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20Y
exemption*

June 8, 2001

ICAN060103

U. S. Nuclear Regulatory Commission
Document Control Desk
Mail Station OP1-17
Washington, DC 20555

Subject: Arkansas Nuclear One - Unit 1
Docket No. 50-313
License No. DPR-51
10CFR50 Appendix R Exemption Request for Makeup
Pump Rooms

Gentlemen:

Pursuant to 10CFR50.12, Entergy Operations requests an exemption from the requirements of Section III.G.2 of 10CFR50 Appendix R for the ~~exemption of the requirements of 10CFR50 Appendix R for the auxiliary lube oil pumps and their associated conduits in the Arkansas Nuclear One Unit 1 (ANO-1) makeup pump rooms.~~ The attached information provides the justification for this request. This submittal contains no commitments. Should you have any questions, please contact me.

Very truly yours,

Original signed by D. E. James for J. D. Vandergrift

Jimmy D. Vandergrift
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ANO-1 Makeup Pump Room Exemption Request

Introduction

On July 1, 1982, the results of the required 10CFR50 Appendix R compliance review were submitted to the NRC (0CAN078202). The review addressed the requirement to provide reactor coolant system inventory control by utilizing the makeup system. Only one makeup pump is required to achieve and maintain safe-shutdown. However, the three makeup pumps (P36A, P36B, and P36C) are located in the same fire zone (Zone 20Y), without separation by 20 feet free of intervening combustibles or rated fire barriers. Conduits containing the auxiliary lube oil pump cabling is located near the floor in the makeup pump rooms. For the reasons discussed below, Entergy Operations is

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requesting an exemption to not require one-hour rated fire barriers for the auxiliary lube oil pumps and their associated conduits.

Physical Characteristics

Fire Zone 20Y is a large area (over 9,000 square feet) at elevation 335' of the auxiliary building that primarily contains radwaste processing equipment (refer to Figures 1, 2, and 3). Previous exemptions have been granted for equipment configurations located in Zone 20Y. This exemption request applies to the makeup pump cubicles and the circuitry required for operation of the makeup pumps, including the auxiliary lube oil pumps.

Each makeup pump room is approximately 11 feet by 20 feet and is adjacent to at least one other pump room. The rooms are separated by partial height (eight feet high), 18 inch thick, concrete masonry unit block walls while the "exterior" walls are full height, 18 inch (minimum) thick reinforced concrete or concrete masonry unit block walls. The ceiling height in this area is 17 feet. Access to the pump rooms from the remainder of Zone 20Y is through open doorways, approximately eight feet high.

The auxiliary lube oil pumps are mounted on the makeup pump skid. The conduits containing the circuitry required for each pump penetrate the floor slab and are routed up to each lube oil pump. The highest elevation of the conduit routings is less than four feet above floor level.

Background

On March 22, 1983 (OCNA038328), an exemption to 10CFR Appendix R, Section III.G.2 for lack of an automatic fire suppression system was granted for the makeup pump rooms. The components in these rooms that were considered necessary for achieving safeshutdown were the makeup pumps (including cabling) and the service water to lube oil cooler isolation valves (including cabling). As part of the justification for the exemption, one-hour rated fire barriers were installed on the conduits routed from the ceiling level down to the makeup pumps and/or the service water valves. Subsequently, the auxiliary lube oil pumps (i.e., P64A, P64B, and P64C) were classified as components required for safe-shutdown. The auxiliary lube oil pumps are run for approximately one minute prior to starting or after stopping a makeup pump. Once the makeup pump is started, the shaft driven oil pump provides lubrication and the auxiliary lube oil pump is secured. The control and power cables associated with the auxiliary lube oil pumps are routed near the floor in each of the makeup pump rooms.

This installation is favorable from a fire protection standpoint since the cables for the auxiliary lube oil pumps are not exposed to the effects of a fire in an adjacent pump room (i.e., the auxiliary lube oil pump cabling would not see the same fire effects as the raceways routed near the ceiling).

The makeup pump rooms are congested with equipment and considered a high noise area and are not conducive to high personnel traffic. Since the conduit containing the auxiliary lube oil pump cabling is located near the floor, there is an increased likelihood of foot traffic (during maintenance activities) damaging any installed fire wrap. Because installation of fire wrap along the floor will not add to the level of fire protection for the conduits located in the makeup pump rooms, Entergy Operations is requesting an exemption for the lack of one-hour rated fire barriers for the auxiliary lube oil pumps and their associated conduits.

Combustible Loading

The primary combustible material located in each makeup pump room is the lube oil contained within each makeup pump (approximately 20 gallons per pump). Floor drains that feed a common header are provided in each room to prevent an oil spill from migrating along the floor to an adjacent makeup pump room. There are no cable trays routed through the makeup pump rooms; therefore, there are no exposed cables that can contribute to the combustible loading. Due to the limited floor space in the makeup pump rooms, the potential for accumulation of significant transient materials is minimized. The in-situ combustible loading for Zone 20Y has been calculated to support a fire severity equivalent to a five-minute duration fire. However, Zone 20Y encompasses several rooms other than the makeup pump rooms. Conservatively assuming that the lube oil is spilled in the floor space of only one makeup pump room (i.e., assuming that the total area is limited to the floor space of a single makeup pump room), the combustible loading from the total volume of lube oil in a makeup pump would support a fire duration of less than 12 minutes.

The full height "exterior" walls act as radiant heat shields to mitigate the hazards external to the pump rooms from affecting the components within the room. The partial height block walls act as a radiant heat shield to mitigate the effects of a fire in one pump room from affecting the components in the adjacent pump rooms. Consequently, in order to cause fire damage to the auxiliary lube oil pumps and their required circuitry in an adjacent pump room, a hot gas layer of sufficient temperature would have to descend to approximately four feet. Prior to descending to this elevation, the heat and hot gases would disperse through the open doorways into the large open area included in Zone 20Y.

Existing Protection Features

Each makeup pump room is equipped with ionization smoke detectors that alarm in the control room. Portable fire extinguishers and manual hose stations are available for use in manual fire suppression activities. The fire brigade response time is less than 10 minutes. The conduits containing the power cables to the makeup pumps are routed from the ceiling level down to the pump motors. A fire originating in a pump cubicle has the potential to generate hot gases to the extent that cable damage could occur to an adjacent makeup pump's power cables.

Consequently, per the March 22, 1983, safety evaluation (OCNA038328), one-hour fire barriers have been installed on the conduits associated with the power cables for P36A and P36B. The conduits providing power to the auxiliary lube oil pumps are located near the floor and are below the hot gas layer as are the makeup/auxiliary lube oil pumps themselves. The partial height walls will effectively shield these components from the radiant heat generated by a fire in an adjacent pump cubicle. Therefore, the cables routed from the floor to the auxiliary lube oil pump are not subject to damage induced by a fire in an adjoining compartment.

Safe-Shutdown Analysis

At least one makeup/auxiliary lube oil pump is required to achieve and maintain safeshutdown. P36A and P64A are supplied with red train power, while P36C and P64C receive green train power. P36B is the swing pump which, along with P64B, can be supplied with either red or green train power. The circuitry is routed in conduit. Since technical specifications permit one of the three makeup pumps to be out of service for an extended period of time, separation must be provided such that fire damage is limited to one makeup/auxiliary lube oil pump. The red train power and control cables for P64B are routed in the "A" makeup pump room along with control cables for the

transfer switch. The cables associated with P64B that are located in the "A" makeup pump room will not prevent operation of the auxiliary lube oil pump (i.e., P64B) from green power. Consequently, there are no redundant green components or circuitry located within the red pump cubicles or vice versa.

Justification for 10CFR50, Appendix R, Section III.G.2 Exemption Request

The following provides the basis for the exemption to Section III.G.2 of 10CFR50 Appendix R for lack of one-hour rated fire barriers for the ANO-1 makeup pump rooms.

10CFR50.12 Requirements: The requested exemption for lack of one-hour rated fire barriers for the makeup pump rooms meets this criteria as discussed below. 10CFR50.12 states that the Commission may grant an exemption from requirements contained in 10CFR50 provided that:

1. The requested exemption is authorized by law: No law has been identified which precludes the activities covered by this exemption request.
2. The requested exemption does not present an undue risk to the public health and safety: Damage to the lube oil pump circuitry could not result from radiant heat since the partial height walls act as a radiant heat shield.
3. The requested exemption will not endanger the common defense and security: The common defense and security is not changed by this exemption request.
4. Special circumstances are present which necessitate the request for an exemption to the regulations of Section III.G.2 of 10CFR50, Appendix R: Pursuant to 10CFR50.12(a)(2), the NRC will consider granting an exemption to the regulations if special circumstances are present. This exemption meets the special circumstances of paragraph 10CFR50.12(a)(2)(ii) - demonstrates that the underlying purpose of the regulation will continue to be achieved. As noted in the previously approved exemption, an automatic suppression system does not add to the level of protection for the makeup pump rooms and is not necessary. The installation of one-hour rated fire barriers on the auxiliary lube oil pump circuitry would not provide significant enhancements to the existing fire protection features.

Conclusion

Damage to the lube oil pump circuitry could not result from radiant heat since the partial height walls act as a radiant heat shield.

As noted in previous correspondence (0CNA038328) and discussed in the background section of this submittal, an automatic suppression system does not add to the level of protection for the makeup pump rooms and is not necessary because of the following mitigative features: the existing floor drains, the partial height walls separating the makeup pump cubicles that serve as radiant heat shields, the ability for heat from a makeup pump fire to be dissipated into the large open area of Zone 20Y, the one-hour fire barriers on the conduits routed along the ceiling, and the capability to promptly detect and suppress fires in the makeup pump room.

These same features would prevent damage from occurring to the auxiliary lube oil pumps and their required circuitry. Consequently, the installation of one-hour rated fire barriers on the auxiliary lube oil pump circuitry would not provide significant enhancements to the existing fire protection features. Based on the discussion presented above, Entergy Operations is requesting an exemption from the requirements of Section III.G.2 of 10CFR50 Appendix R to not require one-hour rated fire barriers for the

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auxiliary lube oil pumps and their associated conduits.

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