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RS-03-070

March 28, 2003

U. S. Nuclear Regulatory Commission
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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

Subject: Additional Information Supporting the Request for License Amendment to Eliminate Main Steam Isolation Valve Closure and Low Condenser Vacuum Scram Functions During Startup Mode

Reference: Letter from T. W. Simpkin (Exelon Generation Company, LLC) to U. S. NRC, "Request for License Amendment to Eliminate Main Steam Isolation Valve Closure and Low Condenser Vacuum Scram Functions During Startup Mode," dated December 20, 2002

In the referenced letter, Exelon Generation Company, LLC (EGC) requested an amendment to Facility Operating License Nos. DPR-19 and DPR-25 for the Dresden Nuclear Power Station (DNPS), Units 2 and 3. The proposed amendment revises the applicability of Technical Specification (TS) 3.3.1.1, "Reactor Protection System (RPS) Instrumentation," Function 5 (i.e., Main Steam Isolation Valve – Closure) and Function 10 (i.e., Turbine Condenser Vacuum – Low) to eliminate the requirement for these functions to be operable while in Mode 2 with reactor pressure $\geq$ 600 psig. The proposed amendment also deletes Required Action F.2 of TS 3.3.1.1 to align with the revised applicability for Functions 5 and 10.

On February 6, 2003, the NRC requested additional information regarding this proposed change. Attachment 1 to this letter provides the requested information, with the exception that the response to NRC Question 5 will be provided at a later date.

EGC has reviewed the information supporting a finding of no significant hazards consideration that was previously provided to the NRC in Attachment B of Reference 1. The supplemental information provided in this submittal does not affect the bases for concluding that the proposed TS changes do not involve a significant hazards consideration.

A001

If you have any questions or require additional information, please contact Mr. Kenneth M. Nicely at (630) 657-2803.

Respectfully,

Patrick R. Simpson

Patrick R. Simpson
Manager - Licensing
Mid-West Regional Operating Group

Attachments:
Attachment 1: Affidavit
Attachment 2: Response to Request for Additional Information

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

ATTACHMENT 1
Affidavit

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

SUBJECT: **Additional Information Supporting the Request for License Amendment to Eliminate Main Steam Isolation Valve Closure and Low Condenser Vacuum Scram Functions During Startup Mode**

AFFIDAVIT

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

Patrick R. Simpson
Manager - Licensing
Mid-West Regional Operating Group

Subscribed and sworn to before me, a Notary Public in and for the State above named, this 28th day of March, 2003.

"OFFICIAL SEAL"
TIMOTHY A. BYAM
NOTARY PUBLIC STATE OF ILLINOIS
COMMISSION EXPIRES 12/04/05

Notary Public

ATTACHMENT 2
Response to Request for Additional Information

NRC Question 1

What is the motivation for removing this particular technical specification (TS)? It will only affect plant behavior during Mode 2, which accounts for a very small percentage of plant operational time. The submittal mentions a reduction in the chance of a spurious SCRAM due to a single point failure or human error in pressure transmitter calibration and testing. However, Dresden Nuclear Power Station, Units 2 and 3, (Dresden) has not pursued this change during the 28 years since GE first made the recommendation of its removal. What is the motivation which has prompted the recent renewed interest? In addition, has Dresden had any spurious SCRAMs due to this logic?

Response

Dresden Nuclear Power Station (DNPS) has an ongoing program to identify and eliminate situations that present unnecessary risk due to unplanned reactivity changes (e.g., scrams and derates). During evaluations prompted by this program, DNPS determined that the circuitry providing the logic for Functions 5 and 10, while in Mode 2 with reactor pressure $\geq$ 600 psig, presents a large number of potential single failures that could scram a unit. The 600 psig automatic bypass depends upon a pressure switch that requires quarterly calibration, which is a delicate operation with the potential to create a pressure perturbation on the sensing header and a full scram. Therefore, DNPS is pursuing the change to eliminate the requirement for Functions 5 and 10 to be operable in Mode 2 with reactor pressure $\geq$ 600 psig.

In the 1970s and 1980s, DNPS experienced a number of full scrams due to this circuitry. As a result, many administrative controls were instituted to mitigate the risk. These controls complicate plant operation and maintenance. None of these full scrams were caused by an actual reactor pressure perturbation.

NRC Question 2

In the amendment request, it states: "...this TS change reduces the risk of an unnecessary plant transient while in Mode 2 by eliminating the potential for a reactor scram due to a single point failure on one pressure transmitter or RPS bus."

Hence, it is presumed that if such a failure occurs after the TS change, the reactor will not scram. Is there anything in the startup procedure, or a fundamental plant characteristic, which will ensure that such a failure is recognized by the operators?

Response

Upon approval of this license amendment request, a modification will be performed to eliminate the portion of the Reactor Protection System (RPS) logic which ensures that Functions 5 and 10 are operable while in Mode 2 with pressure $\geq$ 600 psig. Therefore, if a pressure transmitter fails while in Mode 2, the reactor will not scram.

Functions 5 and 10 will continue to be required in Mode 1. DNPS operators are trained regarding the design of this feature. They understand, for example, that if either RPS bus looses power for any reason, a full scram will occur. Also, if any of four fuses open or either

pressure transmitter receives an excessive mechanical shock, pressure transient, or vibration, a full scram occurs.

NRC Question 3

There are two proposed TS changes, one concerning the MSIV closure Scram (Function 5), and one concerning the condenser low vacuum Scram (Function 10). However, the majority of the supporting material focuses on the MSIV closure Scram. We assume that this weighting is based on the following:

In the UFSAR, it states that an over-pressurization event due to the closure of the turbine stop valves is less severe than one caused by the closure of the MSIVs. Hence, the Condenser Vacuum-Low Scram analysis is bounded by the MSIV closure analysis.

Please confirm if this understanding is consistent with your request.

Response

The NRC's understanding that the supporting material focuses on the main steam isolation valve (MSIV) closure scram because the condenser low vacuum scram is bounded by the MSIV closure analysis is correct.

NRC Question 4

There seems to be some inconsistency regarding the motivation for the original TS requirement regarding the 600 psig pressure limit. In the license amendment request, it states: "This scram logic is the result of experience gained during the startup of an early vintage boiling water reactor in 1966 when operators had difficulty controlling reactor power above approximately 600 psig without pressure control."

The same justification is presented in the GE report given in Attachment F. However, a letter from Commonwealth Edison to the AEC (dated November 16, 1972), regarding an analogous change to the Quad Cities technical specifications, states: "Previously, on the Dresden Units 2 and 3 dockets, the STARTUP/HOT STANDBY mode of operation was specified up to a reactor pressure of 600 psig. This value was specified because of concern for possible "chugging" on large reactors at high pressure with the main steam isolation valves closed."

A third source (the TS bases) cites the possibility of a pressurization transient as the reason for the requirement. Please discuss the apparent inconsistency of these three rationales.

Response

The statement in the license amendment request that "This scram logic is the result of experience gained during the startup of an early vintage boiling water reactor in 1966 when operators had difficulty controlling reactor power above approximately 600 psig without pressure control" is based on General Electric (GE) Service Information Letter (SIL) 107. GE SIL 107 states:

> "Most current BWR technical specifications require a reactor scram if vessel pressure exceeds 600 psi with the reactor mode switch in startup and the Main Steam Isolation Valves (MSIVs) closed. This current scram logic is the result of experience gained during the startup of an earlier GE/BWR in 1966 when, at that time, operators found it was difficult to control reactor power above approximately 600 psi without pressure control."

The reference to "chugging" in the letter from Commonwealth Edison to the AEC, dated November 16, 1972, was an attempt to describe the early BWR's experience in controlling reactor power. The phenomenon is one of power/pressure changes due to steam bubble/void formation and collapse in the smaller and older BWR design.

TS Bases 3.3.1.1 states: "This function is required in Mode 1 and Mode 2 with reactor pressure greater than or equal to 600 psig since, with the MSIV's open and the heat generation rate high, a pressurization transient can occur if the MSIV's close." With respect to Mode 2, this statement alludes to the same phenomenon discussed above. That is, with the reactor "bottled-up", earlier BWRs experienced difficulty in controlling reactor power, due to formation and collapse of steam bubbles/voids, which resulted in pressure/power changes and chugging.

NRC Question 6

The proposed amendment eliminates reactor protection system (RPS) operability requirements for Table 3.3.1.1-1, Function 5 (Main Steam Isolation Valve - Closure) and Function 10 (Turbine Condenser Vacuum - Low) when in Mode 2 with reactor pressure is greater than or equal to 600 psig. The justification for the proposed TS changes states that the potential for reactor scram or other automatic protective actuation will be eliminated during calibration and testing activities. Currently, the protection circuits for these reactor trip functions use installed interlocks to automatically bypass these functions when reactor pressure is below 600 psig and automatically enable the functions at 600 psig. The amendment does not discuss plans to eliminated installed automatic bypasses from the RPS circuitry. The staff concern is that the safety benefit of the proposed TS changes may not be realized if plant staff must use jumpers or lifted leads to bypass installed interlocks in order to perform required TS surveillance testing when in Mode 2 with reactor pressure greater than or equal to 600 psig. Provide additional information regarding the conduct of plant operations to show that the stated safety benefit gains will be realized without modifying the RPS circuitry for functions 5 and 10.

Response

Upon approval of this license amendment request, a modification will be performed to eliminate the portion of the RPS logic which ensures that Functions 5 and 10 are operable while in Mode 2 with pressure $\geq$ 600 psig. Both functions will remain in operation in Mode 1; therefore, the required number of channels, surveillance requirements, or allowable values for both functions will remain unchanged.

The operators will not be required to use jumpers or lifted leads to implement this technical specification change.

NRC Question 7

Revise Bases page B 3.3.1.1-20 to clearly state that the safety basis for Turbine Condenser Vacuum - Low Mode 1 TS requirements is that a significant amount of core energy is present in Mode 1 and that this energy must be rejected to the main condenser.

Response

Revised bases page B 3.3.1.1-20 states, "The function (Turbine Condenser Vacuum-Low) is only required in MODE 1, since in this MODE, there is a significant amount of core energy that can be rejected to the main condenser. During MODES 2, 3, 4, and 5, the core energy is significantly lower. This function is automatically bypassed with the reactor mode switch in any position other than run." No additional changes are required because the revised bases clearly state that the safety basis for the Turbine Condenser Vacuum – Low scram is that a significant amount of core energy is present in Mode 1 and that the main condenser can accept that energy. It also implies that in MODE 2 (and other MODES) the energy is significantly lower than that requiring the main condenser.