

BWROG GSI-189 COMMITTEE

NRC MEETING

September 21, 2004

BWROG GSI-189 COMMITTEE BACKGROUND

- Committee formed to address GSI -189 impact on BWR Mark III Containment Owners.
- Focus of effort is on Plant differences which impact benefits and cost
- Reviewed NRC Benefits and Cost Analysis
- Results of review documented in letter (BWROG – 03053).

BWROG CONCERN: LOW BENEFITS FOR BWRs

- Present worth calculated benefits for mean NUREG 1150 case for MARK III Containment is \$10k.
- Additional allowance for external event benefits should approximate calculated benefits.
- Calculated benefits were conservative
 - GGNS SBO frequency 1.4E-6 vs. NUREG-1150 3.9 E-6
 - Assumed 100% success of non-safety backup power
 - Assumed 40 year life (included full license renewal term)
 - Difference in SBO frequency alone > 60% benefit reduction
- Low benefits do not support proceeding with Plant modifications for BWR Owners

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GSI-189 ALTERNATIVES FOR MARK III

- Plants have HPCS Pump with dedicated Diesel Generator
- HPCS (Division 3) Diesel is of different design than the other Emergency Diesels
- SBO leading to core damage assumes loss of HPCS system flow
- Division 3 Diesel would be a potential source of power for Hydrogen Igniters

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GSI-189 ALTERNATIVES MARCH 31 NRC MEETING

ISSUES FROM MEETING

- PRA Review of SBO leading to core damage
- AEOD Report on HPCS
- HPCS low load operation
- Comparison of Alternate approach with Pre-staged generator

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GSI-189 MARCH 31 MEETING ISSUES

PRA REVIEW OF GGNS SBO

- SBO CDF 1.41 E-6/yr
- SBO LERF 5.98 E-8/YR (Total LERF 2.04E-7/Yr)
- Igniters working full time only reduces LERF by a maximum of 18% (3.8 E-08/yr LERF)
- HPCS Generator cross-tie improves CDF by 5% and can add capability to power igniters
- Conservative common cause failure assumptions contribute to low calculated availability for HPCS for SBO/core damage
- AEOD data supports HPCS Generator high reliability

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GSI-189
MARCH 31 MEETING ISSUES

AEOD REPORT ON HPCS

- Report confirms HPCS Generator is highly reliable.
- Covers 1987-1998 LER's
- Failures dominated by maintenance OOS (71%) and injection valve (22%)
- Results consistent with Plant reliability data

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MARCH 31 MEETING ISSUES

HPCS LOW LOAD

- NRC questioned low load limitations for use of igniters
- Precautions exist for extended low load operation
- Cross tie procedures will add additional loads to HPCS Generator as necessary

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GSI-189 MARCH 31 MEETING ISSUES

COMPARISON WITH PRE-STAGED

- Division III Generator highly reliable
- Meets all emergency power requirements
- Operators familiar and trained on system
- Less burden on Operations during severe accident
- Cost is more in line with postulated benefits
- Early installation of backup power for igniters
- Provides additional defense in depth

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GSI-189 DESIGN CRITERIA ISSUES

- Timing issue critical for BWR to support solution which considers low benefits
- One hour time expectation will drive cost
- Operators must be dedicated to core cooling and power restoration during early stages of SBO
- Result will be increased pre-staging for any solution
- More realistic analysis on when igniters are needed should support more time being available

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GSI-189 RESOLUTION SUMMARY

- Benefits for BWRs (Mark III Containments) are low.
- Modifications and recurring costs of new equipment testing and maintenance would not be commensurate with BWR benefits.
- Alternatives that reduce risks or provide additional defense-in-depth should be considered based on cost effectiveness and individual plant capabilities.