UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

FACILITY OPERATING LICENSE NO. NPF-38

LOUISIANA POWER AND LIGHT COMPANY

WATERFORD STEAM ELECTRIC STATION, UNIT 3

DOCKET NO. 50-382

1.0 INTRODUCTION

By letter dated March 28, 1988, Louisiana Power and Light Company (LPLC), the licensee for Waterford Steam Electric Station Unit No. 3, provided a proposed revision to Technical Specification Bases B 3/4.7.6, "Control Room Air Conditioning System."

The purpose of the proposed revision is to reflect the control room air conditioning system design appropriately in the Technical Specification Bases. The proposed revision would add the following paragraph in the Technical Specification Bases B 3/4.7.6:

> "System design is such that a Control Room Air Handling Unit and Emergency Filtration Unit in opposite trains can be credited for system operability. In addition, the function of the heating coils in each Control Room Air Handling train is to provide personnel comfort during normal operation. During emergency conditions low temperatures in the service areas are no concern; therefore, the heaters provide no safety function and are not required for system operability."

2.0 BACKGROUND

The control room air conditioning system provides the normal and emergency HVAC requirements in the control room and consists of two fully redundant essential trains of air handling units (A AH12 and B AH12) including filters, fans, chilled water cooling coils, electric heating coils, ductwork and dampers, isolation valves and nonessential exhaust fans. The system also includes two redundant essential emergency filtration units (A S-8 and B S-8) required for emergency operation each consisting of fans, electric heating coils, ductwork and dampers, isolation valves, emergency filters and activated charcoal beds for removal of radioactivity and noxious gases.

On January 9, 1988, the inlet damper to control room ventilation emergency filtration train A was removed from service for maintenance which necessiated declaring the A train inoperable. Later that day, essential chiller B was removed from service due to a damaged start switch. After reviewing Technical Specification 3.7.6, Control Room Air Conditioning System, plant operators

entered Technical Specification 3.0.3 based on an inoperable train A S-8 unit and an inoperable train B AH-12 unit. Although the train A AH-12 unit and train B S-8 units were operable, control room personnel interpreted the definition of operability as requiring an operable AH-12 and S-8 unit in a single air conditioning train.

This event was not documented under a licensee event report (LER), however, it was internally documented under a Potential Reportable Event (PRE)-88-004.

3. EVALUATION

The control room air conditioning system is designed to automatically maintain the control room and associated areas within the environmental limits required for operation of plant controls and uninterrupted safe occupancy of required manned areas during all operating modes including LOCA conditions. The system is designed to maintain the control room in either an isolation (full recirculation) mode or under positive pressure.

Power to the redundant essential air conditioning system components is supplied by independent emergency (Class 1E) power supplies thus assuring proper system function and isolation in the event of a single power supply failure. Cooling water to the chilled water cooling coils of the redundant system trains is provided from the corresponding redundant trains of the essential services chilled water system.

During normal operation, one AH-12 unit operates on a continuous basis with non-filtered, cooled air flow capacity of approximately 39,200 cfm (approximately 37,000 cfm in recirculation with 2200 cfm fresh air intake and 2000 cfm exhaust) while the second unit will be automatically started by Class 1E instrumentation should the first unit fail.

The receipt of a high radiation signal from the normal outside air intake detectors or a safety injection actuation signal (SIAS) automatically closes (isolates) the normal outside air intake and exhaust, stops the normal exhaust fans, opens the recirculation dampers, and starts both emergency filtration units (each S-8 unit delivers a filtered, non-cooled air flow of 4000 cfm with 3800 cfm of recirculated air and 200 cfm of fresh air intake). The operators may manually open either of the two separate emergency outside air intakes (the one with the lowest concentration of radioactivity) to provide additional air, which is also passed through the emergency and charcoal filters, for pressurization of the control room. The control room air conditioning system (one AH-12 unit) recirculates the air with a portion passing through the emergency and charcoal filters for clean up.

Upon receipt of a toxic gas signal, the same automatic actions indicated above for the positive pressure emergency mode will occur except that the emergency filtration units are not started. The control room air conditioning system recirculates 100% of the air and no outside air is provided. In the event that a toxic gas signal occurs after a SIAS or high radiation signal, any open outside air intakes would be automatically closed.

3/4.7.1.4 ACTIVITY

The limitations on secondary system specific activity ensure that the resultant offsite radiation dose will be limited to a small fraction of 10 CFR Part 100 limits in the event of a steam line rupture. This dose also includes the effects of a coincident 1 gpm primary to secondary tube leak in the steam generator of the affected steam line and a concurrent loss-of-offsite electrical power. These values are consistent with the assumptions used in the safety analyses.

3/4.7.1.5 MAIN STEAM LINE ISOLATION VALVE

The OPERABILITY of the main steam line isolation valves ensures that no more than one steam generator will blow down in the event of a steam line rupture. This restriction is required to (1) minimize the positive reactivity effects of the Reactor Coolant System cooldown associated with the blowdown, and (2) limit the pressure rise within containment in the event the steam line rupture occurs within containment. The OPERABILITY of the main steam isolation valves within the closure times of the Surveillance Requirements are consistent with the assumptions used in the safety analyses.

3/4.7.2 STEAM GENERATOR PRESSURE/TEMPERATURE LIMITATION

The limitation on steam generator secondary pressure and temperature ensures that the pressure induced stresses in the steam generators do not exceed the maximum allowable fracture toughness stress limits. The limitation to 115°F and 210 psig is based on a steam generator RT_{NDT} of 40°F and is sufficient to prevent brittle fracture. Below this temperature of 115°F the system pressure must be limited to a maximum of 20% of the secondary hydrostatic test pressure of 1375 psia (corrected for instrument error). Should steam generator temperature drop below 115°F an engineering evaluation of the effects of the overpressurization is required. However, to reduce the potential for brittle failure the steam generator temperature may be increased to a limit of 200°F while performing the evaluation. The limitations on the primary side of the steam generator are bounded by the restrictions on the reactor coolant system in Specification 3.4.8.1.

3/4.7.3 COMPONENT COOLING WATER AND AUXILIARY COMPONENT COOLING WATER SYSTEMS

The OPERABILITY of the component cooling water system and its corresponding auxiliary component cooling water system ensures that sufficient cooling capacity is available for continued operation of safety-related equipment during normal and accident conditions. The redundant cooling capacity of these systems, assuming a single failure, is consistent with the assumptions used in the safety analyses.

3/4.7.4 ULTIMATE HEAT SINK

The limitations on the ultimate heat sink level, temperature, and number of fans ensure that sufficient cooling capacity is available to either (1) provide normal cooldown of the facility, or (2) to mitigate the effects of accident conditions within acceptable limits.

The limitations on minimum water level and maximum temperature are based on providing a 30-day cooling water supply to safety-related equipment without exceeding their design basis temperature and is consistent with the recommendations of Regulatory Guide 1.27, "Ultimate Heat Sink for Nuclear Plants," March 1974.

3/4.7.5 FLOOD PROTECTION

The limitation on flood protection ensures that facility protective actions will be taken in the event of flood conditions. The limit of elevation 27.0 ft Mean Sea Level is based on the maximum elevation at which the levee provides protection, the nuclear plant island structure provides protection to safety-related equipment up to elevation +30 ft Mean Sea Level

3/4.7.6 CONTROL ROOM AIR CONDITIONING SYSTEM

The OPERABILITY of the control room air conditioning system ensures that (1) the ambient air temperature does not exceed the allowable temperature for continuous duty rating for the equipment and instrumentation cooled by this system and (2) the control room will remain habitable for operations personnel during and following all credible accident conditions. The OPERABILITY of this system in conjunction with control room design provisions is based on limiting the radiation exposure to personnel occupying the control room to 5 rem of less whole body, or its equivalent. This limitation is consistent with the requirements of General Design Criterion 19 of Appendix A, 10 CFR Part 50.

Operation of the system with the heaters on for at least 10 hours continuous over a 31-day period is sufficient to reduce the buildup of moisture on the adsorbers and HEPA filters. Obtaining and analyzing charcoal samples after 720 hours of adsorber operation (since the last sample and analysis) ensures that the adsorber maintains the efficiency assumed in the safety analysis and is consistent with Regulatory Guide 1.52.

System design is such that a Control Room Air Handling Unit and Emergency Filtration Unit in opposite trains can be credited for system operability.* In addition, the function of the heating coils in each Control Room Air Handling train is to provide personnel comfort during normal operation. During emergency conditions low temperatures in the service areas are no concern; therefore, the heaters provide no safety function and are not required for system operability.

3/4.7.7 CONTROLLED VENTILATION AREA SYSTEM

The OPERABILITY of the controlled ventilation area system ensures that radioactive materials leaking form the penetration area or the ECCS equipment within the pump room following a LOCA are filtered prior to reaching the environment. The operation of this system and the resultant effect on offsite dosage calculations was assumed in the safety analyses.

*Effective for 6 months beginning August 9, 1988

The licensee stated the following in the support of the proposed change for control room air conditioning system Technical Specifications Bases:

a. The system consists of two distinct and diverse parts such that air handling units (AH-12) and ESF air filtration units (S-8) can be operated either together or separately as the situation dictates, therefore, the AH-12 units are not dependent on the operation of the S-8 units.

b. The operability of an AH-12 in one train and an S-8 in opposite train is the safest configuration during the Action Statement of Technical Specification 3.7.6 in comparison with the operability of these units in same train during a loss of offsite power event because either AH-12 or S-8 would continue to provide some control of the control room envelope atmosphere in contrast to the loss of all function for the single train case.

c. Each system train contains an electric heater which provides personnel comfort during normal operation, however, it does not perform any safety function during emergency conditions and are not reviewed for system operability.

The staff has reviewed the above change and supporting rationale and concludes that 1) there would be no change in the susceptibility of the air handling units to fail in normal operation, 2) there would be no change in actuation of ESF filtration units during a radiological emergency, 3) there would be no change in the susceptibility of the air handling units, ESF filtration units, or associated components such as dampers to fail during emergency operation, and 4) the air handling unit heater clarification is correct such that the heaters do not perform any safety function and are not needed for system operability.

The staff does not necessarily concur with the licensee's statement that the operability of a AH-12 in one train and the S-8 in the other train is the safest configuration during the Action Statement. The staff finds, however, that there is no reduction in safety associated with this configuration.

Thus, based on the above evaluation, the proposed change in Technical Specification Bases Section B 3/4.7.6 would appropriately clarify the Technical Specification and, therefore, is acceptable.

4.0 CONCLUSION

Based on the above, the staff concludes that the proposed change provides an appropriate clarification of Technical Specification Section 3.7.6, without altering the involved risks, and will not have an adverse effect on plant operation.

The staff, therefore, find the proposed control room air Conditioning system Technical Specification Bases change acceptable.

Principal Contributor: J. Raval
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