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

MAY 3 1982

R0078

Docket Nos. 50-266
and 50-301

Mr. C. W. Fay
Assistant Vice President
Wisconsin Electric Power Company
231 West Michigan Street
Milwaukee, Wisconsin 53201

Dear Mr. Fay:

SUBJECT: NUREG-0737 ITEM II.E.1.2 AUXILIARY FEEDWATER SYSTEM AUTOMATIC INITIATION AND FLOW INDICATION

On September 13, 1979 the NRC issued a generic letter to all PWR licensees regarding short-term requirements resulting from the Three Mile Island accident. Subsequently, on September 21, 1979 in a letter from D. G. Eisenhut to S. Burstein, the NRC transmitted requirements for the auxiliary feedwater systems at Point Beach Nuclear Plant, Units 1 and 2. These included both generic and plant-specific requirements.

In July 1979 the NRC issued NUREG-0578, "TMI-2 Lessons Learned Task Force Report and Short Term Recommendations" which was followed by an October 30, 1979 clarification letter. On October 31, 1980, the NRC issued NUREG-0737 "Clarification of TMI Action Plan Requirements" to all licensees of operating plants and applicants for operating licenses and holders of construction permits. Among the items contained in NUREG-0737 were clarification of the requirements on auxiliary feedwater (AFW) system automatic initiation and flow indication (Item II.E.1.2). We also sent you requests for additional information on the above subject by letters dated December 12, 1979 and July 28, 1981.

You responded to the above requirements and information requests by letters dated October 20 and 29, 1979; November 27, 1979; December 17 and 31, 1979; March 14, 1980; December 23, 1980; February 4, 1981; March 31, 1981; April 9, 1981; September 14 and 16, 1981, and March 16, 1982. After reviewing your responses, we contacted members of your staff by conference call in March 1982 to resolve the remaining open items and obtain your staff's verbal commitments to satisfactorily address our remaining concerns.

Our evaluation of your responses and the verbal commitments made by members of your staff during the March 1982 conference calls is contained in the enclosed Safety Evaluation Report (SER) and supporting Technical Evaluation Report (TER). Contingent upon your completion of the items verbally committed to by members of your staff in March 1982 as identified in the enclosed SER, we consider this item resolved for your facilities. You are requested to submit proposed modifications to the Point Beach Units 1 and 2 Technical Specifications and your status and schedule for completion of the AFW system modifications in accordance with verbal commitments made by members of your staff within 45 days of receipt of this letter.

Copies to Britt, Burstein, Gorske/Finke, Porter, Reed, Charnoff

The reporting and/or recordkeeping requirements of this letter affect fewer than ten respondents; therefore, OMB clearance is not required under P. L. 96-511.

Sincerely,

Robert A. Clark, Chief
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Enclosures:
SER & TER

cc w/enclosures:
See next page

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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

POINT BEACH UNITS 1 & 2 - AUXILIARY FEEDWATER

AUTOMATIC INITIATION AND FLOW INDICATION

TMI ACTION PLAN ITEM II.E.1.2

INTRODUCTION AND SUMMARY

To improve the reliability of Auxiliary Feedwater Systems (AFWS) at pressurized water reactor (PWR) facilities, the staff is requiring licensees to upgrade the system where necessary to ensure safety grade automatic initiation and flow indication. The criteria for this upgrading are contained in NUREG-0737 (Clarifications of TMI Action Plan Requirements), Section II.E.1.2.

The evaluation of the Point Beach Units 1 & 2 AFWS design was performed for the NRC by Franklin Research Center (FRC) as part of a technical assistance contract program. The results of the FRC evaluation are reported in the attached Technical Evaluation Report (TER - C5257 - 285/295).

Based on our review of the FRC TER and subsequent conversations with the licensee, we conclude that AFWS automatic initiation and flow indication designs are acceptable, with the exceptions noted below.

EVALUATION

The attached TER provides a technical evaluation of the electrical, instrumentation, and control design aspects of the Point Beach Units 1 & 2 AFWS with regard to automatic initiation and flow indication. As noted in the TER, automatic initiation of the motor driven auxiliary feedwater pumps may be bypassed by placing the main feedwater pump control switches in the pull-to-lock (pull-out) position. This lockout feature does not affect the turbine driven AFW pumps (i.e., they will

still respond to an automatic initiation signal). There is no control room indication provided in the present design to alert the operators of this bypass condition. In addition, the motor driven AFW pumps may be taken out of service by placing their pump control switches in the pull-out position. The AFW pumps will not respond to an automatic start signal if the control switches are in "pull-out." There is no inoperable status indication associated with the pull-out position.

Automatic indication at the system level should be provided in the control room to alert the operators to the inoperable status of the AFWS for each of the above conditions. This indication should remain in effect until the system is returned to its normal operational status consistent with the requirements of Section 4.13 (Indication of Bypasses) of IEEE Standard 279-1971. Further guidance is provided in Regulatory Guide 1.47 (Bypassed and Inoperable Status Indication for Nuclear Power Plant Safety Systems).

As noted in the TER, the circuitry providing automatic initiation of the motor driven AFW pumps on loss of both main feedwater pumps does not meet the single failure criterion. The trip of both main feedwater pumps is a secondary AFWS automatic initiation signal for Westinghouse plants and no credit is taken in the accident analysis for this signal. The primary signals used to automatically initiate the auxiliary feedwater system are safety grade. We find this design to be acceptable.

The Point Beach AFW flow indication is currently powered from non-battery-backed power sources. The licensee has committed to upgrade the flow indication power supplies to battery-backed Class 1E sources. These modifications are in progress but have not been completed.

The Point Beach Units 1 & 2 Technical Specifications do not at present require periodic testing of the AFWS automatic actuation logic. The actuation logic should be tested on a staggered monthly test basis (i.e., test each train every other month) consistent with the Westinghouse Standard Technical Specifications (NUREG-0452). Table 15.4.1-1 (Minimum Frequencies for Checks, Calibrations and Test of Instrument Channels) of the Point Beach Technical Specifications should be revised to include this testing. It is our understanding based on a March 25, 1982 telephone conversation with the licensee, that testing of the actuation logic is being performed monthly for the 4 KV bus undervoltage and steam generator low-low level. The current testing of the steam generator low-low level relay matrix verifies proper operation of the output relay coils. These coils operate two sets of contacts, one for reactor trip and one for auxiliary feedwater initiation. Proper operation of the contacts provided for reactor trip is verified, but not for AFW initiation. The testing procedure should be revised to include provisions for verifying proper operation of the contacts causing AFW initiation. The licensee indicated that minor circuit modifications (e.g., providing a test indication lamp on contact closure) may be required to accomplish this. JCR

The environmental qualification of safety related systems including AFWS circuits and components is being reviewed by the Environmental Qualification Branch as part of their review of licensee responses to "Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors," issued to the licensee in NRR letter dated March 5, 1980.

In order to verify AFW flow to the steam generators from the control room, steam generator level instrumentation is used, in conjunction with flow indication. This is in compliance with NUREG-0737 and is acceptable. Guidance criteria for steam generator level instrumentation is specified in

Regulatory Guide 1.97 Revision 2 (R.G. 1.97 - "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident").

CONCLUSION

Based on our review of the Franklin Research Center TER, we conclude that the Point Beach Units 1 & 2 AFWS automatic initiation and flow indication systems comply with the staff's long term safety grade requirements, contingent upon implementation of the licensee's commitments (made during the March 25, 1982 conference call) to upgrade the AFWS flow indication power supplies, and to perform the following modifications:

1. Continuous indication should be provided in the control room when automatic initiation of the motor driven AFW pumps is bypassed by placing the main feedwater pump control switches in pull-out, and when an AFWS train is taken out of service by placing an AFW pump control switch in the pull-out position.

2. The Point Beach Technical Specifications should be revised to include periodic testing of the AFWS automatic actuation logic, and the test procedure should be revised to verify proper operation of the relay coil/contact combination used to initiate AFW on steam generator low-low level.

Principal Contributors:
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TECHNICAL EVALUATION REPORT

AUXILIARY FEEDWATER SYSTEM AUTOMATIC INITIATION AND FLOW INDICATION

WISCONSIN ELECTRIC POWER COMPANY

POINT BEACH NUCLEAR PLANT UNITS 1 AND 2

NRC DOCKET NO. 50-266, 50-301

NRC TAC NO. 11692, 11693

NRC CONTRACT NO. NRC-03-79-118

FRC PROJECT C5257

FRC ASSIGNMENT 9

FRC TASKS 285, 295

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March 17, 1982

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CONTENTS

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FOREWORD

This Technical Evaluation Report was prepared by Franklin Research Center under a contract with the U.S. Nuclear Regulatory Commission (Office of Nuclear Reactor Regulation, Division of Operating Reactors) for technical assistance in support of NRC operating reactor licensing actions. The technical evaluation was conducted in accordance with criteria established by the NRC.

Mr. F. W. Vosbury contributed to the technical preparation of this report through a subcontract with WESTEC Services, Inc.

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1. INTRODUCTION

1.1 PURPOSE OF REVIEW

The purpose of this review is to provide a technical evaluation of the emergency feedwater system design to verify that safety-grade automatic initiation circuitry and flow indication are provided at Point Beach Units 1 and 2. Although not in the scope of this review, the steam generator level indication available at Point Beach Units 1 and 2 is described to assist subsequent NRC staff review.

1.2 GENERIC ISSUE BACKGROUND

A post-accident design review by the Nuclear Regulatory Commission (NRC) after the March 28, 1979 incident at Three Mile Island (TMI) Unit 2 established that the auxiliary feedwater (AFW) system should be treated as a safety system in a pressurized water reactor (PWR) plant. The designs of safety systems in a nuclear power plant are required to meet general design criteria (GDC) specified in Appendix A of 10CFR50 [1].

The relevant design criteria for the AFW system design are GDC 13, GDC 20, and GDC 34. GDC 13 sets forth the requirement for instrumentation to monitor variables and systems (over their anticipated ranges of operation) that can affect reactor safety. GDC 20 requires that a protection system be designed to initiate automatically in order to assure that acceptable fuel design limits are not exceeded as a result of anticipated operational occurrences. GDC 34 requires that the safety function of the designed system, that is, the residual heat removal by the AFW system, be accomplished even in the case of a single failure.

On September 13, 1979, the NRC issued a letter [2] to each PWR licensee that defined a set of short-term control-grade requirements for the AFW system, specified in NUREG-0578 [3]. It required that the AFW system have automatic initiation and single failure-proof design consistent with the requirements of GDC 20 and GDC 34. In addition, it required auxiliary feedwater flow indication in the control room in accordance with GDC 13.

During the week of September 24, 1979, seminars were held in four regions of the country to discuss the short-term requirements. On October 30, 1979, another letter was issued to each PWR licensee providing additional clarification of the NRC staff short-term requirements without altering their intent [4].

Post-TMI analyses of primary system response to feedwater transients and reliability of installed AFW systems also established that, in the long term, the AFW system should be upgraded in accordance with safety-grade requirements. These long-term requirements were clarified in the letter of September 5, 1980 [5] and formalized in the letter of October 31, 1980 [6]. The October 31 letter incorporated in one document, NUREG-0737 [7], all TMI-related items approved by the commission for implementation. Section II.E.1.2 of NUREG-0737 clarifies the requirements for the AFW system automatic initiation and flow indication.

1.3 PLANT-SPECIFIC BACKGROUND

The Licensee of Point Beach Units 1 and 2, Wisconsin Electric Power Company (WE), provided its initial response to Reference 3 on October 20, 1979 [8]. In this response, WE indicated that the AFW system at Point Beach Units 1 and 2 was safety grade, automatically initiated, and contained auxiliary feedwater flow indication. Later, further correspondence between WE and the NRC was issued relating to the implementation of NUREG-0578 [9-17]. On December 23, 1980 [18], WE provided its response to the requirements of NUREG-0737. On July 28, 1981 [19], the NRC forwarded a request for additional information in order for FRC to complete this review; WE responded to this request on September 16, 1981 [20].

2. REVIEW CRITERIA

To improve the reliability of the AFW system, the NRC required licensees to upgrade the system, where necessary, to ensure timely automatic initiation when required. The system upgrade was to proceed in two phases. In the short term, as a minimum, control grade signals and circuits were to be used to automatically initiate the AFW system. This control grade system was to meet the following requirements of NUREG-0578, Section 2.1.7.a [3]:

"1. The design shall provide for the automatic initiation of the auxiliary feedwater system.

2. The automatic initiation signals and circuits shall be designed so that a single failure will not result in the loss of auxiliary feedwater system function.

3. Testability of the initiating signals and circuits shall be a feature of the design.

4. The initiating signals and circuits shall be powered from the emergency buses.

5. Manual capability to initiate the auxiliary feedwater system from the control room shall be retained and shall be implemented so that a single failure in the manual circuits will not result in the loss of system function.

6. The ac motor-driven pumps and valves in the auxiliary feedwater system shall be included in the automatic actuation (simultaneous and/or sequential) of the loads to the emergency buses.

7. The automatic initiating signals and circuits shall be designed so that their failure will not result in the loss of manual capability to initiate the AFW system from the control room."

In the long term, these signals and circuits were to be upgraded in accordance with safety-grade requirements. Specifically, in addition to the above requirements, the automatic initiation signals and circuits were to have independent channels, use environmentally qualified components, have system bypassed/inoperable status features, and conform to control system interaction criteria, as stipulated in IEEE Std 279-1971 [21].

The capability to ascertain the AFW system performance from the control room must also be provided. In the short term, steam generator level indication and flow measurement were to be used to assist the operator in maintaining the required steam generator level during AFW system operation. This system was to meet the following requirements from NUREG-0578, Section 2.1.7.b [3], as clarified by NUREG-0737, Section II.E.1.2 [7]:

"1. Safety-grade indication of auxiliary feedwater flow to each steam generator shall be provided in the control room.

2. The auxiliary feedwater flow instrument channels shall be powered from the emergency buses consistent with satisfying the emergency power diversity requirements of the auxiliary feedwater system set forth in Auxiliary Systems Branch Technical Position 10-1 of the Standard Review Plan, Section 10.4.9 [22]."

The NRC staff has determined that, in the long term, the overall flowrate indication system for Combustion Engineering and Westinghouse plants should include at least one auxiliary feedwater flowrate indicator and one wide-range steam generator level indicator for each steam generator or two flow rate indicators. These flow indication systems should be environmentally qualified; powered from a highly reliable, battery backed non-class 1E power source; periodically testable; part of the plant's quality assurance program; and capable of display on demand.

The operator relies on steam generator level instrumentation, in addition to auxiliary feedwater flow indication, to determine AFW system performance. The requirements for this steam generator level instrumentation are specified in Regulatory Guide 1.97, Revision 2, "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident" [23].

3. TECHNICAL EVALUATION

3.1 GENERAL DESCRIPTION OF AUXILIARY FEEDWATER SYSTEM

Point Beach Units 1 and 2 are Westinghouse-designed two-loop nuclear power plants. The two units are essentially identical. The AFW system supplies water to the secondary side of the steam generators for reactor decay heat removal when normal feedwater sources are unavailable. The AFW system consists of two turbine-driven pumps (400 gpm each) and two motor-driven pumps (200 gpm each). Auxiliary feedwater flow to the steam generators is automatically initiated when preset levels of any of several monitored parameters are exceeded.

The AFW system for each Point Beach unit is partially shared between Units 1 and 2 to supply auxiliary feedwater to both steam generators of each unit. Each AFW system uses a turbine-driven pump and a motor-driven pump. The turbine-driven pump of each unit supplies both steam generators of that unit only. The motor-driven pump of each unit feeds one steam generator of each unit.

Each of the pumps supplies auxiliary feedwater to the steam generators through a motor-operated valve which is normally throttled open. A pressure control valve (PCV) in the discharge line of each motor-driven pump controls the flow to two steam generators by maintaining a constant set pressure at the pump discharge. The motor-operated valves in the AFW system receive no automatic initiation signals. In the event of a component or piping failure, the AFW system may be realigned using remote operated valves to ensure flow to one intact steam generator at each unit. All four pumps normally take suction from two 45,000-gallon condensate storage tanks.

Steam generator level is controlled manually from the control room by operating the appropriate PCVs in the motor-driven pump discharge headers or by throttling the motor-operated valves in the discharge line of the turbine-driven pumps.

3.2 AUTOMATIC INITIATION

3.2.1 Evaluation

The AFW system at Point Beach Units 1 and 2 was not included as part of the engineered safety features in the initial plant design. However, the AFW system is designed as a safety-grade system, to seismic Category I, Class 1E, and the automatic initiation signals and circuits are designed to comply with the criteria of IEEE Std 279-1971 [21].

The Point Beach Units 1 and 2 AFW automatic initiation system consists of two independent actuation trains. The circuits are powered from emergency buses, except the motor-driven pump breaker control, turbine steam admission valves, discharge line motor-operated valves, which are powered from the 125-V dc safeguards buses. The redundant channels are physically separated and electrically independent. A review of the automatic initiation circuitry revealed no credible single failure that would inhibit the automatic initiation system from providing AFW flow to at least one good steam generator per unit, with the exception of the start of the motor-driven pumps on loss of both main feedwater pumps. A failure in this circuit would delay the start of one motor-driven pump until the associated steam generator level reaches the low-low setpoint. The scope of the single failure analysis in this report was limited to the redundancy of power supplies, diversity of actuating signals, and independence and redundancy of automatic initiation circuits.

Each motor-driven pump is powered from the respective unit's emergency ac buses. The loading of the motor-driven pumps onto their respective 480-V ac emergency buses is part of the post-accident automatic load sequencing.

The turbine-driven pump for each unit receives its steam from both steam generators of its respective unit through either of two parallel motor-operated steam admission valves, which are supplied from lines that tap off upstream of each steam generator isolation valve. The steam admission valves are powered from separate dc buses so that a loss of one dc system will not prevent the operation of either turbine-driven pump.

The following signals are used for automatic initiation of the AFW system:

Motor-driven pumps (both pumps start)

- low-low steam generator level (2 out of 3 channels on any steam generator)
- trip of both main feedwater pumps (either unit)
- safety injection (either unit)

Turbine-driven pumps (one pump starts)

- low-low steam-generator level (2 out of 3 channels on both steam generators of one unit)
- undervoltage on both 4 kV buses supplying the main feedwater pumps of one unit.

In addition, the AFW system may be manually initiated from the control room.

The AFW system and components are tested in accordance with technical specifications. The proper operation of the AFW pumps is checked monthly by verifying pump suction and discharge pressure. The AFW initiating signals and circuits are tested monthly from the system monitoring devices through the actuation of the logic relays which make up the start circuits. Flow verification and auto initiation circuits are tested during refueling.

The system design allows one channel to be bypassed for maintenance, testing, and calibration during power operation without initiating a protective action. Any time a channel is bypassed, the bypass is accompanied by a channel alert and channel status light actuation in the control room. If some part of the system has been administratively bypassed or taken out of service, indication is provided in the control room.

During plant startup, the auto initiation circuits are operationally bypassed by placing the main feedwater (MFW) pump switches in PULL-OUT position. Initially, the motor-driven AFW pumps are used to control steam generator level; as the startup progresses, steam generator feed is shifted to the MFW pumps by procedure, thereby eliminating the bypass associated with AFW

auto actuation. However, there is no indication or annunication of this bypass as required by paragraph 4.13 (Indication of Bypasses) of IEEE Std 279-1971.

The only interaction between the AFW system automatic initiation circuits and normal system control functions occurs in the narrow-range steam generator level instrumentation. These level instruments are used for both protection (reactor trip and AFW initiation) and normal control functions in the MFW system. The control signals are separated from the protection signals by isolation transformers so that a malfunction in the control circuits will have no effect on the protection signals.

The following individual alarms are provided on each unit's main control board upper section to alert the operator that the AFW equipment may not operate properly:

- o AFW motor-driven pump A not in auto
- o AFW motor-driven pump B not in auto
- o low-low steam generator level (3 channels each)
- o 2 out of 3 low-low steam generator level (1 channel each)
- o shutdown equipment in local control.
- o motor-breaker trip
- o motor overload
- o safeguard equipment locked off
- o condensate storage tank high/low level.

A review of the automatic and manual initiation circuitry and signals revealed that no single failure to either circuit train would inhibit the capability for manual initiation from the control room. The environmental qualification of safety-related electrical and mechanical components, including AFW system circuits and components, is being reviewed separately by the NRC and is not within the scope of this review.

3.2.2 Conclusion

The initiation signals, logic, and associated circuitry of the automatic initiation feature of the AFW system of Point Beach Units 1 and 2 comply with the long-term safety-grade requirements of NUREG-0578, Section 2.1.7.a, and the subsequent clarification issued by the NRC staff.

3.3 FLOW INDICATION

3.3.1 Evaluation

The capability to evaluate the performance of the AFW system at Point Beach Units 1 and 2 is provided by:

- o AFW flow to steam generator (1 channel per steam generator)
- o AFW pump discharge flow (1 channel per AFW pump)
- o narrow-range steam generator level (3 channels each)
- o wide-range steam generator level (1 channel each)
- o AFW pump discharge and suction pressure
- o AFW pump status indicators
- o discharge valve position indicators
- o condensate storage tank level.

The Licensee has stated that both the AFW flow indication for each steam generator and the individual AFW pump discharge flow indication are safety-grade.

The AFW pump discharge flow indication is powered from separate battery-backed Class 1E, instrument buses. The steam generator AFW flow indication is currently powered from diverse, highly reliable, non-battery-backed power sources. The Licensee has committed to upgrade the power supplies to highly reliable battery-backed, Class 1E power sources by early 1982. (mid-1983) The AFW flow indicators are testable from the transmitter to the indicator. The overall accuracy of the feed flow loops is within ±10%. The flow indication channels are tested in accordance with technical specifications.

The environmental qualification of the AFW flow indicators will be reviewed separately by the NRC and is not within the FRC scope of review.

3.3.2 Conclusion

It is concluded that the AFW flow instrumentation at Point Beach Units 1 and 2 complies with the long-term safety-grade requirements of NUREG-0578, Section 2.1.7.b, and the subsequent clarification issued by the NRC.

3.4 DESCRIPTION OF STEAM GENERATOR LEVEL INDICATION

Steam generator level indication at Point Beach Units 1 and 2 consists of three safety-grade narrow-range level channels and one control-grade wide-range level channel per steam generator. The level transmitters and their power supplies are as follows:

STEAM GENERATORS 1A and 2A

Channel	Transmitter	Instrument Bus
Wide Range	LT-460	Blue
Narrow Range I	LT-461	Red
Narrow Range II	LT-462	Blue
Narrow Range III	LT-463	Yellow

STEAM GENERATORS 1B and 2B

Channel	Transmitter	Instrument Bus
Wide Range	LT-470	Red
Narrow Range I	LT-471	Yellow
Narrow Range II	LT-472	Red
Narrow Range III	LT-473	White

Steam generator level indication is tested monthly and calibrated during refueling.

Control room indication for each of the steam generator level channels consists of a seperate analog meter for each channel.

4. CONCLUSIONS

The initiation signals, logic, and associated circuitry of the Point Beach Units 1 and 2 auxiliary feedwater system comply with the long-term safety-grade requirements of NUREG-0578, Section 2.1.7.a [3], and the subsequent clarification issued by the NRC, with the exception that there is no annunciation provided when the motor-driven pump automatic initiation circuits are bypassed during startup. Indication of bypasses is required by paragraph 4.13 of IEEE Std 279-1971.

The auxiliary feedwater flow instrumentation at Point Beach Units 1 and 2 complies with the long-term safety-grade requirements of NUREG-0578, Section 2.1.7.b [3], and the subsequent clarification issued by the NRC.

12. C. W. Fay (WE)
Letter to H. R. Denton (NRC)
Subject: Lessons Learned Recommendations 2.1.7a and 2.1.7.b
December 17, 1979

13. S. Burstein (WE)
Letter to H. R. Denton (NRC)
Subject: Implementation of NUREG-0578
December 17, 1980

14. S. Burstein (WE)
Letter to H. R. Denton (NRC)
Subject: Implementation of NUREG-0578
December 31, 1979

15. C. W. Fay (NRC)
Letter to R. H. Denton (NRC)
Subject: Implementation of NUREG-0578
March 14, 1980

16. S. Burstein (WE)
Letter to R. H. Denton (NRC)
Subject: Technical Specification Change Request No. 65
February 4, 1981

17. C. W. Fay (WE)
Letter to H. R. Denton (NRC)
Subject: Requirements for Auxiliary Feedwater System
April 9, 1981

18. C. W. Fay (WE)
Letter to H. R. Denton (NRC)
Subject: Response to NUREG-0737
December 23, 1980

19. R. A. Clark (NRC)
Letter to C. W. Fay (WE)
Subject: Request for Additional Information-Auxiliary Feedwater System
July 28, 1981

20. C. W. Fay (WE)
Letter to H. R. Denton (NRC)
Subject: Additional Information Auxiliary Feedwater System
September 16, 1981

21. IEEE Std 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations," Institute of Electrical and Electronics Engineers, Inc., New York, NY.

22. NUREG-75/087, "Standard Review Plan," Section 10.4.9, Rev. 1, NRC, no date.

23. Regulatory Guide 1.97 (Task RS 917-4), "Instrumentation for Light-Water-Cooled Nuclear Power Plants to Assess Plant and Environs Conditions During and Following an Accident," Rev. 2, NRC, December 1980.