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DUKE POWER

September 4, 1990

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

Subject: McGuire Nuclear Station, Units 1 and 2
Docket Nos. 50-369, and 50-370
Supplement to Proposed Amendment to Technical Specification
3/4.7.7, Auxiliary Building Filtered Exhaust Ventilation System

Pursuant to 10 CFR 50.90, find attached a supplement to the proposed amendment transmitted by my letter dated October 15, 1987, and supplemented by letters dated May 11, June 1, and October 8, 1989. The purpose of this supplement, as discussed in a telephone conference on August 27, 1990 by T.L. McConnell, Manager of McGuire Nuclear Station and D.B. Matthews, Directorate II-3 Director and their respective staffs, is to revise the requirement to obtain 0.25 inches water gage negative pressure in the Auxiliary Building ECCS Pump rooms. A justification, technical discussion, and no significant hazards analysis, and environmental analysis to support this change is provided in the attachment.

Currently, we have begun the Unit 2 routine refueling outage that is scheduled for approximately 81 days. Station areas and equipment that are currently unavailable for use at this time, which are involved with approval of this amendment, are necessary to conduct operations associated with equipment decontamination, laundry decontamination, contaminated parts warehouse issuance, hot machine shop activities, and solid radioactive waste processing and storage.

As an interim measure we have performed a review and taken actions allowed by existing Technical Specifications so the laundry, decontamination area and contaminated parts warehouse can be used during the outage. Due to our need for the remaining areas to support our Unit 2 refueling outage, we request NRC approval of the proposed amendment, as soon as practical.

Pursuant to 10 CFR 50.91(b)(1), the appropriate North Carolina official is also being provided a copy of this amendment request.

Should there be any questions or additional information needed to resolve this matter, please contact Steve LeRoy at (704) 373-6233.

Very truly yours,

Hal B. Tucker

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Attachment

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Attachment No. 1

Duke Power Company
McGuire Nuclear Station
Description/Technical Discussion, No Significant Hazards Discussion, and Environmental Impact Discussion

Background

By letter dated October 15, 1987 to the NRC, Duke Power Company (DPC) requested a Technical Specification (TS) revision for McGuire Unit 1 and 2 to TS 3/4.7.7, Auxiliary Building Filtered Exhaust Ventilation (VA) System that consisted of the following changes:

a. Provide a 7-day Action time for 1 train of VA inoperable due to inoperable filter package.

b. Provide a 72-hour Action time for 1 train of VA inoperable due to inoperable flow path.

c. Provide a 7-day Action time when 1 train of VA is unable to maintain .25" WG.

d. Provide a 72-hour Action time when 1 train of VA is unable to maintain a negative pressure.

e. Provide a 24-hour Action time with both VA trains inoperable.

f. Replace term "charcoal" with "carbon".

g. Replace term "ANSI N510-1975" with "ANSI N510-1980".

h. Replace current carbon sample test temperature and acceptance criteria (80°C and 99%) with 30°C and 90%.

i. Replace "720 hours" with "1440 hours" of carbon absorber operation.

By letter dated May 11, 1989, DPC requested an additional change to TS 3/4.7.7 that would reduce the TS required flow rates from 54,000 CFM +/- 10% for Unit 1 and 43,000 CFM +/- 10% for Unit 2 to 45,700 CFM +/- 10% for Unit 1 and 40,500 CFM +/- 10% for Unit 2 respectively. This request was the result of an extensive modification to the McGuire facility that added a Waste Handling Building to the station. This modification provided improvements in the following areas: Radioactive waste handling and compacting areas; Contaminated laundry processing facility; Decontamination facility; and, Waste Solidification area. Additionally, new Chemistry laboratories and Radiation Protection office areas were provided.

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Within the new Waste Handling Building, additional HVAC equipment was added in combination with the existing HVAC equipment to serve these new areas and existing areas that are now encompassed in the Waste Handling Building. Due to the capacity of the new HVAC configuration and because it now services some of the areas once serviced by the VA system, the required flow rates of the VA system needed to be reduced. Please reference our submittal dated May 11, 1989 for further details.

Description / Technical Justification

The purpose of this supplement to our previous submittal is to revise the requirement to maintain a 0.25" W.G. negative pressure as referenced against outside pressure in item c. above to 0.125" W.G.

The design basis for the VA system as discussed in McGuire FSAR Section 9.4.2 is to:

1. Provide a suitable environment for the operation of equipment and personnel access as required for inspection, testing and maintenance;

2. Maintain the building at a slightly negative pressure to minimize out leakage,

3. Provide purging of the building to the unit vent. The air exhausted to the environment from potentially contaminated areas is monitored and filtered, as required, so that the limits of 10 CFR 20 and the TS are not exceeded; and,

4. Provide a suitable environment for the operation of vital equipment during an accident.

   (Note: 10 CFR 100 values are applicable for accident situations.)

Our proposed amendment dated October 11, 1987 added to the second design basis in that the ECCS pump rooms will be maintained at a negative pressure of greater than or equal to 0.25" W.G. relative to the outside atmosphere during post accident system operation. Prior to the October 1987 submittal, testing was performed to demonstrate our ability to meet the 0.25" W.G. requirement. At that time we met the requirement with additional margin. Subsequently, as described above we added a modification that resulted in an additional change to reduce VA system flow rates. Prior to the completion of this modification, additional testing was performed to determine if all flow and pressure requirements could be met. When testing was performed we determined that the 0.25" W.G. negative pressure could not be achieved. The exact reason(s) we could not meet the 0.25" W.G. requirement could not be determined. One possible reason that the previous results could not be repeated is that the alignment of interfacing systems may have originally been non-conservative. Another possible reason is that we may have over time experienced some Auxiliary Building integrity degradation. We are currently investigating this possibility.

Subsequently when we tested in the post modification simulated configuration, we did test in a very conservative configuration that will be discussed below.

In an effort to achieve the 0.25" W.G. negative pressure we have inspected the VA system by performing a walk down of the ducting to include an inspection of the dampers, registers, etc. After completing the necessary maintenance, adjustments, and flow balancing, we have determined that the VA system cannot achieve a 0.25" W.G. negative pressure in the proper test configuration. Therefore, to satisfy the need to have a measurable negative pressure requirement that ensures adequate removal of post accident ECCS Pump leakage, we propose that 0.125" W.G. be substituted for the more restrictive requirement of 0.25" W.G.

The justification and technical basis for this change are discussed with respect to the following areas:

1. The physical layout of the pump rooms and the pressure test locations;

2. Discussion of the ECCS pump room testing including system alignment, instrument error, and outside atmosphere reference point; and,

3. The adequacy of 0.125" W.G. to ensure filtration of ECCS pump leakage to mitigate the radiological consequences of iodine released during accident conditions.

Location of Pump Rooms

The ECCS pump rooms consist of the following rooms:

Room #	Description	Unit	Elevation
500	ND Pump Room 1B	1	695'
501	ND Pump Room 1A	1	695'
502	NS Pump Room 1A	1	695'
503	NS Pump Room 1B	1	695'
504	NS Pump Room 2B	2	695'
505	NS Pump Room 2A	2	695'
506	ND Pump Room 2A	2	695'
507	ND Pump Room 2B	2	695'
626	NI Pump Room 1B	1	716'
627	CC Pump Room 1A	1	716'
628	NI Pump Room 1A	1	716'
629	PD Pump Room	1	716'
630	CC Pump Room 1B	1	716'
633	NI Pump Room 2B	2	716'
634	CC Pump Room 2A	2	716'
635	NI Pump Room 2A	2	716'
636	PD Pump Room	2	716'
637	CC Pump Room 2B	2	716'

Key to Acronyms: CC - Centrifugal Charging; ND - Residual Heat Removal; NI - Safety Injection; NS - Containment Spray; PD - Reciprocal Charging

Enclosure 1 to this submittal shows the locations of all of the ECCS pump rooms. At each elevation, 695' and 716', the Unit 1 and Unit 2 pump rooms are accessible from a common hallway. These common hallways also act as air transfer corridors, allowing exhaust air flow to communicate between rooms associated with Unit 1 and those associated with Unit 2.

Pressure readings were taken from two locations on each of the two pump room elevations. Enclosure No. 1 shows the locations at which readings were taken.

Test Results and Measurement Method

The VA system is tested for both flow rat.. and ECC [illegible] sure with the system aligned in a post accident configuratic [illegible] a single failure. Test alignments are as follows:

	COMPONENT	TES. [illegible] ALIGNMEN1	#2 ALIGNMENT
	VA Filtered Exhaust, ABFX-1A	ON	OFF
	VA Filtered Exhaust, ABFX-1B	ON	OFF
	VA Filtered Exhaust, ABFX-2A	OFF	ON
	VA Filtered Exhaust, ABFX-2B	OFF	ON
Note 1	VA Unfiltered Exhaust, ABNXF-1A	OFF	OFF
	VA Unfiltered Exhaust, ABNXF-1B	OFF	OFF
	VA Unfiltered Exhaust, ABNXF-2A	OFF	OFF
	VA Unfiltered Exhaust, ABNXF-2B	OFF	OFF
	VA Supply Units, ABSN-1A	OFF	OFF
	VA Supply Units, ABSN-1B	OFF	OFF
	VA Supply Units, ABSN-2A	OFF	OFF
	VA Supply Units, ABSN-2B	OFF	OFF
Note 2	VF Supply Unit FPSN-1	ON	ON
	VF Exhaust FPXF-1A	ON	ON
	VF Exhaust FPXF-1B	ON	ON
	VF Supply Unit FPSN-2	ON	ON
	VF Exhaust FPXF-2A	ON	ON
	VF Exhaust FPXF-2B	ON	ON

Note 1: These fans have LOCA and Blackout (B/O) trips in non-safety class control circuits. Verification of trip is required.

Note 2: These fans receive neither LOCA nor B/O trip and are assumed "on" (unless on de-energized buss) or verified "off".

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Attachment No. 1

Key to Acronyms: VA - Auxiliary Building Ventilation
VF - Fuel Pool Ventilation

Test Alignment No. 1 simulates a plant LOCA with a Unit 2 filtered exhaust failure. Test Alignment No. 2 simulates a plant LOCA with a Unit 1 filtered exhaust failure. The alignment of other ventilation systems has been considered. The VF system alignment is included because the exhaust fans from this system utilize the unit vents, as do the VA system exhausts.

The outside air reference point is located just outside the VA system supply unit intake plenum on elevation 786'. Enclosure No. 1 shows the general location, while Enclosure No. 2 provides a more detailed sketch of the outside reference sensing location. Poly tubing (1/4" diameter) is routed down through the duct shaft to each location. This temporary arrangement is sufficiently shielded by parapet walls so that meteorological conditions should not affect instrument readings. Since the VA system supply units are "off" during testing, velocity around the intake plenum is essentially zero (0).

A Nuclear Station Modification will be planned and implemented to provide a permanent external diffuser to be used in conjunction with periodic VA system TS testing. Currently, we plan to use a a Brandt model B-SPP2280. Enclosure No. 3 provides dimensional and error data for this diffuser. Quarter inch tubing will be routed from the end cap to each test location.

Differential pressure is measured using an AIRDATA multimeter. For differential pressure readings the instrument accuracy is ±2% of the reading ± one digit (See Enclosure No. 4).

NRC Information Notice No. 88-76 was used to evaluate the measurement error due to the static fluid columns. It has been determined that no correction is required.

Test results are summarized below.

Pressure Measurement Location	Alignment No. 1 Pressure	Alignment No. 2 Pressure
695-A	0.21 in. W.G.	0.17 in. W.G.
695-B	0.21 in. W.G.	0.17 in. W.G.
716-A	0.215 in. W.G.	0.18 in. W.G.
716-B	0.215 in. W.G.	0.18 in. W.G.
733-A	Not Tested	0.14 in. W.G.
750-A	Not Tested	0.13 in. W.G.

Testing results have been repeated over a period of 3 weeks with little deviation from the above values. Differential pressures are consistent over each floor which indicates that one exhaust train is pulling the whole floor down to the same negative pressure. Readings were most sensitive to changes within the building envelope, such as opening doors.

Adequacy of 0.125" W.G. Negative Pressure

To determine whether 0.125" W.G. of negative pressure in the ECCS pump rooms is adequate to filter ECCS pump leakage during a design basis accident, the conditions of adequacy have been established. Our interpretation of the conditions of adequate negative pressure are as follows:

1. Contain contamination by establishing that the suction from the Unit 2 ventilation exhaust (weaker train) located in the ECCS pump rooms of that unit will collect and thus process contamination from the Unit 1 ECCS pump rooms; and,

2. Establish that atmospheric wind conditions will not adversely affect the ability of the ventilation systems to maintain the 0.125" W.G. negative pressure in the ECCS pump rooms.

The ability of the weaker Unit 2 train to establish adequate suction from the adjoining Unit 1 ECCS pump rooms has been established through testing. With the system in test alignment No. 2, smoke sticks were taken into the hallways common to Unit 1 and 2 pump rooms at each elevation. Flow to the Unit 2 pump rooms was clearly established (see Enclosure No. 1 for flow direction arrows).

Containment of any contamination on the lower plant elevations was further established by measuring the negative pressure on elevations 733' and 750'. These elevations were negative with respect to atmosphere, and were slightly less negative than the lower plant elevations which will deter air flow seepage from the pump rooms through the ceiling to the higher elevations.

The following arguments can be made in justifying why wind will not affect the ability of the VA filtered exhaust system to maintain at least 0.125" W.G. negative pressure in the ECCS pump rooms. Ground elevation at McGuire is at 760' sea level. The ECCS pump rooms are located on elevations 695'and 716', or 65' and 44' below ground, respectively. Two floors separate the 716' elevation from ground level at 733' and 750'. Wind effects will tend to affect building pressure in areas above ground level. These intermediate floors act as a buffer to pressure variations in the Auxiliary Building at lower elevations. By maintaining elevations 733' and 750' at a slightly negative pressure with respect to outside atmosphere, the ability to lessen the effects of wind induced pressure variations at the lower elevations is enhanced. Separation by distance, physical concrete barriers, and the negative pressure gradients on upper elevations all assist in reducing any influence wind will have on the ability of the VA exhaust to maintain at least a 0.125" W.G. negative pressure in the ECCS pump rooms.

All the ECCS pump rooms are located in the core or center of the Auxiliary Building. The majority of the Auxiliary Building is surrounded by other buildings that are physically attached to the Auxiliary Building (See Enclosure No. 1). The Turbine Buildings, Reactor Buildings, Equipment Staging Buildings, and Service Building all act as physical barriers to wind loading. Additionally, the VA system exhaust fans discharge out the Unit 1 and Unit 2 vent stacks. Stack design, height, and size assist in limiting wind influence on discharge flow.

In summary, we have determined that the influence of wind on the McGuire Auxiliary Building should not impact our ability to maintain a negative pressure of 0.125" W.G. in the ECCS pump rooms during post-accident conditions.

No Significant Hazards Discussion

Duke Power Company has determined that this revision to our previous amendment does not involve a significant hazards consideration. Operation of McGuire in accordance with the proposed amendment would not: (1) Involve a significant increase in the probability or consequences of an accident previously evaluated; or, (2) Create the possibility of a new or different kind of accident previously evaluated; or, (3) Involve a significant reduction in the margin of safety. Although this requirement is a decrease in our previously proposed requirement, it has been demonstrated, as previously discussed, that a negative pressure of 0.125" W.G. will ensure post LOCA leakage in the ECCS Pump rooms is drawn and processed by VA system. Additionally, the No Significant Hazards discussions contained in our submittal dated October 15, 1987 and May 11, 1990 remain valid. Therefore, DPC concludes the proposed revision does not involve a significant hazards consideration as defined by 10 CFR 50.92.

Environmental Analysis

As previously stated in our submittal of May 11, 19[illegible] the gaseous curie release from plant operations will not increase as a result of this proposed amendment. The improved waste handling capability will reduce solid radwaste and liquid radwaste volume. The proposal to revise the negative pressure requirement does not change the environmental assessment previously stated in our submittal of May 1989.