

# “Thermal Hydraulic Performance Analysis of a Printed Circuit Steam Generator (PCSG) in Innovative Smart-Plus Reactor: A Proof of Concept Study”

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The Printed Circuit Steam generator (PCSG) is a kind of Printed Circuit Heat Exchanger (PCHE) designed for steam generator application. The PCSG manufacturing process is similar to the PCHE. The PCSG was suggested to be used in the innovative SMART-Plus reactor. Two PCSG designs were considered, one incorporating monitoring channel plates and the other without. The design with monitoring channels was introduced due to the inherent challenges in conducting in-service inspections with the design lacking these channels. To validate the PCSG concept and verify its thermal hydraulic performance, several experimental tests were conducted using two mockups in the SMART Integral Test Loop (ITL) facility. The tests simulated the operating conditions of SMART Plus reactor and its thermal hydraulic parameters such as temperature and pressure. The test facility comprised a primary circulation loop representing the hot side, and a secondary circulation loop representing the cold side. The two mockups were designed and manufactured to mirror the two PCSG concepts: one with monitoring channel plates and the other without. The results demonstrated the viability of the PCSG design as a superheated steam generator. Hence, it was concluded that introducing the PCSG to the SMART-Plus Design is a viable option.

## Speaker Bio

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