

Efforts to Improve Working Environment and Reduce Radiation Exposure at Fukushima Daiichi Nuclear Power Station

Tokyo Electric Power Company Holdings, Inc.

At Fukushima Daiichi Nuclear Power Station, the working environment has been improved in various aspects, such as increasing convenience for workers engaged in the work and reducing radiation exposure. We will continue our efforts to improve the working environment by understanding on-site needs.

- 1) Use of zoning and reducing need to wear protective equipment on-site at the Fukushima Daiichi Nuclear Power Station

Decontamination work to control radioactive materials that had spread over the entire site (e.g. construction of facings) was completed by the end of FY2015 using methods such as removal of surface soil, base course construction, paving and mortar spraying, excluding rubble storage areas. In addition, dose rate monitors and radioactive aerosol monitors with continuous moving filter have been installed on-site where real time measurement results can be obtained.

Based on the progress of measures to reduce environmental radiation dose, the site has been divided into two separate zoning categories—high radiation areas surrounding Units 1-4 buildings and other areas. Efforts have been made to improve safety and efficiency by providing appropriate protective equipment for each zone and reducing workload, in order to reduce risk in radioactive environments while keeping areas treated with facings at the lowest possible contamination level.

- 2) ALARA Committee: beginnings and concept

When radiation exposure is considered a risk, one possibility is to avoid the risk itself (i.e. if no one encounters it, the risk will not occur), but there is a pressing need to proceed with decommissioning while putting safety first. As for ways to reduce risk, changing work methods to low-dose approaches through remote operations, removal of radiation sources, and shielding installation, are important as engineering measures (physical measures). In addition, operational measures such as work procedures, training (mock-ups) and time management will also be implemented as management measures. If those measures are still insufficient, radiation dose limits may also be enforced by having workers wear personal protective gear (protective equipment) such as shielding suits.

Among these measures, implementation of engineering measures has a great effect in reducing radiation exposure but also has a major impact on costs and the work schedule. Because it is difficult to make changes or additions immediately before starting work, measures need to be incorporated into the work design otherwise complications will arise during implementation. Therefore, it is crucial to examine measures to reduce radiation exposure in the early stages. It is also meaningful to discuss the implementation in the ALARA Committee based on the three rules of radiation protection (justification, optimization and dose limits) and in the spirit of ALARA (As Low As Reasonably Achievable) when optimizing radiation exposure. Because management measures and personal protective gear can even be implemented immediately before work with established operational processes, they have been confirmed through examination of safety beforehand and with a radiation management plan (RWA).