framatome

PWR Classroom System Training

Based on PKL Integral Test Facility Results

Classroom training course on pressurized water reactor (PWR) thermal-hydraulic system behavior with PKL experimental results

Challenge

Operators in nuclear power plants (NPPs) have to be prepared to any kind of operational or accidental transients. Understanding the thermal-hydraulic behavior of a PWR is a key point for a better incident or accident management.

Solution

We offer you a training based on our experience as operator of the PKL test facility. The PKL test facility is a scaled-down replication of a 4-loop-type PWR. The test facility is scaled to simulate the thermal-hydraulic system behavior of the full-scale power plant under accidental conditions.

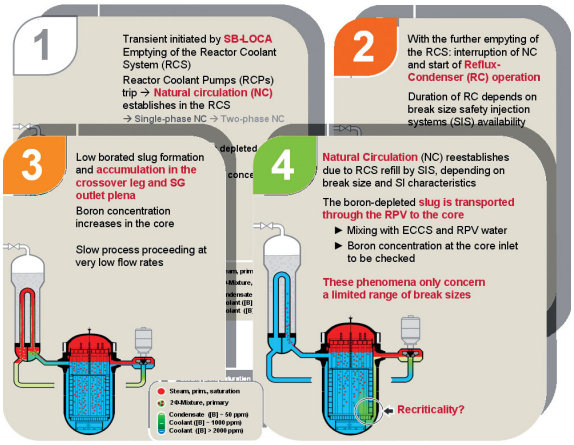
We convey basic thermal-hydraulic principles during various accident scenarios. Alternately, the focus can be on a particular scenario and related phenomena, such as primary or secondary feed-and-bleed procedures for accident management employed during station blackout or failure of residual heat removal system (RHRS) under cold shutdown conditions.

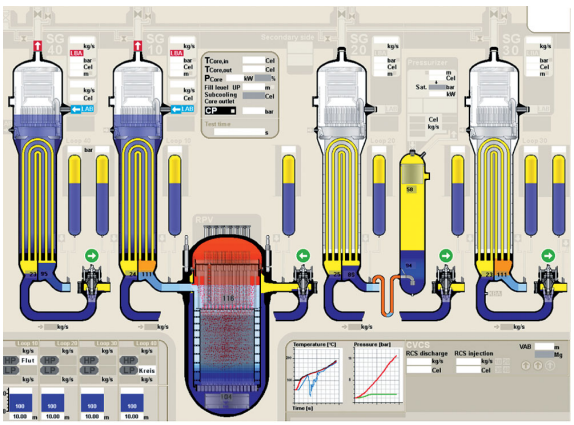
Our skilled trainers have extensive experience in conducting and interpreting integral tests as part of international programs (OECD) and a wide breadth of experience in training NPP personnel.

Upper Plenum Test Facility (UPTF) experiment (1:1 scale) results supply background information on flow phenomena.

Customer benefits

- Increased safety through a comprehensive and clear explanation of all relevant thermal-hydraulic phenomena based on high resolution database
- Unique database of PWR thermal hydraulics during operational transients insufficiently covered by thermal-hydraulic system codes





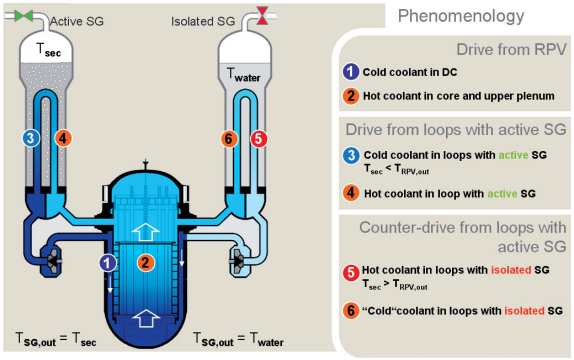


Illustration of training documents

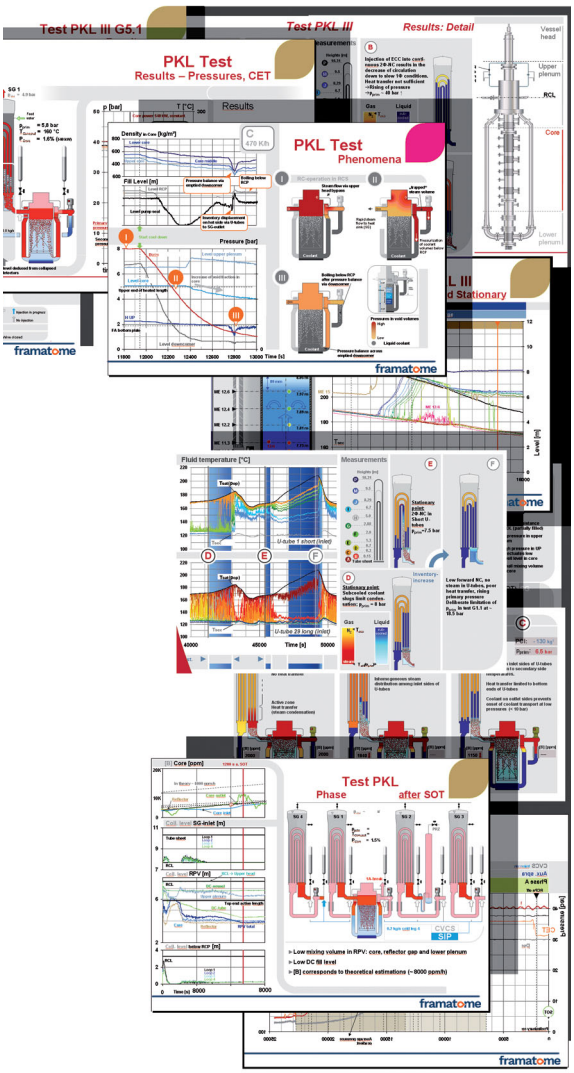
Your performance
is **our** everyday **commitment**

Technical information

Comprehensive visualization of accident evolutions based on PKL results from a broad variety of experimental topics and scenarios enhances the understanding of thermal-hydraulic phenomena.

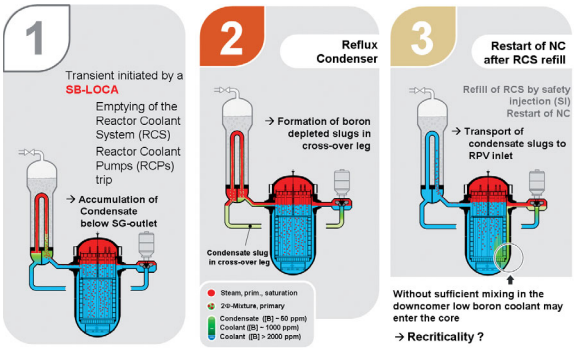
The experimental database includes:

- Large break/small break/intermediate break loss-of-coolant accident
- Steam generator tube rupture
- Main steam line breaks
- Station blackout, loss of feedwater transients
- Failure of RHRS from cold shutdown condition
- Efficiency of accident management (bleed-and-feed) procedures
- Systematic studies on thermal-hydraulic phenomena:
  - Single-/two-phase natural circulation
  - Reflux condenser conditions with/without non-condensable gases



Key figures

Database unique in the world derived from more than
200 experiments



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