

January 21, 1987

AEOD/E701

MEMORANDUM FOR: Richard Vollmer, Deputy Director  
Office of Nuclear Reactor Regulation

FROM: Frederick J. Hebdon, Deputy Director  
Office for Analysis and Evaluation  
of Operational Data

SUBJECT: POTENTIAL CONTAINMENT AIRLOCK WINDOW FAILURE DUE  
TO RADIATION

Enclosed for your consideration is an engineering evaluation report on potential containment airlock window failure due to radiation. This issue was identified at the D. C. Cook plant based on a vendor report in which the airlock windows shattered under beta radiation test conditions. Because of the uncertainty associated with the applicability of the test results to postulated events at D. C. Cook, the licensee decided to install a 3/8-inch thick cover plate over the inner airlock windows to eliminate the potential for beta radiation of the windows.

Our investigation found that airlock windows are used at other plants and that failure of the windows could compromise containment integrity following design basis accidents or core-melt accidents. We found that the beta dose rates used in the tests were significantly higher than those anticipated for LOCAs and core-melt events; however, we were not able to determine the precise combination of causal factors leading to the window failure. Therefore, there is uncertainty whether the windows would in fact maintain their integrity at the lower dose rates anticipated for potential reactor accidents. This uncertainty is consistent with the findings of a recent IE vendor inspection report on Enerfab, Incorporated (the airlock manufacturer).

As part of our review, we also found information that indicated that there may be some degradation in the fracture strength for windows receiving a high integrated gamma dose. Even though this degradation does not reduce the window capability to below the containment design pressures, it may adversely affect the window pressure capability during severe core damage accident scenarios.

In view of these recently received test results, we suggest that the Office of Nuclear Reactor Regulation obtain and review additional information and to verify the acceptability of airlock windows with respect to design basis and severe accidents.

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We have not directly suggested eliminating the window because there may be other data sources available to assuage the uncertainty associated with this issue. On the other hand, the low cost of eliminating the window does not warrant a large research effort.

If you have questions or comments, please do not hesitate to contact me or Sandy Israel (X24438) of my staff. We shall be happy to meet with you or your staff to discuss this matter.

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Frederick J. Hebdon, Deputy Director  
Office for Analysis and Evaluation  
of Operational Data

Enclosure:  
As Stated

- cc w/enclosure:
- D. Wigginton, NRR
- W. Farmer, RES
- E. Merschoff, IE
- J. Stone, IE
- G. Holahan, NRR
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