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Director, Office of Nuclear Reactor Regulation
Attention: G. E. Lear, Director
PWR Project Directorate No. 1
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Gentlemen:

Subject: Docket No. 50-206
Generic Item B-24, Containment Purging/Venting
During Normal Operations
San Onofre Nuclear Generating Station
Unit 1

Reference: April 19, 1985 letter from M. O. Medford, SCE,
to J. A. Zwolinski, NRC, regarding the subject topic

The referenced letter provided our initial response to your letter of November 2, 1984 which requested further justification for allowing unlimited use of the 6-inch containment vent system during plant operation. As identified by the referenced letter, certain areas which the staff has recommended SCE to evaluate and provide a detailed discussion were still under evaluation. Our efforts to complete an evaluation of the remaining areas have been completed, and a detailed discussion of these areas is provided below.

1. A description of the adverse effects on the safety of the plant due to operation during periods of higher than atmospheric pressure inside containment.

Response: Several areas were investigated with regards to plant safety when the containment pressure is above atmospheric pressure. These areas included increased operator actions and awareness, airborne radiation in containment during both pressure build-up and venting, and ALARA considerations.

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Add: RSB - Cammill
RSB - Berlinger

The operator actions necessary to maintain the containment pressure within the Technical Specification limit 0.4 psig include monitoring the containment pressure and cycling the vent system valves to bleed off excess pressure at the necessary intervals (as described in the referenced letter). The primary safety concern with these tasks is the amount of time the operators would have to devote to maintaining containment pressure below 0.4 psig on a long term basis. The containment pressure would have to be monitored periodically at lower pressures and eventually monitored more frequently as the pressure approaches 0.4 psig. These required actions impose an unnecessary burden on operator time and could divert the operators attention from other tasks necessary for safe operation.

The airborne radiation that will build-up within the containment area was evaluated for its maximum value. In addition to the normal background dose rate near the reactor vessel of 21.4 Rem/hr corresponding to continuous containment venting, an additional 1.39 Rem/hr would be accumulated due to isolation of the containment up to the Technical Specification pressure limit of 0.4 psig. Although this quantity of airborne radiation will not activate the containment radiation alarm or the exhaust stack high radiation alarm, radiation exposures will increase due to personnel entry into containment during Modes 1 through 4.

In conclusion, the primary concerns of the adverse effects on the plant due to operating with above atmospheric pressure in containment are the burden placed on the operators to monitor and maintain containment pressure below 0.4 psig and the increased radiation exposure considerations.

2. The costs associated with eliminating the sources of air leakage into containment.

Response: Two methods of eliminating leakage and bleed off were evaluated. One method involved a system to capture and divert all instrument air that is currently exhausted via the pneumatically operated valves to the containment atmosphere. The second method involves replacing all pneumatically operated diaphragm valves with Target Rock solenoid valves.

The first method stated above involves piping all of the bleedoff ports on solenoid valves and routing the instrument air outside containment. The installed cost of this modification would be approximately $210,000 $\pm$ 40%. To effectively implement this modification, the instrument bleed off air would be routed to the instrument air header upstream of CV-40, thereby eliminating exposure to the containment atmosphere. CV-116, the inboard containment vent valve, would operate in a normally closed mode, and open only to relieve containment pressure build-up due to instrument air line leakage and instrument seals leakage.

This would allow CV-10, the outboard containment vent valve, and CV-40 to operate in a normally open mode to relieve clean instrument air. The cost estimate for this modification is based on the most probable routing of instrument air piping and tubing by reviewing the location of all the pneumatically actuated valves.

An alternate method of eliminating instrument air leakage into containment is to eliminate the use of pneumatically actuated valves. The method evaluated was to replace the existing pneumatic actuators with direct acting solenoid valves. The cost associated with engineering, procurement, installation and qualification of the necessary replacement valves would be approximately $1 million $\pm$ 40%.

The above evaluations were based on the assumption that the majority of leakage from the instrument air line is through bleedoffs from three way solenoid valves. Should it be determined that line leakage and instrument seals leakage contribute a greater portion of the total instrument air leakage, additional modifications would be necessary. Since the extent of these modifications could not be determined it is not possible to provide a more accurate cost estimate at this time.

Although instrument air leakage into containment could be reduced by these modifications, there is an additional undesirable affect associated with maintaining containment isolation for an extended period of time. While these modifications would extend the pressure build-up time required to reach the Technical Specification limit and thus the cycling of the vent valve on a less frequent basis, the airborne radiation inside containment would build-up, resulting in a higher radiation vent rate and, in addition, increase the radiation exposure considerations discussed in response to Item 1. The actual dose rate due to extended isolation may or may not actuate the vent stack radiation alarm. The calculation of this value would require a detailed study of decay rates and was not performed for the purpose of our evaluation.

3. A detailed description of the effects frequent cycling of the vent valves would have on the safety function of the valves and the possible increase in maintenance costs.

Response: Further evaluation of the safety concerns associated with frequent cycling of the vent valves has not identified any additional areas which were not discussed in the referenced letter. The possibility for degradation of performance during the interim periods between routine maintenance and testing activities exists and could result in a loss of required leaktight seal. Thus, in case of an accident situation, excessive leakage of a potentially high radioactive containment atmosphere could occur.

As provided by our previous correspondence, the reliability and operability of the containment vent valves under the adverse conditions imposed by a design basis accident have been adequately demonstrated. Cycling of the containment vent valves is therefore considered inappropriate and unnecessary. Further, this activity would impose unwarranted burdens on plant operation. This letter has identified areas in which a compromise in plant safety could be necessary in order to institute a program to limit containment venting. These compromises greatly out-weigh the degree of increased safety associated with having containment isolation during periods of operation. Based on these considerations, limiting the use of the containment vent system should not be imposed on San Onofre Unit 1.

If you have any questions or require additional information, please let me know.

Very truly yours,

M. O. Medford