UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

September 24, 1990

MEETING SUMMARY

SUBJECT: USE AND PRESENTATION OF SEISMIC EXPERIENCE-BASED DATA IN TOPICAL REPORT FOR BWROG EXEMPTION FROM 10 CFR PART 100

DATE August 2, 1990

LOCATION: One White Flint North
8-B-11

I. Background

In their telephone call of 12 June 1990, the staff provided guidance to the BWROG on assembling a fossil plant seismic experience data base that could be acceptable for limited applicability to nuclear plants. The staff suggested the BWROG research similarities in: diameter/thickness (d/t) ratios, earthquake intensity levels actually experienced, seismic analyses, turbine building design codes and standards, and construction standards for masonry walls and walks in the turbine building. The staff also asked the BWROG to tabulate the data base BWRs having a third main steam isolation valve. The table should include the location of this valve relative to the outboard MSIV and turbine stop and control valves, and the location of the final seismic anchor and the seismic class boundary. The table also should specify which BWRs have been seismically analyzed from the seismic class I boundary to the main condenser. In addition, the staff asked that some discussion be included on the seismic capability or seismic qualification method used for BWR turbine buildings, including possible interaction between masonry walls and walks, and main steam piping and the main condenser.

II. Highlights

The staff began the meeting by noting that it is not their intent to encourage seismic experience as a licensing or exemption basis. In the case of ABWR (or any new plant design), matters such as this should be addressed during design and construction.

The MEB further stated that seismic experience is merely an additional line of "defense in depth", along with ECCS capabilities, operator training, emergency operating procedures, etc. Confidence in the ability of the piping and condenser to withstand seismic activity should be thought of as another mitigation system.

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BWR owners' Group

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The MEB staff reviewed the BWROG research material both for format and content. The material addressed outstanding areas of concern and was found to be appropriate for inclusion in the BWROG Topical Report for staff review.

The balance of the meeting was spent discussing the mechanics of the Topical Report and subsequent individual plant exemption requests. It was determined that the BWROG would submit four (4) types of exemptions with the Topical Report. Every member plant of the BWROG will fit into one of those 4 exemption types. Briefly, the exemption types are based on whether plants have an LCS, and whether they are currently exempt from Part 50 Appendix A Type A or C leak testing requirements for their MSIVs. (See the attached Table of Contents for the Topical Report. N.B. Appendix B, which explains the four types of exemptions.) Individual plants would then use the appropriate generic exemption information as part of the basis for their exemption request, to be supplemented by their plant-specific data. In addition, the BWROG Topical Report submittal will include the Hope Creek request for exemption, which will contain all necessary plant specific information and data. This will give the staff a complete picture as to how an individual plant fits into and references the Topical Report. For information and advance planning purposes, the BWROG advised the staff that exemption requests for Fermi-2 and Hatch 1 and 2 would soon follow the Hope Creek request.

The OGC representative advised the staff to use care in describing the Topical Report and exemption requests. It was noted that the term "generic exemption" is an oxymoron, but there can be generic safety evaluations.

The meeting adjourned at approximately 10:50

Attachment:
BWROG MSIV - GENERIC REPORT (Table of Contents)

E. H. Trottier, Project Manager
Project Directorate I-3
Division of Reactor Projects - I/II

Enclosure:
Attendance List

The MEB staff reviewed the BWROG research material both for format and content. The material addressed outstanding areas of concern and was found to be appropriate for inclusion in the BWROG Topical Report for staff review.

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/s/

E. H. Trottier, Project Manager
Project Directorate I-3
Division of Reactor Projects - I/II

Enclosure:
Attendance List

PM:PDI-2	:PDI-2
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09/24/90	/ /90

ATTENDANCE

August 2, 1990

Name	Organization
T. Marsh	NRR
S. Nien Hou	NRR
T. Kenyon	NRR
J. Harold	NRR
B. Bordenick	NRR
E. Trottier	NRR
B. Binz	PSE&G
T. Roche	EQE
L. Lee	GE
S.P. Harris	EQE

September 24, 1990

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JRoe
RWessman
GLainas
JZwolinski
BBoger
WTravers
WButler
ETrottier
TMarsh
SHou
TKenyon
JHarold
BBrodenick
MO'Brien
EJordan, MNBB-3302
ACRS(10)
JCaldwell

BWROG MSIV - GENERIC REPORT

4. RESOLUTION OF PERFORMANCE ISSUES

4.1 Approach

- Change MSIV leak rate limit from current 11.5 scfh/valve (typical) to 100 scfh/valve (typical).
- Delete MSIV Leakage Control System for those plants which currently have a LCS installed.
- Use the "isolated condenser" as alternate leakage treatment path for MSIV.

4.2 Technical Justification for Increasing MSIV Leakage Limits

- Higher MSIV leak rate limit (up to 200 scfh/valve) will not inhibit the MSIV shut-off functional performance. (Demonstrated by MSIV leak rate test experience and by valve manufacturers)
- Post-accident plant releases are within the offsite and control room dose limits (10CFR100 and 10CFR50, Appendix A, GDC-19) following a design basis LOCA.
    - R.G. 1.3 source terms
    - Credit for MSIV leakage holdup and plate-out
    - "Isolated Condenser" leakage path.

4.3 Justification for "Isolated Condenser" as Method for MSIV Leakage Treatment

- Description of an "isolated condenser" leakage pathway
- Seismic evaluation
    - Probability at which MSIV leakage is significant is extremely low (LOCA + SSE + Degraded Core)
    - Main steam piping and condensers are designed to industrial standards and building codes; thus, design margin exists.
    - Main steam piping and condensers exhibit substantial ruggedness. Comparisons of U.S. BWR piping and condenser design with those in the earthquake experience data bases reveal the BWR designs are similar to or more rugged than those that have exhibited good earthquake performance. The possibility of significant failure in BWR main steam piping or condensers in the events of an eastern U.S. design basis earthquake is highly unlikely and that any such failure would be contrary to a large body of historical earthquake experience data, and thus unprecedented.

- Radiological effects

  - Radiological analysis concluded that the increased MSIV leakage rate results in only a small fraction of offsite and control room dose limits.

4.4 Technical Justification for Elimination of Leakage Control Systems

- Use the "isolated condenser" as an alternate method to mitigate the dose consequences of MSIV leakage following an accident. MSIV leakage will be routed to the main steam condenser thru the opening of main steam piping drainage system.

5.0 OPERATIONAL, MAINTENANCE, AND SAFETY BENEFITS

5.1 Benefits Associated with Increasing MSIV Leakage Limits

5.2 Benefits Associated with Elimination of Leakage Control Systems

6. METHOD OF IMPLEMENTATION

- Amend the Technical Specifications to increase MSIV leak rate limit from the current 11.5 scfh/valve (typical) to about 100 scfh/valve (typical).

- For plant with Leakage Control System currently installed, amend the Technical Specifications to remove the requirements for MSIV Leakage Control System.

- Request exemption to 10CFR100, Appendix A on seismicity requirement. This Appendix A requires equipment used to mitigate release to the public be designed to remain functional following a SSE and concurrent load (demonstrate by dynamic analysis or qualification tests). This request exempts the downstream main steam piping and condensers from the Appendix A requirement.

- Request for exemption to 10CFR50, Appendix J, Type A test criteria (some BWRs currently have this exemption for MSIV leakage rates). This Appendix J requires the overall "as measured" integrated leak rate not to exceed 0.75 L_a. This request exempts the "as measured" MSIV leak rates from inclusion into the overall measured leakage rate.

- Request for exemption to 10CFR50, Appendix J, Type C test criteria (Some BWRs currently have this exemption for MSIV leakage rates). This Appendix J requires the overall "as measured" penetration and valve leakage rates not to exceed 0.60 L_a. This request exempts the "as measured" MSIV leakage rates from inclusion into the overall measured penetration and valve leakage rate.

- Upon approval of the proposed Technical Specification amendments and exemption requests, modify (if required) the current main steam drain system to allow post-accident opening capability, in order to convey (unrestricted) MSIV leakage into the main steam condenser.

- Upon approval of the proposed Technical Specification amendments and exemption requests, change the Emergency Operating Procedures to identify necessary operator actions to mitigate MSIV leakage consequences.

- Revise plant Updated Safety Analysis Report and any other documentation.

7. CONCLUSIONS

8. REFERENCES

9. PARTICIPATING UTILITIES

APPENDICES

A. RECENT MSIV LEAKAGE HISTORY AND COST BENEFIT DATA; A SURVEY BY THE BWR OWNERS GROUP

B. EXAMPLES SUBMITTALS

- Type 1: Increase MSIV allowable leak rate limits
  Exemption request to 10CFR100, Appendix A

- Type 2: Increase MSIV allowable leak rate limits
  Exemption request to 10CFR100, Appendix A
  Exemption request to 10CFR50, Appendix J (Type A and/or Type C)

- Type 3: Increase MSIV allowable leak rate limits
  Eliminate MSIV leakage control system
  Exemption request to 10CFR100, Appendix A

- Type 4: Increase MSIV allowable leak rate limits
  Eliminate MSIV Leakage Control System
  Exemption request to 10CFR100, Appendix A
  Exemption request to 10CFR50, Appendix J (Type A and/or Type C)

C. "A TECHNIQUE FOR EVALUATION OF BWR MSIV LEAKAGE CONTRIBUTION TO RADIOLOGICAL DOSE CALCULATION", SEPTEMBER 1990.

D. EQE ENGINEERING REPORT, "PERFORMANCE OF CONDENSERS AND MAIN STEAM PIPING IN PAST EARTHQUAKE", SEPTEMBER 1990.

E. "POTENTIAL OPERATOR ACTIONS TO CONTROL MSIV LEAKAGE", NEDO-30324, SEPTEMBER 1985.

MEETING SUMMARY

SUBJECT: USE AND PRESENTATION OF SEISMIC EXPERIENCE-BASED DATA IN TOPICAL REPORT FOR BWROG EXEMPTION FROM PART 100

DATE AND TIME: 2 AUGUST 1990
08:00 to 10:50

LOCATION: OWFN
8 B 11

PURPOSE: Review the results of BWROG research into similarities between fossil and nuclear plants that the staff would consider for use as seismic-based experience

PARTICIPANTS

NRC	BWROG
Tad Marsh (MEB), Part Time	Bob Binz (PSE&G)
Shou-nien Hou (MEB)	Tom Roche (EQE)
T. Kenyon (PDS)	Louis Lee (GE)
J. Harold (SPLB)	S. P. Harris (EQE)
B. Bordenick (OGC)	
Ed Trottier (NRR)	

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Summary prepared by Ed Trottier (X-21444).

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