AECL
TECHNOLOGIES INC.

May 10, 2004

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

Attention: Ms. B. Sosa
Project Manager, ACR

Reference:
1. Letter V. Langman to B. Sosa, "Technical Description of the ACR-700", July 15, 2003.

Re: **ACR Technical Description and Technical Outline**

In support of the NRC's pre-application review of the ACR-700, the enclosed CD contains the following two AECL reports:

- "ACR-700 Technical Description", AECL report 10810-01371-TED-001, Revision 1, March 2004;
- "ACR-700 Technical Outline", AECL report 10810-01372-TED-001, Revision 3, March 2004.

Attachment 1 provides the list of the main design changes since the previous revision of the Technical Description was issued (Reference 1).

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

Sincerely,

V. G. Snell for

Vince J. Langman
ACR Licensing Manager

/Attachment:
1. Summary of Approved ACR-700 Reference Plant Design Main Changes

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Attachment 1
(Letter V. Langman to B. Sosa, "ACR Technical Description and Technical Outline", May 10, 2004)

Summary of Approved ACR-700 Reference Plant Design Main Changes

This attachment describes the main design changes that have been approved for the ACR-700 reactor.

1. Reactor Building (RB) Diameter

The diameter of the Reactor Building (RB) has been increased from 38 m to 39.5 m.

2. Feeder Header Layout

The feeder header layout has been adjusted to improve accessibility.

3. Calandria Vault

The integrated ACR-700 Calandria Shield Tank Assembly has been changed to a calandria in a steel lined vault.

4. Thermal Optimization

This change consists of the following:

a) addition of 8 fuel channels; and
b) optimization of the steam generator size through:
   i) reduction of steam generator heat transfer area by reducing feedwater temperature from 218 °C to 215 °C; and
   ii) increasing the steam generator thermal efficiency by increasing the reactor outlet header pressure from 12 MPa to 12.2 MPa.

5. Purification Half-Life

To reduce dose limits to station personnel in accordance with ALARA principles, the Reactor Coolant System purification flow has been increased. In addition, the Pressure and Inventory Control System design has been modified as follows:

a) addition of a reflux tube bundle in the bleed condenser for warming up the feed flow; and
b) increase in the size of the bleed condenser from 11.6 m^3 to 16 m^3.

6. End Fitting to Feeder Connection

The connection between the end fittings and the feeder pipes has been changed to a bolted connection. In addition, the inlet to the feeder from the end fitting has been enlarged.

7. RCW/RSW Systems

The Recirculated Cooling Water / Raw Service Water (RCW/RSW) systems has been split into two independent systems namely:

1. Nuclear Steam Plant (NSP) seismically qualified system; and
2. Balance of Plant (BOP) non-seismically qualified system.

8. Pressurizer Size

The pressurizer size has been increased from 44 m^3 to 55 m^3.

9. Upper Feeder Material

The design features the use of stainless steel for the lower feeders to improve erosion corrosion resistance. All top feeder material has been changed to stainless steel SA312T316N.

10. Reactor Building (RB) Ventilation Isolation

This change creates two independent control systems for isolation of the reactor building containment ventilation lines. It adopts a three-isolation valve configuration for each line with two valves located outside containment and one valve located inside containment.

Both control systems provide independent control to initiate the closure of all three valves in each line.

11. Flow Restrictors to the Steam Generator Nozzles

A flow restrictor has been added to the outlet nozzle of each steam generator to choke steam flow in a Main Steam Line Break (MSLB) event.