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August 3, 1984

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Attention: Ms. E. G. Adensam, Chief
Licensing Branch No. 4

Re: McGuire Nuclear Station
Docket Nos. 50-369, 50-370

Dear Mr. Denton:

As a result of an ongoing review of the Fire Protection Program at McGuire, several apparent deviations from Appendix R criteria have been identified. The deviations as well as technical justifications are provided in the attached.

This information is provided to the NRC for information. If there are any questions on this submittal, please adivse.

Very truly yours,

Hal B. Tucker

Hal B. Tucker

RLG/rhs

Attachment

cc: Mr. J. P. O'Reilly, Regional Administrator
U. S. Nuclear Regulatory Commission
Suite 2900
101 Marietta Street, NW
Atlanta, Georgia 30323

Mr. Ralph Birkel
NRC Project Manager

Mr. W. T. Orders
Senior Resident Inspector
McGuire Nuclear Station

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Aperture Card Dist
A006 1/1 Drawings
To: R. Birkel

DUKE POWER COMPNAY

McGuire Nuclear Station

Deviations from Appendix R Justifications

1. Steel Penetrating Fire Barriers

   a) Nuclear Service Water Pumps are located on Elevation 716. Component cooling pumps are located on Elevation 733. Redundant pumps and motors are separated by 1-1/2 hour fire rated partitions. In each case cable tray hangers penetrate these fire rated partitions. Pumps and motors are protected by automatic detection and suppression systems.

   b) Turbine driven Auxiliary Feedwater Pumps are separated from motor driven Auxiliary Feedwater Pumps by three-hour fire rated masonry walls. In each unit pipe supports and restraints penetrate masonry walls through a sleeve which is sealed in accordance with mechanical pipe penetration specifications. Each area is protected by automatic detection and suppression systems.

      The only combustible material in the above areas is plastic cable insulation. Considering the provided protection features and cable insulation ignition temperature, we conclude that fire will not propagate between redundant pump and motor sets.

2. Reactor Building Walls

   a) Process piping penetrations in Reactor Building shield walls which are 36 inches thick incorporate a special guarded mechanical sleeve assembly (as shown on Attachment 1, Drawing MC-1676-3.8) designed to maintain Reactor Building pressure boundary integrity. These assemblies are typical of those utilized at other stations where Reactor Buildings include an Annulus area. "Hot" penetrations include a layer of insulation between process pipe and guard pipe to minimize heat transfer to the concrete wall. "Cold" penetrations, with fluids at ambient temperature, include a dead air space which moderates heat transfer between process pipe and guard pipe.

      Considering the configuration as described above, fire will not propagate across the Reactor Building shield wall through process pipe penetration assemblies. In addition, automatic sprinklers and detectors are provided in the Annulus to further mitigate potential for fire propagation.

   b) Spare sleeves and those used for penetration of instrument tubing are sealed by welding a 3/8 inch steel plate or 1/2 inch pipe cap to the Auxiliary Building side of each sleeves opening to maintaining containment integrity.

      Redundant cables required for safe shutdown are located in Auxiliary Building Electrical Penetration Rooms on Elevations 733 and 750. Combustible material which would contribute to an exposure fire is light. Penetration room ceilings are approximately 16 feet high and the rooms are about 140 feet long and 20 feet to 40 feet wide which is an appreciable volume for heat from a thermal plume to dissipate. Fires involving cable insulation propagate very slowly. Detection is provided in each area such that a fire in either of the penetration rooms or

the Annulus would be detected in the incipient stages and suppressed by fire brigade response or automatic sprinklers in the Annulus.

Considering the above, a fire which originates on one side of the Reactor Building wall will not generate sufficient heat to propagate a fire across the wall. Therefore, additional fire resistance of Reactor Building mechanical penetrations is not considered necessary.

c) HVAC duct penetrations in Reactor Building walls do not have fire rated dampers. A description is as follows:

The Containment Purge System (described in FSAR Section 9.4.5) has four penetrations per unit, located near Column HH-52 (Unit 2 at HH-60) between Elevations 776 and 787. Two penetrations are 24 inches by 64 inches. Penetration sleeves are 3/16 inch stainless steel plate designed to withstand thermal and seismic loading. These penetrations are flashed with 1/4 inch stainless steel angles similar to a fire damper sleeve arrangement. A motor operated damper is provided in each duct consisting of 10 gauge steel housing and 16 gauge steel baldes, considerably heavier than 18 gauge housing and 22 gauge blades for a typical fire damper. The remaining two penetrations of the containment purge system consist of 10 inch diameter schedule 20 stainless steel pipe also designed to withstand thermal and seismic loading. A motor operated butterfly damper is provided in each duct consisting of 11 gauage steel frame and 10 gauge steel blade. All dampers are normally closed and fail closed. If fire dampers were included in the design of this system, an inadvertent damper closure could result in a positive or negative containment pressure that exceeds the values set forth for normal plant operation.

The Annulus Ventilation System (described in FSAR Section 6.2.3) has four penetrations per unit in Reactor Building wall near the Containment Purge System penetrations. Two penetrations are 28 inches by 16 inches. Penetration sleeves are 3/16 inch stainless steel plate designed for thermal and seismic loading. These penetrations are flashed with 1/4 inch stainless steel angles similar to a fire damper sleeve arrangement. The remaining two penetrations of the Annulus Ventilation System consist of 16 inch diameter schedule 20 stainless steel pipe also designed for thermal and seismic loading. The Annulus Ventilation System is an engineered safety feature system. The system functions to achieve a negative annulus pressure with respect to the atmosphere following a LOCA. If fire dampers were included in the design of this system, the potential for inadvertent damper closure would decrease the system reliability. Additionally, the duct is sealed to maintain secondary containment integrity so that dampers could not be reopened in the event of inadvertent closure.

d) Access into the Reactor Buildings from the Auxiliary Building is provided by portals located at two elevations. The fire boundary walls of each Reactor Building has been revised to include the walls enclosing the personnel access portals. These revisions were necessary due to the degree of difficulty expected in sealing the Reactor Building shield walls where the portals penetrate.

The walls and ceilings of the enclosure on Elevation 778+0 are constructed of 3/16 inch steel plating on both sides of eight inch steel

columns or beams. The space between the steel plating is filled with Dow Corning 3-6548 Silicone RTV foam. The walls of the enclosures on Elevation 733+0 are constructed as previously described with one exception. The wall containing the entrance door into the Personnel Access Portal is constructed of 3/16 inch steel plating on both sides of three inch steel columns. The space between the steel plating is filled with Dow Corning 3-6548 Silicone RTV foam. All walls on the 733+0 elevation extend to the concrete floor slab above.

Although fire tests of these assemblies have not been conducted, as constructed, these walls form a substantial fire barrier. Administrative control of combustible loading provides further assurance of barrier integrity.

3. Fire Boundary Doors With Security Hardware

At walls which are both fire and security boundaries, doors are constructed identical to those which are UL listed for three-hour fire resistence with labels attached. This security hardware was not subjected to fire tests and the door units are mortised to accept security hardware, therefore, UL labels are not attached. Considering there are no combustible materials adjacent to either side of these doors, doors are constructed identical to UL labeled doors installation of security hardware does not represent potential for fire propagation across the boundary.

4. Cork Expansion Joints

In areas where the Auxiliary Building abutts the Reactor and Diesel Generator Buildings, the structures are spaced approximately three inches apart so that during a Design Basis Seismic Event the buildings would move independently rather than act as a rigid frame structure. In constructing the walls, floors and roof of the Auxiliary Building, compressed cork was installed in the three inch gap as filler material at all interfaces with the Reactor Buildings.

Electrical penetration rooms for redundant trains of cables required for hot shutdown are located in the Auxiliary Building on Elevations 733+0 and 750+0. These cables are required by 10CFR50, Appendix R to be separated by full three-hour fire rated barriers. Walls, floors and ceilings of the Auxiliary Building are twelve inches to twenty-four inches of reinforced concrete with electrical and mechanical penetrations sealed to maintain three-hour fire rating.

An investigation has identified that the arrangement as described above does not comply with Appendix R in that the cork configuration has not been tested and approved for three-hour fire resistance. The compressed cork has been removed from the floor, ceiling and wall of the Electrical Penetration on Elevation 750+0 where they abutt the Reactor Building and an approved three-hour fire rated material is installed in the voids as stated in correspondence of September 28, 1983 from H. B. Tucker to J. P. O'Reilly of NRC Region II. The gap between the Auxiliary Building and the Diesel Generator Building at the 750+0 elevation has also been filled with an approved three-hour fire rated material.

Cork remains in place at Elevation 733. Automatic sprinkler systems and fire detection systems are provided in motor driven Auxiliary Feedwater Pump Rooms below seismic expansion joints and will preclude the potential for fire spread between Elevations 716 and 733.