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Tokyo Electric Power Company Holdings, Inc.

Nuclear Reform Monitoring Committee:

Review of the TEPCO's Self-Assessment Effort on Nuclear Safety Reform

Overview of Review Activities

The Nuclear Reform Monitoring Committee (hereinafter referred to as “Committee”) conducted a review on the self-assessment of nuclear safety reform by Tokyo Electric Power Company Holdings, Inc. (hereinafter referred to as “TEPCO”) which aims at assessing the levels of achievement and reflecting the results for future improvement.

The Committee's Role in the Self-Assessment

Since the inception of the Nuclear Safety Reform Plan in 2013, TEPCO's management has provided quarterly progress reports on the implementation of the plan. While these reports are useful, it was decided that a more comprehensive self-assessment of progress should be conducted. It was also believed that a thorough self-assessment might identify areas in which the Nuclear Safety Reform Plan could be enhanced to provide an even greater measure of safety.

The Committee has provided its input through the self-assessment process and also set the “Criteria for the Goals and Objectives of Nuclear Safety Reform” (hereinafter referred to as “Criteria”) in advance of the assessment as a guiding principle for the review.

The Committee conducted site visits to the Kashiwazaki Kariwa Nuclear Power Station (hereinafter referred to as “Kashiwazaki Kariwa”) in November 2015 with primary focus on in-house technical self-sufficiency and emergency response capability, and to the Fukushima Daiichi Nuclear Power Station (hereinafter referred to as “Fukushima Daiichi”) in March 2016 regarding on-site nuclear risk management and exposure dose management.

The Committee received the report of TEPCO’s self-assessment on September 2, 2016. In order to aid in its review and provide the perspective of a nuclear operator, the Committee also invited Mr. Randall Edington, former Executive Vice President and CNO, Arizona Public Service to provide assistance.

In addition to the visits by individual Committee members and designated experts to the sites/regional offices and review of background information, interviews were conducted with managers in the headquarters of the nuclear divisions and at individual sites. Interviews were also conducted with managers of the Nuclear Safety Oversight Office, risk communicators and Social Communication Office (67 persons were interviewed in the entire review process). With the support by Mr. Edington, a Committee member further conducted a site visit to Palo Verde Nuclear Power Station, with the notable safety and performance records in the U.S. after the Palo Verde turnaround, the Emergency Operations Facility and the National SAFER Response Center. The Committee member had a substantial discussion with Palo Verde leaders and stakeholders in order to verify TEPCO’s progress in the light of international excellence and make sure that the recommendations by the Committee sufficiently considered the cultural differences.

Through the site visits, interviews and discussions with the nuclear leaders and international experts, the Committee thought that the self-assessment provided an overall accurate perspective on the current status of performance, and identified the meaningful areas for improvement for further reforms in the pursuit of performance excellence and the firm commitment to a nuclear safety culture. The Committee would like to stress that any self-assessment process must be critical by nature and therefore should identify areas for future improvement.

Observations and Findings

Based on the criteria for the self-assessment that were established by the Committee, it was found that TEPCO has attained a certain level of achievement as a whole and that the principles of Nuclear Safety Reform have been embodied in the organization. In this connection, the Committee believes that the Nuclear Safety Reform Plan drives the organization in the right direction, but it needs to be further advanced to make TEPCO an organization that provides ‘safety’ and ‘peace of mind’ above operations.

Improvements were especially noted in the following areas:

- Top management places a priority in nuclear safety as a fundamental part of its business. Safety culture awareness has permeated throughout the organization and has improved significantly.
- In order to enhance the governance, the necessity for an integrated management is recognized for mutually related activities. The revision of the management structure was launched in the nuclear divisions in line with this direction.
- An effective Nuclear Safety Oversight Office (NSOO) has been established. It is providing meaningful independent advice to line management and executives. This advice has prompted significant improvements in safety.
- OE (Operational Experience), CAP (Corrective Action Program), performance monitoring and trend analysis have been incorporated for further safety enhancement.
- Initiatives have been taken for the technical competence and human capacity building through the Human Resources & Organization Development Center and Nuclear Human Resource Training Center.
- Emergency preparedness has been enhanced from the aspects of both technical equipment and training.
- TEPCO has also made significant improvements in communication with its stakeholders. The flow of information from line management to risk communicators has become a regular practice. Periodic meetings for information sharing between the Social Communication Office headquarters and the Risk Communicators are effective. Constructive discussions have been made for the gathering of risk information from the sites and information disclosure to address the expectation of the general public.
- At Fukushima Daiichi, the idea of “ALARA (As Low As Reasonably Achievable)” has been adequately integrated into the business processes, such as setting the work

priorities by comparing the decrease of radiation risks on the environment against the increase of workers' risks concerning radiation and industrial safety.

The Committee also identified some areas where further attention and intensive efforts are required.

- Nuclear safety reform is a long journey in the continuous pursuit of excellence. Milestones should be established in order to share a sense of accomplishment and enhance personnel engagement.
- A lack of organizational alignment (i.e., a process to ensure all aspects of the organization are aligned with the realization of its vision) was observed among/within the sites which may result in issues or impacts on consistency of performance, management oversight and improvement/efficiency. This could result in people not pursuing the same goals.
- It is important to steadily conduct “Change Management” for a number of programs as a result of nuclear safety reform.
- Training needs are substantial. The incorrect mindset also exists that the person should know what is needed simply by becoming managers. The challenges of a complex site, like Fukushima Daiichi, require personnel skills well beyond those necessary for a clean, undamaged facility. The Nuclear Human Resources Training Center should have a waste management decontamination and decommissioning component and strive to incorporate relevant international experience.
- The concept of risk communication is fully recognized. In order to enhance precise recognition on risks and lead to build trust with stakeholders through day-to-day communication, further efforts are expected under the leadership by the Social Communication Office to establish a consistent philosophy toward risk communication of the individual Risk Communicators. Responsibility, jurisdiction and the chain of command among communication related departments should be revisited to have corporate communications function effectively, especially in the case of an emergency.

Recommendations

- Consistent efforts should be made to build a strong nuclear safety culture and instill the nuclear safety culture in an organizational culture.
- The need for formal training and/or professional facilitation for the managers should be evaluated to instill a strong safety culture in the organization. A comprehensive approach should be considered for the training (even for the training with technical focus) incorporating other management expectations. Training and qualification programs should also be reviewed relative to the top industry programs/standards. An integrated plan that addresses resources and other needs for effectively conducting (e.g., developing, instructing, attending) the training would be beneficial.
- Considering the large number of contractors/workers on site, a safety culture program should be developed to the same standards being implemented for TEPCO personnel reflecting the relationship between individual contractors and the power plant.
- Alignment of the activities is necessary for the organization as a whole. Internal communication of key information should be strengthened. Once developed, any initiatives should be steadily implemented. Their implementation should be monitored and accountable for planned/anticipated progress.
- Performance improvement activities (e.g. OE, CAP, benchmarking, self-assessment) and the training/qualification program should be better integrated into the business process considering the characteristics of individual power stations (while assuring the alignment).
- The knowledge about nuclear power plant operation among leadership should be enhanced and the role of operation personnel should be examined from the aspect of “operational focus”. Engineering capacity and “engineer’s conscience” as well as the understanding of operation should be enhanced within the organization.
- Benchmarking for nuclear safety, risk management, radiation protection and/or communications should be considered for Fukushima Daiichi, while the site is radiologically complex and very unique.
- NSOO is continuously working to improve its efficiency and effectiveness in raising the standards of TEPCO’s nuclear safety. It should improve the clarity with which it assesses its data to create actions. NSOO should also improve the rigor with which it ensures that these actions are completed.

- The Social Communication Office is expected to consistently carry out its role to win back the trust from stakeholders and take a proactive role in this function within the organization. In order to build an effective communication structure, the Social Communication Office should clearly state the expectations and requirements for the Risk Communicators for both normal and emergency situations. Communication drills should be repeatedly conducted and serious retrospection should be taken to assure the smooth transition of modal changes from normal to emergency situations. Communication practices should be further improved through benchmarking the practices at nuclear power plants overseas.

Conclusion

- TEPCO is making progress in implementing its Nuclear Safety Reform Plan and has made significant improvement in nuclear safety leadership, culture, operations and emergency preparedness. In order to make these changes into a strong nuclear safety culture and a part of an organizational culture, continuous efforts are expected. The long journey in the pursuit of excellence should not become complacent.
- The Committee believes that the self-assessment process is critically important and thus a successful self-assessment should identify areas for improvement. There are areas identified through the self-assessment requiring further improvement in both the nuclear safety and communications fields, such as improved governance, organizational alignment and the training and technical competence of TEPCO staff. As a result of the self-assessment TEPCO has further developed its action plans, implementation of which the Committee will continue to monitor.
- The Committee observes that TEPCO remains totally committed to improving nuclear safety and to achieving the highest safety standards. Continuation of the self-assessment practice is expected, as a part of this endeavor, which leads to the meaningful input to the nuclear safety reform.

Addendum: Recommendations for the Future Self-Assessment

- Revision of metrics should be considered for the future self-assessment such as,
 1. To conduct separate assessments for KK, 1F and 2F, and
 2. To narrow the scope for the assessment but further to break down the assessment guidelines (check lists) to sufficiently articulate the status and areas of improvement for each site.
- Understanding of the Performance Indicators/Key Performance Indicators should be enhanced. The Performance Indicators should also be critically examined to make sure they accurately represent the conditions being measured and are not based on data/conditions atypical with respect to those measured by other plants.
- Reviews about total exposure (person-Sv) per task and an assessment metrics for effective ALARA planning should be further considered. Metrics should be in place regarding the number of tasks with ALARA reviews, completeness of the review and weighted total person-Sv exposure per task.
- Areas to enhance the performance metrics to demonstrate organizational implementation of corporate safety policies should be further explored such as “How are the risk maps created and managed?”, “Is senior management briefed on changes to the risk maps?” and “Is there a management action tracking system when changes occur?”