UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET SW SUITE 23T85
ATLANTA, GEORGIA 30303-8931

May 9, 2000

EA-98-543

Duke Energy Corporation
ATTN: Mr. W. R. McCollum
Vice President
Oconee Nuclear Station
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: EXERCISE OF ENFORCEMENT DISCRETION
(INSPECTION REPORT NOS. 50-269/99-13, 50-270/99-13, AND 50-287/99-13)

Dear Mr. McCollum:

This refers to inspections conducted by the Nuclear Regulatory Commission (NRC) at your Oconee 1, 2, and 3 reactor facilities concerning the design of your emergency feedwater (EFW) system. The subject inspection report documented apparent violations involving various aspects of the EFW system. The issues were also documented in NRC Inspection Reports 50-269,270,287/99-08 and 50-269,270,287/99-10, were discussed with you at a February 8, 1999, meeting at the NRC headquarters office, and were the subject of an NRC letter to you dated February 24, 1999.

An open, predecisional enforcement conference was conducted in the Region II office on April 25, 2000, with you and members of your staff to discuss the apparent violations, the root causes, and corrective actions to preclude recurrence. A list of conference attendees as well as copies of the NRC's and your presentation materials are enclosed.

Based on the information developed during the inspections, and the information you provided during the conference, we have concluded that five violations of NRC requirements occurred. A summary of each violation, its safety significance, Duke Energy Corporation's (DEC) position on the violations as stated at the conference, and the NRC's disposition of each violation is fully discussed below.

The first violation (identified at the conference as EEI 50-269,270,287/99-13-01 and -02), involved the failure to implement the requirements of 10 CFR 50, Appendix B, Criterion III, Design Control; Criterion XVI, Corrective Action; and the reporting requirements of 10 CFR 50.72 and 10 CFR 50.73. In 1979, DEC performed a modification to the EFW system of Units 1, 2 and 3 (modification ON 1,2,3-1275). However, the modification left EFW valves C-187 and C-176 designed to open on a low condenser hotwell level that would result from a main feedwater line break (MFLB), consequently draining the Upper Surge Tank (UST) water to the condenser hotwell in about two minutes. Since the design of the EFW system was such that all three EFW pumps would automatically start and take suction from the UST, the result would be loss of the EFW system flow when the pump suction water was lost. DEC's letter to the NRC of May 17, 1979, clearly stated the design basis of the EFW system at that time, which was incorporated into subsequent revisions to the Updated Final Safety Analysis Report (UFSAR), Section 10.4.7.1, Emergency Feedwater System Design Basis. This FSAR Section stated (and states) that "the EFW system assures sufficient feedwater supply to the steam generators of each unit, in the event of loss of the Condensate/Main Feedwater System, to

remove energy stored in the core and primary coolant." In addition, the UFSAR stated that "Sufficient redundancy and valving are provided in the design of the EFW piping system with isolation and cross-connections allowing the system to perform its safety-related function in the event of a single failure coincident with a secondary pipe break and the loss of normal station auxiliary AC power". Because of the physical plant condition described above, the EFW system could not perform its safety-related function in the event of a single failure coincident with a secondary pipe break and the loss of normal station auxiliary AC power. Therefore, the NRC has determined that this condition represented a failure to assure that the design basis was correctly translated into specifications, drawings, procedures, and instructions as required by Appendix B, Criterion III. DEC modified the EFW system in 1993 and 1994 to correct this design deficiency. An additional aspect of this violation (EEI 50-269,270,287/99-13-02), is associated with your failure to promptly correct and report the condition, as required by 10 CFR 50, Appendix B, Criterion XVI, Corrective Action; 10 CFR 50.72; and 10 CFR 50.73. In 1989, DEC incorrectly evaluated this condition as not affecting EFW system operability, not being outside the EFW system design basis, and not being reportable, and thus failed to promptly take corrective action until approximately four years later.

At the conference, DEC stated its disagreement that this issue constituted a violation of regulatory requirements. Rather, your contention was that DEC made a reasonable but different interpretation of the design basis of the EFW system, and that EFW system modifications were subsequently performed based on this interpretation. DEC also stated at the conference that the lack of design basis specificity may have contributed to the design basis interpretation that was made. After consideration of the information you presented at the conference, the NRC position remains that the post-Three Mile Island modification to the EFW system was not in accordance with the design basis as described in the UFSAR.

The NRC normally would consider this violation at Severity Level II based on guidance contained in the "General Statement of Policy and Procedure for NRC Enforcement Actions" (Enforcement Policy), NUREG-1600 (dated November 9, 1999), in that the EFW system would not be able to perform its intended safety function. In addition, based on our risk assessment, this design deficiency resulted in a moderate increase in risk, which would support a Severity Level II characterization. However, as provided in Section VII.B.6 of the Enforcement Policy, the NRC may refrain from issuing a Notice of Violation for a Severity Level II violation which involves special circumstances. After consultation with the Director, Office of Enforcement, and the Deputy Executive Director for Reactor Programs, I have been authorized to exercise discretion and refrain from issuing a Notice of Violation for Violation (1). Discretion is particularly warranted in this case because DEC modified the physical condition of the plant in 1993 and 1994 and thus has been in compliance with Appendix B, Criterion III requirements since that time, and DEC stated at the conference its intent to formally report this issue to the NRC by revising an existing Licensee Event Report.

Violation (2), identified as EEI 50-269,270,287/99-13-03, also resulted in a failure to satisfy Appendix B, Criterion III requirements. This violation involves the adequacy of the design basis water sources which are relied upon to supply water to the steam generators in the event of a MFLB. As stated above, UFSAR Section 10.4.7.1 states the design basis requirements of the EFW system: "Sufficient redundancy and valving are provided in the design of the EFW piping system with isolation and cross-connections allowing the system to perform its safety-related function in the event of a single failure coincident with a secondary pipe break and the loss of normal station auxiliary AC power". UFSAR Section 10.4.7.1.7 states that for a MFLB upstream of the isolation check valve, the resulting transient would have the same response as a loss of main feedwater. UFSAR Section 10.4.7.1.10 states that for the cooldown part of a loss of main

feedwater transient, the feedwater inventory requirements are “well within the available hotwell and upper surge tank capacity.” In the case of a MFLB upstream of the isolation check valve, the plant design is such that the contents of the condenser hotwell would be lost out the break. Consequently, once the UST inventory is depleted (in about one hour and prior to reaching conditions to initiate shutdown cooling), the affected unit’s EFW system pumps would no longer have an available suction water source .

DEC disagreed at the conference with the NRC’s position that the design basis for the EFW system included the ability to mitigate a MFLB, and that the design basis water sources for a MFLB were the UST and the condenser hotwell. Rather, DEC’s interpretation of the design basis of the EFW system permits reliance on the use of diverse sources of water (including the Standby Shutdown Facility and EFW cross-ties between units) to feed the once through steam generators during a MFLB. The NRC has concluded that the design basis of the EFW system as described in UFSAR Section 10.4.7.1 permits reliance only on the hotwell and UST as water sources during a MFLB. The NRC normally would consider Violation (2) at Severity Level III based on guidance contained in the Enforcement Policy, in that the EFW system would not be able to perform its intended function under certain conditions. However, the NRC acknowledges that the Oconee plant design includes alternate water sources that are capable of feeding the steam generators in the event of a MFLB. These design features mitigate the increase in risk associated with a MFLB such that the overall contribution to risk is low. Therefore, the NRC has concluded that this violation should be characterized at Severity Level IV. DEC’s planned corrective actions for this issue include clarifying the UFSAR and pursuing a change to the EFW system licensing basis by submission of a license amendment request. Based on these actions, the NRC has concluded that Violation (2) should be characterized as a non-cited violation, in accordance with Section VII.B.1.a of the Enforcement Policy.

As discussed at the conference and in the subject inspection report, the risk assessment associated with Violation (2) did not take into consideration a potential vulnerability associated with the effect of a high energy line break on the 4 kilovolt safety-related electrical busses. Because this issue is unrelated to the violations associated with this enforcement action, and the issue potentially involves an increased risk during a high energy line break, the NRC will identify this potential vulnerability as an unresolved item such that additional review may be conducted. DEC stated at the conference its intent to conduct additional high energy line break analyses related to this potential vulnerability. For tracking purposes, the NRC will administratively document this unresolved item in a future inspection report.

Violation (3), identified as EEI 50-269,270,287/99-13-04 and -06 at the conference, relates to a 1993/1994 modification of EFW valve C-187, which left the EFW system vulnerable to a single failure coincident with a secondary pipe break. This vulnerability is also contrary to the design basis requirements of UFSAR Section 10.4.7.1 and Appendix B, Criterion III. DEC’s 10 CFR 50.59 safety evaluation that was performed in 1994 failed to recognize that the valve C-187 modification involved an unreviewed safety question, which would have required NRC approval prior to installing the modification. The NRC considers the 10 CFR 50.59 aspect of this issue to represent a missed opportunity to identify single failure vulnerabilities in the EFW system during the 10 CFR 50.59 process.

In response to Violation (3), you reiterated your position that DEC’s interpretation of the design basis of the EFW system would permit this modification. The NRC disagrees with DEC’s interpretation of the design basis of the EFW system, in that the design basis requirements of UFSAR Section 10.4.7.1, describe the EFW system as capable of performing its safety-related

function in the event of a single failure coincident with a secondary pipe break and the loss of normal station auxiliary alternating current power. The NRC normally would consider this violation at Severity Level III in that the EFW system would not be able to perform its intended function under certain conditions (i.e., in this case, not single failure proof). However, as discussed at the conference, the increase in risk associated with this violation is low, due to the collective low probability associated with the initiating event (a situation requiring emergency feedwater) coupled with the hotwell control valve failing open, the Standby Shutdown Facility failure, and the primary system feed and bleed capability failure. Therefore, the NRC has concluded that Violation (3) should be characterized at Severity Level IV. DEC's planned corrective actions for this violation includes consideration of system modifications, pursuing appropriate licensing basis changes as appropriate, and clarifying the design basis by submission of a license amendment request. Based on these planned actions and other considerations, the NRC has concluded that Violation (3) should be characterized as a non-cited violation, in accordance with Section VII.B.1.a of the Enforcement Policy.

Violation (4) involved a 1989 modification to valve C-187 which failed to establish an adequate EFW system seismic boundary, as required by UFSAR Section 3.2 and 10 CFR 50, Appendix B, Criterion III (identified as EEI 50-269,270,287/99-13-05 at the conference). This 1989 modification failed to implement the seismic design basis requirement that during a seismic event the UST would be protected against a break in a non-seismic secondary pipe to assure that the safety function of the EFW system would not be lost. DEC did not contest that a historical violation occurred, but clarified at the conference that the condition was resolved (and compliance restored) in 1993/1994 by a modification that added circuitry to automatically isolate valve C-187 on a low UST level. The NRC accepts this clarification that the non-compliance existed from 1989 until 1993, based on further review of the UFSAR Section 3.7.3.9 description of seismic boundary valves. This issue also would normally be considered at Severity Level III because the EFW system would not have been able to perform its intended function under certain conditions of a seismic event. However, after consultation with the Director, Office of Enforcement, I have been authorized to exercise discretion and refrain from issuing a Notice of Violation, as provided in Section VII.B.6 of the Enforcement Policy. Exercise of discretion is warranted in this case because of DEC's modification in 1993 which restored compliance with Appendix B, Criterion III requirements since that time. In addition, the NRC notes that the increase in risk due to Violation (4) was low.

Violation (5) involved an inadequate 10 CFR 50.59 safety evaluation performed by DEC in November 1998 (identified as EEI 50-269,270,287/99-13-07 at the conference). This 50.59 evaluation failed to recognize that a UFSAR change involved an unreviewed safety question and a change in the Technical Specifications (TS), and that NRC approval was required prior to making the change. Specifically, on November 18, 1998, the DEC staff approved a change to the UFSAR that reduced the stated design and performance requirements for the EFW system and consequently increased the probability of occurrence of a malfunction of equipment important to safety over that previously evaluated in the safety analysis report. The DEC approved UFSAR revision no longer stated that the EFW system was designed to withstand the single failure of any EFW pump or valve, but instead stated that the EFW system was designed to withstand only the single active failure of an EFW pump or control valve. Also, the approved UFSAR revision no longer required that the EFW system be able to mitigate a secondary pipe break coincident with a single failure. DEC again restated its position that its interpretation of the design basis of the EFW system would permit this UFSAR change. As stated above, the NRC disagrees with DEC's interpretation of the design basis of the EFW system. The NRC may consider a 10 CFR 50.59 violation of this nature at Severity Level III, depending on factors such as the resulting risk if the change was implemented. In this case, the licensee's

November 1998 UFSAR change did not result in a physical change to the plant. In addition, the increase in risk due to plant modification changes already implemented as a result of the DEC's position on permissible changes (i.e., Violations (2) and (3)) was low. As such, the NRC has concluded that this violation should be characterized at Severity Level IV. In addition, because DEC has restored compliance by withdrawing the UFSAR change, Violation (5) is characterized as a non-cited violation in accordance with Section VII.B.1.a of the Enforcement Policy.

At the request of the NRC, DEC presented the results of its assessment of the risk significance of the 36 additional single failure issues identified during your single failure analysis of the EFW system. DEC also outlined corrective actions to address these issues, including modifications to the plant, clarifying design basis documentation, and pursuing changes to EFW design basis requirements by submission of a license amendment request. The NRC agrees with your assessment that these issues, individually and cumulatively, represent a low increase in risk. The NRC also agrees in concept with your initial and planned actions to resolve these issues, and notes that these issues may be subject to future inspection. The NRC also notes that DEC has entered the issues which comprise the violations discussed in this letter into DEC's corrective action program as Problem Investigation Process report O-00-01590.

At the conclusion of the conference, you emphasized that DEC has focused its time and resources on improving the design and licensing bases of the EFW system, improving the clarity of design basis documents, reducing operator burden, increasing design margins where appropriate, implementing selected modifications based on the factors DEC discussed at the conference, and continued review of key safety systems. DEC summarized the issues at the conference by stating that feedwater can be successfully delivered to provide an adequate secondary heat sink, that the issues discussed at the conference arose from insufficient licensing documentation during the post-Three Mile Island era and were not a result of poor design control or DEC's 10 CFR 50.59 program. You also indicated that DEC has initiated comprehensive actions to resolve the issues identified. In addition, although you disagreed with the NRC's characterization of the issues as violations (except Violation (4)), DEC expressed its intent to move forward with a strong focus on improving the design and licensing bases and design margins at the facility.

The NRC agrees that your activities should remain focused on improving design margins, where appropriate, and clarifying and improving the design basis of the facility. The NRC also has concluded that the issues discussed above constitute violations of regulatory requirements and that DEC should implement corrective actions as required by 10 CFR 50, Appendix B, Criterion XVI. Notwithstanding the many activities discussed by DEC to address these violations, your compliance with regulatory requirements could require operability evaluations, plant modifications, clarifying the UFSAR and other design basis documentation, as well as pursuing a change to EFW design basis requirements by submission of a license amendment request. In addition, selected issues may be the subject of future inspection activities.

You are not required to respond to this letter, unless the description therein does not adequately reflect your corrective actions or your position. If you contest the violations as documented by this letter, you should provide a response within 30 days of the date of this letter, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, Region II, and the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 20555-0001.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, and any response will be made publicly available. To the extent possible, your response, should you chose to provide one, should not include any personal privacy, proprietary, or safeguards information so that it can be placed in the public domain without redaction.

If you have any questions regarding this letter, please contact Victor McCree, Deputy Director, Division of Reactor Projects, at (404) 562-4500.

Sincerely,

/RA/

Luis A. Reyes
Regional Administrator

Docket Nos. 50-269, 50-270, 50-287
License Nos. DPR-38, DPR-47, DPR-55

Enclosures:
1. List of Conference Attendees
2. NRC Presentation Material
3. DEC Presentation Material

cc w/encls:
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RI, RIII, RIV
OE:EA File (BSummers) (2 letterhead)
EHayden, OPA
GCaputo, OI
HBell, OIG
DLaBarge, NRR
BMallett, RII
LPlisco, RII
VMcCree, RII
CEvans, RII
KClark, RII
ABoland, RII
COgle, RII
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RCarroll, RII
DLange, OEDO
SSparks, RII
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COPY?	YES NO	YES NO	YES	YES NO

OFFICE	RII:DRP	RII:EICS	RII:ORA	RII:DRS	RII:ORA	
SIGNATURE	/RA	/RA	/RA	/RA	LREYES FOR	
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DATE	5 / 9 / 00	5 / 4 /00	5 / 4 / 00	5 / 9 / 00	5 / 9 / 00	/ /
COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: C:\FINALEA.WPD

* D. Nelson concurrence for Borchardt via telephone; V. Ordaz concurrence for Johnson via telephone, L. Reyes concurrence for Mallett.

LIST OF CONFERENCE ATTENDEES

Nuclear Regulatory Commission

L. Reyes, Regional Administrator, Region II (RII)
B. Mallett, Deputy Regional Administrator, RII
C. Casto, Director, Division of Reactor Safety (DRS), RII
V. McCree, Deputy Director, Division of Reactor Projects (DRP), RII
D. Nelson, Senior Enforcement Specialist, Office of Enforcement
C. Evans, Acting Enforcement Officer, RII
S. Sparks, Senior Enforcement Specialist, RII
C. Ogle, Chief, Branch 1, DRP, RII
M. Shannon, Senior Resident Inspector - Oconee, DRP, RII
J. Euchner, Regional Counsel, RII
R. Schin, Senior Reactor Inspector, DRS,RII
A. Boland, Acting Chief, Plant Support Branch, DRS, RII
W. Rogers, Senior Reactor Analyst, DRS, RII
K. Clark, Senior Public Affairs Officer, RII
E. Girard, Acting Chief, Engineering Branch, DRS, RII
D. Lange, Senior Regional Coordinator, Office of the Executive Director for Operations, (EDO)
V. Ordaz, Senior Enforcement Coordinator, Office of Nuclear Reactor Regulation (NRR), (via video conference)
R. Emch, Section Chief, Project Directorate II-1, NRR, (via video conference)
D. O'Neal, Reactor Analyst, NRR (via video conference)
D. LaBarge, Licensing Project Manager, NRR (via video conference)
J. Hannon, Section Chief, Plant Systems Branch, NRR (via video conference)
H. Berkow, Director, Project Directorate II, NRR (via video conference)
J. Tatum, Senior Reactor Engineer, Plant Systems Branch, NRR (via video conference)
K. Landis, Acting Regional Coordinator, EDO (via video conference)

Duke Energy Corporation (DEC)

M. Tuckman, Executive Vice President
W. McCollum, Vice President, Oconee Site
M. Nazar, Manager of Engineering, Oconee Site
E. Burchfield, Engineering Supervisor II, Design Basis, Oconee Site
W. Foster, Safety Assurance Manager, Oconee Site
L. Nicholson, Licensing Manager, Oconee Site
J. Fisicaro, General Manager, Nuclear Services
D. Brewer, Engineering Supervisor II, Severe Accident Analysis Group

NRC PREDECISIONAL ENFORCEMENT CONFERENCE

OCONEE NUCLEAR STATION

APRIL 25, 2000

I. OPENING REMARKS AND INTRODUCTIONS
L. Reyes, Regional Administrator

II. NRC ENFORCEMENT POLICY
C. Evans, Acting Enforcement Officer, RII

III. SUMMARY OF THE ISSUES
L. Reyes, Regional Administrator

IV. STATEMENTS OF CONCERNS / APPARENT VIOLATIONS
V. McCree, Deputy Director, Division of Reactor Projects

V. LICENSEE PRESENTATION

VI. BREAK / CAUCUS

VII. NRC FOLLOW UP QUESTIONS

VIII. CLOSING REMARKS
L. Reyes, Regional Administrator

Enclosure 2

Apparent Violations (Abbreviated Version)

A. In 1979, modification ON 1,2,3-1275; Add Two Motor-Driven EFW Pumps; failed to upgrade the EFW system per post-TMI requirements of NUREG-0737 Item II.E.1.1. This modification failed to meet the requirements of 10 CFR 50, Appendix B, Criterion III, Design Control, in that it failed to implement the design basis that the EFW system could perform its safety-related function in the event of a secondary pipe break as described in a licensee letter to the NRC dated May 17, 1979, and UFSAR Section 10.4.7.1. The modification left EFW valves C-187 and C-176 designed to open on a low condenser hotwell level (that would result from a main feedwater line break) and to consequently dump the UST water to the condenser hotwell in about two minutes. Since the design of the EFW system was such that all three EFW pumps would automatically start and take a suction from the UST, the result would be failure of the EFW system when the suction water was lost and potential damage to all EFW pumps. This design remained in effect until it was modified in 1993 and 1994. **(EEI 50-269,270,287/99-13-01, Past EFW System Design Was Not Functional for a Main Feedwater Line Break)**

NOTE:
The apparent violations discussed in this predecisional enforcement conference are subject to further review and subject to change prior to any resulting enforcement decision.

B. In 1989, the licensee failed to promptly correct and also to report a deficient and nonconforming condition that was outside the design basis of the plant, as required by 10 CFR 50, Appendix B, Criterion XVI; 10 CFR 50.72; and 10 CFR 50.73. Problem Investigation Report (PIR) 4-89-0111, dated June 30, 1989, identified a condition wherein the loss of condenser hotwell level would result in automatic opening of valve C-187, draining the UST to the hotwell, and losing the water supply to the EFW pumps. This condition could have prevented the EFW system from fulfilling its design safety function of supplying water to the steam generators during a break in any of the non-seismic pipes attached to the hotwell or a main feedwater line break, as described in a licensee letter to the NRC dated May 17, 1979, and UFSAR Section 10.4.7.1. The licensee incorrectly evaluated this condition as not affecting EFW system operability, not being outside the EFW system design basis, and not being reportable. The licensee subsequently continued to operate all three units with this condition for over four years before taking corrective action in the form of a plant modification. The licensee's failure to report this condition effectively denied the NRC an opportunity to be aware of the condition and to require more prompt corrective action, including the identification of the root causes. **(EEI 50-269,270,287/99-13-02, Inadequate Corrective Action and Reporting for Past EFW System Design That Was Not Functional for a Main Feedwater Line Break)**

NOTE:
The apparent violations discussed in this predecisional enforcement conference are subject to further review and subject to change prior to any resulting enforcement decision.

C. In 1979, modification ON 1,2,3-1275; Add Two Motor-Driven EFW Pumps; failed to upgrade the EFW system per post-TMI requirements of NUREG-0737 Item II.E.1.1. The modification failed to meet the requirements of 10 CFR 50, Appendix B, Criterion III, Design Control, in that it failed to implement the design basis that the EFW system could perform its safety-related function in the event of a secondary pipe break (not considering a coincident single failure) as described in UFSAR Section 10.4.7.1. Following a secondary pipe break, the hotwell water could be lost out the break, resulting in insufficient EFW system water sources to cool down the RCS to conditions at which the decay heat removal system may be operated. This water source vulnerability remains in effect. **(EEI 50-269,270,287/99-13-03, Insufficient Water Sources for EFW System)**

NOTE:
The apparent violations discussed in this predecisional enforcement conference are subject to further review and subject to change prior to any resulting enforcement decision.

D. In 1993 and 1994, modification ON 1,2,3-2911; UST Makeup to Hotwell Control Valves, failed to meet the requirements of 10 CFR 50, Appendix B, Criterion III, Design Control; in that it failed to implement the design basis that the EFW system could perform its safety-related function in the event of a single failure coincident with a secondary pipe break. ON 1,2,3-2911 modified air-operated valve C-187 to automatically close at a low UST level of seven feet to protect the EFW pumps' suction water source. However, the modification left the EFW system vulnerable to a single failure in that there was still a single C-187 valve which could cause the EFW system to fail during a break in a main feedwater line or a non-seismic pipe attached to the condenser hotwell. Prior to September 30, 1999, a single failure analysis had not been completed on the EFW system. This single failure vulnerability remains in effect. **(EEI 50-269,270,287/99-13-04, EFW System Single Failure Vulnerability)**

NOTE:
The apparent violations discussed in this predecisional enforcement conference are subject to further review and subject to change prior to any resulting enforcement decision.

E. In 1989, modification ON 1,2,3-2640; EFW Seismic Upgrade; failed to establish an adequate EFW system seismic boundary. This modification failed to meet the requirements of 10 CFR 50, Appendix B, Criterion III, Design Control in that it failed to implement the seismic design basis that during a seismic event the EFW system upper surge tanks would be protected against a break in a non-seismic secondary pipe, to assure that the safety function of the EFW system would not be lost. This design basis was described in UFSAR Section 3.2; the licensee's letter to the NRC dated May 7, 1986; and the NRC Safety Evaluation Report on Seismic Qualification of the Emergency Feedwater System, dated January 14, 1987. Modification ON 1,2,3-2640 made air-operated valve C-187 safety-related, to support moving the EFW system seismic boundary from normally open valves C-186 and C-191 to a single EFW system boundary at air-operated valve C-187. However, valve C-187 was not remotely operable from the control room and was not maintained normally closed. Instead, C-187 cycled open automatically and routinely during plant operation to add makeup water to the main condenser from the upper surge tanks. In addition, C-187 was susceptible to spurious opening as demonstrated on April 16, 1999, when the Unit 1 C-187 valve spuriously opened due to aging of O-rings and diaphragms in the pneumatic relay assembly. This seismic design deficiency remains in effect. **(EEI 50-269,270,287/99-13-05, Inadequate EFW System Seismic Boundary)**

NOTE:
The apparent violations discussed in this predecisional enforcement conference are subject to further review and subject to change prior to any resulting enforcement decision.

F. In 1993 and 1994, 10 CFR 50.59 safety evaluations failed to recognize that a modification involved an unreviewed safety question (USQ) and that NRC approval was required prior to installing the modification. The licensee installed modification ON 1,2,3-2911; UST Makeup to Hotwell Control Valves; which modified air-operated valve C-187 to automatically close at a low UST level of seven feet to protect the EFW pumps' suction water source. However, the modification left the EFW system with an increased probability of occurrence of a malfunction of equipment important to safety over that previously evaluated in the safety analysis report. The modification left the EFW system vulnerable to a single failure in that there was still a single C-187 valve which could cause the EFW system to fail during a break in a main feedwater line or a non-seismic pipe attached to the condenser hotwell. The licensee's PRA recognized that a single failure of valve C-187 was one of the top contributors to a potential EFW system failure. The PRA stated: "If a main feed line break is assumed, the UST could be drained into the hotwell, thereby failing EFW's initial suction source." The licensee's safety evaluations, dated December 30, 1993; April 7, 1994; and August 4, 1994; for units 3, 1, and 2, respectively; incorrectly concluded that this modification did not involve a USQ and consequently the licensee installed the modification without the required NRC approval. **(EEI 50-269,270,287/99-13-06, Inadequate Safety Evaluation for EFW System Modification to Automatically Close Valve C-187 and Protect EFW Pumps' Suction Source)**

NOTE:
The apparent violations discussed in this predecisional enforcement conference are subject to further review and subject to change prior to any resulting enforcement decision.

G. In 1998, a 10 CFR 50.59 safety evaluation failed to recognize that a UFSAR change involved a USQ and a change in the Technical Specifications (TS), and that NRC approval was required prior to making the change. On November 18, 1998, the licensee approved a change to the UFSAR that reduced the stated design and performance requirements for the EFW system and consequently increased the probability of occurrence of a malfunction of equipment important to safety over that previously evaluated in the safety analysis report. The approved UFSAR revision no longer stated that the EFW system was designed to withstand the single failure of any EFW pump or valve, but instead stated that the EFW system was designed to withstand only the single active failure of an EFW pump or control valve. Also, the approved UFSAR revision no longer required that the EFW system be able to mitigate a secondary pipe break coincident with a single failure, but instead stated: "In the case of a secondary pipe break coincident with a single failure, the emergency feedwater function may be provided by another unit's EFW pumps, the SSF auxiliary service water (ASW) pump, or the station ASW pump." However, TS 3.4 required that each unit's EFW system be able to perform the secondary system decay heat removal safety function, without reliance on other equipment to provide the emergency feedwater function. The licensee's safety evaluation, dated November 18, 1998, incorrectly concluded that this change did not involve a USQ or a change in the TS and consequently the licensee made the change without the required NRC approval. **(EEI 50-269,270,287/99-13-07, Inadequate Safety Evaluation for UFSAR Change That Reduced EFW System Design Criteria)**

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