

Measures to prevent the spread of contamination in hot laboratory expansion and removal work at 1F Units 5 and 6

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1. Introduction

As work on measures to decommission reactors and improve the work environment progresses at Fukushima Daiichi Nuclear Power Plant, there are increasing numbers of samples requiring analysis in terms of characteristics such as radioactivity density and concentration.

At TEPCO, samples to be analyzed are divided between three analysis facilities depending on radioactivity concentration: Low-concentration samples at the Chemical Analysis Building, medium-concentration samples at the Environmental Management Building, and high-concentration samples at the hot laboratory in Units 5 and 6. Recently, Toshiba conducted expansion work at the hot laboratory in Units 5 and 6.

In this expansion work, exposure reduction was achieved by preventing contamination from being brought in from outside the building, and by improving work efficiency through reduction of physical burdens on the body, prevention of bodily contamination, and prevention of the spread of contamination of the area.

2. Contamination situation prior to start of work

Shoe exchange when entering the building has been implemented at Units 5 and 6 since the initial stage of the disaster. Contamination levels in the area after the shoe exchange have been maintained at an average of 160 cpm, and the ambient dose rate is at or below 0.1 $\mu\text{Sv/h}$. On the other hand, in the area before the shoe exchange, contamination levels and ambient dose rates are both high, at an average of 5,000 cpm and 2.5 $\mu\text{Sv/h}$ respectively.

3. Description of expansion work

The hot laboratory to be expanded was spread out broadly, even in the high-contamination area in front of the shoe exchange area, and there were concerns that, if left in that condition, there would be worsening of work efficiency and safety due to heavy contamination of equipment/gear, and increased exposure due to the rise in ambient dose rates. Therefore, the following measures were implemented:

- (1) Decontamination of the high-contamination area (guideline: 100 cpm)
- (2) Relocation of the shoe-exchange location to the front of the expanded work area and installation of laminated adhesive mats
- (3) Installation of shoe-exchange spaces and laminated adhesive mats in front of the entrances to each new hot laboratory room
- (4) Checking of work materials and tools brought into the expanded work area for contamination
- (5) Survey of ceiling panels for contamination prior to removal, and removal using local exhaust fans
- (6) Implementation of various measures to seal in contamination in removal of highly

contaminated equipment

- (7) Implementation of measures to prevent contamination from spreading when doing duct work at the rest station (uncontaminated area)

4. Results of work

The above measures lowered contamination levels and dose rates in the work area.

This enabled reduction of physical burdens on the body by allowing workers to wear dust masks (low-contamination work), prevented bodily contamination by preventing contamination from being brought in, and prevented the spread of contamination of the area by using a clean-shed and local exhaust fans. These measures contributed to completion of work on schedule, without any accidents or disasters.

These improvements in work efficiency contributed greatly to reduction of exposure.