



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

April 6, 1990

Docket No. 50-285

LICENSEE: Omaha Public Power District

FACILITY: Fort Calhoun Station, Unit 1

SUBJECT: SUMMARY OF MEETING TO DISCUSS THE MAIN FEEDWATER  
SEISMIC ISSUES

On March 6, 1990, the staff met with the licensee to discuss seismic issues associated with the Main Feedwater (MFW) piping in the Auxiliary and Turbine Buildings. The issues arose as part of the licensee's Design Basis Reconstitution Program which is presently in process. The purpose of the meeting was to discuss the licensee's interim operability criteria as applied to the MFW piping. Enclosure 1 is a listing of meeting attendees.

The licensee made an overview presentation of the problems as shown in Enclosure 2, and indicated the following:

1. The original high energy line break analysis used more conservative assumptions for the seismic analysis in postulating breaks.
2. The piping in the Auxiliary Building up to the isolation valves had to be Seismic Category 1, but in actuality all piping of the MFW line in the Auxiliary Building was designed to Seismic Category 1.
3. Piping in the Turbine Building is not Seismic Category 1; however, the analysis of the high energy line break extends to an anchor in the Turbine Building.
4. The original piping analysis ignored the Turbine Building response.

In addition, the licensee stated that the problem involves approximately 100 feet of the 16 inch MFW pipe, and about 55 pipe supports in the section of piping. With respect to the supports, the licensee indicated that approximately 17 may need to be modified to meet the interim operability criteria. Therefore, these modifications are currently the critical path for the present 1990 refueling outage scheduled to be completed by mid-May.

In performing their reconstitution analysis, it was determined that the stresses calculated in both the seismic design and the high energy line break analysis exceeded the design basis. The licensee has established interim operability criteria which were acceptable to the staff provided that the licensee meets the conditions specified in Regulatory Guide 1.84. With this guidance, the licensee can continue operation after this 1990 outage. In addition, the licensee indicated that although the Main Steam line has not yet been reviewed, the same findings may occur which may result in a delay of this outage.

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Another problem discussed at this meeting was the alternate seismic criteria. The staff, in reviewing these criteria, has transmitted a request for additional information to complete their review. The staff indicates significant problems with the alternate seismic criteria.

In conclusion, the licensee stated the following:

1. Operability criteria are acceptable for the short time basis.
2. Although the staff is not in agreement with the alternate seismic criteria, these are not widely used by the licensee.
3. Once acceptable seismic criteria are developed, additional analyses will be performed, and any required modifications identified.
4. Required modifications will be completed during the next refueling outage scheduler in 1991.

15/  
Anthony Bournia, Project Manager  
Project Directorate IV  
Division of Reactor Projects - III,  
IV, V and Special Projects  
Office of Nuclear Reactor Regulation

Enclosures:  
As stated

cc w/enclosures:

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NAME	: PNoonan	: ABournia:bj	: TMarsh	: FHebdon	:	:	:
DATE	: 04/2/90	: 04/02/90	: 04/6/90	: 04/6/90	:	:	:

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Enclosure 1

OPPD/NRC Meeting Concerning MFW Piping

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P. T. Kuo	NRC/NRR/EMEB
A. Lee	NRC/NRR/EMEB
P. Prescott	NRC/NRR/PEB
J. W. Chase	OPPD
R. Phelps	OPPD
S. K. Gambhir	OPPD
R. Lewis	OPPD
D. DeBoer	OPPD
D. Dinovic	OPPD
C. Morrell	SWEC
L. Varone	SWEC
T. Hicks	STS Inc.

## OPPD / NRC MARCH 6, 1990 MEETING AGENDA

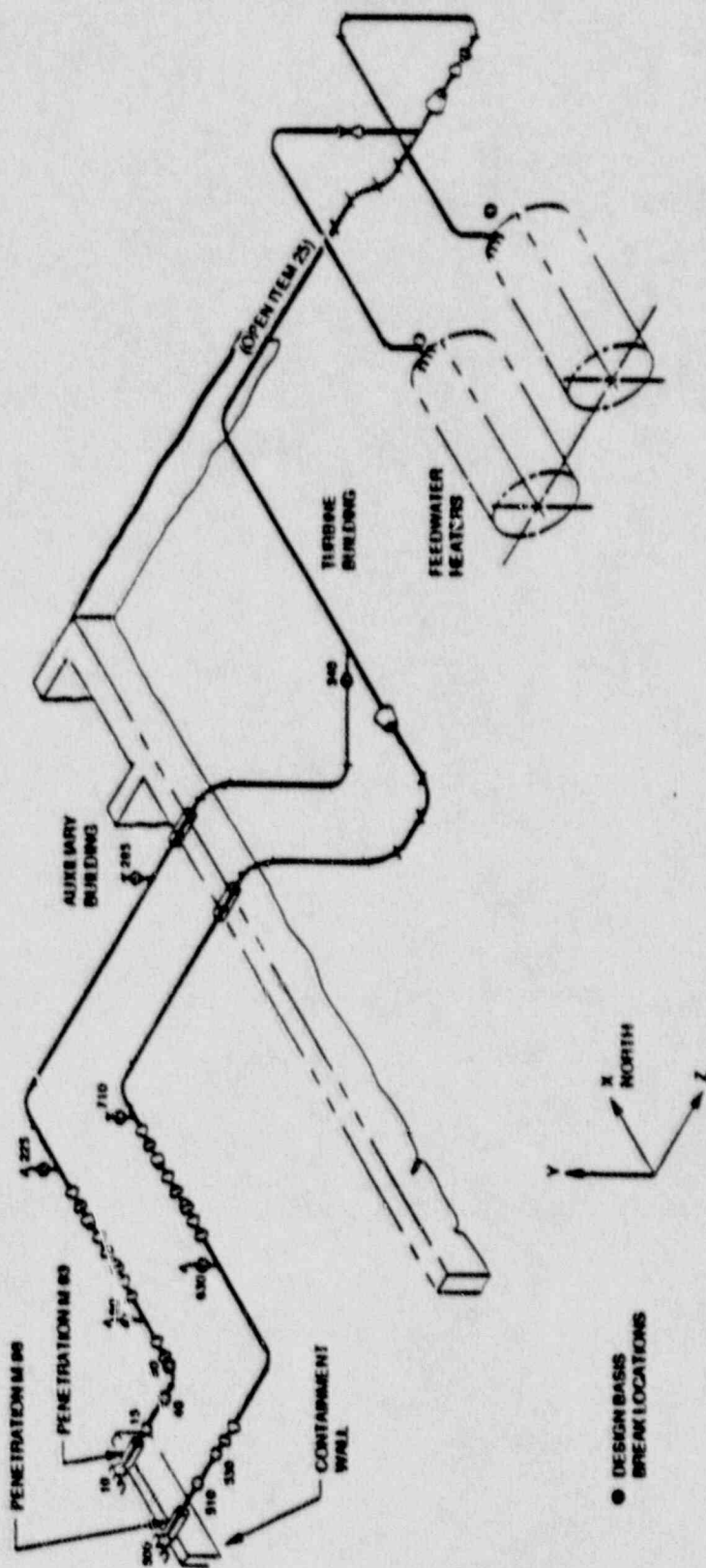
- |   |                               |
|---|-------------------------------|
| I. INTRODUCTION                                     | J. W. CHASE/<br>S. K. GAMBHIR |
| II. MEETING PURPOSE                                 | R. L. PHELPS                  |
| III. DISCUSSION                                     |                               |
| A. Feedwater Seismic Classification<br>Design Basis | R. E. LEWIS                   |
| B. Current Situation                                | R. E. LEWIS                   |
| C. Proposed Operability Criteria                    | R. E. LEWIS                   |
| D. Proposed Actions                                 | C. G. MORRELL                 |
| IV. QUESTIONS AND ANSWERS                           | J. W. CHASE                   |
| V. CONCLUSIONS                                      | R. L. PHELPS                  |



## **MEETING PURPOSE AND OBJECTIVE**

- o Discuss OPPD's Interim Operability Criteria for Piping System Analysis.**
- o Discuss Application of the Interim Operability Criteria to the Feedwater Lines for the Current Outage Modifications.**





POSTULATED DESIGN BASIS BREAK LOCATIONS IN FEEDWATER PIPING  
Outside Containment

# **FEEDWATER SEISMIC CLASSIFICATION**

## **Excerpts from USAR Appendix F**

o Section F.1.3, "Classification of Systems and Equipment":

"Systems and equipment designated as Class I are listed below." ... "Systems, equipment and other items not listed are Class II."

Section F.1.3.d.3, (Excerpt from Class I list):

"Main Steam and Feedwater Piping (in Containment and Auxiliary Building up to Containment Isolation Valves)."

o Section F.2.4, "Class II Seismic Criteria":

"Class II equipment and components conform to the applicable design codes and standards. No special provisions were made against seismic effects."

# FEEDWATER SEISMIC CLASSIFICATION

## Excerpts from USAR Appendix F (continued)

- o Section F.2.2, "Methods of Analysis for Class I Structures and Components":

Section F.2.2.2., "Structures or Equipment Supported in or on Other Structures":

"B31.1 piping in the Auxiliary Building received the same attention with regard to selection of hangers and restraints as the B31.7 piping. Seismic stresses were combined with longitudinal stress due to pressure, weight, and other sustained loads and limited to  $S_h$  (allowable stress in hot condition)."

- o Historic correspondence, recently retrieved through DBD efforts, indicate that all of the Feedwater piping in the Auxiliary Building was designed to Seismic Class I criteria to eliminate seismic induced flooding concerns.

# **PROPOSED OPERABILITY CRITERIA**

- o Operability Criteria**
- o With Required Modifications**



# PROPOSED OPERABILITY CRITERIA

## EXISTING CRITERIA/ LIMITS

B31.7/B31.1 Code Stress

B31.1/Sy For Supports

F.S. of 4 and 5 for  
Anchor Bolts

UBC

1/2% Damping

## Abbreviations

Sy = Material Yield Strength

F.S. = Factor of Safety

UBC = Uniform Building Code

## OPERABILITY CRITERIA/ LIMITS

1 Sy (normal)

2 Sy (faulted)

Level D (faulted)

F.S. of 2

Newly Created Turbine  
Building Response  
Spectra

PVRC Damping

Multiple Support  
Excitation  
(Absolute Summation)

## BASIS

Palisades  
Operability  
Criteria, Rev 1,  
11/22/89

ASME III, Level D

ASME III and  
Appendix F

Palisades

Proposed Alternate  
Appendix F  
Response Spectra

ASME Code  
Case N-411

PVRC Draft for  
ISM, 9/11/89

## **PROPOSED ACTIONS**

- o Feedwater System Support Modifications this Outage**
  - Impact on Resources**
  - Impact on Schedule (Critical Path Activity)**
- o Utilize and Implement Operability Criteria**
- o Utilize and Implement PVRC Dampening Spectra and Turbine Building Response Spectra**
- o Evaluate MS System Piping Design for Similar Issues**

## **LONG TERM GOALS**

- o NRC Acceptance of Alternate Seismic Criteria**
- o Clarification of Non-Safety Related Piping Seismic II Criteria**
- o Modify Feedwater Supports (as needed) to comply with FCS Design Criteria**
- o NRC Approved Generic Operability Criteria**