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 March 08, 2017. The present update brings out further progress in the investigations.

As reported earlier, the sections of the failed coolant channels from these units were removed and brought to a facility in Mumbai for examination. Apart from the observation of cracks in these channels, examination of these coolant channels also indicated shallow multiple localized corrosion spots on their outer surface. Removal and detailed examination in laboratory of three more healthy channels, and in-situ nondestructive examination by refined tooling of large number of channels on the reactors indicated that localized corrosion has taken place practically in all the coolant channels of KAPS-1&2. Both reactors have a total of 612 coolant channels.

As was reported earlier, presence of some trace impurity was identified in the carbon dioxide gas, which is used in the annulus gas system of such reactors. It is indicated that the gas supply since 2012 could have presence of such impurity. Detailed investigations through series of experiments carried out simulating the reactor environment conditions of radiations, temperature etc., have now revealed that the localized corrosion had occurred due to presence of trace impurity (identified as a hydrocarbon) in the CO_2 gas. Through these experiments it has been established that presence of such trace impurity in annulus gas mixture form certain products under reactor environment conditions, which are capable of causing localized corrosion on the coolant channels under prolonged exposure condition. As brought out in earlier information updates, inspections were performed expeditiously in all the other Pressurized Heavy Water Reactors in the country, after the events in KAPS-1&2. These inspections have confirmed that the localized corrosion phenomena was limited to KAPS 1&2 reactors alone. Based on the outcome of

investigations, specifications for CO_2 gas and its quality assurance checks have been made more stringent for all operating reactors. The capability of coolant channel leak detection system was also analysed and found to meet the design requirements.

AERB will continue to provide further updates on the progress of investigations on the incidents of leakages from coolant channels in KAPS 1&2.