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Docket No.: 52-003

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Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, DC 20555

ATTENTION: T. R. QUAY

SUBJECT: REVISION OF FSER OPEN ITEM 410.413F

Dear Mr. Quay:

Attached is Revision 1 of our response to FSER open item 410.413F. It has been changed in response to a request from the NRC staff. This response is identical to the copy sent to the staff for review. The status for this open item (OITS # 6431) will be changed to closed.

Please contact D. A. Lindgren at (412) 374-4856 if you have any questions.

Brian A. McIntyre, Manager
Advanced Plant Safety and Licensing

jml

Attachment

cc: J. M. Sebrosky, NRC (w/Attachment)
N. J. Liparulo, Westinghouse (w/o Attachment)

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410.413F (OITS #5431)

Design basis events are routinely evaluated and addressed by plant design and procedures. When the design basis threat has been addressed, less-than-design-basis events may then become the worst-case events and their impact should be evaluated to ensure that the consequences are bounded by the design-basis event analysis. These type of events may result in conditions not readily seen, considered, or properly addressed. In such cases, it may be prudent to revisit previous assumptions about the adequacy of plant design and procedures.

With regard to protection against fluid system pipe failures for high- and moderate-energy piping, AP600 analysis needs to properly consider the above type of event. (Maine Yankee Event Report 97-009-01 provides information concerning an operating plant occurrence that illustrates the staff's concern.)

Response *(Revision 1)*:

The event referred to above involved the potential for a crack in a moderate energy line and resultant environmental conditions in an area in the turbine building that had not been considered for environmental qualification because there were no high energy line breaks in the area. This situation is not applicable to the AP600. The turbine building, annex building, and the radwaste building do not contain safety-related systems or components.

The safe shutdown systems and components required to mitigate a pipe break in the AP600 are located on the nuclear island. These systems and components are located in containment and to a limited extent in the auxiliary building. The safe shutdown equipment inside containment is environmentally qualified for the effects of a design basis accident. Table 3.6-2 identifies the compartments and high energy breaks that are postulated as the source of hot, high pressure fluid. This table also identifies compartments outside containment that have hot, high energy line breaks. The environmental effects of high energy line breaks on safe shutdown systems and components in these areas bound the effects of moderate energy line breaks.

There are limited areas in the auxiliary building with safety-related equipment in the vicinity of only moderate-energy lines. The safety-related components to be evaluated are isolation valves and penetrations in compartments where the containment isolation valves for moderate energy systems are located and the valves in the PCS valve room. Cracks are postulated in safety-related and nonsafety-related moderate energy lines. Temperature and high humidity effects do not have to be considered for a moderate energy break. The environmental effects of a moderate energy break or crack are a result of the spray of water on equipment. The potential for spray effects is evaluated as part of the flooding analysis. The fire protection system piping is routed through corridors and stairwells that do not contain safety related equipment and is not a postulated source of environmental effects. The effects of spray from fire fighting efforts is considered as part of the fire evaluation.

Safety-related, active valves subject to a water spray due to a crack or break in a moderate energy line are qualified to operate in the presence of the spray. The valves qualified for the environmental effects of high-energy line breaks do not require a separate qualification for the effect of water sprays. These valves are expected to survive the spray experienced due to a crack in a moderate-energy line.

There are limited considerations for breaks and components in the turbine building. See subsections 3.6.1.2.2 and 3.6.1.3.3 for additional discussion. Environmental qualification is not required for these considerations.

With regard to protection against postulated failures for high- and moderate-energy piping, AP600 analysis has properly considered a spectrum of pipe sizes to encompass pipe failure scenarios whose consequences could exceed those for the worst-case as identified by design-basis event results.

SSAR Revision:

In Table 3.11-1 note that the following valves and associated limit switches and solenoid valves are qualified for water spray from a moderate energy crack. (Add an "S" to the last column.)

CAS PL V014
CCS PL V200
CCS PL V208
CVS PL V047
CVS PL V090
PCS PL V001A
PCS PL V001B
PCS PL V002A
PCS PL V002B
PSS PL V011
PSS PL V023
PSS PL V046
PXS PL V042
RNS PL V011
RNS PL V022
SFS PL V035
SFS PL V038
VFS PL V003
VFS PL V010
VWS PL V058
VWS PL V086
WLS PL V057
WLS PL V068

Revise note 6 in Table 3.11-1 to add the following:

S = Qualified for operation with spray from a moderate-energy pipe crack or spray from a cold high energy pipe crack.