

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

DOCKETED
USNRC

In the Matter of
Philadelphia Electric Company
(Limerick Generating Station
Units 1 and 2)

Docket Nos. 50-352 o84 MAR 16 A10:57
50-353 o1

March 14, 1984.

OFFICE OF SECRETARY
DOCKETING & SERVICE
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Intervenor Lewis' MOTION FOR NEW CONTENTION BASED ON IE NOTICE NO. 84-17.

INTRODUCTION

On 3-10-84, Intervenor Lewis received IE Notice No. 84-17 : Problems With Liquid Nitrogen Cooling Components Below the NIL Ductility Temperature, issued 3-5-84. The Notice contained very new information which was not previously available to Intervenor Lewis or any public source to which Intervenor Lewis had access or knowledge. Specifically, the very new information in IE Notice No. 84-17 is the cause of the "Cracks in BWR Mark I Containment Vent Headers" which were described in IE Notice No. 84-01.

IE Notice No. 84-17 describes problems which can occur at Limerick Nuclear Power Plant. The reason that IE Notice No 84-17 relates to Limerick is that

1. IE Notice refers specifically to BWR owners and operators. Limerick is a BWR.
2. The Notice refers to Mark I containment. Limerick is a Mark series containment which is similar to the Mark I containment in many respects.
3. The notice refers to systems and parts that are presently incorporated in the Limerick design, Containment, inerting, vent headers.
4. The Notice specifically broadens the area of concern to include many applications:
"Licensees who have used liquid nitrogen (or other potentially very cold fluids) in applications where the fluid could come in contact with safety-related components subject to brittle fracture should consider inspecting these components for possible indication of cracks."
5. This information is very new and has not been incorporated in design. The potential for a financially strapped utility to hurry construction and operation to avoid design changes is very attractive. PECO, the owner of Limerick, has been referred to in the papers and in its own rate filings as having less than the "best" bond ratings.

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Background

This motion stems from the concern that Intervenor Lewis has with the potential for Pressurized thermal shock in the Limerick Boiling water reactors (BWRs.) One of the conditions necessary for pressurized thermal shock to present a problem not incorporated in the design is that some or all of the material involved in the pressurized thermal shock be below its NIL ductility temperature and therefore in a brittle condition. Intervenor incorrectly limited his previous concern to the RPV only and also incorrectly assumed that the only way that any material would be chilled to the or below the NIL ductility temperature is by having the NIL ductility temperature raised by the action of neutron flux.

IE Notice 84-17 shows that the RPV is not the only system wherein the temperature can go below the NIL ductility temperature in normal operation and that the RPV wall is not the only system that can be so affected. Therefore, Intervenor raises a contention with a much broader area of concern than just the RPV wall and a much more potential for decreasing temperature below the NIL ductility temperature than those materials so affected by neutron flux. Due to these considerations of the breadth of affected systems and potential for lowering temperature into the brittle range below the NIL ductility temperature, the definition of pressurized thermal shock as previously proposed by the NRC staff will not suffice for all possible problems. The contention will still include the area and concern of pressurized thermal stress as PTS is a distinct subset of problems caused by lowering the temperature of an affected material below its NIL ductility temperature.

As previously discussed in Contention I-62, NIL ductility temperature is the temperature at and below which a material, usually metal, experiences an abrupt decrease in its toughness and, sometimes, ductility properties. Specifically, the liquid which caused the cracking problems at Hatch No 2 was liquid nitrogen, which is sufficiently cold to lower most materials below their NIL ductility temperature. Liquid nitrogen is used to inert the containment during operation and accident conditions. Much of the liquid nitrogen system is safety related. As safety related equipment, the liquid nitrogen system must pass engineering and NRC reviews. However, these reviews are limited to known quantities. Also some parts of the liquid nitrogen system are not reviewed in depth as these parts are not considered safety related. Previously placement of the liquid nitrogen lines were not considered a safety related problem. IE Notice No 84-17 mentions how placement does become a safety related problem, "where the fluid could come in contact with safety related components subject to brittle fracture." Further the IE Notice does not limit itself to liquid nitrogen; but also, includes "(or other potentially very cold fluids)." Therefore all potentially very cold fluids and their placement in the containment should be looked at from the viewpoint of safety.

How Limerick can be affected.

Any area or component that is in close proximity to a liquid nitrogen line or a potentially very cold liquid is in danger of being chilled below its NIL ductility temperature. Design stress, which is not presently required to meet the low toughness inherent in decreasing the temperature below the NIL ductility temperature, could easily break the chilled part. Since this is a new concern based on new material and information only known for a few days, there is little likelihood that the design of Limerick is presently designed to take into account this new information from IE Notice 84-17. Depending on the component/system, a distinct and present danger exists that a Class 9 accident could ensue endangering the public health and safety.

This concern is further aggravated by the conditions at Limerick and the financial condition of PECO.

1. In answer to Frank Romano's interrogatories on welding, the Applicant gave statements that some welds had been inspected which later the Applicant admitted were not inspected. From this change in Applicant's statements, Applicant can be seen to have a very fluid view of what is happening at the site. Therefore, admonitions from the Applicant cannot be taken at face value for this grave concern.
2. Due to the limited help that I gave Mr Romano with his Contention and the work that I put into the room PECO provided containing answers to intervenor interrogatories, I found that there were many engineering change orders and field change orders that did not appear to have full followup. This will make determining actual routing of liquid nitrogen lines and lines containing potentially very cold fluids very difficult.
3. Limerick Unit 1 is very near to fuel loading. Fuel has already been moved onto the site. There is also a big push on the part of PECO to operate the Unit soon. The push to operate is predicated upon a law in Pennsylvania that a utility may not charge customers or ratepayers for a plant until it is "used and useful." Used and useful is considered equivalent to producing electricity. PECO is paying a lot of overtime on the Limerick site right now. Putting Limerick on line would aid PECO's financial picture as PECO could then petition the PA PUC to put PECO's Limerick in the rate base. All these financial considerations weigh against PECO doing a timeconsuming but necessary evaluation to assure the health and safety of the public against any problems associated with this very new concern of components being cooled below their NIL ductility temperature by potentially very cold fluids.

Conclusion.

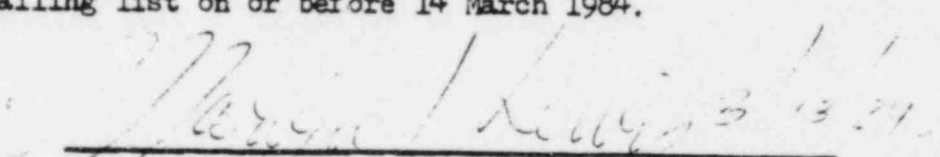
Therefore ,Intervenor respectfully submits a new contention for the consideration of the Atomic Safety and Licensing Board:

The Limerick Generating Station Units 1 and 2 design is deficient because liquid nitrogen or other potentially very cold fluids can cool vital components of the plant below the NIL ductility temperature of the susceptible materials of which they are manufactured.

Basis

IE Notice No 84-17 describes a particular problem of cracking in the vent header at Hatch no 2 caused by liquid nitrogen cooling the vent header material below its NIL ductility temperature. The IE Notice goes on to generalize the concern to all liquid nitrogen lines and potentially very cold fluids. This concern is very new and not included in the SER or any other pertinent document in this instant proceeding. The problem is further compounded by actions on the part of the Applicant that demonstrate its rush to completion and operation for reasons that are not related to safety.

I have sent this out to the entire mailing list on or before 14 March 1984.


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