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UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D. C. 20555

MAY 20 1980

Generic Task No. A-17

MEMORANDUM FOR: K. Kniel, Chief  
Generic Issues Branch, DST

THRU: P. Norian, Section Leader  
Generic Issues Branch, DST

FROM: J. Angelo, Task Manager A-17  
Generic Issues Branch, DST

SUBJECT: SUMMARY OF MEETING WITH SANDIA NATIONAL LABORATORIES TO  
DISCUSS FURTHER TECHNICAL ASSISTANCE ON TASK A-17

Members of the NRC staff met with representatives of Sandia National Laboratories in Bethesda, Maryland on May 14, 1980 to discuss further technical assistance on Generic Task A-17, Systems Interaction in Nuclear Power Plants. The principal item of discussion concerned the need to demonstrate the effectiveness of the fault tree analysis in revealing systems interactions. This need arises from the ACRS Subcommittee on Plant Arrangements which reviewed the results of Phase I at its meeting on February 20, 1980 and expressed some reservations about the effectiveness of the work and suggested that we demonstrate the methods. The other principal item of discussion was related to follow-on studies of systems interaction. Persons who attended the meeting are listed in Enclosure 1 to this summary report. The main points of discussion are summarized in the following paragraphs.

We mentioned again, as we have several times in the past, that one of the major problems is the fact that the ACRS concerns that are characterized under the generic umbrella of "systems interaction" covers virtually the entire range of NRC actions. Also, nearly any event that could possibly occur in a power plant will fit someone's definition of an interaction. This being the case, it is important to make some kind of decision about what is a system interaction and under what NRC action item or review element or review organization unit the particular class or category of event is covered. We concluded that we needed to give more thought and consideration to this aspect of the generic problem as part of the demonstration of effectiveness of the method of analysis used in Phase I.

As a point of fact, Sandia Laboratories considered Phase I itself as a demonstration vehicle to convey the usefulness or effectiveness of the deductive method of systems analysis referred to as the fault tree method. We did not expect in Phase I to answer or identify all the interactions that are possible. Now, apparently, we have not yet made a successful demonstration. Our discussions with Sandia Laboratories representatives were intended to further develop a demonstration of the method before we extend the method of analysis into other areas of potential systems interaction such as human errors, accident conditions, extreme environmental conditions, etc.

Another important item is to resolve the basic question of what kinds of events we seek to prevent or minimize; that is, what events should be considered for the "top event" of a fault tree analysis. Here we have an infinity of events that could range all the way from core melt to failure of the normal feedwater system (or any other normal system which then challenges the shutdown systems). Here again, we need to give more consideration to what events we are going to use as the top events of fault tree method.

Jack Hickman (Sandia Laboratories) presented a discussion of systems interaction that is depicted in the charts of Enclosure 2. In the first chart of Enclosure 2, Mr. Hickman lists the areas that Sandia Laboratories discerns as ACRS concerns taken from the meeting of February 20, 1980 with the ACRS Subcommittee on Plant Arrangements. The following chart depicts the specific area covered by Phase I fault trees for a specific case.

Sandia Laboratories will rescope the program proposal for the immediate concern of demonstrating the effectiveness of Phase I and will present the new scope within about two weeks.



John Angelo, Task Manager A-17  
Generic Issues Branch  
Division of Safety Technology

Enclosures:

1. Attendance List
2. Systems Interaction Discussion

cc: J. Hickman  
Division 4412  
Sandia National Laboratory  
P. O. Box 5800  
Albuquerque, NM 87185

ENCLOSURE 1

Attendance List

Meeting with Sandia National Laboratories

on

Generic Task No. A-17  
"Systems Interaction in Nuclear Power Plants"  
May 14, 1980

Sandia National Laboratories

D. J. McCloskey  
J. Hickman

NRC

K. Kniel, NRR  
J. Stolz, NRR  
P. Morian, NRR  
T. Scarbrough, OSD  
D. Zukor, ACRS  
J. Angelo, NRR

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