

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of
COMMONWEALTH EDISON COMPANY
(Zion Station, Units 1 and 2)

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Docket Nos. 50-295
50-304

NRC Staff Testimony on
Contention 2(f)(2)

By John J. Zudans

I am employed as a Senior Mechanical Engineer in the Engineering Branch, Division of Operating Reactors, Office of Nuclear Reactor Regulation, United States Nuclear Regulatory Commission. A statement of my professional qualifications is attached to this testimony.

Contention 2(f)(2) states:

There has been insufficient development of all credible accident scenarios.

For example:

* * * *

- (2) There is insufficient information regarding the methods by which accidental damage to stored spent fuel assemblies will be prevented during the installation of the new poisoned spent fuel storage racks.

Section 3.8 of the Nuclear Service Corporation report dated February 3, 1978 and incorporated into the Zion spent fuel pool rack modification proposal addresses the procedure for replacing the existing racks with the new racks. Neither the old racks or the new racks will be transported over the locations

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which contain stored spent fuel, thus eliminating the potential for a drop accident involving the racks. The actual procedure for replacing the racks, as described by the licensee, is summarized below.

1. The spent fuel (which at that time will total 368 assemblies) will be stored in the southern end of the pool (Figure 1).
2. The eight northernmost racks in the spent fuel pool will be removed, one by one, from the north end of the pool. These racks will be empty and will be removed one at a time, northernmost first. Where these racks are adjacent to racks which contain fuel assemblies, the empty racks will be raised slightly and translated at least the width of the rack to the north, away from the partially filled rack, before they are lifted out of the pool.
3. Eight new absorber racks will be placed in the north end of the pool. They will be emplaced northernmost first, one by one. As Figure 2 shows, four of these racks will be a 10' x 10' configuration, three will be 10' x 11', and one will be 5' x 10'.
4. Using normal fuel handling procedures, the 368 stored fuel assemblies will be transferred to the four northernmost new absorber racks.
5. The remaining nine large and three small racks will be removed, one by one, over the west side of the pool.
6. The remaining 16 new absorber racks will be installed, one by one, northernmost first, from the west side of the pool.

The fuel handling procedure to be employed is the normal procedure as described in the Zion Final Safety Analysis Report (FSAR) and is not affected by this modification.

Additional handling of fuel assemblies during installation of the racks will increase the probability of a fuel assembly drop, but the consequences will not increase and will actually be less than the consequences of dropping an assembly freshly removed from the reactor, the design basis fuel handling accident addressed in the staff's Safety Evaluation related to operation of the Zion Station, dated October 1972. This postulated fuel bundle drop and the consequences of such an accident are below the limits of 10 CFR 100. Furthermore, the consequences of all known credible accidents were evaluated and reviewed at the operating licensing stage and reported in the FSAR, and they are unchanged by this proposed modification.

Based on the review of the licensee's procedure for installation of the racks, there is no possibility of the racks sliding or tipping near any fuel. Sliding and tipping of the racks is a consequence of a seismic event and is addressed in Section 2.4.1 of Staff's Safety Evaluation related to the proposed modification. Analysis showed that during the safe shutdown earthquake minimal sliding of the racks would occur, but tipping would not.^{1/}

Regarding swelling of the new fuel storage racks, it is my opinion the licensee's action in venting the cells has virtually eliminated the possibility^{2/} of any swelling, and therefore eliminated the possibility of stuck fuel assemblies.

^{1/} The potential for sliding or tipping of new fuel racks during installation is addressed in the supplemental testimony of J. E. Kohler on Contention (2)(f)(2).

^{2/} Swelling of the racks will be discussed in greater detail by NRC Staff witness Edward Lantz, addressing Contention (2)(j)(3).

In the unlikely event that swelling should occur, the affected storage location could be revented thereby releasing any trapped gas and alleviating pressure on any stuck fuel assembly. Also, tests have been performed by Exxon Nuclear ^{3/} indicating that no damage to fuel would be expected in the event of swelling.

It is my opinion that the proposed modification does not give rise to any previously unreviewed credible accident scenarios and that the proposed procedure for replacing the spent fuel racks at Zion is adequate to prevent accidental damage to spent fuel in the pool during the installation of the modified racks.

^{3/} Public Service Electric and Gas Company letter to Mr. A. Schwencer, NRC, dated October 31, 1978.

PROFESSIONAL QUALIFICATIONS
OF
JOHN J. ZUDANS

My name is John J. Zudans. I am currently employed by the U. S. Nuclear Regulatory Commission as a Senior Mechanical Engineer, Engineering Branch, Division of Operating Reactors, Office of Nuclear Reactor Regulation.

My duties and responsibilities include the review and evaluation of structural, mechanical and material aspects related to safety issues involving nuclear reactor facilities licensed for operation.

I am also the coordinator for all spent fuel pool modification reviews in the Engineering Branch. In this capacity, I am responsible for maintenance of the Branch Technical Position on spent fuel pool modifications and the maintenance of continuity for all reviews within the branch. I am a graduate of Villanova University with a Bachelor of Science degree (1970) in mechanical engineering. I am also attending the University of Maryland towards a masters degree in mechanical engineering.

Prior to my present appointment, I was employed by Stone & Webster Engineering Corp., Cherry Hill N. J. (1974-1976) and Ingersoll-Rand Co., Phillipsburg N. J. (1972-1974).

My duties as a Principal Engineer at Stone & Webster included the design and analyses of spent fuel pool liners, containment liners and attachments thereto, for new nuclear facilities. I worked on the Niggara Mohawk Nine Mile Unit 2, and River Bend, Units 1 and 2, nuclear facilities.

While employed at Ingersoll-Rand Co., my duties included the design, analysis of certain pumps used in the U. S. Navy nuclear submarine program.

Professional Societies

American Society of Mechanical Engineers.