

Radiation Exposure Dose Survey of the Small Rooms on the First Floor of the Reactor Building for Unit 1 of the Fukushima Daiichi Nuclear Power Plant

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For future removal of the fuel debris, repair of the primary containment vessel (PCV) in the reactor building (R/B) and related tasks are planned. To perform such work, it is necessary to grasp in advance the situations and the atmosphere dose rates of the work areas and conduct environmental improvement that allow such work to be performed. Because there still are areas whose actual environments in the field have not been clearly confirmed, we conducted surveys of such areas to confirm their actual environments.

In this report, we present the results of our surveys of the small rooms of the R/B for Unit 1.

1. Survey Plan

The surveys of the small rooms were conducted by setting up bases in low dose areas and having workers send remotely-operated robots and other equipment from the bases into the rooms. The next section presents the results for the individual small rooms surveyed.

2. Survey Results

(1) Traversing in-core probe (TIP) room

Small remotely-operated robots and other equipment were sent into the TIP room through a hole drilled in a wall of the room and a survey was conducted using the robots and equipment to determine the dose rate distribution and locate the contaminants. The result of the survey shows that the west half (the half on the PCV side) of the room is a high dose area and that the main contaminant is located in the instrumentation piping penetration section (the maximum value was 290 mSv/h). The dose rate measurements taken in the east half of the room are relatively low (less than 5 mSv/h), which means that the east half has been less affected by the contaminants and that indicated the possibility to perform the planned PCV repair work and related tasks.

(2) High pressure coolant injection system (HPCI) valve room

The dose rate distribution in the room was measured using small remotely-operated robots and other equipment. The result of the survey shows that the dose rate in the area around the HPCI piping penetration section (root part) is about 7000 mSv/h. It is deduced from this that contaminated vapor is the source of contamination that has flowed into and concentrated in the bellows cover of the penetration section. It is necessary to start studying dose reduction methods for this area.

(3) Main steam isolation valve (MSIV) room

The dose rate distribution in the room was measured by inserting survey equipment mounted on a long pole into the room. The result of the survey shows that there are highly contaminated areas in the room but the

dose in the east passage in the room is low, and that indicated the possibility to survey the adjacent small room for the reactor shutdown cooling system-pump (SHC-P) room.

3. Conclusions

By these surveys, we successfully obtained information about the actual environments of the target small rooms by devising methods and equipment for each room, without having workers to approach high dose areas. Since various tasks are planned towards removing the debris, further studies will be conducted by making use of experiences that have been gained from these surveys, with the highest priority given to reducing the exposure of workers.