



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

ENCLOSURE

SAFETY EVALUATION BY THE OFFICE OF SPECIAL PROJECTS
INVOLVING THE REDUNDANCY OF THE CONTAINMENT ATMOSPHERE

DILUTION SYSTEM (CADS) VENTING CAPABILITY

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT, UNITS 1, 2 AND 3

DOCKET NOS. 50-259, 50-260, AND 50-296

1.0 INTRODUCTION

By the submittal dated July 16, 1981, the licensee committed to install an additional containment vent line of the CADS in order to satisfy the requirements of NUREG-0737, Item II.E.4.1, that the dedicated penetration or the combined single-failure proof alternative shall be sized such that the flow requirements for the use of the purge system are satisfied. The design shall be based on 10 CFR 50.44 requirements.

2.0 DISCUSSION

The CADS is remote manually operated from the main control room and is used following a loss-of-coolant accident (LOCA) to add nitrogen to the drywell or pressure suppression chamber (torus) in order to reduce the concentration of combustible gases. When either the oxygen or hydrogen concentration in primary containment exceeds the design basis requirements, the operator can add nitrogen into the drywell or torus. Two paths are available for this addition to primary containment, each of which is redundant and meets the single failure criterion.

The CADS relies on the containment vent lines for gas release from the primary containment through the standby gas treatment system to the environs in the event of a LOCA. These vent lines are used to decrease the pressure in the drywell and the torus when pressure increases to 30 psig from the addition of nitrogen to the containment.

3.0 EVALUATION

In order to prevent spurious opening of a vent line after a LOCA due to a single active failure, the inboard vent line isolation valves are powered from Bus A and the outboard vent line isolation valves are powered from Bus B. Because these valves fail closed and must be energized to open, only one valve per vent line can fail open due to an active failure.

Dual vent paths are provided for releasing containment atmosphere in a controlled manner from the drywell and torus; however, installed emergency power sources do not meet the single failure criterion for opening the containment vent isolation valves since the inboard and outboard valves are supplied from separate buses. The licensee does not rely solely on onsite emergency power sources to meet the single failure criterion for opening the vent valves because offsite power sources can be relied on to satisfy this single failure criterion. Since the earliest the vent valves should be opened, in accordance with 10 CFR 50.44, is 30 days after a LOCA and the power source required to open these valves (5 watts at 120 volts a.c.) is readily available, (including portable offsite sources), it would be a simple task to restore power and open the containment vent isolation valves in order to control containment pressure after a LOCA.

4.0 CONCLUSION

Based on the availability of alternate power sources for opening the containment vent valves 30 days after a LOCA, we conclude that the present Browns Ferry design satisfies the single failure requirement of NUREG-0737, Item II.E.4.1. Furthermore, although the licensee has committed to install a third vent path, the staff concludes that the present dual vent path design with existing procedures describing the use of alternate power sources to open the vent valves is acceptable."

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