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Mr. C. V. Mangan
Vice President
Nuclear Engineering & Licensing
Niagara Mohawk Power Corporation
300 Erie Boulevard West
Syracuse, New York 13202

Dear Mr. Mangan:

Subject: Acceptance Review of the Application for an Operating License for Nine Mile Point Nuclear Station, Unit 2

On January 31, 1982, the NRC staff received your tendered application for an operating license for Nine Mile Point Nuclear Station, Unit 2. Your application included General Information and Affidavit, an Environmental Report - Operating License Stage (ER-OL), a Physical Security Plan, and a Final Safety Analysis Report (FSAR).

The staff has completed its review of the General Information, the ER-OL, and the FSAR and has concluded that the information tendered, taken as a whole, is sufficiently complete for docketing your application and for initiation of the safety and environmental reviews. Substantive deficiencies may exist in some sections that need to be corrected during the review.

Your filing of the application for docketing should include three (3) originals signed under oath or affirmation by a duly authorized officer of your organization. In addition, your filing should include fifteen (15) copies of the General Information portion of the application, forty-one (41) copies of the ER-OL, and forty (40) copies of the FSAR. As required by Section 50.30 and Section 51.21, 10 CFR Parts 50 and 51 respectively, you should retain an additional ten (10) copies of the General Information, one hundred nine (109) copies of the ER-OL, and thirty (30) copies of the FSAR for direct distribution in accordance with Enclosure 1 of this letter and further instructions which may be provided later. Within ten days after filing, you must provide an affidavit that distribution has been made in accordance with 10 CFR Part 2.101 and the Enclosure 1 to this letter. All subsequent amendments to the ER-OL and FSAR will require forty-one (41) and sixty (60) copies respectively, for distribution.

The NRC Caseload Forecast Panel visited the Nine Mile Point-2 site in February 1983. Observations made during the visit will be considered during the development of the schedule for the review of your OL application. You have informed the staff that your projected fuel load date for Nine Mile-2 is February 28, 1986. It is requested that you inform the staff, promptly, of any change of that date.

| OFFICE | | | | | | |
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| SURNAME | 8304010628 830329 PDR ADOCK 05000410 A PDR | | | | | |
| DATE | | | | | | |

After docketing, the staff will follow a revised review procedure whereby only a single set of requests for additional information (FSAR review "questions") will be transmitted to you for responses. After your responses have been reviewed, a draft SER will be prepared to provide a basis for a series of meetings designed to close out open items.

During the course of our preliminary review of your tendered FSAR and ER-OL, the enclosed requests for additional information (Enclosures 2 and 3 respectively) were generated. In addition to Enclosures 2 and 3, other additional information is needed to expedite our review. Enclosures 4 through 12 contain these requests for additional information. These requests are, for the most part, generic requests for information or sample requests for information (i.e. Q-list). These requests should be reviewed for applicability to Nine Mile Point Nuclear Station, Unit 2 and responded to in the FSAR as appropriate. Your responses to the requests for additional information in Enclosures 2, 3, and 4 should be submitted as changes to the FSAR, in amendment form, within sixty days from the docketing date, except as otherwise noted within. Your letter of transmittal for docketing of the application should include a commitment to provide the requested information within sixty days of the date of your letter.

If during the review you believe that there is a need to appeal a staff position, you should bring your appeal to my attention as early as possible so that the appropriate meetings can be arranged. This procedure is an informal one designed to provide an opportunity for your management to discuss with staff management any areas of disagreement in the case review. Briefly, each side of the issue in question is to develop the position it intends to take and forward the position statement to the Division of Licensing. From these positions, an agenda containing appropriate discussion items will be developed and distributed prior to any meeting. There are provisions for two stages of actual appeal meetings. The first stage involves NRR management at the Assistant Director level. If the matter is not resolved at the Assistant Director level, the second stage meeting is held with appropriate Division Directors in attendance. Your representatives should be of comparable management level to those expected to attend from NRC. If a satisfactory solution has not been developed by the end of the second stage meeting, an appeal to the Director of NRR may be submitted. As with other applicant/staff meetings, a summary report will be prepared and distributed per the current service list, including forwarding a copy to the Public Document Room.

The new provisions of 10 CFR 50.34(g), which require an evaluation of the facility against the Standard Review Plan, apply to this review. As was discussed between my staff and your licensing representatives, it was agreed that you will submit this information by docketing.

On March 26, 1982, the Commission published a final rule entitled, "Need for Power and Alternative Energy Issues in Operating License Procedures," 47 Federal Register 12940, which amends its regulations in 10 CFR Part 51 to no longer require operating license applicants to address such issues in the ER.

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| DATE▷ | ..... | ..... | ..... | ..... | ..... | ..... | ..... |

On March 31, 1982, the Commission published a final rule entitled. "Elimination of Review of Financial Qualifications of Electric Utilities in Licensing Hearings for Nuclear Power Plants," 47 Federal Register 13750, which eliminates the requirements for financial qualifications review and findings for electric utilities that are applying for construction permits or operating licenses. As a result of these two final rules, the staff will not include these issues in the licensing review for Nine Mile Point Nuclear Station, Unit 2.

If you have any questions concerning the enclosed information or docketing of your application please call the license project manager, M. Haughey (301) 492-8362.

Sincerely,

Original signed by:

Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

Enclosures:
1. Distribution List
2. Requests for Additional Information Related to FSAR
3. Requests for Additional Information Related to ER
4. Remarks Pertaining to Subsequent Enclosures
5. Sample Request Regarding Q-List Items Controlled by the QA Programs
6. Clarification of GDC 51 Requirements
7. Preservice and Inservice Inspections
8. Preservice Inspection and Testing of Snubbers
9. Discussion of Sump Debris on ECCS and Containment Spray Operation
10. Requirements for Documentation of Seismic and Pump and Valve Operability Qualificaton
11. Discussion Purge and Vent Valve Operability
12. Discussion of TMI Item II.D.1
13. Discussion of TMI Item II.K.3.28
14. Procedures and Training for Station Blackout
15. Discussion of Initial Test Plan Review Problems

cc w/ enclosure: See next page

| OFFICE | DL:LB#2/PM | DL:LB#2/LA | OELD | DL:LB#2/BC | DL:AD/L | DL:DIR | |
|---|---|---|---|---|---|---|---|
| SURNAME | MHaughey:pt | EHylton | BMBenbard | ASchwencer | TNovak | DGEisenhut | |
| DATE | 3/22/83 | 3/22/83 | 3/23/83 | 3/25/83 | 3/28/83 | 3/28/83 | |

Nine Mile Point 2

Mr. Gerald K. Rhode
Vice President, System Project Management
Niagara Mohawk Power Corporation
300 Erie Boulevard West
Syracuse, New York 13202

cc: Mr. Troy B. Conner, Jr., Esq.
Conner & Wetterhahn
Suite 1050
1747 Pennsylvania Avenue, N.W.
Washington, D. C. 20006

Mr. Richard Goldsmith
Syracuse University
College of Law
E. I. White Hall Campus
Syracuse, New York 13210

T. K. DeBoer, Director
Technological Development Programs
New York State Energy Office
Agency Building 2
Empire State Plaza
Albany, New York 12223

Ezra I. Bialik
Assistant Attorney General
Environmental Protection Bureau
New York State Department of Law
2 World Trade Center
New York, New York 10047

Resident Inspector
Nine Mile Point Nuclear Power Station
P. O. Box 126
Lycoming, New York 13093

Mr. John W. Keib, Esq.
Niagara Mohawk Power Corporation
300 Erie Boulevard West
Syracuse, New York 13202

Enclosure 1

# DISTRIBUTION LIST FOR

# NINE MILE POINT NUCLEAR STATION, UNIT 2

# ENVIRONMENTAL REPORT*

## ADVISORY COUNCIL ON HISTORIC PRESERVATION

Mr. Peter H. Smith (1)
Advisory Council on Historic Preservation
1522 K Street, N.W. - Suite 536
Washington, D. C. 20005

cc letter without enclosure:

State Historic Preservation Office
Commissioner, Parks and Recreation
Agency Building #1
Empire State Plaza
Albany, New York 12220

## U. S. DEPARTMENT OF AGRICULTURE

### Soil Conservation Service (State Office)

U. S. Soil Conservation Service (1)
U. S. Courthouse & Federal Building
100 S. Clinton Street, Room 771
Syracuse, New York 13260

## ARMY U.S. CORPS OF ENGINEERS DISTRICT (1)

U. S. Army Engineer Division, North Central
536 S. Clark Street
Chicago, Illinois 60605

## U. S. DEPARTMENT OF COMMERCE (6)

Joyce M. Wood, Director
Office of Ecology and Conservation
Department of Commerce - Room 6800
National Oceanic and Atmospheric
Administration
Washington, D. C. 20230

## FEDERAL ENERGY REGULATORY COMMISSION

Mr. Lawrence R. Anderson, Director (1)
Office of Electrical Power Regulation
Federal Energy Regulatory Commission
400 First Street, N.W. - Room 304RB
Washington, D. C. 20426

## U. S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Mr. Charles Custard (2)
U. S. Department of Health & Human Services
Room 537F Humphrey Building
200 Independence Avenue, S. W.
Washington, D. C. 20201

## U. S. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT REGION (2)

Environmental Officer
Department of Housing & Urban Development
26 Federal Plaza
New York, New York 10007

## U. S. DEPARTMENT OF INTERIOR

Mr. Bruce Blanchard, Director (18)
Office of Environmental Project Review
U. S. Department of the Interior, Rm. 4256
18th and C. Streets, N. W.
Washington, D. C. 20240

## U. S. DEPARTMENT OF TRANSPORTATION

Mr. Joseph Canny (1)
Office of the Assistant Secretary
for Policy and International Affairs
U. S. Department of Transportation
400 7th Street, S. W. - Room 9422
Washington, D. C. 20590

Capt. William R. Riedel (1)
Water Resources Coordinator
W/S 73 U.S.C.G. - Room 1112
U. S. Department of Transportation
2100 Second Street, S. W.
Washington, D. C. 20590

## REGIONAL OFFICE (1)

Secretarial Representative
U. S. Department of Transportation
26 Federal Plaza, Room 2339
New York, New York 10007

*Number in Paren denotes number of copies to be served

STATE OFFICIALS (1)

Attorney General
Department of Law
State Capitol
Albany, New York 12224

Director, Technical Development Programs
State of New York Energy Office
Agency Building 2
Empire State Plaza
Albany, New York 12223

New York State Department of
Environmental Conservation
ATTN: Director, Office of
Environmental Analysis
Albany, New York 12201

OFFICIALS OF ADJOINING STATES (1)

Director, Atomic Energy Control Board
P. O. Box 1046
Ottawa, Canada KIP 5S9

U. S. ENVIRONMENTAL PROTECTION AGENCY

EIS Review Coordinator
EPA Region II
26 Feceral Plaza
New York, New York 10007

LOCAL OFFICIAL(S) (1)

Town of Scriba, Supervisor
R. D. #4
Oswego, New York 13126

CLEARINGHOUSES

State Clearinghouse (10)

New York State Clearinghouse
New York State Division of the Budget
State Capitol
Albany, New York 12224

Areawide Clearinghouse (1)

Central New York Regional Planning and
Development Board
Midtown Plaza
700 East Water Street
Syracuse, New York 13210

OTHER (1)

Librarian, Thermal Reactors Safety Group
Brookhaven National Laboratory
Building 30
Upton, Long Island, New York 11973

# DISTRIBUTION LIST
# FOR
# GENERAL INFORMATION PORTION OF OPERATING LICENSE APPLICATION AND FINAL SAFETY ANALYSIS REPORT

| ADDRESSEE | REPORT TO BE SERVED |
|---|---|
| **STATE OFFICIALS** (1 each) | |
| Attorney General<br>Department of Law<br>State Capitol<br>Albany, New York 12224 | Application, General Information and Amendments thereto<br>Safety Analysis Report and Amendments thereto |
| Director, Technical Development Programs<br>State of New York Energy Office<br>Agency Building 2<br>Empire State Plaza<br>Albany, New York 12223 | Application, General Information and Amendments thereto<br>Safety Analysis Report and Amendments thereto |
| New York State Department of Environmental Conservation<br>ATTN: Director, Office of Environmental Analysis<br>Albany, New York 12201 | Application, General Information and Amendments thereto<br>Safety Analysis Report and Amendments thereto |
| **BORDERING STATE OFFICIALS** (1 each) | |
| Director, Atomic Energy Control Board<br>P. O. Box 1046<br>Ottawa, Canada KIP 5S9 | Application, General Information and Amendments thereto<br>Safety Analysis Report and Amendments thereto |
| **LOCAL OFFICIAL** (1) | |
| Town of Scriba, Supervisor<br>R. D. #4<br>Oswego, New York 13126 | Application, General Information and Amendments thereto<br>Safety Analysis Report and Amendments thereto |
| **U. S. ENVIRONMENTAL PROTECTION AGENCY REGIONAL OFFICE** (2) | |
| EIS Review Coordinator<br>EPA Region II<br>26 Federal Plaza, Room 2339<br>New York, New York 10007 | Safety Analysis Report and Amendments thereto |
| **OTHER** (1) | |
| Pacific Northwest Laboratories (W. Apley)<br>P. O. Box 999<br>Richland, Washington 99352 | Safety Analysis Report and Amendments thereto |

Enclosure 2

REQUESTS FOR ADDITIONAL INFORMATION
RELATED TO THE FINAL SAFETY ANALYSIS REPORT

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| FT00.1 (1.7.1) | The list of electrical, instrumentation and control (EI&C) drawings indicates that a number of drawings will be issued later. Provide a schedule for submitting these drawings. Three copies of all proprietary and nonproprietary EI&C drawings, including revisions as they are issued, should be provided separate from the FSAR but incorporated by reference in this section. |
| F100.2 (1.7.2) | As per Regulatory Guide 1.70, Revision 3, for each piping and instrumentation diagram (including revisions as issued) in the FSAR, two large-scale copies (approximately 22 in. x 34 in.)* should be provided separately but should be referenced in this section. The piping and instrumentation diagrams should contain grid coordinates and drawing cross-references. Provide this information or a schedule indicating when this information will be provided. |
| F100.3 (1.7.3) | As per Regulatory Guide 1.70, Revision 3, this section of the FSAR should include a list of any other specific data submitted in response to requests of the NRC staff, including card decks for computer codes, computer printouts, and detailed geologic, seismologic, and foundation engineering information. Three copies of each such item should be submitted separately but should be referenced in this section. Confirm that the above guidance will be followed for data submitted in response to NRC staff requests. |
| F100.4 (1.8) | Section 1.8 indicates that your position on several regulatory guides will be provided in the future. Either provide these positions or a schedule for submittal of the position for each guide. |

*As discussed with Norm Rademacher of Niagara Mohawk Power Corporation, one-half size drawings will be acceptable if all detail required is legible.

F100.5
(1.9)

A footnote in Table 1.9-1 states "Indications of conformance and tables discussing differences will be provided in an amendment when the application is docketed." This amendment should conform to the following:

1. Applications for light water cooled nuclear power plant operating licenses docketed after May 17, 1982, shall include an evaluation of the facility against the Standard Review Plan (SRP) in effect on May 17, 1982, or the SRP revision in effect six months prior to the docket date of the application, whichever is later.

2. The evaluation shall include an identification and description of all differences in design features, analytical techniques, and procedural measures proposed for a facility and those corresponding features, techniques, and measures given in the SRP acceptance criteria. Where such a difference exists, the evaluation shall discuss how the alternative proposed provides an acceptable method of complying with those rules or regulations of the Commission, or portions thereof, that underlie the corresponding SRP acceptance criteria.

3. The SRP was issued to establish criteria that the NRC staff intends to use in evaluating whether an applicant/licensee meets the Commission's regulations. The SRP is not a substitute for the regulations, and compliance is not a requirement. Applicants shall identify differences from the SRP acceptance criteria and evaluate how the proposed alternatives to the SRP criteria provide an acceptable method of complying with the Commission's regulations.

F100.6 (1.10)

Section 1.10 indicates that your position on some of the TMI issues is under development. Either provide these positions or a schedule for submittal of the position for each issue.

F311.1 (2.1.1.2)

As per Regulatory Guide 1.70, Revision 3, the area of plant property should be stated in acres. Also, the minimum distance from each reactor to the exclusion area boundary should be shown and specified.

F451.7 (2.3.2.3)

Provide a map showing the detailed topographic features (as modified by the plant) within a 5-mile (3.1 km) radius of the plant. Also provide a smaller scale map showing topography within a 50-mile (80 km) radius of the plant as well as a plot of maximum elevation versus distance from the center of the plant in each of the sixteen 22-1/2-degree compass point sectors (centered on true north, north-northeast, northeast, etc.) radiating from the plant to a distance of 50 miles (80 km).

F240.7 (2.4.1.2)

For the hydrosphere, include a description of existing and proposed water control structures, both upstream and downstream, that may influence conditions at the site. For these structures, (1) tabulate contributing drainage areas, and (2) describe types of structures, all appurtenances, ownership, seismic design criteria, and spillway design criteria. Provide a regional map showing major hydrologic features. List the owner, location, and rate of use of surface water users whose intakes could be adversely affected by accidental release of contaminants.

F240.8 (2.4.2.3.1)

For the probable maximum precipitation, either provide or reference a description of the maximization procedures and/or studies available for the area, with consideration of storm configuration (orientation of areal distribution).

F240.9 (2.4.2.3.3)

As per Regulatory Guide 1.70, Revision 3, Section 2.4.3.6, discuss setup, significant (33-1/3%) and maximum (1%) wave heights, runup, and resultant static and dynamic effects of wave action on each safety-related facility from wind-generated activity that may occur coincidently with the peak PMF water level. Provide a map and analysis showing that the most critical fetch has been used to determine wave action.

F230.1 (2.5)

As per Regulatory Guide 1.70, Revision 3, this section should be prefaced by a summary that contains a synopsis of Sections 2.5.1 through 2.5.6. Include a brief description of the sites, the investigations performed, results of investigations, conclusions, and a statement as to who did the work.

F230.2 (2.5.2.7)

The probability of exceeding the operating basis earthquake during the operating life of the plant should be determined and stated.

F410.1 (3.5.1.4)

The tornado missile protection analysis should take into account the effect of missiles on ventilation openings in the various facility buildings housing essential shutdown equipment. Reference or provide a discussion regarding this subject.

F410.2

The information missing in Tables 3.6A-4 to 3.6A-60 is to be provided in an amendment. Provide this information or a schedule indicating when this information will be submitted. Table 3.6A - Pipe Breaks - should also reference Branch Technical Position ASB 3-1.

F240.9 (2.4.2.3.3)

As per Regulatory Guide 1.70, Revision 3, Section 2.4.3.6, discuss setup, significant (33-1/3%) and maximum (1%) wave heights, runup, and resultant static and dynamic effects of wave action on each safety-related facility from wind-generated activity that may occur coincidently with the peak PMF water level. Provide a map and analysis showing that the most critical fetch has been used to determine wave action.

F230.1 (2.5)

As per Regulatory Guide 1.70, Revision 3, this section should be prefaced by a summary that contains a synopsis of Sections 2.5.1 through 2.5.6. Include a brief description of the sites, the investigations performed, results of investigations, conclusions, and a statement as to who did the work.

F230.2 (2.5.2.7)

The probability of exceeding the operating basis earthquake during the operating life of the plant should be determined and stated.

F410.1 (3.5.1.4)

The tornado missile protection analysis should take into account the effect of missiles on ventilation openings in the various facility buildings housing essential shutdown equipment. Reference or provide a discussion regarding this subject.

F410.2

The information missing in Tables 3.6A-4 to 3.6A-60 is to be provided in an amendment. Provide this information or a schedule indicating when this information will be submitted. Table 3.6A – Pipe Breaks - should also reference Branch Technical Position ASB 3-1.

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| F210.1<br>(3.6.2.5A) | This section references Appendix 3C which describes pipe failure protection. Missing are Sections 3C2.2-10, 3C2.3, 3C2.4, and 3C2.5 which are to be provided in an amendment. Provide this information or a schedule indicating when this information will be submitted. |
| F220.1<br>(3.8.4.8) | Provide a Section 3.8.4.8 which indicates if there are masonry walls and if so supply information in accordance with SRP section 3.8.4 and Appendix A to SRP Section 3.8.4 of NUREG-800. |
| F220.2<br>(Appendix 3A) | Missing in this appendix are Table 3A.12-1 and Figures 3A.12-1, 3A.13-1, 3A.13-2, 3A.22-1, 3A.26-1, 3A.26-2, and 3A.29 which are to be provided in an amendment. Provide this information or a schedule indicating when it will be submitted. |
| F210.2<br>(3.9.1.1A) | It was indicated that Table 3.9A-1 will be completed later. Provide the date when this information will be submitted. |
| F271.1<br>(3.9.3A) | Table 3.9A-12 indicates that additional information will be supplied. Provide the date the amendment will be submitted. |
| F271.2<br>(3.10) | In Tables 3.10A-1 and 3.10B-1, various data are identified as "later" or "to be supplied" in an FSAR amendment; provide these data or a date by which they will be supplied. |
| F270.1<br>(3.11) | Data for Section 3.11 are identified as being in the Environmental Qualification Document (EQD), which will be supplied in a future amendment; provide the EQD or a date by which it will be supplied. |
| F210.3<br>(5.2.1.2) | Table 5.2-1, Applicable Code Cases, indicates that additional information will be supplied in a future amendment. Either provide this information or a schedule for its submittal. |

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| F281.1 (6.1.2) | Indicate the total amount of protective coatings, paints, and organic materials (including uncovered cable insulation) used inside the containment that do not meet ANSI N101.2 (1972) and Regulatory Guide 1.54. |
| F281.2 (6.1.2) | Table 6.1-3 states information on motor electrical insulation will be added by amendment. Either provide this information or a schedule for submitting the information. |
| F252.1 (6.2) | Provide or reference a discussion that addresses SRP 6.2.7 of NUREG-0800.** |
| F440.1 (6.3.3.3) | Either correct the following statement in Section 6.3.3.3 or provide a solution that will result in acceptable consequences. "For large breaks, failure of one of the standby diesel-generators is in general the most severe failure. For small breaks, the failure of the HPCS is the most severe failure; neither failure results in an acceptable consequences." |
| F440.2 (6.3.3.7.3) | Either provide the plant specific LOCA analyses or the date when this analysis will be submitted. |
| F480.1 (Appendix 6A) | Appendix 6A states some information will be provided in the future, for example, Tables 6A.5-1 through 6A.5-11, 6A.6-1, 6A.6-2, and 6A.9-6. Either provide this missing information or a schedule for submitting the information. |
| F430.1 (8.2.1) | Section 8.2.1 does not specify transmission line lengths to the Scriba substation, nor does it include layout and right-of-way drawings. Provide these drawings or a date by which they will be supplied. |

**It is recommended that a working meeting be held between NMPC and their supporting groups and the NRC staff review group for this area to discuss NRC concerns prior to responding to this request for additional information. This meeting should be requested through the NRC licensing project manager.

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| F280.1 (9.5.1) | Section 9.5.1 addresses compliance with BTP APCSB 9.5-1 rather than BTP CMEB 9.5-1 (NUREG-0800). The fire protection program will be reviewed to the guidelines of BTP CMEB 9.5-1. Provide a comparison that shows conformance of the fire protection program to BTP CMEB 9.5-1. Deviations from these guidelines should be specifically identified. A technical basis should be provided for each deviation. |
| F460.1 (11.3.2.1) | Section 11.3.2.1 specifies design basis holdup times which do not appear to be consistent with values given in Table 11.3-2. Address this inconsistency. |
| F460.2 (11.3.2.2) | As per Regulatory Guide 1.70, Revision 3, provide or reference a tabulation showing the calculated concentrations of airborne radioactive material (by radionuclide) expected during normal and anticipated operational occurrences for equipment cubicles, corridors, and areas normally occupied by operating personnel. |
| F460.3 (11.4.1) | As per Regulatory Guide 1.70, Revision 3, provide or reference: (a) the seismic criteria and analytical procedures for structures housing the solid radwaste system and (b) the quality group classification for the solid radwaste components and piping. The piping and instrumentation diagrams should also show seismic and quality group interfaces. |
| F460.4 (11.4.3) | As per Regulatory Guide 1.70, Revision 3 provide or reference for the dry solid waste: (a) a tabulation of maximum and expected waste input in terms of isotopic and curie content along with the bases for the values, and (b) the maximum and expected annual curie content. |

F470.3 (12.1.2.5)

Section 12.1.2.5 states "Specific examples of improvements based on dose assessment, operational experience, and the ALARA design review will be provided in an amendment as disposition of proposed changes is finalized." Provide a schedule for submittal of this information.

F470.4 (12.1.3.1)

Section 12.1.3.1 references Section 12.1.2.2.4 which is not included in the FSAR. This discrepancy should be resolved.

F470.5 (12.2.2.2)

Section 12.2.2.2 references Tables 12.2-14 and 12.2-15. These tables indicate the information will be provided in an amendment. Either provide this information or a schedule for submitting the information.

F470.6 (12.3)

Monitor set points in Tables 12.3-1 and 12.3-2, and Figures 12.3-32 and 12.3-65 are indicated as information to be supplied later. Either provide this information or a schedule for submitting the information.

F470.7 (12.4)

Section 12.4 indicates that the dose assessment is in progress and that doses and details of the man-rem evaluation will be provided in an amendment. The bases and details of the dose assessment as specified in Regulatory Guide 1.70, Revision 3, and Standard Review Plan 12.3-12.4 (NUREG-0800) should be supplied. Either provide this information or a schedule for submitting the information.

F470.8 (12.5.1.2)

Section 12.5.1.2 references Section 13.1.4 for the experience and qualifications of responsible individuals. The FSAR does not contain a Section 13.1.4. This discrepancy should be resolved and the experience and qualifications of individuals should be supplied.

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| F630.1 (13.1.2.1) | As per Regulatory Guide 1.70, Revision 3, and NUREG-0800, specify the number of operating shift crews. Also, provide the schedule, relative to the fuel loading date, for filling all positions. |
| F630.2 (13.2.16) | Section 13.2.16 provides a listing of documents that are applicable to training. Clearly state the extent to which the guidance in these documents will be used and justify any exceptions. |
| F810.1 (Appendix 13.B) | Appendix 13.B indicates that some information will be supplied later such as Section 4.3 on Unit 2 spectrum of postulated accidents, Appendix D information on Unit 2 instrumentation and monitors, and Appendix F information on evacuation times to be supplied in a separate document. Either provide the missing information or provide a schedule for submitting this information. |
| F640.1 (14.2.1) | Provide a schedule for submitting the two-pump trip coastdown curves (Figure 14.2-138-1) or replace the figure with a statement indicating the curves will be provided in GE test instructions which will be available for NRC review prior to (date). |
| F640.2 (14.2.2.8) | Section 14.2.2.8 refers to Table 14.2-147 which is not in the FSAR. This discrepancy should be resolved. |
| F640.3 (14.2.9) | As per Regulatory Guide 1.70, Revision 3, provide a schedule for development of plant procedures. |
| F100.7 (FMEA Book 1) | The FMEA Book 1 indicates that some system designs are being corrected and that the associated drawings and FMEAs will be revised and provided in amendments. Provide a schedule for updating the system drawings and FMEAs. |

F620.1
(1.10)

Provide a revision to FSAR Section 1-10, I.D.1 Control Room Design Reviews, and I.D.2 Safety Parameter Display System that states that Niagara Mohawk Power Corporation (NMPC) will follow the guidance provided by Supplement 1 to NUREG-0737. The supplement was transmitted to NMPC by letter, dated December 17, 1982 from D. G. Eisenhut, Director, Division of Licensing.

F241.1
(2.5.4)

In several places in Section 2.5.4 it is indicated that "Major Category I structures are founded on bedrock." In 2.5.4.11 under "Settlement" it is indicated ". . . all Major Category I structures are founded on bedrock, with the exception of the radwaste building." This inconsistency should be explained and corrected in the FSAR.

F410.3
(6.7)

Section 6.7, Main Steam Isolation Valve Leakage Control Design was not included in your FSAR. In Table 1.8-1 under "Regulatory Guide 1.96" it was stated that because of the unique design of the positive seal ball valve, no seal system is required. Topical reports for this valve are still under review. It was indicated in our January 2, 1981 letter from R. Tedesco to G. Rhode that space for appropriate containment penetrations be reserved in the event our review discloses problems with the proposed system for which backfitting of a leakage control system is required.

F620.2
(1.10)

The response to TMI Item I.D.1 references BWR Owners Group August 1982 submittals of Level I, II, and III display formats. These references should be provided.

F100.8 (16.0)

A commitment should be made in Chapter 16 to resubmit the Nine Mile Point Unit 2 proposed technical specifications approximately 12 to 18 months prior to the expected fuel load date using the then current version of GE-STS (General Electric - Standard Technical Specifications).

F100.9 (Safeguards)

A pre-employment screening program for site employees was not addressed in the Physical Security Plan. The Physical Security Plans should include a description of measures that will be taken to ensure that only individuals that have been determined to be trustworthy are granted unescorted access to protected and vital areas of the plant. As noted in the Statement of Considerations accompanying the publication of 10 CFR 73.55, ANSI-N18.7, "Industrial Security for Nuclear Power Plants" should be used as guidance for employee screening.

311.2 (2.1.1.3)

In Section 2.1.1.3 of the FSAR, Lake Road is described as privately owned between Lakeview Road and County Road 29, and that public use is permitted during normal operating conditions. According to Figure 2.1-2, a portion of Miner Road also traverses the exclusion area. Indicate the ownership of this portion of the road and its use during normal operating conditions.

311.3 (2.1.2.1)

According to the description of the exclusion area boundary in Section 2.1.2.1 and in Figure 2.1-2 of the FSAR, the area encompasses the James A. Fitzpatrick site in addition to the Nine Mile Point site. However, the Fitzpatrick site is the property of PASNY. Hence, NMPC ownership rights appear to extend to only a portion of the total exclusion area. Indicate the authority which will permit NMPC to control activities over the portion of the exclusion area that is not owned by NMPC.

NMPC ownership of the site property is referenced to mineral rights. Indicate whether ownership is limited to mineral rights or whether other forms of ownership (such as surface rights) are also in effect.

311.4 (2.1.3)

Population data should be provided in a format described in Regulatory Guide 1.70, Section 2.1.3. Specifically, the radial distances of the population rings in Tables 2.1-4 through 2.1-22, and Figures 2.1-5 through 2.1-18 should be revised using radial distances expressed in non-fractional miles (sufficient data is given in Table 7c-1 through 7c-28 of the ER).

311.5 (2.2.3 - 1.2)

Although Section 2.2.3.1.2 of the FSAR identifies delayed ignition in the section heading, the discussion within the section appears to address potential explosion effects with respect to ignition at the point of release. Provide an analysis which shows the maximum distance that flammable concentrations of propane may drift towards Unit 2 prior to ignition and the overpressures that would be generated upon ignition.

REQUESTS FOR ADDITIONAL INFORMATION

ENCLOSURE 3

RELATED TO THE FINAL ENVIRONMENTAL REPORT
HYDROLOGIC ENGINEERING ENVIRONMENTAL ACCEPTANCE REVIEW
NINE MILE POINT UNIT 2

E240.1 (3.3) Update the water use data (including temperature in Table 3.3-1 to include historical meteorologic and hydrologic data recorded up to calender year 1982 (or for as recently as available data will permit).

E240.2 (2.3.1)

a) Provide more detailed estimates of current velocities (including direction) and their frequency of occurrence. These may be based on wind frequency and direction data and an appropriate mathematical model. Correlations with observed measurements should be discussed.

b) discuss sediment movement in the vicinity of the intake and discharge structures. Specifically address the possibility of the intake being affected by sediment deposition. Also, address the potential role of sediment movement in transporting radionuclides.

E240.3 (3.4) Discuss the effect of ice on the intake structure and the likelihood of the plant being shutdown in winter months due to ice damage to or ice blockage of the intake structure.

E240.4 (7.1) Calculate the radiological consequences of a liquid pathway release from a postulated core melt accident. The analysis should assume, unless otherwise justified, that there has been a penetration of the reactor basemat by the molten core mass, and that a substantial portion of radioactively contaminated suppression pool water was release to the ground. Doses should be compared to those calculated in the Liquid Pathway Generic Study (NUREG-0440, 1978). Provide a summary of your analysis procedures and the values of parameters used (such as permeabilities, gradients, populutions affected, water use). It is suggested that meetings with the staff of the Hydrologic Engineering Section be arranged so that we may share with you the body of information neccessary to perform this analysis.

E240.5 (5.6) Descriptions of floodplains, as required by Executive Order 11988, Floodplain Management, have not been provided. The definition used in the Executive Order is:

Floodplain: The lowland and relatively flat areas adjoining inland and coastal waters including floodprone areas of offshore islands, including minimum that area subject to a one percent or greater chance of flooding in any given year.

a) Provide descriptions of the floodplain adjoining Lake Ontario adjacent to the site and plant facilities. On a suitable scale map(s) provide delineations of those areas that will be flooded during the one percent (100 year) flood both before and after plant construction.

b) Provide details of the methods used to determine the floodplain in response to a) above. Include your assumptions of and basis for the pertinent parameters used in the computation of the water elevations. If studies approved by the Federal Insurance Administration (FIA) are available for the site and other affected areas, the details of the analysis used in the reports need not be supplied. You can, instead, provide the reports from which you obtained the floodplain information.

c) Identify, locate on a map and describe all plant structures and topographic alterations in the floodplains. Indicate the start and completion dates of all such items.

E240.6 (5.6) a) Discuss the hydrologic effects of all items identified in response to question E240.6C. Discuss the potential for changes in littoral sediment transport due to plant construction.

b) Provide the details of your analysis used in response to a above. The level of detail is similar to that identified in item 240.5b.

Terrestrial Resources

E290.1 There are inconsistencies between Figures 2.2-1 and 2.4-2 and 6.5-1. For example, Figure 2.2-1 has a recreational area along the western boundary of the site along the lake, while Figures 2.4-2 and 6.5-1 classify this area as residential; in Figure 2.2-1 there is a residential area east of the site along the lake while in Figures 2.4-2 and 6.5-1 the same area is classified under two or three other categories. Other inconsistencies occur. In Figures 2.4-2 and 6.5-1 five categories have symbols that are so similar that it is not possible to identify a particular category with any confidence. Corrections to these three figures should be made.

E290.2 The mapped land use categories in Figure 2.2-2 do not always correspond with the land use categories in Figure 2.2-1. For example, in Figure 2.2-1 there is a large area east of the site classified as agriculture and it is classified as forest in Figure 2.2-2. Other discrepancies occur and should be checked with corrections made.

E290.3 The mapped land use categories in Figure 2.2-5 do not appear correct. The whole site is classified as "forest/wetland" and the two residential areas described in question E290.1 are classified as commercial/industrial. These discrepancies should be checked and appropriate corrections made.

E290.4 The same comments made in question E290.2 apply to Figure 2.2-6.

E290.5 A few minor discrepancies occur between Figures 2.2-2 and 2.2-8. For example, a small area in the backward "L" residential area is classified as public facilities in Figure 2.2-8 and as agricultural land in Figure 2.2-2. These discrepancies should be checked and corrections made.

Aquatic Resources

E291.1 (ER Sec. 2.3.2.3)

(a) Provide annual commercial fishery harvest estimates for the years 1976 through 1980 for that portion of Lake Ontario within the 80 km radius.

(b) Provide estimates of the sport fish harvest by weight and species, similar to the estimates of number of fish presented in ER Tables 2.3-8, 9, 10. Also provide estimated sport fish harvest by weight for that portion of Lake Ontario within the 80 km radius.

E291.2 (ER Sec. 2.4.2) Provide copies of each of the reports of the comprehensive ecological survey of Lake Ontario conducted in the site vicinity during 1973-1978; upon which the ER-OL relies.

E291.3 The ER section on ichthyoplankton (2.4.2.1.4), benthic organisms (2.4.2.1.5), and fish (2.4.2.1.6) cite reference numbers 39, 41, and 47 that refer to citations on phytoplankton and crustaceans zooplankton. Please clarify.

E291.4 Provide a copy of reference number 51 by Storr (1977) "Lake Ontario Fish Tag Report Summary 1972-1976" that formed the basis for discussions in the ER on fish movements.

E291.5 (ER Sec. 2.4.2.1.6) The discussion of endangered species on ER page 2.4-34 cites the Fish and Wildlife Service 1978 list.

(a) Provide a current update of threatened or endangered aquatic species in the site vicinity.

(b) Provide a listing of any aquatic species listed as threatened or endangered by the State of New York that have been collected or that are believed to be present in the site vicinity.

E291.6 (a) Provide a bibliographic listing and reprint copies of all journal and professional conference proceedings publications (by applicant and applicant's consultants) that have resulted from aquatic studies and monitoring of the NMP-JAF site area.

(b) Provide a bibliographic listing of all technical papers that have been prepared by state and federal agencies and private organizations on the aquatic resources associated with the NMP-JAF site area.

E291.7 (ER Sec. 3.4) Provide, in tabular form, a comparison of all cooling system design specifications and structure locations as they now exist with those that were evaluated in the FES-CP stage.

E291.8 (ER Sec. 5.2.1) The average rate of water withdrawal from the lake is stated to be 54,605 gpm (on page 5.2-1). Section 3.3 (page 3.3-1) stated the average water withdrawal to be 53,600 gpm. Please clarify.

E291.9 (ER Sec. 5.3) Provide the status of the application for an SPDES permit for operation of Unit 2.

E291.10 (ER Sec. 5.3.1.2.6) Provide copies of SWEC and OSS Unit 6 studies of fish survival in the diversion system. These are cited as reference numbers 9 and 10 on ER page 5.3-13.

E291.11 (ER Sec. 5.3.1)

(a) Provide copies of the 316(a) and (b) studies conducted on NMP Unit 1, Fitzpatrick NPP, and Oswego Units 1-6.

(b) Also provide a copy of the 1973-1981 NMP aquatic ecology study (cited as reference number 3 on ER page 5.3-49).

E291-12 ER Section 2.3.1.1.6 discusses the interaction of existing thermal plumes from NMP Unit 1 and JAF. ER Section 5.3.2 discusses the impacts to biota from interactions of existing plumes and the predicted NMP-2 plume.

(a) Provide an analysis of the effects of fish attraction to the existing plumes and the contribution this could have to entrapment at the NMP-2 intakes, when the existing plumes (and their attracted fishes) interact with the NMP-2 intakes.

(b) Provide an analysis of the extent to which fishes attracted to the existing thermal plumes (especially alewife and smelt) spawn earlier than normal and the contribution this has to ichythoplankton entrapment when the plumes interact with the cooling water intake structures.

E291.13 (ER Sec. 6.5.2.2) Provide the details of the proposed plan of study for 316(a) and (b) monitoring under the SPDES permit.

E291.14 (ER Sec. 1.2) Provide the estimated schedule for finalizing the SPDES; include the hearing schedule.

E291.15 (ER Sec. 2.3.3.2) Identify the International Joint Commission office with which we can follow up concerns over water quality in Lake Ontario.

E291.16 (ER Sec. 2.3.3.3) Provide the state plan for bringing the waters of Lake Ontario into compliance. Provide the state's basis for the water quality standard of 200 mg/l for TDS.

E291.17 (ER Sec. 3.3.2) Provide the makeup and blowdown flow rates required in order to obviate sulfuric acid usage in the circulating water system. What would be the cost of this relative to the cost of the acid?

E291.18 (ER Sec. 5.5.2.1) Provide the recommendations, objectives, and goals of the International Joint Commission relevant to Nine Mile Point. Will the project impair in any way attainment of goals of the IJC?

E 310-1 The ad valorum taxes for Unit 2 have been estimated for the first 10 years of operation (Sec. 5.8.2.1). What assumptions have been made in deriving these figures? How will each jurisdiction share in the division of local property taxes (see Table 2.5-24)? Has the applicant filed for an exemption from local taxes resulting from the installation of anti-pollution equipment? To what extent will an exemption affect local tax revenues?

E 310-2 Is the applicant subject to additional state-imposed taxes (e.g., a gross receipts tax)? If the applicant is liable for such taxes, provide an estimate in 1982 dollars.

E 310-3 The operating staff for Unit 2 is estimated to be approximately 300 employees (Sec. 5.8.2.2). Does this figure include security forces and other employees of contractors who would regularly be found on the Unit 2 site? If not, the applicant should provide such data on employment.

E 310-4 What is the applicant's estimate of payroll for Unit 2 employees (utility as well as contractor) expressed in 1982 dollars?

E 310-5 The applicant should provide a table showing the mid-year numbers of operating phase workers at the Unit 2 site. These data should reflect utility employees and contractor personnel (e.g., security guards) who would normally be found

on the site, but should exclude intermittent or occasional employees, such as those employed in fuel loading. The applicant should provide these data for a period beginning in 1983 and ending when the complement of operating phase staff is on site.

E 310-6 Does the applicant anticipate purchasing goods or services from the area within 50 miles of the site during the operating period? If yes, provide an estimate in 1982 dollars of the value of the purchases.

E 320.1 Provide the following:

A production cost analysis which shows the difference in system production costs associated with the availability vs. unavailability of the proposed nuclear addition. Note, the resulting cost differential should be limited solely to the variable or incremental costs associated with generating electricity from the proposed nuclear addition and the sources of replacement energy. If, in your analysis, other factors influence the cost differential, explain in detail.

a. The analysis should provide results on an annual basis covering the period from initial operation of the first unit through five full years of operation of the last unit.

b. Where more than one utility shares ownership in the proposed nuclear addition or where the proposed facility is centrally dispatched as part of an interconnected pool, the results of the analysis may be aggregated for all participating systems.

c. The analysis should assume electrical energy requirements grow at (1) the system's latest official forecasted growth rate, and (2) zero growth from the latest actual annual energy requirement.

d. All underlying assumptions should be explicitly identified and explained.

e. For each year (and for each growth rate scenario) the following results should be clearly stated: (1) system production costs

with the proposed nuclear addition available as scheduled; (2) system production costs without the proposed nuclear addition available; (3) the capacity factor assumed for the nuclear addition; (4) the average fuel cost and variable O & M for the nuclear addition and the sources of replacement energy (by fuel type) - both expressed in mills per kWh; and (5) the proportion of replacement energy assumed to be provided by coal, oil, gas, etc. (The base year for all costs should be identified)

E 320.2 Provide average, present worth fuel and O and M costs for the Nuclear Unit. (This cost should be calculated for both a 30 year and a forty year operating life.) Provide escalation, discount rates and all other variables assumed in calculating these costs.

E 320.3 Provide a brief summary of the methodology used in arriving at the $123 million decommisioning estimate provided in Section 5.9.2.1.

AEB QUESTIONS
NINE MILE POINT UNIT 2
ENVIRONMENTAL REPORT

Questions for Radiological Consequences of Accidents Review of Nine Mile Point-2

E450-1 Our examination of Figures 7A.6-6 and 7A.6-12 reveals that the calculation of the monetary cost of potential severe accidents did not include the low-probability accidents that would result in costs greater than $10,000,000. Judging from the RSS and from many recent studies, we have reason to believe that severe accidents could cause much greater economic losses. Please extend the calculation to include the higher costs as a function of probability.

E450-2 Figure 7A.6-9 includes data from the Grand Gulf Unit 1 Environmental Statement. Comparison of the CCDFs from the two documents indicates that the CCDFs in Figure 7A.6-9 may be for latent fatalities within 50 miles of the plant, and not for all those at risk from cancer. If so, this should be stated. A more complete depiction of latent fatality risk would include all those people who receive a dose that would increase their chances of a cancer fatality.

E450-3 Figures 7A.6-10 and -11 show that at a $10^{-7}$ probability, the consequences of Unit 2 accidents are as large as from 100 nuclear power plants. This comparison may make Nine Mile Point look more risky than is realistic. Additional clarification should be provided.

E451.1 Hourly data tape with onsite meterological data for Nine Mile Point-2 was submitted on March 4, 1983. Dew point temperatures were not included on this tape. Provide the dew point temperatures from November 1, 1973 through October 31, 1980.

E451.2 (2.7.1) Examination of additional regional meteorological information is necessary to provide a more complete description of the site and surrounding area:

i) Compare the site to other NWS stations in the vicinity of Nine Mile Point, NY:

1) Rochester, NY (43° 07'N 77° 40'W) 547' ASL: Detailed meteorological data and local climatological data summaries prepared annually are available.

2) Oswego East, NY (43° 28'N 76° 30'W) 350' ASL: Daily temperature and precipitation measurements 1951-present; and local climatological data summaries available.

3) Watertown, NY (43° 58'N 75° 52'W) 497' ASL: Daily temperatures and precipitation measurements, 1971-present; and local climatological data summaries are available.

E451.3 (2.7.1) Present a plot of maximum elevation versus distance from the center of the station in each of the sixteen 22½ degree compass point sectors (i.e., centered on true north, north northeast, northeast, etc.) radiating from the station to a distance of 50 miles.

E451.4 (2.7.4) The description of the atmospheric dispersion model used for calculation of annual average relative concentration ($\chi/Q$) and relative deposition ($D/Q$) values requires additional clarification.

i) Describe how recirculation and trapping were considered.

ii) Numerically demonstrate how: "recirculation of onshore flow would decrease $\chi/Q$ (values) below estimates made for inland locations," as stated in FSAR Section 2.3-54. Can this statement be supported for locations of concern like the site boundary (< 1 mi.).

iii) Discuss the appropriateness of a straight-line trajectory model for use at the Nine Mile Point site, considering spatial and temporal variations in airflow. Provide adjustments to the straight-line model, if necessary.

E451.5 (5.3.3.1) Discuss the validity of a cooling tower drift study done with a large percent (> 40%) of missing meteorological input data;

i) Present the periods of missing data, and

ii) Show that at least one annual cycle was represented by key meteorological parameters for the period January 1, 1974 through December 31, 1976.

E 451.6 (6.4.2) The existing onsite meteorological measurements program is described in FSAR Section 2.3.3.1 as a pre-operational program. The relative humidity data recovery did not meet the guideline recovery (90%) stated in Regulatory Guide 1.23.

i) Present in detail the description of the operational meteorological monitoring program. Will supplemental meteorological data be part of the operational program?

E. 470.1

Indicate whether goats are raised within 50 miles of Nine Mile Point. If so, the fraction of the year the goats are on pasture should be indicated.

E. 470.2 (Section 6.2)

The Operational Radiological Environmental Monitoring Program should be revised to include the following:

A. Waterborne Pathway

1. Surface - 1 sample downstream of the discharge area.
2. Drinking water - 1 sample of each of 1 to 3 of the nearest water supplies affected by plant discharges and 1 sample from a control location.

B. Ingestion - 1 sample of each principal class of food product from any area irrigated by water containing plant discharges.

E291.20 Identify, by means of specific references, all areas of outdated information as indicated in your letter of February 3, 1982 in the NRC report entitled "Evaluation of the Environmental Effects Due to the Change in Cooling Systems at Nine Mile Point, Unit 2, from a Once-Through System to a Closed Cycle System Utilizing a Natural Draft Cooling Tower". References should identify specific items of outdated information in that report and the specific references in the ER or FSAR that contain the correct and updated information.

ENCLOSURE 4

Request for Additional Information

Nine Mile Point Nuclear Station, Unit 2

Docket Nos.: 50-410

There are many areas in which requirements have been added or modified, or in which staff concerns have been raised in the review of other pending OL applications. To expedite the review process for your application, it is requested that you evaluate these areas and, where appropriate, upgrade your FSAR to include how these requirements are met or how these staff concerns are resolved. You should submit these changes to the FSAR, in amendment form, within sixty days from the docketing date except as otherwise noted below.

(1) Safety-Related Structures, Systems and Components (Q-list) Controlled by the QA Program - Staff requests for additional information regarding this issue have been sent to a number of OL applicants. A sample request from the Perry review is provided as Enclosure 5.

(2) Fracture Prevention of Containment Pressure Boundary (GDC 51) - Enclosure 6 provides the technical basis by which the staff determines compliance with GDC.51.

(3) Instrumentation for Detection of Inadequate Core Cooling - (TMI Action Item II.F.2 in NUREG-0737) - Discussion of this item should address how core thermocouple readouts are provided in the control room including location and rate of printout (see Part (4) of attachment 1 to Item II.F.2).

(4) Preservice and Inservice Inspections - Staff guidance in this review area has been sent to a number of pending OL applicants. A copy of that guidance is provided as Enclosure 7.

(5) Preservice Inspection and Testing of Snubbers - The staff has recently established requirements to ensure snubber operability which have been transmitted to pending OL applicants. A copy of those requirements is provided as Enclosure 8.

(6) Effects of Containment Coatings and Sump Debris on ECCS and Containment Spray Operation - A copy of the staff concerns on this issue, including a request for additional information which has been sent to a number of OL applicants, is provided as Enclosure 9.

(7) Equipment Qualification Branch Requests for Information

a. Audit Team Reviews:

A copy of the staff request for additional information in this review area is provided as Enclosure 10. This information should be submitted as a separate document (not a FSAR amendment) about 2 months prior to the site visit which will be scheduled when 85 to 90 percent of the safety related equipment is completely installed and qualified.

b. Operability Qualification of Purge and Vent Valves:

A copy of the staff request for additional information in this review area is provided as Enclosure 11. Responses to this request may be submitted as a separate document (not a FSAR amendment).

c. TMI Action Plan II.D.1:

A copy of the staff request for additional information in this review area is provided as Enclosure 12.

d. Verify Qualification of ADS Accumulator System Valves (II.K.3.28):

A copy of the staff request for additional information in this review area is provided as Enclosure 13.

(8) Procedures and Training for Station Blackout - In response to a recommendation in a recent decision by the Atomic Safety and Licensing Appeal Board (ALAB-603), to ensure that station blackout events can be accomodated, the staff is requesting licensees and OL applicants to implement emergency procedures and a training program for station blackout events. A copy of that request is provided as Enclosure 14.

(9) Initial Test Program Reviews - A discussion of problems encountered during recent OL application reviews is included as Enclosure 15 along with a recommended course of action to reduce Test Program review time.

ENCLOSURE 5

PERRY

Request for Additional Information

260.0 Quality Assurance Branch

260.6 Section 17.1.2.2 of the standard format (Regulatory Guide 1.70) requires the identification of safety-related structures, systems, and components controlled by the QA program. You are requested to supplement and clarify Table 3.2-1 of the Perry FSAR in accordance with the following:

a. The following items do not appear on FSAR Table 3.2-1. Add the appropriate items to the table and provide a commitment that the remaining items are subject to the pertinent requirements of the FSAR operational quality assurance program or justify not doing so.

1. Safety-related masonry walls (see IE Bulletin No. 80-11).

2. Biological shielding within the fuel handling intermediate building, control building, and reactor building complex auxiliary building.

3. Missile barriers within the fuel handling intermediate building, reactor building complex auxiliary building, control building, diesel generator building, off-gas building, and emergency service water pump house.

4. Spent fuel pool and liner.

5. Drywell-wetwell vacuum breaker.

6. Diesel generator combustion air intake and exhaust system.

7. Radiation monitoring (fixed and portable).

8. Radioactivity monitoring (fixed and portable).

9. Radioactivity sampling (air, surfaces, liquids).

10. Radioactive contamination measurement and analysis.

11. Personnel monitoring internal (e.g., whole body counter) and external (e.g., TLD system).

12. Instrument storage, calibration, and maintenance.

13. Decontamination (facilities, personnel, and equipment).

14. Respiratory protection, including testing.

15. Contamination control.

16. Accident-related meteorological data collection equipment.

17. Seismic category I slopes of the Lake Erie shoreline bluff located 305 feet north of the emergency service water pumphouse.

18. Seismic category I fill.

19. Foundation for seismic category I electrical duct banks and manholes.

20. Site grading and watershed alterations.

21. Valve operators for all safety-related valves.

22. Motors for all safety-related pumps.

b. The following items from FSAR Table 3.2-1 need expansion and/or clarification as noted. Revise the list as indicated or justify not doing so.

1. Provide a commitment that the safety-related instrumentation and controls (I&C) described in Sections 7.1 through 7.6 of the FSAR plus safety-related I&C for safety-related fluid systems will be subject to the pertinent requirements of the FSAR QA program. This can be done by footnote to Table 3.2-1.

2. For the systems shown below, expand the list in Table 3.2-1 to include the indicated components under the pertinent 10 CFR 50 Appendix B quality assurance requirements or verify that they are included as part of the components already listed.

IX RHR System

Containment spray nozzles
Conical stainless strainer

XXIII Offgas System

As per Section C.6 of Regulatory Guide 1.143

XXXII Standby AC Auxiliary Power Systems (Class IE)

Diesel generator packages including auxiliaries (e.g., lube system, jacket cooling, air start system, governor, voltage regulator, excitation system)
6900 volt switchgear
480V load centers
480V motor control centers
Instrumentation, control, and power cables (including underground cable system, cable splices, connectors and terminal blocks)

Conduit and cable trays and their supports containing Class IE cables and those whose failure may damage other safety-related items
6900/480V transformers
Valve operators
Protective relays and control panels
AC control power inverters
Containment electrical penetration assemblies
Other cable penetrations (fire stops)

XXXIII 125 Volt Class IE DC Vital Power Distribution System

125V batteries, battery chargers, and distribution equipment
Cables
Conduit and cable trays and their supports containing Class IE cables and those whose failure may damage other safety-related items
Battery racks
Protective relays and control panels

XXXIV Structures

Reactor pressure vessel shield wall annulus
Drywell head compartment
RWCU heat exchanger compartment
RWCU demineralizer valve compartment
RWCU demineralizer compartment
RWCU valve nest compartment
Main steam tunnel compartment
Drywell-to-suppression pool vents

XXXV.1 Annulus Exhaust Gas Treatment System Units

Filter housing
Fans and motors
Demisters
Heaters
Ductwork
Dampers

XXXV.12 Fuel Handling Building Exhaust Units

Filter housing
Fans and motors
Demisters
Heaters
Ductwork
Dampers

XXXV.25 Control Room Emergency Recirculation Units

- Filter housing
- Fans and motors
- Demisters
- Heaters
- Ductwork
- Dampers

XXXV.30 Combustible Gas Control

- Hydrogen analyzer
- Hydrogen recombiners

XXXV. Control Room HVAC System

- Fans and motors
- Cooling coils (DX)
- Filters
- Humidifiers
- Condenser
- Charcoal filter housing
- Ductwork and dampers
- Valves with safety isolation function
- Utility exhaust fan
- Unit heaters

c. Enclosure 2 of NUREG-0737, "Clarification of TMI Action Plan Requirements" (November 1980) identified numerous items that are safety-related and appropriate for OL application and therefore should be on Table 3.2-1. These items are listed below. Add the appropriate items to Table 3.2-1 and provide a commitment that the remaining items are subject to the pertinent requirements of the FSAR operational QA program or justify not doing so.

| | | NUREG-0737 Enclosure 2 Clarification Item |
|---|---|---|
| 1) | Plant-safety-parameter display console. | I.D.2 |
| 2) | Reactor coolant system vents. | II.B.1 |
| 3) | Plant shielding. | II.B.2 |
| 4) | Post accident sampling capabilities. | II.B.3 |
| 5) | Valve position indication. | II.D.3 |
| 6) | Dedicated hydrogen penetrations. | II.E.4.1 |
| 7) | Containment isolation dependability. | II.E.4.2 |

| | | |
|---|---|---|
| 8) | Accident monitoring instrumentation. | II.F.1 |
| 9) | Instrumentation for detection of inadequate core-cooling. | II.F.2 |
| 10) | HPCI & RCIC initiation levels. | II.K.3(13) |
| 11) | Isolation of HPCI & RCIC. | II.K.3(15) |
| 12) | Challenges to and failure of relief valves. | II.K.3(16) |
| 13) | ADS actuation. | II.K.3(18) |
| 14) | Restart of core spray and LPCI. | II.K.3(21) |
| 15) | RCIC suction. | II.K.3(22) |
| 16) | Space cooling for HPCI & RCIC. | II.K.3(24) |
| 17) | Power on pump seals. | II.K.3(25) |
| 18) | Common reference level. | II.K.3(27) |
| 19) | ADS valve, accumulators, and associated equipment and instrumentation. | II.K.3(28) |
| 20) | Emergency plans (and related equipment). | III.A.1.1/III.A.2 |
| 21) | Equipment and other items associated with the emergency support facilities. | III.A.1.2 |
| 22) | Inplant $I_2$ radiation monitoring. | III.D.3.3 |
| 23) | Control-room habitability. | III.D.3.4 |

ENCLOSURE 6

## Fracture Prevention of Containment Pressure Boundary (GDC-51)

GDC-51 requires that under operating, maintenance, testing and postulated accident conditions, (1) the ferritic materials of the containment pressure boundary behave in a nonbrittle manner and (2) the probability of rapidly propagating fracture is minimized.

The Nine Mile Point-2 containment is a reinforced concrete structure with a thin steel liner on the inside surface which serves as a leaktight membrane. The ferritic materials of the containment pressure boundary which were considered in the staff's assessment are those which have been applied in the fabrication of the equipment hatch, personnel lock, penetrations and fluid system components including the valves required to isolate the system. These components are the parts of the containment system which are not backed by concrete and must sustain loads during the performance of the containment function under the conditions cited by GDC-51.

The acceptability of these materials within the context of GDC-51 is determined in accordance with the fracture toughness criteria identified for Class 2 materials by the Summer 1977 Addenda to ASME Code Section III.

ENCLOSURE 7

## PRESERVICE INSPECTION BRANCH

We require that your inspection program for Class 1, 2 and 3 components be in accordance with the revised rules in 10 CFR Part 50, Section 50.55a, paragraph (g). Accordingly, submit the following information:

(1) A preservice inspection plan which is consistent with the required edition of the ASME Code. This inspection plan should include any exceptions you propose to the Code requirements.

(2) An inservice inspection plan submitted within six months of the anticipated date for commercial operation.

This preservice inspection plan will be required to support the safety evaluation report finding regarding your compliance with preservice and inservice inspection requirements. Our determination of your compliance will be based on the edition of Section XI of the ASME Code referenced in your FSAR or later editions of Section XI referenced in the FEDERAL REGISTER that you may elect to apply.

Your response to this item should define the applicable edition(s) and subsections of Section XI of the ASME Code. If any of the examination requirements of the particular edition of Section XI you referenced in the FSAR cannot be met, a request for relief must be submitted, including complete technical justification to support your request.

Detailed guidelines for the preparation and content of the inspection programs to be submitted for staff review and for relief requests are attached as an Appendix to Section 121.0 of our review questions.

## APPENDIX TO SECTION 121.0

## GUIDANCE FOR PREPARING PRESERVICE AND INSERVICE INSPECTION PROGRAMS AND RELIEF REQUESTS PURSUANT TO 10 CFR 50.55a(g)

A. Description of the Preservice/Inservice Inspection Program

This program should cover the requirements set forth in Section 50.55a(b) and (g) of 10 CFR Part 50; the ASME Boiler and Pressure Vessel Code, Section XI Subsections IAW, IWB, IWC and IWD; and Standard Review Plans 5.2.4 and 6.6. The guidance provided in this enclosure is intended to illustrate the type and extent of information that should be provided for NRC review. It also describes the information necessary for "request for relief" of items that cannot be fully inspected to the requirements of Section XI of the ASME Code. By utilizing these guidelines, applicants can significantly reduce the need for requests for additional information from the NRC staff.

B. Contents of the Submittal

The information listed below should be included in the submittal:

1. For each facility, include the applicable date for the ASME Code and the appropriate addenda date.

2. The period and interval for which this program is applicable.

3. Provide the proposed codes and addenda to be used for repairs, modifications, additions or alternations to the facility which might be implemented during this inspection period.

4. Indicate the components and lines that you have exempted under the rules of Section XI of the ASME Code. A reference to the applicable paragraph of the code that grants the exemption is necessary. The inspection requirements for exempted components should be stated (e.g., visual inspection during a pressure test).

5. Identify the inspection and pressure testing requirements of the applicable portion of Section XI that are deemed impractical because of the limitations of design, geometry, or materials of construction of the components. Provide the information requested in the following section of this appendix for the inspections and pressure tests identified in Item 4 above.

C. Request for Relief from Certain Inspection and Testing Requirements

It has been the staff's experience that many requests for relief from testing requirements submitted by applicants and licensees have not been supported by adequate descriptive and detailed technical information. This detailed information is necessary to: (1) document the impracticality of the ASME Code requirements within the limitations of design, geometry, and materials of construction of components; and (2) determine whether the use of alternatives will provide an acceptable level of quality and safety.

Relief requests submitted with a justification such as "impractical," "inaccessible," or any other categorical basis, require additional information to permit the staff to make an evaluation of that relief request. The objective of the guidance provided in this section is to illustrate the extent of the information that is required by the NRC staff to make a proper evaluation and to adequately document the basis for granting the relief in the staff's Safety Evaluation Report. The NRC staff believes subsequent requests for additional information and delays in completing the review can be considerably reduced if this information is provided initially in the applicant's submittal.

For each relief request submitted, the following information should be included:

1. An identification of the component(s) and/or the examination requirements for which relief is requested.

2. The number of items associated with the requested relief.

3. The ASME Code class.

4. An identification of the specific ASME Code requirement that has been determined to be impractical.

5. The information to support the determination that the requirement is impractical; i.e., state and explain the basis for requesting relief.

6. An identification of the alternative examinations that are proposed: (a) in lieu of the requirements of Section XI; or (b) to supplement examinations performed partially in compliance with the requirements of Section XI.

7. A description and justification of any changes expected in the overall level of plant safety by performing the proposed alternative examinations in lieu of the examination required by Section XI. If it is not possible to perform alternate examinations, discuss the impact on the overall level of plant quality and safety.

For inservice inspection, provide the following additional information regarding the inspection frequency:

8. State when the request for relief would apply during the inspection period or interval (i.e., whether the request is to defer an examination).

9. State when the proposed alternative examinations will be implemented and performed.

10. State the time period for which the requested relief is needed.

Technical justification or data must be sumitted to support the relief request. Opinions without substantiation that a change will not affect the quality level are unsatisfactory. If the relief is requested for inaccessibility, a detailed description or drawing which depicts the inaccessibility must accompany the request. A relief request is not required for tests prescribed in Section XI that do not apply to your facility. A statement of "N/A" (not applicable) or "None" will suffice.

D. Request for Relief for Radiation Considerations

Exposures of test personnel to radiation to accomplish the examinations prescribed in Section XI of the ASME Code can be an important factor in determining whether, or under what conditions, an examination must be performed. A request for relief must be submitted by the licensee in the manner described above for inaccessibility and must be subsequently approved by the NRC staff.

We recognize that some of the radiation considerations will only be known at the time of the test. However, the licensee generally is aware, from experience at operating facilities, of those areas where relief will be necessary and should submit as a minimum, the following information with the request for relief:

1. The total estimated man-rem exposure involved in the examination.

2. The radiation levels at the test area.

3. Flushing or shielding capabilities which might reduce radiation levels.

4. A proposal for alternate inspection techniques.

5. A discussion of the considerations involved in remote inspections.

6. Similar welds in redundant systems or similar welds in the same systems which can be inspected.

7. The results of preservice inspection and any inservice results for the welds for which the relief is being requested.

8. A discussion for the consequences if the weld which was not examined, did fail.

TO ALL APPLICANTS:

ENCLOSURE 8

Due to a long history of problems dealing with inoperable and incorrectly installed snubbers, and due to the potential safety significance of failed snubbers in safety related systems and components, it is requested that maintenance records for snubbers be documented as follows:

Pre-service Examination

A pre-service examination should be made on all snubbers listed in tables 3.7-4a and 3.7-4b of Standard Technical Specifications 3/4.7.9 This examination should be made after snubber installation but not more than six months prior to initial system pre-operational testing, and should as a mimimum verify the following:

(1) There are no visible signs of damage or impaired operability as a result of storage, handling, or installation.

(2) The snubber location, orientation, position setting, and configuration (attachments, extensions, etc.) are according to design drawings and specifictions.

(3) Snubbers are not seized, frozen or jammed.

(4) Adequate swing clearance is provided to allow snubber movement.

(5) If applicable, fluid is to the recommended level and is not leaking from the snubber system.

(6) Structural connections such as pins, fasteners and other connecting hardware such as lock nuts, tabs, wire, cotter pins are installed correctly.

If the period between the initial pre-service examination and initial system pre-operational test exceeds six months due to unexpected situations, re-examination of items 1,4, and 5 shall be performed. Snubbers which are installed incorrectly or otherwise fail to meet the above requirements must be repaired or replaced and re-examined in accordance with the above criteria.

Pre-Operational Testing

During pre-operational testing, snubber thermal movements for systems whose operating temperature exceeds 250° F should be verified as follows:

(a) During initial system heatup and cooldown, at specified temperature intervals for any system which attains operating temperature, verify the snubber expected thermal movement.

(b) For those systems which do not attain operating temperature, verify via observation and/or calculation that the snubber will accommodate the projected thermal movement.

(c) Verify the snubber swing clearance at specified heatup and cooldown intervals. Any discrepencies or inconsistencies shall be evaluated for cause and corrected prior to proceeding to the next specified interval.

The above described operability program for snubbers should be included and documented by the pre-service inspection and pre-operational test programs.

The pre-service inspection must be a prerequisite for the pre-operational testing of snubber thermal motion. This test program should be specified in Chapter 14 of the FSAR.

ENCLOSURE 9

Containment Sump and its effect on long term cooling following a LOCA

During our reviews of license applications we have identified concerns related to the containment sump design and its effect on long term cooling following a Loss of Coolant Accident (LOCA).

These concerns are related to (1) creation of debris which could potentially block the sump screens and flow passages in the ECCS and the core, (2) inadequate NPSH of the pumps taking suction from the containment sump, (3) air entrainment from streams of water or steam which can cause loss of adequate NPSH, (4) formation of vortices which can cause loss of adequate NPSH, air entrainment and suction of floating debris into the ECCS and (5) inadequate emergency procedures and operator training to enable a correct response to these problems. Preoperational recirculation tests performed by utilities have consistently identified the need for plant modifications.

The NRC has begun a generic program to resolve this issue. However, more immediate actions are required to assure greater reliability of safety system operation. We therefore require you take the following actions to provide additional assurance that long term cooling of the reactor core can be achieved and maintained following a postulated LOCA.

1. Establish a procedure to perform an inspection of the containment, and the containment sump area in particular, to identify any materials which have the potential for becoming debris capable of blocking the containment sump when required for recirculation of coolant water. Typically, these materials consist of: plastic bags, step-off pads, health physics instrumentation, welding equipment, scaffolding, metal chips and screws, portable

inspection lights, unsecured wood, construction materials and tools as well as other miscellaneous loose equipment. "As licensed" cleanliness should be assured prior to each startup.

This inspection shall be performed at the end of each shutdown as soon as practical before containment isolation.

2. Institute an inspection program according to the requirements of Regulatory Guide 1.82, item 14. This item addresses inspection of the containment sump components including screens and intake structures.

3. Develop and implement procedures for the operator which address both a possible vortexing problem (with consequent pump cavitation) and sump blockage due to debris. These procedures should address all likely scenarios and should list all instrumentation available to the operator (and its location) to aid in detecting problems which may arise, indications the operator should look for, and operator actions to mitigate these problems.

4. Pipe breaks, drain flow and channeling of spray flow released below or impinging on the containment water surface in the area of the sump can cause a variety of problems; for example, air entrainment, cavitation and vortex formation.

   Describe any changes you plan to make to reduce vortical flow in the neighborhood of the sump. Ideally, flow should approach uniformly from all directions.

5. Evaluate the extent to which the containment sump(s) in your plant meet the requirements for each of the items previously identified; namely

debris, inadequate NPSH, air entrainment, vortex formation, and operator actions.

The following additional guidance is provided for performing this evaluation.

(1) Refer to the recommendations in Regulatory Guide 1.82 (Section C) which may be of assistance in performing this evaluation.

(2) Provide a drawing showing the location of the drain sump relative to the containment sumps.

(3) Provide the following information with your evaluation of debris:

(a) Provide the size of openings in the fine screens and compare this with the minimum dimensions in the pumps which take suction from the sump (or torus), the minimum dimension in any spray nozzles and in the fuel assemblies in the reactor core or any other line in the recirculation flow path whose size is comparable to or smaller than the sump screen mesh size in order to show that no flow blockage will occur at any point past the screen.

(b) Estimate the extent to which debris could block the trash rack or screens (50 percent limit). If a blockage problem is identified, describe the corrective actions you plan to take (replace insulation, enlarge cages, etc.).

(c) For each type of thermal insulation used in the containment, provide the following information:

(i) type of material including composition and density,

(ii) manufacturer and brand name,

(iii) method of attachment,

(iv) location and quantity in containment of each type,

(v) an estimate of the tendency of each type to form particles small enough to pass through the fine screen in the suction lines.

(d) Estimate what the effect of these insulation particles would be on the operability and performance of all pumps used for recirculation cooling. Address effects on pump seals and bearings.

ENCLOSURE 10

Equipment Qualification Branch
Audit Review Teams
Request for Information

To confirm the extent to which safety-related equipment meets the requirements of the General Design Criteria (GDC) of 10 CFR Part 50, the NRC staff, assisted by Technical Assistance Contractors, will conduct a plant site audit and review. It is our intent to conduct a plant specific on-site Pump and Valve Operability Review Team (PVORT) audit concurrent with the Seismic Qualification Review Team (SQRT) audit. We believe such scheduling should minimize manpower and scheduling conflicts for the applicant, the NRC staff, and our technical assistance contractors.

Since the site audit is performed on a sampling basis it is necessary to ensure that 85 to 90 percent of the safety related equipment are qualified and installed before the audit. In order that the staff is familiar with the seismic and dynamic qualification programs currently being conducted, it is requested that all test programs be identified by submitting a brief description of the program, items being tested, the vendor or the testing laboratory involved, and the dates and location of the tests. Information about the ongoing test programs should be submitted as soon as possible so that the NRC staff can review and witness relevant tests for selected items.

A list of all safety-related equipment should be provided so that an assessment of the equipment qualification status can be made by the staff. Equipment should be divided first by system then by component type. Attachment #1 shows a tabular format which should be followed to present the status summary of all safety-related equipment.

After the information on Attachment #1 is received, and it is determined that the equipment qualification is substantially complete, selections will be made of the equipment to be audited, and reviewed, by the SQRT and PVORT. Specific information on equipment selected for audit by each review team will be requested. The information that will be requested for those equipment selected by the SQRT is shown in Attachment #2. The information that will be requested for those equipment selected by PVORT is shown in Attachment #3. In addition, the applicant will be requested to provide a complete set of floor response spectra identifying their applicability to the equipment listed in Attachment #1.

For the equipment selected by the SQRT for audit, the combined Required Response Spectra (RRS) or the combined dynamic response will be reviewed. The SQRT will examine and compare the equipment on-site installation v/s the test configuration and mounting, and determine whether the test, or analysis which has been conducted conforms to the applicable standards and agrees with the RRS. In cases where the plant is a BWR facility, the equipment qualifying documentation must also provide evidence that the hydrodynamic loads in the (0 - 100) Hz frequency range have been accounted for.

For the equipment selected by the PVORT for audit, the applicant must provide evidence that appropriate manufacturers' tests have been conducted, reviewed, and approved, and that the equipment meets, or exceeds the design requirements. The applicant must also provide qualification test and or analysis results that provide assurance that the equipment will operate (function) during and following the Design Basis Events (DBE) and all appropriate combinations thereof.

The specific information requested in Attachments #2, and #3 should be provided to the NRC staff two weeks prior to the plant site visit. The applicant should make available at the plant site all the pertinent documents and reports of the qualification for the selected equipment. After the visit, the applicant should be prepared to submit certain selected documents and reports for further staff review. The purpose of the audits is to confirm the acceptability of the qualification procedures, and implementation of the procedures to all safety-related equipment based on the review of a few selected pieces. If a number of deficiencies are observed or significant generic concerns arise, the deficiencies should be removed for all equipment important to safety subject to confirmation by a follow-up audit of randomly selected items before the fuel loading date.

The site audits will also include a review of the extent to which the documentation of equipment qualification is complete. The acceptance criteria for requirements on records is provided in Section 3.10 of the Standard Review Plan Revision 2 (NUREG-800).

Another element of the seismic and dynamic qualification review deals with the containment isolation valves for the purge and vent systems to assure their ability to close against postulated accident pressure inside containment. Information needed for this review and the basis for the review are provided in Attachments 4 and 5.

ATTACHMENT #1

- MASTER LISTING OF SEISMIC AND DYNAMIC QUALIFICATION SUMMARY AND STATUS OF SAFETY-RELATED EQUIPMENT
- ASSOCIATED EXPLANATORY NOTE

MASTER LISTING OF SEISMIC AND DYNAMIC QUALIFICATION SUMMARY AND STATUS OF SAFETY RELATED EQUIPMENT

PLANT NAME: DOCKET NO: UTILITY: A/E: NSSS: PAGE OF

FOR EQUIPMENT LISTED BELOW

THE SUPPLIER IS: A/E ☐, NSSS ☐, OTHER ☐. SAFTY SYSTEM & FUNCTION ARE:

| EQUIP. NO. | EQUIPMENT | | | | LOCATION | | LOADS CONSIDERED | | | QUALIFICATION METHOD | | | LOWEST NATURAL FREQUENCY | | | STATUS | | RRS REF | CODES AND STANDARDS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TYPE AND DESCRIPTION | MANUFACTURER AND MODEL NO. | TEST REPORT NO. | QUANTITY | BUILDING AND ELEVATION | MOUNTING | SEISMIC | OTHER DYNAMIC | READ INPUT (ZPA) | ANALYSIS | TEST FREQUENCY | TEST DIRECTION | T/B (H2) | S/S (H2) | V (H2) | QUALIFICATION | INSTALLATION | | |
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## NOTES TO MASTER LISTING

(1) The information on Plant Name, Docket No., etc., are pertinent to the power station and will be the same for all sheets.

(2) The equipment is listed by supplier (circle one after "SUPPLIED BY:") and by system (indicate name and function of system after "SYSTEM AND FUNCTION:"). Typical safety systems, for example, are Engineered Safeguard Actuation, Reactor Protection, Containment Isolation, Steamline Isolation, Main Feedwater Shutdown and Isolation, Emergency Power, Emergency Core Cooling, Containment Heat Removal, Containment Fission Product Removal, Containment Combustible Gas Control, Auxiliary Feedwater, Containment Ventilation, Containment Radiation Monitoring, Control Room Habitability System, Ventilation for Areas Containing Safety Equipment, Component Cooling, Service Water, Emergency Systems to Achieve Safe Shutdown, Postaccident Sampling and Monitoring, Radiation Monitoring, Safety-Related Display Instrumentation. The supplier will usually be either A/E or NSSS. Use separate sheets for each system. Use additional sheets when a given system has more equipment than can be listed on one sheet.

(3) "IDENT. NO." is to be filled in by the organization preparing the list. Each equipment listed should have separate identification number. The following form is recommended:

(a) For A/E supplied equipment, the number may be "BOP-XXX." If more than one group is preparing forms, the number may be "BOP-M-XXX" (Mechanical) or "BOP-IC-XXX" (Instrumentation and Control).

(b) For NSSS supplied equipment, the number may be NSSS-M-XXX, NSSS-IC-XXX, etc.

(c) The number written on each line (for each listed equipment) should be an ordered numeric listing for the above indicated-XXX (-001 through completion). These numbers need not follow in order for each system (-002 and -004 may be with one system, but -003 may be with another system).

(d) Inside the parenthesis should be the "BOP-M," "NSSS-IC," etc.

(4) The "TYPE" refers to its generic name, such as pressure transmitter, indicator, solenoid value, cabinet, etc. Equipment type should be described by indicating for example, motor driven pump, turbine driven pump, motor operated valve, air operated valve, 18" valve, etc. Following abbreviations can be used where appropriate.

Valves:
BV - Ball valve, BFV - Butterfly valve, CV - check valve, DV - Diaphragm valve,
GV - Gato valve, GLV - Glove valve, SV - Safety Valve, RV - Relief Valve

Pumps:
CP - Centrifugal pump, PDP - Positive displacement pump, DDP - Deep draft pump,
JP - Jet pump

(5) Quantity refers to the number of the same equipment used in the plant.

(6) Under mounting condition indicate the following as applicable:

CF for concrete floor mounting
CW for concrete wall mounting
DM for direct mounting
HM for hanger mounting
RM for rack mounting
CM for cabinet mounting
EM for equipment mounting

Mounting details such as number of bolts, weld length, etc. need not be indicated here.

(7) The columns "SEISMIC" and "OTHER DYNAMIC" need only be checked (X) if applicable. In the case of BWRs indicate "H" under "OTHER DYNAMIC" column where qualification includes hydrodynamic loads.

(8) Under "REQ'D INPUT (ZPA)," the applicable "g" level should be provided.

(9) Under Qualification Method under analysis, indicate "S" for static, and "D" for dynamic; under test frequency, indicate "SF" for single, and "MF" for multiple; and under text direction, indicate "SD" for single, "MD" for multiple.

(10) Equipment status is to be addressed separately to qualification and to installation.

The applicable letter should be provided under the column headed "QUAL," according to the following code:

A The qualification and associated documentation are complete.

B The qualification testing is finished but associated documentation is not yet submitted or still in review.

C The qualification plan/procedure is documented, but testing has not yet begun.

D Equipment to be qualified.

E Equipment is judged not qualifiable and will be replaced with qualified equipment.

F For BWR plants only: Equipment is qualified for seismic loading only. Requalification will be performed to account for the suppression pool hydrodynamic loading effects.

The applicable letter should be provided under the column headed "INSTALLATION," according to the following code:

A Installation is completed. Equipment is ready for service.

B Equipment mounting/hookup is completed, but significant parts of the equipment are not yet installed.

C Equipment is located at its intended service location, but mounting and/or hookup is not completed.

D The equipment is not installed and is not available for inspection.

(11) The Required Response Spectra (RRS) package should be provided along with the Master Listing. Only response spectra applicable to the listed equipment should be included, each numbered for reference under the column headed "RRS REF." In many cases, several equipment will reference the same RRS.

(12) Codes and Standards

Applicable codes, standards and Regulatory Guides should be indicated here, for example, ASME Section III Class 2; IEEE-344, 1975, 323-1974, 382-1972; ANSI N278-1, Regulatory Guide 1.100, 1.148 etc.

# Seismic and Dynamic Qualification Summary of Equipment

I. Plant Name: _____ Type:

1. Utility: _____ PWR: _____

2. NSSS: _____ BWR: _____

3. A/E: _____ Other _____

II. Component Name: _____

1. Scope: [ ] NSSS [ ] BOP [ ] Other

2. Model Number: _____ Quantity: _____

3. Size or Range: _____

4. Vendor: _____

5. If the component is a cabinet or panel, name and model Number of the devices included: _____

_____

6. Physical Description:

a. Appearance: _____

b. Dimensions: _____

c. Weight: _____

7. Location: Building: _____

Elevation: _____

8. Field Mounting Conditions [ ] Bolt (No. ____, Size ____)
[ ] Weld (Length ____)
[ ] _____

9. Mounting Orientation [e.g., on floor, cantilevered, suspended, etc.]

_____

10. a. System in which located: _____

b. Functional Description: _____

c. Is the equipment required for [ ] Hot Standby [ ] Cold Shutdown

[ ] Both [ ] Neither [ ] Other _____

II. Pertinent Reference Design Specifications for Qualification Requirements: _____

_____

a. Seismic Input

b. Hydrodynamic Load Input

c. Fatigue Considerations

d. Service Conditions

e. Qualified Life

III. Is Equipment Available for Inspection in the Plant:

[ ] Yes [ ] No [ ] Partial or limited availability

IV. Equipment Qualification Method:

[ ] Test [ ] Analysis [ ] Combination of Test and Analysis

Qualification Report*: _____

(No., Title and Date): _____

Company that Prepared Report: _____

Company that Reviewed Report: _____

Where Report is filed or available: _____

Applicable Codes And/Or Standards: _____

V. Vibration Input:

1. Loads considered:
   a. [ ] Seismic only
   b. [ ] Hydrodynamic only
   c. [ ] Vibration from normal operation
   d. [ ] Combination of (a), (b), and (c)

2. Method of Combining RRS:

   [ ] Absolute Sum [ ] SRSS [ ] _____ (other, specify)

3. Required Response Spectra** (attach the graphs): _____

NOTE:
*If more than one report complete items IV thru VII for each report.
**If other than RRS is used, describe method.

4. Damping Corresponding to RRS: OBE _____ SSE _____

5. Required Acceleration in Each Direct:

[ ] ZPA [ ] Other _____ (specify)

OBE S/S = _____ F/B = _____ V = _____

SSE S/S = _____ F/B = _____ V = _____

6. Were fatigue effects considered:

[ ] Yes [ ] No

If yes, describe how they were treated in overall qualification program: _____

_____

_____

VI. If Qualification by Test, then Complete:

1. [ ] Single Frequency [ ] MuTti-Frequency [ ] random
[ ] sine beat
[ ] _____

2. [ ] Single Axis [ ] Multi-Frequency
[ ] Independent Axis [ ] In-phase motions

3. Number of Qualifications Tests:

OBE _____ SSE _____ Other _____ (specify)

4. Frequency Range: _____

5. Natural Frequencies in Each Direction (Side/Side, Front/Back, Vertical):

S/S = _____ F/B = _____ V = _____

6. Method of Determining Natural Frequencies

[ ] Lab Test [ ] In-Situ Test [ ] Analysis

7. TRS enveloping RRS using Multi-Frequency Test

[ ] Yes (Attach TRS & RRS graphs)

[ ] No

8. Maximum Input g Level Test:

OBE S/S = _____ F/B = _____ V = _____

OBE S/S = _____ F/B = _____ V = _____

9. Laboratory Mounting:

A. [ ] Bolt (No: ____, Size ____)

[ ] Weld (Length ____) [ ] _____

B. Orientation and Fixturing: _____

10. Functional operability verified:

[ ] Yest [ ] No [ ] Not Applicable

11. Test Results including modifications made: _____

_____

12. Other tests performed (such as aging or fragility test, including results):

_____

_____

13. Failure Modes (If appropriate _____)

14. Margins Available: [ ] Input Spectrum [ ] Fragility

VII. If Qualification by Analysis, then complete:

1. Method of Analysis:

[ ] Static Analysis [ ] Equivalent Static Analysis

[ ] Dynamic Analysis: [ ] Time-History [ ] Response Spectrum

2. Natural Frequencies in Each Direction (Side/Side, Front/Back, Vertical):

S/S = _____ F/B = _____ V = _____

3. Model Type: [ ] 3D [ ] 2D [ ] 1D

[ ] Finite Element [ ] Beam

[ ] Closed Form Solution [ ] Other _____

4. [ ] Computer Codes: _____

Frequency Range and No. of modes

[ ] Hand Calculations

5. Method of Combining Dynamic Responses from Seismic and Other Dynamic Loads:

[ ] Absolute Sum [ ] SRSS [ ] Other: _____ (specify)

6. Damping:

OBE _____ SSE _____ Basis for the damping used: _____

7. Support Considerations in the model: _____

8. Critical Structural Elements:

A.

| Identification Location | Governing Load or Response Combination | Seismic Stress | Total Stress | Stress Allowable |
|---|---|---|---|---|

B.

| Maximum Critical Deflection | Location | Maximum Allowable Deflection to Assure Functional Operability |
|---|---|---|

9. Failure Modes: _____

10. Margins Available: [ ] Input Spectrum [ ] Stress or Deflection

# PUMP AND VALVE
# OPERABILITY ASSURANCE REVIEW

## I. PLANT INFORMATION

1. Name: _____ Unit No. ___ 2. Docket No.: _____

3. Utility: _____

4. NSSS: _____ [] PWR [] BWR

5. A/E: _____

6. C.P. Docket Date: _____ C.P. SER Date: _____

## II. GENERAL COMPONENT* INFORMATION

1. Supplier: [] NSSS [] BOP

2. Location: a. Building/Room _____

   b. Elevation _____

   c. System _____

3. Component I.D. No. on P&ID dwg: _____

4. If component is a [] Pump complete II.5.

   If component is a [] Valve complete II.6.

5. General Pump Data

| a. Pump | b. Prime-mover |
|---|---|
| Name _____ | Name _____ |
| Mfg. _____ | Mfg. _____ |
| Model _____ | Model _____ |
| S/N _____ | S/N _____ |
| Type _____ | Type _____ |

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* The component, whether pump or valve, is considered to be an assembly composed of the body, internals, prime-mover (or actuator) and functional accessories.

6. General Valve Data

a. Valve

Name _____

Mfg. _____

Model _____

S/N _____

Type _____

Size _____

Weight _____

Mounting Method _____

b. Actuator (if not an integral unit)

Name _____

Mfg. _____

Model _____

S/N _____

Type _____

Size _____

Weight _____

Mounting Method _____

Required Operating Torque _____

Maximum Delivered Torque _____

| Parameters: | Component Design | System Normal | System Accident |
|---|---|---|---|
| Press | | | |
| Temp | | | |
| Flow | | | |
| Media | | | |

Max ΔP across valve _____

Closing time @ max ΔP _____

Opening time @ max ΔP _____

Power requirements: (include normal, maximum and minimum).

Electrical _____

_____

_____

Pneumatic/Hydraulic _____

_____

_____

List functional accessories:* _____

_____

_____

_____

4. Safety requirements:

[] Intermittent Operation [] During postulated event

[] Continuous Operation [] Following postulated event

If component operation is required following an event, give approximate length of time component must remain operational.

_____ (e.g., hours, days, etc.)

5. For VALVES:

Does the component [] Fail open [] Fail closed [] Fail as is

Is this the fail safe position? [] Yes [] No

Is the valve used for throttling purposes? [] Yes [] No

What is the maximum acceptable internal and external leakrate?

_____ _____

## IV. QUALIFICATION

1. Reference by specific number the design codes and standards used as a guide to qualify the component:

_____

_____

_____

_____

2. Have acceptance criterias been established and documented in the test plan(s) for the component? [] Yes [] No

3. Are the margins* identified in the qualification documentation? [] Yes [] No

4. Was the component that was qualified a model or an actual assembly? _____. If a model, what was its scale? _____. If an actual assembly, was it qualified as an assembly or by sub-assemblies? (i.e., valve, actuator, pump, driver) _____

_____

* Margin is the difference between design basis parameters and the test parameters used for equipment qualification.

8. Was the tested component precisely identical (as to model, size, etc.) to the in-plant component? [] Yes [] No If "No", is installed component [] oversized or [] undersized?

9. Is component orientation sensitive? [] Yes [] No [] Unknown If "Yes", does installed orientation coincide with test/analysis orientation? [] Yes [] No

10. List all plant loading conditions considered during tests or analysis; (e.g., normal, upset, emergency, faulted).

_____

_____

11. What is the fundamental frequency of the component?

_____

_____

12. Does the component have a unique design or utilize unique material in its construction? (Examples are special gaskets or packing, one of a kind components, limitations on nonferrous materials, special coatings or surfaces, etc.)

[ ]Yes [ ]No If "Yes" identify: _____

_____

_____

13. What is the design (qualified) life of the component, exclusive of normal maintenance items such as packing, bearings, seals, diaphragm, gaskets, and other elastomers? _____

_____

14. Which of the components normal maintenance items requires the most frequent replacement/repair? _____
What is the normal time interval between replacements/repairs?

_____

15. List the harshest environmental conditions that the component could be exposed to during or following an accident, [e.g., temp., pressure, humidity, submergence, radiation (type and dose), etc.]:

_____

_____

_____

ENCLOSURE 11

# Operability Qualification of Purge and Vent Valves

Demonstration of operability of the containment purge and vent valves and the ability of these valves to close during a design basis accident is necessary to assure containment isolation. This demonstration of operability is required by NUREG-0737, "Clarification of TMI Action Plan Requirements," II.E.4.2 for containment purge and vent valves which are not sealed closed during operational conditions 1, 2, 3 and 4.

1. For each purge and vent valve covered in the scope of this review, the following documentation demonstrating compliance with the "Guidelines for Demonstration of Operability of Purge and Vent Valves" (Attachment 2) is to be submitted for staff review:

   A. Dynamic Torque Coefficient Test Reports (Butterfly valves only) - including a description of the test setup.

   B. Operability Demonstration or In-situ Test Reports (when used)

   C. Stress Reports

   D. Seismic Reports for Valve Assembly (valve and operator) and associated parts.

   E. Sketch or description of each valve installation showing the following (Butterfly valves only):

      1. direction of flow
      2. disc closure direction
      3. curved side of disc, upstream or downstream (asymmetric discs)
      4. orientation and distance of elbows, tees, bends, etc. within 20 pipe diameters of valve
      5. shaft orientation
      6. distance between valves

   F. Demonstration that the maximum combined torque developed by the valve is below the actuator rating.

2. The applicant should respond to the "Specific Valve Type Questions" (Attachment 1) which relate to his valve.

3. Analysis, if used, should be supported by tests which establish torque coefficients of the valve at various angles. As torque coefficients in butterfly valves are dependent on disc shape, aspect ratio, angle of closure, flow direction and approach flow, these things should be accurately represented during tests. Specifically, piping installations (upstream and downstream of the valve) during the test should be representative of actual field

installations. For example, non-symmetric approach flow from an elbow upstream of a valve can result in fluid dynamic torques of double the magnitude of those found for a valve with straight piping upstream and downstream.

4. In-situ tests, when performed on a representative valve, should be performed on a valve of each size/type which is determined to represent the worst case load. Worst case flow direction, for example, should be considered.

5. For two valves in series where the second valve is a butterfly valve, the effect of non-symmetric flow from the first valve should be considered if the valves are within 15 pipe diameters of each other.

6. If the applicant takes credit for closure time vs. the buildup of containment pressure, he must demonstrate that the method is conservative with respect to the actual valve closure rate. Actual valve closure rate is to be determined under both loaded and unloaded conditions (if valves close faster at all angles of opening under loaded conditions, no load closure time may be used as conservative) and periodic inspection under tech. spec. requirements should be performed to assure closure rate does not increase with time or use.

Attachment 1
Specific Valve Type Questions

The following questions apply to specific valve types only and need to be answered only where applicable. If not applicable, state so.

A. Torque Due to Containment Backpressure Effect (TCB)

For those air operated valves located inside containment, is the operator design of a type that can be affected by the containment pressure rise (backpressure effect) i.e., where the containment pressure acts to reduce the operator torque capability due to TCB. Discuss the operator design with respect to the air vent and bleeds. Show how TCB was calculated (if applicable).

B. Where air operated valve assemblies use accumulators as the fail safe feature, describe the accumulator air system configuration and its operation. Discuss active electrical components in the accumulator system, and the basis used to determine their qualification for the environmental conditions experienced. Is this system seismically designed? How is the allowable leakage from the accumulators determined and monitored?

C. For valve assemblies requiring a seal pressurization system (inflatable main seal), describe the air pressurization system configuration and operation including means used to determine their qualification for the environmental condition experienced. Is this system seismically designed?

D. Where electric motor operators are used to close the valve has the minimum available voltage to the electric operator under both normal or emergency modes been determined and specified to the operator manufacturer to assure the adequacy of the operator to stroke the valve at accident conditions with these lower limit voltages available? Does this reduce voltage operation result in any significant change in stroke timing? Describe the emergency mode power source used.

E. Where electric motor and air operator units are equipped with handwheels, does their design provide for automatic re-engagement of the motor operator following the handwheel mode of operation? If not, what steps are taken to preclude the possibility of the valve being left in the handwheel mode following some maintenance, test etc. type operation?

F. For electric motor operated valves have the torques developed during operation been found to be less than the torque limiting settings?

Attachment 2
Guidelines for Demonstration
Of Operability of Purge and
Vent Valves

## Operability

In order to establish operability it must be shown that the valve actuator's torque capability has sufficient margin to overcome or resist the torques and/or forces (i.e., fluid dynamic, bearing, seating, friction) that resist closure when stroking from the initial open position to full seated (bubble tight) in the time limit specified. This should be predicted on the pressure(s) established in the containment following a design basis LOCA. Considerations which should be addressed in assuring valve design adequacy include:

1. Valve closure rate versus time - i.e., constant rate or other.

2. Flow direction through valve; $\Delta P$ across valve.

3. Single valve closure (inside containment or outside containment valve) or simultaneous closure. Establish worst case.

4. Containment back pressure effect on closing torque margins of air operated valve which vent pilot air inside containment.

5. Adequacy of accumulator (when used) sizing and initial charge for valve closure requirements.

6. For valve operators using torque limiting devices - are the settings of the devices compatible with the torques required to operate the valve during the design basis condition.

7. The effect of the piping system (turns, branches) upstream and downstream of all valve installations.

8. The effect of butterfly valve disc and shaft orientation to the fluid mixture egressing from the containment.

## Demonstration

Demonstration of the various aspects of operability of purge and vent valves may be by analysis, bench testing, in-situ testing or a combination of these means.

Purge and vent valve structural elements (valve/actuator assembly) must be evaluated to have sufficient stress margins to withstand loads imposed while valve closes during a design basis accident. Torsional shear, shear, bending, tension and compression loads/stresses should be considered. Seismic loading should be addressed.

Once valve closure and structural integrity are assured by analysis, testing or a suitable combination, a determination of the sealing integrity after closure and long term exposure to the containment environment should be evaluated. Emphasis should be directed at the effect of radiation and of the containment spray chemical solutions on seal material. Other aspects such as the effect on sealing from outside ambient temperatures and debris should be considered.

The following considerations apply when testing is chosen as a means for demonstrating valve operability:

Bench Testing

A. Bench testing can be used to demonstrate suitability of the in-service valve by reason of its traceability in design to a test valve. The following factors should be considered when qualifying valves through bench testing.

   1. Whether a valve was qualified by testing of an identical valve assembly or by extrapolation of data from a similarly designed valve.

   2. Whether measures were taken to assure that piping upstream and downstream and valve orientation are simulated.

   3. Whether the following load and environmental factors were considered

      a. Simulation of LOCA

      b. Seismic loading

      c. Temperature soak

      d. Radiation exposure

      e. Chemical exposure

      f. Debris

B. Bench testing of installed valves to demonstrate the suitability of the specific valve to perform its required function during the postulated design basis accident is acceptable.

   1. The factors listed in Items A.2 and A.3 should be considered when taking this approach.

In-Situ Testing

In-situ testing of purge and vent valves may be performed to confirm the suitability of the valve under actual conditions. When performing such tests, the conditions (loading, environment) to which the valve(s) will be subjected during the test should simulate the design basis accident.

NOTE: Post test valve examination should be performed to establish structural integrity of the key valve/ actuator components.

Enclosure

Request for Additional Information by the
Equipment Qualification Branch

TMI Action Plan II.D.1

Prior submittals do not provide the basis for the conclusion that the test results presented in NEDE-24988-P on safety/relief valve testing are applicable to your specific plant. Describe the basis thoroughly, as indicated below.

1. The test program utilized a "rams head" discharge pipe configuration. Most plants utilize a "tee" quencher configuration at the end of the discharge line. Describe the discharge pipe configuration used at your plant and compare the anticipated loads on valve internals in the plant configuration to the measured loads in the test program. Discuss the impact of any differences in loads on valve operability.

2. The test configuration utilized no spring hangers as pipe supports. Plant specific configurations do use spring hangers in conjunction with snubber and rigid supports. Describe the safety relief valve pipe supports used at your plant and compare the anticipated loads on valve internals for the plant pipe supports to the measured loads in the test program. Describe the impact of any differences in loads on valve operability.

3. Report NEDE-24988-P did not report any valve functional deficiencies or anomalies encountered during the test program. Describe the impact of valve safety function of any valve functional deficiencies or anomalies encountered during the program that were not reported.

4. The purpose of the test program was to determine valve performance under conditions anticipated to be encountered in the plants. Describe the events and anticipated conditions at the plant for which the valves are required to operate and compare these plant conditions to the conditions in the test program. Describe the plant features assumed in the event evaluations used to scope the test program and compare them to the features at your plant. For example, describe high level trips to prevent water from entering the steam lines under high pressure operating conditions as assumed in the test event and compare them to trips used at your plant.

5. The valves are likely to be extensively cycled in a controlled depressurization mode in a plant specific application. Was this mode simulated in the test program? What is the effect of this valve cycling on valve performance and probability of the valve to fail open or to fail close?

6. Describe how the values of valve $C_V$'s in report NEDE-24988-P will be used at your plant. Show that the methodology used in the test program to determine the valve $C_V$ will be consistent with the application at your plant.

# VERIFY QUALIFICATION OF ADS ACCUMULATOR SYSTEM VALVES

## REVIEW AND ACCEPTANCE CRITERIA

### 1.0 CRITERIA - NUMBER OF ACTUATIONS

The applicant/licensee should define the number of times the ADS valves must be capable of cycling using only the accumulator inventory and the length of time these accumulators are required to perform their function following an accident.

### 1.1 Acceptance - Reactor System Branch Concurrence

1.1.1 Actuations. A statement defining the number of times the ADS valves are capable of cycling using only the accumulator inventory, and the length of time these accumulators are capable of performing their function following an accident (e.g., the ADS accumulators are designed to provide two SR/V actuations at 70% of drywell design pressure, which is equivalent to 4 actuations at atmospheric pressure for the duration stated in the plants FSAR).

1.1.2 System Description. A concise description of the ADS accumulator system design and operation (e.g., train, air supply, capacity, alarms and their location, etc.).

### 2.0 CRITERIA - LEAKAGE CRITERIA

(a) The applicant/licensee should provide the bases for the allowable leakage criteria,

(b) The leakage criteria should include some margin to account for a possible increase in leakage resulting from the effects of a harsh environment and/or a seismic event, or

(c) A statement that either test and/or analysis have demonstrated that the leakage rate does not increase following an accident.

### 2.1 Acceptance

2.1.1 Basis for Leakage Criteria. A concise discussion regarding the bases for the allowable leakage criteria.

2.1.2 Leakage Criteria Margin. A statement verifying that the criteria considers harsh environment, seismic events, operator action etc., and includes some margin for them, or

2.1.3 Increase Leakage Rate. A statement that analysis and/or test have demonstrated that a harsh environment and/or seismic event would not increase the leakage rate.

2.1.4 Leak Criteria and Safety Related Equipment. A statement verifying that no credit was taken for non-safety related equipment and instrumentation, when establishing the allowable leakage criteria.

## 3.0 CRITERIA -PERIODIC LEAK TESTING

The licensee/applicant should perform periodic leak testing of the ADS accumulator system to assure emergency supply for the required number and durations of valve actuations.

### 3.1 Acceptance

3.1.1 Periodic Leak Test. A statement defining the periodic leak testing of the ADS accumulator system. (i.e., the time interval between these leak tests, along with a concise description of the test procedure employed).

3.1.2 Backup System Description. If a backup system is provided, a concise description of the design and operation of this system and a statement that test and/or analysis have confirmed that the backup system will meet the overall requirements of the ADS system.

3.1.3 Alarms and Instrumentation. A concise description of the alarms and instrumentation associated with the ADS accumulators system and backup, if applicable.

3.1.4 Backup System Test. A concise description of the tests performed on the backup system, if applicable.

3.1.5 Alarm Surveillance. A concise description of surveillance performed, and how frequent, on alarms associated with the ADS accumulator system, and backup if applicable.

3.1.6 Leakage Rate Verification. If a backup system is not provided a statement that test and/or analysis have verified that the leak rate will not prevent the ADS from performing as required.

## 4.0 CRITERIA - TECHNICAL SPECIFICATIONS

The applicant/licensee should propose technical specifications that specify leak test frequency, allowable leak rate, and the action to be taken if the leak rate limit is exceeded.

### 4.1 Acceptance

Excerpts from the plant's technical specification verifying that they specify the following:

4.1.1 Frequency. ADS accumulator system leak test frequency.

4.1.2 Allowable Leakage Rate. ADS accumulator system allowable leakage rate.

4.1.3 Leak Rate Exceeded. Actions to be taken, in a specified time frame, should the ADS accumulator system allowable leakage rate be exceeded.

## 5.0 CRITERIA - SEISMIC AND ENVIRONMENTALLY QUALIFIED

The applicant should state that the ADS accumulator system, and associated control circuitry, from the ADS valve operator out to and including the accumulator system isolation check valve are seismic and environmentally qualified.

### 5.1 Acceptance

5.1.1 Seismic Qualification. A concise description as to what areas of the ADS accumulator system, associated control circuitry and backup system, if applicable, are seismically qualified.

5.1.2 Environmental Qualification. A statement confirming that the ADS accumulator system is qualified to accomodate the effects of and is compatible with the environmental conditions associated with normal operation, maintenance, testing, and postulated accidents as stated in General Design Criteria 2 and 4 of Appendix A of 10 CFR 50.

5.1.3 Safety Related Equipment. A statement that verifies that the ADS valves accumulators, associated equipment and instrumentation are capable of performing their function during and following an accident situation while taking no credit for non-safety related equipment and instrumentation.

ENCLOSURE 14

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

February 25, 1981

TO ALL LICENSEES OF OPERATING NUCLEAR POWER REACTORS AND APPLICANTS FOR OPERATING LICENSES (EXCEPT FOR ST. LUCIE UNIT NOS. 1 & 2)

SUBJECT: EMERGENCY PROCEDURES AND TRAINING FOR STATION BLACKOUT EVENTS (Generic Letter 81-04)

A recent decision by the Atomic Safety and Licensing Appeal Board (ALAB-603) concluded that station blackout (i.e., loss of all offsite and onsite AC power) should be considered a design basis event for St. Lucie Unit No. 2. An amendment to the Construction Permit for St. Lucie Unit No. 2 was subsequently issued on September 18, 1980. The NRC staff is currently assessing station blackout events on a generic basis (Unresolved Safety Issue A-44). The results of this study, which is scheduled to be completed in 1982, will identify the extent to which design provisions should be included to reduce the potential for or consequences of a station blackout event.

However, the Board has recommended that more immediate measures be taken to ensure that station blackout events can be accommodated while task A-44 is being conducted. Although we believe that, qualitatively, there appears to be sufficient time available following a station blackout event to restore AC power, we are not sure if licensees have adequately prepared their operators to act during a station blackout event.

Consequently, we request that you review your current plant operations to determine your capability to mitigate a station blackout event and promptly implement, as necessary, emergency procedures and a training program for station blackout events. Your review of procedures and training should consider, but not be limited to:

a. The actions necessary and equipment available to maintain the reactor coolant inventory and heat removal with only DC power available, including consideration of the unavailability of auxiliary systems such as ventilation and component cooling.

b. The estimated time available to restore AC power and its basis.

c. The actions for restoring offsite AC power in the event of a loss of the grid.

d. The actions for restoring offsite AC power when its loss is due to postulated onsite equipment failures.

e. The actions necessary to restore emergency onsite AC power. The actions required to restart diesel generators should include consideration of loading sequence and the unavailability of AC power.

f. Consideration of the availability of emergency lighting, and any actions required to provide such lighting, in equipment areas where operator or maintenance actions may be necessary.

g. Precautions to prevent equipment damage during the return to normal operating conditions following restoration of AC power. For example, the limitations and operating sequence requirements which must be followed to restart the reactor coolant pumps following an extended loss of seal injection water should be considered in the recovery procedures.

The annual requalification training program should consider the emergency procedures and include simulator exercises involving the postulated loss of all AC power with decay heat removal being accomplished by natural circulation and the steam-driven auxiliary feedwater system for PWR plants, and by the steam-driven RCIC and/or HPCI and the safety-relief valves in BWR plants.

We conclude that the actions described above should be completed as soon as they reasonably can be (i.e., within 6 months). In addition, so that we may determine whether your license should be amended to incorporate this requirement, you are requested, pursuant to §50.54(f), to furnish within ninty (90) days of receipt of this letter, an assessment of your existing or planned facility procedures and training programs with respect to the matters described above. Please refer to this letter in your response. In the event that completion within 6 months can not be met, please propose a revised date and justification for the delay.

This request for information was approved by GAO under a blanket clearance number R0072 which expires November 30, 1983. Comments on burden and duplication may be directed to the U.S. General Accounting Office, Regulatory Reports Review, Room 5106, 441 G Street, NW., Washington, D.C. 20548.

Sincerely,

Darrell G. Eisenhut, Director
Division of Licensing
Office of Nuclear Reactor Regulation

ENCLOSURE 15

## INITIAL TEST PROGRAM REVIEWS

## COMMON REVIEW PROBLEMS OF FSAR CHAPTER 14

Changes to your test program or test procedures resulting from our review could impact your license schedule if the changes require that you (1) increase your staffing for the initial test program, (2) modify and rerun preoperational test procedures which may have already been completed, or (3) modify startup test procedures. This is because increases in staffing normally require some lead time, preoperational test procedures must be written, approved, and made available to NRC 60 days prior to fuel loading, and startup test procedures must be written, approved, and made available to NRC 60 days prior to fuel loading.

Based upon recent reviews of the initial test program for OL applications, we believe that our review time can be significantly reduced if, at the start of our review, your FSAR addresses and accounts for staff information requests on previous applications. All of our recent reviews have contained numerous requests and positions identical or similar to those which had to be resolved during previous reviews.

We request that you consider these known staff requests and positions on Chapter 14 sent to other recent applicants. Incorporating the resolution of these items into your FSAR prior to our review will reduce NRC review time and should ensure that the review of your initial test program description will not impact your schedule for fuel load or startup.

An area of particular concern is that of acceptance criteria in Chapter 14.2.12 test descriptions. Regulatory Guide 1.70 paragraph 14.2.12 states that test descriptions should include a "summary description of ... acceptance criteria". This item can be satisfied by providing a list of acceptance criteria parameters and the "source" or "basis" of acceptance ranges, rather than actual acceptance criteria values. In other words, the test description should reference the documents which the test procedure preparer will use (e.g., vendor test specifications, topical reports, accident analyses, FSAR design bases, etc.). This information will enable (1) our reviewers to verify that test objectives will be met and (2) our inspectors, when reviewing test procedures, to verify correct acceptance criteria be tracing them back to the source.