Confidence in ESBWR Safety Features

INPRO Dialogue Forum

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IN 2.1.4: Confidence in innovative components and approaches

AL 2.13: “Before the introduction or enhancement of inherent safety characteristics and use of passive safety systems the validity of these approaches has been established by appropriate RD&D programs.”
ESBWR ... ‘Proven’ innovation

PCCS heat exchanger test
Depressurization Valve test
drywell to wetwell vacuum breaker test

Panda Full Height Containment Test facility

BiMAC testing

GIST facility

Isolation Condenser Testing

natural circulation proven at Dodewaard

FMCRDs from ABWR

fuel – modified GNF2

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Depressurization Valve (DPV)

DPV Under Test at Wyle Laboratories

CLOSED

OPEN
GDCS Integrated System Testing (GIST)

• GDCS is a new feature; extensive testing
• Integrated systems testing performed
• Full-scale in vertical direction
PCCS Heat Exchanger Test

PCCS is new feature; extensive testing

PCCS heat exchanger testing was done in Italy in same facility used for ICS HX testing

Because of lower power, both halves of full-size unit could be tested
PCCS Heat Exchanger Integral Testing

Integral systems testing performed in Japan and Switzerland

Full-scale in vertical direction

Paul Scherrer Institute (PSI), Switzerland
Isolation Condenser Testing

ICs are used in BWR/2s & 3s

- Dresden 2/3
- Oyster Creek
- Nine Mile 1
- Tube and shell configuration

ESBWR is same in principle, but different geometry

- One full-scale half unit tested over wide range of operating conditions
BiMAC Testing

Single Channel Test

Systems Effects Test