

RS-10-053

March 15, 2010

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: Additional Information Supporting License Amendment Request to Change Fire Protection Program Requirements for Upper Cable Spreading Rooms

- References:**
1. Letter from P. R. Simpson (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request to Change Fire Protection Program Requirements for Upper Cable Spreading Rooms," dated March 26, 2009
 2. Letter from M. J. David (U.S. Nuclear Regulatory Commission) to C. G. Pardee (Exelon Nuclear), "Braidwood Station, Units 1 and 2, and Byron Station, Unit Nos. 1 and 2 – Request for Additional Information Related to Upper Cable Spreading Room Fire Protection Requirements (TAC Nos. ME0971, ME0972, ME0973, and ME0974)," dated January 27, 2010

In Reference 1, Exelon Generation Company, LLC (EGC) requested a license amendment for Braidwood Station, Units 1 and 2, and Byron Station, Units 1 and 2. The proposed change revises the Fire Protection Program to eliminate the requirement for the backup manual carbon dioxide fire suppression system in the upper cable spreading rooms. The NRC requested additional information to complete review of the proposed license amendment in Reference 2. In response to this request, EGC is providing the attached information.

EGC has reviewed the information supporting a finding of no significant hazards consideration, and the environmental consideration, that were previously provided to the NRC in Attachment 1 of Reference 1. The additional information provided in this submittal does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. In addition, the additional information provided in this submittal does not affect

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the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

There are no regulatory commitments contained in this letter. Should you have any questions concerning this letter, please contact Mr. Kenneth M. Nicely at (630) 657-2803.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 15th day of March 2010.

Respectfully,


Patrick R. Simpson
Manager – Licensing

Attachment: Response to Request for Additional Information

ATTACHMENT
Response to Request for Additional Information

NRC Request

Your letter dated March 26, 2009, Attachment Page 2, states that,

"...Each of the upper cable spreading rooms has an automatically actuated Halon fire suppression system that is designed and tested to provide sufficient Halon 1301 gas to suppress a surface or deep seated cable fire in any of the upper cable spreading rooms. Each of these upper cable spreading rooms is a separate fire area and has been designed and constructed with three-hour fire rated barriers..."

Further, your letter dated March 26, 2009, Attachment Pages 6 and 7, states that,

"...In the event of a design basis fire, the fire would not spread out of the room because of the substantial construction of the walls, floor, and ceiling and penetrations and openings are sealed, except as noted in the fire barrier description within Section 2.3.3 of the Fire Protection Report..."

"...The upper cable spreading rooms are designed and constructed such that they are bounded on all sides, floor and ceiling by three-hour fire rated construction..."

The NRC staff notes that FPR Section 2.3.3.17, "Upper Cable Spreading Area (Fire Zone 3.3B-2)," FPR Section 2.3.3.18, "Unit 1 Upper Cable Spreading Area (Fire Zone 3.3C-1)," and FPR Section 2.3.3.20, "Unit 1 Upper Cable Spreading Area D (Fire Zone 3.3D-1)," discuss details of nonrated penetration seals at Braidwood and Byron. Fire barriers with nonrated penetration seals in the UCSRs could be viewed as compromising defense-in-depth (DID) involving fires in the UCSRs.

Section II, "General Requirements," of Appendix R to Title 10 of the *Code of Federal Regulations*, Part 50, states, in part, that the fire protection program shall extend the DID concept of fire protection in fire areas that are important to safety, with the following objectives:

- (1) Prevent fire from starting.
- (2) Rapidly detect, control, and extinguish.
- (3) Protect structures, systems, and components that are important to safety so that a fire that is not promptly extinguished by the fire suppression activities will not prevent the safe-shutdown of the plant.

The third objective of the DID concept involves spatial separation of combustible materials or isolation of combustible materials by fire-resistant barriers. In particular, fire-rated horizontal and vertical barriers will limit fire spreading from one fire area to another fire area.

The NRC staff requests that the licensee provide a discussion on how the required third objective of fire protection DID will be maintained with nonrated penetration seals in the UCSRs, including an explanation of how spreading of the fire beyond the UCSR would be prevented by the nonrated penetration seals. Provide details of any potential fire propagation paths in the UCSRs.

Also in the response, address the expectation that nonrated penetration seals would not result in Halon 1301 leakage from the area after actuation of the Halon 1301 fire suppression system.

ATTACHMENT
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Response

At Braidwood, the south wall at column rows 25 and N-P between Fire Zones 3.3B-2 (i.e., Upper Cable Spreading Room (UCSR)) and 18.4-2 (i.e., Control Room HVAC Room) is of 3-hour fire-rated construction, but contains a non-rated fire seal as discussed in the Fire Protection Report Fire Hazards Analysis (FHA) section 2.3.3.17. In addition, the east wall at Braidwood at column rows P and 13-14 between UCSRs 3.3C-1 and 3.3D-1 is of 3-hour fire-rated construction, but contains two non-rated penetration seals as discussed in FHA section 2.3.3.18. At Byron, the east wall at column rows L and 16-17 between Fire Zones 3.3C-1 (i.e., UCSR) and 8.6-0 (i.e., Turbine Deck) is of 3-hour fire-rated construction, but contains one non-rated penetration seal as discussed in FHA section 2.3.3.18.

The subject penetrations are non-standard seals that were installed using Thermal Science Incorporated (TSI) Thermo-Lag. In the original design, the subject seals had a 3-hour fire rating and an air tight rating. The Thermo-Lag was used to encase the penetration against the wall inside the UCSR such that an equivalent 3-hour fire rating was achieved. Voids inside and around the raceway were sealed with trowel grade Thermo-Lag or mastic to provide an air tight seal. Subsequently, industry issues with the acceptability of Thermo-Lag as a fire barrier resulted in derating the fire rating of the penetration seals. Plans for resolving the Thermo-Lag issue were submitted to the NRC in References 1 and 2 for Braidwood and Byron, respectively, and identified that the existing Thermo-lag would be abandoned in place, no credit would be taken for it as a fire barrier, and the combustible contribution to each fire zone would be evaluated and incorporated into the Fire Protection Report FHA.

Evaluations were performed for each seal to determine the acceptability to abandon the Thermo-Lag in place without causing an adverse impact on the ability to achieve and maintain shutdown in the event of a fire. The seals are of substantial construction, being made of multiple layers of Thermo-Lag applied up to the original 3-hour rating. However, no credit was taken for any fire rating provided when the condition was evaluated. Consistent with defense-in-depth (DID) objective 3, the evaluations determined that the non-rated penetration seals did not adversely impact the ability to achieve and maintain safe shutdown. In addition, consistent with DID objective 3, no credit was taken for the Halon system or the CO₂ system in suppressing the fire as part of the evaluation of the configuration. Therefore, abandonment of the UCSR CO₂ system does not affect the conclusions of the evaluations that were originally performed to support derating the fire rating of the penetration seals.

As discussed above, the seals are of substantial construction and have an air tight rating. Though no credit is taken for the fire rating of the seals, the seals will not immediately fail in a fire. Further, the combustible nature of the Thermo-Lag material is such that the material will not continue to burn once flame is removed and any degradation of the seals would stop once Halon is applied.

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References

1. Letter from K. L. Kaup (Commonwealth Edison Company) to U.S. NRC, "Braidwood Station Response: 'Request for Additional Information Regarding Generic Letter 92-08, 'Thermo-Lag Fire Barriers' Pursuant to 10 CFR 50.54(f),' " dated March 28, 1995
2. Letter from K. L. Graesser (Commonwealth Edison Company) to U.S. NRC, "Byron Station Response: 'Request for Additional Information Regarding Generic Letter 92-08, 'Thermo-Lag Fire Barriers' Pursuant to 10CFR50.54(f),' " dated March 29, 1995