



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

Report Nos.: 50-413/92-31 and 50-414/92-31

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 Nuclear Station Units 1 and 2

Inspection Conducted: December 13, 1992 - January 9, 1993

Inspector: W. H. Meeks Jr. 1/29/93
For W. T. Orders, Senior Resident Inspector Date Signed

Inspector: W. H. Meeks Jr. 1/29/93
P. C. Hopkins, Resident Inspector Date Signed

Inspector: W. H. Meeks Jr. 1/29/93
J. Zeiler, Resident Inspector Date Signed

Approved by: Robert E. Martin 01/29/93
George A. Belisle, Chief Date Signed
Projects Section 3A
Division of Reactor Projects

SUMMARY

Scope: This routine resident inspection included, but was not limited to the following areas: plant operations review, engineered safety features (ESF) system walkdowns, cold weather protection review, surveillance observation review, maintenance observation review, review of Licensee Event Reports, and followup on previous inspection findings.

Results: One non-cited violation was identified involving the failure to follow cleanliness control requirements (paragraph 8).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

S. Bradshaw, Shift Operations Manager
*J. Cox, Acting Regulatory Compliance Manager
J. Forbes, Engineering Manager
S. Frye, Operations Support Manager
*T. Harrall, Safety Assurance Manager
*J. Lowery, Compliance
W. McCollum, Station Manager
W. Miller, Operations Superintendent
M. Tuckman, Catawba Site Vice-President

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

NRC Resident Inspectors

W. Orders
P. Hopkins
*J. Zeiler

* Attended exit interview.

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. Plant Status

Unit 1 Summary

Unit 1 operated the entire report period at essentially full power and with no major problems.

Unit 2 Summary

Unit 2 began the report period operating at full power. On December 14, a reactor trip on low-low steam generator level occurred as a result of an inadvertent trip of the 2A main feedwater pump during testing. Details pertaining to the reactor trip are discussed in Paragraph 3.c. Reactor startup commenced on December 18 and the unit was placed on-line the same day. The unit reached full power on December 19 and operated at essentially full power for the remainder of the report period.

3. Plant Operations Review (71707 and 71710)

a. General Observations (71707)

The inspectors reviewed plant operations throughout the report

period to verify conformance with regulatory requirements, TS and administrative controls. Control Room logs, the Technical Specification Action Item Log, and the R&R log were routinely reviewed. Shift turnovers were observed to verify that they were conducted in accordance with approved procedures. The complement of licensed personnel on each shift inspected, met or exceeded the requirements of Technical Specifications. Further, daily plant status meetings were routinely attended.

Plant tours were performed on a routine basis. The areas toured included but were not limited to the following:

- Turbine Buildings
- Auxiliary Building
- Units 1 and 2 Diesel Generator Rooms
- Units 1 and 2 Vital Switchgear Rooms
- Units 1 and 2 Vital Battery Rooms
- Standby Shutdown Facility

During the plant tours, the inspectors verified by observation and interviews that measures taken were proper and procedures were followed to assure that 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 conditions, and access control badging.

In addition, the areas toured were observed for fire prevention and protection activities and radiological control practices. The inspectors also reviewed PIRs to determine if the licensee was appropriately documenting problems and implementing corrective actions.

b. Engineered Safety Feature Systems Walkdown (71710)

During this report period, the inspectors completed a detailed walkdown of accessible portions of both trains of the Unit 1 CA System and Train A of the Unit 1 NI System. Using the licensee's CA and NI system lineup procedures, OP/1/A/6250/02 and OP/1/A/6200/06, the inspectors verified that system flowpath valves and assorted system drain and vent valves were in their proper positions. This lineup verification was accomplished using both the control room board indication and local valve position where possible. No discrepancies were observed.

The condition of selected CA and NI system valves was examined to ensure that they were installed correctly, with no bent stems, missing handwheels, or improper labeling. Outstanding work requests on components in these systems were examined to ensure that no major maintenance, which could possibly affect the systems' performance, had been performed. Selected process instrumentation was examined to ensure proper installation,

functioning, and that local indications were consistent with expected values and matched control room indications.

The in-plant walkdowns included a comparison of portions of the as-built system configurations against plant drawings to ensure that the as-built system reflected the current system design. No discrepancies were noted.

c. Unit 2 Reactor Trip (71707)

On December 14, an NLO was performing the weekly test of the overspeed trip mechanism to the 2A main feedwater pump. During the conduct of the test, the main feedwater pump tripped. The Digital Feedwater System responded to the trip by initiating a turbine runback, but this automatic action was not sufficient to prevent the reactor from tripping at 3:30 p.m. on low-low level in Steam Generator 2D. With one exception involving an erratic NC loop average temperature indication, all plant systems and components responded as expected after the reactor trip. Due to the indicated increase in NC loop B average temperature immediately following the feedwater pump trip, the Condenser Dump Valves remained open longer than expected. The valves closed when the P-12 permissive was reached, i.e., once two of the four NC loop average temperatures reached 553°F. The minimum NC temperature reached was 530°F. The plant was stabilized in Mode 3 at 10:41 p.m.

The inspectors responded to the Control Room shortly after the reactor trip and determined that the operators responded effectively to the event, utilizing appropriate emergency and abnormal procedures.

The subsequent investigation of the trip determined that the momentary relaxation of the operator's hand while holding the spring-loaded overspeed trip lockout switch in the lockout position caused the feedwater pump to trip. It was reported that similar problems with the switch had been experienced by electrical technicians while testing the overspeed trip mechanism during past outages. Based on the problems experienced with the trip device, an evaluation of the system's testability features will be performed to determine what corrective action is necessary to prevent recurrence.

The Digital Feedwater System is designed to enable system runback without a reactor trip if one main feedwater pump trips. The system had been previously tested following installation and determined capable of handling a pump trip. Investigations are still in progress to determine why the system was unable to handle this pump trip without tripping the reactor.

No violations or deviations were identified.

4. Cold Weather Protection Review (71714)

During the report period, the inspectors conducted a review to determine if the licensee had effectively implemented procedures and controls for protecting safety-related systems against extreme cold weather. The following procedures were reviewed:

a. PT/O/B/4350/08 - Heat Tracing Alignment Verification Inspection

This procedure is performed monthly to verify that electrical breakers to heat tracing equipment are in their proper positions (i.e., typically closed).

b. PT/O/B/4700/38 - Cold Weather Preparation

This procedure verifies that plant heaters are energized and operational. Additionally, the Outside Doghouse curtains are lowered on each unit and certain air handling units which are susceptible to freezing are isolated.

c. OP/1,2/B/6400/01A - Condenser Circulating Water System (Enclosures 4.13 and 4.14)

Enclosures 4.13 directs the removal of certain cooling tower fans from operation based on outside temperature to prevent potential freezing. Enclosure 4.14 provides for increased surveillance of the cooling tower fans during cold temperature periods.

The inspectors verified that the above procedures were performed at the appropriate time in preparation for the winter season and that any discrepancies that were identified during the conduct of the procedures were adequately resolved. Using procedure PT/O/B/4350/08, the inspectors independently verified the position of approximately one-third of the breakers listed for each unit. In addition, the inspectors walked down outside portions of heat tracing on level instrumentation for each unit's Refueling Water Storage Tank. No discrepancies were identified.

No violations or deviations were identified.

5. Surveillance Observation (61726)

a. General

During the inspection period, the inspectors verified that plant operations were in compliance with various TS requirements. Typical of these requirements were confirmation of compliance with the TS for reactivity control systems, reactor coolant systems, safety injection systems, emergency safeguards systems, emergency power systems, containment, and other important plant support systems. The inspectors verified that: surveillance testing was performed in accordance with 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 acceptance criteria and were reviewed by personnel other than the individual directing the test, and any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

b. Surveillance Activities Reviewed

The inspectors witnessed or reviewed the following surveillances:

PT/1/A/4250/06	Auxiliary Feedwater Pump 1A Performance Test
PT/1/A/4350/02A	Diesel Generator 1A Operability Test
PT/1/A/4450/03A	Annulus Ventilation System Train 1A Operability Test
PT/1/A/4600/02A	Mode 1 Periodic Surveillance Items
PT/2/A/4600/02A	Mode 1 Periodic Surveillance Items

On January 4, the inspectors witnessed a surveillance designed to check the head/flow parameters of CA pump 1A using PT/1/A/4250/06. The procedure requires that the pump be started in miniflow recirculation to the UST. Once adequate miniflow is verified via a status light in the Control Room and by local indication in Auxiliary Shutdown Panel Room 1A, valve (1CA-71) located in the recirculation test flowpath to the UST, is opened in order to provide full rated flow capability. When the pump was initially started, the status light did not actuate. The pump was immediately shutdown and an investigation was initiated to determine the cause of the flow problem. It was determined that 1CA-71, the discharge valve to the UST, had been leaking when the pump was started. This caused flow to be diverted from the miniflow line which caused the status light not to actuate. The pump was subsequently tested successfully by double isolating the recirculation test flowpath during the pump startup. Until 1CA-71 can be repaired and tested, the surveillance will be performed with the recirculation test flowpath double isolated.

No violations or deviations were identified.

6. Maintenance Observations (62703)

a. General

Station maintenance activities of selected systems and components were observed/reviewed to ensure that they were conducted in accordance with the applicable requirements. The inspectors verified licensee conformance to the requirements in the following areas of inspection: 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 the status of outstanding jobs and to assure that priority was assigned to safety-related equipment maintenance which may affect system performance.

b. Maintenance Activities Reviewed

The inspectors witnessed or reviewed the maintenance activities associated with the following Work Order Tasks (WOs):

92092498-01	Investigate/Repair OPDT Loop A Channel 1 Out-of-Tolerance
92098461-01	Investigate/Repair Refueling Water Storage Tank Level Channel 3 Failing Low
92099839-01	Modify Unit 1 SG PORVs
92099840-01	Modify Unit 2 SG PORVs

The last two WOs above implemented TSMs to defeat the automatic steam relief capabilities for each unit's four SG PORVs, (i.e., the non-safety related function of the valves). The PORVs provide a containment isolation function and are required to be operable and capable of closing within 5 seconds per TS 3.6.3. When several of the valves failed to consistently meet their stroke time, the TSMs were developed to meet the Action Statement of TS 3.6.3 which requires that the valves be secured in the closed position. The TSMs ensure that the PORVs remain closed so that no single failure could cause them to inadvertently open.

The SG PORVs are also designed to function during a postulated SGTR coincident with a loss of offsite power in order to provide NC System cooldown to a temperature at which the Residual Heat Removal System may be started. In this mode, the valves are controlled through safety-related manual loaders located in the Control Room. An assured source of compressed gas (Nitrogen) is provided to the pneumatic operators of the valves to ensure their ability to operate. Neither the Nitrogen sources or the safety-related manual loaders are affected by the modifications. The inspectors reviewed the TSM and its associated 10 CFR 50.59 evaluation and determined that the valves could still satisfy this safety-related function with the TSM installed.

The licensee conducted extensive testing of the valves to determine the cause of the stroke time failures. Test results indicate that the cause of the increased stroke times is due to an increased drag force, possibly caused by an internal piston ring located around the valve plug. The motive force for the valve in the closed direction is provided solely by an actuator spring. Test results indicate that the increased drag force does not pose a damaging or degrading effect to the valve but does challenge the ability of the actuator springs to close the valve in the required

time limit. The inspectors will continue to monitor the licensee's progress toward resolving the stroke time problems.

No violations or deviations were identified.

7. Review of Licensee Event Reports (92700)

The below listed LER was 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.

(Closed) LER 413/91-13: Reactor Trip due to Reactor Coolant Pump Trip Caused by Equipment Failure.

On June 20, 1991, Unit 1 tripped on the low reactor coolant flow permissive (P-8) due to a trip of Reactor Coolant Pump 1A. It was subsequently determined that a defective Silicon Controlled Rectifier (SCR) caused the overcurrent relay for the pump's breaker to actuate resulting in the pump trip. All other SCRs associated with the NC pump breakers were checked and determined to be operating properly. Inspections of SCRs in other critical applications were also performed. Since a similar failure resulted in a reactor trip of Unit 2 in May 1991, the licensee added SCR testing to the existing preventative maintenance program on relays. The licensee's corrective actions was determined to be acceptable.

No violations or deviations were identified.

8. Followup on Previous Inspection Findings (92701 and 92702)

(Closed) URI 413, 414/92-24-01: Review Licensee's Cleanliness Controls for Critical Maintenance Activities.

During the previous inspection, the inspectors witnessed and reviewed certain Unit 1 outage maintenance activities that indicated a need for greater attention to material cleanliness controls. Specifically, it was noted that adequate measures were not being used to ensure that reactor coolant boundary surfaces were protected from outside contamination (i.e., from grease, debris, etc.).

The licensee's procedure for defining the cleanliness requirements for maintenance activities involving systems and components of the reactor coolant system boundary is contained in MMP 1-6, Housekeeping Requirements during Maintenance Activities on Open Systems and Components. Step 6.1 requires that prior to opening a sealed system, the immediate surroundings shall be cleaned to remove contaminants that could enter the system or component. Step 6.17.5, requires that Cleanliness Level II areas be equipped with clean clothing facilities

and that clothing changes be performed for body parts entering an open system or component (of the reactor coolant boundary). Personnel involved with the aforementioned maintenance activities described in the previous inspection report failed to follow these requirements.

Technical Specification 6.8.1 requires in part that written procedures be established, implemented and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. This failure to follow procedure MMP 1.6 is considered a violation of TS 6.8.1, however, after review of the circumstances relative to the issue, it was determined that the criteria specified in Section VII.B.(1) of the NRC Enforcement policy were satisfied. The violation was not willful, nor similar to a prior violation for which corrective actions have not been sufficient to prevent recurrence, and appropriate corrective action was initiated to provide personnel with more guidance and training regarding management's expectations of cleanliness requirements. For those reasons, this issue is documented as NCV 413/92-31-01: Failure to Follow Maintenance Procedure Involving Cleanliness Control Requirements.

One NCV was identified.

9. Exit Interview

The inspection scope and findings were summarized on January 12, 1993, 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>
NCV 413/92-31-01	Failure to Follow Maintenance Procedure Involving Cleanliness Control Requirements (paragraph 8).

10. Acronyms and Abbreviations

CA	-	Auxiliary Feedwater
LER	-	Licensee Event Report
MMP	-	Maintenance Management Procedure
NC	-	Reactor Coolant
NCV	-	Non-Cited Violation
NI	-	Safety Injection
NLO	-	Non-Licensed Operator
OP	-	Operating Procedure
OPDT	-	Over-Power Delta Temperature
PIR	-	Problem Investigation Report
PORV	-	Power Operated Relief Valve
PT	-	Periodic Procedure
R&R	-	Removal and Restoration

SG	-	Steam Generator
SGTR	-	Steam Generator Tube Rupture
TS	-	Technical Specifications
TSM	-	Temporary Station Modification
URI	-	Unresolved Item
UST	-	Upper Surge Tank