



## ***Integral Isolation Valve (IIV) Design Update***

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**(Redacted Version)**

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## Purpose/Objective

- Discuss contents of planned technical report to be submitted to NRC
- Obtain NRC comments/feedback
- Discuss regulatory observations regarding the IIVs

## IIV Technical Report

- IIV technical report is being prepared, planning to submit the technical report to NRC by the end of October 2013
- Contents of the technical report include:
  - Design Overview
  - Regulatory Conformance
    - Operating Experience
    - Environmental and Seismic Qualification
    - Pre-service Testing
    - In-service Testing
    - Diagnostic Testing
    - In-service Inspection
    - Leakage Detection
  - PRA and FMEA
  - mPower's position on the IIVs
    - Low Break LOCA Elimination
    - Eliminate GSI-191 Concerns



## IIV Benefits

**Enhances Plant Safety by Maintaining Primary Coolant Inventory**



# Exterior View of IIVs



# DESIGN OVERVIEW

## Letdown IIV Design

- [ ]
- Incorporates [ ] valve operating experience and lessons learned

**IIVs Utilize Proven Design Features**

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**Letdown IIV**



## RCI Makeup & ECC Injection IIV Design

- [ ]
- RCI makeup IIVs– [ ]
- ECC Injection IIVs – [ ]
  - Extensive operating experience
- Incorporates [ ] operating experience and lessons learned

**Utilizing Proven Design Features Which Provide Immediate Isolation**

# RCI Makeup IIV

# ECC Injection IIV

# IIV Cross-Sectional Vessel Penetration

# REGULATORY CONFORMANCE



# Regulatory Conformance

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# PRA and FMEA

# Risk Significance

**Only the ECC Injection Valves Meet the Risk Significance Threshold**



# Potential Failure Locations



## Reliability Data Collection

- Sources considered
  - INEEL/EXT-98-0082, Selected Component Failure Rate Values from Fusion Safety Assessment Tasks, L.C. Cadwallader, September 1998
  - Risk Analysis for Process Plant, Pipelines, and Transport, J.R. Taylor, Taylor Associates Aps, Denmar
  - EPRI TR-1021086 Pipe Rupture Frequencies for Internal Flooding PRAs Rev 2
  - Gasket/bolting/weld failure data
  - Gasket manufacturer failure/leak data
- Very low frequency events
- Value in qualitative comparison

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## **mPOWER's POSITION ON THE IIVs**

## mPower's Position on the IIVs

- [

- GSI-191

- [

- ]

## Conclusions

- IIVs[

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## Path Forward

- IIV technical report is being prepared, planning to submit the technical report to NRC by the end of October 2013
- Feedback from this meeting will be considered in the development of the technical report
- Plan to keep NRC advised as the design of the IIVs progresses
- NRC to convey their position

# Questions

## Abbreviations / Acronyms

DBA – Design Basis Accident  
DCD – Design Certification Document  
ECC – Emergency Core Cooling  
FMEA – Failure Modes and Effect Analysis  
GL – Generic Letter  
GSI – Generic Safety Issue  
IIV – Integral Isolation Valve  
IPIT – Intermediate Pressure Injection Tank  
JOG – Joint Owners Group  
LOCA – Loss-of-Coolant Accident  
MOV – Motor Operated Valve  
PRA – Probabilistic Risk Analysis  
RCI – Reactor Coolant Inventory  
RCS – Reactor Coolant System  
RCPB – Reactor Coolant pressure Boundary  
RG – Regulatory Guide  
RVF – Reactor Vessel Flange  
RWST – Refueling Water Storage Tank