

Update on Investigations on incidents of leakage from the coolant channels in KAPS units

AERB has been providing updates on the event of leakage from a coolant channel from KAPS-1 on March 11, 2016 and the status of the investigations being performed for establishing the causes of the event. The last update in this regard was issued on July 1, 2016. The present update brings out further progress in the investigations.

The affected portion of the failed coolant channel in KAPS-1 has now been removed from reactor and brought to a laboratory which has sophisticated examination facilities with radiation shielding. Removal of the affected portion of the channel was done after devising special tools and procedures to ensure that no valuable evidence related to the failure is lost in the process of removal. It also required fabrication of a specially designed shielded flask as the removed portion of the channel was to be transported to the laboratory located about 300 kms away, preserving the evidences. These aspects were specifically reviewed by AERB before approving the removal and transportation of the channel.

After bringing the affected portion of the channel to the laboratory, preliminary examinations have been carried out. These examinations have confirmed presence of a number of through wall cracks in the channel. The existence of localised corrosion spots was also confirmed on the outer surface of this channel. Similar corrosion spots were also seen on the outer surface of the channels removed from KAPS-2 as part of the investigations taken up after observing a minor leak from a coolant channel earlier, as brought out in the last update. Based on the findings of the preliminary examinations, AERB has asked for a detailed plan for failure analysis of the KAPS-1 channel and completion of the investigations for establishing the root cause of coolant channel leaks expeditiously.

The investigations on the causes of the corrosion spots seen on KAPS channels point to the possible presence of some trace impurity in the carbon dioxide gas, which is used in the annulus gas system of coolant channels in KAPS units. Detailed investigations in this regard indicate that this could have happened sometime after 2012. Further investigations for determining the trace impurity and causes of the corrosion spots are in progress.

In the meantime, as mandated by AERB, critical inspection of coolant channels has been being carried out in other operating PHWRs to check for existence of similar corrosion spots and any other defect. The inspections covering more than 80 channels of PHWR stations at all the sites did not show the existence of corrosion spots or any other defect in any station other than KAPS-1&2. The problem of corrosion spots on the outer surface of coolant channels is found to be specific to KAPS-1&2 units only. As an abundant precaution, AERB has asked other operating PHWRs to further strengthen the quality assurance checks on the carbon dioxide gas being used in annulus gas system.

Pending completion of the investigations, both the units of KAPS-1&2 are kept under shutdown. The fuel from the reactor core of both the units have been unloaded as part of the preparatory activities for coolant channel replacement campaign.

AERB will keep on providing further updates based on the investigation findings of KAPS events.