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Exelon SM
Nuclear

RS-03-153

July 31, 2003

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

Subject: Additional Information Regarding Request for License Amendment for Pressure-Temperature Limits

Reference: Letter from P. R. Simpson, (Exelon Generation Company, LLC) to U. S. NRC, "Request for Changes Related to Technical Specifications Section 3.4.9, 'Reactor Coolant System Pressure and Temperature Limits,'" dated February 27, 2003

In the referenced letter, Exelon Generation Company (EGC), LLC, requested a change to Facility Operating License Nos. DPR-19 and DPR-25 and the Technical Specifications (TS) for Dresden Nuclear Power Station, Units 2 and 3, regarding reactor coolant system pressure and temperature limits.

In a communication from Mr. L. W. Rossbach on June 6, 2003, and a subsequent teleconference on July 8, 2003, the NRC requested additional information concerning this proposed change. The attachments to this letter provide the requested information as follows.

1. Attachment 1 provides the requested information in a proprietary version furnished by General Electric (GE) Company.

2. Attachment 2 contains a non-proprietary version of the information and an affidavit supporting withholding from public disclosure.

The enclosed responses contain proprietary information. GE, as the owner of the proprietary information, has executed the enclosed affidavit, which identifies that the enclosed proprietary information has been handled and classified as proprietary, is customarily held in confidence, and has been withheld from public disclosure. The proprietary information has been provided to EGC in a GE transmittal that is referenced in the affidavit. The proprietary information has been faithfully reproduced in the enclosed responses such that the affidavit remains applicable. GE has requested that the enclosed proprietary information be withheld from public disclosure in accordance with 10 CFR 2.790, "Public inspections, exemptions, requests for withholding," and 10 CFR 9.17, "Agency records exempt from public disclosure."

A001

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

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 31st day of July 2003.

Respectfully,

Keith R. Jury

Keith R. Jury
Director - Licensing
Mid-West Regional Operating Group

Attachment 1: Additional Information Regarding Request for License Amendment for Pressure-Temperature Limits (Proprietary Version)

Attachment 2: Additional Information Regarding Request for License Amendment for Pressure-Temperature Limits (Non-Proprietary Version)

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

Additional Information Regarding Request for License Amendment for Pressure-Temperature Limits (Non-Proprietary Version)

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 enclusures to letter GENE-AEP-15947-PPD-023 from General Electric (Paul Doverspike) to Exelon Corporation (John Nosko), *"Pressure- Temperature Curves for Dresden 2& 3, Response to RAIs 1.1-1.3,* dated July 31, 2003. The specific [[proprietary information]] is delineated by double brackets, as shown in this sentence, marked in the margin adjacent to the specific material.

(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), and 2.790(a)(4) for "trade secrets" (Exemption 4). The material for which exemption from disclosure is here sought 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 aspects of past, present, or future General Electric customer-funded development plans and programs, resulting in potential products to General Electric;

d. 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 paragraphs (4)a., and (4)b, above.

(5) To address 10 CFR 2.790 (b) (4), 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 detailed methods and processes, which GE has developed and applied to pressure-temperature curves for the BWR over a number of years.

The development of the BWR pressure-temperature curves was achieved at a significant cost, on the order of ¾ million dollars, to GE. 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 29TH day of JULY 2003.

David J. Robare
General Electric Company

NRC RAI No. 1

The power uprate was 17%, however, the corresponding increase in the peak vessel flux is about [[ ]]. It has been common practice to increase power distribution toward the lower and outer part of the core. This should have resulted in a post-EPU peak flux increase higher than 17%. Please explain the proposed values.

Response:

The core design for the pre-EPU consisted of fuel bundles that had a full complement of rods that extended the full length of the bundle. In the case of the post-EPU core, the fuel consisted of GE14 bundles that have [[

]]

Figure 1. Pre- and Post-EPU Azimuthal Distribution at Core Midplane without Axial Factors

[[

]]

Figure 2. Pre- and Post-EPU Peak at Reactor Pressure Vessel (RPV) ID Axial Flux Distribution

Figure 1 presents the azimuthal distribution without the axial factor adjustment for both pre- and post-EPU conditions performed at core mid-plane. It can be seen from Figure 1, [[

]]

Figure 2 shows that the RPV ID, pre-EPU flux peaks at an elevation much higher than mid-plane and resulted in an [[ ]]; whereas for post-EPU, the flux peaks near the mid-plane and resulted in [[ ]]. Thus, when these factors are applied to the respective mid-plane peak fluxes, the RPV ID peak flux ratio of post-EPU to pre-EPU is [[ ]].

NRC RAI No.2

The 35° surveillance capsule results (for both Units) indicate C/M ratios of [[ ]], respectively, (1) have the calculations for the dosimetry measurements been updated? (2) provide a physical explanation for the discrepancy, noting that the calculated values are the same, suggesting identical geometry and irradiation, (3) what is the relevance of these numbers in the context of this submittal?

Response:

1) The dosimetry measurements have not been updated.

2) A bounding calculation was performed based on Dresden 3 and used for both units since the Dresden 2 unit had a measured capsule flux that was 30% less than Dresden 3. The C/M ratio for Dresden 3 is [[ ]] indicating good agreement between measurement and calculation. If a plant-specific calculation were to be performed for Dresden 2, it is expected that the C/M ratio will be more consistent with that of Dresden 3.

The C/M ratio presented for the Dresden 2 capsule in the P-T curves report was based on a measured flux that was the average of the iron, copper, and nickel wires. This gives a C/M value of [[ ]]. However, upon reviewing the measured flux report from the original vendor it was clear that they had reported a value of measured flux based on the average of the iron and copper wires only. Thus, based on this originally reported measured flux, the C/M ratio for Dresden 2 would be [[ ]].

3) The C/M comparisons were presented for information purposes and were not used in the P-T curve analyses. The calculated peak vessel flux from Dresden 3 was used as the basis for the total pre-EPU fluence for the PT curve evaluation for both units. The post-EPU fluence was based on the flux derived from an equilibrium core that was representative of both the Dresden units.

NRC RAI No. 3

Provide the axial fast flux (E > 1.0 MeV) distribution (pre- and post-EPU), the axial location of the peak, the girth weld and the post-EPU critical element.

Response:

The relative fast flux profiles on the RPV wall for the pre- and post-EPU conditions are presented in Tables 1 and 2.

Table 1. Normalized Axial Flux at RPV ID: Pre-EPU

Distance from BAF (in)	Flux normalized to peak
-2.48E+01	0.0076
-2.40E+01	0.0098
-2.32E+01	0.0116
-2.24E+01	0.0135
-2.16E+01	0.0155
-2.08E+01	0.0176
-2.00E+01	0.0199
-1.93E+01	0.0224
-1.85E+01	0.0251
-1.77E+01	0.0281
-1.69E+01	0.0314
-1.61E+01	0.0349
-1.53E+01	0.0387
-1.45E+01	0.0429
-1.37E+01	0.0474
-1.29E+01	0.0523
-1.21E+01	0.0575
-1.13E+01	0.0632
-1.05E+01	0.0693
-9.77E+00	0.0759
-8.98E+00	0.0829
-8.20E+00	0.0906
-7.42E+00	0.0988
-6.64E+00	0.1077
-5.86E+00	0.1169
-5.08E+00	0.1269
-4.30E+00	0.1370
-3.52E+00	0.1476
-2.73E+00	0.1584
-1.95E+00	0.1702
-1.17E+00	0.1813
-3.91E-01	0.1935
7.50E-01	0.2102

Distance from BAF (in)	Flux normalized to peak
2.25E+00	0.2337
3.75E+00	0.2581
5.25E+00	0.2832
6.75E+00	0.3088
8.25E+00	0.3342
9.75E+00	0.3590
1.13E+01	0.3833
1.26E+01	0.4043
1.38E+01	0.4229
1.50E+01	0.4403
1.62E+01	0.4572
1.74E+01	0.4731
1.86E+01	0.4884
1.98E+01	0.5030
2.10E+01	0.5170
2.22E+01	0.5303
2.34E+01	0.5434
2.45E+01	0.5546
2.55E+01	0.5650
2.65E+01	0.5747
2.75E+01	0.5845
2.85E+01	0.5937
2.95E+01	0.6031
3.05E+01	0.6120
3.15E+01	0.6210
3.25E+01	0.6296
3.35E+01	0.6382
3.45E+01	0.6465
3.55E+01	0.6550
3.65E+01	0.6632
3.75E+01	0.6715
3.85E+01	0.6796
3.95E+01	0.6876

Distance from BAF (in)	Flux normalized to peak
4.05E+01	0.6955
4.15E+01	0.7035
4.24E+01	0.7109
4.33E+01	0.7177
4.41E+01	0.7243
4.50E+01	0.7311
4.59E+01	0.7375
4.67E+01	0.7444
4.76E+01	0.7506
4.84E+01	0.7576
4.93E+01	0.7637
5.01E+01	0.7705
5.10E+01	0.7765
5.19E+01	0.7831
5.27E+01	0.7891
5.36E+01	0.7957
5.44E+01	0.8016
5.53E+01	0.8079
5.61E+01	0.8138
5.70E+01	0.8199
5.79E+01	0.8256
5.87E+01	0.8316
5.96E+01	0.8373
6.04E+01	0.8427
6.11E+01	0.8478
6.19E+01	0.8527
6.26E+01	0.8575
6.34E+01	0.8622
6.41E+01	0.8670
6.49E+01	0.8715
6.56E+01	0.8764
6.64E+01	0.8810
6.71E+01	0.8855

Distance from BAF (in)	Flux normalized to peak
6.79E+01	0.8900
6.86E+01	0.8943
6.94E+01	0.8986
7.01E+01	0.9028
7.09E+01	0.9069
7.16E+01	0.9112
7.23E+01	0.9149
7.30E+01	0.9186
7.37E+01	0.9220
7.43E+01	0.9256
7.50E+01	0.9288
7.57E+01	0.9323
7.63E+01	0.9354
7.70E+01	0.9388
7.77E+01	0.9420
7.84E+01	0.9453
7.91E+01	0.9488
7.99E+01	0.9521
8.06E+01	0.9555
8.14E+01	0.9585
8.21E+01	0.9617
8.29E+01	0.9646
8.36E+01	0.9674
8.44E+01	0.9705
8.51E+01	0.9731
8.59E+01	0.9757
8.66E+01	0.9782
8.74E+01	0.9807
8.81E+01	0.9828
8.89E+01	0.9851
8.96E+01	0.9872
9.04E+01	0.9890
9.13E+01	0.9914
9.21E+01	0.9929
9.30E+01	0.9947
9.39E+01	0.9958
9.47E+01	0.9974
9.56E+01	0.9980
9.64E+01	0.9992
9.73E+01	0.9993
9.81E+01	1.0000
9.90E+01	0.9995
9.99E+01	0.9996
1.01E+02	0.9985

Distance from BAF (in)	Flux normalized to peak
1.02E+02	0.9981
1.02E+02	0.9963
1.03E+02	0.9952
1.04E+02	0.9928
1.05E+02	0.9907
1.06E+02	0.9877
1.07E+02	0.9846
1.08E+02	0.9808
1.09E+02	0.9764
1.10E+02	0.9708
1.11E+02	0.9646
1.12E+02	0.9576
1.13E+02	0.9498
1.14E+02	0.9411
1.15E+02	0.9315
1.16E+02	0.9210
1.17E+02	0.9097
1.18E+02	0.8972
1.19E+02	0.8839
1.20E+02	0.8691
1.21E+02	0.8537
1.22E+02	0.8368
1.23E+02	0.8193
1.24E+02	0.8002
1.25E+02	0.7804
1.26E+02	0.7591
1.27E+02	0.7354
1.28E+02	0.7080
1.29E+02	0.6797
1.30E+02	0.6501
1.31E+02	0.6194
1.33E+02	0.5878
1.34E+02	0.5557
1.35E+02	0.5232
1.36E+02	0.4906
1.37E+02	0.4578
1.39E+02	0.4217
1.40E+02	0.3835
1.42E+02	0.3471
1.43E+02	0.3130
1.44E+02	0.2893
1.45E+02	0.2725
1.46E+02	0.2568
1.47E+02	0.2406

Distance from BAF (in)	Flux normalized to peak
1.47E+02	0.2261
1.48E+02	0.2118
1.49E+02	0.1985
1.50E+02	0.1855
1.51E+02	0.1734
1.51E+02	0.1616
1.52E+02	0.1507
1.53E+02	0.1400
1.54E+02	0.1303
1.54E+02	0.1209
1.55E+02	0.1122
1.56E+02	0.1040
1.57E+02	0.0965
1.58E+02	0.0893
1.58E+02	0.0827
1.59E+02	0.0764
1.60E+02	0.0707
1.61E+02	0.0652
1.61E+02	0.0603
1.62E+02	0.0556
1.63E+02	0.0513
1.64E+02	0.0472
1.65E+02	0.0435
1.65E+02	0.0400
1.66E+02	0.0367
1.67E+02	0.0337
1.68E+02	0.0309
1.68E+02	0.0283
1.69E+02	0.0259
1.70E+02	0.0237
1.71E+02	0.0216
1.72E+02	0.0197
1.72E+02	0.0179
1.73E+02	0.0163
1.74E+02	0.0148
1.75E+02	0.0134
1.76E+02	0.0121
1.76E+02	0.0109
1.77E+02	0.0098
1.78E+02	0.0087
1.79E+02	0.0077
1.79E+02	0.0067
1.80E+02	0.0057
1.81E+02	0.0045

Table 2. Normalized Axial Flux at RPV ID: Post-EPU

Height above BAF (in)	Flux normalized to peak
7.56E-01	0.1178
2.27E+00	0.1667
3.78E+00	0.2030
5.30E+00	0.2370
6.81E+00	0.2686
8.32E+00	0.2980
9.83E+00	0.3263
1.13E+01	0.3533
1.27E+01	0.3774
1.39E+01	0.3984
1.51E+01	0.4181
1.63E+01	0.4365
1.75E+01	0.4536
1.88E+01	0.4695
2.00E+01	0.4868
2.12E+01	0.5021
2.24E+01	0.5168
2.36E+01	0.5316
2.47E+01	0.5449
2.57E+01	0.5567
2.67E+01	0.5679
2.77E+01	0.5789
2.87E+01	0.5903
2.98E+01	0.6007
3.08E+01	0.6120
3.18E+01	0.6231
3.28E+01	0.6330
3.38E+01	0.6446
3.48E+01	0.6535
3.58E+01	0.6660
3.67E+01	0.6762
3.76E+01	0.6851
3.85E+01	0.6946
3.93E+01	0.7035
4.02E+01	0.7122
4.11E+01	0.7213
4.19E+01	0.7313
4.28E+01	0.7392
4.37E+01	0.7505
4.45E+01	0.7590
4.54E+01	0.7675
4.63E+01	0.7770
4.71E+01	0.7856
4.80E+01	0.7957
4.88E+01	0.8042
4.95E+01	0.8127
5.03E+01	0.8207
5.11E+01	0.8278
5.18E+01	0.8358
5.26E+01	0.8432
5.33E+01	0.8508
5.41E+01	0.8595
5.48E+01	0.8668
5.56E+01	0.8748
5.64E+01	0.8819
5.71E+01	0.8894
5.79E+01	0.8963
5.86E+01	0.9023
5.94E+01	0.9096
6.01E+01	0.9161
6.09E+01	0.9236
6.15E+01	0.9302
6.22E+01	0.9344
6.29E+01	0.9403
6.35E+01	0.9446
6.42E+01	0.9500
6.49E+01	0.9545
6.56E+01	0.9585
6.62E+01	0.9640
6.69E+01	0.9676
6.76E+01	0.9720
6.82E+01	0.9754
6.89E+01	0.9794
6.96E+01	0.9829
7.03E+01	0.9850
7.09E+01	0.9887
7.16E+01	0.9904
7.23E+01	0.9931
7.30E+01	0.9958
7.35E+01	0.9960
7.40E+01	0.9982
7.48E+01	0.9988
7.56E+01	0.9993
7.63E+01	1.0000
7.70E+01	0.9994
7.77E+01	0.9994
7.83E+01	0.9981
7.90E+01	0.9973
7.97E+01	0.9962
8.04E+01	0.9955
8.10E+01	0.9938
8.17E+01	0.9920
8.24E+01	0.9915
8.30E+01	0.9888
8.37E+01	0.9872
8.44E+01	0.9845
8.51E+01	0.9815
8.59E+01	0.9791
8.66E+01	0.9757
8.74E+01	0.9735
8.81E+01	0.9704
8.89E+01	0.9677
8.96E+01	0.9648
9.04E+01	0.9618
9.12E+01	0.9598
9.19E+01	0.9551
9.27E+01	0.9521
9.34E+01	0.9504
9.42E+01	0.9480
9.49E+01	0.9461
9.57E+01	0.9439
9.64E+01	0.9419
9.73E+01	0.9399
9.81E+01	0.9370
9.90E+01	0.9351
9.99E+01	0.9333
1.01E+02	0.9315
1.02E+02	0.9295
1.02E+02	0.9288
1.03E+02	0.9266
1.04E+02	0.9245
1.05E+02	0.9231
1.06E+02	0.9210
1.07E+02	0.9185
1.08E+02	0.9155
1.08E+02	0.9121
1.09E+02	0.9089
1.10E+02	0.9039
1.11E+02	0.8988
1.12E+02	0.8929
1.13E+02	0.8858
1.14E+02	0.8776
1.15E+02	0.8695
1.16E+02	0.8596
1.18E+02	0.8493

Height above BAF (in)	Flux normalized to peak
1.19E+02	0.8375
1.20E+02	0.8238
1.21E+02	0.8095
1.22E+02	0.7906
1.23E+02	0.7714
1.24E+02	0.7483
1.25E+02	0.7224
1.26E+02	0.6931

Height above BAF (in)	Flux normalized to peak
1.28E+02	0.6638
1.29E+02	0.6331
1.30E+02	0.6020
1.31E+02	0.5691
1.33E+02	0.5346
1.34E+02	0.4957
1.35E+02	0.4515
1.37E+02	0.4066

Height above BAF (in)	Flux normalized to peak
1.38E+02	0.3603
1.40E+02	0.3129
1.41E+02	0.2631
1.43E+02	0.2137
1.44E+02	0.1498

The peak flux at pre-EPU conditions was [[ ]] and the peak flux at post-EPU conditions was [[ ]]. Using the respective fluxes for pre- and post-EPU fluxes in conjunction with the factors in Tables 1 (pre-EPU) and 2 (post-EPU), the absolute values of the flux at any axial location on the RPV ID can be determined for each of these conditions.

The location of the peak flux on the RPV wall for pre-EPU conditions is at 98.1" above the bottom of active fuel (BAF). For the post-EPU condition the location is at 76.3" above BAF. The location of the girth weld is 42.2" above BAF for both units. The post-EPU critical element (the axial Electroslag weld that occurs in both beltline shells) spans the entire elevation of the beltline.