



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

Report Nos. 50-413/88-30 and 50-414/38-30

Licensee: Duke Power Company
422 South Church Street
Charlotte, N.C. 28242

Docket Nos.: 50-413 and 50-414

License Nos.: NPF-35 and NPF-52

Facility Name: Catawba 1 and 2

Inspection Conducted: July 26, 1988 - August 26, 1988

Inspectors:	<u><i>P. K. Van Doorn</i></u>	<u>9/20/88</u>
	P. K. Van Doorn	Date Signed
	<u><i>M. S. Lesser</i></u>	<u>9/20/88</u>
	M. S. Lesser	Date Signed
Approved by:	<u><i>T. A. Peebles</i></u>	<u>9/20/88</u>
	T. A. Peebles, Section Chief	Date Signed
	Projects Branch 3	
	Division of Reactor Projects	

SUMMARY

Scope: This routine, resident inspection was conducted on site inspecting in the areas of review of plant operations; surveillance observation; maintenance observation; review of licensee nonroutine event reports and Part 21 reports; followup of previously identified items; and followup of Information Notices.

Results: Licensee programs covered by this inspection were observed to be adequate. No violations were identified. One strength was observed concerning the licensee's sensitivity towards industry events involving loss of decay heat removal capability (paragraph 3.b.).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *H. B. Barron, Operations Superintendent
- W. F. Beaver, Performance Engineer
- *W. H. Bradley, QA Surveillance
- R. N. Casler, Unit 1 Coordinator
- R. H. Charest, Station Chemistry Supervisor
- *I. E. Crawford, Integrated Scheduling Superintendent
- W. P. Deal, Health Physics Supervisor
- *R. M. Glover, Compliance Engineer
- T. P. Harrall, Design Engineering
- F. N. Mack, Project Services Engineer
- W. W. McCollough, Mechanical Maintenance Supervisor
- W. R. McCollum, Station Services Superintendent
- C. E. Muse, Unit 2 Coordinator
- *T. B. Owen, Station Manager
- G. T. Smith, Maintenance Superintendent
- J. M. Stackley, I&E Engineer
- D. Tower, Shift Operating Engineer
- R. F. Wardell, Technical Services Superintendent
- R. White, CSRG Chairman
- J. W. Willis, Senior QA Engineer, Operations

Other licensee employees contacted included technicians, operators, mechanics, security force members, and office personnel.

NRC Resident Inspectors

- *P. K. Van Doorn
- *M. S. Lesser

*Attended exit interview.

2. Unresolved Items

An Unresolved Item is a matter about which more information is required to determine whether it is acceptable or may involve a violation. There were no unresolved items identified in this report.

3. Plant Operations Review (71707 and 71710)

- a. The inspectors reviewed plant operations throughout the reporting period to verify conformance with regulatory requirements, Technical Specification (TS), and administrative controls. Control room logs, danger tags logs, Technical Specification Action Item Log, and the removal and restoration log were routinely reviewed. Shift turnovers

were observed to verify that they were conducted in accordance with approved procedures.

The inspectors verified by observations and interviews, that the measures taken to assure physical protection of the facility met current requirements. Areas inspected included the security organization; the establishment and maintenance of gates, doors, and isolation zones in the proper condition; and that access controls and badging were proper and procedures followed.

In addition to the areas discussed above, the areas toured were observed for fire prevention and protection activities. These included such things as combustible material control, fire protection systems and materials. The inspectors reviewed Problem Investigation Reports to determine if the licensee was appropriately documenting problems and implementing appropriate corrective actions.

b. Unit 1 Summary

The unit started the period at 100% power. On August 1, 1988. The licensee began to see evidence that a previously identified 1D Steam Generator (SG) tube leak was increasing in rate, and by August 5 was up to 91.4 gallons per day. At this rate the licensee felt it could easily locate the leaking tube and decided to shutdown and commence an outage. This completed a record 145 day continuous run. On August 12, with the reactor coolant system drained and eddy current testing (ECT) in progress on the 1D steam generator, the 1B Residual Heat Removal Pump (ND) was declared inoperable due to excessive vibration and seal leakage. The licensee suspected that the motor's lower bearing was damaged and that replacement was necessary. The licensee did not feel comfortable remaining in a drained condition with only one ND pump and decided to postpone ECT, fill the reactor coolant system and replace the damaged ND pump. When this was completed the system was again drained and ECT continued. This decision by management reflected an appropriate level of sensitivity to industry events involving loss of decay heat removal. The inspectors also witnessed extra caution being taken by operators during the draining process and additional supervisory personnel in the control room during the process. The licensee has also shown sensitivity to this issue in the past via response to inspector concerns regarding operation of ND with low flow alarms and addition of more level instrumentation. Therefore, licensee sensitivity to loss of decay heat removal capability is considered a strength.

One SG tube was later identified as the source of the leakage and a total of two tubes were plugged. The flaw was located above the upper tube support plate in a row 1 tube and attributed to tight U-band stress. The licensee plans to perform stress relief of the steam generator tubes during the next refueling outage. The unit ended the period with the outage complete and preparations made to enter mode 4.

c. Unit 2 Summary

The unit started the period at 100% power. On August 1 power was reduced to 79% after sodium levels of 150-190 ppb were detected in the steam generators. Chemistry technicians had been backwashing the condensate polishers with the demineralized water which was unknowingly contaminated due to an exhausted ion exchanger. On August 8, power was reduced to 98% and subsequently to 93% on August 16 due to increased clogging of the main feedwater flow orifice. The unit remained at 93% for the rest of the periods.

- d. On August 23, licensee management met with C. W. Hehl and T. A. Peebles of NRC/RII to discuss policies for initiating and performing operability evaluations or justifications for continued operation in the event equipment cannot meet its design requirements. Hypothetical examples was discussed to established guidelines for when NRC review is desired and/or required.
- e. On August 5, Unit 2 was in the process of venting the containment building through the Containment Air Addition and Release System (VQ). The inside containment isolation valve, VQ-2, failed when a motor winding phase shorted. The licensee proceeded with efforts to replace the actuator and applied Technical Specification (TS) 3.6.3 which essentially requires the valve be made operable within 4 hours or the penetration be isolated. The licensee initially complied with the action statement by shutting and removing power from the outside isolation valve VQ-3. Later in the day, however, it became necessary to vent the containment building on two occasions and VQ-3 was opened for 2-3 hours each time. The licensee's interpretation of the TS allowed the penetration to become unisolated periodically provided the time was limited to 4 hours.

The inspectors were concerned that this was not the intent of the TS and that during the subsequent releases the unit was not meeting single failure criteria. A phone call was initiated between licensee management and NRC/RII/NRR. After discussions the licensee agreed with the inspectors concerns and proposed compensatory measures where operators would be stationed downstream of VQ-3 to isolate manual valves in the event of a single failure of VQ-3 during containment release. This was accepted by RII management and verified by the inspectors. The licensee agreed to revise their interpretation of TS 3.6.3 to prevent unisolating containment penetrations when aware of inoperable isolation valves. This issue is considered to be another example of a weakness previously identified in Report 413,413/88-25 regarding management of TS compliance. This is identified as inspector followup item 414/88-30-01, TS Interpretation of Containment Isolation Valves.

On August 22, the inspectors were informed by the licensee that VQ-2 had failed again and proposed compensatory measures, such that containment venting could be performed. The inspectors initially

considered Technical Memorandum 28-29 of August 22, 1988, to be inadequate in that it did not compensate for a single failure of VQ-2. The Technical Memorandum was revised to address the concerns.

Maintenance crews noticed the VQ-2 actuator had rotated approximately 90 degrees and discovered a coupling plate nut was loose. Maintenance procedures appeared to adequately address torquing of the nut. The licensee is tentatively attributing the second failure to the loose nut allowing the actuator to rotate, preventing the torque switches from functioning, resulting in motor damage. The reason for the loose nut is being investigated.

No violations or deviations were identified.

4. Surveillance Observation (61726)

a. During the inspection period, the inspector verified plant operations were in compliance with various TS requirements. Typical of these requirements were confirmation of compliance with the TS for reactor coolant chemistry, refueling water tank, emergency power systems, safety injection, emergency safeguards systems, control room ventilation, and direct current electrical power sources. The inspector verified that surveillance testing was performed in accordance with the approved written procedures, test instrumentation was calibrated, limiting conditions for operation were met, appropriate removal and restoration of the affected equipment was accomplished, test results met requirements and were reviewed by personnel other than the individual directing the test, and that any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

b. The inspectors witnessed or reviewed the following surveillances:

5205 SWR	Inspect Containment Sump Screens
9469 IAE	Inspect Namco Limit Switches
PT/1/A/4600/7	Surveillance Requirements for Unit 1 Shutdown
11500NSM	Calibrate RN Temperature Instruments

No violations or deviations were identified.

5. Maintenance Observations (62703)

a. Station maintenance activities of selected systems and components were observed/reviewed to ascertain that they were conducted in accordance with the requirements. The inspector verified licensee conformance to the requirements in the following areas of inspection: the activities were accomplished using approved procedures, and functional testing and/or calibrations were performed prior to returning components or systems to service; quality control records were maintained; activities performed were accomplished by qualified

personnel; and materials used were properly certified. Work requests were reviewed to determine status of outstanding jobs and to assure that priority is assigned to safety-related equipment maintenance which may effect system performance.

- b. The inspectors witnessed or reviewed the following maintenance activities:

5253 PRF	Inspect/Repair 2NV-125B Indication
40540 OPS	Replace Actuator on 2NM-197
TP/1/A/1200/02A	RHR Pump 1B Replacement
6543 PRF	Repair MSIV Slow Stroke Time
6013 PRF	TSM for Installation of DP instruments across Steam Generator

No violations or deviations were identified.

6. Review of Licensee Non Routine Event Reports and Part 21 Followup (92700)

- a. The below listed Licensee Event Reports (LER) were reviewed to determine if the information provided met NRC requirements. The determination included: adequacy of description, verification of compliance with Technical Specifications and regulatory requirements, corrective action taken, existence of potential generic problems, reporting requirements satisfied, and the relative safety significance of each event. Additional inplant reviews and discussion with plant personnel, as appropriate, were conducted for those reports indicated by an (*). The following LERs are closed:

*413/87-39	Auxiliary Feedwater Auto-Start While Implementing Modifications during Refueling
413/87-47, Rev. 1	ESF Actuations due to Lack of Precision Instrumentation and a Personnel Error
413/88-11	Improper Documentation of ASME Testing of Nuts due to a Manufacturing Deficiency and a Personnel Error (see note)
*413/88-15	Sliding Links Left Open due to Unknown Cause Rendering Part of Auxiliary Shutdown Panel 1B Inoperable (Ref. Unresolved Item 413,414/88-13-02)
413/88-21	Firewatch Established on Incorrect zone due to Inaccurate Information on Fire Protection Graphic Display

*414/87-27, Rev. 1	Manual Reactor Trip due to a Feedwater Control Valve Circuit Card Failure and AFW Auto-Start
*414/88-21	Manual Reactor Trip due to Main Feedwater Pump Low Pressure Steam Supply Being Isolated for Unknown Reasons
*414/88-72	Reactor Trip due to a Possible Installation Deficiency Resulting in a Fuse Failure
414/88-24	Turbine Driven AFW Pump Auto Start Caused by Loss Alternate Control Power due to an Unknown Cause

Note: LER 413/88-11 Describes deficiencies involving deficiencies in vendor test documentation relative to a specific material. Although the LER did not address other materials from the vendor, the inspector verified that a review of other purchases was conducted as part of the licensee evaluation.

- b. The inspector verified that the licensee had taken appropriate corrective action relative to the following 10 CFR Part 21 issues:

P21-87-02 (Unit 1)	Inadequate High Temperature Resistance of Rockbestos Coaxial Cable Insulation Located on Sorrento High Range Rad Monitors. (Licensee evaluated cable as acceptable for present use, leakage current also being evaluated)
P21-88-02 (Units 1 and 2)	Defect in Calcon Control Devices Supplied with DSR and DSRV Diesels. (Licensee replaced components with upgraded parts)

No violations or deviations were identified.

7. Follow-up on Previous Inspection Findings (92701 and 92702)

- a. (Closed) Inspector Followup Item 413,414/88-22-04: Fisher Control Air Actuator Sizing. The licensee obtained sizing calculations from Fisher Controls and evaluated the operability of applicable valves. The evaluation resulted in the following results: (1) Auxiliary Feedwater Flow Control Valves would not completely open against design loads; however, since travel stops have been installed to limit opening of the valves for pump runout conditions, the valves would open to the travel stops before design loads would impair opening (2) Main Steam Isolation Bypass Valves would not shut against design differential pressure (dp). Design dp would occur following a

downstream break of the steam piping, however, the consequences of the valves not fully closing were determined to be within the bounds of existing accident analysis. Based upon this the valves were considered operable by the licensee. The inspectors, however, pointed out that TS 3.6.3 requires the valves to isolate. Based on this, the licensee appropriately declared the valves inoperable, complied with the Action Statement and subsequently modified the valves to allow complete isolation under design dp. Certain maintenance activities associated with these valves will require testing to verify frictional drag does not exceed design values. This item was documented in PIR C88-0223 and is closed.

- b. (Open) Unresolved Item 413,414/88-22-03: Potential Inadequate Venting of ECCS Systems. The inspectors reviewed isometric drawings to determine adequacy of the licensee's ECCS venting surveillance procedure PT/1(2)/A/4200/06. The procedures were determined to have adequately vented high point discharge piping. An August 24, 1988 Catawba Nuclear Station Memo to File from Ron C. Maynard documented licensee discussions with Westinghouse on the basis for ECCS venting surveillance TS 4.5.2.6.1. The basis does not include Residual Heat Removal discharge piping to the centrifugal charging pumps and the Safety Injection pumps. Westinghouse, however, did recommend that these lines be vented periodically in lieu of IE Notice 88-23, Potential for Gas Binding of High Pressure Safety Injection Pumps during a LOCA. The licensee examined its own piping layout and determined that venting of these lines is not necessary.

This item remains open pending review of licensee efforts to improve system fill and vent methods with Removal and Restoration (R&R) procedures.

- c. (Closed) Inspector Followup Item 413,414/88-15-03: Changes in RHR Operation with Low Flow Annunciators. The licensee revised OP/1/A/6200/04 to ensure that NI-173 and NI-178 were not closed simultaneously making both trains of RHR inoperable. Based on this change and a previous change allowing RHR flow through one train only this item is closed.
- d. (Closed) Unresolved Item 413/86-17-01: Review of Compliance to TS 4.5.2, ECCS Venting. This issue involved whether the monthly pump casing venting surveillance was necessary for pumps which were running. Although the casing venting of a pump is not appropriate or technically necessary, the licensee agreed that compliance with the TS required the venting and agreed to change procedures accordingly and schedule the venting to be accomplished within TS required time limits. The inspector verified that the procedure change was in progress and since this issue is technically insignificant, this item is closed.

- e. (Closed) Violation 414/87-30-01: Incorrect values of Z and S used in Technical Specification equation 2.2-1. The licensee provided a revised response to the violation in their letter of May 13, 1988. That response was reviewed in the Region II office. It properly defines the terms in equation 2.2-1 and describes its correct application to instrument calibration and rack errors. The evaluation in the response that stated there was no violation of the limiting safety system setting is acceptable.

Further corrective action described by the licensee included the issuance of a Technical Specification interpretation for guidance of site personnel. This interpretation was reviewed by both the resident and regional offices and found acceptable. This item is closed.

No violations or deviations were identified.

8. Followup of Licensee Actions on Information Notices (92701)

- a. The inspector verified that the licensee had received and reviewed specific Informations Notices (INs) and that appropriate corrective action appeared to be taken. Licensee actions were reviewed for the following INs:

IN 86-81, Supp. 1	Broken External Closure Springs on Atwood and Morrill Main Steam Isolation Valves
IN 87-08	Degraded Motor Leads In Limitorque DC Motor Operators
IN 87-48	Information Concerning the use of Anaerobic Adhesive/Sealants
IN 87-50	Potential LOCA at High Low Pressure Interfaces From Fire Damage
IN 87-28, Supp. 1	Air System Problems at U.S. Light Water Reactors (See para. b.)

- b. IN 87-28, Supp. 1 served to forward NUREG-1275, Vol. 2 describing various air system problems. The licensee has conducted a review of design and maintenance of instrument air (VI) and Diesel Generator control and starting air systems (VG). Various problems have been encountered in these systems. The licensee has added an additional more reliable air compressor and a backup diesel compressor for the VI system. Other planned actions include evaluate whether to add desiccant air dryers, install an alarmed dew-point hygrometer downstream of the air dryers, install automatic rain traps on air dry outlet filters and evaluate equipment for additional inspections.

The licensee has added additional surveillances and preventive maintenance relative to the VG system and is evaluating overall system design and heat exchanger tubing material for improvements. (See NRC Report No. 413,414/88-15.) The licensee is also conducting further review based on NRC Generic Letter 88-14. Further NRC followup will be conducted relative to the Generic Letter.

No violations or deviations were identified.

9. Exit Interview

The inspection scope and findings were summarized on August 26, 1988, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection findings listed below. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

<u>Item Number</u>	<u>Description and Reference</u>
414/88-30-01	Inspector Followup Item - TS Interpretation of Containment Isolation Valves