

RS-12-045

10 CFR 50.12
10 CFR 50, Appendix R

March 23, 2012

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

Dresden Nuclear Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-237 and 50-249

Subject: Response to Request for Additional Information Regarding the Request for Exemption from 10 CFR 50, Appendix R, Section III.L

- References:**
- (1) Letter from D. M. Gullott (EGC) to NRC, "Request for Exemption from 10 CFR 50, Appendix R, Section III.L," dated February 13, 2012
 - (2) Letter from J. Wiebe (NRC) to M. J. Pacilio (EGC), "Dresden Nuclear Power Station, Units 2 and 3 – Request for Exemption From 10 CFR 50, Appendix R, Section III.L – Unacceptable with the Opportunity to Supplement (TAC No. ME8008)," dated March 19, 2012

In Reference 1, in accordance with 10 CFR 50.12, "Specific exemptions," Exelon Generation Company, LLC (EGC) requested a permanent exemption from the requirements in 10 CFR 50 Appendix R, "Fire Protection Program for Nuclear Power Facilities Operating Prior to January 1, 1979," Section III.L "Alternative and dedicated shutdown capability," paragraph 4, for Dresden Nuclear Power Station (DNPS) Units 2 and 3. The requested exemption would eliminate the requirement for the on-shift High Voltage Operator (HVO), a member of the Safe Shutdown (SSD) staff, to remain "on site at all times" and would allow the HVO to conduct normal shift duties, including those at remote Owner Controlled Areas (OCAs), while fulfilling a required position on the SSD staff. In addition, the exemption would eliminate the requirement to remain "on site at all times" for one on-shift Operations Supervisor, also a member of the SSD staff, and allow that individual to perform the duties of a Safety/First-aid Monitor during switching operations occurring at a remote OCA, i.e., the 345kV switchyard or lake lift station. The exemption was requested in accordance with the requirements of 10 CFR 50.12(a)(2)(ii) since the application of the regulation in this particular circumstance is not necessary to achieve the underlying purpose of the rule.

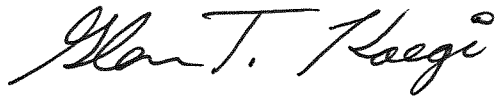
In Reference 2, the NRC formally notified EGC that additional information was needed in order to commence a detailed review of the submittal. Prior to issuance of Reference 2, on March 7, 2012, a teleconference was held between members of the NRC and EGC staffs to discuss and clarify the additional information that would be requested. A subsequent telephone call was

held between J. Wiebe (NRC) and J. A. Bauer (EGC) to confirm the response due date. The due date was determined to be March 26, 2012, i.e., 13 working days after the date of the clarification conference call in accordance with NRC Office Instruction LIC-109, Acceptance Review Procedures.” The requested information is provided in Attachment 1 of this letter.

This letter contains no new regulatory commitments.

If you have any questions concerning this letter, please contact Joseph A. Bauer at (630) 657-2804.

Respectfully,

A handwritten signature in cursive script that reads "Glen T. Kaegi".

Glen T. Kaegi
Director – Licensing and Regulatory Affairs
Exelon Generation Company, LLC

cc: NRC Regional Administrator, Region III
NRC Senior Resident Inspector – Dresden Nuclear Power Station
Illinois Emergency Management Agency – Division of Nuclear Safety

ATTACHMENT 1

Response to Request for Additional Information Regarding the Request for Exemption from 10 CFR 50 Appendix R, Section III.L "Alternative and dedicated shutdown capability"

In Reference 1, in accordance with 10 CFR 50.12, "Specific exemptions," Exelon Generation Company, LLC (EGC) requested a permanent exemption from the requirements in 10 CFR 50 Appendix R, "Fire Protection Program for Nuclear Facilities Operating Prior to January 1, 1979," Section III.L "Alternative and dedicated shutdown capability," paragraph 4, for Dresden Nuclear Power Station (DNPS) Units 2 and 3. The requested exemption would eliminate the requirement for the on-shift High Voltage Operator (HVO), a member of the Safe Shutdown (SSD) staff, to remain "on site at all times" and would allow the HVO to conduct normal shift duties, including those at remote Owner Controlled Areas (OCAs), while fulfilling a required position on the SSD staff. In addition, the exemption would eliminate the requirement to remain "on site at all times" for one on-shift Operations Supervisor, also a member of the SSD staff, and allow that individual to perform the duties of a Safety/First-aid Monitor during switching operations occurring at a remote OCA, i.e., the 345kV switchyard or lake lift station. The exemption is being requested in accordance with the requirements of 10 CFR 50.12(a)(2)(ii) since the application of the regulation in this particular circumstance is not necessary to achieve the underlying purpose of the rule.

In Reference 2, the NRC formally notified EGC that additional information was needed in order to commence a detailed review of the submittal. Prior to issuance of Reference 2, on March 7, 2012, a teleconference was held between members of the NRC and EGC staffs to discuss and clarify the additional information that would be requested. A subsequent telephone call was held between J. Wiebe (NRC) and J. A. Bauer (EGC) to confirm the response due date. The due date was determined to be March 26, 2012, i.e., 13 working days after the date of the clarification conference call in accordance with NRC Office Instruction LIC-109, Acceptance Review Procedures." The requested information is provided below.

Note that the below discussion focuses primarily on the HVO activities; however, the remote OCA considered (i.e., the Goose Lake pumping station) is the most limiting OCA from a travel time standpoint; therefore, the conclusions are also applicable to scenarios where the Operations Supervisor is performing switching activities at the 345 kV switchyard or lake lift station.

RAI #1

Provide a summary of the analysis used to determine that adequate time is available to ensure reliability in accordance with Section 4.2.2 of NUREG 1852. Include additional uncertainties and variability in the time required for manual actions that were considered.

In Part II of the submittal, "Bases for Exemption Request" section NUREG-1852 Guidance, the licensee cited NUREG-1852 as being germane to the subject exemption request with respect to feasibility and reliability criteria for competing manual actions similar to safe shutdown (SSD) activities.

NUREG-1852, Section 3.2.2, "Analysis Showing Adequate Time Available to Ensure Reliability" as referenced by the licensee, addresses the reliability of the operator manual actions. It states in part that adequate time should be available to account for uncertainties that may be encountered by the operator manual actions. In lieu of directly accounting for sources of uncertainty, the extra time should be sufficient to make up for uncertainties in

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estimates of the time available and the time it takes to diagnose and execute operator manual actions. For this exemption, reliability considerations for the travel to return to the plant are relevant.

Response

Initial Justification Presented in Reference 1

As noted in Reference 1, the limiting scenario requiring Safe Shutdown actions by the High Voltage Operator (HVO) is addressed in Dresden Safe Shutdown Procedure, DSSP 0100-CR, "Hot Shutdown Procedure – Control Room Evacuation." In this scenario, the hydraulic analysis of record (AOR) shows that the Isolation Condenser and Control Rod Drive (CRD) pump injection are both required to be restored in 32 minutes. In January 2006, a time validation was conducted and all critical actions were completed in 25 minutes. Specifically, the critical action assigned to the HVO (i.e., locally starting the 2A (3A) CRD pump) was completed in 14 minutes.

Reference 1 also notes that if the HVO is located at the most limiting remote Owner Controlled Area (OCA) (i.e., the Goose Lake pumping station) at the onset of the above scenario, the HVO can be notified and return to the protected area to perform his/her assigned SSD function in 15 minutes, as was demonstrated in February 2012. Therefore, adding the 15 minutes travel time to the 14 minutes SSD action time (i.e., the validated time for the HVO specific action of starting the CRD pump) yields 29 minutes to complete the HVO SSD function. The 29 minutes remains within the hydraulic AOR requirement of 32 minutes.

Additional HVO Response Time Validation in Support of this RAI #1

It is important to note that the actions in question pertain to fire areas addressed by Appendix R, Section III.G, "Fire protection of safe shutdown capability," paragraph 3, and as-such, NUREG-1852 does not strictly apply. NUREG-1852 specifically addresses exemption requests associated with Appendix R, Section III.G, paragraph 2 manual actions. DNPS has used the guidance in NUREG-1852 from a philosophical standpoint in developing this exemption request.

In March 2012, subsequent to receiving the NRC's request for additional information, DNPS conducted an additional time validation of the above scenario. This validation was performed in two separate steps: 1) the time for the HVO to travel from the remote OCA to the operator SSD muster area; and 2) the time from the HVO to travel from the SSD muster area to the CRD pump location and simulate a pump start.

Individual HVOs were timed from the Goose Lake pumping station through the Main Access Facility to the operator SSD muster area. The HVOs, positioned at the Goose Lake pumping station, were contacted by the Control Room (simulated) via radio and directed to return to the plant. The HVOs were instructed to move briskly with purpose, but not run; and to drive within the speed limit on the public roads (as the HVO utilizes a company vehicle to reach the Goose Lake pump house which is approximately 1.5 miles from the DNPS security entrance). The three individual HVOs times for this step were 16, 13.5, and 16 minutes, respectively.

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Separate from the above simulation, three different HVOs were timed from the operator SSD muster area to the CRD pump location where they simulated the CRD pump start. The three individuals completed the simulated pump start in 12.5, 10, and 19 minutes, respectively. Note that two minutes will also be added to these times to account for a short pre-job briefing that would normally take place in the SSD muster area. Two minutes was selected based on engineering judgment.

Therefore, the representative time for the entire evolution is taken as the sum of the longest recorded times (i.e., most conservative) for the two steps; i.e.,

$$16 + 19 + 2 \text{ (briefing)} = 37 \text{ minutes}$$

Note that Dresden Abnormal Operating Procedure DOA 0010-10, "Fire/Explosion," is entered any time a confirmed fire exists (e.g., by multiple corroborating indications of a fire, or report of a fire by personnel). To maximize the time margin available for performing time critical actions, DOA 0010-10 has been revised (in Revision 14) to order a recall of operators any time a fire is confirmed. If the fire is located inside the protected area, then instructions are given to "Recall Operations personnel outside the protected area (i.e., switchyard, lift station, etc.) to be available for assistance."

Cable fire testing performed by the Industry is documented in NEI 00-01 Rev 2, "Guidance for Post-Fire Safe Shutdown Circuit Analysis," (i.e., Reference 3). This document notes that cables do not fail immediately. Data indicated that the average time to failure for thermoset and armored cables exceeded 30 minutes; and the average time to failure for thermoplastic cables was 15 minutes. DNPS has a both thermoset and thermoplastic cable (with the exception of a few cables in the drywell which are stainless steel). Therefore, the operator recall upon confirmation of a fire would be initiated before conditions have degraded to the point where a reactor shutdown is necessary in accordance with the DSSPs. Specifically, Control Room (CR) personnel would notify all operators (including the HVO) to return to the plant, in accordance with DOA 0010-10, prior to the growth of a fire that would necessitate entry into DSSP 0100-CR. Therefore, at least 15 additional minutes are available from the time the recall instruction is given to the HVO to the time that DSSP-0100-CR is entered and the associated start of the AOR time requirement for SSD action completion. Subsequently, 15 minutes is subtracted from the total HVO response time (see column 6 in Table 1) since the operator recall would begin approximately 15 minutes prior to the start of the 32 minute time requirement in the AOR.

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Table 1
Most Conservative HVO Response Time and Margin to AOR Limit

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Time to Return to Station and Report to SSD Muster Area	Pre-job Briefing	Time to Leave SSD Muster Location and Start the CRD Pump	Total Response Time	Fire Growth between DOA 0010-10 entry and DSSP entry	Time to Complete CRD Pump Start from DSSP Entry (Col 4 – Col 5)	Margin to 32 minute AOR Limit (32 – Col 6)
16	2	19	37	15	22	10

As can be seen, the margin to the 32 minute AOR limit, using the most conservative combination of the HVO response times was 10 minutes.

In addition to the time margin shown above, it should be noted that additional time margin is embedded in the hydraulic analysis of record (AOR) for these scenarios, although not explicitly credited. The 32 minute time limit emanates from assuming that the Isolation Condenser is placed in service and CRD pump injection is initiated to the reactor pressure vessel (RPV). Until the Isolation Condenser is placed in service, RPV level gradually decreases due to safety relief valve (SRV) cycling to relieve reactor pressure. Once the Isolation Condenser is initiated, SRV cycling ceases and RPV inventory loss due to SRV cycling also ceases. Thus, additional time is effectively available for the restoration of CRD pump injection.

HVO Travel Time and Station Access Uncertainties

Travel time and station access uncertainties were initially addressed in Reference 1, Attachment 1 on page 4 of 10 in the "HVO Travel Time and Station Access Impediments" section. Specifically, travel time uncertainties associated with adverse weather conditions were addressed; however, it should be noted that there are no Technical Specification related readings taken at the Goose Lake pumping station, and log taking activities at this location may be delayed in the event of severe weather until additional personnel are available. It is also noted that NRC guidance in NRC BTP APCS 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," Section III.A, "Defense in Depth," does not require that fires be postulated concurrent with other plant accidents or the most severe natural phenomenon.

Other various travel time uncertainties such as HVO illness or injury, radio malfunction, varying locations within the remote OCA, and varying physical capabilities of individual operators are not specifically addressed in this evaluation but are accommodated in the margin to the AOR time limit shown in above table. It is worthy to note that none of the HVO's activities at the Goose Lake pumping station would prevent immediate return to the plant upon notification from the Control Room.

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RAI #2

Provide information concerning when, in a fire event, the operators would be directed to return to the plant (e.g., fire alarm sounding in an SSD-related fire area, verification of actual fire in a fire area containing SSD equipment, when a control room evacuation is required and procedure (and timeline) entry is required, or some other time).

Response

As noted above, Dresden Abnormal Operating Procedure DOA 0010-10, "Fire/Explosion," is entered any time a confirmed fire exists (e.g., by multiple corroborating indications of a fire, or report of a fire by personnel). To maximize the time margin available for performing time critical actions, DOA 0010-10 has been revised (in Revision 14) to order an operator recall any time a confirmed fire exists. If the fire is located inside the protected area, then instructions are given to "Recall Operations personnel outside the protected area (i.e., switchyard, lift station, etc.) to be available for assistance." This recall is within the first step of the "Subsequent Operator Actions" section of the procedure; therefore, this recall would occur shortly following confirmation of a fire.

REFERENCES

1. Letter from D. M. Gullott (EGC) to NRC, "Request for Exemption from 10 CFR 50, Appendix R, Section III.L," dated February 13, 2012
2. Letter from J. Wiebe (NRC) to M. J. Pacilio (EGC), "Dresden Nuclear Power Station, Units 2 and 3 – Request for Exemption From 10 CFR 50, Appendix R, Section III.L – Unacceptable with the Opportunity to Supplement (TAC No. ME8008)," dated March 19, 2012
3. NEI 00-01 Rev 2, "Guidance for Post-Fire Safe Shutdown Circuit Analysis," June 5, 2009