ENCLOSURE 1

F. Murley

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

May 11, 1989

MEMORANDUM FOR: Thomas E. Murley, Director
Office of Nuclear Reactor Regulation

FROM: Robert B. A. Licciardo, Reactor Engineer (Nuclear)
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SUBJECT: DIFFERING PROFESSIONAL VIEW CONCERNING

a) Issuance of SER to Zion 1/2 allowing full power operation with open 42" containment isolation valves.

b) Methodology used for calculating related offsite doses.

The writer submits a Differing Professional View (DPV) in accordance with the provisions of NRC Manual Chapter 4125.

This issue has arisen out of the Safety Evaluation Report (SER) undertaken for the Zion Units 1 and 2 as prepared by the writer; see Attachment.

The principal issue is the prudent and conservative calculation of the additions to offsite dose which may result from a LOCA at a facility during the use of open purge supply and exhaust valves at full power.

The licensee for Zion 1/2 has proposed full power operation of the facility with the 42" purge supply and exhaust containment isolation valves open to a limited position of 50°, and capable of isolation within seven (7) seconds of the commencement of a LOCA.

The writers SER concludes that the 42" valves at Zion should remain closed in Modes 1, 2, 3 and 4 because the consequence of the offsite dose to thyroid (from iodine) during a LOCA is unacceptably high; whole body has not been evaluated. The least value for the additional offsite dose which may be proposed within the licensing basis is 64,000 rem over the first seven (7) seconds of the LOCA. Management staff has disagreed with the writer's methodology and conclusion and plans issuance of a separate SER permitting the operation requested. The writer requests non-issuance of the related SER to the licensee. He also proposes probability of a generic action on other facilities which have been granted such licenses based on the staff's current methodology.

In general, the management staff has adopted a criterion described in SRP BTP CSB 6-4 which is that providing the maximum time for closure of these containment isolation valves does not exceed 5 seconds (and by plant-specific exception, up to 15 seconds), then the valves would be closed before the onset of fuel failure following a LOCA so that the only contribution to offsite dose is from RCS operational levels of fission product directly discharged into containment during this period, and then through the open containment isolation valves before closure.

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In evaluating the consequence for Zion, the writer has used an alternate Criterion in BTP CSB 6-4 which states that:

> "The following analyses should be performed to justify the containment purge system design:
>
> An analysis of the radiological consequences of a loss-of-coolant accident. The analysis should be done for a spectrum of break sizes, and the instrumentation and setpoints that will actuate the purge valves closed should be identified. The source term used in the radiological calculations should be based on a calculation under the terms of Appendix K to determine the extent of fuel failure and the concomitant release of fission products, and the fission product activity in the primary coolant. A pre-existing iodine spike should be considered in determining primary coolant activity. The volume of containment in which fission products are mixed should be justified, and the fission products from the above sources should be assumed to be released through the open purge valves during the maximum interval required for valve closure. The radiological consequences should be within 10 CFR Part 100 guideline values."

Using these related guidelines for Zion, the fuel performance over the 0-7 seconds is detailed and shows that fuel failure (by infringement of DNBR criteria) occurs within ½ seconds of the commencement of the LOCA, and together with other licensing basis responses including fission product release from the fuel gap and the thermal hydraulic conditions in the core, containment and discharge nozzle, result in a substantive discharge of fission products to the environment of far greater consequence than are calculated by the staff.

The relative consequences of these differing approaches are that whereas the staff methodology gives additions to offsite dose resulting in total doses within 10 CFR Part 100 limits, the alternate approach used by the writer shows a substantially increased offsite dose exceeding 10 CFR Part 100 limits, with completely unacceptable consequences to Public Health and Safety.

The writer requests review of the Differing Professional View in a timely manner in accordance with the provisions of NRC Manual Chapter 4125.

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