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**Estimation of Direct Containment Heating Loads in KNGR
Using CONTAIN Code**

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Abstract

The CONTAIN 1.2 analyses were performed to estimate the containment pressure loading due to DCH in the KNGR containment. Three scenarios, designated as Scenarios V, Va, and VI, were selected as bounding cases of DCH sequence in conformity with the NRC's DCH issue resolution study of Zion plant. Conservative initial conditions in the RCS and the containment before vessel breach (VB) and some phenomenological assumptions were considered. For phenomenological processes that are well understood, a standard methodology for mechanistic models in the CONTAIN code was used, including debris-gas heat transfer, chemical reaction, particle trapping, debris transport, steam blowdown, and hydrogen combustion. Based on the CONTAIN 1.2 calculation results, the maximum pressure and temperature occurred in the case of Scenario Va where the resulting pressure loading in the KNGR containment dome due to DCH was 0.530 MPa. This pressure loading is much lower than the KNGR containment pressure capacity associated with the Factored Load Category allowables of 0.839 MPa, assuring that the KNGR containment is robust to the DCH phenomenon.