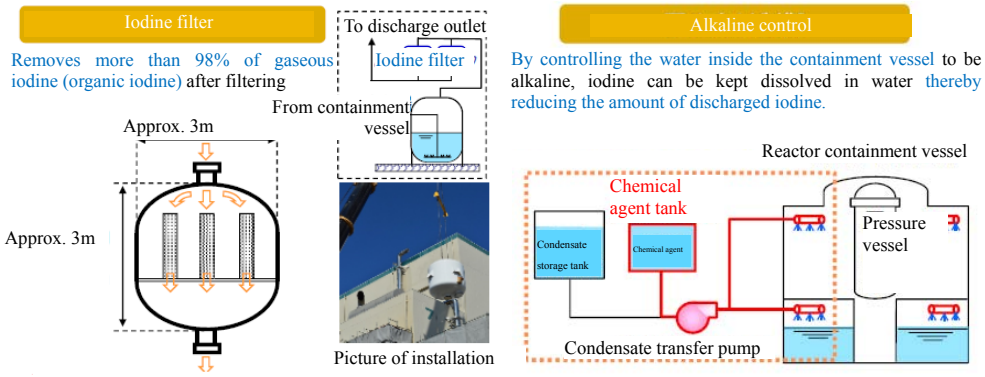
During inspections, countermeasures for reducing gaseous radioactive waste, which is difficult to remove, must be examined. Since radioactive iodine is easily ingested and accumulates in the thyroid gland, it is an important isotope from the perspective of internal exposure and therefore vital that discharges be suppressed.

Gaseous iodine (organic iodine) does not dissolve easily in water and therefore cannot

[10] Terabecquerel: 10^{12}Bq

be removed by the water scrubbers of the filtered venting equipment. Therefore, a new iodine filter was additionally installed at the outlet of the filtered venting equipment. By employing filters that contain silver zeolite, which absorbs organic iodine, more than approximately 98% of gaseous iodine (organic iodine) can be removed.

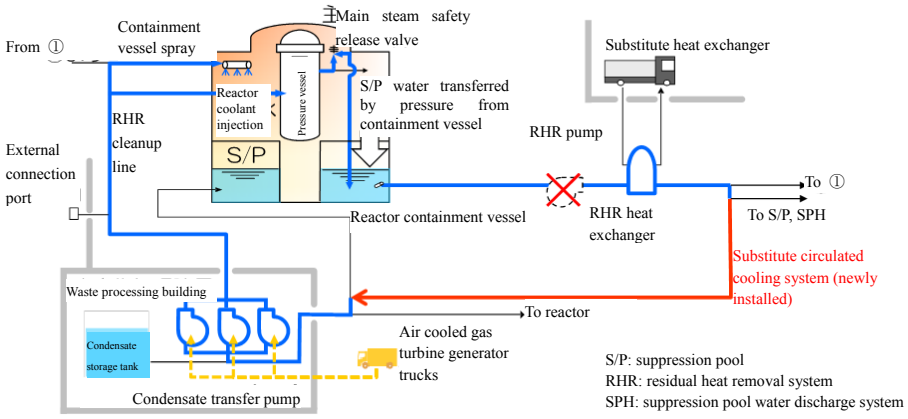
Furthermore, by increasing the acidity of water in the PCV pressure suppression chamber, iodine that leaks from the pressure vessel is dissolved and contained within the water thereby suppressing the amount of iodine discharged to approximately 1/100,000 (if the PCV is vented 38 hours after an accident occurs). Since freshwater needs to be used in the suppression chamber during plant operation, tanks and pipes will be additionally installed in order to inject an acidic agent into the water in the event of a serious accident. The iodine filters and alkaline control method were both developed by TEPCO and using them together will enable large reductions of iodine discharged into the environment during venting.



Countermeasures for reducing iodine discharges during reactor containment vessel venting

○ Alternate circulated coolant system installation

In addition to these countermeasures for suppressing discharges of radioactive material, a plan has been devised to avoid the need to vent the PCV as much as possible by preventing increases in pressure inside the reactor containment vessel through cooling. In order to cool and remove heat from inside the PCV, efforts have been made to diversify and make redundant coolant injection methods and secure power. In order to remove heat, alternate heat exchanger was additionally installed. In addition to this, efforts are underway to enhance heat removal methods by newly installing an alternate circulated coolant system.



Alternate circulated coolant system schematic

(3) Impact assessment results for radioactive materials dispersed during an accident

A radioactive material dispersion impact assessment was implemented in order to confirm the efficacy of safety measures at Kashiwazaki-Kariwa in the event of an accident, and deliberate logistical support by TEPCO for the evacuation of local residents.

This radioactive material dispersion impact assessment was conducted based on five scenarios:

① 25 hours from accident until filtered venting and discharge

② 18 hours from accident until filtered venting and discharge

③ 6 hours from accident until filtered venting and discharge

④ Discharge of radioactive material that has not been filtered due to rupture of the PCV as a result of the failure to inject cooling water

⑤ Venting 38 hours after accident

The compliance inspection by the Nuclear Regulation Authority focuses on scenario ⑤, so scenario ⑤ was used as the basic scenario upon which to base the assessment.

TEPCO dispersion impact assessment (five scenarios)

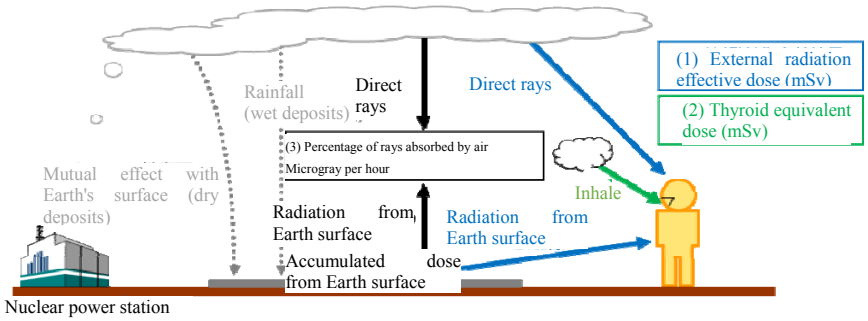
Scenario	Safety Function			Pressure vessel rupture	Containment vessel rupture	Time until discharge	Compliance inspection	Niigata Prefecture assessment[*1]	TEPCO assessment[*2]
	Cooling water injection		FV						
	Design standard compliant equipment	Severe accident compliant equipment							
① Venting 25 hours after accident (Large LOCA[*3] + loss of all emergency cooling system function + station black out (SBO))	×	Used (Permanent)	Used	No	No	25h	- *4	Implemented	Implemented
② Venting 18 hours after accident (Loss of high pressure/low-pressure function + station black out (SBO) + inability to cool reactor using fire engines)	×	Used (fire engine)	Used	Yes	No	18h	-	Implemented	Implemented
③ Venting 6 hours after accident (No scenario)	×	×	Used	Yes	No	6h	-	Implemented	Implemented
④ Reference case (PCV ruptures and reactor material is discharged without passing through the filter vents. Cooling water injection function not considered.)	×	×	×	Yes	Yes	8h	-	Implemented	Implemented
【Basic Scenario】 ⑤ Venting 38 hours after accident (Compliance inspection scenario: Revision of ① assessment conditions)	×	Used (Permanent)	Used	No	No	38h	Implemented	-	Implemented

*1: Niigata Prefecture uses SPEEDI (System for Prediction of Environmental Emergency Dose Information)

*2: DIANA (Dose Information Analysis at Nuclear Accident) used

*3: LOCA: loss of cooling accident

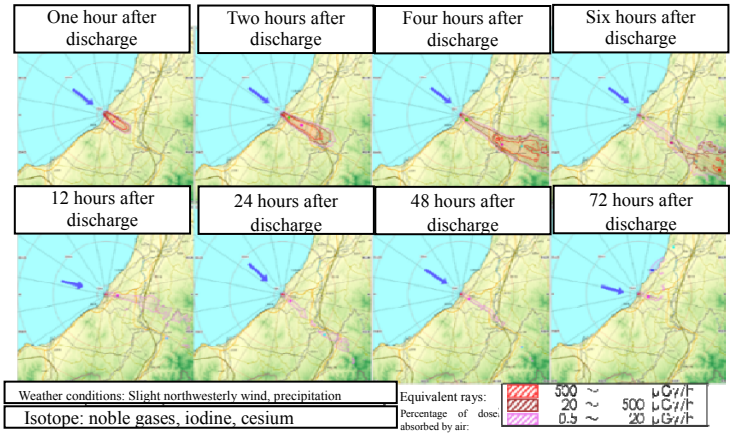
*4: Old scenario used for application of building permit



(1) External radiation effective dose (mSv): External radiation exposure from Earth surface and directories
(2) Thyroid equivalent dose (mSv): Internal exposure from ingestion
(3) Percentage of rays absorbed by air: Per time unit dose from direct rays and Earth surface

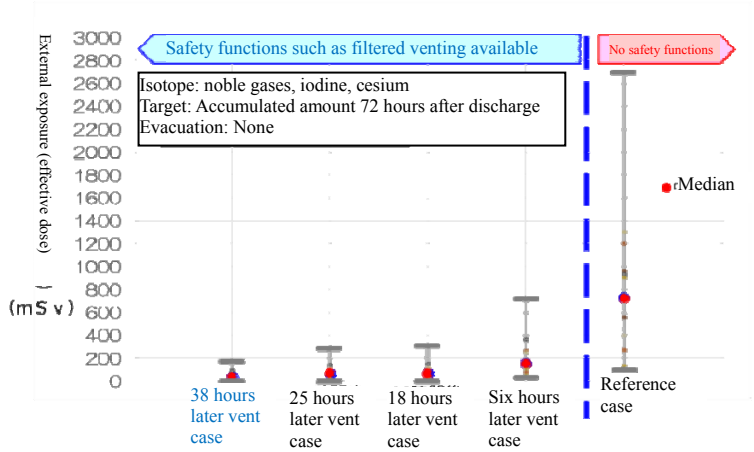
Data calculated during dispersion impact assessment

((1) effective dose, (2) thyroid gland equivalent dose, (3) air absorption dose rate)



Assessment resulted example

(trends for air absorption dose rate for Scenario ⑤ Venting 38 hours after accident)



External exposure (effective dose)*assessment result (dispersion within PAZ[11] range)

[11] PAZ (Precautionary Action Zone): zone within which preventative protection measures are taken. The area within a 5 km radius from the nuclear facility.

* If a person was to stay in the same place outside

The dispersion impact assessment has confirmed that using filtered venting equipment and iodine filters, and lengthening the time until venting is necessary are effective measures for reducing exposure. These assessment results were explained to the Niigata Prefecture Technical Committee on December 16 where the effectiveness of filtered venting equipment in regards to removing iodine and cesium was confirmed.

(4) Status of explanations given to the communities of Niigata Prefecture

- Community visits and tours of the power station

Representatives from the Niigata Headquarters (Niigata division, Kashiwazaki-Kariwa, Shinanaogawa power stations) are making visits to local governments and various organizations within Niigata Prefecture in order to explain the safety measures currently underway at the power stations and the status of decommissioning efforts at Fukushima Daiichi. In particular, in the Kashiwazaki-Kariwa region, visits are made to the town board chairman of Kashiwazaki City and the district director of Kariwa Village in order to listen to opinions and answer questions. During these opportunities to engage in dialogue with local communities tours of the power station are being proactively recommended.

12,379 people from the Kashiwazaki-Kariwa region and 31,305 people from Niigata Prefecture have participated in these power station tours (total number of people that have tour the facility since the Fukushima nuclear accident as of the end of December 2015)

- Briefings

Briefings for the siting community

The status of new regulatory requirement compliance inspections at Units 6 and 7, the handling of the safety cable and general system cable nonconformities, and the results of the dispersion impact assessment of radioactive materials discharged during a serious accident were explained to the Kashiwazaki City Council (December 21) and the Kariwa Village Council (December 22). The same briefing was given to residents during town hall meetings in Kashiwazaki City (December 21) and Kariwa Village (December 22). A total of 172 people attended these briefings (this briefing was the eighth one implemented since the Fukushima nuclear accident [a grand total of 1,533 people have attended these briefings]). At these briefings many questions were asked about the cable installation nonconformities, power station site geology, and evacuation plans.

Since October 24, “Power Station Talk Salons” have been established at TEPCO public communication's facilities (three locations) in Kashiwazaki City and Kariwa Village in order to create opportunities to engage in direct dialogue with more residents of the siting community. At the salons, Kashiwazaki-Kariwa risk communicators use videos to explain the efforts underway to improve the safety of Kashiwazaki-Kariwa based on the lessons learned from the Fukushima nuclear accident. Approximately 400 local residents have visited the salons and have said such things like, “I live in Kariwa Village close to the power station so I'd like you to make it safe,” “I'd like you to make more efforts to provide information on the power station to city residents,” and “It was good to hear about the various safety measures underway. Having a place like this where we can get information is a good idea.”

Power station talk salon in Energy Hall (Kashiwazaki City)

[Activities in Niigata Prefecture]

Briefing booths were set up in Joetsu City (October 20, 22, 23) and Niigata City (December 15-24) in order to create opportunities to brief prefecture residents on the status of safety measures at Kashiwazaki-Kariwa. Thanks to flyers put in newspapers, and advertisements on the radio and the website approximately 400 people visited the booths.

- Conveying information to the public through mass media

Television and radio commercials are being broadcast as part of efforts to deepen the understanding of the residents of the siting community and Niigata Prefecture in regards to efforts underway to improve the safety of Kashiwazaki-Kariwa.

Television commercial (safety measures [Training Version])

(5) Design management sheet inadequacies and main control room underfloor cable separation problems

a. Design management sheet inadequacies

➢ Overview

During the second safety inspection of FY2015 on the status of design/procurement management, the following issues were pointed out for 7 out of 12 design projects related to equipment vital for safety that are being implemented in response to the new regulatory requirements.

① Design deliberation is not being implemented in accordance with plan

② Design deliberation is being conducted in a method that differs from that in the design plan

③ The adequacy of officially submitted documents and schematics is not being confirmed

When design management sheets for a total of 807 design projects were examined in response to these issues that were pointed out, it was found that 343 of them contained the same inadequacies as those pointed out during safety inspection, and that 735 had some sort of inadequacy (missing information, selection error by verifier, etc.) (to be corrected by February of this year)

➢ Direct causes

- The department in charge felt that it was okay to use drafts of documents and schematics, which were confirmed in a way that differs from the design deliberation and adequacy confirmation method stipulated in the design plan.
- Even though the manual states that “any design changes or changes to the details of the design action plan must be reflected in the design management sheet,” the department in charge felt that this did not apply to changes in the

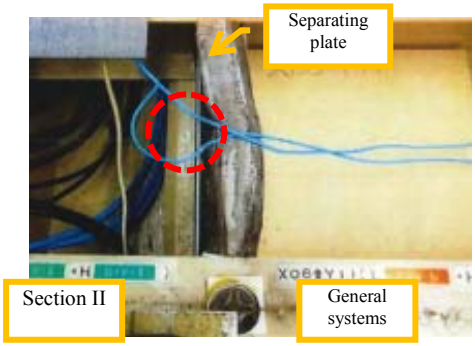
details of design projects if the changes did not result in any installation problems.

- The department in charge felt that all it had to do was create a design management sheet[12] and did not understand the importance of using the design management sheets as an objective record of the design process. This thinking resulted in numerous inadequacies.
- The manual states the role of the party verifying the design, but the wording was convoluted thereby preventing many managers from correctly understanding the manual.

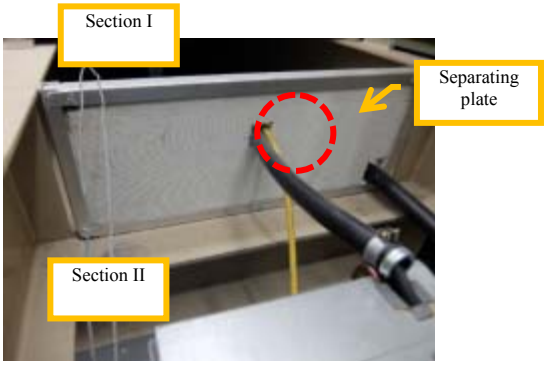
b. Main control room underfloor cable separation problems

➢ Overview

When TEPCO work supervisor and contract workers checked cable routes in the free access space under the Unit 6 main control room in preparation for work to reinforce the seismic resistance of measuring equipment power cables, they found that four of the dividing plates used to demarcate the underfloor cable pit had fallen down (for vertical separating plates), and that instrument/control cables had been laid so that there were crossing different sections. When a survey of all the units was conducted to check if any more cables had been laid in the same manner, it was found that a total of 1,049 cables were crossing different sections at Units 1-7[13].



Cables crossing over a separating plate into a different section (Unit 6)



Cable passing through separating plate without a protective covering (Unit 4)

Examples of inadequate separation during cable installation

[12] Because there had been problems in the past with failures to create design management sheets.
[13] All cable nonconformities have been corrected at Unit 6 as of November 6, and at Unit 7 as of December 10.

Site inspection by the Nuclear Reform Monitoring Committee (Unit 6)

- Direct causes
  - When the work was contracted there were no specific instructions on maintaining the separation between cables for existing equipment during cable installation in the requirements and specifications supplied by TEPCO.
  - After inspecting the site, there were cases when the contractor consulted with TEPCO about existing cable tray selection, but in these instances TEPCO did not give instructions on appropriate cable installation routes.
  - When the cables were being installed TEPCO did not inspect the worksite or examine documents and schematics to ensure that the cable routes were appropriate.
  - In all of the cases, TEPCO did not fully understand the underfloor structures of the main control rooms or the need to maintain separation during cable installation, and therefore was not able to check the suitability of the worksite or make appropriate demands to the contractor.
  - Some of the problematic cables were for televisions, phones, and LAN networks, and it is not always the case that the department in charge of doing the work is comprised of nuclear engineers. It is necessary for not only those directly working with plant equipment, but all personnel in the Nuclear Power Division to understand the fundamentals of nuclear safety.

c. Ascertaining root causes and implementing recurrence prevention measures

Countermeasures for preventing a recurrence of the issues mentioned above were compiled (publicly disclosed on November 30)[14] after ascertaining the causes other than the direct causes mentioned above, determining problems with work processes, work management, and the education that supports these tasks, and also examining case studies from the past involving earthquakes, fires, and inundation. In particular, the

[14] http://www.tepco.co.jp/cc/press/2015/1263779_6818.html

nonconformities found with separating cables underneath the main control room floor indicate weaknesses with fire protection countermeasures that "prevent a ripple effect from a single fire causing function loss with safety system equipment." This shows that the fundamental approach to ensuring nuclear safety, which consists of:

A) not allowing facilities/equipment of low importance to safety to impact of facilities/equipment vital for safety

B) not allowing one singular event to have repercussions or escalate,

was not being fully conveyed to all employees. This is a very serious matter that shows that it is necessary to put even more effort into improving safety awareness and technical skill, which are two of the objectives of nuclear safety reform.

The reality that all employees working with nuclear power have a responsibility to ensure nuclear safety has been driven home in order to improve safety awareness, however this incident has forced us to reaffirm the fact that nuclear safety is the responsibility of all employees, and not just those employees engaged in technical work. In order to improve technical skill efforts are being made to enhance the ability to propose defense-in-depth measures, train system engineers, and improve the ability of TEPCO employees to handle technical tasks on their own. And, the Nuclear Reform Monitoring Committee has said that the fact that a TEPCO employee was the party that discovered the cable separation nonconformity shows that nuclear safety reforms are having an impact. On the other hand, we must reflect seriously upon the fact that inadequate work was done during the same time period as nuclear safety reforms, which shows that improvements in technical skill have only just begun.

Based on this, TEPCO feels that it is necessary to widely disseminate information on not only the cable nonconformities, but other incidents, in light of the two conditions mentioned above. TEPCO shall therefore examined the following issues and formulate countermeasures if necessary.

- Preventing facilities with low importance for safety from impacting facilities vital for safety as a result of an earthquake
- Preventing equipment located outside from being thrown up by a tornado and colliding with safety equipment.
- Preventing a single fire from causing a loss of function of all safety systems
- Preventing flooding from impacting safety systems
- -Confirming the status of implementation of other countermeasures based on past operating experience

Furthermore, as a result of examining each work process, such as design, procurement, installation, and inspections, it was decided that an expert intimately familiar with safety system design conditions and technical guidelines will be assigned to confirm safety. In regards to educational problems, plans to periodically implement training and confirm the level of expertise shall be implemented so that employees do not have to rely solely on OJT to acquire the knowledge required to ensure nuclear safety and ensure that rules are complied with.

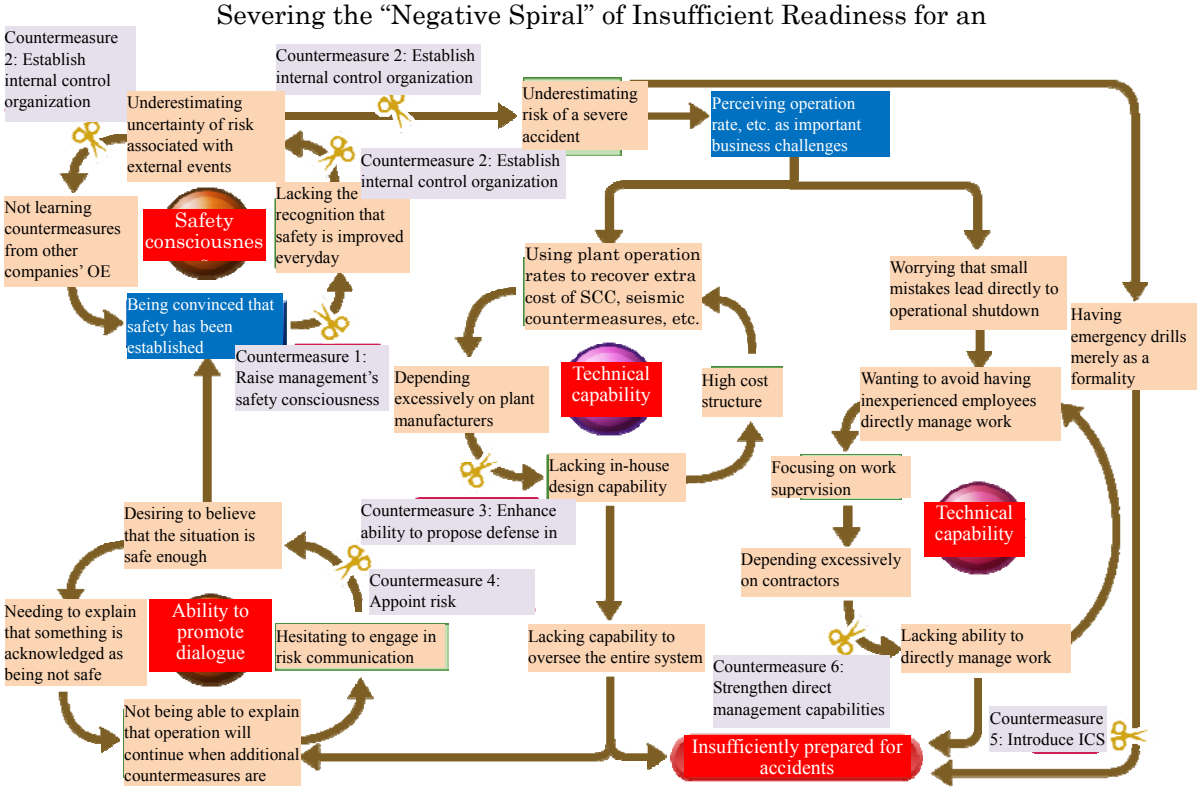
In order to ensure that the countermeasures mentioned above function effectively further root cause analysis shall be performed and additional countermeasures shall be put in place as necessary based on the results of this analysis in effort to make drastic improvements (as reported to the Nuclear Regulation Authority on January 29 of this year).

2. The Progress of the Nuclear Safety Reform Plan (Management)

"Third-quarter achievement" and "future plans" have been compiled for the six countermeasures intended to put an end to the so-called "negative spiral" that has exasperated structural problems within the Nuclear Power Division to give a progress update on the Nuclear Safety Reform Plan (Management).

And, 2014 third quarter nuclear reform KPI results and assessments are introduced in "2.7 Nuclear safety reform achievement percentage evaluation."

Severing the "Negative Spiral" of Insufficient Readiness for an



2.1 Measure 1: Reform from top management

(1) Third quarter achievements

[Training for management and nuclear power leaders]

- Management and nuclear power leaders have to have a high level of safety awareness. Therefore, training is being provided on the following three subjects in a planned manner.
  - Fukushima nuclear accident causes and countermeasures
  - Basic principles of nuclear safety design and safety culture
  - Learning from case studies from other companies
- During the third quarter former All Nippon Airways Co., Ltd. pilot, Mr. Yamauchi,

who saved more than 500 passengers when the attempted hijacking of ANA flight 61 almost brought the plane down in July 1999, was invited to give a lecture and talk about his experience through which the following common lessons useful to TEPCO were learned.

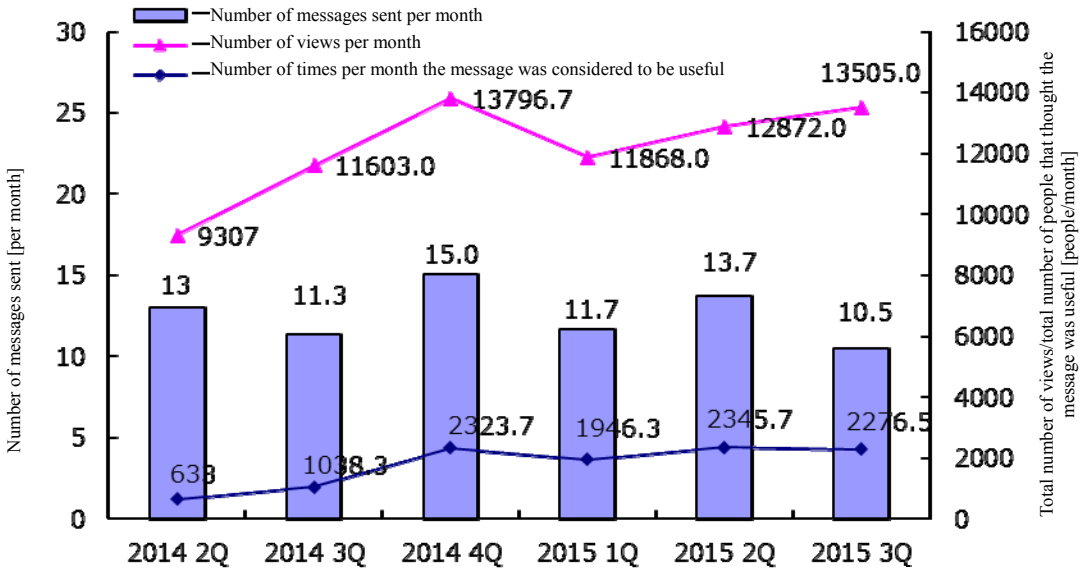
- Experience from past accidents was not leveraged (it was assumed that a hijacking was impossible).
- Even the best of us can cause an accident (you can't trust even the most reliable).
- Sharing knowledge is the important whether the accident experience was a success or failure (having the courage to share the information will prevent future accidents).

Lecture by Mr. Yamauchi, former All Nippon Airways Co., Ltd. pilot

[Conveying the expectations of nuclear power leaders]

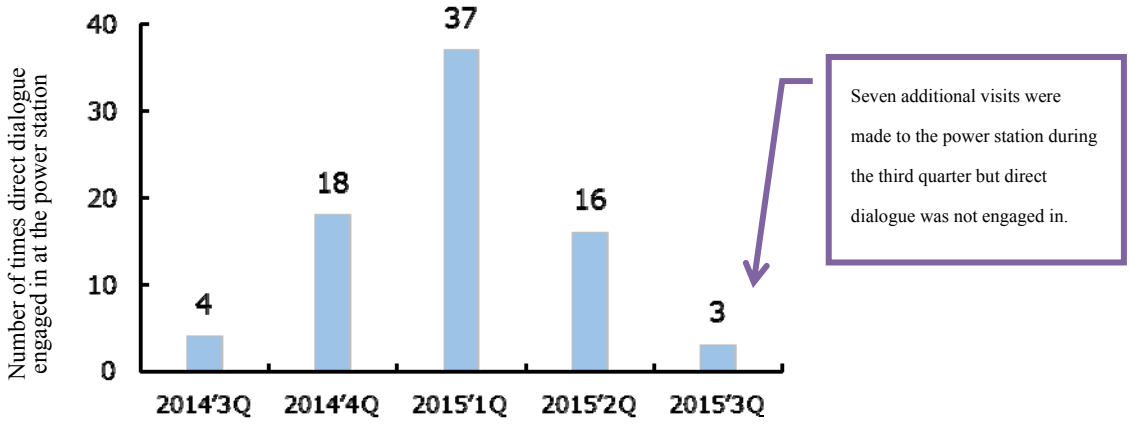
- In order to promote nuclear safety reform, it is necessary that nuclear power leaders accurately convey the objectives, plans, and intentions of their expectations to all employees. In order to do this, nuclear power leaders are taking advantage of video messages, intranet messages, e-mail, meetings, and morning briefings in order to convey their expectations.
- The following is data on the messages conveyed by nuclear power leaders via the intranet and the extent to which these messages are viewed by employees. The data shows that the number of employees viewing the messages is increasing and that the number of people that feel that the messages are “useful” is remaining the same. The approximate number of people viewing a single message is now 1,300, an increase of approximately 950 people compared to the last survey. And the number of people that feel that the messages are useful has exceeded 210 and is increasing. However, since approximately only 17% of employees viewing of messages feel

that they are useful, nuclear power leaders are striving to send messages that better convey their feelings.

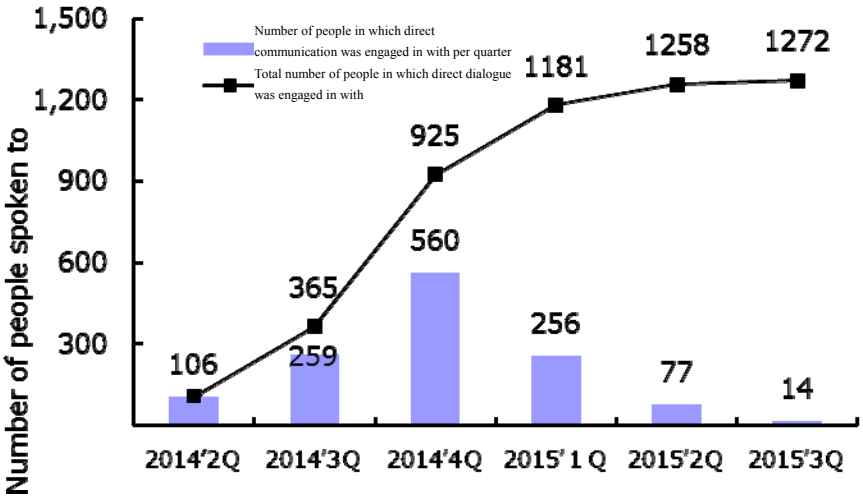


Number of messages sent by nuclear power leaders via the intranet and the number of people that viewed the messages/felt the messages were useful (monthly average)

- In order to convey the feelings that cannot be accurately conveyed through written messages sent via the intranet, the General Manager of the Nuclear Power and Plant Siting Division has been speaking directly with managers and general employees since February 2014. And, the Secretariat of the Nuclear Reform Special Task Force (hereinafter referred to as, "TF Secretariat") continues to talk directly with employees on the front lines in the field in order to repeatedly explain the objectives of the nuclear safety reform and the relevancy to everyday work.



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



Number of times the TF Secretariat engaged in direct dialogue with workers on the front line

- From FY2015 the General Manager of the Nuclear Power and Plant Siting Division and the president of the Fukushima Daiichi Decontamination & Decommissioning Engineering Company (FDEC) have presented awards to people that challenged themselves and have taken the initiative to complete certain missions, and people that have striven to achieve high objectives. Details on the number of awards given during third quarter are as follows.

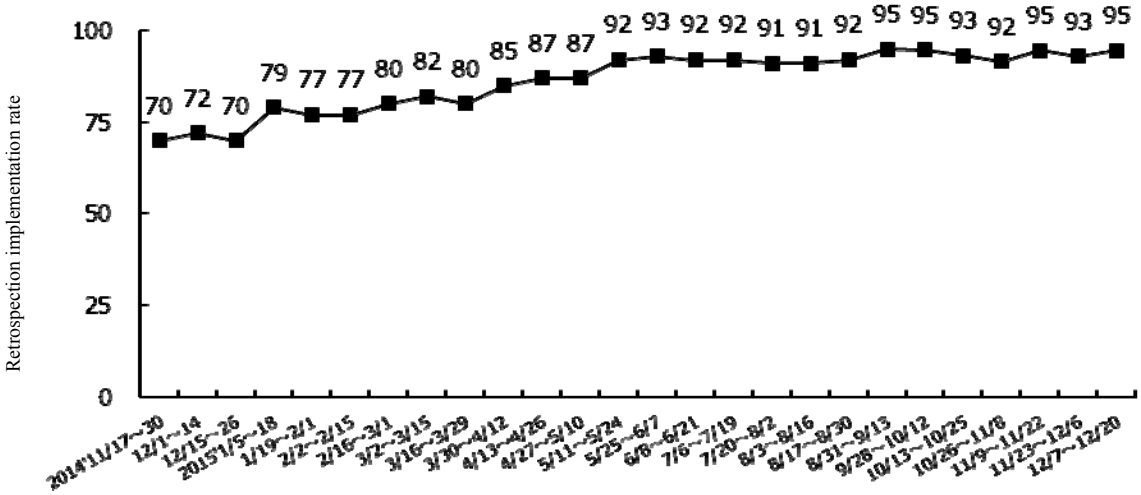
Number of awards given by the General Manager of the Nuclear Power and Plant Siting Division and the president of the Fukushima Daiichi Decontamination & Decommissioning Engineering Company (FDEC)

Period	Head Office	Fukushima Daiichi	Fukushima Daini	Kashiwazaki-Kariwa
Q1	3	11	6	8
Q2	8	13	4	4
Q3	5	9	6	5

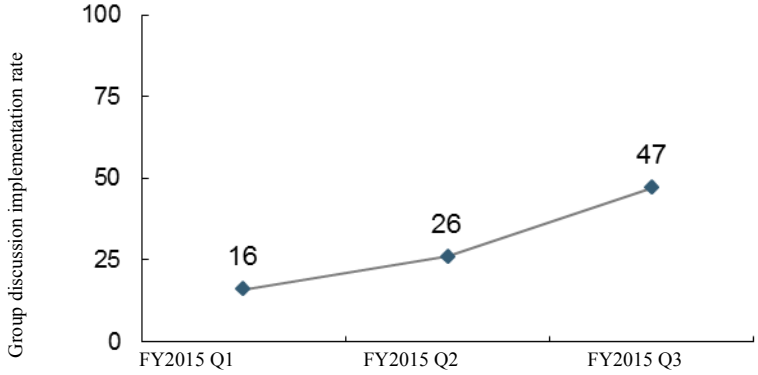
[Permeating nuclear safety culture throughout the organization]

- In order to permeate nuclear safety culture throughout the organization and help it to take root, 10 traits and 40 behaviors of people/leaders and organizations that embody robust nuclear safety culture were identified in order to use specific examples of behavior and actions that define the abstract concept of nuclear safety culture.
- The Nuclear Power Division has begun taking action to strive to improve safety

awareness and encourage people to be more retrospective of their own actions on a daily basis. The rate at which people are being retrospective is being maintained at over 90% thereby showing that the activity is taking root. As a result of the Promotion Secretariat participating as a facilitator in group discussions for sharing the results of retrospection and becoming aware of new things through learning from each other, which has continued since the second quarter, implementation rate has increased to approximately 50%. We shall make continual efforts to revitalize these group discussions.



Daily retrospection implementation rate



Group discussion implementation rate

[Overseas benchmarking]

- Overseas excellence (best practices) is being benchmarked and proactively incorporated in order to achieve the world's highest levels of safety.
- In order to investigate methods for systematically assessing the nuclear safety culture of the organization, the INPO and the Palo Verde Nuclear Power Station in

the US were used for benchmarking from December 6 through December 13. The results of benchmarking showed that TEPCO needs to make improvements in the following two areas:

- TEPCO needs a standardized and systematic method for assessing nuclear safety culture from the results of interviews and behaviors noticed through performance indicators and daily management observation.
- In order to implement the assessment mentioned above the skills of assessors need to be improved.

Therefore, a nuclear safety culture assessment promotion team that centers on the CFAM[15]/SFAM,[16] who are in charge of safety culture, shall be formed to formulate the details of assessment methods and improve the skill of assessors while receiving guidance and recommendations from a team of overseas experts.

Explanation of methods for assessing the safety culture of an organization (INPO)

Explanation of methods for permeating nuclear safety culture (Palo Verde)

[Third-party reviews]

- Third-party reviews of the level of establishment of nuclear safety culture and of organizational management that aims for the world's highest level of safety are being proactively conducted in order to confirm the achievements of nuclear safety reform and bring about improvements.
- A WANO-CPR[17] follow-up review was conducted in October 2015. In response to this review, TEPCO is engaging in the following improvements.
  - Establishment of high operating and maintenance standards at the Fukushima Daiichi NPS.
  - Monitoring of new efforts related to nuclear safety culture (retrospection

[15] Corporate Functional Area Manager: Leaders at Head Office that aim to achieve the world's highest level of excellence for each area of work at the power station
[16] Site Functional Area Manager: CFAM counterpart at the power stations
[17] Corporate Peer Review: Peer review of the Head Office of nuclear operators

based on the 10 traits, management observation enhancement, CFAM/SFAM actions, etc.) shall be enhanced in order to promote further understanding and permeation.

- The nuclear safety reform management framework and KPI/PI shall be examined, along with the effectiveness of reorganization.
- Understanding of "Supervision" and "Monitoring" done as part of management observation and CFAM/SFAM actions shall be deepened and those applicable shall be given the training they require.

(2) Future plans

The knowledge obtained by management and nuclear power leaders through third-party reviews and benchmarking shall be leveraged in order to improve organizational management so as to achieve the world's highest level of safety. Third-party reviews and benchmarking shall not be transitory, but rather continually implemented.

In particular, focus shall be put on the improvements to be made in response to the WANO-CPR follow-up review, and on acquiring systematic methods for assessing nuclear safety culture.

2.2 Measure 2: Strengthening observation and assistance for management

(1) Measures implemented during the third quarter

➢ Nuclear Safety Oversight Office (NSOO) efforts

The following opinions of the monitoring activities by the Nuclear Safety Oversight Office (NSOO)[18] over the last couple of months and primarily in the third quarter were reported to the executive officer on January 12 and the Board of Directors on January 21.

[18] NSOO Director Dr. John Crofts's title was changed from Nuclear Safety Representative, Head of Nuclear Safety Oversight Office to Chief of Nuclear Safety Oversight (CNSO), Head of Nuclear Safety Oversight Office (December 8 of last year).

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

Foreword

This report summarises the Nuclear safety Oversight Office (NSOO) assessment results for 2015 Q3 (October through December). The recommendations, advice and observations have been discussed with the management as they arose and have already been accepted and acted on (or actions planned).

1. 1F

In this quarter we have continued to assess;

•Contractor management and safety in the field,

Although there is a continuing need to focus on basic safety rules in the field, management is working hard to improve safety. We observed some very good behaviour by 2 contract companies and have advised that 1F use these as benchmarks.

•Safety management in major projects.

Although the nuclear safety of the project we observed was managed well, we recommend that the Project Management Operation Guide should include the requirement to manage nuclear safety risks.

We have started to assess Maintenance Management, focusing on some of the water treatment facilities installed immediately after the accident in 3/11. Maintenance problems associated with the speed of installation and the longer than anticipated operation are understood by 1F management.

We also report on our observations of a 1F emergency exercise, which was well managed, and a range of individual work and training assessments. In general good control and management of work was seen. However the observations and recommendations show a continuing need to focus on;

•safe behaviour in the field

•radioactive contamination control and dust monitoring
•properly assessing and managing nuclear risk

2. 2F

At Daini, we have assessed;
•Work Management Processes (unit 1 reactor restructuring work)
•Safety Management in the Field (Radiation Waste Building).
Whereas work management is good there are still problems with safety in the field and with radiation contamination control in the field.

3. KK

Assessment activities this Quarter at KK focused on;
•Operator preparation for restart at units 6/7
•Preparations for emergency – ICS exercise
•Preparations for emergency – Restoration team
•Safety management in the field
In overview, good performance is seen in all areas,.. However, the implications of the cabling problems (fire barriers) in units 6/7 control room are of concern.

4. Corporate Assessments

Whereas there is always room for improvement, efforts are being made to enhance the nuclear safety culture as laid out in the Nuclear Safety Reform Plan. In particular, improvements in training for work team leaders and supervisors at 1F and the 4 weekend courses run for Group Managers and General Managers.

The US advisor to the Nuclear Safety Culture CFAM is now involved and is also expected to make a significant impact in this area.

5. CNSO Perspective on Q3 Assessment Results.

Because of industrial safety accidents NSOO has focused its efforts on industrial safety and work control over the last year. The summary of all this is that whereas poor

working practices are still seen in the workplace sometimes, management are working very hard to correct the problems and things are improving. NSOO recommends continuing emphasis by site management in all these areas.

5.1 Nuclear Safety

Recent events and NSOO assessments and observations indicate that NSOO should now refocus its activities on Nuclear Safety. This is where the significant long term risks are. They can be considered in 3 categories;

•Higher Consequence / Low Probability events – HC/LP.

Nuclear safety is already a high priority for KK management and NSOO already focuses on the new safety enhancements, maintenance, the readiness of staff to operate a nuclear power station and the effectiveness of the emergency arrangements should anything go wrong.

However the recent cable event should be viewed as a warning, as a potential precursor to one of these HC/LP events. The underlying causes mean that other safety systems might have been similarly affected.

•Medium Consequence / Medium Probability events – MC/MP.

These events are typically high accidental personnel radiation exposure, or criticality events and radioactive material release from decommissioning or fuel cycle plants. An MC/MP event is not normally a big issue at a well-run nuclear power station site. However in the current situation at 1F and 2F this level event must be the main focus.

In the Q1 report, CNSO set an action to "develop a strategy to meet the risk requirements of the revised 1F roadmap". This action is re-emphasise by this Q3 report.

•Low (but not zero) Consequence / High Probability events - LC/HP.

By this we mainly mean the accumulation of radiation dose by the workforce or the spread of radioactive contamination. This is also not normally a problem on a well-run nuclear power station site where radiation levels are insignificant and a good nuclear safety culture is present.

However, we have high contamination and high radiation doses at 1F. The CNSO's interpretation of the NSOO assessment results is that, particularly but not exclusively at 1F;

- radiation control in the workplace is difficult and needs to be more rigorously managed,
- contamination control is poor, the monitoring of airborne activity is difficult and needs to be more rigorously managed,
- there is a generally poor understanding of the hazards and risks of radiation in the workforce.

CNSO recommends that, whereas good work has been done to reduce the dose budget for a program of work, now is the time to introduce tighter dose controls to reduce the dose and harm to individuals. CNSO suggests the introduction of Personal Dose Constraint Objectives.

5.2 Nuclear Safety Culture – The cement in the safety wall.

Work is proceeding in many areas that contribute to nuclear safety culture at the instigation of the nuclear leaders. For example Traits, Training, Competence, Operating Experience, Non Conformance, Learning, Safety Management System (CFAM), etc.

CNSO considers each of these aspects to be the building bricks of the nuclear safety defensive wall and each needs to be strong. However the bricks need cement to hold them together and make the safety wall strong. CNSO sees this cement as comprised of the nuclear leaders and middle managers, and in particular their values, commitment and passion.

Whereas the basic strategies for developing a Nuclear safety Culture, as set out in the Nuclear Safety Reform Plan is sound, CNSO recommends that there should be more focus on the values, the commitment and the passion of the leaders.

6. Close Out of Actions and Recommendations

A key performance indicator for NSOO is that the suggestions and recommendations that we make acted upon by line management. Performance is improving in this area.

6.1 10 Actions from the Board

A further 2 actions have been closed this quarter, leaving only 3 with some outstanding aspects. In each case the action could now be easily closed and nuclear leaders are encouraged to take the necessary action.

6.2 NSOO Recommendations.

Once again good progress has been made, with closure of a further 20 actions. This leaves the total outstanding as only 28 and there are now no actions for which no action is being taken. A further 10 actions have been raised in assessments this quarter.

<table>
<tr><td rowspan="2"></td><td colspan="2">Status as of the end of FY2015 Q2</td><td colspan="3">Status as of the end of FY2015 Q3</td></tr>
<tr><td>Prior to FY2015 Q1</td><td>FY2015 Q2 new recommendations</td><td>Prior to FY2015 Q1</td><td>FY2015 Q2 recommendations</td><td>FY2015 Q3 new recommendations</td></tr>
<tr><td>Recommendations that have been completed</td><td>47</td><td>-</td><td>67</td><td>-</td><td>-</td></tr>
<tr><td>Recommendations that are being implemented</td><td>39※</td><td rowspan="2">6</td><td>19</td><td>6</td><td rowspan="2">10</td></tr>
<tr><td>Recommendations for which no action has been taken</td><td>3</td><td>3</td><td>-</td></tr>
<tr><td>Total</td><td colspan="2">95</td><td colspan="3">105</td></tr>
</table>

※ There was “40” in the Q2 report but two similar recommendations were merged in this report.

[Safety steering council meetings]

- A Safety Steering Council was established in June 2014. This Council meets quarterly and is advantageous in that a small number of personnel from management[19] can focus discussions on one or two topics.
- A meeting was not held during the third quarter, but in February of this year the Safety Steering Council will meet to discuss the results of each indicator and observation, as well as third-party reviews based on which it will examine the overall state of nuclear safety at TEPCO.

[Enhancing management observation]

- In order to promote nuclear safety reform and improve nuclear safety, improvements must be implemented with accuracy. That's why management observation (MO), which is used by the best nuclear operators overseas, is used to monitor site situations and accurately ascertain problems.
- In order to alleviate discrepancies with approaches to, and methods for implementing, MO, which was an issue during the first quarter, overseas benchmarking results have been used to create Common Management Observation Guidelines (December 17). The objective of MO is defined as to "confirm whether or not the company is on the track to making improvements that will result in the world's highest level of nuclear safety, radiation safety, and labor safety through the daily management observation of work, so that reforms can be promoted promptly and independently without relying on external reviews by the IAEA, WANO and JANSI, etc., and accelerate performance improvements at power stations."
- Details of MO activities are as follows:

○ Managers shall stipulate requirements, such as by setting detailed expectations, remain in one area for fixed period of time to concentrate on the surroundings and quickly give feedback to the entire organization in regards to good practices noticed and areas for improvement so as to improve the performance of the power station.

○ Managers shall use OE information to learn from the world's highest standards, ascertain the gap that exists between those standards and conditions in the field, and make improvements. There should be parties responsible for compiling MO for the entire organization and analyzing/assessing the information that has been gathered.

○ It is necessary to improve the skills necessary for MO whilst simultaneously engaging in MO. Therefore, managers that have long experience with MO shall be selected as

[19] The council is comprised of four members, the Pres. (Chairman), Managing Director of the Nuclear Power Plant Siting Division, FDEC President, and Head of the NSOO (the General Manager of the Nuclear Safety and Supervision Department serves as secretariat).

core management observers to give advice to and guide other managers. Furthermore, training and field coaching is being implemented with assistance from WANO[20]. WANO training and field coaching for power station managers was implemented during the third quarter (Fukushima Daiichi: October 29, 30 (participants: 93), Fukushima Daini: November 5, 6 (participants: 24), Kashiwazaki-Kariwa: October 1, 2 (participants: 57)).

- Third quarter MO results are as follows:

Category	HQ	Fukushima Daiichi	Fukushima Daini	Kashiwazaki-Kariwa
Number of times implemented	43 times total 0.4 times/month/person	437 times total 1.0 times/month/person	218 times total 1.1 times/month/person	449 times total 1.6 times/month/person
Number of best practices/areas for improvement	46	672	224	1545

[Improving the skills of middle management]

- Management and nuclear power leaders are trying to promote reform, but it is also necessary that middle management is fully aware of its own responsibility in regards to nuclear safety and that it thoroughly tries to fulfill its obligations along with nuclear power leaders.
- In order to improve the skills of middle management the following three training sessions will be held for group managers and shift supervisors (section manager class) (all training sessions are new except for TWI training).
    - Training for new managers were held in two parts from November 6-8, and from November 13-15 in order to allow participants to understand and acquire behaviors that embody nuclear safety culture and a sense of values that must be maintained in order to improve nuclear safety (63 subjects participated).
    - Management training for new managers to foster motivation in the workplace commenced on October 23 and to date 44 people have participated. The training for selected group managers will begin on January 18 (subjects: approximately 110).
    - Training to improve the ability to train personnel that can engage in work

[20] Second-quarter training for headquarter managers has already concluded

safely (TWI training[21]) began on October 26 and to date 43 people have participated.

- In addition to group manager and shift supervisor (section managers) training, power station department manager training was also planned. During this training the roles of department managers that oversee anywhere from dozens to 250 workers, and the mission is reaffirmed thereby accelerating nuclear safety reforms. The training was held in two parts on December 5-6, and December 12-13 (35 subjects participated). The objective of the training was to cultivate a sense of values, sense of responsibility, and passion towards nuclear safety amongst middle management, which is mentioned in the report from the Nuclear Safety Oversight Office.

(2) Future plans

- The Nuclear Safety Oversight Office will move forward with nuclear safety improvements by continuing to monitor/point out issues, and make proposals, which are important activities for improving nuclear safety. Furthermore, the Board of Directors will continue to periodically receive reports on the monitoring activities and proposals made/issues pointed out by the Nuclear Safety Oversight Office and on the status of efforts on the executive side in order to confirm the status of nuclear safety.
- Management observation skill improvement and improvements through MO will be made concurrently based on the Common Management Observation Guidelines. In particular, efforts to improve skills will be accelerated through specialized coaching in the areas of operation and maintenance by a team of international experts invited to give assistance to the CFAM/SFAM that will reside in Japan from January, in addition to support from the WANO and INPO.

2.3 Measure 3: Strengthening the ability to propose defense in depth

(1) Third quarter achievements

[Improving technical skills through a competition designed to enhance the ability to make proposals that improve safety]

- Competitions designed to enhance the ability to make proposals that improve safety are being held to give workers the technical skills required to propose safety measures that are highly cost-effective from a multifaceted view of defense in depth,

[21] Training Within Industry training (on-the-job training for primarily field supervisors. Participants learn how to teach, how to treat people, how to make improvements, and how to engage in work safely. The training drives home the point that, “if a subordinate can’t do something it means that their supervisor hasn't taught them correctly.”)

and promptly bring these measures to fruition.

- To date four of these competitions have been held and they're becoming customary. The current status of these competitions is as follows.

○ 121 proposals were received for the 1st competition held in FY2015 out of which 13 excellent ideas were selected by a committee of judges and votes by employees in the Nuclear Power Division.

[Excellent ideas chosen from the 1st competition of FY2015]

- Addition of procedures that enable the quick insertion of multiple control rods in the event of a station blackout or scram failure (Kashiwazaki-Kariwa)
- Equipment that enables groundwater underneath the power station to be utilized for snow melting equipment on the roof of the reactor buildings (Kashiwazaki-Kariwa)
- Improved safety and time reductions associated with carrying temporary hoses in the event of a tsunami, which are used as materials for tsunami countermeasures (Fukushima Daiichi)
- Reductions in equipment malfunction risks through improvements to methods for managing pump axle bearings (spare parts) (Fukushima Daini), etc.

○ Out of the 30 excellent proposals from the 1st competition of FY2014, there was one proposal that has been put into practice since the last report was given (A total of 21 ideas have been put into practice). And, out of the 15 excellent ideas from the 2nd competition of FY2014, two of these proposals have been put into practice since the last report was given (a total of seven ideas have been put into practice).

<1st competition of FY2014>

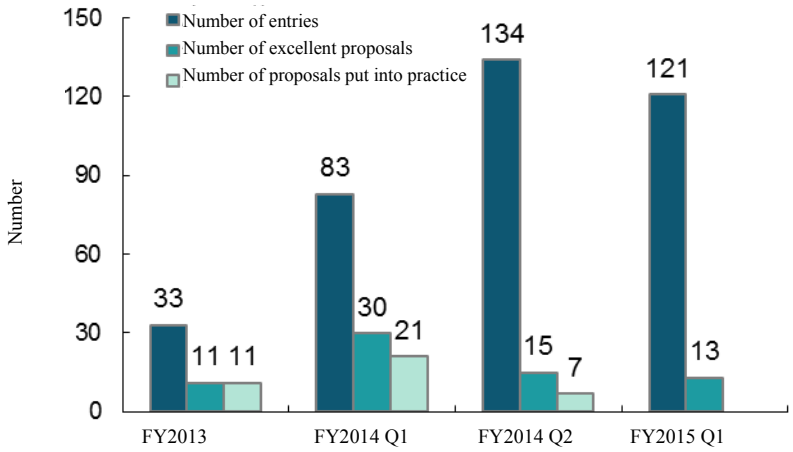
- Licensed Reactor Engineers (LRE) were given mobile devices (smartphones) in order to create an environment that enables them to participate in online meetings with the power station. (Kashiwazaki-Kariwa)

Securing methods of communication with the nuclear power station during an emergency (Kashiwazaki-Kariwa)

< 2nd competition of FY2014>

- A server used to ascertain the location of workers with PHS phones was additionally installed in order to help confirm the safety of field workers in the event of an emergency and put into operation for some areas. The area of coverage will be gradually enlarged going forward. (Fukushima Daini)
- In the event of an emergency, such as a loss of power, emergency response vehicles, such as power supply trucks, will be used to restore operations. However, other vehicles parked in the parking area for emergency vehicles may hinder this process, so no parking signs have been posted. (Fukushima Daini)

Creating no parking zones in areas where emergency response vehicles shall be parked



Number of entries received for the competition to enhance the ability to make safety measure proposals, number of excellent proposals selected, and the number of proposals that have been put into practice

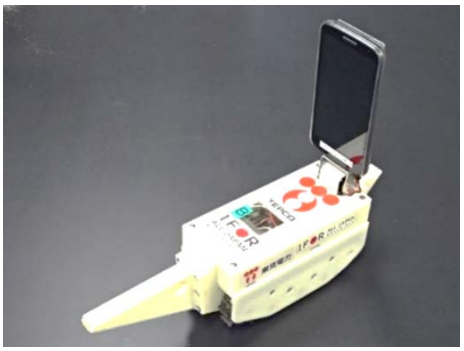
○ The performance indicator (PI) for the competition to enhance the ability to make safety measure proposals is calculated by multiplying the number of proposals by the average assessment points by the percentage of proposals that were put into practice within six months after being proposed. The PI score for the 2nd competition of FY2014 was 1,143 (objective: 1,500 points) (the PI for the 1st competition of FY2015 shall be calculated after the percentage of ideas that have been put into practice within six months after proposal is determined). This performance indicator is used to determine three things: the number of proposals, the quality of the proposals (assessment points), and whether or not the proposals are being promptly put into practice (according to plan). Based on the results to date, it is particularly necessary to put more effort into improving speed, or in other words, the ratio of ideas that have been put into practice within six months after being proposed.

○ In order to ascertain the reasons why there has been a decrease in the ratio of excellent ideas that have been put into practice within six months, which is one of the reasons why the competition PI is not increasing, the process of putting an excellent idea into practice was monitored for the proposals made during the 2nd competition of FY2014. The results of monitoring at Fukushima Daiichi brought the following issues to light and improvements were quickly implemented.

Hindering factor	Improvement measure
Lack of motivation by personnel to put the excellent idea into practice (the person that made the proposal was commended, but not the people putting it into practice)	Both the person making the proposal and the people putting it into practice are commended.
Lack of interdepartmental communication for countermeasures that require involvement of multiple departments (it was taking time to decide what department would be responsible, and what the scope of jurisdiction for each department was to be, etc.)	When excellent idea is selected the department responsible for implementation is also determined.

[Improvement of technical skills use on a daily basis]

- In addition to the competition for enhancing the ability to make safety measure proposals, enhancements to engineering skills within TEPCO groups are made on a daily basis in order to promptly move forward with safety improvements.
- At Fukushima Daiichi, a small robot that utilizes a smart phone was developed in order to perform a survey of the openings of the Unit 3 reactor containment vessel. And, at Kashiwazaki-Kariwa Units 6 and 7, the TEPCO group developed and installed equipment for improving safety, such as filtered venting equipment, iodine filters, and spent fuel pool external spray equipment.



Robot used to survey the opening of the reactor containment vessel

Installation of filtered venting equipment (Kashiwazaki-Kariwa Unit 7)

Iodine filter installation (Unit 7)

Spent fuel pool external spray equipment

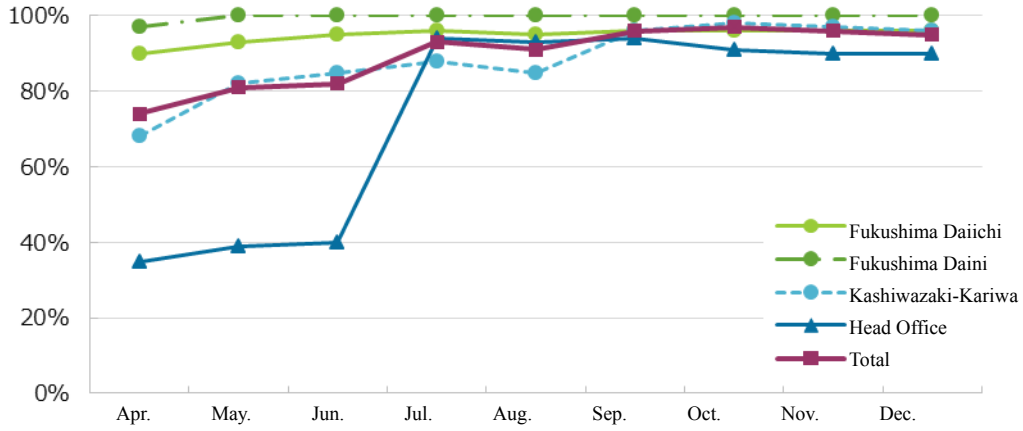
- Being heavily involved in the design, manufacturing, and inspection process enables the basis for specifications to be ascertained and also pushes improvement activities quickly forward which in turn is advantageous in consideration of future maintenance/renovations and handling troubles. Repeatedly engaging in these activities shall improve the level of technical skill.

[Leveraging operation experience (OE) information]

- One of the lessons learned from the Fukushima nuclear accident was the necessity to learn from the failures of other companies. If an incident has occurred somewhere in the world, it can also happen at a TEPCO power station, so countermeasures need to be deliberated.
- Efforts are being made to improve work processes before an accident occurs, gather operation experience from both within and outside Japan, quickly deliberate countermeasures, and promote the use of this information by all personnel in the Nuclear Power Division.

○ During the third quarter 45 new pieces of OE information were gathered and 38 pieces of data, including OE information that was previously gathered, were analyzed. Information of this type continues to be processed in a planned manner and there is currently no OE data waiting for analysis that is over three months old.

○ Since the second quarter the PI "Status of implementation of efforts to share OE information during daily briefings (Daily OE)," which is now used as a substitute for the number of pieces of OE data awaiting analysis, was good showing that the activity is becoming a habit.



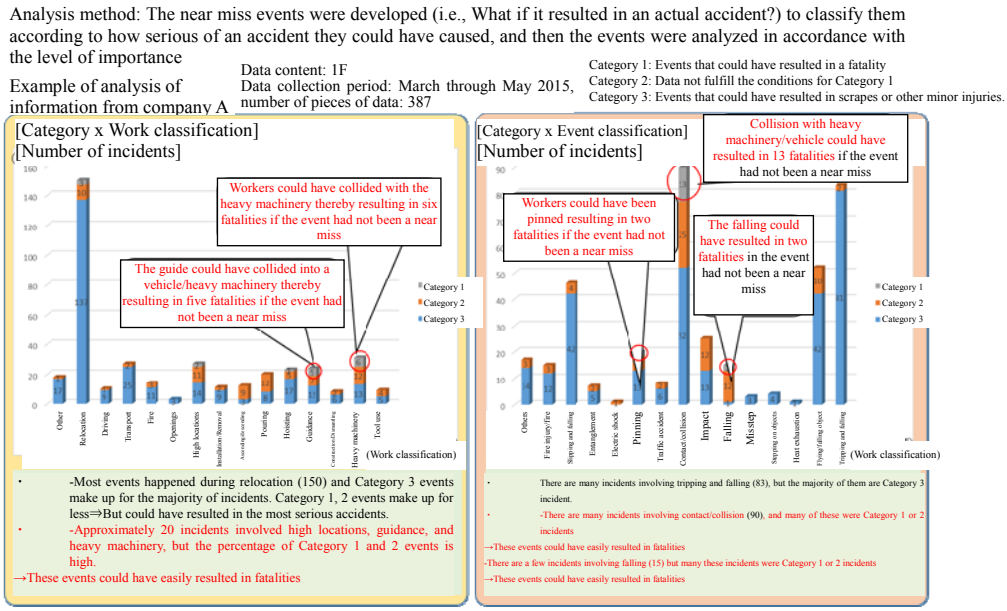
Daily OE implementation status

○ OE of particular importance should be ascertained and understood by all personnel in the Nuclear Power Division. Therefore, in December, a study session was held for all Nuclear Power Division personnel on SOER[22] 13-2 "Lessons learned from the Fukushima Daiichi Nuclear Power Station accident," which is OE information of particular importance.

○ Safety system separation training was implemented in the wake of the main control room underfloor cable separation nonconformities. During this training similar cases in the past (examples of hindrances to system separation) were introduced, and all of the employees of the Nuclear Power Division were told about the importance and significance of leveraging OE information in order to prevent recurrence and also to prevent new accidents from happening.

○ Since July, TEPCO have been working with contractors to collect information on near misses and close calls. A trial analysis of data from Fukushima Daiichi, which has led the way in terms of data gathering, is underway.

[22] Significant Operating Experience Report



Analysis of near misses and close calls

Going forward, the scope of analysis will be enlarged as more effective and common methods of analysis are developed. And, even though not a lot of cases of near misses and close calls were gathered at Fukushima Daini and Kashiwazaki-Kariwa in the second quarter, during the third quarter 156 cases were gathered showing progress. Improvements will be made to enable more efficient information gathering.

[Hazard analyses]

- We have created a mechanism and approach to handle accidents and hazards that can easily develop into cliff edge scenarios for which there is a great degree of uncertainty in regards to how often they will occur as we strive to propose and implement countermeasures based on the assumption that these hazards will occur.
- At Kashiwazaki-Kariwa approximately 30 hazards were analyzed during 2014 and countermeasures are being deliberated in accordance with plans. During this quarter additional countermeasures, such as handling procedures, were created based on the results of exchange opinions with external experts on the impact that electromagnetic waves from a solar flare, etc., could have. The aforementioned plan was then reported to the Nuclear Power Risk Management Committee.

[Safety reviews]

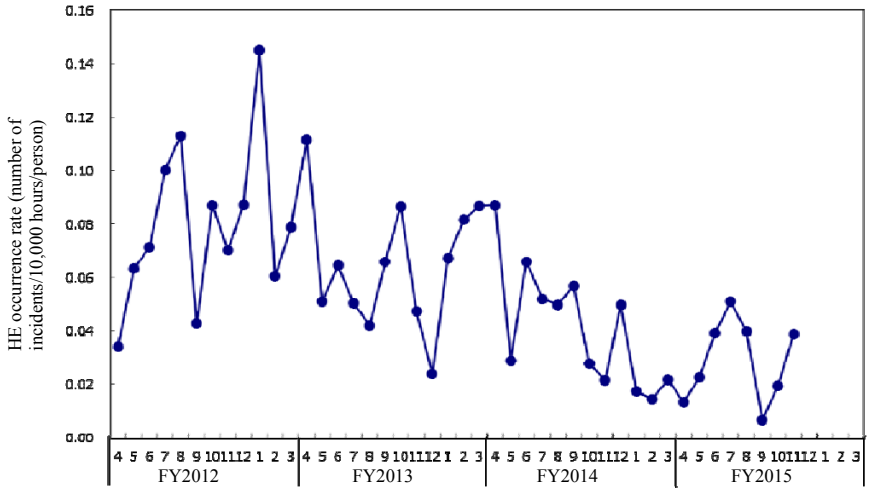
- At TEPCO, we don't just stop with making improvements based on nonconformities, and issues pointed out during safety inspections and third-party

reviews, but also look deeper at the underlying contributors and implement safety reviews in order to proactively and continually improve nuclear safety.

➢ Safety reviews are being implemented at each power station as follows:

○ Fukushima Daiichi

At monthly performance review meetings, personnel's awareness of nuclear safety is reviewed by using the number of human errors for each department and the number of proposed work improvements as indicators. Whereas the number of human errors has decreased, this decreasing trend has also leveled off, so going forward we will expand the scope of focus, identify weaknesses for all nonconformities from the perspectives of equipment and quality management, and make improvements.



Trends in the number of human error is at Fukushima Daiichi

○ Fukushima Daini

Since “ensuring equipment performance,” which was originally planned as the topic of review, is reviewed as part of the maintenance program, the topic was changed to “procedures for responding to accidents with emergency safety measure equipment (portable equipment).” Based on the fact that the reactor is currently shut down, a review has been commenced after creating plans and guidelines to identify latent weaknesses with methods of securing power, and procedures and equipment for injecting coolant into the spent fuel pools from amongst accident response procedures, in order to find areas of improvement.

○ Kashiwazaki-Kariwa

In order to prepare for external events that would have a large impact on the plant but

for which the frequency of occurrence is unclear, we have examined what impact fires and damage to equipment caused by the intentional crashing of an airplane into the plant would have and are in the process of implementing emergency training (classroom and field) based on the results of that deliberation. Furthermore, in order to further reduce risks in the field, reviewers observe emergency response training to look at the movement of personnel from a third-party perspective. In particular, risks for each response category, such as misplacing the keys to an emergency vehicle, or obstacles in the way or access routes, etc., are identified and efforts to improve these issues are continually made. During this quarter, securing access routes during an emergency and training on using portable equipment to transport water was reviewed.

[Improving the ability to solve problems that span all departments]

- We are aware that the project management ability of the Nuclear Power Division is weak when it comes to solving problems that span all departments. In order to improve this maintenance work process improvements (introduction of Maximo[23]) have been a target of nuclear safety reforms and the degree of improvement of project management is being confirmed by monitoring the implementation status of these maintenance work process improvements.
- On December 18, basic design of the system development for maintenance work process improvements (introduction of Maximo) was completed and detailed design is currently underway. When deciding on important specifications, necessary materials for making decisions will be prepared and presented to the steering committee so that they can make a decision (the following two main things were decided on this quarter). Ensure that the project is moving forward by making sure to make decisions at every milestone.
    - ✓ Partial addition to scope of system development
    - ✓ Data preparation plan
- Part of the processes deliberated during third quarter (work management processes) will be put into trial operation from December for air-conditioning equipment at Kashiwazaki-Kariwa Units 1-4. Issues that must be solved in preparation for full-scale launch are being identified as deliberation continues.
- Furthermore, explanations of new work processes and an overview of how these processes will be utilizing information technology have begun for parties involved with process changes in the Head Office Nuclear Power Division and at Kashiwazaki-Kariwa. Surveys passed out after the explanations will be used to

[23] IT solution for making strategic asset management a reality

analyze the level of understanding, acceptance, enthusiasm and the opinions towards the changes, and these results will be reflected[24] in change management activities (activities required to efficiently and effectively implement change. Briefings will also be held at Fukushima Daiichi, Fukushima Daini and Higashidori.

(2) Future plans

Countermeasures for enhancing the ability to propose defense-in-depth measures are steadily progressing and results are being seen. And, improvements are being formulated for problems that have come to light or developed in the course of countermeasure implementation. The main points of enhancement are as follows:

- Competition for enhancing the ability to propose safety improvements

The 2nd competition of FY2015 will be held in the fourth quarter. Since the number of submitted proposals is not increasing, for this 2nd competition of FY2015 the support by supervisors for hashing out the details of ideas that workers have will be promoted in effort to increase the number of proposal entries. Monitoring of the process through which an excellent idea is put into practice will continue to be monitored at Fukushima Daini and Kashiwazaki-Kariwa as improvements are deliberated/implemented upon identifying background factors that hinder ideas from being put into practice quickly.

- Leveraging operating experience (OE) from within and outside Japan

The following three efforts will be implemented in addition to activities engaged in to date.

- Enhanced gathering of information on near misses, which are latent factors behind accidents and troubles. These near misses will be analyzed and the results shared in an effort to enhance danger prediction activities (*kiken-yochi* (KY)).
- The OE officer in each department will not just screen OE information[25], but also promote the use of OE information in his/her department and propose to the secretariat at Head Office methods for improving the use of OE information based on the status of use of OE information.
- During the fourth quarter an open study session on important OE information (serious accidents both within and outside of Japan, and SEOR) will be held. We hope to get all employees in the Nuclear Power Division to understand these accidents and troubles, and the lessons learned from them. Starting next fiscal year the study of important OE information will be incorporated into education and

[24] One of the reasons why project management for solving issues that span all departments has not proceeded smoothly is because change management activities were not fully implemented.
[25] The OE screening officer looks at actual equipment and how it is being used when analyzing OE information.

training programs.

- Safety reviews

Even though each power station is subjected to safety reviews in accordance with fiscal year plans, there are fewer and fewer differences between these reviews and other improvement activities. Therefore, during the safety review the degree of achievement of nuclear safety will be comprehensively analyzed based on performance indicators, management observation and third-party review results in order to identify weaknesses and focus on them in an effort to make reviews more effective (deliberation on this issue has continued since the second quarter).

- Employing IT for maintenance processes

As we continue to move forward with new work management and system development, progress will be steadily managed based on project management. Deliberation on indicators for measuring and assessing actual advantages gained from the new work processes and the employment of IT will continue to hash out indicator details.

2.4 Measure 4: Enhancing risk communication activities

(1) Third quarter achievements

[General activities]

- The Social Communication Office and risk communicators continue to gather risk information for the Nuclear Power Division and propose policies for publicly disclosing and explaining countermeasures for risks to management and the Nuclear Power Division. In particular, as part of efforts to disclose information on the drainage channel problems at Fukushima Daiichi that were discovered in February of last year, eight risk communicators led by a supervising risk communicator are gathering risk information from within the FDEC and making suggestions on how to prevent these risks from manifesting. Furthermore, the results from a survey on information disclosure awareness and actions are currently being compiled, analyzed and assessed.
- In the Niigata area, Niigata Headquarter risk communicators, Kashiwazaki-Kariwa risk communicators and the Social Communication Office are periodically holding liaison meetings[26] in an effort to gather risk information, proactively disclose information, and improve sensitivity to issues important to society, as is being done at Fukushima Daiichi.

[Communicating with the siting community]

- Efforts to proactively communicate with the members of the local communities, local governments, and related organizations are underway in the form of briefings given on Fukushima Daiichi decommissioning/contaminated water countermeasures and safety measures being implemented at Kashiwazaki-Kariwa.
- In Fukushima Prefecture, an explanatory flyer has been put inside newsletters sent to the local governments of nine cities, towns, and villages in the Hamadori region that are delivered to each household. Home visits are also being made to residents in Naraha, for which the evacuation order has been lifted, as well as regions for which accommodations are being prepared in preparation for lifting of the evacuation order (Kawamata Town, Katsurao Village, Minami-Soma City) in an effort to engage in more direct communication.

[26] Meetings were held every other week during the third quarter but will be held every week starting in the fourth quarter.

Visiting homes in Kawamata Town

- As the decommissioning of Fukushima Daiichi progresses, briefings are continuously being given on matters of great concern to the local community such as the disassembly of the reactor building, which has the potential to disperse radioactive material, on-site/offsite training, as well as the construction of facilities for work preparations. We are striving to alleviate the concerns of the public by answering questions face-to-face with the local residents through these briefings. On December 2, a briefing was held to give a report on the status of the disassembly of the Unit 1 reactor building cover, and an overview of the training yard facilities to be newly built in Hirono Town.

Briefing given to the residents of Hirono Town

- Information is continually being given to the Fukushima Council on Decommissioning and Contaminated Water Countermeasures[27] and at the 10th meeting on December 22 a report on the status of decommissioning and contaminated water countermeasures was given. The attendees pointed out that "the

[27] Established in February 2014. The Council consists of a chairman (METI Minister) as well as representatives from Fukushima Prefecture/local governments, local agencies/organizations/experts, regulatory agencies, Decommissioning/Contaminated Water Countermeasures Team Office and TEPCO.

information being conveyed by TEPCO does not meet the need of the residents that have returned home" and there was a request to "create tools to allow residents that have returned home to convey to those preparing to return home, as well as visitors from the outside, what the conditions at Fukushima Daiichi are." The opinion was also voiced that information needs to be broken down better since the information that fishermen, farmers, and mothers with small children want to know is all different. In response to these requests we are engaged in the creation of various videos and pamphlets on different topics.

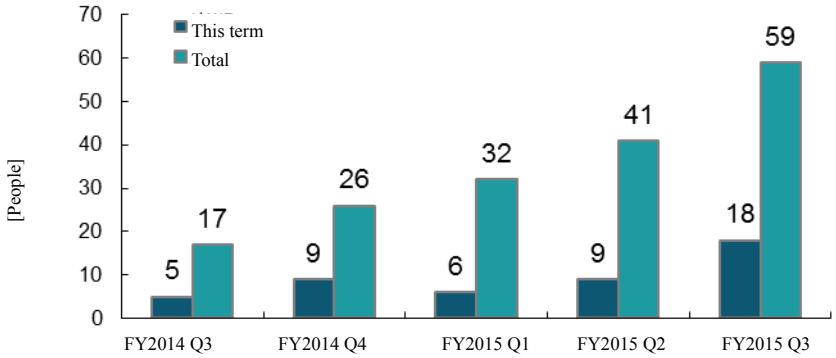
Fukushima Council on Decommissioning and Contaminated Water Countermeasures

- At the meeting of the Prefectural Council on Safety Assurance during the Decommissioning of Nuclear Power Stations in Fukushima Prefecture[28] sponsored by Fukushima Prefecture (5th of FY2015: December 3), opinions were given in regards to making the effects of contaminated water countermeasures more visible, and ensuring the safety of the dismantling of the Unit 2 reactor building refueling floor, which is planned for the near future. Based on the concerns and worries of the prefectural residents we will be sure to implement the best radioactive material dispersion prevention countermeasures and enhance monitoring through monitoring posts.

[28] Established in August 2013. Comprised of scholars and professionals from various organizations representing the Chamber of Commerce/agriculture and fisheries/tourism from 13 cities, towns, and villages.

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

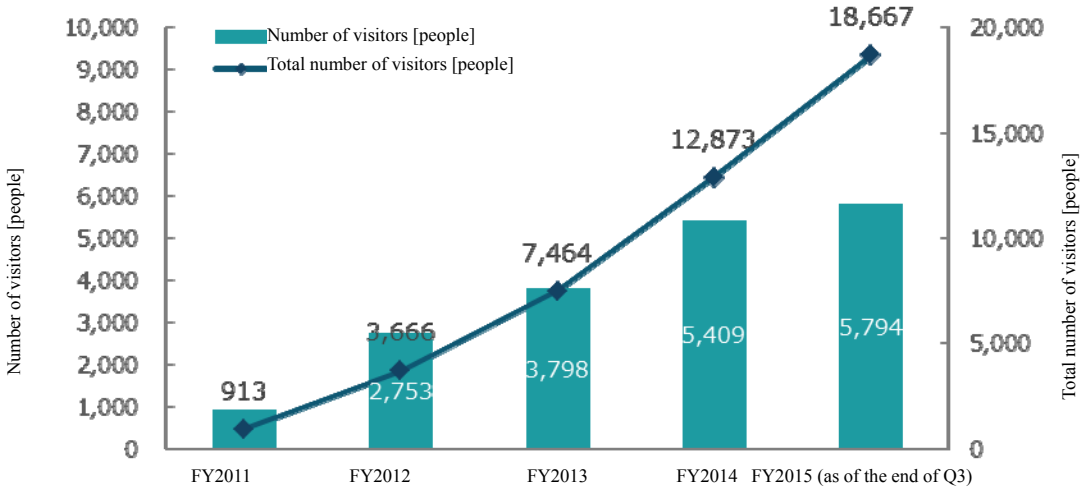
- Engineering related managers from Fukushima Daiichi are being continually assigned for short terms in the Fukushima Corporate Communications Department for training in order to enhance cooperation between the Engineering Department and the Corporate Communications Department and improve the awareness of engineering employees about external communication (18 managers assigned to the department during quarter 3 for a total of 59 managers that have undergone such training).



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

- Now that progress has been made with environmental improvements we are proactively inviting people to come visit Fukushima Daiichi. Since the Fukushima nuclear accident more than 18,000 people have visited Fukushima Daiichi (as of the end of December). Some of the people that have visited the site have commented that they felt the decommissioning is progressing, and that actually visiting the site

has helped them deepen their understanding of the work being done. We plan to continue having people from within and outside of Japan see with their own eyes the status of decommissioning in addition to the equipment for treating and storing contaminated water.



Number of visitors to Fukushima Daiichi (since FY 2011, total: 18,667 people (as of the end of December))

- In addition to conventional community briefings, the Niigata Headquarters and Social Communication Office are holding opinion exchange sessions in Niigata for women living in the prefecture as part of efforts to create opportunities to engage in direct two-way communication with stakeholders in Niigata Prefecture. Thirty-four women that live in Niigata Prefecture (mostly in Niigata City) were invited to this opinion exchange session to learn what they think about energy issues including nuclear power. During the first session the efforts that TEPCO are engaged in to improve nuclear safety were explained. During the second session, a panel discussion was held during which four experts from the local community discussed "Japan's energy problems." The women that attended the session said such things as, "I got a better understanding of the safety measures implemented at Kashiwazaki-Kariwa," and, "I'd like to hear a more detailed discussion of high-level radioactive waste problems."


Opinion exchange session for women in the Niigata area
(left: photo from the session, right: General Manager Enomoto)

[Enhancing communication that leverages the Internet]

- Photographs and CG are continually being leveraged to disseminate information about nuclear power in an easy-to-understand manner. Twelve new videos were released through the website during third quarter. And, at press conferences held by the FDEC at J Village, consideration is being given to conveying information of substance, such as by utilizing videos entitled “local reports from risk communicators.”

<Videos on Fukushima Daiichi>

- Status of Unit 2 reactor containment vessel internal surveys, surveys of the inside of the pedestal and top of the platform (A2 survey) and removal of X-6 shielding blocks (October 7)
- Unit 3 reactor containment vessel internal survey (October 20)
- Current status of drainage channel K countermeasures (pumping water into drainage channel C) (October 22)
- Training on removal of obstructing steel trusses using Fukushima Daiichi NPS Unit 1 reactor building mockup (November 5)
- Survey of Unit 3 reactor containment vessel equipment hatch using small survey robot (November 27)
- Status of debris storage on-site at Fukushima Daiichi (December 10)
- Partial discharge of rainwater from drainage channel K into the ocean at Fukushima Daiichi NPS (December 11)
- Development of Fukushima Daiichi Nuclear Power Station upper floor decontamination device (December 16)
- Report on the results of the deliberation/investigation into matters as of yet

unconfirmed/unsolved concerning the detailed mechanism by which the Fukushima nuclear accident unfolded ~4th Report~ (December 17)

- The Fukushima Daiichi Nuclear Power Station Today ~Reflecting on the Accident and Moving into the Future~ (Updated version) (December 21)
- <Videos on Kashiwazaki-Kariwa>
- IAEA review of the Kashiwazaki-Kariwa Nuclear Power Station (December 10)
- The never-ending efforts at the Kashiwazaki-Kariwa Nuclear Power Station to improve safety (updated version) (December 15)

➢ Promoting the use of social network services (SNS) to disseminate information

- Facebook pages have been set up for Fukushima Revitalization Headquarters Director Ishizaki, Niigata Headquarters Director Kimura and Nuclear Safety Oversight Office Executive Director Crofts.
- The RC Series was officially launched on TEPCO's Facebook page on August 31. Efforts are being made to enhance the scope of information being conveyed about TEPCO's nuclear power business, such as by having risk communicators post about two articles every month and conveying risk information related to Fukushima Daiichi.

Facebook page for John Crofts

[Communication with people overseas]

➢ TEPCO gives information to foreign embassies located in Tokyo and also provides private briefings on reactor decommissioning and contaminated water issues as requested (during the third quarter visits were made to the embassies of South Korea, Russia, and the Taipei Representative Office due to the great interest that these nations have in the impact that the closure of the sea side impermeable wall is

having on sea water).

- In addition to Europe and United States, TEPCO is also enhancing its relations with mass media organizations in Asia. In addition to reports on the enhanced safety measures being implemented at Kashiwazaki-Kariwa based on the lessons learned from the Fukushima nuclear accident broadcast in China and Singapore, the following stories on Fukushima Daiichi, in which news organizations have a great interest, have been broadcast:
  - Commencement of operation of subdrain drainage at Fukushima Daiichi (South Korea)
  - Work environment improvements at Fukushima Daiichi NPS (Taiwan)
  - The contribution that robots are making in the process of reactor decommissioning (Singapore)
- The General Manager of the Social Communication Office, General Manager of the Corporate Communications Department in the General Administration Department at the FDEC, and risk communicators from the Fukushima Corporate Communications Department visited Sellafield in the UK in order to benchmark communications activities. A plan to cooperate in the future was discussed through an exchange of opinions with the heads of the Corporate Communications Department at Sellafield. During the visit, a meeting of the West Cumbria Site Stakeholders Group (WCSSG), which is attended by members of the community in which Sellafield is located, was observed. This enabled the Japanese visitors to learn how relationships with stakeholders in the siting community are being constructed and to observe how unique issues, such as reactor decommissioning and waste management, are being communicated.

West Cumbria Site Stakeholders Group (WCSSG) meeting

[Improving the skill of risk communicators]

- Employees newly assigned to risk communicator positions in July were subjected

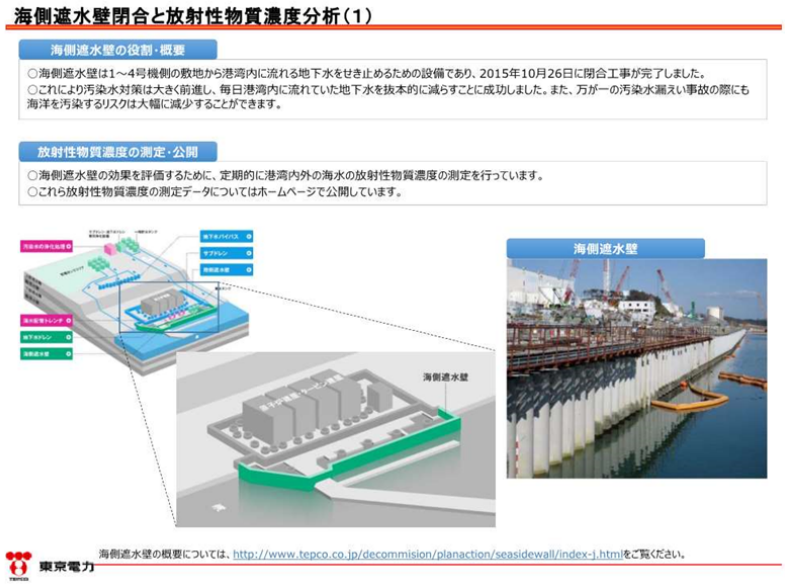
to training simulating press conferences and various types of briefings (November 10: two participants, November 11: four participants).

- Debate sessions have been utilized in order to improve the ability of risk communicators to think logically, cultivate the ability to communicate risk, and listen closely to people in order to understand their position and way of thinking. Risk communicators from primarily the Fukushima area were divided into two groups, one "for" and one "against," and engaged in the debate on various actual issues occurring in the field (October 19). Afterwards participants commented that hearing various opinions enabled them to open their eyes wider, and that they were able to reaffirm the importance of conveying their points in a manner that is easy to understand for the layman. More debate training will be held next fiscal year after making improvements based on this latest training session.

Debate training (top: "Against" team; bottom: Judges)

[Public disclosure of all radiation data measured at the Fukushima Daiichi NPS]

- In accordance with our policy of disclosing all radiation data (publicly announced on March 30) the scope of data posted to our website has been gradually enlarged since April 30 and as of August 20 all data is being posted (approximately 70,000 pieces of data per year). Improvements will be made based on viewership.
- When posting radiation data that is of particular concern to society and news agencies, instead of just presenting the data and citing reports, we give simple and to-the-point explanations.



Materials showing the main points of work being done to close the sea side impermeable wall

(2) Future plans

We will continue to strive to improve explanatory materials, create videos, leverage the Internet, and give tours of power station as we develop our risk communication activities.

In particular, we are focusing on creating content that conveys the messages and information that people want to hear, such as ocean monitoring data for fishermen and dust monitoring data for farmers.

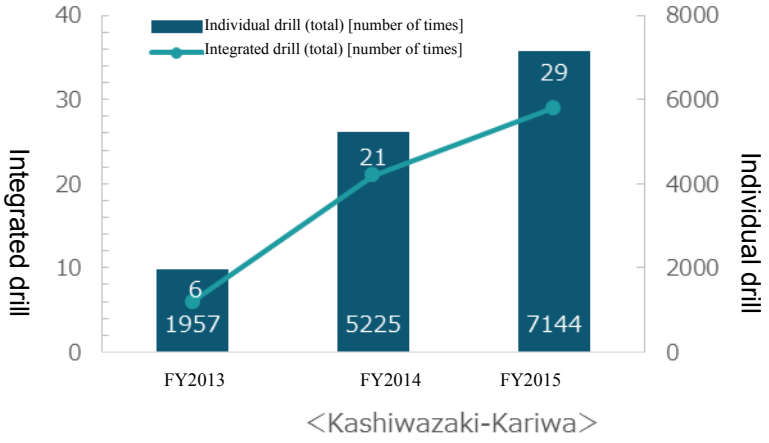
Furthermore, in order to continually improve communication, we need to quantitatively assess the status of efforts and achievements of these efforts. During the fourth quarter we will conduct the survey of people outside the company in regards to the quality and quantity of information being disseminated by TEPCO, and how this information is being received as a KPI for our ability to promote dialogue.

2.5 Measure 5: Strengthening emergency response capabilities of power stations and head office

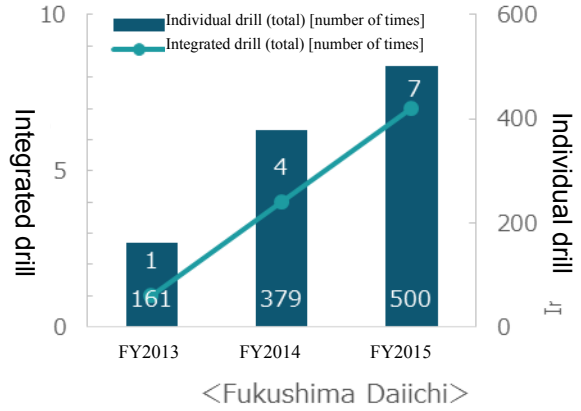
(1) Third quarter achievements

- We are improving the ability of the organization to respond to emergencies by repeatedly conducting individual and integrated drill. The following graphs show the number of times the training has been conducted at each power station.

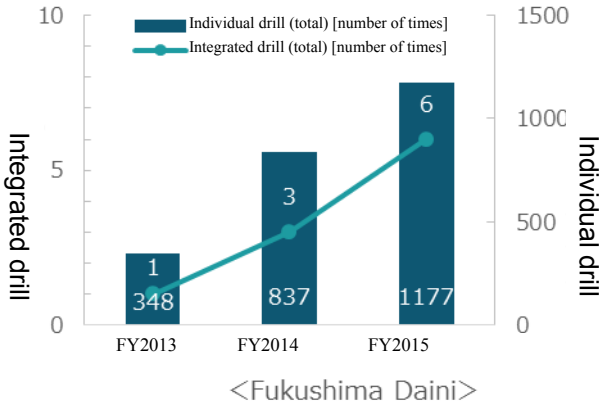
Individual drill and integrated drill implementation (by power station)



<Kashiwazaki-Kariwa>



<Fukushima Daiichi>



<Fukushima Daini>

- On October 22, Fukushima Daiichi and Fukushima Daini conducted joint integrated drill with the FDEC and the Fukushima Revitalization Headquarters. During the training, Head Office assisted with sharing important information between Fukushima Daiichi and Fukushima Daini that could impact work and evacuation, and at the logistics support center (J Village), training on coordination between the utilities on the setting up of logistic support centers and the distribution and transport of materials based on the Treaty of cooperation between nuclear operators

was conducted. At Fukushima Daiichi and Fukushima Daini areas that require further improvement, such as categorizing and sharing vital information necessary for accident response, were identified and countermeasures will be put in place.

- At Fukushima Daini integrated drill was held on December 17. The training simulated a nuclear disaster that caused multiple casualties. Areas that require further improvement, such as methods for classifying the wounded and sharing information within the office, were identified and countermeasures will be put in place.

Fukushima Daiichi training (injecting coolant into the common pool)

Fukushima Daini training (training on treating exposure victims (decontaminating wounds))

Training conducted at the logistics support center (J Village)
((left) training on setting up power supply centers, (right) training on distributing materials)

- Integrated drill was held at Kashiwazaki-Kariwa on October 16, November 19, and December 14. During the training on November 19 and December 14, in order to improve the effectiveness of regional preparedness and support by the local government, the Niigata Headquarters was put in charge of the regional response instead of the Head Office in Tokyo. Furthermore, in response to the recommendations[29] from IAEA-OSART, a main office was built inside the power station emergency response center thereby providing a quiet environment in which

[29] Improvements need to be made for the layout of emergency response center so as to enable effective management and coordination by departments responding to an emergency (preventing command/management from being hindered by noise of the people passing by).

personnel can concentrate on developing strategies for handling an accident. Furthermore, members of the Nuclear Reform Monitoring Committee observed integrated drill on November 19 and commented that the ability to respond to a disaster has improved compared to when the Fukushima nuclear accident occurred.


Integrated drill at Kashiwazaki-Kariwa
((left) training being observed by members of the Nuclear Reform Monitoring Committee
(right) training on using the head office built inside the emergency response center)

Gas turbine generator trucks training
(observed by members of the Nuclear Reform Monitoring Committee)


Training at the Niigata Headquarters　　Training at the Niigata OFC[30] (simulated press conference)

[30] Off-site Center (Base of operations for emergency response: Refers to a base of operations that is set up off-site away from the site of an accident in order to handle an emergency situation at the nuclear facility)

- The Nuclear Power Division participated in training for all companies conducted on November 16 during which a logistic support center was set up at the Shinanogawa Power System Office. During individual drill to date the effectiveness of each function of the logistic support center had been verified, but during this training personnel practiced transferring Shinanogawa Power System Office functions to the Shinanogawa Control & Maintenance Office, reassigning personnel within the Shinanogawa Power System Office, and laying out movement routes for material distribution, in addition to identifying problems that need to be solved, such as ensuring that the routes for vehicles and people that may be contaminated with radioactive materials are different from others.


Training at the logistics support center (Shinanogawa Power System Office)
((left) screening training, (right) training on deploying satellite trucks and fire countermeasure vehicles)

(2) Future plans

Headquarters at each power station will continue to implement individual and integrated drill based on diverse scenarios with cooperation from external agencies while receiving advice from external experts. Furthermore, proactive efforts will be made to identify issues and make improvements through self-assessments, and third-party reviews by the Nuclear Regulatory Agency and the IAEA, etc., in an effort to further improve our ability to respond to emergencies.

Furthermore, in order to ensure that steady progress is made with improving/enhancing the ability to respond to emergencies at Head Office and the power station, TEPCO is in the process of creating a mid/long term plan that includes a basic training plan and identifies the unique risks associated with each power station in order to become an organization that can handle emergencies. This plan will not just include accidents that involve a loss of power to multiple units caused by an earthquake or tsunami, but also how to handle a multitude of other risks and accident scenarios that may occur in conjunction with those risks so as to eliminate the “unpredicted” and increase the frequency of training on serious accidents and accidents that are difficult to

handle.

Also, the three roles of the Head Office Emergency Response Center of supporting power station actions, supporting regional preparedness by local governments, and informing the public, will be enhanced. Out of these three, supporting regional preparedness by local governments needs to be more effective, so an effective framework will be examined through training and continual efforts shall be made to improve capability.

2.6 Measure 6: Strengthening emergency response capabilities and field personnel capabilities

(1) Third quarter achievements

a. Improving the technical ability of TEPCO personnel to enable them to directly handle problems thereby preventing escalation of problems into severe accidents

[Maintenance personnel]

- Fukushima Daiichi

Training on directly handling problems (operating power supply trucks, training on connecting power cables, etc.) is being continuously implemented in accordance with conditions at the power station.

- Fukushima Daini

In order to enhance the technical ability of TEPCO personnel to directly handle problems during emergency, four teams have been created (① Debris Removal and Road Restoration Team, ② Power Generator Switch Over Team, ③ Temporary Cable Connections Team, ④ Cooling Water Pump Restoration Team) and these teams undergo continual training. While this repeated training helps to maintain technical skill, it is also being used to train new site commanders. Furthermore, during the third quarter training on laying and connecting cables at night was conducted in order to further improve technical skill. We will continue to be creative in our implementation of training so as to enable a flexible response to various conditions.

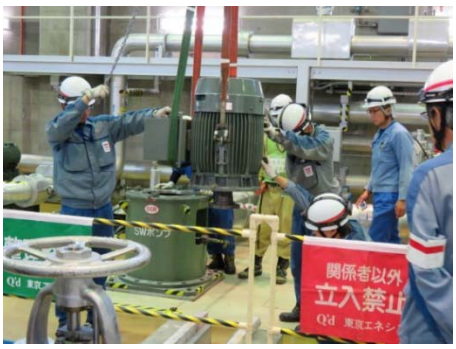
Night training on laying and connecting cables (Fukushima Daini)

➢ Kashiwazaki-Kariwa

To prepare for decreased performance caused by a crack in air-conditioning ducts due to an earthquake, training on assembling scaffolding to reach elevated locations is continually implemented so as to be able to handle any damage regardless of the extent of damage or the location. Furthermore, in addition to training at skill training centers on how to switch over to vertical pump generators, training on dissembling, inspecting, and testing safety relief valves in order to prepare for valve seat leaks is being implemented in an effort to improve technical skill and the ability to handle problems directly.

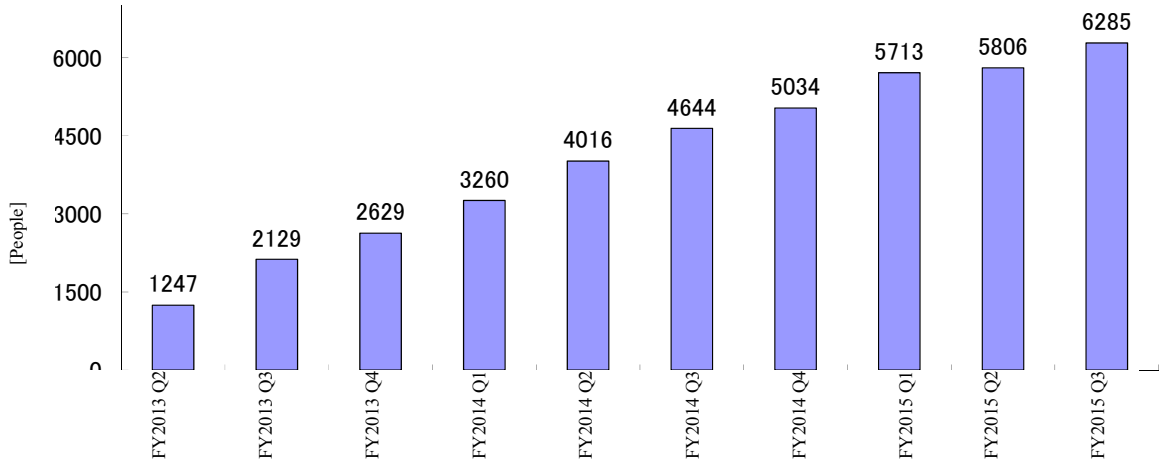
Air-conditioning equipment duct repair training

((left) scaffolding to reach elevated locations, (right) repairing a damaged duct using ultraviolet curing resin sheets)



In-house engineers replacing electric motor for vertical pump generators

In-house engineers dissembling and inspecting safety relief valves



Trends in the number of maintenance personnel that have participated in training on handling problems directly (total for Fukushima Daiichi, Fukushima Daini, and Kashiwazaki-Kariwa)

[Operators]

- Fukushima Daiichi

Unit 5/6 operators have been training on the use of fire engines and power supply trucks since FY2014. As of the end of December 2015, 22 workers have been certified to operate power supply trucks (fill-rate: 62%, increase of six people over second quarter), and 43 workers have been certified to operate fire engines (fill-rate: 122%, increase of one worker over second quarter) with the objective of certifying at least 35 workers (80% of the 43 workers in the field). For Unit 1-4 operators, acquiring operation/management skills, such as skill with operating contaminated water treatment equipment and spent fuel common pool equipment, has been prioritized, but training on the use of power supply trucks will be increased going forward.

- Fukushima Daini

Training on fire engines commenced in FY2014. As of the end of December 2015 the 29 workers acquired the skill (fill-rate: hundred 20%, increase of one worker over second quarter) while the objective was 24 workers (80% of the 29 workers in the field). Power supply truck training started in quarter to and out of the goal of 24 workers, 23 workers (fill-rate: 95%, increase of 11 workers over second quarter) have been trained.

- Kashiwazaki-Kariwa

○ Instructors have been trained within operation shift team departments to provide ongoing training on starting up power supply trucks and connecting fire engines. As of the end of December 2015, out of the objective 105 workers (80% of the 131 field workers), 124 workers (fill-rate: 118%, decrease of four workers over second quarter) had been certified on power supply truck operation, and 132 workers (fill-rate: 125%, a decrease of two workers over second quarter) had been certified to operate fire engines. In addition to normal startup procedures, workers were also trained on manual switching in the event of a suction/exhaust damper malfunction on a power supply truck. Furthermore, efforts to train and certify instructors within operator training units have resulted in the certification of 60 instructors as of the end of December 2015 (increase of 20 instructors over second quarter).

○ Efforts are made to increase the ability of operators to diagnose equipment problems in conjunction with the increasing in the number of operators in order to respond to emergencies. Unit 6 and 7 operators have been certified in-house to diagnose equipment after undergoing the required training. The sampling of data by operation shifts from the approximate 140 pieces of rotating equipment at Unit 7 continued during third quarter in order to improve the field skills of workers by allowing them to acquire a wide variety of knowledge about equipment and increase their concern over the status of equipment.

○ In the wake of the main control room underfloor cable separation nonconformity, even operators that are not directly involved in cable installation have been subjected to training on safety system separation, so that they will be more concerned with cables at their feet and also have increased awareness in regards to checking the status of actual equipment.

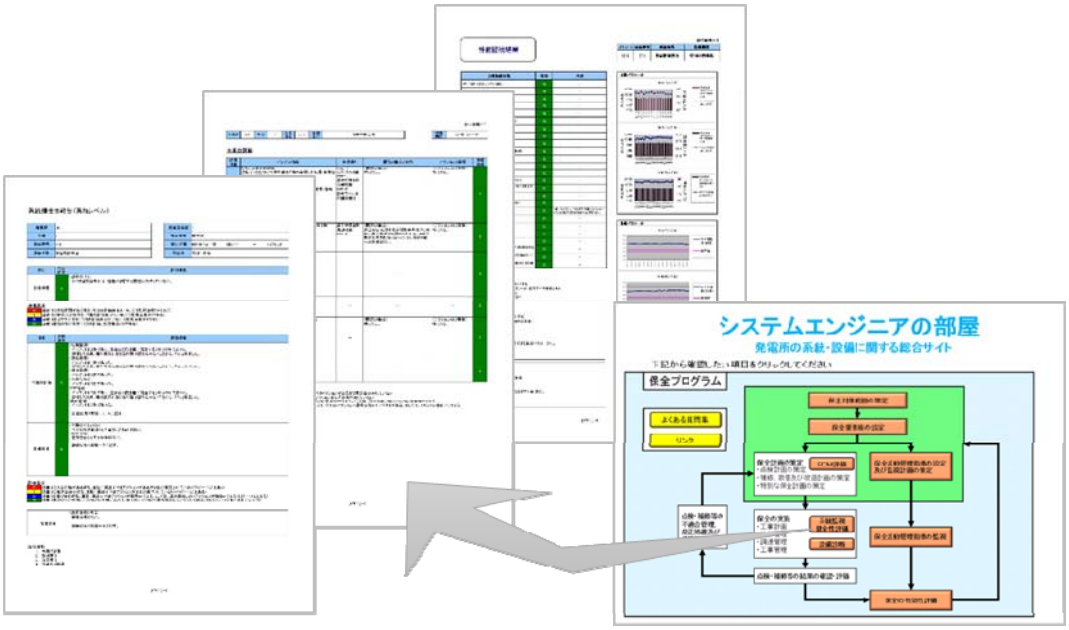
○ In addition to improving their ability to respond to emergencies, operators are also proactively engaged in activities to improve technical skill related to normal operation monitoring/operations by leveraging the results of overseas benchmarking, observations by teams of overseas experts, and the results of third-party reviews. Simulator training is the main tool used to improve the technical skill of operators, and three-way communication methods and methods for post-training reviews have

been improved to be more effective.

b. Improving the level of expert knowledge required for tasks

[Training in assigning system engineers]

- In order to quickly and safely stabilize the reactor in the event of an emergency, workers need to be able to quickly understand the accident situation and choose feasible courses of action. In order to enable this, system engineers that are intimately familiar with the design of equipment important for safety, laws/ordinances/regulations, operation, and maintenance are being trained.
- By creating system monitoring programs for main systems and monitoring the systems to ensure that system performance and function are satisfying design requirements, system engineers can check the reliability of equipment and deliberate measures for further improvement.
- During third quarter the monitoring results for each of the eight systems of Kashiwazaki-Kariwa Units 6 and 7 were compiled into a system integrity report. Furthermore, due to the increase in the number of systems monitored from 10 to 15, new system monitoring programs have been created for five more systems and a dedicated website on the company's intranet has been created in order to share information on system integrity reports. Also, system engineers have continued since second quarter to assess maintenance standards (analyzing the impact of a loss of function and setting maintenance importance levels for systems) related to safety countermeasure equipment that is nearly being installed at Kashiwazaki-Kariwa. System engineers are also using their knowledge to prepare for the use of new safety countermeasure equipment.
- The mechanism for enhancing system engineering functions is solidifying and during third quarter detailed training criteria for training personnel were determined. Going forward training will be implemented in a planned manner in order to further improve the reliability of equipment and enhance the technical capability of the organization to respond to emergencies. Furthermore, although original plans called for increase to 10 workers and increase in the number of monitored systems to 40 systems by the end of FY2015, the allocation of personnel to work on safety improvement measures at Kashiwazaki-Kariwa Unit 6 and 7 resulted in a revision of the plan according to which the number of monitored systems will be increased to 20 under the current five-worker framework.



Sharing system integrity reports via a dedicated website on the company intranet

(Example: Residual heat removal system (RHR) system integrity report

[Configuration management]

- Configuration management refers to the process of maintaining plant safety by ensuring that power station facilities and equipment have been manufactured, installed and is operating as designed. And, deliberation is continuing on the construction of a systematic process for maintaining and managing design requirements and matching actual equipment with equipment configuration information (schematics).
- During the third quarter progress is made with the creation of design guidelines for equipment used to handle serious accident at Kashiwazaki-Kariwa Unit 7, and preparations were completed on an environment for operating a support system used to manage design requirements. In addition, various tasks required to construct this process are underway (preparation of equipment data, hashing out of the details of work process flows, etc.)
- Going forward in this work process flow will be examined in order to clarify roles and the details of various tasks. Furthermore, design guideline data (requirements, basis, etc.) shall be put into the support system and managed so as to be able to effectively share information on design requirements.

[Enhancing procurement capabilities]

- The technical capability of the entire TEPCO Group shall be enhanced in order to

further enhance the ability to procure any highly cost-effective manner.

- Overseas benchmarking was utilized to identify the differences between other companies and TEPCO in regards to project frameworks, the leveraging of engineering companies and ordering methods, and the deliberation/implementation of methods for making improvements has begun.

[Enhancing safety assessment capability]

- Efforts are being made to improve safety by accurately ascertaining power station risks and considering these risks during daily decision-making. As a result, assessment capability has been developed and the training of personnel has begun.
- In regards to developing assessment capability, risk assessments for internal flooding and fires, and assessments of the risks associated with simultaneous multiple reactor operation are being conducted in cooperation with companies that have assessment experience in an effort to improve the technical capability of the TEPCO Group. Furthermore, a test evaluation of Level 3PRA[31] internal events was conducted and problems were identified. Furthermore, nuclear power stations in the United States have been benchmarked in order to begin making assessment models more accurate.
- In regards to personnel training, not only personnel engaged in risk assessments, but personnel from a wide variety of departments have completed EPRI (US Electric Power Research Institute) training (1 person from Fukushima Daini, 3 people from Kashiwazaki-Kariwa). Personnel from the Headquarters have completed a portion of the training that deals with handling safety improvement countermeasures at Kashiwazaki-Kariwa Unit 6 and 7, and the rest of the training will be completed during the next fiscal year. More people will be continuously sent to EPRI training in order to increase the number of personnel that has the required knowledge. Furthermore, deliberations will continue on a mechanism for leveraging risk information when engaging in tasks.

c. Maintaining and improvement required technical skills

[Skill certification training improvements]

- On-the-job training underway since FY2014 shall be expanded from the maintenance department to radiation protection, fuel, and safety engineering to continue to improve technical skill.

[31] Probabilistic risk assessment of the impact on the general public that a discharge of radiation into the environment resulting from an accident that has caused damage to the core would have that focuses on human error and malfunction of equipment used for reactor operation.

- In order to improve technical skill, preparations are underway to confirm that nonconformities/hazards in the field and in work reports can be identified, not only by maintenance personnel but also by radiation protection personnel.

[Improvement activities of the CFAM/SFAM]

- CFAM/SFAM have begun ascertaining overseas excellence, identifying problems that need to be solved, and proposing/implementing improvement measures for each field of expertise (April last year). As part of these activities a team of experts from overseas (two teams, total: seven people) were invited to give guidance and recommendations in regards to monitoring implemented by the CFAM/SFAM, problem resolution, and the training of personnel in the aforementioned fields of expertise over a period of approximately six weeks during third quarter. (Some of the team members will be at TEPCO Head Office from January of this year).
- Efforts are being made to improve personnel training by identifying problems with TEPCO's education and training methods through discussions and coaching between teams of overseas experts and TEPCO's Personnel Training Department. Going forward power stations in the United States will be benchmarked in order to see how effective training education is being implemented in the United States and make improvements to TEPCO's education and training.

Guidance and advice given to CFAM/SFAM by teams of overseas experts (Kashiwazaki-Kariwa)

d. Understanding the basics of nuclear safety

- Training on separating safety systems is being implemented in the wake of the Kashiwazaki-Kariwa main control room underfloor cable separating nonconformity (chapter 1.3 (5) in this report). During this training, participants learn about the basic approach to safety design as it concerns the separation and independence of safety equipment and about similar operating experience (OE information) related to safety equipment separation and independence. As of December of last year all

employees of the Nuclear Power Division (approximately 3,500 people, including office workers) had completed training.

Training on safety system separation at Kashiwazaki-Kariwa

- Based on the nonconformity mentioned above, education on the basic concept required to ensure nuclear safety as a nuclear power operator is being provided to a wide variety of personnel, including contractors.

(2) Future plans

Personnel training is required to improve technical skill, which is achieved as an organization, not as individuals. Various efforts are underway according to plan, but going forward the following two issues must be tackled.

① CFAM/SFAM will accelerate improvements to each field of expertise while receiving assistance from the team of overseas experts that is at TEPCO from January of this year. There are also plans to increase the number of members on the team of overseas experts.

② A nuclear power personnel training center[32] (tentative name) will be established and preparations started in fourth quarter. The following outlines the approach to establishment of the nuclear power personnel training center.

- In order to aim to achieve the world's highest level of nuclear safety, people that can make this happen are necessary.
- The world's finest nuclear power operators put much energy into personnel training. Based on the unaltered policy that personnel training is an important issue, education and training by management designed to improve the technical skill of the organization and of individuals is implemented in a planned manner based on SAT[33] and continually subjected to improvements.

[32] Referred to as “nuclear safety training center” in previous progress reports
[33] Systematic Approach to Training (global standard for developing education and training proposed by the IAEA)

- There is a large gap between the state of personnel training implemented by TEPCO's Nuclear Power Division and the rest of the world.
    - ✓ Personnel training has improved through nuclear safety reforms but efforts need to be accelerated in order to catch up to the rest of the world.
    - ✓ Although SAT was introduced and education and training programs constructed prior to the Fukushima nuclear accident, improvements have not been continually made since the Fukushima nuclear accident and the system needs to be quickly rebuilt.
- In order to solve the problems mentioned above the General Manager of the Nuclear Power and Plant Siting Division needs to directly oversee the enhancement of management functions and frameworks related to personnel training.
- Furthermore, a Nuclear Power Division Personnel Training Database that has information on the work that a certain person has engaged in and the training in which they have participated, in addition to employee information (department to which the employee is assigned, certifications, etc.), shall be used to manage and integrate information needed for personnel training on individual basis.

2.7 Nuclear safety reform achievement percentage evaluation

(1) Nuclear safety reform KPI/PI status

- Nuclear safety reform KPI results for FY2015 Q3 are as follows:

Nuclear Safety Reform KPI Results

Nuclear Safety Reform KPI		FY2015 Q3
Safety awareness KPI	Traits[34]	88.3 points (Nuclear Power Division) 83.7 points (Nuclear Power Leaders)
	M&M[35]	81.0 points
Technological capability KPI	Planned	74.8 points
	Actual	40.9 points (end of Q2)
Ability to promote dialogue KPI	Internal	77.2 points (Nuclear Power Division) 83.3 points (Nuclear Power Leaders)
	External	Assessed at the end of the fiscal year

- The PI results for each countermeasure of which the FY2015 Q3 nuclear safety reforms are comprised are as follows:

PI results for each Nuclear Safety Reform Countermeasure

Countermeasure	FY2015 Q3[*1]	Objective Value
Measures 1, 2		
1. Rate of retrospective reviews using the traits	94.6% (total) 84.6% (nuclear power leaders)	100% (excluding dispatched/temporary workers, people undergoing long-term leaves)
2. Percentage of people that responded, "I don't know" during retrospection	0.1% (total) 0% (nuclear power leaders)	under 10%
3. Trends for indicator movement averages (quarterly)	Percentage of 40 behaviors that are showing increasing trends. 80% (total) 35% (nuclear power leaders)	70%+ increasing trend * the number of behaviors that are showing increasing trends decreased during third quarter. Continual monitoring will be performed to determine whether or not this is a temporary phenomenon or indicative of a PI peak.
4. Number of times group meeting/departmental meetings were held to discuss the results of retrospection	For some percent	More than 70% of department/groups should be meeting at least twice a month
5. Number of times management reviews were held to discuss the results of retrospection	Once	Once or more per quarter
6. Number of times messages about	Twice or more a month	Twice or more month

[34] 10 traits of robust nuclear safety culture. Calculated based on PI of 1. to 5. For countermeasures 1, 2.

[35] Acronym for "messages and management observation." Calculated based on countermeasure 1, 2 PI-6. to 12.

nuclear safety were disseminated by nuclear leaders		
7. Number of people that read the messages	Increasing trend (as of the end of November)	Increasing trend for monthly totals
8. Number of "It was useful" responses	Remains steady (as of the end of November)	Increasing trend for monthly totals
9. Number of times management engaged in power station management observation (MO)	1.14 times/month/person	Objectives have been set by each department[*2]
10. Number of good practices or issues identified based on MO	2.17/time	1 or more/time[*2]
11. Percentage of good practices that were disseminated laterally or issues that were improved within one month	87.5% (for those items identified between September and November)	70% or more
12. Percentage of good practices that were disseminated laterally or issues that were improved within three months	67.2% (for those items identified between July and September)	100%
13. Percentage of work action plans that have quantitative goals for each quarter based on countermeasure 3, 5, 6 or PO&C	74.8 points	50 points or more (originally) 70 points or more (until third quarter)
14. Action plan goal achievement percentage	40.9 points (as of the end of second quarter)	50 points or more
Measure 3		
1. Number competitions to enhance the ability to make safety improvement proposals x Average assessment points x Percentage of excellent ideas that were put into practice within six months	FY2014 2nd competition: 1,143 points	1,500 points or more
2. Percentage of leveraging of OE information (percentage of leveraging of OE information during daily meetings, etc.)	95%	100% (every day for each department)
3. Percentage of newly arrived OE information viewed	66%	50% or more
4. Hazard analysis implementation	Completed (Kashiwazaki-Kariwa)	To be completed by the end of FY2014 (extensions have been granted for Fukushima Daiichi and Fukushima Daini)
5. Hazard improvement plan progress rate	75%	Plan progress rate: 100%
Measure 4		
1. Assessment of the quality/quantity of information disseminated in regards to Fukushima Daiichi decommissioning, nuclear safety reform and accident/troubles	To be assessed at the end of the fiscal year	Chronological changes in overall assessments from questionnaires distributed to external evaluators should show positive trends
2. Assessment of the awareness/stance of TEPCO's public relations/public hearing activities		
Measure 5		
1. Self-assessment of the PO&C emerge	(Head Office) October: 4.1	Average of four points or

to response field (EP.1-3)	points (Kashiwazaki-Kariwa) October: 3.5 points November: 3.8 points December: 3.5 point	more from the five-step self-assessment performed by team leaders or higher once each quarter or following integrated drill
Measure 6		
1. Number of emergency response personnel that have been certified in-house on the operation of fire engines, power supply trucks, cable connection, radiation surveys, wheel loaders and crane trucks	117%*4	120% of that required by each power station by the end of FY2017.
2. Number of certified (SE) system engineers	To be assessed at the end of the fiscal year	5 people/reactor
3. Number of professional engineers trained in each field of seismic resistance, PRA, fire protection, and chemistry management.	To be assessed at the end of the fiscal year	100% Training plan achievement rate
4. Number of worker certified in-house on operation, maintenance, security	To be assessed at the end of the fiscal year	100% Training plan achievement rate
5. Number of people that hold certifications required by TEPCO obtained outside the company, such as Type 1 electrical engineering, Class 4 hazardous materials, hypoxia (approximately 15 qualifications)	To be assessed at the end of the fiscal year	All employees in each field, or the required number, by the end of FY2017
6. Number of people that hold certifications from outside of the company that are recommended by TEPCO, such as high pressure gas manufacturing and safety, heavy equipment operation, etc. (Approximately 15 qualifications)	To be assessed at the end of the fiscal year	30% or more in each field by the end of FY2017
7. Number of people that have been certified outside of the company has licensed reactor engineers, Type 1 chief radiation handling officer, engineers (nuclear/radiation), etc.	To be assessed at the end of the fiscal year	100% achievement of training plan

*1: Results as of the end of December 2015 unless otherwise stated.

*2: Goals originally all set to as “More than once/month/person” but shall be increased in accordance with the duties of each department. And MO implementation plan (including objectives) is currently being created but an assessment of the achievement level of objectives has yet to be conducted.

*3: Change to a mechanism that assesses in terms of the level of difficulty of training

*4: Numbers for Fukushima Daiichi are not included since the required number is being re-examined based on the difference in conditions compared to Fukushima Daini and Kashiwazaki-Kariwa.

(2) Nuclear safety reform KPI/PI assessment

The KPI/PI for safety awareness, technical skill, and the ability to promote dialogue all remain good from the second quarter. However, rather than just assessing these

indicators based on whether they are high or low, changes are being made as necessary to KPI/PI and objectives raised in order to make improvement activities even more effective by:

- aiming even higher if scores are high (objectives achieved),
- analyzing causes and making improvements if scores are low (objectives not yet achieved)
- and, assessing whether or not the KPI/PI are effective for measuring the degree of achievement of nuclear safety reforms in either case.

Amongst the PI's that comprise safety awareness KPI (traits), the percentage of people that responded, "I don't know," in regards to the implementation rate of retrospection is stable and being maintained at a good level. Therefore, measurement of these two PI's will continue[36], however there are plans[37] to remove them from the elements that comprise KPI. Since the number of PI's that comprise safety awareness KPI (traits) will decrease from 5 to 2 as a result, the sensitivity of the remaining three PI's will be increased thereby making it even clearer where weaknesses lie. Additionally, in regards to the average trend for each indicator, since the percentage out of those showing an increasing trend out of 40 behaviors was measured, the effectiveness of these three PI's will be assessed to plan for revision.

Furthermore, amongst the PI's related to operation experience (OE) information, since the percentage of OE information leveraged (daily OE) continues to achieve objectives within a short period of time since the activities began, measurement will continue[38] but it will be removed from the PI's. In return, PI's that look at how OE information is being leveraged in actual work are being deliberated. The degree to which OE information is being leveraged during group meetings and TBM-KY, and accident/trouble (including instance that are not serious) recurrence, are candidates for new PI's. Since the viewing percentage for newly arrived OE information continues to achieve objectives (50% or more) the objective will be raised to 60% starting in FY2016.

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[36] They will function as alarms, and if scores become worse than 90% or 5%, respectively, the cause will be ascertained and countermeasures put in place.

[37] For approximately two quarters they will be calculated along with KPI as the switch over is made.

[38] It will function as an alarm, and if the score become worse than 90% the cause will be ascertained and countermeasures put in place.

3. Nuclear safety reform self-assessment plans

(1) Self-assessments

To date TEPCO has confirmed the progress of the Nuclear Safety Reform Plan every quarter, and in addition to this, from this fiscal year nuclear safety reform KPI/PI have been established in order to quantitatively assess the degree to which nuclear safety reforms have been achieved. One of the lessons learned from the Fukushima nuclear accident was the fact that it is dangerous to assume that safety has already been achieved. Therefore, rather than thinking of safety as a goal that can be achieved, assessment results are used to confirm the effectiveness of safety measures and set the bar even higher.

The Reassessment of the Fukushima Nuclear Accident and Nuclear Safety Reform Plan was compiled in March of this year; exactly 3 years since the disaster. In recognition of this milestone, a self-assessment plan was publicly announced on November 20 of last year in order to assess the achievements of the reform plan[39]. According to this plan, a self-assessment of the six countermeasures of the Nuclear Safety Reform Plan will be conducted using direct dialogue, management observation, and nuclear safety reform KPI/PI based on the desired achievements and criteria (manifestations of desired achievements).

The results of the self-assessment will be compiled and publicly disclosed as part of the FY2015 Q4 progress report.

(2) Expectations and Goals of the Nuclear Reform Monitoring Committee

During the 10th Nuclear Reform Monitoring Committee meeting held on November 20 of last year, TEPCO proposed its plan for implementing a self-assessment of nuclear safety reform. In response to this proposal the members of the Nuclear Reform Monitoring Committee discussed the issue and compiled the criteria for the goals and objectives for TEPCO that was reported to the Board of Directors (January 12). The criteria is as follows.

[39] http://www.tepco.co.jp/cc/press/2015/1263497_6818.html

1. ***Management should lead the way in "prioritizing nuclear safety," and each and every employee should constantly question the level of safety with the aim of raising its standard.***

   TEPCO's approach, prior to the accident, should be changed. Then nuclear safety was assumed to have been fully established and priority was given to business issues such as improving the availability ratio. With sincere reflection on the Fukushima Nuclear Accident, the management needs to place nuclear safety as the paramount business challenge, making sure that all employees are aware of safety and work on continuous improvement.

2. ***Governance of the Nuclear Power Division should be enhanced.***

   There must be improvements for overall nuclear risk management, which was not sufficient for a company that deals with the unique risks associated with nuclear power. The roles, responsibilities, and authority of each department need to be clearly defined, and a framework of checks and follow-ups needs to be put in place as well as the compliance with the basic rules of nuclear safety.

3. ***On-site nuclear risks should be consistently managed.***

   Actions should be taken to prevent complacency about compliance with regulations and guidelines, and to reinforce the conviction that further improvement in nuclear safety is always necessary. The latest knowledge needs to be pro-actively obtained. Nuclear safety needs should be reassessed based on site-specific conditions and management capacity so that on-site nuclear risks are clearly understood and necessary countermeasures are promptly implemented.

4. ***Lessons should be continuously learned from incidents and problems both within and outside the company concerning nuclear safety, and these lessons should be pro-actively incorporated into the organization.***

   The passive approach prior to the accident should be changed to taking appropriate action to incorporate information and operating experience (OE) from domestic and overseas power stations and other nuclear facilities. Nuclear safety needs to be continuously enhanced to achieve international excellence through the following activities: analyzing the root cause of on-site incidents, applying measures to prevent the occurrence of similar incidents,

analyzing the OE from the failures and successes of other companies and examining the countermeasures required at TEPCO. Those actions should be proactively communicated to the domestic and international stakeholders.

5. ***In-house technical self-sufficiency should be maintained.***

   There must be a reversal of the decline of in-house technical skills, which was caused by increased dependency on outside technology vendors. The technical dependence on external sources needs to be appropriately optimized. The on-site situation needs to be understood properly not only for emergency response but also for the operations and maintenance in normal conditions. The knowledge, expertise, and skills demanded of in-house personnel need to be clearly defined and maintained, and human resources need to be obtained in a structured manner to satisfy these requirements.

6. ***Emergency response capability should be constantly improved in order to be able to handle all types of accidents.***

   Actions should be taken to ensure the improvement in emergency response training that was insufficient before the accident. This includes the need for a clear chain-of-command response. Advance preparations need to be made for personnel, facilities, operating procedures, and a clear chain of command to satisfy emergency response requirements. Effectiveness needs to be improved through repeated, systematic and practical training with clear objectives, assuming various hazard conditions.

7. ***The opinions of others should be considered. Risks and information should be pro-actively disclosed and dialogue promoted so as to build social trust.***

   There must be fundamental changes in the passive approach to disclosure of information. During the accident, a gap existed between the company's criteria for information disclosure and what was expected by the general public. Efforts need to be made to disclose risks and information promptly and appropriately in a straightforward and understandable manner to address the needs of the general public and the technical community. There needs to be continuous interaction with all stakeholders.

8. ***Exposure doses should be managed and reduced as much as reasonable.***

   There must be continuous improvement in working conditions, which became

an important issue in the process of reactor decommissioning and contaminated water management at the Fukushima Daiichi Nuclear Power Station. The work that involves a high risk of exposure should be identified and the number of workers and employees should be optimized. The radiation exposure limits for departments and individuals need to be set, assessed, and managed to be as low as reasonably achievable, and in accordance with international standards.

TEPCO will make partial revisions to its self-assessment plan based on the criteria put forth by the committee members, and the status of the self-assessment shall be reported to committee members as necessary.

Comparison of the Nuclear Reform Monitoring Committee's criteria and TEPCO's self-assessment plan

Criteria	TEPCO self-assessment plan	
	Desired Achievements	Criteria
1. Management should lead the way in "prioritizing nuclear safety," and each and every employee should constantly question the level of safety with the aim of raising its standard.	<Countermeasures 1> Corporate climate in which the motivation to improve nuclear safety does not falter	a. Nuclear safety must be the utmost priority for management and nuclear power leaders who must feel that it is their personal mission to improve nuclear safety and permeated that value through the entire organization. b. Middle management must be fully aware of its responsibility towards nuclear safety and must be thoroughly committed to fulfilling its responsibility just like nuclear leaders. c. Each and every employee must be aware of nuclear safety culture and challenge themselves to embody nuclear safety culture and make improvements.
2. Governance of the Nuclear Power Division should be enhanced.	<Countermeasure 2> Risk management and performance monitoring/assessment/improvement cycle establishment/acceleration	a. In order to not just be satisfied with complying with the safety regulations, but aim to achieve the world's highest level of safety, the performance of the power station shall be monitored (KPI/PI, management observation (MRO), benchmarking with other industries in Japan and overseas, etc.), and improvement process establishment accelerated based on PO&C.

Criteria	TEPCO self-assessment plan	
	Desired Achievements	Criteria
3. On-site nuclear risks should be consistently managed.		b. TEPCO shall proactively subject itself to third-party reviews by the Nuclear Reform Monitoring Committee, Nuclear Safety Oversight Office (NSOO), and IAEA/WANO, and seriously contemplate those comments and proposals made by these organizations to help TEPCO achieve the world's highest level of safety.
4. Lessons should be continuously learned from incidents and problems both within and outside the company concerning nuclear safety, and these lessons should be proactively incorporated into the organization.	<Countermeasure 3> Acquiring the technical skill to promptly manifest highly cost-effective defense in depth	a. Mechanisms and activities for identifying risk on a daily basis, analyzing that risk, and making improvements must have taken root and be effective.
5. In-house technical self-sufficiency should be maintained.	<Countermeasure 6> Ensuring that TEPCO employees have the technical skill to directly engage in work and training personnel that can help improve nuclear safety	a. Define what technical skills are required for emergency response and ensure that personnel have acquired these skills through training b. Define the skills that Nuclear Power Division employees must have as well as the skills required for each work process, and propose/implement training plans to secure personnel that has the aforementioned skills c. CFAM/SFAM should be monitoring power station performance from the perspective of a power station that seeks the very highest level of safety in the world, propose measures for resolving problems and engage in personnel training.
6. Emergency response capability should be constantly improved in order to be able to handle all types of accidents.	<Countermeasure 5> Further improving the emergency response capabilities of the organization	a. Emergency response personnel and materials should always be on standby • Each and every person should understand their role and be able to fulfill it

Criteria	TEPCO self-assessment plan	
	Desired Achievements	Criteria
		• Individual and integrated drill should be carried out in a planned manner based on a systematic and consistent training system • Emergency response procedures and materials are being maintained
7. The opinions of others should be considered. Risks and information should be pro-actively disclosed and dialogue promoted so as to build social trust.	<Countermeasure 4> Sincere approach to information disclosure	a. Nuclear power leaders and management should be improving their awareness and implementation of the disclosure of risk information, and fulfill their responsibility to do so. b. The Social Communication Office and risk communicators should gather a wide variety of opinions from society, engage in monitoring to ensure that the thinking of the Nuclear Power Division, and the ruler by which it makes decisions, is not different from that of society's, and make corrections as necessary.
8. Exposure doses should be managed and reduced as much as reasonable.	<Additional> Exposure doses shall be planned and managed in accordance with ALARA rules.	a. When creating work plans, nuclear power leaders and management shall weigh the feasibility of the work with the expected exposure doses and prioritize work in a manner so that the balance of risks and rewards is acceptable. b. Department and individual exposure doses shall be monitored as necessary, and improvements aimed at further reducing exposure doses shall be made without being satisfied just because dose levels fall below objectives.

Content in blue are revisions that have been made since the plan was publicly announced on November 20 of last year.

Conclusion

During the third quarter of FY2015 various contaminated water countermeasures at Fukushima Daiichi have progressed to the point where the risk of contaminated water leaks has been decreased and the amount of contaminated water generated is being steadily suppressed. The members of the Nuclear Reform Monitoring Committee visited the Kashiwazaki-Kariwa NPS and confirm that safety systems are being enhanced and that emergency response capability is being improved based on the lessons learned from the Fukushima nuclear accident.

Meanwhile, the accident resulting in cable damage, design management sheet inconsistencies and the main control room underfloor cable separation nonconformity have shown that the leveraging of operation experience (OE) information and the further development of education and training, which are goals of nuclear safety reform, have not yet had an impact on actual work. We must stop and examine where we fall short, ascertain the root causes, and make improvements while confirming that countermeasures are being effectively implemented.

Furthermore, a basic plan has been compiled in order to confirm the achievements over the last three years (degree to which our goals have been achieved). During the first quarter a self-assessment shall be implemented in accordance with this plan under the monitoring and supervision of the Nuclear Reform Monitoring Committee.

We shall move forward with nuclear safety reforms under the objective guidance and supervision of the Nuclear Reform Monitoring Committee while remaining resolute to **“become a nuclear operator that never forgets the Fukushima nuclear accident and continues to achieve an unparalleled level of safety by which today is safer than yesterday, and tomorrow is safer than today.”**

Please visit our website to comment or give your opinion of these reforms.

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