Commonwealth Edison
One First National Plaza, Chicago, Illinois
Address Reply to: Post Office Box 767
Chicago, Illinois 60690

May 17, 1985

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Subject: Byron Station Unit 1
Environmental Effects of
High Energy Line Breaks
NRC Docket No. 50-454

Dear Mr. Denton:

This letter provides justification for continued operation of Byron Station Unit 1 in light of revised predicted environmental parameters resulting from certain high energy line breaks.

In the event of a rupture of a high energy line in the auxiliary building, an increase in temperature and humidity is expected in general areas of the auxiliary building in addition to the local effects associated with the line break. High energy line breaks in two systems, Steam Generator Blowdown (SD) and Auxiliary Steam (AS), have recently been found to have a greater potential effect on environmental conditions than originally predicted.

The SD lines were originally evaluated considering the break to occur while the system was operating at a normal blowdown rate of 15 gpm per steam generator. Restrictions in the control valves in the system prevented the total flow from having a significant effect on the general area environmental conditions. Because of increased concerns about secondary water chemistry, the system is now expected to operate at blowdown rates of 50 to 90 gpm per steam generator. When this change was identified, the original assessment was that the revised flows would still result in little change in environmental conditions. However, detailed calculations indicate that the higher flow will exceed the auxiliary building HVAC capacity and result in a slow increase in temperature and humidity throughout the auxiliary building. If the break flow is assumed to continue for 30 minutes without action to isolate the break, the auxiliary building temperature would exceed equipment qualification temperatures.

Subsequent to discovering the problem in the SD system, further investigation revealed a similar problem resulting from a high energy line break in the Auxiliary Steam System. Although the AS lines are routed in a pipe tunnel and are restricted to non-safety

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related areas, it has been determined that some flow from postulated line breaks could enter safety-related areas in the auxiliary building rather than flowing back to the turbine building or being handled by the HVAC system. If the break flow is assumed to continue for 30 minutes without action to isolate the break, the temperature in certain local areas of the auxiliary building would exceed equipment qualification temperatures.

Modifications are currently being designed to prevent the harsh environmental effects from these high energy line breaks. Temperature sensors will be installed in locations that will promptly detect a temperature rise due to the local effects of these line breaks. A signal will be sent from these sensors to automatically close an isolation valve in the affected line, thereby terminating the break flow. Design, procurement, installation and testing of these modifications will be completed by August 31, 1985.

To allow temporary continued operation of the plant, steam generator blowdown flow has been reduced to 15 gpm per steam generator and the AS line has been isolated such that a break in that line will not affect safety-related areas in the auxiliary building.

However, steam generator water chemistry is degrading due to the reduced blowdown flowrate and this will ultimately require the plant to be shutdown. In order to justify resumption of the higher blowdown flowrates required to maintain secondary water chemistry, a person will be posted at a location in the auxiliary building where the effects of the postulated SD line break would be promptly detected, yet not prevent their ability to communicate the problem to the control room or create a personnel safety problem. Control room operators, upon notification of the onset of the postulated line break, would immediately close the SD containment isolation valves. This person will be posted at the location described above whenever the blowdown flow from any steam generator is greater than 15 gpm.

Auxiliary steam is required to support periodic operation of the Unit 1 boric acid evaporators, radwaste evaporators, and Unit 2 systems preoperational testing. In order to allow the continuation of these activities, personnel will be posted at specific locations in the auxiliary building where the effects of the postulated AS line breaks would be promptly detected, yet not prevent their ability to communicate the problem to the control room or create a personnel safety problem. As with the SD line break, control room operators would immediately isolate the AS supply line upon notification of the onset of a postulated AS line break. These personnel will be posted at the required locations whenever auxiliary steam is being supplied to equipment in the auxiliary building. The auxiliary steam line will be isolated at its turbine building source whenever auxiliary steam is not needed in the auxiliary building.

The actions proposed above to promptly detect and isolate these postulated line breaks will effectively prevent any unacceptable harsh environmental effects from occurring. Based on the foregoing, we believe continued operation of Byron Unit 1 is justified.

Immediate NRC approval of this justification for continued operation is needed to support the present Byron Unit 1 start up testing schedule.

Please address any questions regarding this matter to this office.

One signed original and fifteen copies of this letter are provided for NRC review.

Very truly yours,

K. A. Ainger

K. A. Ainger
Nuclear Licensing Administrator

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cc: NRC Resident Inspector - Byron

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