

**Jaegers, Cathy**

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**From:** Barry Quigley [quigley10cfr@gmail.com]  
**Sent:** Friday, April 20, 2012 8:44 AM  
**To:** Borchardt, Bill  
**Cc:** Pederson, Cynthia; Duncan, Eric; Bartlett, Bruce; Robbins, John  
**Subject:** 2.206 Petition for Turbine Building HELB  
**Attachments:** Byron 2-206 Petition.doc

Mr. Borchardt,

Please see attached petition regarding Byron and Braidwood HELB. Some aspects of the issue are complex, I am available to provide additional explanation as needed. I believe that prompt action is required.

Regards,

Barry Quigley  
815-406-2005 (daytime number)

April 20<sup>th</sup>, 2012

Re: Byron & Braidwood High Energy Line Breaks

Dear Mr. Borchardt,

This 2.206 petition requests NRC to require Exelon Nuclear's Byron and Braidwood Units 1 and 2 to be *immediately* shutdown until all Turbine Building (TB) High Energy Line Break (HELB) concerns are identified and those important to safety are corrected.

*Background*

The physical layout of the Byron and Braidwood plants exposes both trains of emergency electric power generation, emergency AC distribution, ESF batteries and DC distribution to the effects of non-safety related piping failures. Although the areas of concern are in the safety-related auxiliary building, they directly connect to the turbine building via ventilation openings in the common wall between the auxiliary and turbine buildings. The openings range in size from 5 ft<sup>2</sup> to 40 ft<sup>2</sup>.

The design flaw was missed by the licensee and NRC reviewers during initial licensing in the mid- to late-80s. The potential to disable multiple all trains of safety-related equipment was first identified in 1991 [REDACTED]. An analysis was done in response which credited closure of fire dampers to protect equipment, however the analysis scope was limited due to the compressed schedule to respond to the NRC. In 1996, additional analysis was done in response to single failure concerns of the fire dampers. Piping stresses analyses were done to eliminate some break locations, however the work stopped far short of a comprehensive review of the HELB regulatory requirements.

*Basis for Request*

The major issues are:

- An adequate supply of combustion air for the diesel generators is threatened because the combustion air can be diluted with steam. Although the combustion air is drawn from an air shaft (not the turbine building), it is also the same air shaft that supplies ventilation for the DG room. Under certain conditions, the ventilation damper alignment is such that steam that enters the DG room from the ventilation exhaust can back flow into the inlet air shaft. From there it can be drawn into the engine, potentially starving the engine of air.
- The effects of high temperature in the ESF switchgear rooms on the protective relaying setpoints has not been evaluated. The concern is that high temperatures could alter the setpoints such that protective actions occur under normal loading conditions.

- The current method of analysis for TB HELB uses a "lumped volume" approach wherein the mass and energy of the ruptured line mixes instantly with the entire volume before flowing into the areas of concern. Since this substantially reduces the energy flow, it does not always give conservative results. For example, a preliminary assessment using the sub-divided volume feature in GOTHIC shows that the structural limits on the block wall between the ESF switchgear rooms would be substantially exceeded.
- There has been no structured and detailed review of the licensing requirements for HELB.



Regards,

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815-406-2005 (work)

