

Transient Simulation Using SPACE for ATLAS Facility to Investigate the Effect of Heat Loss on Major Parameters

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Abstract : A heat loss model for ATLAS facility was introduced using SPACE code predefined correlations and various dialing factors. As all previous simulations were carried out using a heat loss free input; the facility was considered to be completely insulated and the core power was reduced by the experimentally measured values of heat loss to compensate to the account for the loss of heat, this study will consider heat loss throughout the simulation. The new heat loss model will be affecting SPACE code simulation as heat being leaked out of the system throughout a transient will alter many parameters corresponding to temperature and temperature difference. For that, a Station Blackout followed by a multiple Steam Generator Tube Rupture accident will be simulated using both the insulated system approach and the newly introduced heat loss input of the steady state. Major parameters such as system temperatures, pressure values, and flow rates to be put into comparison and various analysis will be suggested upon it as the experimental values will not be the reference to validate the expected outcome. This study will not only show the significance of heat loss consideration in the processes of prevention and mitigation of various incidents, design basis and beyond accidents as it will give a detailed behavior of ATLAS facility during both processes of steady state and major transient, but will also present a verification of how credible the data acquired of ATLAS are; since heat loss values for steady state were already mismatched between SPACE simulation results and ATLAS data acquiring system. Acknowledgement- This work was supported by the Korean institute of Energy Technology Evaluation and Planning (KETEP) and the Ministry of Trade, Industry & Energy (MOTIE) of the Republic of Korea.

Keywords : ATLAS, heat loss, simulation, SPACE, station blackout, steam generator tube rupture, verification

Conference Title : ICNESSC 2017 : International Conference on Nuclear Engineering Systems and Soft Computing

Conference Location : San Diego, United States

Conference Dates : December 18-19, 2017