

January 28, 2003

NOTE TO: FILE

FROM: Daniel M. Frumkin, SPLB/DSSA/NRR */RA/*

SUBJECT: RECORD OF TELEPHONE CALL WITH FIRE BARRIERS TASK TEAM

On January 28, 2003, one member of the NRC staff (Daniel Frumkin) had a telephone discussion with Vern Patton of First Energy and Harold Lefkowitz of Duke Energy to discuss team input to the quantitative fire protection significant determination process (SDP) as part of the reactor oversight processes (ROP). A task description was developed by SPSB (Attachment 1) and this was used as a reference for this telephone call.

Mr. Frumkin lead the discussion to answer the questions. It was generally agreed that a minimum of three degradation levels were appropriate. Mr. Patton believed that a method could be developed to have a continuum of degradations levels, rather than three discrete levels. The existing degradation criteria was discussed briefly.

Mr. Lefkowitz commented that fire barrier performance is dependant on fire severity and also dependant on fire barrier material type.

Development of a screening methodology was not discussed.

Mr. Patton will continue to work on a continuum approach to quantitative fire damage. Mr. Lefkowitz will work with Mr. Patton to ensure that fire severity and material are considered. Mr. Frumkin will continue to work on the criteria/indication.

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Attachment 1:

Team Assignments
Team D: Fire Barrier Team
1/14/03

Lead Coordinator: Dan Frumkin, 301-415-2280, dxfl@nrc.gov

Overview of Assignment

The fire barrier team must determine how findings related to fire barriers will be treated. This involves the following activities:

1. Define degradation ratings for fire barriers (including raceway fire barriers and primary fire barrier elements such as walls, ceilings, floors, etc.).
2. Determine the performance time of a degraded fire barrier system (e.g., consistent with the degradation ratings).
3. Determine if a screening approach can be applied to fire barrier failure scenarios

Team Task: Define Fire Barrier Degradation Ratings

The Fire Barrier Team must define degradation levels and criteria applicable to a degraded fire barrier systems. Key questions/issues:

1. How many degradation levels are to be defined (two or three)?
2. What are the criteria/indicators for each degradation level?

Team Task: Performance of Degraded Fire Barriers

Degradations or inadequacies in fire barriers come into play in the analysis of fire growth and damage times. In particular, raceway fire barriers are relevant to FDS2 scenarios, and inter-compartment fire barriers are relevant to FDS3 scenarios. The team must determine how much credit will be given to a degraded fire barrier element. Key questions/issues:

1. Nominally, fire barriers will be assigned a performance time to reflect how long a fire barrier will last given a challenging fire exposure. Is this approach viable?
2. We need to correlate the qualitative degradation ratings to an anticipated fire performance time for the fire barrier.
 1. A table of values is needed that would correlate the qualitative degradation rating to the performance time for the fire barriers of interest.
 2. Potentially, this could be expressed in absolute terms: e.g., a highly degraded one hour barrier lasts 5 minutes
 3. It may also be possible to state the performance in relative terms - e.g., high degradation implies a 90% degradation in performance time so that a 1 hour barrier is now a 6 minute barrier.

3. The barrier team should decide if, and if so how, fire barriers should be grouped, and then establish quantitative measures of the degraded performance in the context of time to reach FDS2 or FDS3 given a challenging fire.
4. Are the barrier performance times dependent on the fire scenario? In general we need a fire scenario sufficient to threaten the barrier, so the answer here may be no - assume that a threatening fire scenario is a prerequisite.

Team Task: Fire Scenario Screening Approach

It may be desirable to develop a screening approach that would eliminate the need for analysis of some FDS2 and/or FDS3 scenarios (those that involve failure of a fire barrier element). For example, if fire barriers are not degraded, then they will receive full credit, and the likelihood of their failure will be low. Risk may well be dominated by the single compartment fire scenarios and/or fire scenarios that lead only to damage to exposed (non-fire barrier protected) cables and components.

In such cases it would be desirable to screen such scenarios rather than to perform a more detailed quantification. This task logically falls to the fire barrier team. Key questions/issues:

1. Is an FDS2/3 screening approach feasible?
2. Under what conditions should the approach apply?
3. What would be the screening criteria?

Note that methods such as the FIVE FCIA analysis approach might offer a starting point for a strawman approach.