

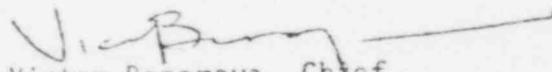
NOV 2 1982

MEMORANDUM FOR: L. G. Hulman, Chief
Accident Evaluation Branch, DSI

FROM: Victor Benaroya, Chief
Chemical Engineering Branch, DE

SUBJECT: ACRS LETTER ON CONTROL ROOM HABITABILITY, MEMORANDUM
DATED OCTOBER 19, 1982

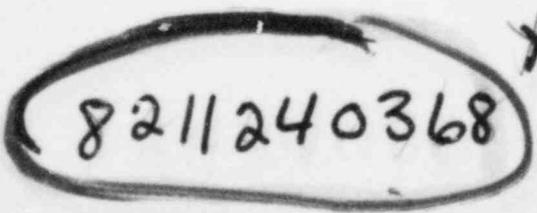
Attached is our response to ACRS Recommendation Number Seven, Leak Tightness of Fire Dampers and Reliability of Fire and Smoke Detectors. We do not believe we have any direct involvement in the preparation of responses one (Control Room HVAC System) and four (Qualification of Personnel for Evaluating Control Room HVAC Systems). F. Nolan will be available to assist you with any questions which may arise.


Victor Benaroya, Chief
Chemical Engineering Branch
Division of Engineering

Attachment:
As Stated

cc: w/attachment
W. Johnston
W. Houston
L. Rubenstein
T. Speis
R. Ferguson
T. Wambach
F. Nolan
S. Pawlicki
T. Sullivan

XA Copy Has Been Sent to PDR


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XA

ATTACHMENT

ACRS RECOMMENDATION NUMBER SEVEN

7. Our response for this question is concerned with the response time and leak tightness of fire dampers and the reliability of smoke and fire detectors. Specific responses for each of these items are as follows:

A. Criteria for Response Time and Leak Tightness of Fire Dampers

To our knowledge, there have been no studies conducted to date, which have specifically addressed the question of fire damper reliability. However, our experience with the design and installation of fire dampers permits us to make some relevant observations. In general, fire damper operation is caused by the melting of an eutectic alloy fusible link which releases the damper. The damper is then free to close either from the force of gravity or due to the force of a spring. On a relative scale, the reliability of a fusible link operator on a fire damper should be roughly equivalent to the reliability of a fusible link on an automatic sprinkler head since they both work on the same principle. Additionally, samples of fire dampers that are approved by Underwriters' Laboratories must pass a reliability test. The Underwriters' reliability test (UL 555 - Fire Dampers and Ceiling Dampers) requires a damper to be subjected to a cycling test, a salt spray corrosion test, and a dust loading test.

B. Leak Tightness of Fire Dampers

Fire dampers are normally installed to close in the direction of air flow. If the damper has been correctly installed, it should be capable of closing while the ventilation system is operating. If this occurs, the majority of air flow will be stopped by the fire damper. Because a fire damper is designed to prevent the spread of fire, not smoke, a

Small amounts of heat, light, and smoke can pass through a fully closed fire damper. Depending on the nature and location of a fire, it is possible that an amount of smoke could leak into the control room, even if all fire dampers have functioned properly.

C. Reliability Requirements for Smoke and Fire Detectors Used in Control Rooms

Fire and smoke detection systems are considered to be state-of-the-art equipment that is recommended by fire protection engineers for installation in typical industrial applications that have proven themselves on the long run. Therefore, we have no reason to believe that specialized fire detection equipment should be required for nuclear power plant control rooms. The reliability philosophy associated with the use of conventional fire detection systems is consistent with the reliability philosophy that prevails for other safety related systems and components, such as reactor safety systems and scram circuits. In all cases, we rely on redundant circuits and components to achieve the required degree of reliability.

D. The Following Comments Relate to this Matter:

1. For all new plants, intake air to the control room is directly from the outside. Therefore, a fire should not affect the control room air if the ventilation system is properly designed.
2. The control rooms are under positive pressure if the ventilation system is properly designed.
3. In order to have deleterious air inside the control room, the fire damper either has to fail or not completely seal.

For those cases where the fire fails completely, there will be some time delay before the temperature and/or combustion products can affect components in the control room. During this period, actions can be initiated to safely shut down the plant from outside the control room. In addition, the operators can wear breathing apparatus if needed.