

RS-03-105

May 16, 2003

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

- References:**
- (1) 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
  - (2) Letter from L. W. Rossbach (U. S. NRC) to J. L. Skolds (Exelon Generation Company, LLC), "Dresden Nuclear Power Station, Units 2 and 3 – Request for Additional Information Regarding Technical Specification Amendment Request (TAC Nos. MB7028 and MB7029)," dated May 6, 2003

In Reference 1, 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.

In Reference 2, the NRC requested additional information regarding this proposed change. Attachment 1 to this letter provides the requested information.

Some of the information contained in Attachment 1 is classified as proprietary to General Electric (GE). The proprietary information is of the type that GE maintains in confidence

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and withholds from public disclosure. It has been handled and classified as proprietary as supported by the affidavit in Attachment 3. EGC hereby requests that this information be withheld from public disclosure in accordance with the provisions of 10 CFR 2.790, "Public inspections, exemptions, requests for withholding." Attachment 2 provides a redacted, non-proprietary version of the information in Attachment 1.

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.

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

I declare under penalty of perjury that the foregoing is true and correct.

Respectfully,

May 16, 2003  
Executed on

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

Attachments:

- Attachment 1: General Electric Report GE-NE-0000-0014-1511-R2, "Dresden Elimination of Low Pressure Isolation Setpoint – NRC RAI," dated May 15, 2003 (PROPRIETARY VERSION)
- Attachment 2: General Electric Report GE-NE-0000-0014-1511-R2, "Dresden Elimination of Low Pressure Isolation Setpoint – NRC RAI," dated May 15, 2003 (NON-PROPRIETARY VERSION)
- Attachment 3: General Electric Company Affidavit

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 2**

**General Electric Report GE-NE-0000-0014-1511-R2,  
"Dresden Elimination of Low Pressure Isolation Setpoint – NRC RAI," dated May 15, 2003  
(NON-PROPRIETARY VERSION)**

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Title: Dresden Elimination of Low Pressure Isolation Setpoint – NRC RAI	Originator: Jose L Casillas	Date: 5/15/03
DRF Number: 0000-0005-7308	Version: <b>Final</b>	Sheet 1 of 4

**Objective:**

The NRC comments note the fact that both the SIL-107 (Ref 1) and the Test report (Ref 2) indicate that the elimination of the requirement is only recommended for the BWR/4 type plant. The references also state that earlier and later plant designs were to also perform a test to satisfactorily conclude that the reactor would remain stable at high pressure without pressure control. This response provides a historical understanding of the phenomena and operating plant experience.

**NRC Request for Additional Information (5):**

The argument is made in the December 20, 2002, amendment request that the “bottled-up” testing performed at Browns Ferry Unit 1 during 1974 is applicable to Dresden, despite the fact that Browns Ferry 1 is a BWR/4 and the Dresden units are BWR/3s. The GE report provided as Attachment F of the amendment request, states:

“...the test of the later BWR ... is applicable to the Dresden conditions and therefore acceptable power and pressure response is expected at the reactor conditions for the startup mode, up to and including the maximum design pressure.”

However, the Browns Ferry 1 test report, provided as Attachment I of the amendment request, states: “Because of the design-unique nature, each pre-BWR/4 product must be considered on an individual basis to determine bottled-up operating capacity by a similar test procedure. Thus, no generic BWR/1, 2 or 3 bottled-up operation permission is, or will be, available.”

The analysis performed in the GE report, Attachment F, is based on argument, not “a similar test procedure.” Hence, GE has presumably performed detailed analysis to back up this argument. With this in mind, please provide Reference 1 of Attachment F: GE Work Authorization DR203: Elimination of Dresden 2 and 3 MSIV Closure and Low Condenser Vacuum Scram Function During Startup Mode and Reactor Pressure above 600 psig.

In addition, if this report does not contain details of the comparison between Browns Ferry and Dresden (such as actual values of the important parameters that were considered: feedwater temperatures, power densities etc.), please provide these.

**GE Response:**

The NRC notes the fact that both Service Information Letter (SIL)-107 (i.e., Reference 1) and the General Electric (GE) test report for Browns Ferry Unit 1 (i.e., Reference 2) indicate that the elimination of the requirement is only recommended for the BWR/4 type plant. The references

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also state that earlier and later plant designs were to perform a test to satisfactorily conclude that the reactor would remain stable at high pressure without pressure control. The NRC clarified the request for additional information in a conference call with Exelon Generation Company, LLC (EGC) and GE on March 10, 2003. Specifically, the NRC requested information with respect to:

1. The requirement for additional testing as described in Reference 2,
2. Technical detail as to the factors that contribute to the chugging or pressure/power increase, and
3. A discussion of the applicability of these factors to Dresden Nuclear Power Station (DNPS).

The requested information is provided below, as well as a historical understanding of the phenomena and operating plant experience.

#### Testing Requirement

In order to understand the stated requirements in Reference 2, discussions were held with GE personnel involved with the original test work. The desire to operate at higher than 600 pounds per square inch gauge (psig) reactor pressure prior to establishing the pressure control function was identified following the startup of BWR/2 and BWR/3 type plants. Studies were performed to understand the phenomena for these later direct-cycle BWR/2 and BWR/3 plants, concluding that although reactor dynamic behavior at this low power could not be calculated analytically at that time, system stability at such low power was not expected to be a problem. Thus a test was proposed to demonstrate the system stability, and was performed for the startup of a BWR/4 (i.e., Browns Ferry Unit 1). The BWR/4 plant types were regarded as the first standardized designs, whereas the earlier BWR/1, BWR/2 and BWR/3 plants were regarded as plants of unique design. This standardized plant concept made it difficult to generically extend the test results to earlier BWRs, as well as to potentially different future BWR designs. Therefore, Reference 2 recommended that each earlier BWR plant must be considered on an individual basis to determine bottled-up operating capability by a similar test procedure. In practice, the test results described in Reference 2 have been applied to all BWR/4 plants, including smaller sized reactor vessels, and all later BWR designs (i.e., BWR/5, BWR/6 and ABWR).

#### Details of Phenomenon

The undesirable behavior was experienced during the startup of the Gundremmingen (KRB-A) Nuclear Power Station, which is a dual cycle BWR/1 plant. The phenomenon is described in the start-up report as a pressure-power oscillation during heatup near rated temperature with no primary steam flow. As reactor pressure is increased, the voids are collapsed which provides a pressure coefficient with a positive feedback effect on reactor power. The pressure coefficient is equivalent to the void coefficient and the pressure/void relationship applies to these terms. The phenomenon was corrected by allowing flow to the pressure regulator.

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] As described above,  
the phenomenon at KRB-A was mitigated by allowing flow to the pressure regulator, [

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The BWR/4 test described in Reference 2 involved significant pressure and power perturbations at the typical startup power conditions at the pressure range of interest. Specifically, the BWR/4 reactor (approximately 9000 cubic feet of steam volume and 12 cubic feet per bundle) was taken from a pressure of 650 pounds per square inch absolute (psia) to 920 psia by control rod withdrawals without experiencing the undesirable behavior. Additionally, a large pressure perturbation was introduced by opening and closing bypass valves to verify stability with respect to pressure and power behavior without pressure control. Both of these actions confirmed the acceptability of operation with pressure above 600psig in an isolated state.

#### Applicability of Reference 2 to DNPS

A comparison of DNPS to the test BWR/4 plant, Browns Ferry Unit 1, characteristics shows that they are very similar with respect to parameters affecting startup behavior. [

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In summary, the BWR/4 test is representative of DNPS expected behavior and thus the DNPS characteristics are not conducive to the early BWR pressure/power oscillation response.

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[  
] The consequences are bounded by the safety evaluations at high power.

#### References

1. General Electric Nuclear Energy Service Information Letter 107, "Increasing Flexibility of Reactor Startups," dated October 31, 1974
2. NEDO-20697, "Bottled-Up Operation of a BWR," dated November 1974

**ATTACHMENT 3**

**General Electric Company Affidavit**

# General Electric Company

## AFFIDAVIT

I, **David J. Robare**, state as follows:

- (1) I am Technical Projects Manager, Technical Services, General Electric Company ("GE") and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.
- (2) The information sought to be withheld is contained in The information sought to be withheld is contained in GE Report GE-NE-0000-0014-1511-R2, "*Dresden Elimination of Low Pressure Isolation Setpoint – NRC RAI*", dated May 15, 2003. The proprietary information is identified by a double underline inside square brackets.
- (3) In making this application for withholding of proprietary information of which it is the owner, GE relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), 2.790(a)(4), and 2.790(d)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).
- (4) Some examples of categories of information which fit into the definition of proprietary information are:
  - a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;
  - b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

- c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of General Electric, its customers, or its suppliers;
- d. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, of potential commercial value to General Electric;
- e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in both paragraphs (4)a. and (4)b., above.

- (5) The information sought to be withheld is being submitted to NRC in confidence. The information is of a sort customarily held in confidence by GE, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by GE, no public disclosure has been made, and it is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.
- (6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within GE is limited on a "need to know" basis.
- (7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.
- 8) The information identified in paragraph (2), above, is classified as proprietary because it contains responses containing or based on detailed results of analytical models, methods and processes, including computer codes for BWRs.

The development of the evaluation process along with the interpretation and application of the analytical results is derived from the extensive experience database that constitutes a major GE asset.

- (9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GE's comprehensive BWR safety and technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology and includes development of the expertise to determine and apply the appropriate evaluation process. In addition, the technology base includes the value derived from providing analyses done with NRC-approved methods.

The research, development, engineering, analytical and NRC review costs comprise a substantial investment of time and money by GE.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to GE would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

I declare under penalty of perjury that the foregoing affidavit and the matters stated therein are true and correct to the best of my knowledge, information, and belief.

Executed on this 15th day of May, 2003.



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David J. Robare  
General Electric Company