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1D/2D ANALYSES OF THE LOWER HEAD VESSEL IN CONTACT WITH HIGH TEMPERATURE MELT

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Abstract

One- and two-dimensional analyses were performed for the ceramic/metal melt and the vessel to interpret the temperature history of the outer surface of the vessel wall measured from typical Al2O3/Fe thermite melt tests LAVA (Lower-plenum Arrested Vessel Attack) spanning heatup and cooldown periods. The LAVA tests were conducted at the Korea Atomic Energy Research Institute (KAERI) during the process of high temperature molten material relocation from the delivery duct down into the water in the test vessel pressurized to 2.0 MPa. Both analyses demonstrated reasonable predictions of the temperature history of the LHV (Lower Head Vessel). The comparison sheds light on the thermal hydraulic and material behavior of the high temperature melt within the hemispherical vessel.