

- To realize our determination to be a “nuclear operator than continuously improves safety to unparalleled levels by enhancing safety levels on a daily basis while always keeping the Fukushima Nuclear Accident firmly in mind,” TEPCO has been promoting the Nuclear Safety Reform Plan since April 2013 in our pursuit of the world’s highest level of safety.
- The Nuclear Safety Reform Plan consists of 6 measures that compensate for the lack of “safety awareness”, “technological capability” and “dialogue-promoting capability” which are the underlying contributors for accidents and aim for improving them.
- Next March, it will be 3 years since the Nuclear Safety Reform Plan started and therefore a self-assessment of the results of the activities will be conducted.

Before



- It was assumed that nuclear safety had been established already and sufficient attention was not paid to the common failure factors leading to earthquakes and tsunami right from the design stage. This led to harsh conditions such as complete loss of power.
- The continuous risk reduction with measures such as incorporation of foreign safety enhancement measures typical to the anti-terrorism activities in the US were not sufficient.



- Training was a mere formality since the genuine possibility of a severe accident and simultaneous accidents in multiple units was not taken into consideration.
- There was confusion in the chain of command to be followed during an accident, procurement of the necessary equipment and materials took a long time and there was lack of ability to operate them.
- Public relations activities in general were not prompt and accurate.

■ Taking responsibility for the accident, the Chairman, President and Nuclear Chief Officer of Nuclear Power and Plant Sitting Division resigned.

■ Corporate governance was reformed radically by ensuring that majority of the Board members are external Directors.

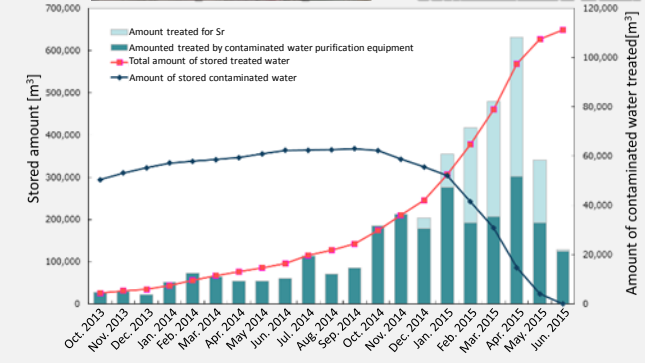
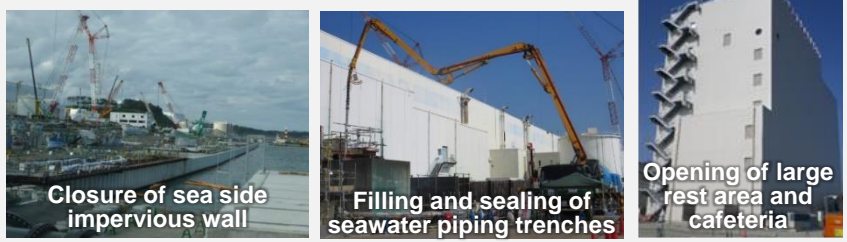
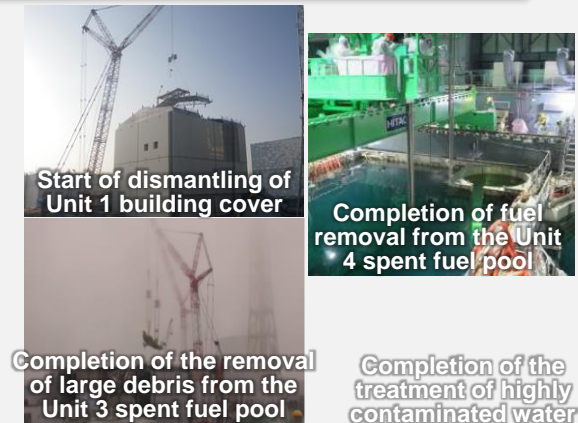
Equipping for accident

After <Current Status>

- Management and Nuclear Power Leadership demonstrate leadership by improving their own safety awareness and inculcate nuclear safety culture across the entire organization.
- Nuclear Reform Monitoring Committee (Chairman, Dr. Klein), Nuclear Safety Oversight Office (NSOO) (Director, Dr. Crofts) monitor and supervise the Management and Nuclear Power Division from a third-party standpoint.

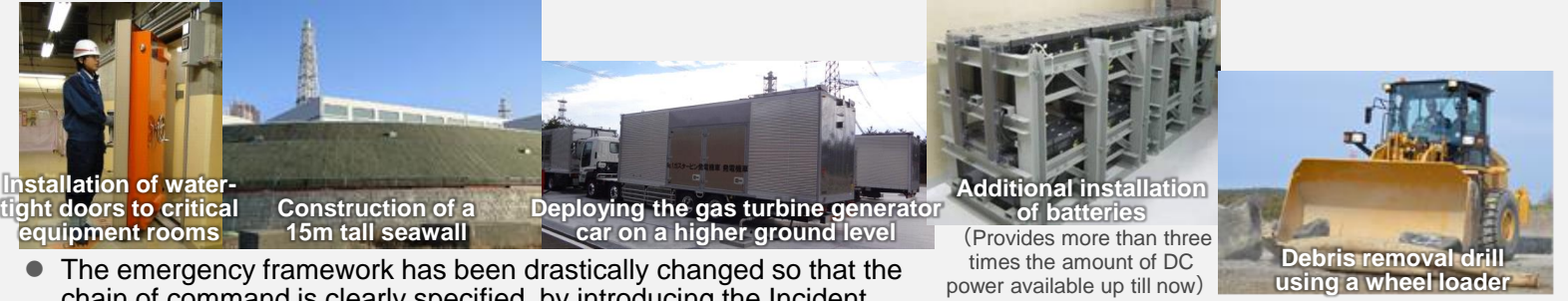
[Fukushima Daiichi]

- Steady progress is being made with preparations to remove fuel from the spent fuel pools.
 - The removal of all fuel was completed at Unit 4 on December 22, 2014 and work began to dismantle the Unit 1 building cover. At Unit 3 the removal of large debris from the spent fuel pool was completed.
- The risk of contaminated water discharges into the ocean has been largely reduced in conjunction with the completion of treatment of highly contaminated water, the sealing of seawater piping trenches and the pumping up of groundwater from wells (subdrains) around the buildings.
- Work environment improvements are continually being made through such measures as reductions in exposure through decontamination, enlargement of the area that does not require full facemasks, and the opening of a large rest facility and cafeteria.



[Kashiwazaki-Kariwa]

- Diverse and simultaneous safety enhancement measures are built without assuming that the facility will operate as per specification



- The emergency framework has been drastically changed so that the chain of command is clearly specified, by introducing the Incident Command System from the US
 - Equipment such as fire engines and wheel loaders are deployed in advance and the knowledge about the method of operating and repairing them is acquired so that for a duration of 72 hours after an accident, we can respond to the situation ourselves without relying on external support.
 - Drill is conducted without informing the trainees about the scenario in advance and the scope of training is expanded by including mock press conferences, etc. The risks and expected situation is brought up promptly and openly.



Post-accident Response

History of Nuclear Safety Reforms at TEPCO

Measure 1	Reform from Top Management	Measure 2	Strengthening Observation and Assistance for Management	Measure 3	Strengthening the Ability to Propose Defense in Depth	Measure 4	Enhancing Risk Communication Activities	Measure 5	Strengthening Emergency Response Capabilities of Power Stations and Headquarters	Measure 6	Strengthening Emergency Response Capabilities and Field Personnel Capabilities
<ul style="list-style-type: none"> The Management implements nuclear safety reforms on its own while improving the knowledge regarding safety required for nuclear power and inculcates safety culture in the organization 		<ul style="list-style-type: none"> Management and nuclear power leaders actively seek the advice and evaluation of the Nuclear Safety Oversight Office (NSOO) and strive to effectively improve the nuclear safety awareness of the entire organization while also enhancing their own nuclear safety awareness. 		<ul style="list-style-type: none"> A mechanism is built to foster the technological capabilities for promptly proposing enhancement of cost-effective safety improvement measures, in accordance with defense in depth. 		<ul style="list-style-type: none"> The gap between TEPCO's approach / judgment and the society is eliminated and a framework that prevents the expansion of risk is provided. The risk communicator should work while following the basic policy of "assuming a bigger risk, and promptly and openly bringing it up without unnecessary fear of its repercussions". 		<ul style="list-style-type: none"> The emergency organizations for nuclear disaster prevention are reformed by following the ICS (Incident Command System) which has been adopted as a standard in the emergency response organizations in the US. In addition to comprehensive training, learning and repetitive training for individuals and teams is implemented and emergency response capabilities including collaboration between internal and external agencies are improved. 		<ul style="list-style-type: none"> Engineering capability for direct management is enhanced so that TEPCO employees can implement the initial emergency response. Engineering capabilities are enhanced through activities such as providing technological infrastructure for improving nuclear safety and enhancing TEPCO's technology and independent activities. 	

	Major Activities	Expected Results																																	
Measure 1 March 11, 2011 Fukushima Nuclear Accident Issue of "Nuclear Safety Reform Plan"	<p>[May 2013] Start of training for officers focusing on the improvement of safety awareness</p> <p>[July 2013] Implementation of Simulator Training for nuclear power leaders in which the Main Control Room (MCR) at the time of an accident is simulated</p> <p>[October 2013] Safety culture self-assessment workshop conducted by IAEA</p> <p>[February 2014] Initiation of talks between nuclear power leaders and the middle management of each power station</p> <p>[July 25, 2014] Establishment of "Change Management Guide" as a standard process when carrying out reforms and improvements</p> <p>[September 2014] Promoting the messages from the Nuclear power leaders</p> <p>[November 11, 2014] Establishment of "10 traits and 40 behaviors of every individual, leader and organization that embody a healthy nuclear safety culture" as the ideal nuclear safety culture that TEPCO aims for. In addition, initiatives for the retrospection of day-to-day activities based on the 10 traits and 40 behaviors were started on November 17.</p> <p>[October 26, 2014] Establishment of "Nuclear Power Division Management Guidelines" documenting the expectations of the nuclear power leaders from the Nuclear Power Division</p> <p>[February 26, 2015] Preparation of a small booklet, "For increasing nuclear safety", that summarizes the mutual relationship between the activities required for understanding and promoting the nuclear safety reforms</p> <p>[December 15, 2014] Morning briefings started to enable managers and Nuclear Power Division leaders to share information on power stations</p> <p>[April 2015] Initiative for awarding the "People who took the lead and performed the big challenge", "People who worked hard to achieve high goals" by the Nuclear power leaders.</p> <p>[December 2014] Establishing the Key Performance Indicators (KPI) for nuclear safety reforms</p>	<p>Organizational culture in which improving nuclear safety has an unwavering value</p>																																	
Measure 2	<p>[May 15, 2013] Establishment of "Nuclear Safety Oversight Office (NSOO)" as a direct control organization under the Board of Directors, and appointment of United Kingdom's Dr. John Crofts as the Director</p> <p>[July 1, 2013] Preparations for the framework of the Nuclear Safety Oversight Office were completed, activities were started</p> <p>[November 29, 2014, December 6, 2014] Nuclear Power Division debate intended for the Manager class of the Nuclear Power Division was held, and the understanding regarding promotion of nuclear safety reforms was refreshed</p> <p>[January 2015] "Management improvement training to realize reform" and "Human resource cultivation improvement training for work safety" commenced in order to improve the skills of middle management</p> <p>[February 2015] Overseas advisors evaluated the activities of the Nuclear Safety Oversight Office, gave advice regarding skill expansion, re-confirmation of priorities, etc.</p> <p>[April 1, 2015] The Nuclear Safety Oversight Office was reorganized for direct reporting to the President and Director Crofts was appointed as the Corporate Officer</p> <p>[September 2015] Management observation training for Managers was started</p> <p>[November, December 2015] Department manager training/newly appointed manager training implemented</p>	<p>Definition and acceleration of the cycle of monitoring, evaluating and improving performance</p>																																	
Measure 3	<p>[June 2013] The safety measures were reviewed from a multilateral point of view leading to the start of "Improve the safety competition" which proposes and realizes major cost-effective safety measures.</p> <p>[August 20, 2013] Development of improvement measures and framework for promoting the introduction of IT in maintenance operation processes.</p> <p>[September 2013] Analysis of about 30 external hazardous events was started</p> <p>[March 2014] Of the Nuclear Maintenance Integrated Management System (G1), the introduction of MAXIMO (Phase 1) that aims for non conformance management and work management process has been completed and study pertaining to the introduction of Phase 2 in the first half of the FY 2016 has started.</p> <p>[March ~ May 2014] 2nd Safety improvement proposal ability enhancement competition (name changed)</p> <p>[May 2014] Sharing of Operation Experience (OE) information through the G1 system started</p> <p>[November 2014] Increase in the number of views due to improvement in the new OE information (such as ingenuity of the title, etc.)</p> <p>[March 2015] Analysis targeting KK, pertaining to about 30 hazard events was completed.</p> <p>[June 2015] Achievement of 0 cases as OE information analysis queue count for the 2nd consecutive time.</p> <p>[May ~ July 2015] 4th Safety improvement proposal ability enhancement competition</p>	<p>Acquisition of the technological capability for promptly achieving highly cost-effective defense in depth</p>																																	
Measure 4	<p>[April 10, 2013] Social Communication (SC) Office was established and Risk Communicator (RC) was appointed.</p> <p>[January 1, 2014] An external expert was invited and appointed as the Corporate Officer for managing the Social Communication Office</p> <p>[July 2014] Representative training in which the Engineering related Managers from the Fukushima Daiichi NPS participated in training in the Corporate Communications Department was started in order to strengthen the cooperation between the Engineering Division and the Corporate Communications Division.</p> <p>[February 9, 2015~March 2, 2015] Survey for stakeholders related to nuclear power and reactor decommissioning was conducted.</p> <p>[April 1, 2015] A comprehensive risk communicator was appointed at the Fukushima Daiichi NPS</p> <p>[September 14, 2015~September 18, 2015] The current situation of Fukushima Daiichi NPS and safety measures at Kashiwazaki-Kariwa were presented in the IAEA meeting</p> <p>[August 20, 2015] Based on the policy of, "publishing all the radiation data", all the numbers pertaining to the Fukushima Daiichi NPS radiation data (about 70,000 cases per year) were published.</p>	<p>Sincere attitude towards information disclosure</p>																																	
Measure 5	<p>[January 2013] Preparations for ICS (Incident Command System) framework for emergency response organizations started</p> <p>[March 2013] Operation of emergency response organizations using the ICS (Incident Command System) framework started (KK)</p> <p>[October 2013] Operation of emergency response organizations using the ICS (Incident Command System) framework started (1F,2F)</p> <p>[July 2014] Deployment of gas turbine generator car and fire engine</p> <p>[Emergency Response Training]</p> <p>[Fire-fighting training for large-scale fires]</p>	<p>Further improvement of emergency response capabilities of the organization</p> <table border="1"> <caption>Comprehensive Training Results (Kashiwazaki-Kariwa)</caption> <thead> <tr> <th>Year/Quarter</th> <th>No. of trainings</th> <th>Accumulation</th> </tr> </thead> <tbody> <tr><td>2013 1Q</td><td>2</td><td>2</td></tr> <tr><td>2013 2Q</td><td>3</td><td>5</td></tr> <tr><td>2013 3Q</td><td>4</td><td>9</td></tr> <tr><td>2013 4Q</td><td>6</td><td>15</td></tr> <tr><td>2014 1Q</td><td>12</td><td>27</td></tr> <tr><td>2014 2Q</td><td>3</td><td>30</td></tr> <tr><td>2014 3Q</td><td>3</td><td>33</td></tr> <tr><td>2014 4Q</td><td>3</td><td>36</td></tr> <tr><td>2015 1Q</td><td>3</td><td>39</td></tr> <tr><td>2015 2Q</td><td>3</td><td>42</td></tr> </tbody> </table>	Year/Quarter	No. of trainings	Accumulation	2013 1Q	2	2	2013 2Q	3	5	2013 3Q	4	9	2013 4Q	6	15	2014 1Q	12	27	2014 2Q	3	30	2014 3Q	3	33	2014 4Q	3	36	2015 1Q	3	39	2015 2Q	3	42
Year/Quarter	No. of trainings	Accumulation																																	
2013 1Q	2	2																																	
2013 2Q	3	5																																	
2013 3Q	4	9																																	
2013 4Q	6	15																																	
2014 1Q	12	27																																	
2014 2Q	3	30																																	
2014 3Q	3	33																																	
2014 4Q	3	36																																	
2015 1Q	3	39																																	
2015 2Q	3	42																																	
Measure 6	<p>[May 2013] Expectations from system engineers clarified and training plan developed</p> <p>[September 1, 2013] The power station's everyday methods of working were reorganized and a new organizational structure created. (2F, KK) Establishment of System and Component Engineering Group (2F, KK)</p> <p>[June 10, 2014 ~ June 17, 2014] General in-house work training skill competition held to check skill level (2F)</p> <p>[March 2015] Efforts to monitor risks and share risk information commenced to enable the Head Office to ascertain conditions at each plant</p> <p>[March 31, 2015] Employees most familiar with functions appointed as CFAM/SFAM of each area of function to ascertain gap with the world's highest standards and improvement activities commenced.</p> <p>[July 2013] In-house training to improve the emergency response capabilities of maintenance personnel and operators commenced</p> <p>[March 2015] Activities for improving technical skill broken into four categories: "In-house skills," "Skills that require expert knowledge," "Skills required to perform tasks," and "Basic nuclear safety skills"</p>	<p>Cultivation of human resources that ensures in-house technical skill and improves nuclear safety</p> <table border="1"> <caption>Maintenance Personnel Field Training Results</caption> <thead> <tr> <th>Year/Quarter</th> <th>Number of Personnel</th> </tr> </thead> <tbody> <tr><td>2013 2Q</td><td>1247</td></tr> <tr><td>2013 3Q</td><td>2129</td></tr> <tr><td>2013 4Q</td><td>2629</td></tr> <tr><td>2014 1Q</td><td>3260</td></tr> <tr><td>2014 2Q</td><td>4016</td></tr> <tr><td>2014 3Q</td><td>4644</td></tr> <tr><td>2014 4Q</td><td>5034</td></tr> <tr><td>2015 1Q</td><td>5713</td></tr> <tr><td>2015 2Q</td><td>5806</td></tr> </tbody> </table>	Year/Quarter	Number of Personnel	2013 2Q	1247	2013 3Q	2129	2013 4Q	2629	2014 1Q	3260	2014 2Q	4016	2014 3Q	4644	2014 4Q	5034	2015 1Q	5713	2015 2Q	5806													
Year/Quarter	Number of Personnel																																		
2013 2Q	1247																																		
2013 3Q	2129																																		
2013 4Q	2629																																		
2014 1Q	3260																																		
2014 2Q	4016																																		
2014 3Q	4644																																		
2014 4Q	5034																																		
2015 1Q	5713																																		
2015 2Q	5806																																		

NRMC	3 rd Meeting March 29, 2013	4 th Meeting July 26, 2013	5 th Meeting December 2, 2013	6 th Meeting May 1, 2014	7 th Meeting December 1, 2014	8 th Meeting March 30, 2015	9 th Meeting August 24, 2015	10 th Meeting November 20, 2015	
Third party review	April 15-22, 2013 IAEA Reactor Decommissioning Review Mission (1F)	October 21 - November 2, 2013 WANO-CPR (Head Office)	November 25 - December 04, 2013 IAEA Reactor Decommissioning Review Mission (1F)		February 9 - 17, 2015 IAEA Reactor Decommissioning Review Mission (1F)	April 8 - 22, 2015 JANSI Peer Review (KK)	June 29 - July 13, 2015 IAEA-OSART (KK)	August 18 - 25, 2015 WANO-SDR (2F)	October 19 - 23, 2015 WANO-CPR (Head Office)

- While carrying out self-assessment of the results of each countermeasure, a "guideline" embodying the results is established.
- In the future, self-assessment with respect to each of these guidelines is carried out based on direct dialogue, results of management observations and KPI/PI

<Self-assessment Guidelines (Draft)>

	Expected Results	Guidelines	Evaluated factors / Observed factors	Corresponding KPI/PI
Measure 1	Organizational culture in which improving nuclear safety has an unwavering value	<ul style="list-style-type: none"> a. The Management and nuclear power leaders give utmost priority to nuclear safety, realize that continuing to enhance this is their mission and inculcate the same across the entire organization b. The middle management is sufficiently aware of its responsibility towards nuclear safety and puts it into practice by thoroughly fulfilling the responsibility along with the nuclear power leaders c. Each and everyone is aware of the nuclear safety culture, embodies it and strives for its improvement 	<ul style="list-style-type: none"> • Status of transmission of the expectations of nuclear power leaders • Status of retrospection based on the 10 Traits (individual and organization) • Response from direct dialogue • Benchmark Status • Experiences of the Management and nuclear power leaders (including measures 2 ~ 6) 	<p>[KPI: Safety awareness (Traits)]</p> <ul style="list-style-type: none"> • Self-assessment pertaining to nuclear safety (nuclear power leaders / entire Nuclear Power Division) <p>[KPI: Safety awareness (M&M)]</p> <ul style="list-style-type: none"> • Improvement utilizing the Management Observation (MO) and transmission of messages by the nuclear power leaders regarding safety <p>[PI]</p> <ul style="list-style-type: none"> • Implementation rate of retrospective activities using the traits • Proportion of "Don't know" response in retrospection • Average shift of the 40 behaviors (rate of increase) • Number of group meetings, department meetings, etc. held for discussing the results of retrospection • Frequency of reviews by the management pertaining to results of retrospection • Transmission of nuclear safety messages by the nuclear power leaders • Number of persons who have already read the message, number of persons who found the message "helpful"
Measure 2	Definition and acceleration of the cycle of monitoring, evaluating and improving performance	<ul style="list-style-type: none"> a. Aiming for the world's highest level, the performance of the power station is monitored based on PO&C (KPI/PI, MO, benchmarks, etc.), it is established that improvement is to be made and its speed is improving as well. b. In addition to the Nuclear Reform Monitoring Committee and the Nuclear Safety Oversight Office (NSOO), third party reviews are actively accepted, and suggestions and proposals are sincerely responded to. 	<ul style="list-style-type: none"> • Status of discussion during Management review • Implementation of change management 	<p>[KPI: Safety awareness]</p> <ul style="list-style-type: none"> • Same as Measure 1 <p>[PI]</p> <ul style="list-style-type: none"> • Frequency of Management Observation (MO) of the power station by the management • Number of good practices and key issues that have been identified based on the MO • Rate of horizontal dissemination of good practices or improvement of issues in less than 1 month • Rate of horizontal dissemination of good practices or improvement of issues in less than 3 months
Measure 3	Acquisition of the technological capability for promptly achieving highly cost-effective defense in depth	<ul style="list-style-type: none"> a. The mechanism and activities for routinely identifying risks, analyzing them, making improvements on that basis is established and is showing results. 	<ul style="list-style-type: none"> • Status of activities pertaining to the Safety improvement proposal ability enhancement competition • Status of activities pertaining to Operation Experience (OE) information utilization • Status of activities pertaining to Management Observation (MO) • Status of activities pertaining to hazard analysis • Status of activities pertaining to safety reviews 	<p>[KPI: Technological Capabilities]</p> <ul style="list-style-type: none"> • The percentage of the action plan that the work plan, in which quantitative targets are set for each quarter, comprises, in connection with the PO&C or measures 3, 5, 6 • The target achievement ratio of each action plan <p>[PI]</p> <ul style="list-style-type: none"> • Number of proposals proposed in the safety improvement proposal ability enhancement competition x average evaluation points x rate of implementation of the number of good proposals in less than half year • Implementation rate of Operation Experience (OE) information utilization • Browsing rate of new Operation Experience (OE) information • Hazard analysis implementation and improvement plan progress rate

<Self-assessment Guidelines (Draft)>

	Expected Results	Guidelines	Evaluated factors / Observed factors	Corresponding KPI/PI
Measure 4	Sincere attitude towards information disclosure	a. Nuclear power leaders and management fulfill their responsibility towards improving the awareness regarding disclosure of risk information, and practicing it. b. Social Communications Office and risk communicator monitor the status of the Nuclear Power Division and make corrections as necessary.	<ul style="list-style-type: none"> Status of discussions at the Nuclear Risk Management Committee, regular meetings, etc. Status of discussions at the Problem study group that handles accident related problems. Reporting status from newspapers, TV, etc. 	[KPI: Dialogue-Promoting Capability (external)] <ul style="list-style-type: none"> Evaluation of the quality and quantity of information dissemination pertaining to Fukushima Daiichi NPS reactor decommissioning, nuclear safety reforms, accident related problems, etc. Evaluation of TEPCO's awareness and approach pertaining to PR and public hearing activities [KPI: Dialogue-Promoting Capability (internal)] <ul style="list-style-type: none"> Evaluation of "communication for enhancing safety" from among the Traits [PI] <ul style="list-style-type: none"> Same as KPI (Dialogue-Promoting Capability (external))
Measure 5	Further improvement of emergency response capabilities of the organization	a. Emergency response personnel and equipment in on standby at all times. <ul style="list-style-type: none"> Each person understanding his own role and executes it. A systematic and consistent training system has been put in place and individual training and comprehensive training are systematically implemented. Emergency response procedures, equipment, etc. are maintained. 	<ul style="list-style-type: none"> Formulation of medium- and long-term plan and status of its implementation Training performance and evaluation results (self-evaluation, third-party evaluation) 	[KPI: Technological capability] <ul style="list-style-type: none"> Same as Measure 3 [PI] <ul style="list-style-type: none"> Self-evaluation based on the emergency response field in PO&C (EP.1 ~ 3)
Measure 6	Cultivation of human resources that ensures in-house technical skill and improves nuclear safety	a. The skill level necessary for communication during emergency is defined and personnel having the relevant skill levels are secured through training b. The skill level that must be possessed by the entire Nuclear Power Division and the skill level required for each work process is defined, development plans for personnel possessing the relevant skill levels are formulated and put into practice and the personnel is secured. c. CFAM/SFAM monitors the power station performance, designs problem solving strategies, undertakes initiatives to develop human resources, etc. as a leader who aims at the world's highest level of excellence.	<ul style="list-style-type: none"> Designing of development plans, implementation status, target achievement status CFAM/SFAM activities 	[KPI: Technological capabilities] <ul style="list-style-type: none"> Same as Measure 3 [PI] <ul style="list-style-type: none"> Number of in-house certified personnel from amongst the emergency personnel handling fire engines, power supply cars, cable connection, etc. Number of certified System Engineers (SE) Number of professional engineers handling areas such as seismic resistance, PRA, fire protection, chemical management, etc., who have been developed. Number of in-house certified persons handling operation, maintenance, security, etc. Number of external qualified personnel defined as mandatory by the company for Lightning 1 type, hazardous material B4, oxygen deficiency, etc. Number of external qualified personnel recommended by the company for high pressure gas manufacturing safety, construction machinery operation, etc. Number of external qualified personnel recruited for Licensed Reactor Engineer (LRE), Senior Operator for Type 1 radiation, professional engineer (nuclear and radiation divisions), etc.