Self-assessment of Nuclear Safety Reform

TEPCO aims to become a nuclear operator that continuously improves safety to unparalleled levels by making each day safer than the last while never forgetting the Fukushima Nuclear Accident

September 2, 2016

Tokyo Electric Power Company Holdings, Inc.

TEPCO

Overview

Nuclear power leaders need to be further committed to the reforms that all employees have engaged in together since 2013

The following two points should be accelerated based on the self-assessment of the "8 expectations from the Nuclear Reform Monitoring Committee (2016)" and the "Nuclear Safety Reform Plan (2013)"

1. Reforms by nuclear leaders

- Proactive attitude to "question"
- Enhancement of system for clarifying the chain of command and confirming the status of execution of orders

2. Acquire the skills and management ability required of a nuclear operator that aims to achieve the world's highest level of safety

- Establish a nuclear human resources training center and enhance the training system
- Reconstruct the systematic education and training program in a concentrated manner from a long-term point of view

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1. Background of Self-assessment

- In 2013, Formulation of "the Fukushima Nuclear Accident Overview and Nuclear Safety Reform Plan"

  We commenced nuclear safety reforms with the resolution to **"never forget the Fukushima nuclear accident and become a nuclear operator that continues to create unparalleled levels of safety while making each day safer than the last."**

- At the end of 2015, Implementation of a self-assessment

  As we approach the third anniversary since the commencement of nuclear safety reforms, we implemented a self-assessment to determine how close we are to achieving the desired effects of the Nuclear Safety Reform Plan and shore up the weakness identified in the process and results of the assessment thereby accelerating nuclear safety reforms.

- On September 2, 2016 We reported that we will have the review on Self-assessment by the NRMC and publish the result of it.

2. Criteria for the Goals and Objectives from the NRMC

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.*
2. **Governance** of the Nuclear Power Division should be enhanced.
3. On-site **nuclear risks** should be consistently managed.
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.
5. In-house **technical self-sufficiency** should be maintained.
6. **Emergency response capability** should be constantly improved in order to be able to handle all types of accidents.
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**.
8. **Exposure doses should be managed and reduced as much as reasonable.**

- Self-assessment implementation plan presented to the 10th meeting of the NRMC (November 20, 2015)
- Nuclear Reform Monitoring Committee presents expectations and requirements for the self-assessment (January 12, 2016 (disclosed on February 9))

3. 5 General Assessment Categories

※INPO：Institute of Nuclear Power Operations

- Based on INPO※ assessment categories, general assessment to achievements of Nuclear Safety Reform were implemented in 5 points.
- Organizations assessed were FDEC and Nuclear Power & Plant Siting Division (Kashiwazaki Kariwa・Fukushima Daini) 」

Nuclear Safety Oversight Office assessed on its organization that system and process for oversight are developing by themselves.

I. Ideal	-A state of "continually achieving unparalleled levels of safety and making each day safer than the last while never forgetting the Fukushima nuclear accident," which is the objective of the Nuclear Safety Reform Plan. -Third-parties also assess performance as being excellent.
II. World's Highest Level	-A state where high standards that exceed legal and technical regulations have been stipulated by the operator and performance is being improved in accordance with these objectives. -Many areas meet excellent industrial standards and performance has reached an exemplary level to the point where it is used for benchmarking by other nuclear operators.
III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety	-A state where high standards that exceed legal and technical regulations have been stipulated by the operator for safety awareness, technical skill, the ability to engage in dialogue, and other areas in pursuit of the world's highest level of safety. Self-assessments are used to ascertain discrepancies between the operator and other operators, and self-regulatory efforts to make improvements are engaged in. -Never-ending efforts are made to prepare for weaknesses that have yet to manifest.
IV. Self-regulatory and continuous reforms need to be accelerated	-Like III., a state where reforms are being implemented in regards to insufficient safety awareness, technical capability and the ability to promote dialogue, as they pertain to voluntarily set standards that exceed legal and technical requirements. -Since the speed and achievements of reforms are unsatisfactory it is necessary to further accelerate self-regulatory and continuous reforms in order to improve performance.
V. Only the bare minimum regulatory requirements have been met	-State where nuclear safety awareness and behavior has decreased because only satisfying the bare minimum regulatory requirements has resulted in a lack of safety awareness, technical ability, and the ability to promote dialogue. -This was the state of TEPCO prior to the Fukushima Accident, there was the false conviction that safety has already been achieved and therefore reforms were not implemented.

4-1. Self-assessment results 【FDEC】

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Criteria and Overall Assessment	Main Achievements	Areas for further Improvement
1. Management leading the way in prioritizing nuclear safety [Countermeasure 1 : Reforms instigated by management] III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety	• Commend and make an example of employees that prioritize safety. (Ex.) Awards given by the president in FY2015 to 47 employees that have "challenged themselves" and "achieved high goals" in the course of building safety culture.	• Explain to all 6,000 contract workers that complying with stipulated methods, procedures, and work instructions can help prevent personnel accidents if everyone follows rules and procedures and also reduce radiation exposure and prevent leaks of radioactive materials
2. Enhanced governance **3. On-site nuclear risk management** [Countermeasure 2 : Enhancing supervision and support of management] IV. Self-regulatory and continuous reforms need to be accelerated	• Progress made with identifying a wide variety of risks based on the experience and lessons learned from the Fukushima accident and implementing countermeasures • Engaged in performance improvements from a long-term perspective based on an agreement signed with overseas operators with a plethora of experience, such as Sellafield in the UK	• Change management methods based on overseas examples will be applied to not just reorganization but also other fields
4. Continuous learning from incidents and problems [Countermeasure 3 : Enhancing the ability to propose defense-in-depth measures] III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety	• Daily meetings for sharing past experience with operation, etc., are taking root • More than 80% of station personnel feel that leveraging information on past experience is significant	• More than 10,000 examples of near misses will be analyzed and leveraged
5. In-house technical self-sufficiency [Countermeasure 6 : Personnel training to improve nuclear safety] IV. Self-regulatory and continuous reforms need to be accelerated	• Education and training is being implemented in accordance with plan and personnel are acquiring required skills	• A systematic mechanism for cultivating human resources that can achieve the world's highest level of safety as a nuclear operator will be created

※[ ]: countermeasures in "Nuclear Safety Reform Plan"

4-2. Self-assessment results 【FDEC】

Criteria and Overall Assessment	Main Achievements	Areas for further Improvement
6. Emergency response capability [Countermeasure 5 : Enhancing the ability of power stations and the Head Office to handle emergencies] III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety	• Best practices from overseas have been incorporated and continual reforms made through the introduction of the Incident Command System	• Diverse risk scenarios for general training will be deliberated
7. Building trust through communication [Countermeasure 4 : Enhancing the risk communication] III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety	• All radiation data from the Fukushima Daiichi NPS (approximately 70,000 pieces of data annually) • Communication tools such as the 1 For All Japan website and the Monthly 1F newsletter created to show the work environment, workers and the jobs being done	• Communication reforms will be continually made be continually ascertaining what concerns society has about the Fukushima Daiichi NPS • Direct dialogue with stakeholders by nuclear power leaders and risk communicators will be enhanced
8. Exposure dose reduction/management III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety	• Site radiation levels have been greatly reduced through site decontamination and the removal of highly radioactive contaminated water • The area within the Fukushima Daiichi NPS site that does not require the use of full face masks or non-woven fabric coveralls (protective clothing) enlarged to approximately 90% of the site (March 2016)	• There is a greater risk of exposure than at other power stations so countermeasures will be continually implemented • Station personnel and contractors will aim to reduce exposure doses to "as low as reasonably achievable"

5-1. Self-assessment results 【Nuclear Power & Plant Siting Division (KK・2F)】

KK・2F

Criteria and Overall Assessment	Main Achievements	Areas for further Improvement
1. Management leading the way in prioritizing nuclear safety [Countermeasure 1 : Reforms instigated by management] III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety	• Commend and make an example of employees that prioritize safety. (Ex.) Awards given by the general manager in FY2015 to 77 employees that have "challenged themselves" and "achieved high goals" in the course of building safety culture, and the general manager visited the power station periodically (71 times in FY2015) to speak directly with station personnel	• Energy will be put into continually reforming organizational weaknesses during individual and organizational retrospection • Measures will be implemented to prevent these activities from losing substance
2. Enhanced governance **3. On-site nuclear risk management** [Countermeasure 2 : Enhancing supervision and support of management] IV. Self-regulatory and continuous reforms need to be accelerated	• Risk management now prioritizes safety rather than operating rates and cost • Experts in each functional area have been given the responsibility of overseeing improvements. These improvements are engaged in while receiving support from overseas experts.	• Nuclear safety will be improved through "questioning" in the field • The frequency of site observation by managers and communication will be increased
4. Continuous learning from incidents and problems [Countermeasure 3 : Enhancing the ability to propose defense-in-depth measures] III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety	• Activities performed from the perspective of defense-in-depth, such as the competition to enhance the ability to propose safety improvements and voluntarily sharing OE information, etc., are taking root (Utilization rate of OE information at daily meetings: 96%)	• Comments, near miss information and best practices from outside the company will be used to make improvement activities more efficient.

KK・2F

5-1. Self-assessment results 【Nuclear Power & Plant Siting Division (KK・2F)】

Criteria and Overall Assessment	Main Achievements	Areas for further Improvement
5. In-house technical self-sufficiency [Countermeasure 6 : Personnel training to improve nuclear safety] IV. Self-regulatory and continuous reforms need to be accelerated	• Education and training is being implemented in accordance with plan, and personnel has acquired the skills required of their tasks.	• A systematic mechanism for cultivating human resources that can achieve the world's highest level of safety as a nuclear operator will be created
6. Emergency response capability [Countermeasure 5 : Enhancing the ability of power stations and the Head Office to handle emergencies] III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety	• Training based on harsh scenarios is being repeatedly implemented based on the lessons learned from the Fukushima accident and response ability is improving KK (FY2015): General training: 34 times Specific training: 8,292 times	• Continual improvements will be made to quickly gathering information and improve the skill of personnel at the Head Office
7. Building trust through communication [Countermeasure 4 : Enhancing the risk communication] III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety	• At KK, energy is being put into communication activities for the siting community, such as by giving tours of the facility, opening the talk salon and having information booths • Continual reforms will be made to convey information in an easy-to-understand manner	• Explanations and dialogue about not just accidents and troubles, but also risks inherent to the power station will be developed
8. Exposure dose reduction/management III. Self-regulatory and continuous reforms are underway in pursuit of the highest level of safety	• At both Fukushima Daini and KK exposure doses are being managed based on annual exposure plans • Employee and contractor exposure is being kept low	• Fukushima Daini will quickly develop measures for issues pointed out during the external review of KK

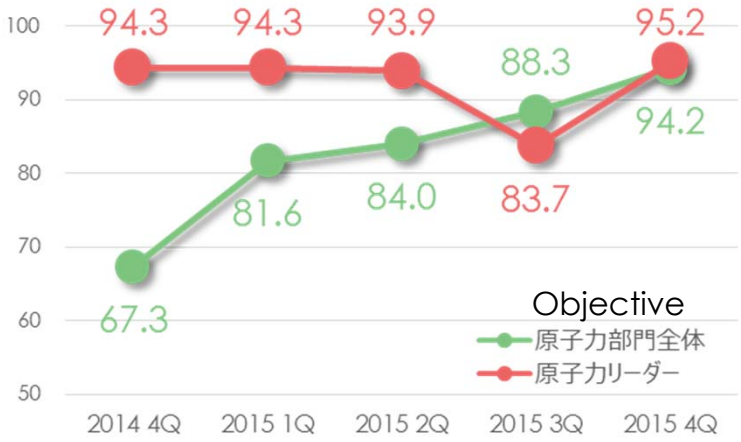
Reference

KPI・PI results（abstract）

1. Management leading the way in prioritizing nuclear safety

Self-assessment of nuclear safety

[Target：more than 70 points]

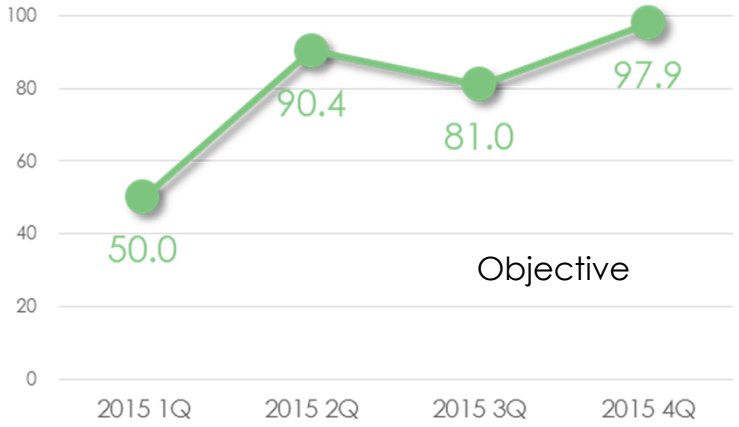


2. Enhanced governance

3. On-site nuclear risk management

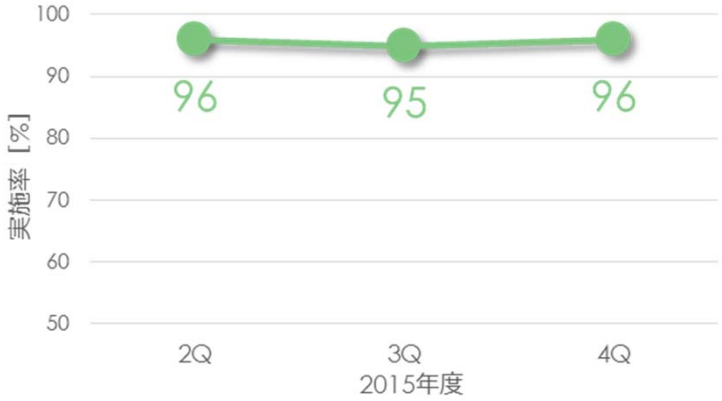
Improvements that leverage MO and messages from nuclear power leaders on safety

[Target：more than 70 points]



4. Continuous learning from incidents and problems

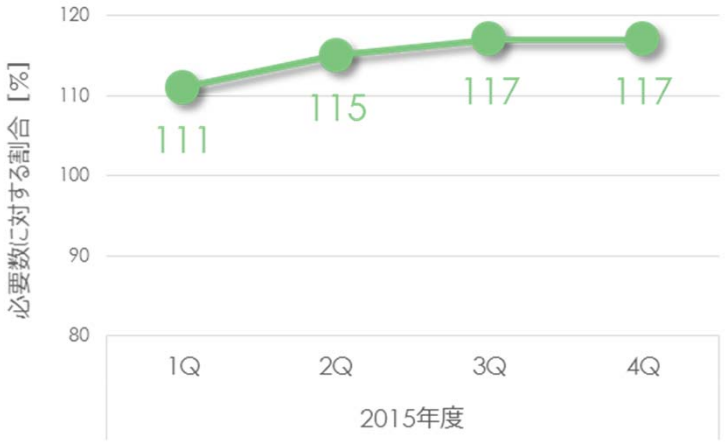
Rate of effective use of OE information at daily meetings [Target: 100%]



Browse rate of newly arrived OE information [Target: 50% and above]

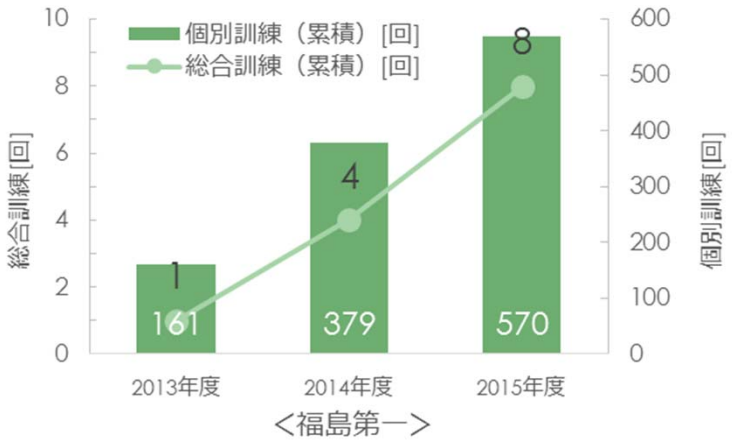
5. In-house technical self-sufficiency

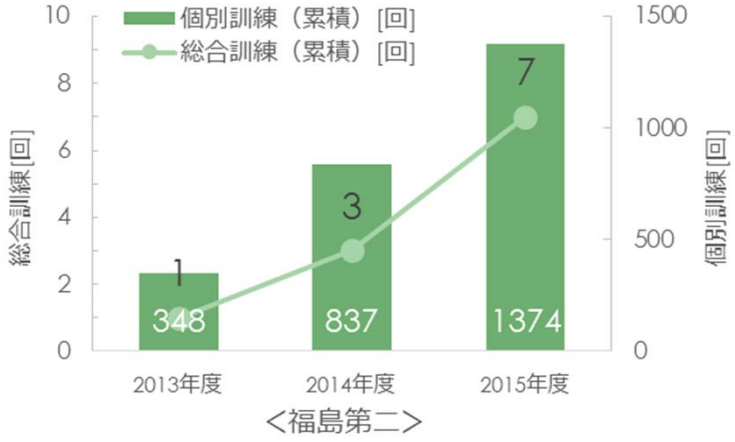
Number of internal certificate holders for emergency response personnel for fire engines, power supply vehicles, cable connection, radiation survey and operation of heavy machinery [Target: 120% against number of personnel needed at each power station by the end of FY2017]

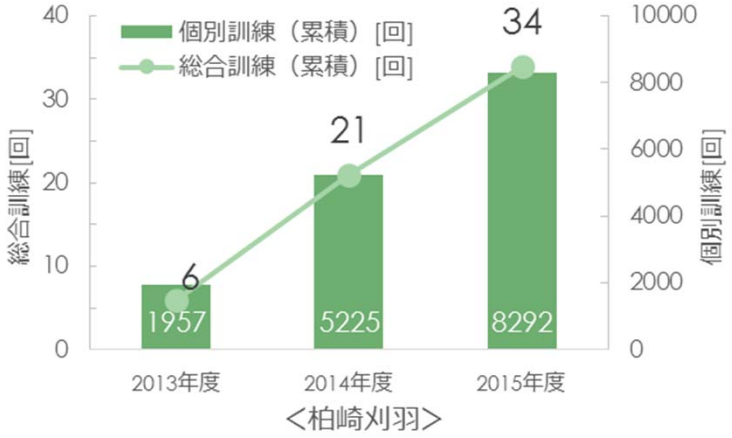


6. Emergency response capability

Number of practices of integrated and individual drills at each power station

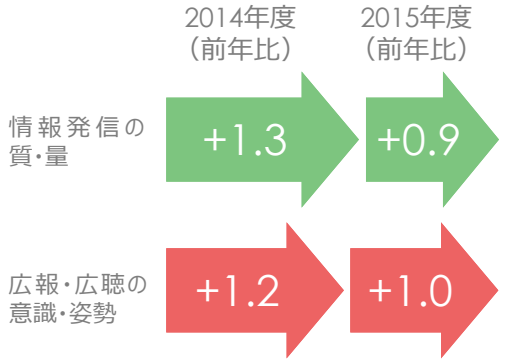






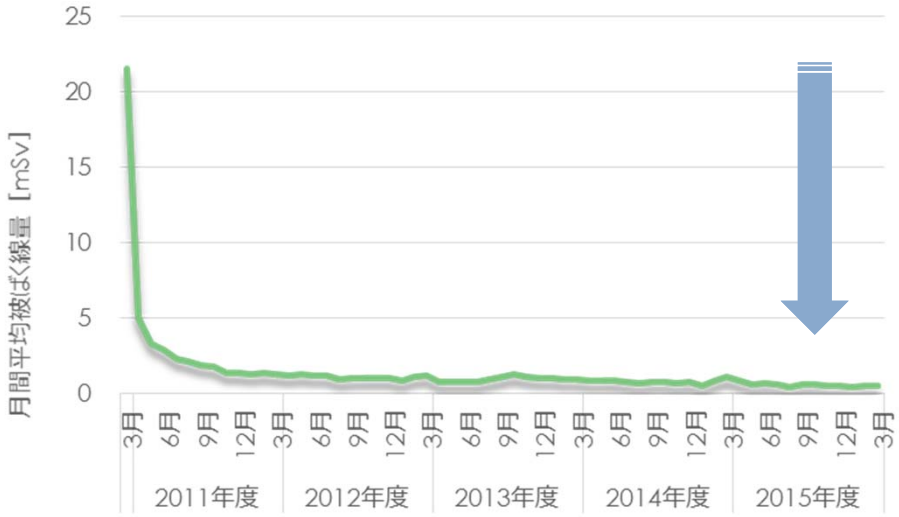
7. Building trust through communication

External assessments of the information disseminated by TEPCO
[Target：Point increase]

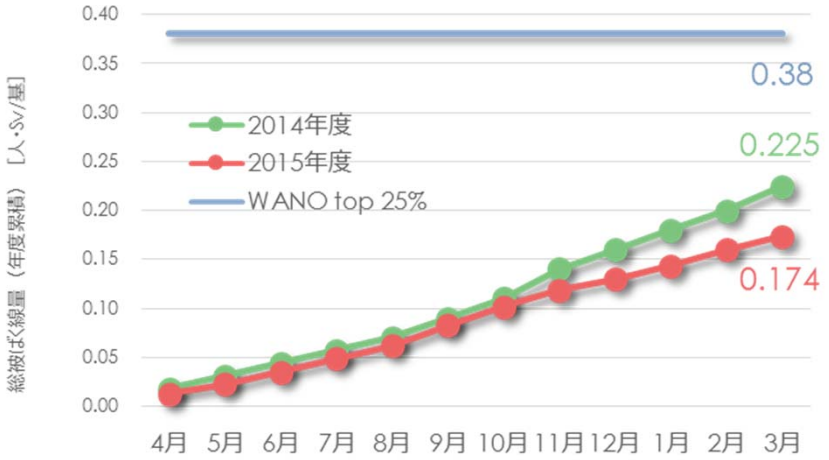


8. Exposure dose reduction/management

- Fukushima Daiichi
  [Average exposure dose has been substantially reduced since immediately after the Fukushima Accident]



- Kashiwazaki Kariwa
  [Target：less than 0.3 man･Sv/year・unit]



- Fukushima Daini
  [Target：Less than 0.13man･Sv/year・unit]