

The Status of Nuclear Safety Reform Initiatives

~Reform Progress and Improvement of Key Issues~

September 15, 2022

Tokyo Electric Power Company Holdings, Inc.

Report contents

- At the previous NRC meeting, a report was given on the main points of nuclear reforms and the status of initiatives, and key issues that require stronger monitoring/supervision were indicated
- At this meeting, TEPCO shall report on the progress of nuclear reforms and improvements that have been made pertaining to the aforementioned key issues

Key issues (2022.3.9)

- Initiative to continually improve safety
 - Addressing changes in risks that should be managed
- Control-focused management
- Communication within the organization and with society

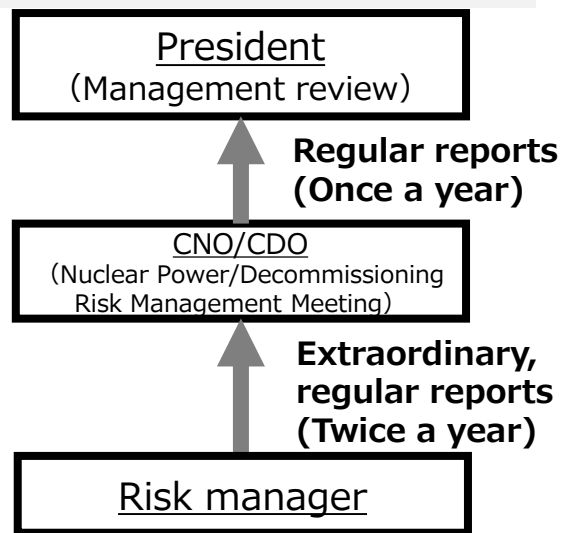
Report contents

- Strengthening risk management
- The state of department structures , governance and monitoring functions
- Cooperating with contractors
- Improving motivation in the workplace
- Communication with society

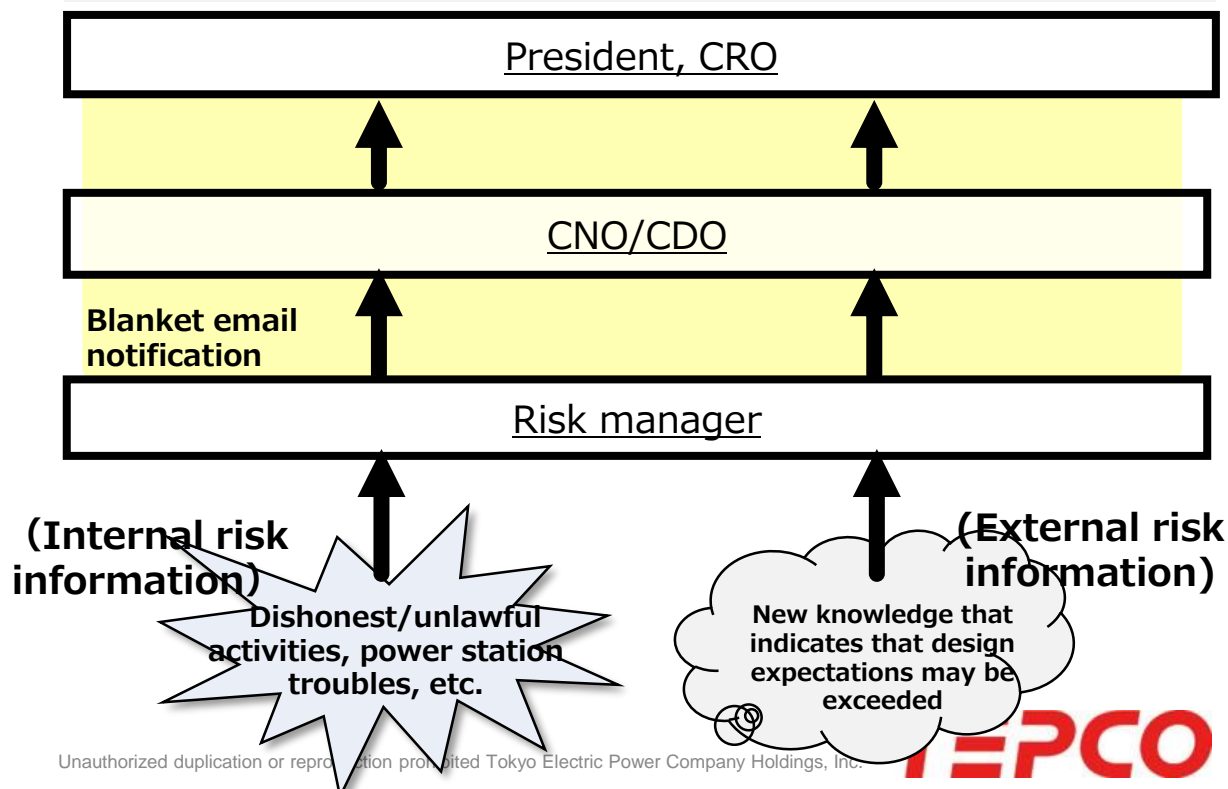
Strengthening risk management ~Risk escalation~

- Fundamentally, each department engages in risk-management independently. Risks are brought to the attention of upper management (department/committees) when assistance is required.
- In order to manage/mitigate reputational risk, risk managers immediately send blanket emails notifying relevant parties, such as the President and executives, when risks manifest, such as when troubles occur at power stations (117 risks reported during FY2021)

<Times of nonemergency>



<When risks manifest>



Strengthening risk management ~Reporting achievements~

Acquired information

On April 21, 2020, the Cabinet Office's Japan Trench/Kuril-Kamchatka Trench Massive Earthquake Model Review Committee released the results of a tsunami simulation based on two wave source models: the Japan Trench (Sanriku/Hidaka offing) model (Mw9.1), and the Kuril-Kamchatka Trench (Tokachi/Nemuro offing) model (Mw9.3).

The conditions of the aforementioned simulation differed from simulations conducted internally at TEPCO.


	Status of handling
① Gather risk information	<p>【4/21】 The aforementioned information was gathered.</p> <p>The tsunami resulting from the Cabinet Office's simulation may exceed the height of the seawall currently being constructed based on internal simulations. However, procedures for repairing major equipment that may be flooded by a tsunami have already been created.</p>
② Quickly report risk information	<p>【4/22】 A report was given to the Chief Decommissioning Officer (CDO)</p> <p>【4/27】 <u>A report was given to the President</u></p> <p><u>Instructions from the president: Deliberate methods for preventing contamination leaks</u></p>
③ Implement risk mitigation measures	<p>In response to the instructions from the President, the following measures were implemented to prevent contamination leaks in order to ensure a more thorough response to such leaks based on existing procedures.</p> <ul style="list-style-type: none"> • Confirm the status of materials and equipment on hand and deliberate whether or not additional materials/equipment are required. ⇒ 【4/28】 It was determined that additional equipment is required. The acquisition of additional equipment/materials was completed during FY2020. • Confirm the status of training and determine whether or not additional training is required. ⇒ 【4/28】 It was determined that additional training is required. Additional training commenced during FY2020 and is underway.
④ Implement additional measures	<ul style="list-style-type: none"> • The Cabinet Office's wave source model was obtained and a tsunami simulation was conducted using detailed geological data. The tsunami simulation was completed during the first half of FY2020. • The tsunami simulation results were used to deliberate whether or not additional measures are required. • Construction began on the Japan Trench/Kuril-Kamchatka Trench Seawall in FY2021 as an additional measure. Construction is expected to be completed during the second half of FY2023.


Strengthening risk management ~ Managing risks with risk maps~

- In accordance with companywide risk management processes, risk maps are used to comprehensively identify, assess, and implement countermeasures for risks.

Benefits of employing risk maps

Examples of risks that have manifested recently

- ① Changes in predicted tsunami height
- Predicted tsunami height has changed as we have examined outer rise tsunamis, and then tsunamis from the Kuril-Kamchatka trench, and then tsunamis from the Japan Trench.
- 

- ② Changes in conditions inside and outside the company
- There have been changes in various conditions that impact risk management, such as nuclear security, material procurement, litigation, and Covid-19, etc.
- 

Benefits of employing risk maps

As predicted causal events change, the **risks on the nuclear risk map are revised thereby making it easier to discuss countermeasures.**

By assessing each risk using common standards and visualizing the level of importance, **the awareness of everyone involved with risk, including upper management, can be unified and then reflected in work plans**

Strengthening risk management ~Focused Self Assessment~

- The FDEC is coordinating with the Nuclear Safety Oversight Office to plan a focused self-assessment (FSA) that focuses on the question “Is risk-management functioning effectively?”
- The Nuclear Power & Plant Siting Division has implemented countermeasures based on focused self-assessments and is currently reviewing the effectiveness of these countermeasures.

FDEC

- ◆ We shall examine whether mechanisms built to manage risks (initiatives by meeting bodies, etc.) are functioning effectively, and if the risk management process is adequate, etc., and identify areas for improvement.
- ◆ Furthermore, through this process we shall learn methods for conducting reviews from the Nuclear Safety Oversight Office thereby improving the ability of the FDEC to perform self-assessments.

<Implementation items and review content>



※ Advanced Information Package: Documents reviewed by the reviewer prior to the review

NPD

- ◆ Issues pertaining to risk management education and initiatives aimed at improving sensitivity to risk have been identified, and countermeasures implemented

The state of department structures , governance and monitoring functions ~Nuclear Power & Plant Siting Division~

- some functions of the Head Office Nuclear Power Division were transferred to the Kashiwazaki City office in order to prioritize the field when managing projects, increase opportunities to directly hear the opinions of regional residents, and construct a system that can leverage those opinions in the operation of power stations. (A total of 64 people have been transferred)

<Aim>

i. Strengthen governance

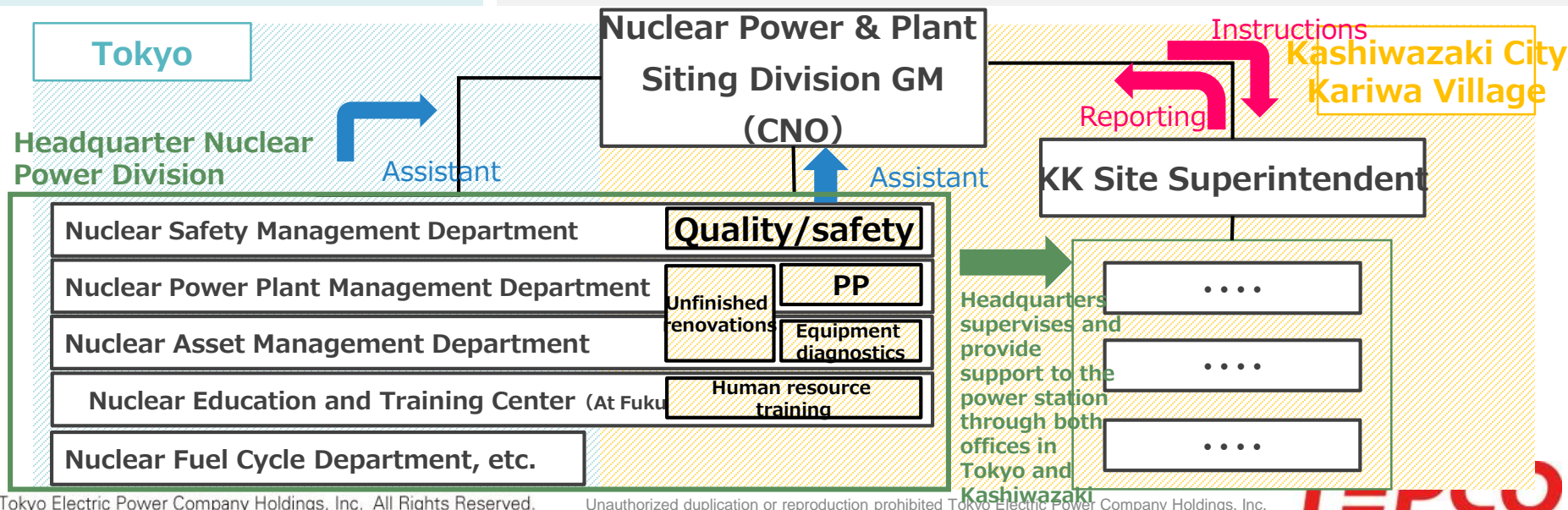
- By having the Nuclear Power & Plant Siting Division GM frequently and directly communicate with the KK site Superintendent, issues that pertain to actual field conditions can be ascertained and clear instructions given

ii. Strengthen oversight

- By increasing opportunities for Headquarters staff to go into the field actual conditions in the field can be ascertained and corrections made

iii. Strengthen support

- Headquarters staff is providing support to the site as it addresses the unfinished safety measure renovations at K7 and additional PP-related inspections



The state of department structures , governance and monitoring functions ~Nuclear Power & Plant Siting Division~

- Chubu Electric Power Co., Inc. OB, Mr. Mizutani, has been invited to be Deputy Site Superintendent. He will support the Site Superintendent by providing advice and also instructions for power station personnel, while also promoting awareness reforms at the power station in unity with personnel.
- Since April 2021, specialists formerly employed by the self-defense force, police, TEPCO and the fire department, etc., have been hired to strengthen nuclear physical protection and improve power station safety
- Going forward, we will continue to proactively employ human resources from outside the company that have a plethora of experience without limiting candidates to people with experience at specific companies or agencies

<Kashiwazaki-Kariwa Nuclear Power Station Deputy Site Superintendent>

Name	Date of appointment	Role
Ryosuke Mizutani	April 1, 2022	<ul style="list-style-type: none"> ➤ Awareness reforms ➤ Business style/system reforms ➤ Technical support, etc.



<Specialists in each field>

Agency of former employment	Number of people	Current office of employment	Area of management	Role
Self-defense force	2	Headquarters	Physical protection	➤ Provide guidance and assistance pertaining to protection measures in order to strengthen security risk awareness, the ability to ascertain actual conditions, and the ability to make organizational corrections
Police Department	5	Kashiwazaki-Kariwa Nuclear Power Station		
Former TEPCO employees	1			
Fire department	1		Safety measure renovations	➤ Create fire protection plans and strengthen fire countermeasures through effective training

The state of department structures , governance and monitoring functions ~FDEC~

- Decommissioning will transition from facility management to project management, and in conjunction with this transition, departments will be reorganized into a project management structure.
- In conjunction with this, we shall establish departments in order to reduce risks in a planned manner.

<Aim>

i. Departmentalizing projects

- Departmentalized programs and clarify responsibilities and authority
- Increases opportunities to go into the field since projects will be isolated from line departments

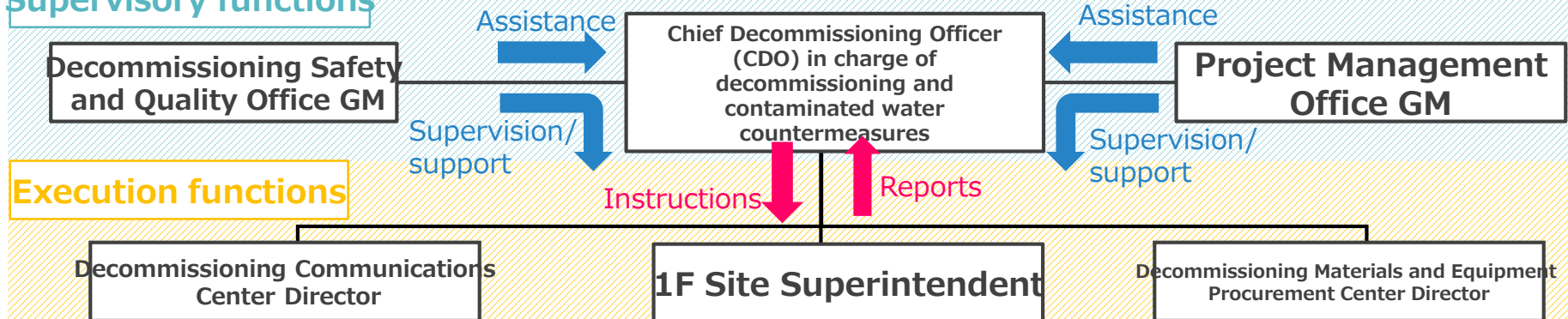
ii. Establishment of Project Management Office

- Manage project progress and quickly ascertain risks
- Support the redistribution of resources for each project
- Construct mechanisms for the entire company

iii. Establishment of Decommissioning and Quality Office

- Provide supervision and support for improving skills pertaining to safety and quality
- Establish inside of the new main administration building at Fukushima Daiichi to provide close support to line/fieldwork

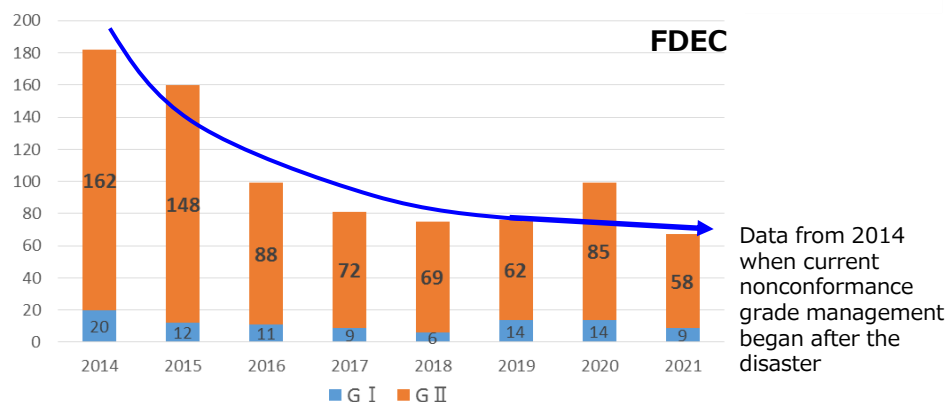
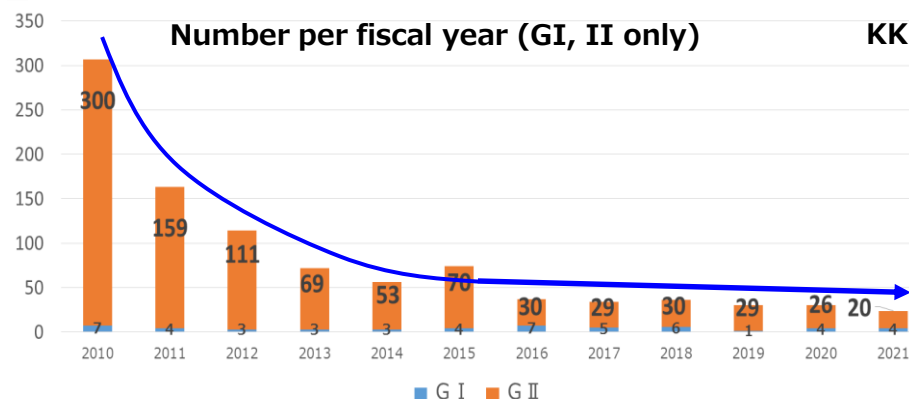
Supervisory functions



Cooperating with contractors ~Performance improvement achievements: The number of nonconformances~

- The number of serious nonconformities is steadily falling
- This is thanks to continual improvements made possible by the strengthened governance of contractors and the combined efforts of not only employees, but contract workers who are responsible for most of the fieldwork.
- Make further improvements in coordination with contractors

【 Trends in the number of nonconformances 】



●CAP have become rooted

- Countermeasures developed based upon condition report issuance trends
- Identifying the causes of human error based upon performance monitoring

●Strengthening the governance of contractors

- Sharing CAP analysis results with contractors, such as by reflecting results in human performance tool procedures

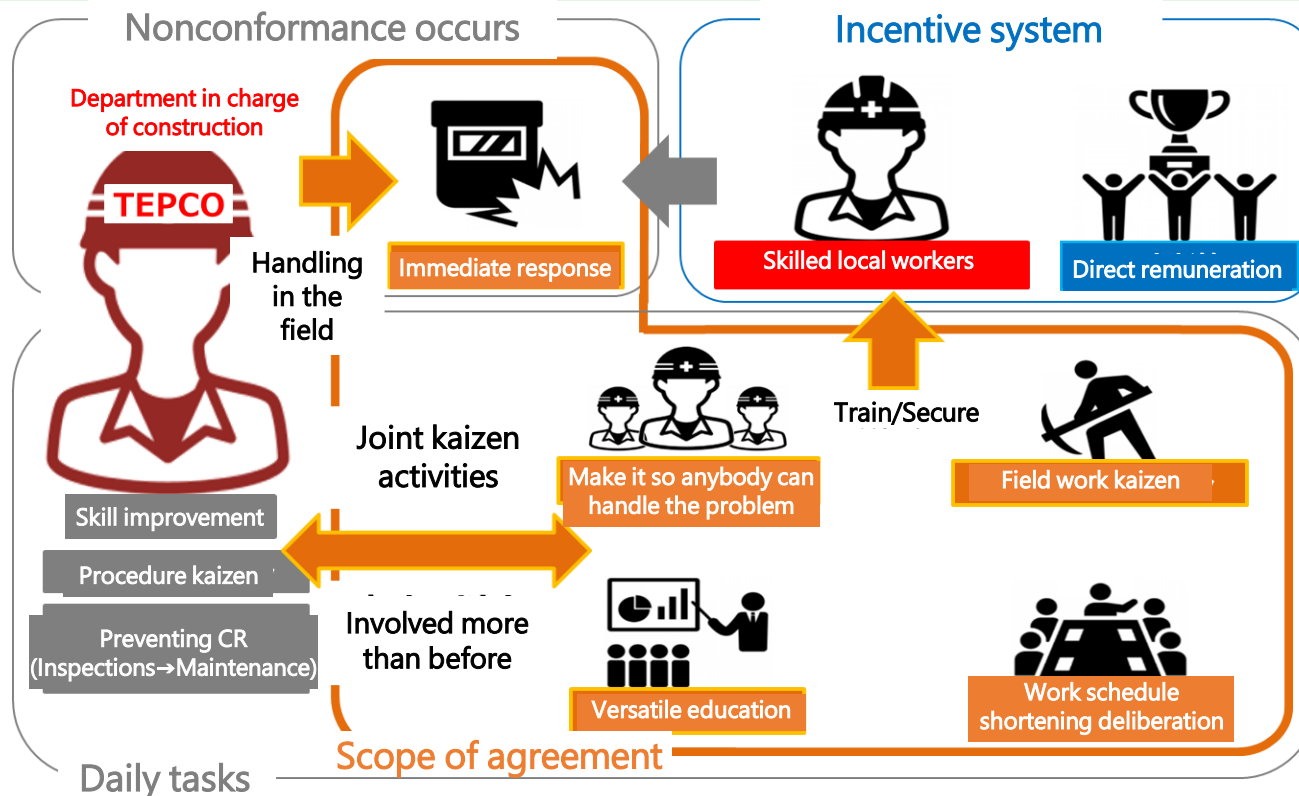
Going forward

●Cooperating with contractors

- Construct a cooperative arrangement with contractors in order to build a system for immediately responding to facility nonconformances. (NPD)
- Revise supply chains, and lead EPC (Engineering / Procurement / Construction) (FDEC)

Cooperating with contractors ~Further improvements: Nuclear Power & Plant Siting Division~

- It's important to work together with contractors to solve problems
- We are prioritizing the construction of an immediate response system in anticipation of nonconformances during operation
- We will provide an environment in which local contractors can work year-round, secure engineering prowess, and cultivate the next generation while also contributing to stable employment

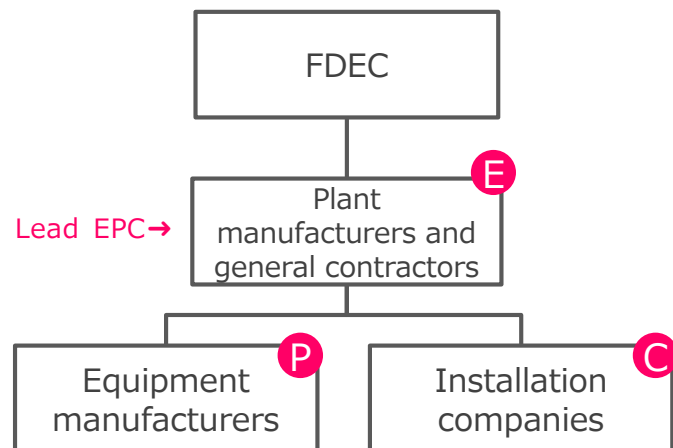


Initiative concept diagram

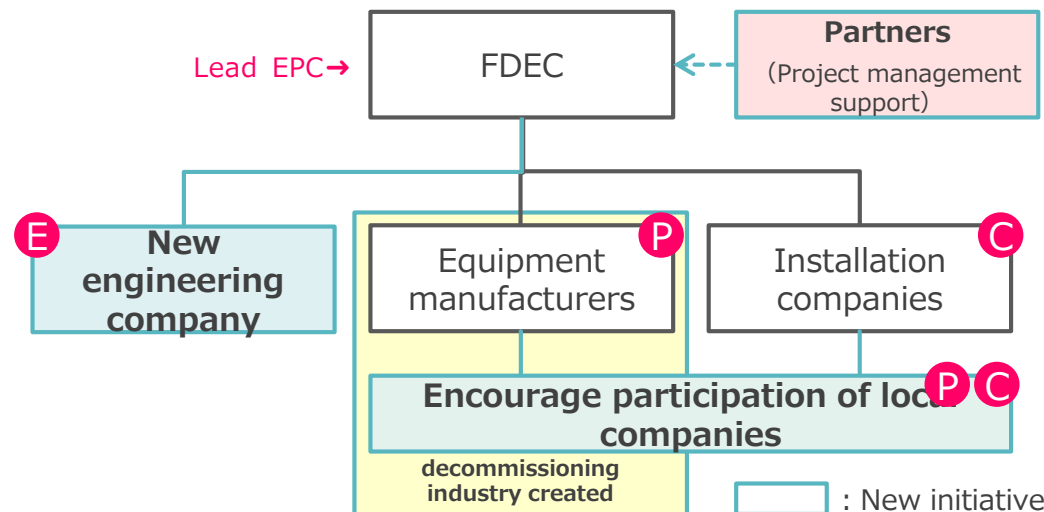
Cooperating with contractors ~Further improvements: FDEC~

- In order for the FDEC to achieve high value results as an owner's engineering firm, the supply chain must be revised and the FDEC must lead EPC (engineering/procurement/construction), which conventionally was delegated to plant manufacturers and general contractors

< Current structure >



< New structure aimed at strengthening engineering >



Improving motivation in the workplace ~The purpose of the Kashiwazaki-Kariwa Nuclear Power Station~

- Activities by upper management and personnel to engage in dialogue, and activities engaged in by primarily younger station personnel to "make a good power station"
- The opinions elicited from station personnel through these activities have been reviewed by power station executives who have in turn defined the "purpose of the power station"
- Through dialogue we have learned from station personnel what tasks are "impossible or wasteful" and leaders have led by example when it comes to NHK (*nakusu* (eliminate), *herasu* (reduce), *kaeru* (change)) thereby reducing desk work and creating more time to concentrate on tasks that need to be done.

<Upper executives engaging in dialogue>



<Activities to create a "good power station">



Personnel
opinions
reflected

"The Purpose of the Kashiwazaki-Kariwa Nuclear Power Station"

- ✓ Core beliefs conveyed in a way that anyone working at the power station can understand

【NHK completed】

- Automation of CR using RPA
- Revision to department self-inspection process
- Streamlining of process for checking Covid-19 infections

【NHK underway】

- Streamlining of tasks that should be consolidated
- Streamlining of requested documents
- Reports digitalization, etc.



Displaying the "purpose"
(Encouraging greetings)

Communication with Society ~Basic Policy and Action Plan: Handling ALPS Treated Water ~

The general public that forms public opinion/
overseas parties

Specific stakeholders

Basic policy

In order to minimize reputational damage we are wildly conveying scientifically-based information to parties in Japan and overseas in an easy-to-understand manner
We are maintaining objectivity and transparency through involvement of third parties

In addition to facing the fears and concerns of stakeholders in regards to decommissioning, contaminated water and treated water countermeasures, we are also doing our best to provide explanations that deepen understanding of TEPCO's approach to these issues and it's initiatives

Primary action plan

- **Conveying information through domestic and overseas media outlets**
 - We continue to provide press releases, press conferences, and encourage coverage
 - We have put advertisements in newspapers about decommissioning initiatives and are conveying the same content the our website (August 2022 ~)
- **Create/develop public relations tools (including tools for overseas parties)**
 - Update special websites (Japanese/English/Chinese/Korean)
 - Treated water Q&A, (3D) videos, pamphlets
- **Proactively give tours of the power station**
 - Short "smart course" tours and online tours
- **Ensuring objectivity and transparency**
 - Widely conveying information on marine life breeding tests
 - March 2022 ~Daily breeding log posted to websites and social networking platforms
 - September 2022 ~Commencement of breeding tests/WebCam
 - Ocean monitoring strengthening/data disclosure
 - Welcoming agriculture, forestry, and fisheries industry officials to observe measurement taking

- **Seizing various opportunities to communicate with stakeholders**
 - We continue to give briefings to producers, such as fishermen, as well as tourist industry officials, etc.
 - We continue to provide information on a timely basis to local governments, various organizations, and distributors/retailers
 - ~ We also encourage tours of the power station
 - During FY2021 and FY2022 we expanded the scope of Fukushima Daiichi Nuclear Power Station tours and symposiums to include all of Fukushima Prefecture (FY2022: To be held a total of 17 times including for the 13 cities, towns and villages)
 - Playing a major role in two-way communication with local residents

Communicating with society (perspective) ~KK~

- Various activities to foster understanding that target different segments of society shall be engaged in as part of efforts to communicate with local residents.
 - The objectives of these initiatives are as follows.
- <Objectives>
- Foster understanding about our power portfolio ⇒ Promote understanding about Japan's energy situation and explain why nuclear power is necessary
 - Power station initiatives/safety PR ⇒ Alleviate the local residents' concerns about power station operation.
 - Assure the public that TEPCO is competent ⇒ Gain acceptance of TEPCO as a nuclear power operator
 - Cultivate a sense of unity with the region ⇒ Get local residents to trust us and accept the power station as a "member of the community"

Target	Initiative	Objective			
		Foster understanding about our power portfolio	Power station initiatives/safety PR	Assure the public that TEPCO is competent	Cultivate a sense of unity with the region
General public	Communication booths	○	○		
	Various media (news letters/internet ads/SNS)	○	○		
	Symbiosis activities				○
	Events				○
	Regional briefings	○	○	○	
	TV/radio commercials	○	○		
Opinion leaders	Visits to Chamber of Commerce member companies		○	○	
Mass media	Report briefings, press conferences		○	○	

Our resolution

"Keep the Fukushima Nuclear Accident firmly in mind; we should be safer today than we were yesterday, and safer tomorrow than today; we call for nuclear power plant operators that keep creating unparalleled safety."

Reference documents

Nuclear Reform Framework

The significance of nuclear reforms = Becoming a "trusted company"

**Cultivating peace of mind
[Trusted] state**

Continue this state, which is
natural for our existence
(Urgent)

Normal
times

- Rule compliance, safe work methods, suitable information disclosure, etc.

Times of
emergency

- Quickly convey transparent (convincing) information, and quickly make repairs

**Building relationships where value
is shared
[Mutual dependence] state**

Build win-win relationships
(Short-term/mid-term)

- Grow along with local companies (employment) through our electricity business

**[Assimilation]
awareness**

Build relationships while making local
residents understand that "this is THEIR
power station, in THEIR town"
(mid/long-term)

- Remain a local company that shares the same sense of values as local residents, local employment (regional revitalization)

Reforms

- **Reform 1** Unify management of Headquarters and power stations
- **Reform 2** Introduce mechanisms and systems for completing projects
- **Reform 3** Drastic strengthening of physical protection/enlargement of resources and improvements in quality
- **Reform 4** Personnel deployment/rotation revisions and leveraging of external experts
- Creation of human resource cultivation and training plan
- **Reform 5** Motivation improvements and office environment improvements
- Ascertain what is needed to engage in business in order to fulfill the needs of customers, and respond accordingly
- Initiatives aimed at becoming a power station rooted in the community

Results of gathering and analyzing risk information

The strengthening of risk management, which is a nuclear reform plan initiative, is also positioned as part of "TEPCO's basic stance as a nuclear operator" in the safety regulations, and we have commenced risk management based upon the constructed mechanisms. The following are examples of achievements.

(1) What information is gathered?

Examples of information that is gathered are reports from government agencies, operating experience information, academic papers/reports, published articles, such as from academic journals, and information from overseas.

(2) How is this information organized?

Knowledge from information sources is gathered, and risk information that may exceed the envisioned design/development limitations of nuclear facilities is identified as "serious risk information" that is of particular significance.

(3) Results

After gathering and identifying information in accordance with (1) and (2) above, we have found no (zero) serious risks to report at this time.

The attachment provides more information on the following:

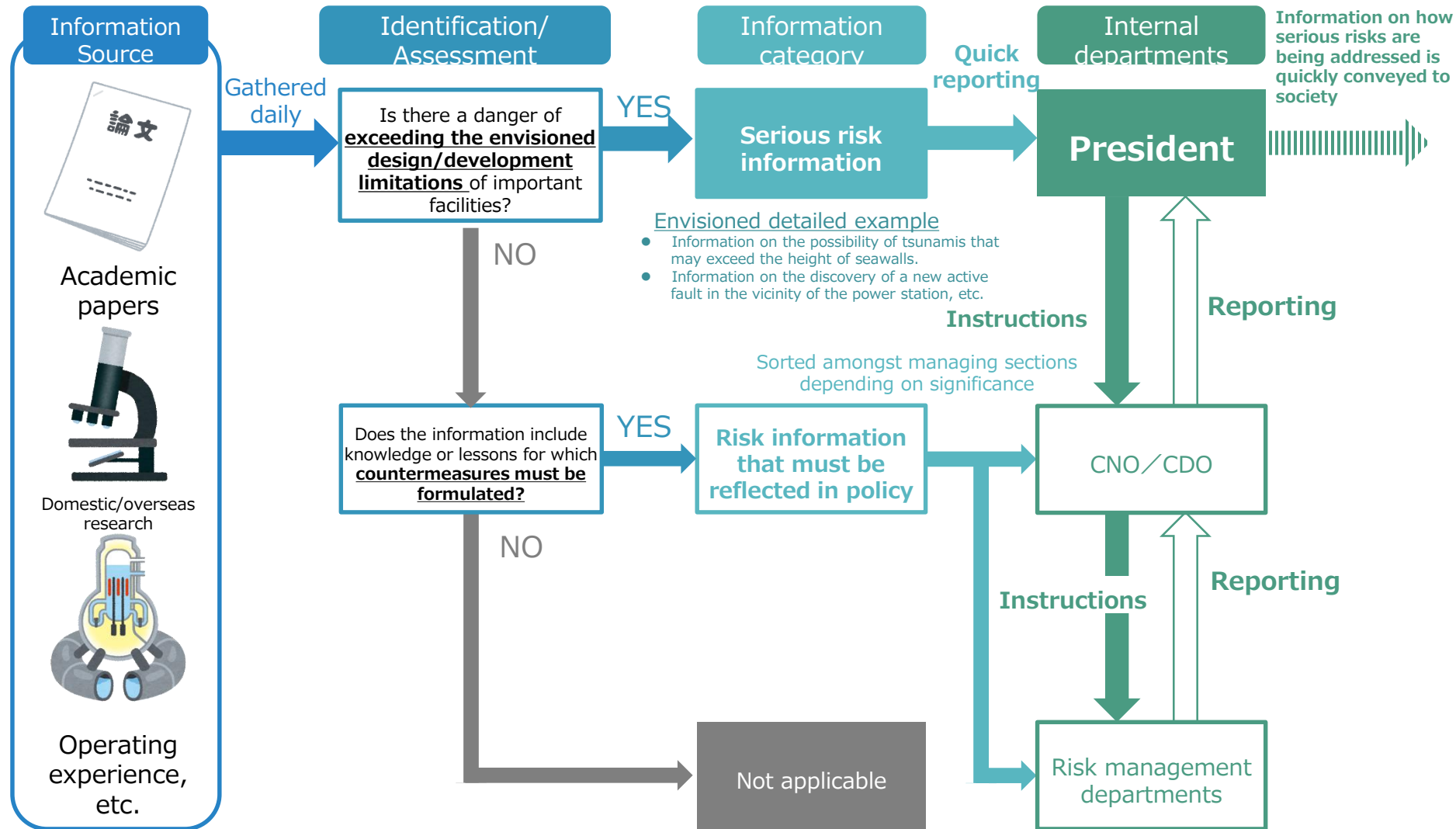
- Definitive examples of serious risk informations and information sources from which information is gathered
- Overview of method by which information is organized
- Status of addressing serious risks that were identified last fiscal year

Furthermore, information on risks that are not deemed serious, but can contribute to improving the safety of nuclear facilities is reflected as needed in the design and operation of such facilities in an effort to continuously make improvements.

Information sources from which information is gathered

Type of information gathered	Source (Approximately 280. The following are examples)
Safety-related research	<ul style="list-style-type: none"> •TEPCO research •Joint research by electric companies •Japan Atomic Energy Agency (JAEA) •U.S. Electric Power Research Institute (EPRI)
Operating experience information	<ul style="list-style-type: none"> •Nuclear Information Archives (NUCIA) •The Federation of Electric Power Companies of Japan •World Association of Nuclear Operators (WANO) •U.S. Institute of Nuclear Power Operations (INPO)
Information needed to conduct probabilistic risk assessments	<ul style="list-style-type: none"> •Joint research by electric companies •U.S. Nuclear Regulatory Commission (NRC) report •Central Research Institute of Electric Power Industry reports •NRRC Technical Advisory Committee (TAC) comments
Information on domestic and overseas standards	<ul style="list-style-type: none"> •Japan Electric Association standards •International Atomic Energy Agency (IAEA) standards •Japan Society of Mechanical Engineers standards •U.S. American Nuclear Society (ANS) standards
Information from international agencies and domestic/overseas academic societies	<ul style="list-style-type: none"> •Atomic Energy Society of Japan •U.S. American Nuclear Society (ANS) •Japan Society of Mechanical Engineers •U.S. American Society of Mechanical Engineers (ASME)
Information from international agencies and domestic/overseas academic societies (natural phenomena)	<ul style="list-style-type: none"> •Headquarters for Earthquake Research Promotion •Volcanological Society of Japan •Geospatial Information Authority of Japan •Japan Meteorological Agency

Summary of method for organizing information



The state of department structures , governance and monitoring functions ~Nuclear Power & Plant Siting Division~

- Employees in charge of providing support to the Nuclear Power & Plant Siting Division General Manager, quality/safety and equipment diagnostics, schedule management, and human resource training have been transferred (16 people transferred in November 2021, and 48 people transferred in May for a total of 64 people)
- Upper management greet employees at the front gate of the power station and directly observe field conditions pertaining to security

Headquarter line departments frequently visit the power station to provide oversight

- Various issues pertaining to the final state of Headquarter function transference, such as securing working/living spaces, preparedness bases and teams, measures for contributing to the region, and the organization of departments at the power station and Headquarters, etc., are being deliberated



Opening ceremony at the Kashiwazaki City branch office



People at work in the office



Greeting activities

Cooperating with contractors ~Strengthening the governance~

- Compared to the United States more fieldwork in Japan is entrusted to contractors, so "becoming dependent upon contractors" can become a problem if everything is left up to the contractors.
- Based on the results of CAP human error analysis, areas where HPT is to be used, photos and illustrations, and work points are mentioned in the work manuals for contractors in an effort to strengthen governance.

【Excerpt from procedure guide explanatory documents (concept drawing)】

8. 作業手順

小田電機製作所 施工要領

作業項目	作業要領	HPT	作業要領	作業要領	作業要領
1. 作業準備	①作業許可状の発行 ②作業許可状の発行内容を確認する ・作業許可状の発行内容を確認する（実施計画表等） ③作業許可状の発行内容を確認する（実施計画表等）				
2. 作業開始	①作業許可状の発行 ②作業許可状の発行内容を確認する ・作業許可状の発行内容を確認する（実施計画表等） ③作業許可状の発行内容を確認する（実施計画表等）	①HPT	②HPT	③HPT	④HPT
3. 作業完了	①作業許可状の発行 ②作業許可状の発行内容を確認する ・作業許可状の発行内容を確認する（実施計画表等） ③作業許可状の発行内容を確認する（実施計画表等）	①HPT	②HPT	③HPT	④HPT

The absence of photos, etc. make it difficult to imagine actual conditions. This is how conventional procedures were written.

By attaching photos it's easier to imagine the work that needs to be done.
This type of manual that includes important work points is referred to as an "improved expressive procedure ※".

作業要領

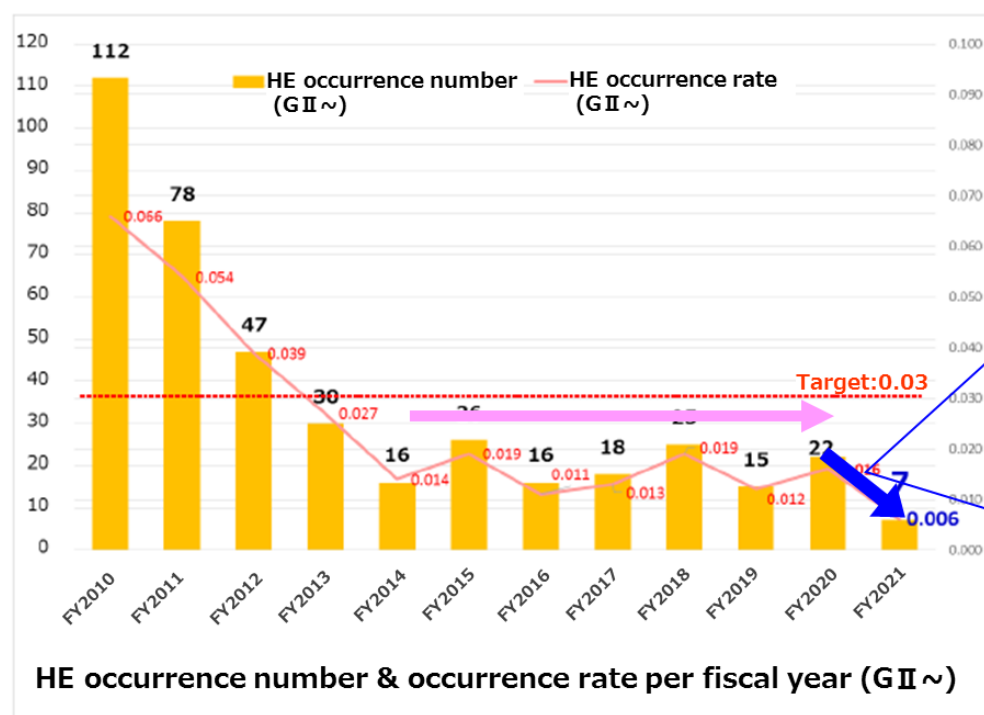
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※ Quoted from maintenology (Japan Society of Maintenology)

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Cooperating with contractors ~Performance improvement achievements : HE occurrence number~

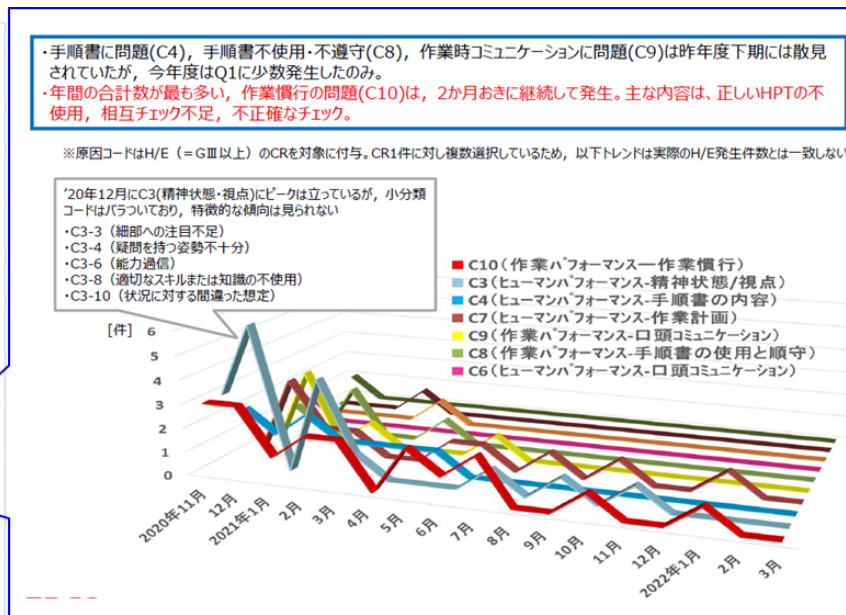
- HE occurrence rate amongst employees and contractors has decreased. Performance continues well at below the target for US operators (0.03). However, there has been no further decline since 2015.
- We are identifying HE causes based upon performance monitoring and thoroughly implementing countermeasures that focus on this issue (KK: 68% decrease compared to FY 2020)



※ Occurrence rate = Occurrence number / Total work time (man & 10,000 hours)

Target is the same level as power stations with excellent performance in the US based upon INPO08-

004 Human Performance KPI



CAP analysis results shared with contractors, such as by reflecting results in human performance tool procedures

Improving motivation in the workplace ~The purpose of the Kashiwazaki-Kariwa Nuclear Power Station~

Our (all people that work at the power station) purpose = Make the power station better	
Who we aim to be	Our resolution/promise
A power station that loves, and is loved by, the community	<Our basic stance> <ul style="list-style-type: none"> We will abide by the Kashiwazaki-Kariwa rules of conduct We will learn from worker accidents, fires and human errors, etc. We will continue to grow by implementing kaizen based on the actual field conditions, and the actual condition of equipment in the field
	<Our connection to regional residents> <ul style="list-style-type: none"> We will be sincere when conveying information and leverage the opinions we receive We will proactively participate in regional activities and contribute in times of regional emergency We will work with regional residents to become a power station that leverages regional technologies
A power station that everyone is proud of and motivated to work at	<ul style="list-style-type: none"> We will care for people and equipment Everyone will feel like they have a leading role and take responsibility for their own work Everyone will communicate honestly with each other (Keep expressing your true feelings until the other party accepts them in order to solve problems)) Trust and be grateful for each other
A power station chosen by customers	<ul style="list-style-type: none"> Properly manage the power station and generate power in a stable and efficient manner Leverage new technologies and knowledge to continually update equipment and improve operation Minimize waste discharge and reduce the burden on the environment