

Group B
RECORDS BEING RELEASED IN THEIR ENTIRETY

<u>NO.</u>	<u>DATE</u>	<u>ACCESSION NUMBER</u>	<u>DESCRIPTION/ (PAGE COUNT)</u>
Note: Item numbers match number designated on incoming request.			
1.	02/11/94	9402230243	Letter from Albert F. Gibson, NRC, to J. W. Hampton, Duke, "Notice of Violation and Notice of Deviation (68 pages) ADAMS Legacy record – Best available copy
2.	03/14/94	9403180250	Letter from J. Hampton, Duke Responds to NRC 940211 ltr re violations noted in insp repts 50-269/93-25, 50-270/93-25 & 50-287/93-25 (11 pages) ADAMS Legacy record - Best available copy
4.	12/19/94	9412280087	Letter from Albert F. Gibson, NRC, to J. W. Hampton, Duke, "Notice of Violation and Notice of Deviation (38 pages) ADAMS Legacy record – Best available copy
31.	05/26/09		G20090305/EDATS: OEDO-2009-0338 - Glenda P Evans E-mail re Briefing Package for Visit to Jocassee Dam on June 23, 2009 (6 pages)

#1
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Bucket Nos. 50-269, 50-270, 50-287
License Nos. DFR-38, DFR-47, DFR-55

Duke Power Company
ATTN: Mr. J. D. Hampton
Vice President, Oconee Site
P. O. Box 1439
Seneca, SC 29679

Gentlemen:

SUBJECT: NOTICE OF VIOLATION AND NOTICE OF DEVIATION
(NRC INSPECTION REPORT NOS. 50-269/93-25, 50-270/93-25, AND
50-287/93-25)

This refers to the Service Water System Operational Performance Inspection (SWSOPI) conducted by Mr. W. G. Rogers and others of this office on November 1 through December 14, 1993. The inspection included a review of activities authorized for your Oconee Nuclear Power Station. At the conclusion of the inspection, the findings were discussed with members of your staff identified in the enclosed inspection report.

The enclosed inspection report identifies areas examined during the inspection. The team assessed the operational performance of your service water system. In particular, the team performed detailed reviews of the service water system design, maintenance, operation, surveillance, and testing. The team also assessed the planned or completed actions in response to Generic Letter (GL) 89-13, "Service Water System Problems Affecting Safety Related Equipment," issued on July 18, 1989.

The implementation of your Generic Letter 89-13 actions did not include portions of your safety-related service water systems. This was the most significant factor in concluding that your actions to the Generic Letter were not adequate. Most importantly, the High Pressure Service Water system was not included in your response to the Generic Letter or your implementation of your commitments to the Generic Letter. Therefore, please submit an additional response that addresses all Generic Letter actions within 30 days of receipt of this letter as part of your response to the Notice of Deviation on this matter.

The material condition was good for those service water systems classified as safety-related. Also, maintenance and normal operation of the service water systems were generally adequate. However, there were a number of significant findings in other areas during the inspection. These included:

1. The assumption that the Low Pressure Service Water (LPSW) pumps will not incur any significant damage when operating during a postulated design basis event with inadequate net positive suction head for 30 minutes was not adequately validated.

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2. The SSF Auxiliary Service Water discharge lines to the steam generators were not properly flushed following construction. Consequently, questions remain as to whether the lines can pass the required flow.
3. Assumed flow distributions to the steam generators and the service water pumps in Standby Shutdown Facility (SSF) calculations were not validated.
4. There was no analysis of the temperature rise of Circulating Cooling Water or LPSW systems following a postulated failure of the Koonsee Dam. Additionally, there was no analysis of the intake canal's impounded volume losses through evaporation or seepage following a postulated failure of the Koonsee Dam.
5. There was only one valve isolating the safety-related portion of the LPSW system from the nonsafety-related turbine building portion.
6. The SSF could not withstand a postulated failure of the Jocassee Dam. This was inconsistent with your Individual Plant Examination submittal.
7. The High Pressure Service Water system was not designed or maintained commensurate with its importance to safety.

Findings 1, 2, 3, and 4 were associated with violations discussed below and will require your written response. Finding 5 has been classified as an unresolved item pending our further review of your basis for excluding valves LPSW-06 and LPSW-130 from consideration as single failures in your analysis of design basis accidents. Please provide a written response describing your basis for this exclusion. A written response describing your analysis and actions planned regarding items 6 and 7 is also requested. Please submit these responses to items 5, 6, and 7 within 30 days from the date of this letter.

There were other findings such as the inadequate implementation of your (2. 80-11) actions, an inadequate material suitability review of Balzans for repairing reactor building cooling coil leaks and emissions of critical aspects during engineering reviews of conditions adverse to quality. There were weaknesses in the SSF periodic test program and in the procedural guidance of select abnormal events. Also, SSF calculations were not promptly updated following design changes, and the initiation of the Auxiliary Service Water system within 45 minutes was questionable.

Collectively, all these findings and others discussed in the inspection report indicate weaknesses in:

- * your design control measures which allow the use of unvalidated and nonconservative calculational assumptions and do not assure proper translation of the design into the abnormal procedures,

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- the adequacy of engineering evaluations,
- your testing program, and
- the scope of your quality assurance program through inaccurate classification of components which perform safety-related functions

Please evaluate this report with special emphasis on these areas and provide in a separate correspondence, within 60 days of receipt of this letter, those programmatic corrective actions warranted by the inspection report findings.

As indicated earlier, certain of your activities appeared to be in violation of NRC requirements as specified in the enclosed Notice of Violation (Notice). One violation reflected multiple design control inadequacies. One violation concerned inadequate testing of service water system SSP equipment and Emergency Condenser Cooling Water. Another violation involved numerous examples of inadequate or inadequately implemented quality related procedures. The last violation illustrated inadequate corrective actions for a postulated waterhammer in the Low Pressure Service Water system and the lack of seismic qualification of the High Pressure Service Water system.

Certain other of your activities appeared to deviate from previous commitments made by Duke Power Company. One deviation involves the failure to include all the applicable service water systems in Generic Letter 88-13 corrective actions. The other deviation involved an inadequate test of the High Pressure Service Water system's capability during a Station Blackout.

In addition, the enclosed inspection report identified certain activities that violated NRC requirements that will not be subject to enforcement action because your efforts in identifying and correcting the violation met the criteria specified in Section VII.B of the Enforcement Policy. These activities included omissions of select Low Pressure Service Water system check valves from the inservice test program and omissions in your safety classification system for Condenser Circulating Water equipment supporting Low Pressure Service Water system operation.

You are required to respond to this letter and should follow the instructions specified in the enclosed Notice when preparing your response. In your response, you should document the specific actions taken and any additional actions you plan to take to prevent recurrence. After reviewing your response to these Notices, including your proposed corrective actions and the results of future inspections, the NRC will determine whether further NRC enforcement action is necessary to ensure compliance with NRC regulatory requirements.

In accordance with 10 CFR 2.799 of the Commission's regulations, a copy of this letter, the enclosures, and your response to this letter will be placed in the NRC Public Document Room.

Duke Power Company

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The responses directed by this letter and the accompanying Notice are not subject to the clearance procedures of the Office of Management and Budget as required by the Paperwork Reduction Act of 1980, Pub. L. No. 96-511.

Should you have any questions concerning this letter, please contact us.

Sincerely,

(Original signed by A. F. Gibson)

Albert F. Gibson, Director
Division of Reactor Safety

Enclosures:

1. Notice of Violation
2. Notice of Deviation
3. Inspection Report No. 50-269, 270,
and 287/93-25

cc w/encs:

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cc w/encs cont'd: (See page 5)

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FEB 11 1994

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NRC Resident Inspector
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Seneca, SC 29070

FOR PREVIOUS LIST OF CONCURRENCES, SEE ATTACHED PAGE

RII:MS	RII:MS	RII:MS	RII:MS	RII:MS	RII:MS
Wagner: wpr/1r	Wagner	Wagner	Wagner	Wagner	Wagner
01/7/94	01/7/94	01/7/94	01/7/94	01/7/94	01/7/94

RII:MS	RII:MS	RII:MS
Wagner	Wagner	Wagner
01/7/94	01/7/94	01/7/94

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I believe the design of the
LPSW system for isolation between
SC/SM-2 and non SC/SM-2 portions
of the system is inadequate. A
single isolation valve is not
adequate.

Duke Power Company

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L King
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EXCERPT

NOTICE OF VIOLATION

Babe Power Company
Genese Nuclear Plant
Units 1, 2, and 3

Docket Nos. 50-269, 50-270
and 50-287
License Nos. DPR-28, DPR-47
and DPR-58

During an NRC inspection conducted on November 1 through December 14, 1993, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C, the violations are listed below:

- A. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Actions," requires, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures established shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the significant condition adverse to quality, the cause of the condition, and the corrective action taken shall be documented and reported to appropriate levels of management.

Contrary to the above, as of December 14, 1993:

1. Measures had not been established to assure that conditions adverse to quality had been corrected in that the evaluation of Condition Adverse to Quality Report, PIP 92-454, for a postulated water hammer within the Low Pressure Service Water piping downstream of the reactor building cooling units, did not address the water hammer effects on the structural integrity of the piping.
2. Measures had not been established to assure that conditions adverse to quality had been corrected in that the evaluation to determine corrective actions for design study 0006 327 and Problem Investigation Report 92-004 concerning the postulated response of the High Pressure Service Water system to the maximum hypothetical earthquake did not include the consequences of spurious fire protection component activations.

This is a Severity Level IV violation (Supplement 1).

- B. 10 CFR 50, Appendix B, Criterion III, "Design Control," states in part "Measures shall be established to assure that applicable regulatory requirements and design basis...are correctly translated into specifications, drawings, procedures, and instructions...Measures shall also be established for the selection and review for suitability of

EXCERPT

application of materials...and equipment that are essential to the safety-related functions....Design control measures shall be applied to items such as...stress, thermal, hydraulic and accident analysis..."

Babe Power Company Typical Report 1-A, Table 17.0-1, states that the Babe Power Company's quality assurance program meets the requirements of ANSI 45.2.11-1974, Quality Assurance Requirements for the Design of Nuclear Power Plants.

ANSI 45.2.11-1974, Quality Assurance Requirements for the Design of Nuclear Power Plants, requires Net Positive Suction Head (NPSH) be considered as a design input in Section 3.2.11.

Contrary to the above, as of December 14, 1980:

1. The NPSH of the Low Pressure Service Water pumps was not adequately considered as a design input in that calculation DEC-0019 was accepted by the licensee's engineering personnel with inadequate NPSH.
2. Measures established to assure design basis are correctly translated into procedures were inadequate in that no procedural controls existed to assure the Low Pressure Service Water's pump flows inputted into the hydraulic computer model for the Low Pressure Service Water system remained valid during quarterly testing of the Low Pressure Service Water pumps.
3. The measures applied to the selection of Balzama as a suitable material for application to the Unit 2 Reactor Building Cooling Unit tubes were inadequate in that the commercial grade evaluation, CDB 2021.01-01-0001, did not consider the thermal (temperature) and hydraulic (pressure) changes Balzama would experience due to accident conditions.
4. The design basis of the Emergency Circulating Cooling Water system was not adequately translated into design documents in that the calculations supporting Emergency Circulating Cooling Water decay heat removal capability did not include numerous aspects of the design that would reduce that system's decay heat removal capability.
5. The design basis of the Circulating Cooling Water system's capability to withstand loss of Lake Meads was not translated into any design document.
6. The design basis of the Low Pressure Service Water system's capability to function as described in Case B of Abnormal Procedure AP/1/A/1702/13, "Loss of Condenser Circulating Water Intake Canal/Sea Failure," Step B.5.1, was not translated into any design document.

7. The design basis of the Safe Shutdown Facility Auxiliary Service Water system's capability to remove decay heat was not adequately translated into design documents in that a minimum flow less than required by 20 gpm per steam generator pair was established in calculation GDC-0171.

This is a Severity Level IV violation (Supplement 1).

- C. 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," requires that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings, of a type appropriate to the circumstances and shall be accomplished in accordance with those instructions, procedures, or drawings. Instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished.

Because Nuclear Site Directive 1.6.1, "Cleanliness in Safety Related Areas," Section 3.1, states that the highest level zone designation allowed for safety related equipment is 3.

Nuclear Generation Department Directive 2.6.1, "Problem Investigation Process," Section 3.4 provides that adverse conditions requiring engineering assistance be processed as an upper tier adverse quality report which receives a written operability evaluation.

Contrary to the above:

1. As of December 14, 1988, a prescribed procedural activity affecting quality did not contain appropriate acceptance criteria for determining that the activity had been satisfactorily accomplished. Procedure GDC-101, Engineering Calculations/Analysis, Section 2.6.4 did not establish a definitive length of time for revising calculations following design changes; thus, allowing calculation GDC-1223, Safe Shutdown Facility's Service Water Hydraulic Model, and GDC-2020, Standby Shutdown Facility Heating Ventilation and Air Conditioning Load Calculations, to not be updated for years after design changes affecting these calculations were implemented.
2. As of December 14, 1988, a prescribed procedure did not contain appropriate acceptance criteria for determining that an important activity affecting quality had been satisfactorily accomplished in that no flow instruments existed to confirm 200 gpm was being provided to each steam generator or 400 gpm to an un-isolated steam generator by the Auxiliary Service Water pump as directed by Emergency Procedure EP/1.2.2/A/1000/01, Section 302.

3. As of December 14, 1993, drawings affecting quality were not adequately prescribed in that the Kenoma Turbine Generator Cooling Water system drawings, KPB-100A-1.1 and KPB-100A-2.1, did not indicate the existence of an additional valve downstream of valve 2A-3 for Unit 2; the supply line to the air compressor coolers was interconnected to the 15 inch main piping for Unit 1; the piping downstream of valve 1A-76 was copper for both Units; or a consistent piping class break in the supply line to the generator thrust bearing coolers for both Units.
4. In November 1993, an activity affecting quality was not performed in accordance with prescribed procedures in that a condition adverse to quality report associated with a broken coupling on the Kenoma hydroelectric station's Unit 2 turbine guide bearing oil cooler was neither processed as an upper tier adverse quality report nor did it receive a written operability evaluation.
5. In November, 1993, an activity affecting quality was not performed in accordance with prescribed procedures in that a safety related work order, 92077549, for performing the triennial inspection of Kenoma hydroelectric station's Unit 2 turbine guide bearings oil cooler per NP/2/A/2000/21 specified a housekeeping zone higher than 3.

This is a Severity Level IV violation (Supplement 1).

6. 10 CFR 90, Appendix B, Criterion XI, "Test Control," states in part, "A test program shall be established to assure that all testing required to demonstrate that structures, systems, and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptance limits contained in applicable design documents. The test program shall include...proportional tests, and operational tests during nuclear power plant...operation, of structures, systems, and components. Test procedures shall include provisions for assuring that all prerequisites for the given test have been met, that adequate test instrumentation is available and used, and that the test is performed under suitable environmental conditions...."

Duke Power Company Topical Report 1-A, Table 17.0-1, states that the Duke Power Company's quality assurance program meets the requirements of ANSI N45.2.0-1975, "Supplementary Quality Assurance Requirements for Installation, Inspection and Testing of Mechanical Equipment and Systems for the Construction Phase of Nuclear Power Plants," and ANSI N45.2.1-1975, "Cleaning of Fluid Systems and Associated Components During Construction Phase of Nuclear Power Plants."

The proportional testing portion of ANSI N45.2.0-1975, Section 4.2, stated in part "This testing involves the operation of all items in a system...to assure that operation is in accordance with the design

criteria and functional requirements. The testing shall include, but not be limited to....service requirements for initial operation such as flow alignments...."

The installation check portion of ANSI B46.2.6-1975, section 4.5, required in part that flushing procedures contain velocities and acceptance criteria.

The pre-operational cleaning portion of ANSI B46.2.1-1973, section 7.2, stated in part, "The system shall be filled with water of the quality specified and flushed in accordance with approved procedures. Completion of flushing shall be determined by filter, turbidimetric or chemical analyses...."

Contrary to the above, as of December 14, 1980:

1. A test procedure did not include adequate provisions for test instrumentation in that in procedure PT/1/A/0001/87, Change 8, August 8, 1981, Emergency CCH System Flow Test, a 2,000 gpm deviation in the test instrumentation used was not accounted for in the acceptance criteria.
2. The post-construction flushing procedure for the Safe Shutdown Facility's discharge lines to all the steam generators did not contain flush velocities or acceptance criteria based upon filter, turbidimetric or chemical analyses.
3. Periodic Safe Shutdown Facility Auxiliary Service Water pump operability test, PT/3/A/0002/88, was not performed under suitable environmental conditions in that the pump was preconditioned in step 12.2 by venting the pump just prior to its being started masking any air entrapment that would affect pump performance.
4. The preoperational test program to demonstrate that systems and components would perform satisfactorily in service and meet the requirements contained in applicable design documents for the Safe Shutdown Facility's service water system was inadequate in that the flow control capabilities to the steam generators and the flow distributions among the three service water pumps (Auxiliary Service Water; Heating, Air Conditioning and Ventilation; Emergency Diesel Generator Cooling Water) when operating simultaneously as assumed in numerous design calculations was not performed.

This is a Severity Level IV violation (Supplement I).

Pursuant to the provisions of 10 CFR 2.201, Duke Power Company is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with a copy to the Regional Administrator, Region II, and a copy to the NRC

Notice of Violation

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Resident Inspector, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for disputing the violation, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved.

If an adequate reply is not received within the time specified in this Notice, an order or Demand for Information may be issued as to why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

Dated at Atlanta, Georgia
this 11th day of February 1994

ENCLOSURE 2
NOTICE OF DEVIATION

**Duke Power Company
Oconee Nuclear Plant
Units 1, 2 and 3**

**Docket Nos. 50-260, 50-270
and 50-287
License Nos. OPR-30, OPR-47
and OPR-50**

During an NRC inspection conducted on November 1 through December 14, 1983, deviations from written commitments were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Action," 10 CFR Part 2, Appendix C, the deviations are listed below:

A. Duke Power Company letter to the NRC, Subject: Generic Letter 80-13, dated January 26, 1980, stated:

- On page 4 that, "Oconee has established a heat exchanger test program for testable safety related heat exchangers...."
- On page 8 that, "...an initial heat exchanger test program was performed and a periodic test program was established."
- On page 12 that, "Design Study ONS-252 has been initiated to review the entire raw water system of the plant. This study will determine areas where water is stagnant or subject to intermittent flow...."
- On page 17 that, "A SITA (Self Initiated Technical Audit) was completed on the service water system at Oconee...."
- On page 18 that, "...training and procedure review programs have been established and address all maintenance, operating, and emergency procedures."

Contrary to the above, as of December 14, 1983:

1. A periodic testing program had not been established for the testable Kewanee service water system heat exchangers or the Standby Shutdown facility's testable emergency diesel generator heat exchangers.
2. All raw water systems were not reviewed for stagnant or intermittent flow under ONS-252 in that Kewanee service water cooled systems were not included.
3. The training and procedures review programs established for service water systems were not adequate in that these reviews never identified that there were no flow indicators in the Auxiliary Service Water discharge lines to the steam generators, no emergency procedure addressed inadequate Low Pressure Service Water flow and there were no operating procedures for Kewanee service water system.

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Notice of Deviation

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4. Numerous service water systems were omitted from the Self Initiated Technical Audit including the Auxiliary Service Water system, the Standby Shutdown Facility's service water systems, the Kewanee service water systems, the condenser cooling mode of the Circulating Cooling Water system, and the recirculation mode of the Circulating Cooling Water system.
5. Duke Power Company's written commitments associated with Station Blackout, beginning with your letter of April 17, 1980, indicated that Regulatory Guide 1.156, "Station Blackout," Section 3.5, "Quality Assurance and Specification Guidance for Station Blackout Equipment That is Not Safety-Related," would be followed. Section 3.5 in part, refers to Appendix A of the Regulatory Guide for providing guidance on quality assurance activities for non-safety-related equipment. Appendix A, Section 5, "Testing and Test Control," states in part, that a test program be established and implemented to ensure that testing is performed to demonstrate conformance with design and system readiness requirements.

Contrary to the above, as of December 14, 1983, a test procedure for demonstrating that system readiness requirements were met, was inadequate in that the test acceptance criteria did not assure that a 4-hour inventory of High Pressure Service Water cooling water is assured in the Station Blackout event was available from the minimum allowable Elevated Water Storage Tank level.

Please provide to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20543, with a copy to the Regional Administrator, Region II, and if applicable, a copy to the NRC Resident Inspector at the Oconee Nuclear Plant, in writing within 30 days of the date of this Notice, the reason for the deviations, the corrective steps which have been taken and the results achieved, the corrective steps which will be taken to avoid further deviations, and the date when your corrective actions will be completed. Where good cause is shown, consideration will be given to extending the response time.

Dated at Atlanta, Georgia
this 11th day of February 1984



UNITED STATES
NUCLEAR REGULATORY COMMISSION
DOCKET #
101 SANNETTA STREET, N.W., SUITE 2000
ATLANTA, GEORGIA 30303-0000

Report Nos.: 90-260/93-29, 90-270/93-25 and 90-287/93-25

Licensee: Duke Power Company
422 South Church Street
Charlotte, NC 28242

Docket Nos.: 90-260, 90-270, and 90-287

License Nos.: DPR-30, DPR-47,
and DPR-90

Facility Name: Oconee 1, 2 and 3

Inspection Conducted: November 1 through December 14, 1993

Inspector:

Walter E. Rogers
Walter E. Rogers, Team Leader

2/10/94

Date Signed

Accompanying Personnel:

L. Nelson
C. Rupp
L. King
K. Kavanagh (Intern)
B. Tanel (Intern)
P. Holmes-Day

Approved by:

Thomas A. Peebles
Thomas A. Peebles, Chief
Operational Programs Section
Operations Branch
Division of Reactor Safety

2/10/94

Date Signed

SUMMARY

This routine, announced inspection was conducted in the areas of Service Water System Operational Performance Inspection (SWSOP1) on November 1 through December 14, 1993, in accordance with NRC Temporary Instruction 2515/110.

RESULTS

General Weaknesses:

The NRC Temporary Instruction for Service Water Inspections, SWIS item 2515/110, was not closed due to licensee inadequacies in response to OL 89-13. Design control measures contained numerous weaknesses. Unvalidated and nonconservative assumptions were used in various calculations. Calculations or analyses did not exist for some SMS operating modes. Engineering analyses of some conditions were

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inadequate. Vague criteria had been established for updating calculations. The testing program had but omitted critical functions of some systems and equipment. The procedural guidance for some abnormal situations was weak. The safety classification system had numerous omissions. Resolution to self-assessment findings were sometimes untimely and occasionally inadequate.

General Strengths:

The SRSs were in good material condition. The design review portion of the licensee's self assessment was thorough and comprehensive for the system reviewed. Instrument calibration procedures contained detailed and complete descriptions of the instrument's function. The corrosion monitoring program, though of limited scope, was excellent. The RDB concept and the associated testing acceptance criteria were good initiatives.

Findings

LPSS System - For some low probability situations required by the facility's license, the system would be incapable of performing its safety function. For example, RBCS cooling coil leak repair material had not been qualified for accident conditions; failure of the material would affect containment integrity. A fairly complete hydraulic computer model had been developed, but inadequate controls existed for maintaining the hydraulic model valid. Significant material condition improvements had been accomplished (replacement of the unreliable radiation monitoring system) and others were planned (replacement of all RBCs). Extensive analysis/calculations existed on which the system design was based. However, analyses dealing with LPSS WPM and RBCS waterhammer were inadequate. Also, the RBCS performance evaluation process contained two questionable inputs.

CCS System - Corrective actions to SITA findings associated with the CCS subsystem had been untimely. Portions of the CCS system necessary to provide flow to the LPSS system were not properly classified as safety-related. The situation had been recognized by the licensee, and adequate corrective actions were being implemented. No analyses existed to support licensee's capability to withstand failure of the Kanine Ban/loss of inventory of the Lake Kanine. Also, the procedures for this scenario contained weaknesses. The test procedure and heat transfer calculations for the CCS subsystem were inadequate. Fortunately, a large safety margin existed in the actual system's performance.

WPM System - The system was not classified, constructed, tested, or maintained commensurate with its importance to safety. The licensee's engineering organization recognized this deficiency. However, communication to the rest of the organization had been untimely. Also, some of the corrective actions taken by the licensee in response to this deficiency were weak.

SIS - The SIS could not remain operational following a failure of the Jacques Dam. Therefore, no system was available to provide decay heat removal of the three units in this situation. Also, the decay heat removal function of the SIS had not been adequately confirmed. The minimum flow requirements to the steam generators were nonconservative. Numerous calculations had not been updated following facility modifications affecting the calculations. The periodic testing program elements did not add up to an integrated test of the SIS system. Air entrapment affecting AHB pump performance could not be identified during periodic pump testing due to a procedure deficiency. Finally, certain aspects of the licensee's OL actions had not been performed.

AHB System - The system was marginal in its capabilities and did not contain flow instrumentation or provide the operators the ability to control plant conditions from the control room. Testing of the system failed to provide full assurance that the personnel could perform necessary tasks within the requisite time constraints. The testing of specific components in the system was inadequate, but the licensee had recognized the deficiencies and was taking timely corrective actions. Calculations for WPSH and pump minimum flow protection lacked rigor.

Kennecott - The mechanical systems were very reliable. Kennecott had been excluded from the licensee's OL response. Corrective actions to establish all aspects of the quality assurance program at Kennecott had some minor weaknesses in quality of implementation and full integration. Also, some minor quality assurance program deficiencies were present. The calibration program contained some weaknesses including not verifying the annunciator panels alarm at the proper setpoint.

Four cited violations, two non-cited violations, two deviations, one unresolved item, and six inspector follow-up items were identified.

The following items are included as attachments to this inspection report:

- APPENDIX A Persons Contacted
- APPENDIX B Generic Letter 88-12 Action Items
- APPENDIX C Acronyms and Abbreviations