



Header and Multiple Channel Behavior

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Panel on Header Modeling & Multiple Channel Behavior

- **Formed to:**
 - Review header/multiple channel behavior during accident phases.
 - Review available header experiments.
 - Review ACR header/multiple channel model.
 - Define R&D program to address and close header/multiple channel issues.
 - Monitor and guide R&D program.
- **Two meetings to date:**
 - First meeting focused on panel mandate, initially on header issues.
 - Second on expanded mandate to include multiple channel behaviour and on identification of R&D program elements.



R&D Program Elements Identified

- **Systematically assess CATHENA model of ACR during accident phases:**
 - Header nodalization, number of channel groups, azimuthal feeder location and flow regime (examine extremes of mixed to stratified including interfacial area for condensation).
 - Effects of these parameters on cladding temperature behavior and ECC effectiveness.
- **Assess Available Data from Header Experiments:**
 - Quality, consistency of data from steam-water experiments in LASH and, Component Characterization facilities, and air-water experiments in Transparent Header Facility.
 - Usefulness and representiveness (of equivalent reactor conditions) of data for improving understanding of header/multiple channel behaviour and for CATHENA model improvements.



R&D Program Elements Identified (cont.)

- **Examine feasibility of tests using Transparent Header Facility, with additional instrumentation to record feeder flows, and more detailed measurements of header phase distribution.**
- **Examine feasibility of supplementing/improving instrumentation in and around existing or newly-designed RD-14M headers.**
- **Assess potential use of CFD codes to model 3-D header behaviour and of using results to improve CATHENA model (nodalization and flow regime characterization).**
- **Prepare a detailed plan with milestones for the path forward, including design, construction and testing of new steam-water header facility.**



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