

“Efforts to Reduce Radiation Exposure at the Takahama Power Station”

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This is a presentation concerning the efforts to reduce radiation exposure at the Takahama Power Station of the Kansai Electric Power. The collective dose at the Takahama Power Station has mostly been leveling off in recent years, with some ups and downs on what jobs were involved in each refueling outage.

An exposure reduction working group (WG) was set up recently at the Takahama Power Station in addition to the conventional exposure reduction activities (from the 18th periodical inspection of Unit 4 in 2008 onward). This WG aims at exposure reduction in the operation of periodical inspection, involving also the operators from contract companies.

The newly started exposure reduction activities are divided into two large categories shown as follows:

1. From an environmental viewpoint
 - Remove radiation source by injecting zinc while the plant is on-line
 - Adjustment of schedule for draining SG secondary water
 - Installation of temporary shielding
2. Reduction from the viewpoint of outage work activities
 - Assessment of Radiation Effects
 - Installation of portable shielding

Due to the implementation of Zn injection in plant operation, the radioactive Co on the surface of the primary system piping was replaced by Zn, and a 20 to 40% reduction of the dose rate of the primary system piping and the equipment was achieved as compared with periodical inspections before the start of the injection.

Because of the adjustment of schedule for draining SG secondary water, the operation period was able to be reduced by three days. While there was water shielding, the operation was performed by taking advantage of it, aiming at exposure reduction.

Plates of stainless steel with 1-cm thick lead plates attached to them on both sides were used for temporary shielding. The dose rate around the shielding fell by 20 to 40% with the installation of the temporary shielding, which proved effective in protecting operators. However, on the other hand, exposure accompanied the installation of shielding in the area of high dosage, and the area where shielding was effective overall

was limited to the area where many operators remain for a long time, and so there also remained the task of how to reduce the exposure at the time of introducing the shielding.

Based on the assessment of radiation effects, exposure reduction assessment was carried out and effective measures were examined. Since a number of different operations are performed in the same area during the time of periodical inspection, operators are exposed to dosage not only because of their own activities but also because of those of others. The WG offers to the operators prior information about when, where and how much the dose rate is anticipated to increase.

The introduction of simple shielding of a portable type where a lead plate is hung onto a ladder with an S-type hook can be mentioned as an example of the WG's new proposal. This portable and simple shielding was used near an RCP motor at the time of the periodical inspection of Unit 4, and it was found to be effective in reducing the usual dose rate of 0.1 mSv/hr to approximately 0.03 mSv/hr.

The awareness of exposure reduction was raised throughout the power station by the activities of the WG.

