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DUKE POWER

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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: Catawba Nuclear Station, Units 1 and 2
Docket Nos. 50-413 and 50-414
Status of Licensing Issues,
- Generic Letter 89-13, Service Water Systems,
- Safety Evaluation for the Steam Generator Tube Rupture Analysis
- Generic Letter 88-14, Instrument Air

By letter dated August 12, 1993, the NRC staff requested an update on the status and schedule for implementation of outstanding activities associated with the subject licensing issues.

Attached is Duke Power's response which provides the current status and schedule for implementation of the outstanding activities associated with each of the subject licensing issues.

I declare, under penalty of perjury, that the statements set forth herein are true and correct to the best of my knowledge.

D. L. Rehn, Site Vice-President
Catawba Nuclear Station

JLL/

Attachments

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xc: S.D. Ebneter
Regional Administrator, Region II

R.E. Martin, ONRR

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Senior Resident Inspector

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
STATUS OF LICENSING ISSUES
GENERIC LETTER 89-13, SERVICE WATER SYSTEMS
TAC NOS. M73980 & M73981

ACTION I: BIOCIDE ADDITION and FLUSHING/FLOW TESTING

The original response to Generic Letter 89-13, dated January 26, 1990, stated that Catawba Nuclear Station would implement a pilot program to evaluate a non-oxidizing biocide treatment for *Corbicula* (Asiatic Clams). This program would be complementary to the existing flushing, cleaning, inspection and testing programs already in place.

Catawba Nuclear Station was chosen as the initial Duke Power Company (DPC) station for biocide injection testing. Catawba's source for raw water, Lake Wylie, represents the worst case water quality on the DPC nuclear system. *Corbicula* growth and reproduction conditions, station intake location near lake bottom, warm, oxygenated conditions, and shallow depth of lake body are all present at Catawba Nuclear Station. These conditions are either absent or less severe at other DPC nuclear stations.

A supplemental response, dated September 12, 1990, provided the NRC of confirmation of the development of a biocide addition program at Catawba Nuclear Station and that following completion/testing of a modification to reroute the automatic strainer backwash discharge piping to a pathway that will comply with the discharge permit, the biocide addition program and subsequent evaluation will begin. Since September 12, 1990, the modification was successfully completed and tested. Biocide injections were c(npleted on October 5-6, 1991, October 12-13, 1991 and July 14-15, 1993.

The biocide selected for testing and initial use was a non-oxidizing biocide, CT-1 This provided a worst case agent in terms of handling, operation, mixing properties, discharge characteristics, and detoxification requirements. Oxidizing biocides, such as chlorine or hypochlorite are easier to use, but may not be optimal for Catawba, given the oxidation-driven corrosion rates in carbon steel raw water piping systems typically found at the site. Successful injection of non-oxidizing biocide demonstrated that a full spectrum of biocide agents can be used as dictated by engineering judgement (i.e. factors such as corrosion rates, fouling rates, system availability, safety factors, and costs).

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The two (2) trial CT-1 biocide injections performed in October, 1991 proved that it was not possible to treat the Nuclear Service Water System (RN) with high concentrations of biocide and meet Catawba's environmental discharge permit concentration limit. At that time, South Carolina's Department of Health and Environmental Control (DHEC) advised DPC that a National Pollutant Discharge Elimination System (NPDES) permit change request would not be allowed by DHEC. Biocide concentration limits would be changed as a part of the five (5) year NPDES permit renewal process, then scheduled for early 1992.

Permit negotiations with DHEC resulted in a new biocide discharge limit, effective October 1, 1992. However, the new limit was not high enough to provide reliable clam population reduction. Catawba then changed injection methodology. Catawba's RN System effluent piping was modified to add a detoxification injection capability. This allowed high CT-1 biocide concentrations for effective *Corbicula* reduction, while reducing the risk of an unauthorized discharge of biocide to the Standby Nuclear Service Water Pond (SNSWP), should a pond swap occur during injection. A slurry of powdered Bentonite clay was selected as the detoxification agent.

The new CT-1 biocide injection and detoxification method was accomplished on July 14-15, 1993. Samples from this injection from both RN pumphouse pits indicated CT-1 biocide in the system and CT-1 biocide detoxification was effective. CT-1 biocide presence was confirmed by chemical analysis and by "fish-kill" in the RN System pumphouse pit. By completing this injection, Catawba has demonstrated that it has the capability to treat the RN System with a high concentration of biocide, as may be needed to control the growth of *Dreissena polymorpha* (Zebra Mussels) in the future.

This injection also demonstrated that more easily-injected and mixed agents can be used as needed. This provides Catawba with the ability to connect and inject biocides such as chlorine and hypochlorite. Injection and mixing of sulfite or other soluble detoxification agents can be successfully added if necessary.

Biocide injection is not the current method of choice for *Corbicula* control. The RN System flush program no longer adversely affects system availability due to the completion of system modifications. Biocide injection would not materially improve *Corbicula* control under current conditions, compared to the flush program already in place. The risk of Environmental Protection Agency (EPA) effluent violations, and the impact of recent EPA/DHEC- mandated biological toxicity monitoring restrictions, represent significant uncertainties in the use of such chemicals. Additional uncertainty exists as to future NPDES effluent limitations on Bentonite clay. The additional cost of $200,000 per year for biocide injection appears unnecessary at this time.

Biocide injection would not eliminate the use of physical system flushing. Flushing or other injections will be required to assure chemical contact throughout system piping sections. Physical system flushing is also required to prevent blockage of piping due to silt and sediment. Therefore, physical system flushing and sampling is the current method of choice. Biocide injection will be used in the event *Dreissena polymorpha* populations reach a level of concern, as determined by the DPC lake inspection program, or if *Corbicula* infestation characteristics render the flushing program inadequate.

As stated earlier, the potential for flow blockage in the RN System exists not only from *Corbicula* fouling, but also from silt and sediment buildup. The most effective and reliable means to ensure cooling water flow, therefore, is to continue the existing flush program, as documented in the Catawba Service Water System Program Manual, since it will remove both *Corbicula* and silt buildup.

The NRC has also cited the need to control microbiologically influenced corrosion (MIC). Electrical Power Research Institute (EPRI) project 2929-9 was conducted at Catawba and concluded that corrosion in the Catawba Service Water Systems is not driven by MIC [1]. Biocide injections would not significantly reduce microbe-induced corrosion and pitting in the RN System, and are unnecessary to meet MIC concerns.

Accordingly, Catawba's flushing and flow testing program is considered to be an equally effective alternative to the recommendations of the Generic Letter.

1 Reference EPRI Report NP-7240, "In-Plant Electrochemical and Corrosion Studies of Service Water Systems", prepared by Structural Integrity Associates, p. 4-5.

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CATAWBA NUCLEAR STATION
STATUS OF LICENSING ISSUES
GENERIC LETTER 89-13, SERVICE WATER SYSTEMS
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ACTION I: INTAKE STRUCTURE INSPECTION

The supplemental response, dated September 12, 1990, provided the NRC of confirmation of the development of an intake structure inspection program, implementation of procedures for inspections, and that plans were established to clean the intake structure prior to August, 1991. Since September 12, 1990, the RN System intake structure has been inspected annually for sediment and corrosion by scuba divers or by dewatering the intake structure and were cleaned on the following dates:

PIT 'A' (RN Pumps 1A & 2A)	PIT 'B' (RN Pumps 1B & 2B)
Nov. 16, 1990	December 18, 1990

The intake structure inspections for sediment/corrosion will continue annually per the recommendations of Generic Letter 89-13 and cleaning will be performed as needed based on the combined results.

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ACTION II: DOCUMENTATION

The supplemental response, dated September 12, 1990, stated that the development of the Service Water Program Manual was ongoing and planned for completion on or about March 14, 1991. The purpose of this manual was to provide station personnel with a reference document which summarizes the Catawba Nuclear Station position on all Generic Letter 89-13 issues and efforts of various work disciplines to maintain the safety related service water systems in the highest practical state of readiness to perform their intended functions. The development of this manual was completed on February 1, 1991, consistent with the recommendations of the Generic Letter.

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TAC NOS. M73980 & M73981

ACTION III: OPEN-CYCLE SERVICE WATER SYSTEM PIPING AND COMPONENTS

The original response, dated January 26, 1990, stated intentions to perform an annual ultrasonic testing inspection program of service water system piping. Many problems have been encountered with scheduling and performing these inspections around outages, in an effort to accommodate the annual commitment. An inspection evaluation calculation has been developed which determines the next inspection period based on the calculated erosion/corrosion rate. With the development of this calculation, Duke Power Company believes that an equally effective alternative to performing this inspection annually would be to perform the inspection on an as needed basis, as determined by the calculation.

GENERIC LETTER RECOMMENDATIONS VS. EQUALLY EFFECTIVE ALTERNATIVES

By NRC letter, dated August 15, 1991, your staff indicated that the five recommendations which were addressed by the original and supplemental Duke Power Company responses, either essentially adopted the recommendations or provided an alternate response, but that these responses did not always indicate whether Duke Power Company considers the alternate response to be equally effective as the recommended actions of the Generic Letter. The responses to recommendations IV for system walkdowns and V for procedure reviews were specific examples.

Duke Power Company believes that the original response for system walkdowns (IV) is an equally effective alternative to the recommendation of the Generic Letter. Design Study CNDS-0185/00 was completed to confirm the ability of the RN System to perform its required safety function in the event of a failure of a single component. However, as a result of a recent (September, 1993) RN System Self-Initiated Technical Audit (SITA), a walkdown of the RN System was performed to verify the "as built" system is in accordance with licensing basis documentation. There were no significant discrepancies identified.

With regard to the initial response for procedure reviews (V), Duke Power Company believes that the existing practices/programs are consistent with the recommendations of the Generic Letter.

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
STATUS OF LICENSING ISSUES
SAFETY EVALUATION FOR THE STEAM GENERATOR TUBE RUPTURE ANALYSIS
TAC NOS. M66753 & M66754

It was previously demonstrated by Duke Power Company, and concluded by the NRC staff, that the requirements of Catawba Nuclear Station's license conditions had been met subject to the completion of a commitment to show that the operator action times assumed in the analysis are realistic.

Since Duke Power Company's last communication regarding this matter, two (2) significant issues have taken place or have been scheduled:

1) The rewrite of Catawba Nuclear Station's emergency procedures that was performed in order to make them consistent with the Westinghouse Emergency Response Guidelines (ERGs),

2) The planned reanalysis of the steam generator tube rupture event that will be necessary to support the Unit 1 steam generator replacement effort.

Catawba Nuclear Station intends to have all new emergency procedures, generated as a result of the rewrite effort, in place by June, 1994. When these new procedures are in place, all operator response times for the steam generator tube rupture transient will have been validated. In addition, the reanalysis of the steam generator tube rupture event for the steam generator replacement effort is expected to be completed by June, 1994. This reanalysis will likely result in the need to validate different response times for the new Unit 1 steam generators. Therefore, Duke Power Company expects to have this issue completely resolved by July, 1994.

DUKE POWER COMPANY
CATAWBA NUCLEAR STATION
GENERIC LETTER 88-14, INSTRUMENT AIR SYSTEMS
TAC NOS. M71641 & 71642

By M.S. Tuckman's letter dated December 12, 1991, Catawba Nuclear Station submitted a status update for Generic Letter (GL) 88-14 (Instrument Air Supply System Problems Affecting Safety-Related Equipment). This update provided a status of outstanding actions from the initial response, dated May 8, 1989, and seven (7) actions identified by M.S. Tuckman's revised response, dated August 12, 1991. The update concluded that the following actions were incomplete:

- Reset the inboard and outboard doghouse heaters to ≥40°F,
- Revise the verification testing program to the scope of GL 88-14,
- Develop a schedule for completion of verification testing for each component.

The following provides a status of these outstanding actions:

RESET THE INBOARD AND OUTBOARD DOGHOUSE HEATERS TO ≥40 DEGREES

A review, described in the initial response dated May 8, 1989, concluded that the Inboard and Outboard Doghouse Heaters needed to be reset to maintain a minimum temperature of 40°F and that a change to the Final Safety Analysis Report (FSAR) was initiated regarding this setpoint.

Procedures used to control the temperature settings for these heaters have been revised to specify a setting of between 43-45°F and the heater thermostats were subsequently reset to this range. Since the procedures which control these heater settings are permanent station approved procedures and changes to these procedures require a 10CFR50.59 justification, the FSAR change regarding this setpoint was reconsidered and withdrawn.

The review also determined that desiccant air dryers, installed in lines upstream of those portions subjected to temperatures below 40°F, were not used when needed. The Instrument Air System (VI) Design Basis Document was revised to include guidelines to place these dryers in service from October to May of each year. Operations' "Cold Weather Protection" procedure (PT/0/B/4700/38) was revised to place the dryers in service (October) and their "Return From Cold Weather Protection" procedure was revised to secure the dryers from service (May).

M.S. Tuckman's letter dated September 15, 1992, also committed to the implementation of a modification to replace the present four (4) 700 CFM refrigerated air dryers with two (2) 2000 CFM desiccant dryers. Accordingly, Station Modification CN-50431 was initiated to replace the air dryers and is currently scheduled for implementation in 1994. Once the modification has been implemented, the condensation concerns for lines subjected to temperatures below 40°F will be resolved. Until the modification has been implemented, periodic blowdowns of the Instrument Air System piping have been and will continue to be performed to assure no collection of moisture in the system.

REVISION OF VERIFICATION TESTING PROGRAM TO THE SCOPE OF GL 88-14

Test procedures were revised/developed to accommodate "fail-safe" testing, in compliance with GL 88-14, for each identified component, as noted by the following "Schedule For Completion Of Verification Testing For Each Component".

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SCHEDULE FOR COMPLETION OF VERIFICATION TESTING FOR EACH COMPONENT

VALVES

1/2NI050	C-LEG ACCUM 'A' N2 ISOL
1/2NI056	C-LEG ACCUM 'A' FILL ISOL
1/2NI061	C-LEG ACCUM 'B' N2 SUPPLY ISOL
1/2NI067	C-LEG ACCUM 'B' FILL ISOL
1/2NI072	C-LEG ACCUM 'C' N2 SUPPLY ISOL
1/2NI078	C-LEG ACCUM 'C' FILL ISOL
1/2NI084	C-LEG ACCUM 'D' N2 SUPPLY ISOL
1/2NI90	C-LEG ACCUM 'D' FILL ISOL

By M.S. Tuckman's letter, dated August 12, 1991, Duke Power Company (DPC) submitted a supplemental list of safety related air operated components, of which the above valves were included. These lists were developed in response to a commitment to revise the original DPC reply to Generic Letter (GL) 88-14, to consider all safety related components.

When these Cold-Leg Accumulator Fill/N2 Supply valves receive a signal to close, air is vented from the actuator, essentially simulating a loss of instrument air, and the valves stroke to their fail-safe CLOSED position. In response to the above commitment, these valves were verified to be in the CLOSED position on both units during refueling outages (Unit 1: August 18, 1992 and Unit 2: December 15, 1991). These valves are also verified to be in the CLOSED position on a periodic basis, every refueling cycle, per procedure OP/1(2)/A/6200/09, "Cold-Leg Accumulator Operation".

Therefore, the ability of these valves to stroke to their intended fail-safe position was verified initially and continue to be verified periodically beyond the scope of GL 88-14.

PERSONNEL AIRLOCK INFLATABLE SEALS

Testing of both units' personnel airlock inflatable door seals, in compliance with GL 88-14, was accomplished by the completion of test procedures TT/1/A/9200/068 (Unit 1 Upper & Lower Personnel Airlocks) and TT/2/A/9200/071 (Unit 2 Upper & Lower Airlocks).

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AUXILIARY FEEDWATER PUMP TURBINE GOVERNOR

Testing of the Auxiliary Feedwater Pump Turbine Governor, to verify compliance within the scope of GL 88-14, was accomplished by completion of test procedures PT/1/4250/03C (Unit 1 Quarterly Auxiliary Feedwater Pump IWP Test) and PT/2/4250/03C (Unit 2 Quarterly Auxiliary Feedwater Pump IWP Test). These procedures were temporarily revised to verify correct governor position on loss of instrument air.