Abstract

Safety aspects of the installation and operation of a nuclear reactor to be very important because the incidence of accidents in nuclear energy applications in several Nuclear Power Plant. An example that occurs in the reactor power Three Mile Island Unit 2 (TMI-2) in Pennsylvania USA, the beginning due to loss of coolant (Loss of Coolant Accident, LOCA) where the incidence of events ultimately leading to a severe accident (severe accident, SA). Although it is categorized as a severe accident, but the integrity of reactor pressure vessel (PWR type) remain intact and no radioactive material products out into the environment. Sustainability of the cooling phenomenon needs to be done further research and study in an effort to mitigate the accident. The experiments are performed to simulate the cooling process in the case of a severe accident at TMI-2 by using the test HEATING-01 (Heat Transfer in Narrow Gap) annulus vertical rod for bottom flooding based on the initial temperature variation, with size narrow gap 1.0 mm. So that the results obtained when the cooling curves for the three variations of the initial temperature is the higher temperature indicates the beginning of the film boiling regime lasted longer and faster core boiling regime, heat flux values seen at 600°C initial temperature of the wall superheat 2187.76 kW/m² at 588.84 K.

Keywords: Heating-01, boiling regime, bottom flooding, severe accident, the heat flux
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