

RS-06-091

July 14, 2006

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Braidwood Station, Units 1 and 2
Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Byron Station, Units 1 and 2
Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: Response to NRC Request for Additional Information With Respect to Request for License Amendment Related to Application of Alternative Radiological Source Term

- References:
- 1) Letter from K. R. Jury (Exelon Generation Company, LLC) to NRC, "Request for License Amendment Related to Application of Alternative Radiological Source Term," dated February 15, 2005
 - 2) Letter from R. F. Kuntz (U. S. NRC) to C. M Crane (Exelon Generation Company, LLC), "Byron Station, Units 1 and 2, and Braidwood Station, Unit 1 and 2 – Request for Additional Information Related to Alternative Source Term Amendment Request," dated June 28, 2006

In the Reference 1 submittal, Exelon Generation Company, LLC (EGC) requested an amendment to Appendix A, Technical Specifications (TS), of Facility Operating License Nos. NPF-72, NPF-77, NPF-37, and NPF-66 for Braidwood Station, Units 1 and 2, and Byron Station, Units 1 and 2, respectively. The proposed amendment was requested to support application of an alternative source term methodology in accordance with 10 CFR 50.67, "Accident Source Term."

The Reference 2 letter identifies two issues related to the Reference 1 submittal that require additional information to be provided. The attachments to this letter provide the EGC response to the NRC request for information discussed during this conference call.

The information provided in this letter does not affect the supporting analysis for the original license amendment request as described in Reference 1 submittal. No other information contained in the referenced letter is affected by this additional information.

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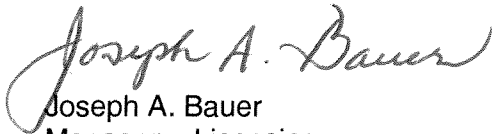
The No Significant Hazards Consideration and the Environmental Consideration provided in Attachment 1 of the Reference 1 letter are not affected by this additional information.

In accordance with 10 CFR 50.91(b), "State consultation," EGC is providing the State of Illinois with a copy of this letter and its attachments to the designated State Official.

If you have any questions about this letter, please contact David Chrzanowski at (630) 657-2816.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 14th day of July 2006.

Respectfully,



Joseph A. Bauer
Manager – Licensing

Attachments: 1) Response to NRC Request for Additional Information
2) Revised Braidwood Station and Byron Station Technical Specification Pages

Attachment 1

**BRAIDWOOD STATION
UNITS 1 AND 2**

Docket Nos. STN 50-456 and STN 50-457
License Nos. NPF-72 and NPF-77

and

**BYRON STATION
UNITS 1 AND 2**

Docket Nos. STN 50-454 and STN 50-455
License Nos. NPF-37 and NPF-66

Response to NRC Request for Additional Information

Attachment 1

Response to NRC Request for Additional Information

NRC Question 1:

Your submittal requested a change to the note on Technical Specification (TS) page 3.9.4-1 from LCO 3.7.13 to TS 3.7.13. Clarify how changing the wording from "LCO" to "TS" changes the applicability of the note, or alternatively, reword the note so that it explicitly defines when the note is applicable.

Exelon Generation Company, LLC (EGC) Response:

The note is being revised from:

-----NOTE-----
Item a. only required when the Fuel Handling Building Exhaust Filter Plenum Ventilation System is not in compliance with TS 3.7.13, "Fuel Handling Building Exhaust Filter Plenum (FHB) Ventilation System."

to:

-----NOTE-----
LCO 3.9.4.a is not required to be met when in compliance with LCO 3.7.13, "Fuel Handling Building Exhaust Filter Plenum (FHB) Ventilation System," or its associated Conditions and Required Actions.

Attachment 2 contains the revised Braidwood Station and Byron Station TS page 3.9.4-1 markups and typed pages.

NRC Question 2:

In the program manual section 5.5.11 the requested change is from 0.05% bypass to 1.0% bypass. The 0.05% bypass is a system integrity test specified in ANSI N510, "Testing of Nuclear Air Treatment Systems," and stated in section C.5.d of Regulatory Guide (RG) 1.52, "Design, Inspection, and Testing Criteria for Air Filtration and Adsorption Units of Post-Accident Engineered-Safety-Feature Atmosphere Cleanup Systems in Light-Water-Cooled Nuclear Power Plants," to insure leak tightness. Please explain how system integrity will be insured given this proposed deviation from the RG 1.52 guidance.

EGC Response:

The requirements of 10 CFR 50 Appendix A will be met as analyzed using an Alternative Source Term (AST). The AST analysis for the Control Room Ventilation System (VC) assumes a charcoal efficiency of 95%. The AST analysis does not distinguish whether the radioactive iodine leaks around (i.e., bypass) or penetrates through (i.e., efficiency) the filters. The bypass leakage and charcoal efficiency are accounted for as follows:

Attachment 1

Response to NRC Request for Additional Information

$$\begin{array}{rcl}
 \text{Ideal} & & \text{AST} \\
 (100\%) & - & \text{Analyses} \\
 & & (95\%) = & \text{Allowance} \\
 & & & (5\%) \\
 \\
 \text{Allowance} & & \text{Bypass} \\
 (5\%) & - & \text{Value} = & \text{Allowed Inefficiency} \\
 & & (1\%) & (4\%) \\
 \\
 \text{Allowed Inefficiency} & & \text{Safety} \\
 (4\%) & / & \text{Factor} = & \text{Penetration Value} \\
 & & (2) & (2\%)
 \end{array}$$

The proposed change in percent bypass would not affect the integrity of VC system. The Braidwood Station and Byron Station Control Room Emergency Make Up Filter units are installed in a mild equipment qualification zone within the Control Room Envelope and are not subjected to outside weather conditions and fluctuations in temperature and humidity as would be expected with an exposed, roof-top unit.

The Control Room Emergency Make Up Filter units are tested in accordance with the Ventilation Filter Testing Program. The purpose of this surveillance is an in-place test to verify the integrity of the carbon adsorber filter assembly to assure that there are no gaps or pathways that allow the effluent to circumvent the charcoal beds. Tables 1 and 2 provide the results of the VC Emergency Make-Up System Bypass As-Left Leakage Test Results for Braidwood Station and Byron Station, respectively.

Table 1
Braidwood VC Emergency Make-Up System Bypass As-Left Leakage Results

A Train		Date					
Filter #	Results	03/1999	05/2000	07/2001	12/2002	12/2003	09/2005
0VC05FA	% Bypass	0.010	0.022	0.011	0.008	0.010	0.020
0VC06FA	% Bypass	0.008	0.014	0.013	0.007	0.015	0.010
B Train		Date					
Filter #	Results	08/1999	01/2001	12/2001	05/2003	11/2004	05/2006
0VC05FB	% Bypass	0.014	0.006	0.011	0.008	0.007	0.013
0VC06FB	% Bypass	0.010	0.006	0.033	0.007	0.009	0.025

Attachment 1

Response to NRC Request for Additional Information

Table 2
Byron VC Emergency Make-Up System Bypass Leakage As-Left Test Results

A Train		Date				
Filter #	Results	03/1999	12/2000	08/2002	02/2004	08/2005
0VC05FA	% Bypass	0.000	0.015	0.000	0.000	0.000
0VC06FA	% Bypass	0.000	0.019	0.000	0.000	0.000
B Train		Date				
Filter #	Results	03/1999	11/2000	07/2002	12/2003	02/2005
0VC05FB	% Bypass	0.000	0.032	0.048	0.012	0.000
0VC06FB	% Bypass	0.000	0.010	0.031	0.042	0.014

As demonstrated in Tables 1 and 2 above, the VC Emergency Make Up Filter bypass leakage test history for Braidwood and Byron Stations indicates a structurally sound enclosure with no adverse trends in system integrity over the course of an 18-month fuel cycle. Note that the measured Halide concentration values obtained during testing can be artificially elevated because of the breakthrough and/or desorption phenomena that occurs during the test sequence, which increases the system unavailability time. The purpose of increasing the allowed in-place leak test acceptance criteria (i.e., the bypass value) is to reduce VC system unavailability during testing.

Breakthrough occurs when the tracer gas saturates the adsorbent bed. Much like a sponge, the adsorbent bed can only retain a given volume of a particular substance. As more tracer gas is introduced into the adsorbent bed, it begins to “breakthrough” on the downstream side; thus artificially elevating the test results. Desorption occurs when the adsorbed tracer has migrated through the adsorbent bed. As a tracer gas is injected upstream of the adsorbent bed, tracer gas may become desorbed/released resulting in a rise in the downstream concentration, similarly artificially increasing the test results.

Even though the amount of breakthrough and desorption is small, the 0.05% acceptance criteria is challenged and contributes to VC system unplanned unavailability because to eliminate these effects and achieve acceptable test results, the system must be purged, troubleshooting performed, and testing repeated. Increasing the allowed bypass leakage to 1% will continue to adequately verify system integrity testing without unnecessarily increasing VC availability.

The charcoal penetration test is performed to determine the efficiency of the charcoal bed. The charcoal is removed and sent to a vendor for laboratory testing. Tables 3 and 4 provide the results of the VC Emergency Make-Up System Charcoal Penetration Test Results for Braidwood Station and Byron Station, respectively.

Attachment 1

Response to NRC Request for Additional Information

Table 3
Braidwood VC Emergency Make-Up System Charcoal Penetration Test Results

A Train	Date					
	02/1999	04/2000	06/2001	11/2002	05/2004	08/2005
% Penetration	0.009	0.067	0.042	0.248	0.024	0.001
B Train	Date					
	07/1999	12/2000	11/2001	05/2003	10/2004	04/2006
% Penetration	0.002	0.048	0.002	0.030	0.037	0.001

Table 4
Byron VC Emergency Make-Up System Charcoal Penetration Test Results

A Train	Date					
	05/1998	12/1999	07/2001	12/2002	01/2005	02/2006
% Penetration	0.015	0.113	0.049	0.066	0.010	0.023
B Train	Date					
	06/1996	11/1997	06/1999	12/2002	07/2002	02/2005
% Penetration	0.009	0.052	0.029	0.043	0.015	0.011

Tables 3 and 4 demonstrate excellent performance of the charcoal filters when compared to the 2% penetration value supported by the AST analyses.

As provided in the submittal from K. R. Jury (Exelon Generation Company, LLC) to NRC, "Request for License Amendment Related to Application of Alternative Radiological Source Term," dated February 15, 2005, the Fuel Handling Accident (FHA), the most limiting design basis accident from a Control Room (CR) dose perspective, results in a calculated CR dose of 4.55 rem TEDE assuming a 95% filter efficiency as previously discussed. This represents a margin of 0.45 to the 5.00 rem TEDE limit. Considering the conservative inputs and assumptions in the AST analysis of Braidwood Station and Byron Station FHA, the contribution to CR dose from 1% bypass is insignificant.

Given the structural reliability of VC Emergency Make Up Filter units and their consistent low levels of bypass leakage, the excellent performance of the charcoal filters in their laboratory penetration tests, the margin to dose limits for CR personnel, and the inherent conservatism of the AST analyses, the proposed change in allowable bypass leakage is an acceptable alternative which will enhance the availability of the VC system.

A similar proposed change in allowable bypass leakage (i.e., from 0.05% to 1%) was previously approved for Catawba Station in a submittal from S. E. Peters (U. S. NRC) to D. M. Jamil (Duke Energy Corporation), "Catawba Station, Units 1 and 2 RE: Issuance of Amendments," dated September 30, 2005 (ADAMS Accession Number ML0527303120).

Attachment 2

**BRAIDWOOD STATION
UNITS 1 AND 2**

Docket Nos. STN 50-456 and STN 50-457
License Nos. NPF-72 and NPF-77

and

**BYRON STATION
UNITS 1 AND 2**

Docket Nos. STN 50-454 and STN 50-455
License Nos. NPF-37 and NPF-66

License Amendment Request
“Alternative Source Term Implementation”

Revised Braidwood Station and Byron Station Technical Specification Pages

Markup of Braidwood and Byron Stations Technical Specification Pages

3.9.4-1

and

Typed Braidwood and Byron Stations Technical Specification Pages

3.9.4-1

3.9 REFUELING OPERATIONS

3.9.4 Containment Penetrations

- LCO 3.9.4 The containment penetrations shall be in the following status:
- a. One door in the personnel air lock closed and the equipment hatch held in place by ≥ 4 bolts;
 - b. One door in the emergency air lock closed; and
 - c. Each penetration providing direct access from the containment atmosphere to the outside atmosphere either:
 - 1. Closed by a manual or automatic isolation valve, blind flange, or equivalent, or
 - 2. Capable of being closed by an OPERABLE Containment Ventilation Isolation System.

-----NOTE-----
Item a. only required when the Fuel Handling Building Exhaust Filter Plenum Ventilation System is not in compliance with LCO 3.7.13, "Fuel Handling Building Exhaust Filter Plenum (FHB) Ventilation System."

APPLICABILITY:

~~During CORE ALTERATIONS,~~

During movement of irradiated fuel assemblies within containment.

RECENTLY IRRADIATED FUEL

REPLACE WITH

-----NOTE-----
LCO 3.9.4.a is not required to be met when in compliance with LCO 3.7.13, "Fuel Handling Building Exhaust Filter Plenum (FHB) Ventilation System," or its associated the Conditions and Required Actions.

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APPLICABILITY: During movement of RECENTLY IRRADIATED FUEL assemblies within containment.

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APPLICABILITY:

~~During CORE ALTERATIONS,~~

During movement of ~~irradiated fuel~~ assemblies within containment.

RECENTLY IRRADIATED FUEL

REPLACE WITH

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LCO 3.9.4.a is not required to be met when in compliance with LCO 3.7.13, "Fuel Handling Building Exhaust Filter Plenum (FHB) Ventilation System," or its associated the Conditions and Required Actions.

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