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NSD-NRC-97-4929
DCP/NRC0696
Docket No.: STN-52-003

January 2, 1997

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

ATTENTION: T. R. QUAY

SUBJECT: AP600 RESPONSE TO REQUESTS FOR ADDITIONAL INFORMATION


Dear Mr. Quay:

Enclosed are Westinghouse responses to NRC requests for additional information pertaining to the AP600 conditional containment failure probability distribution, which is documented in Chapter 42 of the AP600 Probabilistic Risk Assessment report.

The responses close, from a Westinghouse perspective, the addressed questions. The NRC technical staff should review these responses. The status of these RAIs will be changed to "Action N" in the OITS.

A listing of the NRC requests for additional information responded to in this letter is contained in Attachment A.

Please contact Cynthia L. Haag on (412) 374-4277 if you have any questions concerning this transmittal.


Brian A. McIntyre, Manager
Advanced Plant Safety and Licensing

/jml

Enclosure

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

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Enclosure to Westinghouse
Letter NSD-NRC-97-4929

January 2, 1997

NRC REQUEST FOR ADDITIONAL INFORMATION



Question: 480.193 Containment Pressure Capacity

Explain how the best estimate failure pressure, cutoff pressure, and variance values are used to develop the probability distribution function for each containment structure. Provide the resulting mathematical expression (failure probability as a function of pressure) for each containment structure/component (cylindrical shell, containment head, hatches, and key penetrations). Describe the mathematical construction of the overall cumulative failure probability curve.

Response:

Revision 8 of the AP600 PRA uses a Lognormal distribution as the basis for assessing the containment fragility due to internal pressure and temperature following a core damage accident (see Chapter 42 of the AP600 PRA). The information requested in this RAI is provided in Chapter 42 of the AP600 PRA to assess the containment fragility.

PRA Revision: None.

NRC REQUEST FOR ADDITIONAL INFORMATION



Question: 480.194 Containment Pressure Capacity

Provide the basis for using 85 percent of the lower bound estimate of the containment failure pressure as the cutoff pressure, below which the probability of containment failure is zero.

Response:

Revision 8 of the AP600 PRA uses a Lognormal distribution as the basis for assessing the containment fragility due to internal pressure and temperature following a core damage accident (see Chapter 42 of the AP600 PRA). The information requested in this RAI is provided in Chapter 42 of the AP600 PRA to assess the containment fragility.

PRA Revision: None.

NRC REQUEST FOR ADDITIONAL INFORMATION



Question: 480.195 Containment Pressure Capacity

Modelling uncertainties appear to have been neglected in estimating the standard deviation/variance for the structures, even though these have been found to be important for other containment designs. Provide the mathematical expression for the overall cumulative failure probability curve and a tabulation of failure probability versus pressure based on explicitly including the contribution of modelling uncertainties.

Response:

Revision 8 of the AP600 PRA uses a Lognormal distribution as the basis for assessing the containment fragility due to internal pressure and temperature following a core damage accident (see Chapter 42 of the AP600 PRA). The information requested in this RAI is provided in Chapter 42 of the AP600 PRA to assess the containment fragility.

PRA Revision: None.

NRC REQUEST FOR ADDITIONAL INFORMATION



Question: 480.196 Containment Pressure Capacity

The Weibul distribution, in conjunction with the selected pressure cutoff values, is less conservative than a lognormal distribution at the low pressure tail. Provide an assessment of the impact on results (CCFP and frequency of large release) if a lognormal distribution with uncertainties was used in lieu of the Weibul distribution (sensitivity calculation).

Response:

Revision 8 of the AP600 PRA uses a Lognormal distribution as the basis for assessing the containment fragility due to internal pressure and temperature following a core damage accident (see Chapter 42 of the AP600 PRA). The information requested for the Weibull distribution in this RAI is provided in Chapter 42 of the AP600 PRA for the lognormal distribution used to assess the containment fragility.

PRA Revision: None.

Attachment A to NSD-NRC-97-4929
Enclosed Responses to NRC Requests for Additional Information

Re: PRA Chapter 42

480.193

480.194

480.195

480.196