UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W.
ATLANTA, GEORGIA 30323

Report Nos.: 50-413/86-26 and 50-414/86-29

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

Docket Nos.: 50-413 and 50-414 License Nos.: NPF-35 and NPF-48

Facility Name: Catawba 1 and 2

Inspection Conducted: July 7-11, 1986

Inspectors: N. Merriweather 8-21-86
N. Merriweather, Team Leader Date Signed

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SUMMARY

Scope: This was a special, announced inspection concerning the licensee's response to Generic Letter 83-28, "Required Actions Based on Generic Implications of Salem Anticipated Transient Without Scram (ATWS) Events." Areas inspected included post-trip review, equipment classification, vendor interface, post-maintenance testing, and reactor trip system reliability.

Results: No violations or deviations were identified.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*J. S. Hampton, Station Manager
*H. Barron, Operations Representative
*W. F. Beaver, Performance Representative
*S. W. Brown, Reactor Engineer
*B. F. Caldwell, Superintendent, Station Service
*J. W. Cox, Technical Services Superintendent
*T. Crawford, Integrated Schedule
*B. East, Instrumentation and Electrical (I&E) Staff Engineer
*C. S. Gregory, I&E Support Engineer
*C. L. Hartzell, Compliance Representative
*D. Hughes, Planning Coordinator
*J. H. Knuti, Operations
*T. Schiffley, Compliance
*A. Rose, Station Support Engineer, Transmission Department
D. Jackson, Document Control
J. Knudsen, Document Control
R. Powell, Document Control
J. A. Lanning, Administrative Coordinator
J. Quarles, Engineering Co-Op Student
D. O'Brien, Assistant I&E Technician
C. Maybry, Electronics Specialist
R. Hembree, Quality Assurance Inspector
M. Johnson, "C" Electrician
W. Morrison, "A" Electrician
M. Carpenter, "A" Electrician
R. Bledsoe, Sub-Station Equipment Supervisor, Transmission Department
M. McGuffee, PM & NPRDS Coordinator
W. Reburn, Procedure Development Supervisor, I&E
*R. Cole, Operating Experience Management and Analysis Supervisor, Nuclear Safety Assurance
P. Vu, Associate Engineer
*J. Ferguson, Supervisor of Document Control
J. Thomas, Senior I&E Design Engineer
D. Jenkins, Associate I&E Design Engineer
J. Ashe, Staff Engineer
L. Tatum, District Manager of Sub-Station Maintenance
P. Wingard, Co-Op Student
*W. Messer, Maintenance Engineer
*J. J. McCual, QA Representative
*K. W. Schmicht, QA Representative
*R. O. Sharpe, Licensing
*J. M. Stackley, I&E Engineer

Other Organizations

*K. Jabbour, Licensing Project Manager, NRR
R. Wolfgang, Westinghouse Engineer
R. Fast, Westinghouse Senior Field Service Engineer

NRC Resident Inspector

*P. H. Skinner, Senior Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on July 11, 1986, with those persons indicated in paragraph 1 above. The inspector described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee.

Inspector Followup Item 50-413/86-26-01 and 50-414/86-29-01, Review Work Requests and Purchase Documents to Assess Equipment Classification Program for all Safety-Related Components, paragraph 7.

Inspector Followup Item 50-413/86-26-02 and 50-414/86-29-02, Resolution of Deficiencies in Reactor Trip Breaker Maintenance Procedure MP/0/A/2001/05, paragraph 8.

Unresolved Item 50-413/86-26-03 and 50-414/86-29-03, Tracking and Closeout of Vendor Technical Bulletins and Information Letters, paragraph 9.

The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Unresolved Items

Unresolved items are matters about which more information is required to determine whether it is acceptable or may involve violations or deviations. One new unresolved item was identified during this inspection and is discussed in paragraph 9.

5. Background

On February 25, 1983, both of the scram circuit breakers at Unit 1 of the Salem Nuclear Power Plant failed to open upon an automatic reactor trip signal from the reactor protection system. This incident was terminated manually by the operator about 30 seconds after the initiation of the

automatic trip signal. The failure of the circuit breakers was later determined to be related to the sticking of the undervoltage trip attachment. Prior to this incident on February 22, 1983, at Unit 1 of the Salem Nuclear Power Plant, an automatic trip signal was generated based on steam generator low-low level during plant startup. In this case, the reactor was tripped manually by the operator almost coincidentally with the automatic trip. Consequently, the failure of the undervoltage trip attachment was not immediately detected.

As a result of the problems identified with circuit breakers at Salem and at other plants, NRC issued Generic Letter (GL) 83-28, Required Actions Based on Generic Implications of Salem ATWS Events, dated July 8, 1983. This letter required licensees of operating plants to respond to intermediate-term actions to ensure reliability of the Reactor Trip System (RTS). Actions required to be performed by the licensees included development of programs to provide for post-trip review, classification of equipment, vendor interface, post-maintenance testing, and RTS reliability improvement.

Duke Power Company, the licensee of the Catawba Nuclear Station, responded to GL 83-28 in an initial submittal dated November 4, 1983, with several subsequent responses dated February 2, 1984, May 7, 1984, October 19, 1984, November 2, 1985, December 31, 1984, June 24, 1985, August 23, 1985, December 3, 1985, and July 2, 1985. The licensee's responses to items 1.1, 1.2, 2.1, 3.1.3, 3.2.3, 4.1, 4.2.1, and 4.2.2 have been reviewed by the staff for compliance to the positions stated in GL 83-28. Staff evaluations concluded that the licensee's responses to items 1.1., 1.2, 2.1, 3.1.3, 3.2.3, and 4.1 were acceptable, however, for items 4.2.1 and 4.2.2, the staff determined that they were unacceptable. Subsequently, NRC issued a request for additional information dated June 10, 1986, for items 4.2.1 and 4.2.2. The response to this request is still pending. Other items in the GL which have not been finally reviewed are items 2.2, 3.1.1, 3.1.2, 3.2.1, 3.2.2, 4.5.1, 4.5.2, and 4.5.3.

The purpose of this inspection was to verify compliance to the licensee's responses and to assess the adequacy of the licensee's current program, planned program improvements and implementation of present procedures associated with post-trip review, equipment classification, vendor interface, post-maintenance testing, and reactor trip system reliability. The results of the inspection are presented in the paragraphs that follow.

6. Post-Trip Review

The licensee was requested in GL 83-28 to describe their program, procedures, and data collection capability in order to assure that the causes for unscheduled reactor shutdowns, as well as the response of safety-related equipment, are fully understood prior to authorizing a plant re-start. The licensee's response to GL 83-28, Duke Power Company letter dated November 4, 1983, provided a comprehensive description of the program,

procedures, and data collection and analysis capabilities pertinent to performing post-trip reviews. The inspector reviewed the response, NRR's safety evaluation report (NUREG-0954, Supplement 5), appropriate procedures, conducted walk-throughs, and interviewed key licensee personnel in order to assess the adequacy of the licensee's program for post-trip review and response. The results of this inspection are discussed in the following paragraphs.

The inspection was formatted to verify that a post-trip review program has been implemented and meets the following attributes:

a. Procedures and equipment exist to cover post-trip review.

b. Safety assessments of the reactor trip are clearly delineated as part of the post-trip review.

c. Post-trip review procedures are reviewed periodically by an onsite safety review committee such as the Plant Operations Review Committee (PORC) and upgraded in any areas that have been identified as deficient.

d. Plant personnel preparing and/or reviewing post-trip documentation receive initial training and refresher training in post-trip review procedures.

e. Responsibilities and authorities of plant personnel who will perform the review and analysis of these events are clearly defined.

f. Methods or criteria for determining the acceptability of authorized restart have been established.

g. Methods or criteria for comparing plant information with known or essential plant behavior have been established.

h. Guidelines are established for preservation of evidence of reactor trips.

The licensee's response to each of these attributes is discussed individually as follows:

a. Procedures and equipment exist to cover post-trip review

All procedures reviewed for this inspection are listed in paragraph 11. For simplicity and clarity, they will be referred to in the body of this report by number only.

Station Directive (SD) 3.1.18 is the primary station procedure addressing post-trip review. Upon occurrence of a reactor trip, procedure EP/2/A/5000/1A, Revision 1, provides the necessary guidelines to stabilize and control the plant, and it concludes by leading the operators into SD 3.1.18. The reactor engineering staff takes primary

responsibility for completing the post-trip review report with input from the operations staff. SD 3.1.18 provides the following information:

- Purpose
- Applicability
- Responsibilities
- Implementation
- Post-Trip Review
- Restart Decision
- Independent Review
- Subsequent Investigation
- Personnel Qualifications
- Post-Trip Review Actions
- Post-Trip Review Report

The format of the licensee's post-trip review report (PTR) is: (Roman numerals are used in the PTR)

I. Identification of Transient

II. Initial Conditions

III. Plant Response
- A. Safety System Actuation and Performance
- B. Control Systems Actions
- C. Manual Actions
- D. Radiological Response
- E. Transient Data for Key Plant Parameters

IV. Description of Unexpected Responses
- A. Discussion of Any Unexpected Behavior of Key Parameters (Refer to III.E.)
- B. Discussion of Unexpected Personnel Response (Refer to III.C.)
- C. Identification of Systems with Inadequate Performance (Discuss the Nature of the Deficiency) (Refer to III.A. and B.)

V. Identification of Needed Action - Prior to Restart

VI. Identification of Recommended Action - Following Restart

VII. Recovery

A tour of the control room was conducted to confirm placement and operability of all equipment required for capture and analysis of data for the post-trip review. The equipment consisted of a sequence-of-events recorder which discriminated down to one millisecond (but did not feature a word description of the event point), an alarm typer which printed out to the nearest second (and did contain the word description of the event), and a computer designated as the transient monitor. This monitor locks in on an event, and captures information for a period from ten minutes before until 30 minutes after commencement of the event. The information is stored on a floppy disc as well as off-site on tape. The data can be displayed in graph or chart form.

b. Safety assessments of the reactor trip are clearly delineated as part of the post-trip review.

The safety assessment is adequately treated in Section III. The reviewer is required to review safety and control system actuation and performance, compare them to expected behavior and explain any differences, address Technical Specification limits, and identify inadequate performance.

c. Post-trip review procedures are reviewed periodically by an onsite safety review committee such as the PORC and upgraded in any areas that have been identified as deficient.

The Administrative Policy Manual 4.2.8 documents the requirement to review all plant procedures every two years. This is further implemented by SD Manual 4.2.1 which directs review of specific types of procedures by department and submittal to the PORC for approval.

d. Plant personnel preparing and/or reviewing post-trip documentation receive initial training and refresher training in post-trip review procedures.

Initial training for reactor engineering and plant operations personnel in use of the post-trip review procedure, SD 3.1.18, is provided for in Task CO-S011. Licensed operators receive refresher training on the post-trip review procedure, but presently there is no provision for refresher training for the reactor engineering personnel who perform the post-trip review. Discussions with licensee personnel revealed that final post-trip reports are routed among the reactor engineers and plant operations groups for staff review. Site procedures, however, do not require this distribution of the post-trip reports. Therefore, it is recommended that requalification training be provided for reactor engineers on SD 3.1.18, "Investigation of Unit Trip".

e. Responsibilities and authorities of plant personnel who will perform the review and analysis of these events are clearly defined.

Responsibilities and authorities of plant personnel who will perform review and analysis and recommend/authorize restart are clearly defined in paragraphs 3.0, 4.0, and 5.0 of SD 3.1.18.

f. Methods of criteria for determining the acceptability of authorized restart have been established.

As discussed in paragraph b. above, the post-trip review report requires the reactor engineer to determine if all pertinent parameters were within acceptable limits, safety and control equipment functioned properly, and events occurred in a proper sequence. All personnel involved in the post-trip review have been trained in a systematic safety assessment approach to reactor trips through classroom and simulator training.

g. Methods of criteria for comparing plant information with known or essential plant behavior have been established.

The reactor trip report provides the necessary step-by-step checklist to verify that operations occurred as expected. Plant behavior is compared to limiting values contained in the Technical Specifications and expected behavior as described in the final safety analysis report to ensure operation was as expected and within limits. Any deviation is noted in the report and evaluated.

h. Guidelines are established for preservation of evidence of reactor trips.

Paragraph III.E. of SD 3.1.18 provides instructions to attach the transient monitor plots to the post-trip review report. Printouts from the sequence-of-events recorder and the alarm typer are removed daily and stored in the station master file. Review of two reports showed that the printouts are also stored with the original copy of the report in the performance group's working files.

Presently, the period of retention for data and information used for post-trip reviews is a point of debate between NRR and the licensee, NRR wanting lifetime retention and Duke wanting six years. This inspection will leave that topic to be settled between NRR and the licensee.

7. Equipment Classification

GL 83-28 items 2.1 and 2.2 dealt with equipment classification for reactor trip system components and all other safety-related components, respectively. GL 83-28 item 2.1 required that licensees confirm that all components whose functioning is required to trip the reactor are identified as safety-related on documents, procedures, and information handling systems used in the plant. Item 2.2 required licensees to describe their program for ensuring that all other components of safety-related systems necessary for accomplishing required safety functions are also identified as safety-related on documents, procedures, and information handling systems used in the plant. In a letter dated November 4, 1983, Duke Power Company (DPC) responded to GL 83-28 Item 2.1 for the Catawba Nuclear Station. In this response, DPC stated that "all components of the Reactor Trip System whose functioning is required to trip the reactor are identified as safety-related on documents, procedures, and information handling systems used in the plant to control safety-related activities". In the same response, the licensee also described the controls used for all other safety-related components.

The inspector determined that the Catawba Nuclear Station Quality Standards Manual for Structures, Systems, and Components (QSMSSC) provides the mechanism for determining whether or not a given station structure, system, or component is nuclear safety-related or requires that certain quality standards be maintained. This manual identifies four QA condition codes

with QA condition one identifying safety-related items. It provides the detail steps to be followed for determining the QA condition of structures, systems, and components, and it identifies tables of plant structures, systems and components with these defined QA classifications. It also provides evaluation checklists for determining the safety classification of those items where conflicts exist between QA conditions shown in the manual list and design documents.

Station Directive 3.3.1, Determination of QA Condition for Structures, Systems, and Components, further defines station personnel responsibilities on the use of the QSMSSC for determining the QA condition of given Nuclear Station Structures, Systems, and Components.

In order to verify implementation of the QSMSSC, the inspector interviewed responsible licensee personnel and reviewed appropriate documents to determine if selected reactor protection system items were properly being classified as safety-related from information drawings or in the CNS QSMSSC. Planning personnel in both Mechanical and Instrumentation and Electrical Planning were very knowledgeable of the procedures and demonstrated their ability to determine QA conditions by use of drawings and other information documents (i.e., flow diagrams, instrument details, valve lists and electrical drawings). Licensee personnel were able to demonstrate use of the QSMSSC in classifying the following safety-related components:

a. CVCS Valve 1-NV-188A
b. CVCS Valve 1-WV-189B
c. Reactor Trip Breakers
d. MCB Manual Reactor Trip Switches
e. Stationary Gripper in Rod Control System

With the exception of component C, all of the above items required the use of drawings to determine the quality classification. The log for work requests was examined to determine whether or not components were consistently classified by various groups within the plant organization. Work on the control rod drive mechanism was classified as non-safety-related by instrumentation on WR 002796IAE, but safety-related by mechanical on work request WR 002796IAE-1. Previously, the inspector had been informed by mechanical planning that the control rod drive stationary grippers were considered safety-related on DWG CNM 1201.13-0038. The inspector reviewed a computer summary of the work performed on both work requests. Work request No. 2796IAE installed new flux rings onto P4 shaft and meggered CRDM P-4. Work Request No. 2796IAE-1 implemented safety-related maintenance procedure MP/0/A/7650/58 to remove and install new coil at stack P-4. The inspector had a concern regarding the adequacy of the licensee's implementation of the program to properly classify work activities considering the amount of detail in the QSMSSC. Discussions also revealed that completed and reviewed QA checklists were not forwarded to manual holders by the licensing section to be incorporated into the manual when the next manual revision was issued.

The licensee had developed a draft revision of SD 3.3.1 which would no longer require the checklists to be forwarded to the manual holders. It would only require the checklists to be attached to the work requests which is their current practice. The inspector was concerned that the proposed revision would cause evaluations to be done several times and would not provide information to all station personnel that are required to use the QSMSSC. The inspector informed the licensee that because of the lack of detail in the QSMSSC and the differences observed in the classification of work requests on the CRDM discussed above further review of additional work request documents, and procurement documents are necessary to fully assess the effectiveness of the equipment classification program. The inspector did express a concern to the licensee that similar systems exists at other plants which observed some of the same types of weaknesses. Therefore, this subject will be reviewed by the region in subsequent inspections. This item will be identified as Inspector Followup Item 50-413/86-26-01 and 50-414/86-29-01, Review Work Requests and Purchase Documents to Assess Equipment Classification Program for all Safety-Related Components.

Within the area examined, no violation or deviation was identified.

8. Post-Maintenance Testing (Reactor Trip Circuit Breaker)

The inspector ascertained that the licensee is committed to a full program of maintenance and post-maintenance testing of the reactor trip circuit breakers by the following action plan:

- Field observation of the maintenance of a reactor trip circuit breaker.
- Review of licensee's procedures on reactor trip circuit breaker.
- Review of licensee's procedures versus vendor technical manuals.
- Review of completed maintenance work requests on reactor trip circuit breakers.

a. Field Observation: The inspector witnessed the performance of maintenance work request number 005198 SWR, which was the periodic maintenance on the Bypass Reactor Trip Circuit Breaker "B", Serial Number 02YN075B-4. The procedure used was licensee's Maintenance Procedure MP/0/A/2001/05, "Westinghouse DS-416 air Circuit Breaker Inspection and Maintenance," Revision "0", dated December 12, 1983.

The inspector noted that the electricians required the use of special tools to measure the force on the trip bar and the Undervoltage Trip Device (UVTD), and to measure the pre-travel and post-travel of the trip tab on the UVTD. However, none of these special tools were listed in the procedure.

The inspector noted that the force measurements previously mentioned were repeated three times with the average value recorded on the data sheet, and the data taken were not made a part of the permanent record. This was not a part of the licensee's procedure, nor was it referenced in the vendor manuals. Furthermore, an alternate method of measuring the force using a transducer was performed. This alternate method was also an undocumented step in either the licensee's procedure or the vendor manual.

As the craft progressed through the procedure it was observed that several additional tests were performed by the electricians which were not addressed in the procedure. The electricians performed a megger test of the breaker contacts, UVTD dropout voltage test, and a low-voltage shunt trip test. The electricians had two hand written sheets of instructions which detailed the above tests. None of these tests are requirements in the procedures, and, when questioned, the electricians responded that these are necessary tests and that they have been expecting a new manual and procedure requiring these actions for the last 18 months. Therefore, in anticipation of the issuance of the manual and the requirement to trend Rx trip breaker parameters, the licensee developed the hand written sheets.

To get a better understanding of why the craft were using handwritten instructions, the inspectors held discussions with personnel in Design Engineering and the Transmission Department. These discussions revealed first that the licensee had not endorsed the Westinghouse Maintenance Program Manual for DS-416 Reactor Trip Circuit Breakers, Rev. 0 which was issued in November 1984. The licensee has had some disagreements with Westinghouse on some aspects of the manual. As a result for approximately 18 months this manual has not been implemented at Catawba. However, during the review by other groups such as the Transmission Department which maintains the Rx trip breakers they anticipated the issuance of the manual by developing the handwritten procedures to accumulate necessary history data for trending. So that when the manual was released to the site they could revise the station procedures. In this case, Design Engineering did not inform them that the manual would not be released because it had not been endorsed.

The licensee's response to GL 83-28 dated November 4, 1983, indicated that maintenance on Rx trip breakers was consistent to the current manufacturers recommendations as described in the technical manual. Also in a letter to NRC dated December 31, 1984, the licensee transmitted a copy of the maintenance procedure and brief summary of their maintenance program.

Subsequently, NRR issued a draft safety evaluation report (SER) dated June 10, 1986, where they concluded that the licensee's positions on preventative maintenance and trending of the reactor trip breakers was unacceptable. In this SER NRR stated that the primary source for

periodic maintenance program criteria is Westinghouse Maintenance Program Manual for DS-416 Reactor Trip Circuit Breakers, Rev. 0 which has not been implemented by the licensee. NRR requested the licensee to provide additional information within 60 days on items 4.2.1 and 4.2.2.

This issue will be left for NRR resolution.

During the discussions with design, it was learned that the disagreements which existed between Duke and Westinghouse have been resolved and that a new revision of the manual is expected to be issued in August 1986 and will be implemented at the site in September 1986.

The issue of the handwritten procedures was discussed in detail with appropriate management and supervision in the Transmission Department. It was concluded that the licensee's program does not allow the use of hand written procedures. However, the tests which were conducted have been both approved by Westinghouse and NRC as being necessary to perform adequate maintenance and trending of the reactor trip breakers. Based on the above, the inspector concluded that the tests performed did not effect safety, instead they enhanced the reactor trip breaker maintenance program.

The inspector also observed a portion of another work request which implements the Reactor Trip Circuit Breaker Trip Device Functional Test Number IP/0/A/3200/10A. This procedure established the breaker response time and verified its proper operation. The inspector noted that the procedure used a step-by-step format and did not require Quality Assurance. The UV trip device response time was measured and found to be within the acceptable limits.

b. Review of Procedures: The inspector reviewed the licensee's procedures in the area of reactor trip circuit breaker maintenance and post-maintenance testing. The procedures reviewed were as follows:

(1) MP/0/A/2001/05: This procedure covers the requirements to control the inspection and maintenance of Westinghouse DS-416 Reactor Trip Circuit Breaker. The procedure referenced Westinghouse vendor instruction manual drawings. The inspector noted that the procedure was brief and gave very few details on the performance of each step. Furthermore, the procedure was not written in a step-by-step format, which made it difficult to follow. The procedure can only be adequately followed by very experienced electricians who have been drilled in the use of the procedure. Discussions with the licensee revealed that only certified electricians are allowed to perform maintenance on the breakers. However, the inspector felt that more detail should be included in the procedures.

The procedure states that "double asterisks indicate QA inspection steps." These are steps 11.7, 11.8, 11.12.1, 11.12.2, 11.12.3, 11.12.4, and 11.13. QA only verifies that the electricians performed the inspections, it is not an independent inspection to verify quality. QA has only one check-off step.

The inspector met with the licensee to discuss the apparent deficiencies in the reactor trip breaker maintenance procedure MP/0/A/2001/05. The licensee seemed receptive to suggestions to revise the procedure to include tool requirements, add spaces for all UV trip force data, add UVTA dropout voltage drop test, add low-voltage shunt trip test, and megger test. The licensee also agreed to look into a step-by-step approach to the procedure format, increasing the QA requirement, and incorporating later revision of vendor manuals.

The inspector concluded that the post-maintenance testing of the reactor trip circuit breakers will benefit from these procedure changes. The inspector also notes the high level of technical expertise demonstrated by the electricians, and feels that the methods used did not compromise the quality or safety of breaker maintenance. However, the current deficiencies in the procedures plus the lack of appropriate QC inspection provided a concern regarding future reactor trip breaker maintenance activities. The inspectors informed the licensee that this item is open pending review of the revised procedures for Reactor Trip Breaker Maintenance. This will be tracked as Inspector Followup Item 50-413/86-26-02 and 50-414/86-29-02, Resolution of Deficiencies in Reactor Trip Breaker Maintenance Procedure MP/0/A/2001/05.

(2) IP/0/A/3200/10 A&B: These procedures functionally test the Train A & B reactor trip breaker's undervoltage and shunt trip devices independently. The procedures were issued May 1, 1985, and have never been revised.

The inspector noted that the procedure required no QC surveillance and contained many additions and deletions to correct the text. The procedure adequately tests the breaker undervoltage response time and the shunt trip independently.

c. Review of Procedures Versus Vendor Manuals: The inspector reviewed the licensee's procedure for reactor trip maintenance, MP/0/A/2001/05, to verify that the appropriate vendor's technical manuals were incorporated into the procedures, and that the vendor's technical manuals used as a reference were current and complete. The inspector noted that the maintenance procedure required the electricians to refer to the vendor manual for virtually all maintenance information. A concern was identified because very little vendor information had been extracted from the manual and incorporated by paraphrasing the appropriate section in the procedure.

Post-maintenance test procedures IP/0/A/3200/10 A&B adequately incorporated the referenced vendor manuals to perform the reactor breaker undervoltage trip and response time and the shunt trip independently.

d. Review of Completed Work Requests: The inspector reviewed the licensee's latest completed work requests of reactor trip circuit breakers' maintenance and post-maintenance testing for Units 1 and 2. They were found to be complete, with no discrepancies.

Within the area examined, no violations or deviations were identified.

9. Vendor Interface

The inspector reviewed the licensee's procedures and inspected the licensee's control of vendor manuals. The inspector covered the areas of:

- Licensee's procedures on vendor manual control and inspection of controlled vendor manual.

- Licensee's operating experience program (OEP).

- NPRDS interface.

a. Licensee's Procedures on Vendor Manual Control and Inspection of Controlled Vendor Manual: The inspector reviewed the licensee's procedures in the area of vendor manual control for conformance with licensee's commitment as stated in their various responses to GL 83-28.

Excerpts from the licensee's Administrative Policy Manual addressed the handling and control of "Vendor Documents," and directed the Design Engineering Department as the lead section responsible for the approval and issuance of vendor manuals. The Design Engineering Department manual addressed the subject of vendor drawings in Section 2.0, and the subject of vendor manuals in Section 5.0. It has subsections on new and revised manuals, as well as on insertions to vendor manuals. The inspector also reviewed Catawba Nuclear Station Directive 2.15 and noted that the licensee is committed per Section 5.8 to have all vendor drawings assigned as controlled drawings by the Design Engineering Department and controlled by the Master File Room. However, the licensee does not have a companion station directive on vendor manual control, and, instead, stated to the inspector that vendor manuals are handled in the same way as drawings.

The licensee is in the process of a backfit audit of vendor manuals. As per their commitment to GL 83-28, they are upgrading their vendor manual control system at Oconee, and they are scheduled to do the same upgrade at Catawba in January 1 to December 31, 1987. The backfit would entail upgrading the entire vendor manual control system as outlined in their procedures DCP-150 and 153. The inspector concluded that the current status of licensee's vendor manual control system

needs improvements, but they are not committed to do it until the end of 1987.

b. Licensee's Operating Experience Program (OEP): The licensee is attempting to consolidate the lessons and materials available from their internal as well as external sources, and to disseminate the information plant-wide. As such, they have developed some procedures and they are in the process of revising one of the procedures. The OEP program is of interest because of two specific documents that related to the maintenance and quality of the reactor trip circuit breaker.

(1) Westinghouse has issued its maintenance manual on DS-416 circuit breaker, and the manual was transmitted by licensee's OEP group to licensee's I&E group. Several delays in the I&E acceptance of this Westinghouse manual were due to disagreements between Westinghouse and the licensee. To date, these differences have been resolved, and the licensee accepted the Westinghouse manual in September 1986. Upon issuance, the licensee indicated that it would be incorporated into the RTB maintenance procedure.

(2) The licensee has received a Westinghouse Technical Bulletin #NSD-TB 84-02, Rev. 1 in April 1984. This was transmitted by the licensee's OEP group to Engineering with an initial due date of September 1984. Subsequently, this due date was changed to September 1986. The subject of the Bulletin was the inspection of potential loose wiring in reactor trip circuit breakers. The licensee admitted to an oversight in failing to implement the bulletin. The inspectors voiced a concern that this is one example of a weakness in the OEP program for failing to escalate items that are not evaluated in a timely manner for management attention. The licensee responded that a planned revision to procedures will address timeliness of evaluating and closing out vendor technical bulletins and letters. This concern is unresolved pending review of the revised procedures for the OEP program and closure of NSD-TB 84-02. It will be tracked as Unresolved Item 50-413/86-26-03 and 50-414/86-29-03, Tracking and Closeout of Vendor Technical Bulletins and Information Letters.

c. NPRDS Interface: The licensee is committed to the exchange of information with the Nuclear Plant Reliability Data System (NPRDS). The Institute of Nuclear Power Operations (INPO) manages NPRDS on behalf of all nuclear utilities in the United States. As such, NPRDS is a comprehensive industry data base covering the design characteristics and performance of key nuclear plant equipment. The NPRDS coordinator at Catawba inputs data to NPRDS, and contracts information from NPRDS. The inspector saw that the licensee's terminal was plugged into the NPRDS data base, and requested the NPRDS coordinator to obtain whatever data are available on reactor trip circuit breakers. The NPRDS coordinator was unable to receive any information requested. He cited breakdown in data transmission as the cause of the failure.

The NPRDS coordinator also functions as the Preventive Maintenance Coordinator. As the latter, his role includes maintaining a data base with the data obtained from preventive maintenance. These data include those data that were obtained from the preventive maintenance of reactor trip circuit breakers. His group reviewed all these data for trends. However, these data were not plotted out for analysis. The inspector maintained that the data need to be plotted (or otherwise placed in perspective with regard to time) for an adequate analysis of trends. This can then be used in the forecast of degradation or failure of these safety-related components.

The inspector noted that the licensee will soon issue a SD (M) 3.3.4, "Reliability Data System (NPRDS)." The licensee will also issue, in the future, a Maintenance Management Procedure on "Equipment Improvement and NPRDS." These forthcoming publications, in conjunction with the demonstrated capability and knowledge of licensee's personnel committed to the interface with NPRDS, showed the inspector that this aspect of licensee's vendor information program is adequate.

Within the area examined, no violations or deviations were identified.

10. Reactor Trip System Reliability

Item 4.1 of GL 83-28 request that the licensee report whether or not he has incorporated or otherwise resolved any recommendations by the NSSS manufacturer to make modifications within the reactor trip breaker switchgear compartments. In a letter to Mr. D. G. Eisenhut, USNRC, dated November 4, 1983, Duke Power Company stated that Westinghouse Electric Corporation (W) made one recommendation for modifying the reactor trip breakers, and the licensee committed to incorporate that recommendation. W recommended that the undervoltage trip device on DS-416 circuit breakers be replaced. The replacement undervoltage (UV) device would be essentially identical in function to the original UV device, but would not have the dimensional tolerance problems. With the purpose of verifying Duke Power Company's compliance with their commitment in this matter, the NRC inspector reviewed the following documents at the site:

a. Westinghouse Electric Corporation Technical Bulletin Index, revised June 18, 1985 (Index to bulletins issued since 1973, which are a method of disseminating information of relative importance to customers of the Nuclear Service Division).

b. Nonconforming Item Report No. 16,751 by Duke Power Company for Catawba which covers the replacement of the UV devices as recommended in a. above.

The conclusion drawn from the inspection of item 4.1 is that the licensee met the intent of the generic letter.

Item 4.3 of GL 83-28 request that the licensee modify the reactor protection system such that the automatic trip signals to the reactor trip breakers energize the shunt trip coil as well as de-energize the undervoltage trip device. In original designs, the automatic trip signal operated only through the undervoltage trip device. This change is considered by the NRC to significantly improve reliability of the trip circuit. NRC inspectors reviewed Duke drawing No. CNM-1399.40-0005 which shows the aforementioned change to the reactor trip breakers control circuit. The modification included installation of push buttons to allow testing the trip capability by the undervoltage device and the shunt trip coil, and an input to the events recorder from a relay in the trip circuit. Other documents reviewed during inspection of item 4.3 were:

a. Design Change Authorization DCA-CN-2-E1485 "Addition of auto shunt trip to reactor trip switchgear" PMD review 8/17/83.

b. Final Acceptance of Systems/Structures for 2IRE-1 Rod Control System.

c. CP-147A Electrical Panel Fabrication Check List signed 6/20/85, with QA sign-off.

The conclusion drawn from inspection of item 4.3 is that the licensee met the intent of the generic letter.

Within the area examined, no violations or deviations were identified.

11. Licensee's Procedures and Documents Reviewed

a. Maintenance Management Procedure, MMP-1.0, Revision 18, February 12, 1986.

b. Westinghouse DS-416 Air Circuit Breaker Inspection and Maintenance, MP/0/A/2001/05, March 2, 1984.

c. Train A Reactor Trip Breaker Trip Device Functional Test, IP/0/A/3200/10A, May 1, 1985.

d. Train B Reactor Trip Breaker Trip Device Functional Test, IP/0/A/3200/10B, May 1, 1985

e. Catawba Nuclear Station Directive 2.1.5 (DS), "Drawing Distribution and Control," Revision 24, dated June 9, 1986.

f. Catawba Nuclear Station Directive 2.2.1 (SD), "Procedure for Records Management," Revision 28, dated May 13, 1986.

g. Design Engineering Department Manual Section I.4.9, "Vendor Documents," dated December 29, 1978.

h. DCP-150, "Backfit Audit of Vendor Manuals in Design Engineering," Revision 1, dated March 17, 1986.

i. DCP-153, "Audit of Station's Vendor Manuals," Revision 0, dated September 16, 1985.

j. Design Engineering Department Manuals, Section I.4.9, "Vendor Documents," dated December 29, 1978.

k. Operating Experience Program Description (Draft).

l. OEMA/IM-1, "Receipt and Distribution of Operating Experience Information," Revision 0, dated December 22, 1983.

m. Catawba Nuclear Station Directive 3.3.1, "Determination of QA Condition for Structures, Systems, and Components," Revision 2, dated October 15, 1984.

n. EP/2/A/5000/1A, Rev. 1, "Reactor Trip Response"

o. SD 3.1.18, "Investigation of Unit Trip"

p. 4.2.8, "Administrative Policy Manual for Nuclear Stations CNS Station Directive Manual"

q. 4.2.1, "CNS Station Directives Manual"

r. RP/0/B/5000/13, "NRC Notification Requirements"

s. Task CO-S0011, "Training and Qualification Guide"

t. SRG-2, "Incident Investigation and Report Preparation"