Attachment

Further change in the storage level of waste water transferred to the Process Main Building (summary)

1. Summary

In regard with the large quantity of radioactive wastewater at turbine buildings of Unit 2 and 3 (hereafter stated as "high level wastewater"), we decided to urgently transfer it to the Process Main Building and High Temperature Incinerator Building, as we cannot deny the possibility of its leakage.

After that, we implemented the transfer to the Main Process Building and High Temperature Incinerator Building. As the water level reached the criterion (the first basement, floor level of the building), and transfer to the High Temperature Incinerator Building intervenes with other works, we suspended the transfer and checked the water level. As a result, the water level at the Main Process Building was stabled, however, it was confirmed that the water level at the High Temperature Incinerator Building tends to be decreasing. From later investigation, it is considered that there is a high possibility of leakage to the adjacent underground corridor, and transfer is being suspended. However, as the amount of high level wastewater at Unit 2 and 3 tended to be increasing, we decided to change the decision criteria and transfer to the Process Main Building.

After the transfer of the high level wastewater in the Turbine Building of Unit 2, the water level in the Main Process Building came close to the decision criteria (the first basement, 1.4m above the floor), however, as the high level wastewater in the Turbine Buildings of Units 2 and 3 tend to increase, we will transfer the water to the Process Main Building beyond the previous decision criteria of June 8th, 2011.

2. The summary of modification and the reason

(1) Modification summary

【Main Process Building】

	May 15th, 2011	June 4th, 2011	June 8th, 2011	This report
Transfer Volume	Approx. 10,000m3	Approx. 11,500m3	Approx. 14,200m3	Approx. 15,700m3
Criteria	Up to the first basement, floor level (OP3700)	Up to the first basement, bottom of penetrated area (OP4200)	Up to 1.4m above the floor level, first basement (OP5100)	Up to 1.9m above the floor level, first basement (OP5600) *

*: The transfer will be implemented in the range which could secure the water level difference of 90cm from underground water

(2) Modification reason

The water level of high level wastewater of Unit 2 and 3 tends to be increasing due to injection of water to reactors. To prevent possible leakage to the environment, transfer and storage is being carried out to/at Centralized Radiation Waste Treatment Facility, however, if the transfer is kept suspended longer, the risk of leakage will increase as the water level may increase beyond OP4000.

Therefore, we transferred 2,700m3 of the high level wastewater in the Turbine Buildings of Unit 2 and 3 to the Main Process Building as well as the surface condenser, however, after termination of the transfer, the water level in the Turbine Building of Unit 2 and 3 tend to increase again and risks that the water level of the high level wastewater in the turbine buildings exceeds OP 4000 and the water leaks to the outside of the system before the Radioactivity Treatment System commences stable operation persists. For this reason, we further revise the water storage level at the Process Main Building to reduce the risk of possible leakage to the outside of the system.

By making modifications to the storage level regarding the transfer to the Main Process Building as stated above and transferring 1,500m3 of high level wastewater, we can defer the time when the water level in the Turbine Buildings of Unit 2 and 3 reach OP4000 by three days and reduce the risk of possible leakage.

(3) About the criteria

With regard to the transfer of high level waste water at Unit 2 and 3, priority is put on preventing contamination by not allowing any leakage of high level waste water outside of the system.

High level wastewater is transferred from Unit 2 and 3 to the Main Process Building basement, and the water level is supposed to reach the vicinity of 1.4m above the floor of B1 based on the original report. From now on, in transferring beyond the initial criterion, we need to define the new criterion in order to prevent possible leakage outside of the system.

For the prevention of leakage from the building, we will constantly keep the water level in the turbine buildings lower than underground water as we use the underground water pressure.

As it is necessary to take into account the diurnal variation as well as seasonal variation (it is estimated as 50cm) in order to keep the needed water level difference of

40cm obtained from the evaluation, we will transfer the water in the way to lower the water level of the building when the water level difference from underground water fall below 90cm and underground water level declines.

On the other hand, treatment to block water leakage at the penetrated part within and out of the Main Process Building has already been completed. However, taking account of the fact that there was a leakage from the High Temperature Incinerator Building to the adjacent underground corridor, we will examine the reliability of penetrated area of the Main Process Building.

The High Temperature Incinerator Building started receiving the high level wastewater in the Turbine Building of Unit 3. After that, as there was an interference with the other work, we stopped the transfer, checked the water level and confirmed the lowering trend. We investigated where the leaked water went. As the water level in the adjacent underground corridor was increasing, radiation of water in the underground corridor was higher than the radiation of underground water, and the water levels of the High Temperature Incinerator Building and underground corridor approached and tended to be stable, we presume that the high level wastewater in the High Temperature Incinerator Building was leaking to the underground corridor.

As the high level wastewater is stored in the High Temperature Incinerator Building and radiation dose is too high to approach, we examined the outflow pathway of the leaked water to the underground corridor based on the record of waterproof construction work etc. There are several possible causes for the leakage such as shoddy workmanship at the concrete fill, shoddy workmanship of the water seal at the penetrated part of piping or conduit, or oversight of work at the penetrated part. By comparing these causes, the possibility of leakage from the concrete fill cannot be denied, even though it is difficult to identify the cause.

On the other hand, as to the penetrated parts of the Process Main Building, as the water level in the 2nd basement already storing water is stable after transfer, these are reliable. As for the 1st basement, the penetrated parts lower than 90cm below the water level (OP 5700) from the underground water level which conflict with the water storage restriction (as of 19th June, OP 6600) are only penetration of piping (19 places). From the work record, there were no shoddy workmanship such as oversight in applying sealer or falling off of shutoff plates, these are reliable.

Should the water seal is incomplete, as the range of the leakage is limited as the outside of the penetrated parts below the water level (OP5700) is surrounded by underground corridors with rise parts and walls, it is visually confirmed that there are no significant crack in the underground corridor, and it is possible to retrieve the high

level wastewater leaked in the underground corridor by pump, the possibility of leakage to outside of the system is sufficiently low.

As such, we store water at the level which possibility of leakage to outside of the system is sufficiently low (OP 5700) with the safe side (OP 5600). We also transfer in the range which we can keep the water level difference of 90cm from the underground water level.

(4) Radiation protection

In the Process Main Building, the high level wastewater is stored up to the basement floor. The level of the radiation dose is kept low as the evaluation of the radiation dose is estimated as 1.1×10^{-2}mSv/h. The airborne radiation around the Process Main Building decreased after the transfer (maximum 0.3mSv/h) compared with the point before the transfer (maximum 0.9mSv/h). It is assumed that the source of the radiation declined as the time passed and the significant increase of radiation dose cannot be confirmed.

On the other hand, the evaluation of radiation dose at the floor level in the case the water was transferred up to the 1st basement floor level assumed to fall below 1mSv/h, however, the radiation dose is assumed to be high as more than 100mSv/h in some areas such as the neighborhood of the aperture. For this reason, it was planned to ensure the space to re-transfer when the high level wastewater is transferred beyond the 1st basement floor level at first. Now, therefore, we will seek the radiation protection through the operation control as we are now modifying the storage water level of the Process Main Building to reduce the risk of the leakage to the outside of the system and it is difficult to ensure the space to re-transfer. Specifically, we prohibit the work at the 1st floor when the water was transferred up to the 1st basement floor level in principle. If the work is necessary, we will prevent the work at the high radiation dose area such as the neighborhood of the aperture as much as possible. And also, we will develop an appropriate radiation protection direction and respect it, and implement the operation appropriately equipped.

As the high level wastewater is transferred to the 1st basement floor level of the Process Main Building in order to decrease the risk of the leakage to the outside of the system, we will also manage to decrease the radiation dose in the Process Main Building, by lowering the water level below the 1st basement floor level when the risk decrease due to the stabilization of the Radioactivity Treatment System operation.

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