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Exelon Nuclear

RS-01-135

July 13, 2001

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

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

Quad Cities Nuclear Power Station, Units 1 and 2
Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Supplemental Information for GE-14 Fuel License Amendment Request

References: (1) Letter from R. M. Krich (Commonwealth Edison Company) to U. S. NRC, "Request for Technical Specifications Changes, Transition to General Electric Fuel," dated September 29, 2000

(2) Letter from R. M. Krich (Exelon Generation Company) to U. S. NRC, "Supplement to GE-14 Fuel License Amendment Request," dated March 1, 2001

In Reference 1, Commonwealth Edison (ComEd) Company, now Exelon Generation Company (EGC), LLC, requested changes to the Technical Specifications (TS) for the Dresden Nuclear Power Station, Units 2 and 3, and the Quad Cities Nuclear Power Station, Units 1 and 2, to support a change in fuel vendors from Siemens Power Corporation to General Electric (GE) and a transition to GE-14 fuel. In Reference 2, EGC submitted additional proposed TS changes regarding the automatic depressurization system in support of the fuel transition. In a discussion between representatives of EGC and Mr. Jon Hopkins and other members of the NRC, the NRC requested additional information regarding these proposed changes. The attachment to this letter provides the requested information.

Should you have any questions related to this information, please contact Mr. Allan R. Haeger at (630) 657-2807.

Respectfully,

K. A. Ainger for

R.M. Krich
Director – Licensing
Mid-West Regional Operating Group

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Attachments:

Affidavit
Attachment A: Supplemental Information for GE-14 Fuel License Amendment Request
Attachment B: Copies of References for Attachment A

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Dresden Nuclear Power Station
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station
Office of Nuclear Facility Safety – Illinois Department of Nuclear Safety

STATE OF ILLINOIS	)	
COUNTY OF DUPAGE	)	
IN THE MATTER OF	)	
EXELON GENERATION COMPANY, LLC	)	**Docket Numbers**
DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3	)	**50-237 AND 50-249**
QUAD CITIES NUCLEAR POWER STATION, UNITS 1 AND 2)		**50-254 AND 50-265**

SUBJECT: Supplemental Information for GE-14 Fuel License Amendment Request

AFFIDAVIT

I affirm that the content of this transmittal is true and correct to the best of my knowledge, information and belief.

R. M. Krich
Director – Licensing
Mid-West Regional Operating Group

Subscribed and sworn to before me, a Notary Public in and for the State above named, this 9th day of July, 2001.

Notary Public

* OFFICIAL SEAL *
Timothy A. Byam
Notary Public, State of Illinois
My Commission Expires 11/24/2001

Attachment A
Supplemental Information for GE-14 Fuel License Amendment Request
Dresden Nuclear Power Station, Units 2 and 3
Quad Cities Nuclear Power Station, Units 1 and 2

Question

1. *The March 1, 2001, submittal states that the Target Rock dual-function safety relief valve (SRV) was previously not qualified for use to satisfy the ADS requirement in accordance with NUREG-0737, item II.K.3.28. The proposed technical specification (TS) change would credit the Target Rock SRV with performing the ADS function and proposed to only add a surveillance requirement (SR) for verifying the SRV air supply accumulator check valve leakage to be below 0.75 SCFH. However, the qualification of the SRV and associated components for performing the ADS function involves much more than ensuring acceptable accumulator air check valve leakage. Therefore, provide the basis for qualifying the SRV, accumulators, and associated equipment and instrumentation consistent with the NUREG-0737, item II.K.3.28 requirements. Also, the submittal states that the piping and supports from the accumulator to the SRV are seismically qualified. Provide information which verifies that the other SRV associated components are also seismically qualified.*

Response

NUREG-0737, "Clarification of Three Mile Island Action Plan Requirements," item II.K.3.28, "Verify Qualification of Accumulators on Automatic Depressurization System Valves," recommended that licensees verify that accumulators on automatic depressurization system (ADS) valves are provided with sufficient capacity to cycle the valves open five times at design pressures. Additionally, air or nitrogen leakage through valves must be accounted for in order to assure that enough inventory of compressed air or gas is available to cycle the ADS valves. Further, the ADS valves, accumulators, and associated equipment and instrumentation are to be capable of performing their functions during and following exposure to hostile environments and taking no credit for non safety related equipment or instrumentation.

The following items were considered to ensure the qualification of the Target Rock SRV. As discussed in Reference 1, the accumulator size was verified to be capable of allowing five cycles of operation without makeup. As discussed in Reference 1, steps were taken to ensure acceptable leakage from the accumulator, including replacement of the check valves with soft seat spring-loaded ball check valves and the planned addition of a periodic surveillance test to the Technical Specifications (TS) to measure accumulator leakage.

The piping and all associated components downstream of the isolation check valve are seismically supported. This includes the piping and supports, as discussed in Reference 1, as well as the accumulator and the Target Rock SRV. These actions were completed in accordance with commitments made in Reference 2.

As discussed in Reference 3, the Target Rock SRV actuator and solenoid valve are environmentally qualified. Additionally, the Target Rock SRV uses the same automatic depressurization system (ADS) function actuation instrumentation and logic circuitry as the

remaining four ADS valves on each unit and therefore meets the applicable seismic and environmental qualification requirements.

The electrical power for actuation of the ADS function of the Target Rock SRV is supplied by safety related 125 volt DC power.

Question

2. *The proposed crediting of the Target Rock SRV with performing the ADS function is based on the air accumulator supplying all of the air necessary to operate the SRV and on limiting the accumulator check valve leakage. This assumes that the air accumulator has been fully pressurized by the supply air system prior to the time it is needed. However, the proposed TS does not include a SR for periodically verifying air system pressure. The BWR/4 Standard Technical Specifications (NUREG-1433, Volume 1) includes a SR for verifying air system pressure on a 31-day frequency. Provide a proposed SR for periodically verifying the air system pressure or provide justification for not ensuring that adequate air accumulator pressure exists prior to the time it is needed.*

Response

The requested surveillance requirement (SR) verifying pneumatic system pressure will be submitted to the NRC on or before July 27, 2001. A periodic surveillance test measuring accumulator leakage is currently being performed in accordance with the DNPS and QCNPS in-service testing (IST) programs which apply to the Target Rock SRV accumulator. This IST program accumulator leakage surveillance will continue to be a part of the IST program at DNPS and QCNPS. For consistency with the Boiling Water Reactor Improved Standard Technical Specifications (Reference 4), the TS SR for accumulator leakage proposed in Reference 1 will be withdrawn when the requested SR is submitted to the NRC.

References

1. Letter from R. M. Krich (Exelon Generation Company) to U. S. NRC, "Supplement to GE-14 Fuel License Amendment Request," dated March 1, 2001

2. Letter from D. L. Peoples (Commonwealth Edison Company) to U. S. NRC, "Response to IE Bulletin No. 80-01," dated January 18, 1980. A copy of this letter is provided in Attachment B.

3. Letter from J. R. Wojnarowski (Commonwealth Edison Company) to U. S. NRC, "NUREG-0737 Item II.K.3.28, Qualification of ADS Accumulators," dated February 28, 1986. A copy of this letter is provided in Attachment B.

4. NUREG-1433, "Standard Technical Specifications – General Electric Plants, BWR/4," Revision 1, April 1995

Attachment B
Supplemental Information for GE-14 Fuel License Amendment Request
Dresden Nuclear Power Station, Units 2 and 3
Quad Cities Nuclear Power Station, Units 1 and 2

Copies of References for Attachment A

Letter from D. L. Peoples (Commonwealth Edison Company) to U. S. NRC, "Response to IE Bulletin No. 80-01," dated January 18, 1980

Letter from J. R. Wojnarowski (Commonwealth Edison Company) to U. S. NRC, "NUREG-0737 Item II.K.3.28, Qualification of ADS Accumulators," dated February 28, 1986

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

January 18, 1980

Mr. James G. Keppler, Director
Directorate of Inspection and
Enforcement - Region III
U.S. Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

Subject: Dresden Station Units 1, 2, & 3
Quad Cities Station Units 1 & 2
Response to IE Bulletin No. 80-01
NRC Docket Nos. 50-10/237/249 and
50-254/265

Dear Mr. Keppler:

In response to IE Bulletin 80-01, Commonwealth Edison Company has developed a program for confirming the seismic capability and leakage rates for the ADS valve pneumatic supply systems at Dresden Units 2 and 3 and Quad Cities Units 1 and 2. This program is based on an analysis which shows that, for reduced maximum average planar linear heat generation rate (MAPLHGR) limits, the single pneumatically controlled ADS valve on each of these units is not required to meet the licensing basis ECCS requirements. This analysis is discussed in more detail in the following paragraphs. Since these pneumatically controlled valves are not required to provide full ADS function, the pneumatic supply system review will be performed no later than the next refueling outage for each unit. This program will assure plant safety margins consistent with the intent of the Technical Specifications and your IE Bulletin 80-01.

The subject bulletin requires confirmation of the adequacy of the ADS as affected by postulated failures of the Target-Rock valve pneumatic supply system. These postulated failures affect only one of the five valves comprising our ADS; the other four valves are operated electrically from DC power supplies.

The aforementioned ECCS analysis (including ADS) was performed to confirm ECCS adequacy with regard to power supply failures. Specifically, a case involving a small break area loss-of coolant accident and a failure of one DC power supply was analyzed. For this case, only four ADS valves, two LPCI pumps and one core spray pump were considered operable. The results of this analysis indicates that peak clad temperatures remain below the Appendix K limit ($2200^{o}F$) for the reduced MAPLHGR values used. The lower MAPLHGR values are expressed as reduction factors to existing limits based on the most limiting fuel type/exposure.

Since the reduction factor for the most limiting fuel type/exposure is used for all other fuel types, the analysis remains conservative for all other fuel types and exposures. Based on these analyses, ADS operability for the subject bulletin is assured, regardless of the loss of the pneumatic supply system to the Target-Rock valve if the units are operated within the reduced MAPLHGR limits. Accordingly, we will submit Technical Specification changes requiring operability of four ADS valves and defining appropriate actions in the event that an additional valve becomes inoperable and reducing the MAPLHGR limits. These reduced MAPLHGR limits will be administratively in force at the stations until the Technical Specification changes become approved.

We will inspect and modify as applicable the Target-Rock valve pneumatic supply system during scheduled refueling outages to assure seismic capability. Additionally, the isolation check valves will be tested for excessive leakage and modified if appropriate. These actions will be completed on Quad Cities Unit 2 prior to startup from the current refueling outage.

Dresden Unit 1 design does not include an ADS of any kind. The bulletin is, therefore, not applicable and no further action on Dresden 1 is required.

Please address any questions you may have concerning this matter to this office.

Very truly yours,

Robert F Janecek

for D. L. Peoples
Director of Nuclear
Licensing

cc: Director, Division of Reactor
Operations Inspection

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

February 28, 1986

Mr. H. R. Denton, Director
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Dresden Station Units 2 and 3
Quad Cities Station Units 1 and 2
NUREG-0737 Item II.K.3.28
Qualification of ADS Accumulators
NRC Docket Nos. 50-237/249 and 50-254/265

Dear Mr. Denton:

This letter is provided in response to questions raised during telecons with Roby Bevan of your staff regarding closure of the subject TMI item. We were requested to provide additional information supporting our previous position that the Automatic Depressurization Systems (ADS) at Dresden and Quad Cities are acceptable in terms of Item II.K.3.28 requirements. Specifically, we were requested to address scenarios where ADS operation would be required, the necessary duration of ADS operability and other systems available to control reactor pressure and level including reactor depressurization.

The attachment to this letter summarizes the environmental qualification of the ADS valves and describes the scenario whereby ADS valves would be required to function under harsh environmental conditions. Only scenarios involving coolant or steam release to the primary containment are addressed since other events would not produce the harsh or hostile environment relevant to Item II.K.3.28. In addition to establishing that the existing qualification of the ADS valves is adequate, the attachment identifies alternate systems available for pressure and level control and describes provisions of the Emergency Operating Procedures (EOP's) in this area. The information regarding the EOP's is provided only to illustrate the available pressure and level control alternatives and the manner in which they are invoked. These procedures, as with all other procedures, are subject to future changes.

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We believe the attached information in conjunction with our previous submittals, should be sufficient to close this issue for Dresden and Quad Cities.

One signed original and five (5) copies of this letter and the attachment are provided for your use.

If there are any further questions regarding this matter, please contact this office.

Very truly yours,

J. R. Wojnarowski
Nuclear Licensing Administrator

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Attachment

cc: R. Bevan - NRR
R. Gilbert - NRR
Dresden Resident Inspector
Quad Cities Resident Inspector

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ATTACHMENT

References: (a) D.L. Peoples letter to J.G. Keppler dated January 18, 1980

(b) D.L. Peoples letter to J.G. Keppler dated January 25, 1980

The purpose of the Automatic Depressurization System (ADS) is to backup the High Pressure Coolant Injection System (HPCI) and depressurize the vessel for small breaks, where the break size is not large enough to depressurize the reactor. The system consists of four electromatic relief valves and one Target Rock Safety Relief valve, which relieve vessel pressure to the torus via discharge piping. The electromatic relief valve and Target Rock safety valve solenoids have been environmentally qualified in accordance with reports DCN-6035-426 and CQD 15003 respectively. The qualification of the Target Rock safety relief valve accumulator has been addressed in the above references.

The valve actuators are qualified for 10 hours with a peak temperature of 340°F, 76.7 psia in an environment of 100% relative humidity and 5.0 E07 rads TID. These environmental parameters are based on the worst case LOCA event which would produce high containment temperature and pressure. The qualification of the ADS valve actuators is conservatively based on this higher temperature also.

Relevant events to be considered in assessing the adequacy of the ADS qualification are limited to small break scenarios inside primary containment. Large break LOCA's do not require ADS actuation and breaks outside the drywell will not result in a harsh environment in the vicinity of the ADS valves. A worst case LOCA would produce temperature of 340°F in containment, where small breaks of .01 ft^2 would produce peak temperatures of 280°F in containment.

With a small break inside the drywell, the operator will detec an increase in drywell pressure and drywell temperature. The station operating abnormal procedures state that drywell pressure will increase .03 psig for a 2 gpm leak and 1°F for a 2 gpm increase. The drywell environmental parameters are readily available to the operator through the use of his panel indicators, computer, and back panel meters. Annunciators will indicate the elevated temperature and pressure in the drywell above the normal operating conditions. In addition, an increase in the frequency of pumping of the drywell floor drain sumps will be detected by the operator. Coolant leakage monitoring requirements are specified in section 3.6 of the Technical Specifications and require shutdown of the reactor if excessive unidentified leakage is observed. The variety of instrumentation available to the operator as described above provides for early detection of a potential pipe break and subsequent reactor shutdown.

As drywell pressure increases to +2 psig the Reactor Protection System will automatically scram the reactor. The +2 psig drywell pressure is an entry condition into the Emergency Operating Procedures. The operator is provided with the following precaution regarding the use of the EOP's "If an entry condition for a EOP occurs, enter that EOP irrespective of whether that EOP has been or is presently being executed. When it is determined that an emergency no longer exists, enter the applicable operating procedure." For a small break scenario, the operator would enter the procedures for Reactor level control and Reactor pressure control simultaneously. These procedures are provided as follows:

RPV Pressure Control

1. Monitor RPV pressure

2. Verify that no ADS valve is cycling

3. Verify torus temperature and level is within limits to assure stable steam condensation for an ADS blowdown

4. Verify adequate core cooling

5. Control RPV pressure with the turbine bypass valves

Note: If AC power is available, reactor level will be controlled by the feedwater level control system through the use of the reactor feed pumps.

If AC power is not available, the operator is directed to the Reactor level Control procedure (see following page) to stabilize level between +8 and +40 inches.

6. If bypass valves are not available, control pressure with one or more of the following systems:

   - Isolation Condenser or RCIC (Quad Cities)
   - HPCI
   - ADS valves if Torus level is above the top of the T-quenchers
   - IF MSIV's are open leave auxiliary steam loads in service: SJAE, Gland Seal Steam, Max REcycle Reboiler, etc.
   - RWCU (Recirculation Mode), only if boron has not been injected into the RPV
   - Main steam line drains
   - RWCU (Blowdown Mode), only if boron has not been injected into the RPV

7. Once pressure is being controlled and the Reactor is shutdown, the operator continues to depressurize and cooldown the Reactor at the rate of 100°F/hr.

8. When Reactor temperature is below 350°F, the shutdown cooling system is used for additional cooldown to cold shutdown condition.-

Reactor Level Control

1. Monitor reactor water level

2. Confirm automatic initiation of any of the following:

   - MSIV isolation
   - Group 2 through 5 isolations
   - High Pressure Coolant Injection
   - Core Spray
   - Low Pressure Coolant Injection (Residual Heat Removal)
   - Diesel Generators

3. Restore and Maintain Water Level using One or More of the Following Systems:

   - reactor feed pumps
   - control rod drive pumps
   - high pressure coolant injection
   - condensate pumps
   - core spray
   - low pressure coolant injection (Residual Heat Removal)
   - RCIC (Quad Cities Only)
   - Safe shutdown pump (Quad Cities only)

4. Maintain RPV water level above the top of the active fuel.

5. If RPV water level can be maintained above the top of the active fuel then prevent actuation of the ADS valves.

6. Continue efforts to restore RPV water level between +8 and +40.

The operators response time to the event is minimal. Following the scram and the operators immediate actions following the scram, the operator will monitor the reactor parameters of level, pressure, and power. Power will be under control due to insertion of the control rods while reactor pressure and level will be controlled by following the steps of the above procedures. According to the reactor pressure control procedure, steps 1 through 4 require no operator action except to monitor his indications. At step 5, the operator will verify whether the condenser is still available as a heat sink. This is to confirm whether he may use the turbine bypass valves. If a group 1 isolation has occurred and the condenser is not available due to closure of the mainsteam isolation valves, the operator then proceeds through step 7 with a cooldown rate of 100°F/hr and when temperature decreases to less than 350°F, the shutdown cooling system would be used. The reactor level control procedure directs the operator to use the systems available to him for level control. Level control will be performed simultaneously with the steps of the RPV pressure control procedure.

With the initial reactor conditions of 1000 psig and 550°F, the scenario would require availability of the ADS valves for approximately 3 hours. The majority of this time would be used in step 7 of the RPV Pressure Control Procedure with the ADS valves open. Should the operator cooldown at a faster rate, the ADS valves required operability time would be much shorter.

The present qualification of the electromatic relief valves more than envelopes the small break conditions which the valve actuators would be exposed to during the above scenario. The electromatic relief valves are qualified for a worst case LOCA condition which produces the harsh temperature and pressure conditions in the drywell. The above scenario outlines the operator steps to cooldown the reactor from a high pressure situation with HPCI and Isolation Condenser (RCIC) unavailable. In the unlikely event that this scenario would be extended for a longer period of time, the peak temperature conditions of 280°F for a small break are much less than 340°F temperature at which the valve actuators are qualified for 10 hours. Using the Arrhenius Methodology, it could be shown that the ADS valves are qualified for a longer time period at the lower temperature conditions.

Based on the above discussion, it was shown that the ADS valves required operating time is enveloped by the qualified life, as shown in the environmental qualification report.

BMV/mca/7126D*