World Academy of Science, Engineering and Technology
International Journal of
Vol:8, No:, 2014

# Verification and Validation of Simulated Process Models of KALBR-SIM Training Simulator

**Authors :** T. Jayanthi, K. Velusamy, H. Seetha, S. A. V. Satya Murty

**Abstract :** Verification and Validation of Simulated Process Model is the most important phase of the simulator life cycle. Evaluation of simulated process models based on Verification and Validation techniques checks the closeness of each component model (in a simulated network) with the real system/process with respect to dynamic behaviour under steady state and transient conditions. The process of Verification and validation helps in qualifying the process simulator for the intended purpose whether it is for providing comprehensive training or design verification. In general, model verification is carried out by comparison of simulated component characteristics with the original requirement to ensure that each step in the model development process completely incorporates all the design requirements. Validation testing is performed by comparing the simulated process parameters to the actual plant process parameters either in standalone mode or integrated mode. A Full Scope Replica Operator Training Simulator for PFBR - Prototype Fast Breeder Reactor has been developed at IGCAR, Kalpakkam, INDIA named KALBR-SIM (Kalpakkam Breeder Reactor Simulator) wherein the main participants are engineers/experts belonging to Modeling Team, Process Design and Instrumentation and Control design team. This paper discusses the Verification and Validation process in general, the evaluation procedure adopted for PFBR operator training Simulator, the methodology followed for verifying the models, the reference documents and standards used etc. It details out the importance of internal validation by design experts, subsequent validation by external agency consisting of experts from various fields, model improvement by tuning based on expert's comments, final qualification of the simulator for the intended purpose and the difficulties faced while co-coordinating various activities.

**Keywords :** Verification and Validation (V&V), Prototype Fast Breeder Reactor (PFBR), Kalpakkam Breeder Reactor Simulator (KALBR-SIM), steady state, transient state