AECL

TECHNOLOGIES INC.

April 30, 2004

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Your File: Project No. 722

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

Attention: Ms. B. Sosa
               Project Manager, ACR

References:
   1. Letter V.J. Langman to B. Sosa, "Response to NRC's Requests for Additional Information (RAIs) #4 on PRA Analysis Basis", April 15, 2004.
   2. E-mail J. Kim to V. Langman, "ACR-700 RAI #5 PRA Analysis Basis", January 20, 2004.

Re: **Responses to NRC's RAIs 68, 71, and 83 on PRA Analysis Basis**

Further to our response (Reference 1) to NRC's request for additional information set # 4 on PRA analysis basis (Reference 2) and in support of the NRC's pre-application review of the ACR (i.e., specifically focus topic # 11 - ACR PRA Methodology), attachment 1 provides AECL's responses to RAIs # 68, 71, and 83.

If you have any questions on this letter and/or the enclosed material please contact the undersigned at (905) 823-9060 extension 6543.

Yours sincerely,

Vince J. Langman
ACR Licensing Manager

/Attachment:
   1. Responses to RAIs 68, 71, and 83 on PRA Analysis Basis

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Attachment 1
(Letter V. Langman to B. Sosa, "Responses to NRC's RAIs 68, 71, and 83 on PRA Analysis Basis", April 30, 2004)

Responses to RAIs 68, 71, and 83 on PRA Analysis Basis

AECL's responses to NRC's requests for additional information #68, #71 and #83 on PRA Analysis Basis are provided in italic fonts following each of the NRC's questions as follows:

68.   Section 5.5.3.2, Table 5-1, Page 5-12: Since human factors are presumed to be addressed in the HRA, they have been removed from the CCF analysis. Has the denominator used to develop the beta factor (the value of 50000) been adjusted/renormalized to remove the human factor contributions? (Otherwise, the beta factor estimates would consistently be too low.)

AECL Response:
We acknowledge that the approach of dealing with Man Machine Interface (MMI) specified in the UPM manual may introduce double counting of certain types of operator errors in the PSA model. Based on the limited information available on how the denominator of 50000 is derived, we are not in the position to modify the value of the denominator. Therefore, we will consider the lowest MMI sub-factor in the estimation of overall Beta factor. This section will be revised.

71.   General: The NRC staff presumes that the ACR-700 design will utilize state-of-the-art digital control and instrumentation systems. How will software reliability and CCF potential in digital systems be addressed in the PSA?

AECL Response:
Software reliability is not addressed in the PSA. Software reliability is addressed in the software QA program, in terms of design, implementation, and exhaustive testing. For the time being, modeling of the digital control will be treated as a "black box".

The design team believes channelization, separation, and provision of application dependent qualification (EQ and seismic), adequately cover the issue. Therefore CCF for distributed control is not modeled in the PSA because distributed control is treated as a single undeveloped event.

83. Section 10.1, Page 10-1: AECL should perform uncertainty calculations for each plant damage state (PDS), the limited core-damage frequency (LCDF), the severe core damage frequency (SCDF), the large release frequency (LRF), and the conditional containment failure probability (CCFP).

AECL Response:
AECL agrees to perform statistical uncertainty analysis for SCDF, LCDF and LRF. AECL will not perform statistical uncertainty analysis for CCFP because it is included in the LRF uncertainty analysis.