April 23, 2004

Mr. Vince Langman
ACR Licensing Manager
Atomic Energy of Canada Limited (AECL) Technology, Inc.
481 North Frederick Avenue, Suite 405
Gaithersburg, MD 20877

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION ON THE ON-POWER FUELING - ACR-700 PRE-APPLICATION REVIEW (TAC NO. MB5765)

Dear Mr. Langman:

Atomic Energy of Canada Limited (AECL) submitted a formal request for a pre-application review of the Advanced CANDU Reactor (ACR-700) design June 19, 2002.

The Nuclear Regulatory Commission (NRC) staff is reviewing technical information provided by AECL as part of the ongoing pre-application review activities for the ACR-700 design. The NRC staff has determined that additional information is necessary to continue the review. The requests for additional information (RAIs) are included in the enclosure. The topic covered in these RAIs include the on-power fueling for ACR-700. An advanced copy of the RAIs were sent to you via electronic mail on March 30, 2004. On April 20, 2004, AECL participated in a teleconference with the staff to discuss the content of the RAIs and agreed to provide the ACR-700 information requested in the RAIs by May 3, 2004.

If you have any questions or comments concerning this matter, you may contact the undersigned at (301) 415-4125 or jsk@nrc.gov.

Sincerely,

/RA/

James Kim, Project Manager
New Reactors Section
New, Research and Test Reactors Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Project No. 722

Enclosure: As stated

cc: See next page

April 23, 2004

Mr. Vince Langman
ACR Licensing Manager
Atomic Energy of Canada Limited (AECL) Technology, Inc.
481 North Frederick Avenue, Suite 405
Gaithersburg, MD 20877

SUBJECT: REQUESTS FOR ADDITIONAL INFORMATION ON THE ON-POWER FUELING - ACR-700 PRE-APPLICATION REVIEW (TAC NO. MB5765)

Dear Mr. Langman:

Atomic Energy of Canada Limited (AECL) submitted a formal request for a pre-application review of the Advanced CANDU Reactor (ACR-700) design June 19, 2002.

The Nuclear Regulatory Commission (NRC) staff is reviewing technical information provided by AECL as part of the ongoing pre-application review activities for the ACR-700 design. The NRC staff has determined that additional information is necessary to continue the review. The requests for additional information (RAIs) are included in the enclosure. The topic covered in these RAIs include the on-power fueling for ACR-700. An advanced copy of the RAIs were sent to you via electronic mail on March 30, 2004. On April 20, 2004, AECL participated in a teleconference with the staff to discuss the content of the RAIs and agreed to provide the ACR-700 information requested in the RAIs by May 3, 2004.

If you have any questions or comments concerning this matter, you may contact the undersigned at (301) 415-4125 or jsk@nrc.gov.

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Requests for Additional Information (RAIs)-Letter 8
ACR-700 Pre-Application Review - On-Power Fueling

The following questions and comments were generated in support of the pre-application review of the design of on-power fueling systems. The following additional information is required for use in the Safety Assessment Report:

229. Please provide the detailed information used to develop the logic diagrams in document ACR 108-03660-ASD-001, Rev.1, dated January 14, 2004, associated with the following grouped events: GE-08, GE-09, GE-10, GE-43, GE-47, GE-48, GE-49, GE-50, GE-59, GE-69, GE-72. Include the information on what component failures were used to develop the initiating events listed in this document.

230. Provide operating experience information pertaining to the on-power refueling system for operating CANDU reactors. Information should contain sufficient detail to allow for identification of failure mode (e.g., equipment failure, maintenance error, human error, etc.), actual failed component, effect of failure (e.g., coolant leak, reactor shutdown, etc.), radiological consequences, and corrective action. Information should cover a minimum of 10 years of operation.

231. To the extent available, please provide a flow diagram and system description of the auxiliary water system that is used to push the new fuel into the pressure tube, and any detailed design information on how it interfaces with the fueling machine (i.e., Type of connections, valving, is it flexible hose?, how power is supplied to pressurization pumps and from what source, what components are affixed to the fuel machine, etc.).

232. To the extent available, please provide a flow diagram and system description of the auxiliary cooling system that is used to keep the spent fuel (SF) in the fueling machine cool, and any detailed design information on how it interfaces with the fueling machine (i.e., type of connections, flexible hose, how power is supplied to circulating pumps if used, what components are affixed to the fuel machine, etc.).

233. Describe design criteria (e.g., separation of trains) that are proposed to be used in the design of the cable and hose management system to reduce the probability of a common cause failure of all hoses and cables to a single fueling machine head.

234. Section 9.1, “Reliability Requirements” of document 108-35000-DR-001, “Design Requirement - Fuel Handling and Storage System,” Revision 0, states that the reliability of the fuel handling system shall be assessed to demonstrate that no single failure of any portion of the system will compromise its and any interfacing system’s safety-related function. Clarify how this single failure analysis will be applied to components with respect to types of failures (“active” vs. “passive” component failures) and how this single failure analysis will be integrated with potential accident initiators, such as the “passive” failure of a fueling machine pressure boundary component.

235. Section 11.3, “Process Systems” of document 108-35000-DR-001, “Design Requirement - Fuel Handling and Storage System,” Revision 0, states that the heat transport pressure and inventory control system shall supply sufficient water to the fuel machine water system to simultaneously cool 12 fuel bundles in each of two frequency multipliers (FMs), under normal operating conditions and an environmentally and seismically qualified water system shall supply sufficient water in emergency operating conditions to simultaneously cool twelve SF bundles in each of two FMs, to prevent fuel failures due to overheating. Clarify the degree of independence between the normal and emergency cooling systems, and describe what component failures (e.g., pump failures) that are within the scope of normal operating conditions.

236. Section 11.5, “Electrical Power System” of document 108-35000-DR-001, “Design Requirement - Fuel Handling and Storage System,” Revision 0, states that Class II, Class III, and Class IV power will be used to power various portions of the on-power refueling systems. Please provide the definition for these electrical power system classes.

ACR-700

cc:
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