February 13, 2024

FROM: Nuclear Reform Monitoring Committee

ATTN: Tokyo Electric Power Company Holdings, Inc.
          Board of Directors

**Report on Interviews [with Workers] about Safety Culture etc.**

The results of the interviews [with workers] about safety culture etc. are as stated in the attached report.

(Attachment)

# Chapter 1   Reason for Conducting the Interviews and Summary of the Interview Process

## 1. Reason for Conducting the Interviews

Since 2012, the Nuclear Reform Monitoring Committee (hereinafter referred to as, "NRMC") has served as an advisory body for Tokyo Electric Power Company Holdings, Inc.[1] (hereinafter referred to as, "TEPCO"), and has monitored/supervised nuclear safety reform initiatives implemented by TEPCO since the 2011 Fukushima Daiichi Nuclear Power Station (hereinafter referred to as, "Fukushima Daiichi") Accident (hereinafter referred to as the, "Fukushima Daiichi NPS Accident") from a third-party point of view.

In the course of fulfilling this role, at the 19th NRMC meeting held on March 9, 2022, the NRMC pointed out the following key issues in regards to future TEPCO initiatives. In response, TEPCO reported on the status of improvements made to address these key issues at the 20th meeting of the NRMC held on September 15 of the same year, and the NRMC presented its findings.

○ Initiatives for continually improving safety
○ Control-focused management
○ Communication within the organization and with society

The NRMC conveyed to TEPCO its expectations for future initiatives pertaining to these key issues, and stated that there is a special necessity to examine, in detail, the current state of initiatives at Fukushima Daiichi, the Fukushima Daini Nuclear Power Station (hereinafter referred to as, "Fukushima Daini") and the Kashiwazaki-Kariwa Nuclear Power Station (hereinafter referred to as, "Kashiwazaki-Kariwa") pertaining to the following sub-issues of the aforementioned key issues in light of the changes that have occurred following the Fukushima Daiichi NPS Accident, and also the changes that have occurred in the wake of the series of incidents pertaining to physical protection that occurred at Kashiwazaki-Kariwa (hereinafter referred to as, "PP incidents").

○ Initiatives for continually improving safety
- Safety Culture/Safety Awareness
- Technological Capability

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[1] Known as the "Tokyo Electric Power Company" until March 2016

- Kaizen[2] and initiatives to "eliminate/reduce/modify" work tasks (hereinafter referred to as, "kaizen, etc.")
○  Communication within the organization and with society
    - Building smooth relationships between departments and with contractors
    - Improving work environments through dialogue with upper management

It is for this reason that the NRMC decided to have NRMC member, Masafumi Sakurai, interview workers at each power station about the aforementioned issues with the cooperation of attorneys at law, Shiro Shida and Keisuke Kaneko, both of whom have no vested interest in TEPCO, in order to clarify efforts to be commended and problem areas, and discern if there are any discrepancies in awareness with upper management.

**2.  Summary of the Interview Process**

Face-to-face interviews were conducted with General Managers in charge of each department, the group managers that manage the various groups within each department (hereinafter referred to as, "GM"), as well as team leaders that serve under the GM (hereinafter referred to as, "TL"), from January through August 2023. Approximately 105 people were interviewed, and approximately 75 hours-worth of interviews were conducted.

**Chapter 2        Interview Results**
**1.  GM/TL Interviews**
   **(1) Safety Culture/Safety Awareness**
      a.  Changes in safety awareness, and in particular, changes that occurred after the Fukushima Daiichi NPS Accident

      In regards to nuclear safety, almost all interviewees replied that the level of safety awareness after the Fukushima Daiichi NPS Accident is completely different from that prior to the accident.

      To paraphrase, there were many who replied that, "In all honesty, prior to the accident, there was the assumption that nuclear safety meant that somebody is protecting us, or that, 'of course we're protected.' But, after experiencing the accident and seeing it with our own eyes, we realized that each and every one of us are responsible for nuclear safety, and responsible for improving it. That's how awareness changes. And, it wasn't just us, this

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[2] Work to create optimal workflows based on actual local conditions

sense of awareness was shared with new employees that had just been hired, and throughout the workplace." These answers showed us that awareness about each and every person being responsible for nuclear safety is widely shared throughout the workplace.

Furthermore, in regards to various aspects of safety that impact nuclear safety, such as work safety, etc., there were many people who said that safety awareness has improved in the wake of the Fukushima Daiichi NPS Accident.

In particular, there were many who replied that at Fukushima Daiichi, since tasks such as accident handling, repairs, and decommissioning, etc. are being conducted in dangerous environments on a daily basis, and in light of the facts that there were periods when serious labor accidents kept occurring, and that the work environment even today is changing on a daily basis, the workers are in a situation where they cannot remain unresponsive and have to have a high awareness of safety, and that they are engaging in their tasks with such awareness. Also, many stated that even though the work environments at Kashiwazaki-Kariwa and Fukushima Daini differ from those at Fukushima Daiichi, they are being vigilant when going about their tasks and considering safety from various perspectives with the understanding that even the slightest mistakes or accidents can cause a great loss of society's trust.

Also, at Kashiwazaki-Kariwa, Fukushima Daiichi, and Fukushima Daini, many interviewees replied that through proactive initiatives to share CR[3] and OE information[4], negative information about safety is being quickly and clearly shared throughout the organization, and they feel that this has led to a further improvement in safety awareness. Many replied that during department meetings held every morning, CR/OE information from other departments is shared without fail, and discussions are held about whether similar problems have occurred within their own department.

However, there were those that replied that a considerable burden has been put on workers in the field, such as the need to work overtime, as they aim for such high levels of safety, and that they are always faced with the possibility of making mistakes or errors. Some also commented that everyone may be too focused on addressing every and all issues pertaining to safety thereby making

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[3] Condition Report. Reports on symptoms of possible non-conformities.

[4] Operating Experience. Information pertaining to operating experience, such as troubles, etc., from other power stations both within Japan and overseas

it impossible to prioritize what issues need to be addressed.

Also, although few and far between, the answers from some people suggested that they feel safety means fulfilling all regulatory requirements and rules.

b. Messages from upper management about safety

In regards to safety messages sent by the power station Site Superintendent and Head Office upper management (CEO, CNO, CDO, etc.), there is a relatively large number of people that feel that the content of these messages is fairly consistent with the actual state of affairs in the field and that there are not many discrepancies. And, in particular, there were many who responded favorably about the messages from the Site Superintendents, saying that it feels like the messages from the Site Superintendents at all sites, regardless of whether it's Kashiwazaki-Kariwa, Fukushima Daiichi, or Fukushima Daini, have been written after they have gone into the field and actually listened to the opinions of workers. In regards to messages from Head Office upper management, although some feel that the messages are somewhat off the mark compared to those from the Site Superintendents, there is also the sense that the workers are satisfied with the content of these messages and understand that in most likelihood the Site Superintendents are not just relaying the messages as written, but rather editing them to a certain extent so that they are more in line with conditions at each respective power station.

However, there were those that feel that the differences in problem awareness amongst various layers of upper management result in inconsistent messaging that is difficult for workers in the field to follow up on, and that even though the messages themselves have been simplified, there is a large volume of explanatory materials that come with the messages that is hard to digest and therefore just skimmed over by the reader.

**(2) Technological capability**

a. The state of technological capability (during times of emergency in particular)

In regards to technological capability, and the technological capability to handle emergencies in particular, at all the sites (Kashiwazaki, Fukushima Daiichi, and Fukushima Daini) there were many who replied that since the Fukushima Daiichi NPS Accident, all types of training, including emergency handling training, is now conducted under more severe simulated conditions,

and more frequently. This has allowed the workers to understand their roles during an emergency, and to repeatedly confirm what they need to do. Issues that are identified during each of these training sessions are also examined one by one by the overseeing department to find solutions that are subsequently employed during the next training session. The effectiveness of these solutions is then reviewed thereby enabling a process for improvements which has improved not only technological capability, but also the mindset of the workers. Furthermore, in regards to the methodology for implementing training, including scenarios, there were those who said that the training is not too simplistic and easy to get used to, but rather, in many cases, almost shocking, begging the question, "Could something like this really happen!?" However, considering the fact that what actually happened during the Fukushima Daiichi NPS Accident had previously been thought unfathomable, workers agree that training to this degree of intensity/severity is necessary.

And, there are those that replied that they have been able to fulfill their roles and put into practice what they learned during training when actual earthquakes have occurred, and that the issues identified when handling real earthquakes have been subject to review and improvements just like during training.

Most of the concern about technological capability at all the sites (Kashiwazaki, Fukushima Daiichi and Fukushima Daini) pertain to concerns over, and the sense of burden felt by, the overwhelming amount of work (absolute lack of manpower and schedule restrictions, etc.). At Fukushima Daini in particular, there are many workers who pointed out the lack of manpower, including the lack of contractors, and who have misgivings about the priority of Fukushima Daini within the company since it does not have the same problems as the other sites.

Also, whereas the lessons learned from the Fukushima Daiichi NPS Accident taught us the importance of TEPCO as a whole being able to handle problems on its own without technical support from manufacturers, there are workers who feel that being able to handle everything on their own maybe impossible in consideration of schedule restrictions and the gap between the technical ability of workers on site and manufacturers.

Furthermore, in departments that are in charge of work during emergencies that requires special qualifications (such as drivers licenses for special large-sized vehicles, etc.), there are many workers who feel that regular employee

transfers are not taking into consideration the qualifications that these employees have acquired. And that, even though a worker has dedicated a considerable amount of time to obtaining a certain qualification, if they get transferred to a different department, the new member has to start from scratch to acquire the same qualifications, which is very inefficient.

Furthermore, in regards to training, there were workers that replied that the approach to training is to just train on any type of risk that is possible, and that priorities have not been set, which creates an imbalance between actual tasks and training. And, others commented that the focus of training seems to be more on severe accidents and decision-making during a panic, rather than getting workers into action and actually moving around materials and equipment, and that perhaps it's more necessary to have training based on less severe scenarios that are more likely to occur during which workers can actually practice and move around equipment and materials.

b. Preparations and mindset for operation (Kashiwazaki-Kariwa)

At Kashiwazaki-Kariwa, many workers responded that most of the facility preparations, including safety measure renovations, required for operation have been completed and that they have repeatedly engaged in training under simulated operation conditions, and that through this training, they feel like preparations for the restart of operation throughout the entire station have progressed.

Although, in regards to the mindset for operation, while some workers in departments outside of the Operations Division, in particular, replied that since the tasks performed by their own department don't really change whether the plant is in operation or not, they will be able to leverage the experience they've gained while the plant has been shut down and perform as needed, there were other workers that honestly expressed their uneasiness over the lack of personnel that has actually worked on a plant in operation, and that the organization as a whole, and individuals, haven't been able to fully grasp what it will be like to have the plant in operation and to remain vigilant. Furthermore, there were a certain number of workers that expressed a heightened degree of nervousness about making any more mistakes or causing nonconformities as preparations for restart continue.

**(3) Communication within the Organization**

    a. Vertical communication within departments

        In regards to vertical communication within the departments in the power station, at Kashiwazaki-Kariwa, Fukushima Daiichi, and Fukushima Daini, there were many workers who replied that they feel less of a divide between, in particular, the power station Site Superintendents and General Managers, but also between executives and workers in the field. Previously, General Managers, and especially the Site Superintendents, would hunker down in their offices and workers would hesitate to say anything to them, but now the Site Superintendents actively reach out to each department and come into the field, and if you bring up a concern with the Site Superintendents or General Managers, they will think with you about a solution which has made it easier to share information with them. Furthermore, in particular regards to risk information related to safety, many workers said that through initiatives to share the aforementioned CR/OE information, the environment has changed such that this information is not kept to oneself or within any single department, but rather quickly shared with the entire power station.

        Some workers also said that they are proactively leveraging the attributes of new communication tools, such as utilizing web conference systems to remain in constant contact with multiple offices that are physically removed from each other thereby eliminating the sense of physical distance and enabling better communication.

        In regards to communication between department supervisors and subordinates, in particular, many GM said that in light of how the communication style of the aforementioned General Managers has changed, they themselves have started to proactively reach out to their subordinates to check up on them and better communicate with them. Although, there were some that said that there is some miscommunication (just to give one example, GMs leave management up to the TLs so that they can gain experience, but from the TLs perspective, they feel a lack of support and isolated as a result), and because of this, TLs in particular tend to stay in close daily communication with TLs in the same group in order to support each other.

        In contrast, there were workers that pointed out some other real problems. There is dissatisfaction over the fact that it's hard to talk to supervisors because they seem always on edge and always busy, and because the instructions they give tend to cause problems and put a burden on workers in the field. And,

even though initiatives to listen to the "opinions of workers in the field" are great, some workers can't accept what's being presented as the "opinions of workers in the field" because it often differs from the common awareness amongst field workers. Also, even though events, such as sports competitions, are being held in order to cultivate a sense of unity in the field, it's always the same people that participate, and those people who cannot, or will not, participate tend to feel alienated.

b. Horizontal communication between departments

In regards to horizontal communication between departments, although the method in which departments that have very little to do with each other on a daily basis communicate is completely different from communication within those departments, at Kashiwazaki-Kariwa, Fukushima Daiichi, and Fukushima Daini, there are many workers that said that they feel few excessive barriers to communicating with other departments. Furthermore, as mentioned in a. above, there were workers that said that since communication with executives at the General Manager level and above has improved, they know that information shared with General Managers will be discussed amongst them, and as a result, that has indirectly made it easier to communicate with other departments.

Although, there are many workers that replied in regards to communication within the department, especially, that since there is a strong tendency to widely share information with all departments that may need to know such information, a large amount of emails for which the importance, and the pertinence to one's own tasks, is unclear are received on a daily basis, and a great deal of time is lost reading these emails thereby leaving even less time for tasks such as field checks, etc.

Furthermore, at Fukushima Daiichi, while there were a relatively large number of workers that replied that the department reorganization in 2020 that resulted in project-oriented departments has enabled smoother communication about entire projects, which had been managed "vertically" between departments, there are also those that replied that there are now some "horizontal" barriers since tasks that used to be handled within one department are now shared between projects or between centers.

c. Initiatives to cultivate a sense of unity based on the "Purpose" (Kashiwazaki-Kariwa)

There were many workers that spoke positively about initiatives to cultivate a sense of unity, inclusion creation of the "purpose" at Kashiwazaki-Kariwa. By having the power station Site Superintendent and other executives proactively engage in dialogue with field workers, there is a sense among the workers that executives are looking at things through the eyes of workers in the field. And, they feel that improvements are actually being made based upon their opinions. Through this type of feedback, workers feel more like they are part of the power station, and through not only official opportunities for dialogue, such as roundtable discussions, but also initiatives led by the Site Superintendents and executives to encourage workers to greet one another, and in-house network blogs through which executives talk about their daily thoughts that are not necessarily related to their job, workers feel like they know executives better thereby making it easier to communicate about work issues with the entire office.

Furthermore, many workers also positively responded to the "Purpose," saying that even though it should be taken for granted, being able to do these things that should be taken for granted without thinking leads to gaining the trust of society, so sharing the "Purpose" in a tangible manner has significance.

In contrast, some workers replied that this type of slogan has been used in the past, but they are soon forgotten, so they would like to see it passed on with intent so that the same thing doesn't happen to the "Purpose."

d. Communication with contractors

In regards to the relationship with contractors, all workers similarly responded that even though at one time many workers were condescending to contractors, now, you very rarely see that attitude, and contractors are thought of as indispensable partners that are helping to achieve the common goal of improving safety. Furthermore, many departments that have good working relationships with contractors stated that they are striving for mutual understanding by establishing opportunities to regularly communicate with contractor upper management. And, in light of the PP incidents, workers in the security department, in particular, stated that the strong sense of contractors as partners, as mentioned above, also extends to the field of security.

Although, there were a certain number of workers that pointed out difficulties with getting each and every contractor involved in actual work in the field to have high levels of safety awareness. In regards to this, many workers replied that they are getting contractors into the field as much as possible in order to have field workers explain safety precautions in detail based on the conditions in the field. However, there is a lack of middle-management, and, as an organization, it is difficult to monitor communication with young workers and contractor workers in the field. And, in particular, at Fukushima Daiichi, where there are a lot of workers, and new workers are always coming and going, there are many workers that feel that there are issues that need to be addressed pertaining to common awareness between contractors.

**(4) Security**

The responses from all workers at Kashiwazaki-Kariwa, Fukushima Daiichi, and Fukushima Daini about the PP incidents showed that everyone feels that using someone else's ID card, etc., is absolutely unthinkable and unbelievable.

Moreover, many workers at not only Kashiwazaki-Kariwa, but also Fukushima Daiichi and Fukushima Daini, said that in light of the PP incidents, the importance of basic security and basic security measures, such as using your ID card to prove your identity, etc., is emphasized more now throughout the entire power station, and that the awareness of people towards security has changed from one of thinking that security departments will protect them, to realizing that each and every person is responsible for maintaining security. And, rather than just entrusting security personnel to protect them, there is stronger awareness now amongst workers for the need to mutually aim for the common goal of maintaining security. Furthermore, many workers said that by removing security departments from their isolated offices and putting them in with other departments, walls have literally been removed thereby enabling workers to get to know one another, which has subsequently enabled stronger awareness about each and everyone's responsibility for security.

However, although they understand that due to the nature of security work some information needs to remain confidential, there are some workers that find it difficult to follow rules without being provided with an explanation for the rules that goes beyond, "it's needed for security reasons."

On the other hand, in regards to security, some workers responded that

instead of emphasizing mindset and basic operations, it might be better to formulate equipment countermeasures that prevent loopholes (biometric identification, etc.).

Furthermore, although there have been changes to the environment at Fukushima Daiichi, such as newly installing equipment for the locked storage of ID cards in the wake of the PP incidents, and opportunities to discuss security within the office have increased, there were still some workers who said that they do not feel any large change in regards to security awareness itself. And, even though this is a minority opinion, there are more workers that feel this way at Fukushima Daiichi then at Kashiwazaki-Kariwa and Fukushima Daini.

**(5) Kaizen**

a. Feelings about initiatives, progress status, etc.

In regards to kaizen, etc., there seems to be a uniform understanding of the need for this. However, large discrepancies were seen between departments at Kashiwazaki-Kariwa, Fukushima Daiichi and Fukushima Daini in regards to the actual progress status of kaizen, etc.

A relatively large number of examples of kaizen, etc. that were given to us during interviews pertained to reductions in the number of meetings, revisions to how meetings are run (simplification of operation or record-keeping methods, use of web conferencing systems, etc.), and of the digitalization of paperwork. There were also a certain number of examples pertaining to rule and equipment revisions, but in all cases, in departments where it is thought that kaizen, etc., are progressing, there seems to be positive reinforcement by which workers within the departments actually feel that the workload has been reduced through kaizen, etc., and this in turn has created an incentive to implement more kaizen, etc.

In contrast, in departments where the workers do not feel that kaizen, etc. have progressed sufficiently, many workers responded that whereas they understand the mid/long-term merits of implementing kaizen, etc., they don't have enough surplus manpower to implement kaizen, etc. in addition to their daily duties in the short term. And, some workers responded that in general, reductions in work hours seem to be the focus of attention as the main goals of kaizen, etc., and they haven't been able to find any ways in their own departments to achieve these goals.

Furthermore, instead of focusing on "eliminating" and "reducing" large burdens, there is a tendency to go straight to "modifying" from the periphery, and as a result, this has caused a negative spiral by which workers don't feel like there has been much of an effect and it is difficult for them to feel a sense of accomplishment. And, there were workers that said that are basically massaging their work hour reduction numbers by asking other departments to take on some of their work because the numerical targets set by supervisors as kaizen, etc. objectives are too high.

Also, there were some workers that responded that even if they have been able to reduce work hours through kaizen, etc., they have been unable to set priorities for the tasks that they had previously been unable to address due to the lack of time, and all of these jobs come raining down on them at once making them feel like their effort has been wasted.

Furthermore, problems were also pointed out in regards to tasks implemented in cooperation with contractors with workers saying that it's hard to force them to engage in kaizen, etc. because they need to respect the way that the contractors do things, and also that contractors are not very willing to cooperate because they feel that less work will be assigned to them if the kaizen, etc., are successful.

b.  Relationship to safety

In regards to the relationship between kaizen, etc. and safety, all interviewees stated that the priority for all work at the power station is to ensure and improve safety, and everyone understood that safety must not be sacrificed as a result of kaizen, etc. There was no one who replied that it is acceptable to prioritize kaizen, etc. over safety.

To the contrary, there were many workers that said that due to such strong conviction about prioritizing safety, there is trepidation when it comes to revising existing rules or equipment, in particular, because it is assumed that such rules or equipment were put in place due to some past assessment of safety, and the damage may be irreparable if a safety-related issue happens in the future because changes were made, which has made it difficult to make such decisions about field equipment, etc. Or, a great amount of labor is required to gain consensus over a certain issue because even if one department has made the decision to make a change, there are many other safety-related concerns based on different perspectives that are brought up by other

departments that use the same rules or equipment.

## 2. General Managers
### (1) Safety Awareness and Safety Culture

There weren't any General Managers who argued with the basic stance that the highest priority for a nuclear power station is nuclear safety, and that the most minimal of responsibilities of General Managers is to protect, and continue to improve, nuclear safety through their own actions.

In particular, there are many General Managers who were directly involved in handling troubles at Fukushima Daiichi after the Fukushima Daiichi NPS Accident, or who had provided support for these efforts, and many of them responded that proactively conveying their experience to the next generation through various opportunities is indispensable for the organization in order to improve awareness about being responsible for nuclear safety and also maintain vigilance, and that they are striving to convey that message. Furthermore, there were General Managers that also see some issues to address going forward, such as the need for innovative steps to go beyond just repeating what was experienced so as to prevent the workers listening to stories about the Fukushima Daiichi NPS Accident over and over again from falling into a rut.

Furthermore, there are many General Managers who said in regards to the relationship between nuclear safety and actual duties that, nuclear safety should not be looked at in an abstract fashion, but rather that it is necessary to think on a daily basis about the nuclear safety-related risks and issues that exist at one's own power station, and the relationship that these risks and issues have to one's own duties.

For example, many General Managers at Kashiwazaki-Kariwa responded that it was necessary to not only safely complete the process of reactor startup, but also approach nuclear safety from the perspective of continuing operation while maintaining safety, and that it is important to not only thoroughly complete advanced preparations for startup, but also to always be ready to immediately handle any issue that arises after startup.

Furthermore, many General Managers at Fukushima Daiichi responded that they have finally moved past the continual need to "put out fires" that persisted after the accident and have entered a phase where the entire site can focus on preventing troubles and accidents. And, in particular, many replied that a big problem in departments where new contract workers are always coming and going is maintaining a certain level of safety awareness in the field.

And, at Fukushima Daini, many General Managers responded that in addition

to "maintaining stable status," which has been a long-term mission since the Fukushima Daiichi NPS Accident, now that the decommissioning process has started, it is necessary to incorporate good practices from other power stations and other electric companies more than ever before and make changes to their own safety awareness.

In regards to initiatives to share CR/OE information that were pointed out by many GM and TL, there are many General Managers that said that they are helping initiatives to gradually take hold by continually engaging in public awareness activities to let workers know that just because a nonconformity was quickly fixed, that doesn't mean that they don't need to share the information, and that even if they think something is a small matter, society may think differently, so sharing and accumulating information on nonconformities that are no big deal at the moment is actually very helpful for analyzing trends and determining whether recurrence prevention measures are needed, which in the end, is actually good for all of us.

However, in regards to issues pertaining to safety, there were a relatively large number of General Managers who commented that human errors during desk work, in particular, and deviations from rules that have nothing to do with the core of nuclear safety (document management, etc.) are still not decreasing. And, General Managers responded in regards to this that, since human errors in the field have steadily declined by passing down know-how related to developing work environments and detecting errors, that the same initiatives are necessary for desk work, and that is necessary to teach workers that even if they are far removed from the core of nuclear safety, their work still has a significant social impact.

Furthermore, some General Managers said that upper management needs to set priorities because if something is being done for nuclear safety, that task gets priority and it's difficult to stop something that's already been put in motion, so as a result, workers in the field keep having requests put upon them, and this results in a feeling of confinement.

### (2) Technological Capability

In regards to technological capability, and in particular technological capability for responding to emergencies, just like GM and TL, most General Managers responded that technological capability is steadily improving through repeated training.

Moreover, many General Managers pointed out the need for more in-depth

training initiatives, such as the need for training on how to identify realistic actions that need to be taken during an emergency and how to take that action. And, some General Managers said that in addition to training for the entire power station and training carried out by individual departments, they have also started training initiatives in cooperation with multiple departments that need to work together during an emergency, which was something proposed by workers in the field.

In regards to organizational issues pertaining to technological capability, many General Managers at Kashiwazaki-Kariwa, Fukushima Daiichi and Fukushima Daini pointed to passing down technical skill over the long-term, and share the same sense of crisis in regards to creating mechanisms for passing down technical skill now while there are still veterans in the field in order to prevent irreparable damage in consideration of the facts that Japan's labor population is decreasing and that it will be more difficult to secure human resources in the future. Furthermore, in regards to this, some General Managers gave actual examples of steps being taken, such as having veteran employees serve as mentors for younger workers and follow-up with them on everything including how to go about daily tasks.

Furthermore, some General Managers expressed concerns in regards to passing down technical skill, saying that even though proactively leveraging new technologies, such as AI, etc., is indispensable for improving technological capability, TEPCO, as an organization, is not very good at doing this.

Many General Managers responded the same as GM and TL in regards to the preparations for restart at Kashiwazaki-Kariwa saying that, equipment operations and technical preparations are proceeding.

However, in regards to mindset, many General Managers said that since the younger generation of employees that has yet to experience working on an operational plant is having difficulty getting into the required mindset for working at an operational plant, the older, more experienced generation, needs to mentor them and repeatedly pass down skills, and that they can learn from just reading textbooks, but rather need to accumulate as much experience as possible by seeing and listening to a real plant.

Furthermore, there were many General Managers who mentioned concerns in regards to organizational issues saying that considering limited human resources will put a large burden on shift personnel who will have to repeatedly be put on duty in order to operate the plant, and in particular, the large burden that will be put on managers who will have no option but to frequently oversee night shifts

due to the limited number of them.

## (3) Communication

At Kashiwazaki-Kariwa, Fukushima Daiichi, and Fukushima Daini, many managers replied that the mission of management is to create an environment that enables smooth communication within departments, and that General Managers are striving to improve communication throughout the entire organization by leading communication initiatives.

Furthermore, we could see that it is widely understood that mutual understanding and the creation of trusting relationships is indispensable for smooth communication, and many General Managers responded that parties in general manager positions or higher are achieving relatively high levels of mutual understanding and trust.

Furthermore, at Kashiwazaki-Kariwa, we heard many General Managers say that the atmosphere on-site has become brighter through initiatives such as encouraging workers to greet each other, and that communication has become livelier. And, there are many General Managers that said that since communication on a whole has improved, it is becoming easier to see in what parts of the station communication is relatively poor, so going forward, they need to put effort into following up more with these individual locations.

On the other hand, there were some General Managers that said that their department as a whole does what needs to get done, but that there is an even greater sense than before of disinterest in anything beyond that.

In regards to vertical communication within departments, there were many General Managers that said that they are taking special care to build trust with subordinates so that they will not hesitate to report bad news. For example, we were given many examples of innovative steps that are being taken such as daily emphasizing the importance of stopping and reporting something if something bad is noticed; providing as many opportunities as possible for younger workers to report information so as to accumulate communication success stories; and, proactively commending workers when something goes well, and reviewing matters that don't go well with the entire department, including oneself, so that subordinates understand that General Managers don't have the attitude of "expecting things to go well and getting mad when they don't."

However, some General Managers stated frankly that when looking at each individual vertical relationship that exists in a department (for example, the

relationship between a GM and a TL, or the relationship between a TL and members, etc.), some trust relationships based on mutual understanding are not completely developed, and even though managers tried to develop these relationships, it's difficult because there is no correct solution since there are various elements at play, such as the duties that are done within the department, the level of business of everyone, and each individual's sense of values and personality.

In regards to horizontal communication between departments, many General Managers at Kashiwazaki-Kariwa, Fukushima Daiichi and Fukushima Daini said that General Managers are keeping in close communication with one another under the premise of forming mutual understanding and trust, as mentioned above, and that these efforts have reduced a lot of trepidation or hesitation throughout the entire organization when it comes to communicating with other departments. They also said that, although things don't always go smoothly when departments that are very busy try to communicate with each other, even in these cases, in the end, General Managers can discuss the problem amongst themselves and find a solution.

On the other hand, there were also General Managers that said that, in general, meetings at TEPCO are very time-consuming because a lot of materials need to be prepared for the meetings, and it takes time to create and read these materials. Moreover, in recent years this has accelerated. There are also many General Managers who talked of the dilemma of having more of a load put on General Managers since all communication tends to converge at their office thereby actually inhibiting communication in some instances. It's good that various pieces of information, even about minuscule things, are brought up at general manager meetings and discussed, but on the other hand this makes meetings very long and makes it difficult to get back to one's own duties thereby also limiting the amount of time that General Managers have to communicate with their subordinates. And, some managers confess that this is worrisome for them because in many instances they have to make subordinates wait until after normal working hours to get back to them.

**Chapter 3      Observations and Findings**
1. **Safety Culture and Safety Awareness**
   **(1) Changes in Safety Awareness**
   The level of safety awareness amongst field workers at all three power stations

(Fukushima Daiichi, Fukushima Daini, and Kashiwazaki-Kariwa) has dramatically improved compared to prior to the Fukushima Daiichi NPS Accident from the perspectives of both nuclear safety and work safety that impacts nuclear safety. We believe that this is because there was a large qualitative change in the safety awareness of each individual worker that saw the harsh conditions experienced during the Fukushima Daiichi NPS Accident, and that the acts of transcending generations to pass down that experience, and continually engaging in various initiatives to improve safety awareness throughout the organization in light of the lessons learned from the Fukushima Daiichi NPS Accident, have contributed to this improvement in awareness.

We believe that conscious efforts to share CR/OE information at each power station that have taken place recently have had a positive impact on safety awareness improvement from the perspectives of both habitualizing the process of analyzing safety-related problems that occur in other departments and leveraging that information to improve safety in one's own department, and also strengthening awareness about the fact that it should be natural to quickly and widely share negative information about safety within the entire organization.

**(2) Safety Awareness Goals**

It need not be reiterated, but there are no goals to safety. One should continually strive to improve the level of safety in light of actual risks/issues that pertain to one's own duties, and while adapting to changes to those risks/issues. Therefore, the aforementioned situation pertaining to safety awareness should not be considered an arrival point, and going forward, the entire organization needs to voluntarily continue initiatives to improve safety awareness.

In regards to this, even though the number is scarce, the fact that there are still employees that feel that ensuring safety merely means satisfying rules is a source of concern that needs to be pointed out. This thinking that satisfying rules means that safety has been achieved, and the fact that prioritizing safety above all is making it difficult to implement kaizen, etc., are exactly the same as the issues that were pointed out when deeper causes of the PP incidents were investigated (nothing is done beyond what is required by the Nuclear Regulatory Agency; lack of risk awareness; lack of ability to ascertain field conditions; inability of the organization to make corrections, etc.), and it appears that there is a lack of effort to inform each and every worker in the field about these organizational weaknesses and get them to understand that they pertain to them.

Furthermore, it needs to be fully kept in mind that there are still deviations from rules during document management, etc., and also the fact that human errors are still not declining. A reason for this appears to be the prioritization of error prevention during fieldwork and compliance with rules that are (or, thought to be) closely related to nuclear safety, which is exhausting the physical and mental leeway to comply with other rules (or at least the perception that this is the case). It is essential that the organization as a whole continues to engage in the process of confirming whether or not rules are being complied with, regardless of whether or not they are directly related to nuclear safety, and revising the rules that do not match real conditions.

**(3) Remaining Vigilant**

In light of the recent progress made with preparations to restart Kashiwazaki-Kariwa, attention needs to be paid to the fact that the level of tension about not allowing any mistakes or nonconformities at not only Kashiwazaki-Kariwa, but also Fukushima Daiichi and Fukushima Daini, is increasing. It is, of course, vital that each worker and each department works with a sense of responsibility and vigilance towards achieving the goals of the entire organization. However, too much responsibility or pressure leads to decreases in mental safety and can help to give birth to an organizational climate in which information on mistakes or nonconformities is covered up or not shared quickly. It could even get to the point where the existence of mistakes or nonconformities is denied altogether (safety myth). In order to prevent mistakes and nonconformities, etc., it is essential that the organization not just rely on the efforts of individuals and their ability to be careful, but also create a physical and mental environment that does not allow mistakes or nonconformities, and upper management, in particular, needs to fully heed these facts and lead the entire organization in a well-balanced fashion.

**(4) Security Awareness**

It appears that field workers at not only Kashiwazaki-Kariwa, but also Fukushima Daiichi and Fukushima Daini, share a common awareness of the role that each individual plays in security in light of the PP incidents. And, at Kashiwazaki-Kariwa, Fukushima Daiichi and Fukushima Daini, each department is engaging in retrospection and implementing improvements in regards to the lack of openness within the organization and the lack of focus on front-line workers, both of which were problems that were pointed out when the causes of

the PP incidents were ascertained and countermeasures formulated.

However, it appears that there are still certain discrepancies within the organization when it comes to perceptions about security awareness and prioritizing countermeasures. Upper management must continue to give ample consideration to these matters to prevent more and more workers from feeling that the PP incidents and security itself have nothing to do with them.

**(5) The Role of Upper Management**

Workers in the field are positively responding to the proactive efforts of upper management to disseminate messages about safety to field workers, and this can contribute to improving safety awareness in the field.

It is important to continue to communication between upper management and workers in the field to ensure that the contents of these messages fit the actual conditions in the field and match the problem awareness of workers, and that effort is made to avoid such deviations. Furthermore, in light of the fact that some workers feel that the messaging is all over the board and feel overwhelmed by the sheer number of messages, we would hope that innovative steps are taken to systematically organize individual messages so as to improve uniformity and actively select those messages that should be shared with the entire organization.

**2. Technological Capability**

In regards to technological capability, and the ability to handle emergencies, in particular, it appears that many workers throughout the entire organization feel that training has helped to improve both technological capability and mindset. TEPCO should be more readily commended for realizing the importance of continually revising various aspects of training, such as scenarios, content, and frequency, etc., on a corporate level to prevent this feeling of accomplishment from leading to negligence, and to not only contribute to improving objective technological capability, etc., but also prevent field workers that participate in training from losing that feeling of satisfaction and accomplishment. And, TEPCO should as well be commended for implementing new types of training based on the desires of workers in the field and for the fact that these types of initiatives are becoming rooted in the company's culture.

Furthermore, it is evident that at Kashiwazaki-Kariwa there has been quite a bit of progress made with improving technological capability as equipment preparations for restart have progressed. In regards to the mindset and sensitivity needed to work on a plant in operation, it appears that the entire organization shares common awareness

about the need to raise the level of mental preparedness through initiatives to pass down the correct mindset and accumulate experience working on actual equipment in the field in light of the reality that there is a limited number of workers that have actual operational experience. And, we believe it is important to continue these initiatives going forward.

However, we cannot talk about technological capability without addressing the lack of human resources that must have these capabilities, and it is vital that the entire power station, and contractors, see this as an urgent issue in light of the dwindling labor population in Japan. Along with quickly and deliberately passing down technical skill, new technologies, such as AI, etc., must be proactively utilized and, to accomplish this, upper management needs to consciously distribute business resources while referencing cases from outside the company, such as from other power companies.

3. **Communication**
   **(1) Overall Communication Environment**

   It appears that overall, most people in the organization feel that the communication environment within the company has become more open. We believe that this is because upper management and executives have deemed maintaining and securing a communication environment within the company an important issue, and a result of their approach to transcending communication barriers by proactively and personally building friendly relationships with subordinates; and, TEPCO should be commended for these efforts.

   In particular, we believe that initiatives to cultivate a sense of unity based on the "Purpose" at Kashiwazaki-Kariwa has had a considerable impact on increasing the feeling of belongingness of power station workers and also smoothing communication within the organization. Furthermore, TEPCO should also be commended for self-assessing these improvements as not going beyond level one of the four-level scale of achievement, and for making efforts as an organization to further develop these initiatives. Going forward, we hope that these initiatives will not be dependent on personal attributes, such as the personalities of the Site Superintendent and executives, but rather become rooted in the culture of the power station and gradually be expanded to other power stations.

   However, it must not be forgotten that this is not the objective of these initiatives, and that the objective is to create a communication environment within

the power station that can support nuclear safety, or in other words, to involve everyone in the creation of a communication environment that enables information about "dangerous things," "strange things," and "disliked things" within the organization to be quickly shared without any mental burden or stress. Below, we shall consider whether or not a communication environment has been fully developed in this respect.

**(2) Vertical Communication within Departments**

As a result of the aforementioned proactive initiatives implemented by upper management, vertical communication within departments, and communication between managers and field workers, in particular, has become rather smooth in general.

However, in an organization as large as a power station, maintaining trust at the various levels of vertical relationships that exist within the department, and continuing to provide a smooth communication environment, are no easy tasks. It is necessary for managers, in particular, to continually remind themselves that negligence can easily lead to breakdowns in communication, and that it is important to further develop organizational support for workers facing difficulties (Some examples we can think of are establishing a consultation desk, or providing personnel allowances, etc., but the solutions should not be limited to these suggestions.) without just relying on the perseverance of individuals, or passing the buck to field workers and expecting them to engage in mutual follow-ups.

**(3) Communication between Departments**

Horizontal communication within departments has improved considerably compared to the past due to considerable progress made on behalf of executives, and the Site Superintendents, to build trust and mutual understanding.

However, at the field level, in particular, it is easy for horizontal communication between departments to break down due to not wanting to cause an inconvenience on other departments because everyone is so extremely busy. It's not such a bad thing to expect that General Managers will discuss amongst themselves to solve problems in the end. However, we can't avoid feeling like the cart is being put before the horse when General Managers are extremely busy communicating with other departments while communication within the departments is being encumbered. [These efforts are] meaningless if workers in the field do not feel relevant and assume that General Managers will handle all communications with

other departments. We would like to see upper management continue to strive to maintain and secure a well-balanced communication environment in light of these observations.

**(4) Problems with Using Communication Tools**

Furthermore, it needs to be pointed out that communication tools are not being used properly in accordance with the advantages and disadvantages of each tool.

A typical example of this is expecting good communication by just sending out emails. In order to remain faithful to the true meaning of the word "communication" and "convey information that is understood," it is obviously necessary to put sufficient mutual effort into building friendly relationships. And, in addition to this, for example, you need organizational innovations to further improve the selection and use of communication tools that do not rely on the personal decisions of individuals, such as proactively sharing know-how and good practices pertaining to the use of communication tools. Furthermore, it's important to continually look at new communication tools that seem to appear almost daily to decide whether or not to use them in light of issues such as effectiveness and security.

In regards to using meetings as a communication tool, it appears that there is a tendency to spend too much time on the meetings themselves, or for handout preparations, thereby taking time away from other tasks and other forms of communication. The entire organization should continue to look at what needs to be prioritized in order to "convey information that is understood," and make corporate-wide revisions, including revisions to kaizen, etc. initiatives that will be discussed later.

**(5) Brief Summary**

Regardless, there is no silver bullet when it comes to communication issues and we strongly hope that upper management will further develop the environment so as to enable each individual in the organization to engage with a sense of relevance in order to create a smooth communication environment. (Even with reorganizing departments at Fukushima Daiichi to be project-oriented, although there has been a certain impact on communication within projects, new issues have developed pertaining to horizontal communication.)

4. **Kaizen and Eliminating/Reducing/Modifying**

   (1) **Opinions of Initiatives, Progress Status**

   As pointed out in 1 above, there is no end to safety initiatives, and due to this, a constant increase in tasks needed to improve safety cannot be avoided (the same goes for security). However, in light of the dwindling population, it is unlikely that there will be a dramatic increase in human resources within the organization in the future. If this is the case, then, the steady implementation of initiatives aimed at working more efficiently, such as kaizen, etc., must be deemed an urgent issue as they will most certainly have influence over the future fate of the organization. At the very least, in light of this impending crisis, the need for kaizen, etc., can be widely conveyed throughout the organization.

   Although a certain amount of progress seems to have been made with kaizen, etc. when departments are looked at individually, the organization is greatly polarized with some departments not even having started kaizen, tec., and organizational support is strongly needed for these departments.

   (2) **Inhibiting Factors**

   a. Lack of surplus manpower (feeling that there is a lack of manpower)

   During our interviews, the lack of surplus manpower was often pointed out as a factor inhibiting progress with kaizen, etc. in the field.

   Regardless of the absolute lack of surplus manpower in each department, as long as kaizen, etc. initiatives are looked at by departments as "additional work," and "tasks that we are being forced to do," then the company will never be able to eliminate the feeling amongst field workers that there "real job" is being hindered by kaizen, etc.

   From the point of view of the workers implementing the tasks, it is indispensable that organizational effort is dedicated to creating an environment that enables, for example, good practices and progress-related know-how from other departments or other power stations to be shared within the organization, and that each department voluntarily decides to implement similar kaizen, etc., rather than just being forced to engage in kaizen, etc. In particular, we believe there is room to examine the establishment of mechanisms for providing human resource support for departments that are having difficulties implementing kaizen, etc. initiatives, such as by handling tasks related to kaizen, etc., examining detailed methods for implementing kaizen, etc., or helping with process execution, including coordinating with

other departments (one method would be to establish departments, such as a kaizen office, but the solutions should not be limited to this suggestion).

Furthermore, whereas kaizen, etc. initiatives are meant to make tasks more efficient, if too much focus is put on quantitative targets such as work hour etc., it may be difficult for departments that are finding it difficult to achieve such targets due to the content of the work that needs to be done to feel a sense of ownership of kaizen, etc. Therefore, when managing kaizen, etc. achievements, it's necessary to, for example, sufficiently review qualitative elements, such as reductions in the feeling of being burdened by work. We should not overlook the fact that kaizen, etc. should create room to breathe, and that being able to reduce the feeling of burden itself should be an important source of motivation for continually engaging in kaizen, etc.

b.  Decision-making hardships

One more inhibiting factor that was often pointed out was the difficulty in deciding to implement kaizen, etc., or in other words, in determining that safety would not be detrimentally impacted by the kaizen.

It is true that such decisions pertaining to the balance between safety and kaizen, etc. may beyond the scope of individual departments (or, that other departments may be hesitant to accept such a decision) and that this may be difficult to avoid. Therefore, it is important that executives and upper management proactively lead such decisions. And, it is necessary that logical criteria and methodology for determining that there would be no detrimental impact on safety be shared throughout the organization to ensure that there is no hesitation or discrepancies when it comes to decisions made by executives or upper management.

**(3) Actual Problems with Kaizen**

The fundamental reason why kaizen, etc. initiatives, are an urgent issue for TEPCO is because up until now, TEPCO has found peace by merely introducing new rules and work processes to address whatever troubles arise without fully examining the real root of the problem and conditions in the field, etc., which is a necessary process to address these troubles. And, as a result of the habit cultivated over many years of just letting these new rules play out without subjecting them to the PDCA cycle, rules have become excessively redundant and complicated, which is just the same as the "lack of risk awareness/lack of ability to ascertain

field conditions/lack of ability as an organization to make corrections" that were pointed out as deep-rooted factors and fundamental causes of the PP incidents.

Kaizen, etc. initiatives are intended to directly unravel and streamline these excessively redundant and complicated rules, but the expectation is that through continued kaizen, etc. initiatives, TEPCO will be able to figure out what it needs to do in order to avoid creating rules in the future that require kaizen, etc.

## 5. Overall Conclusions

In light of these interviews, we have come to the following three overall conclusions.

Firstly, as an organization, TEPCO is very weak when it comes to setting priorities and using the PDCA cycle.

When something happens, TEPCO's approach is to first and foremost think of all possible countermeasures and then implement all of them without setting priorities or engaging in the PDCA process. This organizational weakness of TEPCO has been pointed out time and time again by the NRMC, and is in line with the issues pointed out as the deep-rooted factors that led to the PP incidents, or namely, a "lack of risk awareness/lack of ability to ascertain field conditions/lack of ability as an organization to make corrections."

Regardless of this fact, during our interviews there were people that stated that, even though the situation has improved compared to the past, problems thought to be caused by insufficient prioritization and the lack of PDCA are still occurring on many levels. TEPCO needs to fundamentally change its conventional pattern of behavior, ascertain the fundamental causes of problems and figure out why it is not good at prioritization or PDCA, and then share those results with everyone in the organization so that it can come together to strive to make improvements.

Our second conclusion pertains to the importance of accurately conveying the fundamental significance of each individual's duties and initiatives, and eventually, the mission and fundamental significance of the existence of each department, to everyone in the company.

For example, the fundamental significance of initiatives aimed at revitalizing communication, such as encouraging workers to greet one another, needs to be properly conveyed to everyone in the company. In other words, the need to understand that by vitalizing communication, the company aims for everyone to be involved in the creation of a communication environment in which information about "dangerous things," "strange things," or "dislikes" can be quickly shared within the organization

without causing any psychological burden.

Only after each and every individual understands why they are engaging in their duties and these initiatives, and engages in them with the understanding of how they are positioned within their own department, the entire power station, and within TEPCO, will these individual duties and initiatives start to have an impact and lead to unity within the organization.

In particular, now that the company is finally entering a stage where it is not forced to consistently "put out fires," this is precisely the right time for the entire company to look 20, 30, and 50 years down the line over the mid/long-term at the fundamental vision for the company to determine not only what the objectives of individual projects, such as decommissioning and restart are, but also to determine what type of value the power stations and TEPCO can provide to society, and what type of company it needs to be to provide that value. And, sharing this vision is vital for improving motivation and also the sense of ownership amongst individual officers and employees.

Our third conclusion pertains to the importance of rooting good initiatives implemented to date as organizational initiatives and part of the company's culture.

The initiatives implemented over the approximate 12 years since the Fukushima Daiichi NPS Accident, and recent initiatives implemented by Site Superintendents and upper management over the last several years, in particular, have taken the entire organization in a good direction. However, going forward, it is important to not personalize these initiatives, but rather root them as organizational initiatives, and sustainable systems/mechanisms/culture.

Whereas we can't deny that the personalities of upper management and managers are not reflected in these measures, successful communication initiatives implemented to date, in particular, must not be allowed to die out, and we strongly urge that innovative steps be taken to root them in the organization.

Through these interviews, we could feel that everyone from GMs and TLs to General Managers are sincerely engaging in their duties amidst a harsh environment. The sincerity and sense of duty of these workers in the field are a valuable asset of TEPCO. We hope that upper management will draw from these assets and continue to strive to become a company that is truly trusted by society.

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