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Integral Isolation Valve (IIV) Design Update

September 17, 2013

(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

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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

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IIV Benefits

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Enhances Plant Safety by Maintaining Primary Coolant Inventory

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Exterior View of IIVs

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DESIGN OVERVIEW

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Letdown IIV Design

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- Incorporates [ ] valve operating experience and lessons learned

IIVs Utilize Proven Design Features

[Proprietary per Affidavit 4(a)-(f)]

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Letdown IIV

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RCI Makeup & ECC Injection IIV Design

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- RCI makeup IIVs– [

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- ECC Injection IIVs – [

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

Utilizing Proven Design Features Which Provide Immediate Isolation

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RCI Makeup IIV

ECC Injection IIV

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IIV Cross-Sectional Vessel Penetration

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REGULATORY CONFORMANCE

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Regulatory Conformance

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PRA and FMEA

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Risk Significance

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Only the ECC Injection Valves Meet the Risk Significance Threshold

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Potential Failure Locations

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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

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mPower's Position on the IIVs

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- GSI-191
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Conclusions

- IIVs[

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 [Proprietary per Affidavit 4(a)-(f)]

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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

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Questions

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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