

## **Tritium removal test for Decommissioning of FUGEN**

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"FUGEN", is the heavy water moderated, light water cooled, pressure tube type reactor developed as the proto-type one with 165MWe, and has been shut down after 25 years operation. The program for the decommissioning of FUGEN had been prepared to complete the whole decommissioning until 2028. Following the approval of the decommissioning program in 2008, we are dismantling a part of the facilities in the turbine building, and also decontaminating the contaminated system, especially the heavy water system.

Heavy water in the system was used as the moderator and has already drained from the system after the termination. However, relatively large amount of tritium, which was generated by  ${}^2\text{H}(n,\gamma){}^3\text{H}$  reaction mainly in the operation, is remaining in the heavy water system. Tritium is a beta-ray source and has a volatile feature as an isotope of hydrogen; therefore, it is required to prevent the inhalation of tritium by using a tight protective gear in the dismantling work of the heavy water system, which results in degradation of workability.

For this reason, it was planned to remove the tritium from the heavy water system as complete as possible before the dismantling work for the system. Previously, tritium removal methods with through-air drying, vacuuming and heating were examined, by using the equipment in the heavy water up-grade facility and the heat exchangers of heavy water pumps.

As the results, these processes were basically effective for removing the tritium. After the removal operation, release behaviors of tritium in the specimens were also measured by exchanging an inner air of each specimen at constant intervals. The release rates from inner surface of the specimen, which were normalized by both an inner surface area of the equipment and an interval time as the releasing duration, could be expressed as the same tendency in a decrease. Presently, we are preparing to remove the remaining tritium in the heavy water system including the calandria as a reactor core structure with using the tritium removal device designed on the basis of above investigations.

In this paper, experimental results for removing the tritium remaining in the heavy water system of FUGEN is described.