

## CFD Application on IRWST Hydrodynamic Analysis during the Sparger Air Venting

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### Abstract

A numerical study was performed using preleased FLUENT V4.5 to investigate the applicability of the CFD model for IRWST hydrodynamic analysis during the sparger air venting. Transient calculations were performed with the compressible VOF model on the selected ABB-Atom Unit Cell Test data. This study was mainly focused on the simulation of the bubble formation process in the water pool and time varying pressure history during the air venting from the sparger. The simulated peak pressure was over-predicted in general, but the main frequency is in good agreement with the simulated data. It was shown that there was a strong dependence on the mass discharge rate of the air trapped in the vent line. The peak pressure acceptable for the conservative evaluation of the sparger performance was obtained by reducing the air discharge velocity. This indicates that the proper estimations of the air venting velocity consistent with the sparger design and operating conditions is essential for the application of FLUENT V4.5 to the sparger performance analysis of KNGR.