

**Update on Investigations on incidents of leakage from the coolant channels in KAPS-1&2 units**

KAPS-1&2 units had experienced the events of leak from the coolant channel on March 11, 2016 & July 01, 2015 respectively. AERB has been providing updates on these events and the status of the investigations being performed for establishing the causes of these events. The last update on the status of investigations of these events was issued on January 19, 2018. This note brings out the conclusions made and the actions taken based on the investigation of these events.

Following these events, failed as well as some other coolant channels were removed from KAPS-1&2 units and examined in a facility in BARC, Mumbai. Also, detailed in-situ examination of the coolant channels of KAPS-1&2 units by non-destructive method were completed. Related to these, experimental and analytical studies were undertaken in the various facilities of the department for the purpose of investigations. Based on all the investigations, it has been concluded that unlisted impurity (hydrocarbons) in the carbon dioxide gas used in the annulus gas system of these reactors, resulted in shallow localised corrosion spots on the outer surface of coolant channels and corresponding generation of hydrogen. Shallow localised corrosion spots led to gradual absorption of the hydrogen by the coolant channels, which affected the material properties. The deteriorated material properties caused the events of leak from the coolant channels.

As brought out in earlier information updates, after the events in KAPS-1&2, inspections were performed expeditiously in all the other Pressurized Heavy Water Reactors (PHWRs) in the country. These inspections had confirmed that the localized corrosion phenomena was limited to KAPS 1&2 reactors alone. Based on the outcome of investigations, specifications for CO<sub>2</sub> gas and its quality assurance checks have been made more stringent for all the operating PHWRs. Scope of coolant channel in-service inspection programme has been enhanced by including requirement for detection of localised corrosion during periodic inspections.

Subsequent to these events, coolant channel replacement activities were taken up in KAPS-1&2 units. These activities have been completed in KAPS-2 unit and its start-up activities are under review.

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