

**Byron Unit 1 and Braidwood Unit 2
Request for Deferment of Downstream
Effects Related Modifications**

May 16, 2006

Exelon Attendees

Bruce Rash – Corporate Engineering Design Director

Brian Davenport - Corporate Engineering

John Panici – Braidwood Design Engineering

Joseph Bauer – Corporate Licensing

Douglas Walker - Corporate Licensing

Dan Brush – Project Manager

Ivo Garza – Sargent and Lundy

Presenter: Brian Davenport - Corporate Engineering

AGENDA

- Request for Deferment of Downstream Effects related plant changes until Spring 2008 for Byron Unit 1 and Braidwood Unit 2, only.
 - Summarize GSI-191 Analyses & Testing
 - Plant Change Implementation Plans
 - Downstream Effects Analyses Performed
 - Downstream Effects Plant Changes Needed
 - NRC Decision Requested

GSI-191 Resolution Schedule

Full Scope:

- Byron Unit 2 (Spring 2007)
- Braidwood Unit 1 (Fall 2007)

Sump Screen Replacement/Defer Downstream only:

- Byron Unit 1 (Fall 2006)
- Braidwood Unit 2 (Fall 2006)

Replacing all Sump Screens prior 12/31/07 in accordance with GL schedule.

Decision Requested

- Approval to Defer Downstream Effects related plant changes until Spring 2008 Refueling Outages, for Byron Unit 1 and Braidwood Unit 2, **only**.
 - Work Scope to be Deferred
 - ECCS Throttle Valve / Orifice Work
 - CS Pump Cyclone Separator Removal / Modification
 - Proposed Schedule
 - Byron Unit 1 - Spring 2008 Refueling Outage
 - Braidwood Unit 2 - Spring 2008 Refueling Outage

ANALYSIS STATUS:

Analysis/testing performed to ensure adequate NPSH for ECCS Pumps

- NEI 02-01 Walkdowns (all 4 units complete)
- Debris Generation Analysis performed
- Containment Transport Analysis performed
 - Includes Computational Fluid Dynamics (CFD) model
- Head Loss Analysis (per GR/SER) performed
- Vendor's Strainer Head Loss Testing performed (w/o chemical effects)
- Bypass testing performed
- Downstream Effects analysis performed (per WCAP 16406-P)
- **Scheduled testing**
 - Chemical Effects Testing (completion June 2006)
 - Supplemental head loss testing (completion June 2006)

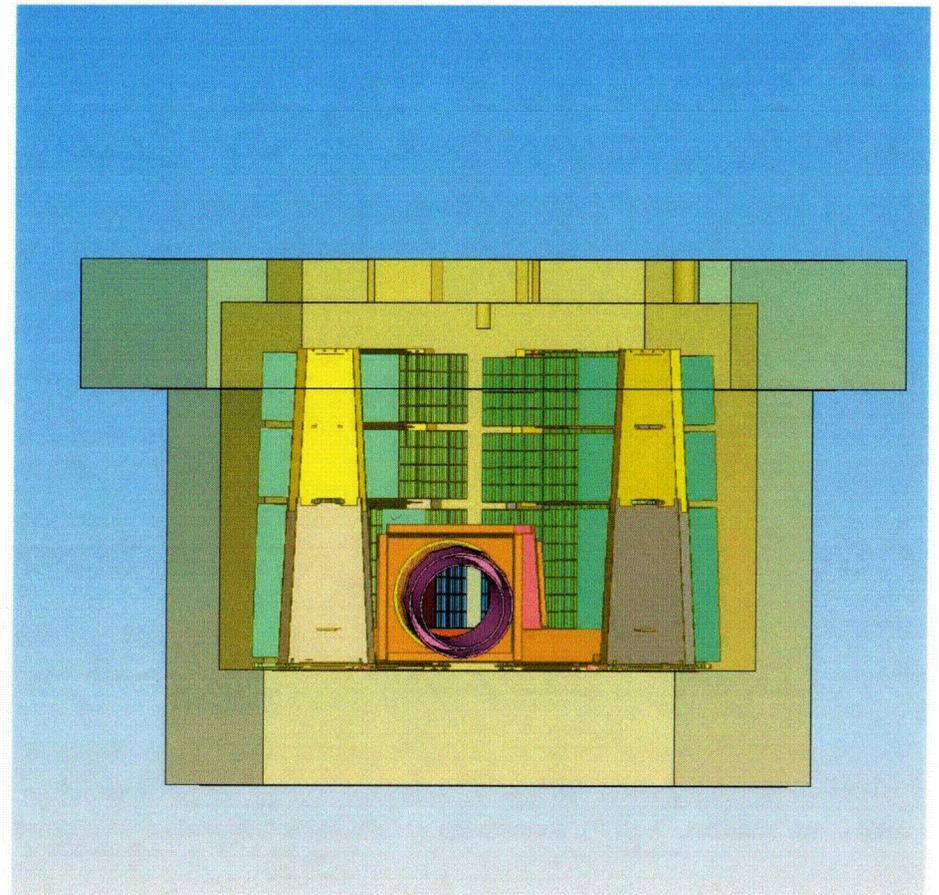
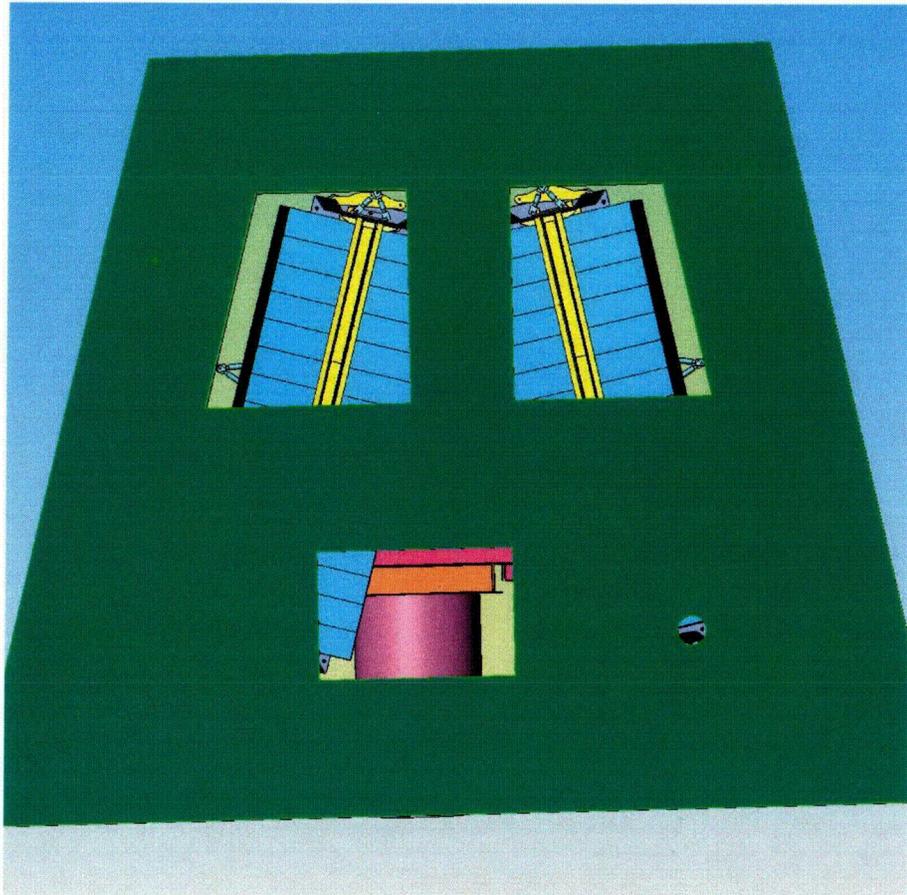
Performing analyses in accordance with recommended NEI and GR/SER Guidelines

Plant Change Implementation

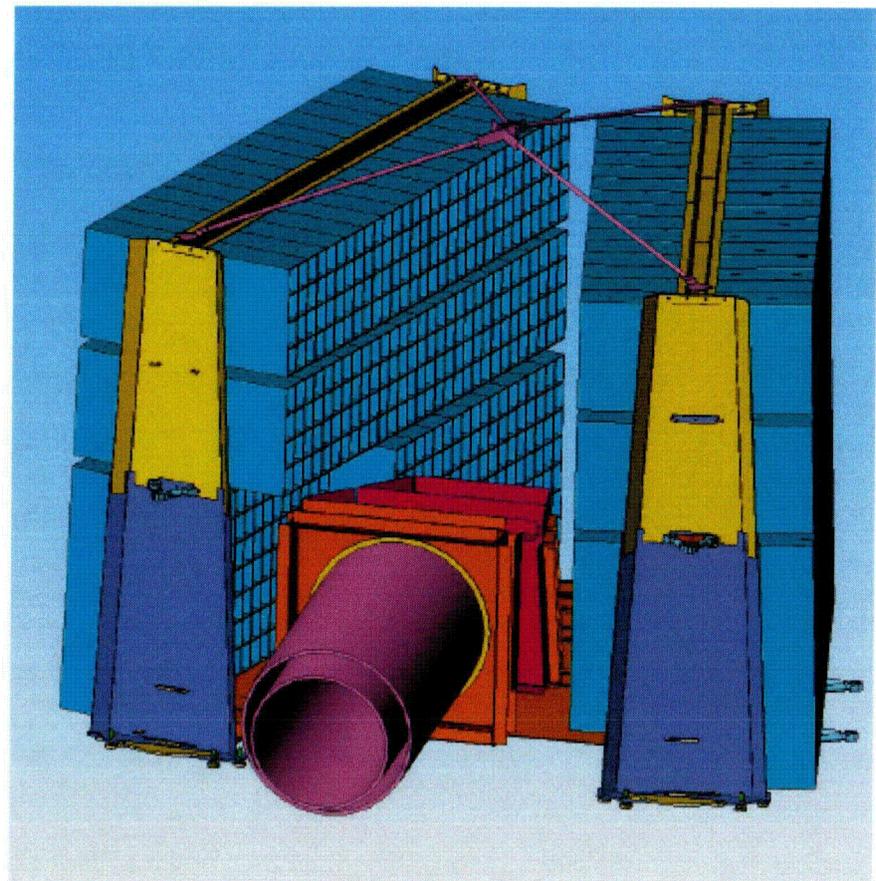
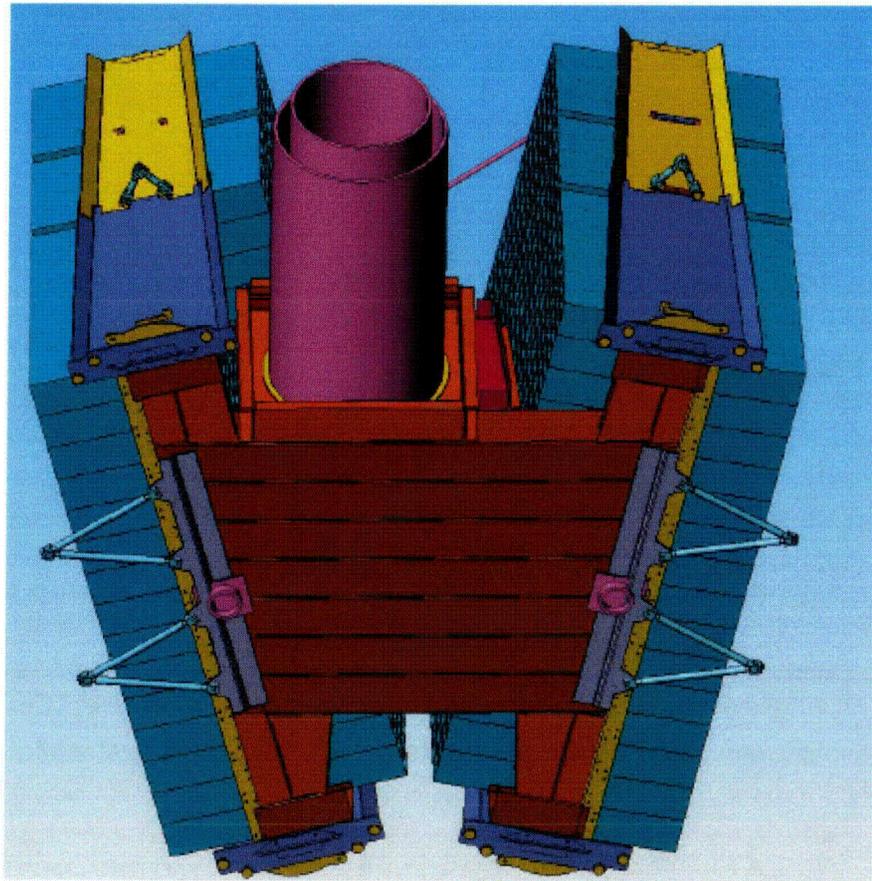
- Install new replacement sump strainers in each sump (2 sumps per unit)
 - New strainer size approximately 3000 sq.ft./sump; current total strainer area ~ 150 sq.ft.
 - New screen mesh size will be smaller than current (1/12" versus 3/16" currently)
- Remove fiberglass insulation on mid-section of steam generators & connecting piping within ZOI, replace with Reflective Metal Insulation (RMI) (Unit 1 at each plant)
 - Alleviates fiber debris load at sump screen
 - Unit 2 at each plant is virtually all RMI insulation
- Install trash racks for debris interception
 - Upstream of new sump screens

*Minimizing fiber, debris load mainly RMI, Coatings, and Latent debris.
Installing maximum strainer area that fits inside plant sumps.*

Screen Installation



Screen Installation



Downstream Effects Analysis

- Analysis performed – based on WCAP 16406-P
 - Equipment Evaluated for wear and plugging
 - Residual Heat Removal (RHR) Pumps and Heat Exchangers
 - Safety Injection (SI) Pumps
 - Charging / Safety Injection (CV) Pumps
 - Containment Spray (CS) Pumps, Spray Eductors and Nozzles
 - Flow Orifii (restricting and flow element)
 - Throttle Valves
 - Instrumentation
 - Piston Check Valves
 - Relief Valves
 - Reactor fuel and vessel internals

Component wear is minimal for 30 day mission time.

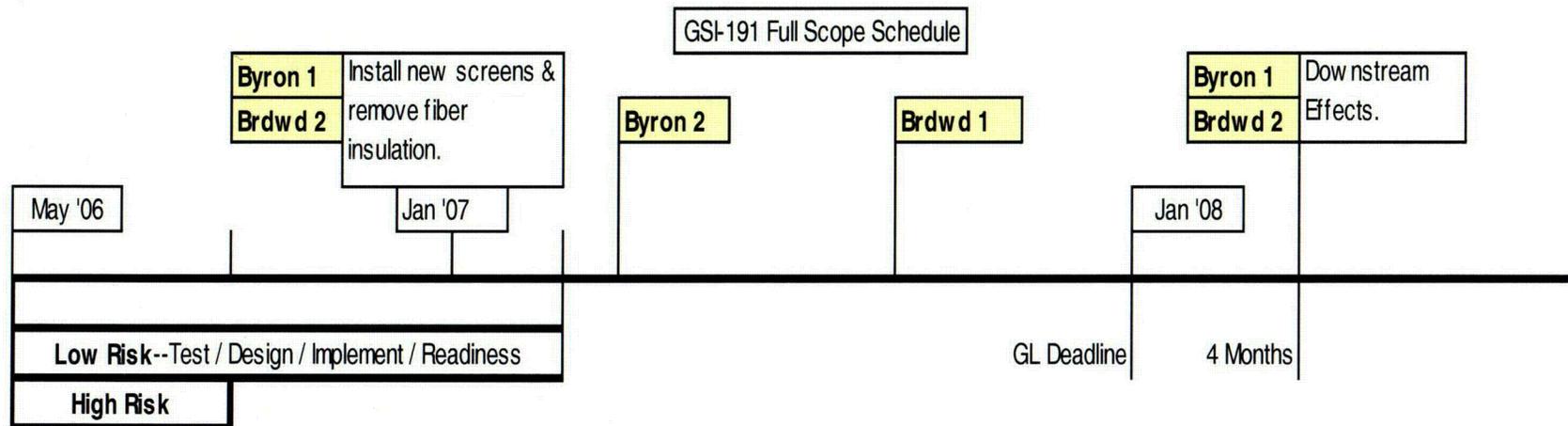
Downstream Effects Plant Change Implementation

- Identified two plant changes due to possible plugging issues
 - ECCS Throttle valves (8/Unit)
 - Replacement of trim and some pressure retaining parts on 8 valves/unit and downstream orifii
 - CS Pump Cyclone Separator removal from the seal purge line
 - Flowserve preliminary solution replaces separator with a pressure breakdown device.

Changes to ECCS throttle valves needed; removal of cyclone separator preliminary scope determined with pump seal vendor.

Downstream Effects Challenges

GSI-191 Full Scope Schedule



Full evaluation and shop testing needed to confirm acceptable impact on ECCS systems. Insufficient time to ensure proper requirements are met.

Safety Impact

➤ Margin Improvements

- Removing fibrous insulation from ZOI areas and replacing with RMI (Unit 1 at both Byron & Braidwood)
- New Strainers Size Approximately 3000 sq.ft./sump; 2 sumps/unit; current strainer area ~ 150 sq.ft.
- New screen mesh size will be smaller than current (1/12" versus 3/16" currently)
- Adding trash racks upstream of new sump screens for large debris interception

➤ Mitigating Factors (Bulletin 2003-01 measures)

- Existing FME controls
- Improvements to the loose debris surveillances
- EOP changes to speed up cooldown in the event of a Small Break (SB) LOCA

Planned improvements increase margin and lower risk.

Safety Impact

➤ Risk Perspective

- Short duration (12/31/07 – Spring 2008) from Generic Letter required implementation schedule
- Large Break LOCA generates/transport max. debris to sumps
 - SI and CV are only really needed for smaller LOCA's
- Sensitivity study of potential flow blockage indicates that 50% flow reduction of SI cold leg injection still provides adequate core cooling.
- Qualitative Risk assessment indicates a small incremental increase in risk.
- Cyclone separator concern much less likely due to reduction of fibrous insulation in ZOI inside containment
- Not likely to significantly impact CS Pump operation.

Additional 4 months results in very small incremental risk increase

Closing Remarks

- Bruce Rash- Exelon Corporate
Engineering Design Director

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