Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

January 25, 2008

TVA-BFN-TS-418
TVA-BFN-TS-431

10 CFR 50.90

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Stop OWFN, P1-35
Washington, D. C. 20555-0001

Gentlemen:

In the Matter of	)	Docket Nos. 50-259
Tennessee Valley Authority	)	50-260
		50-296

BROWNS FERRY NUCLEAR PLANT (BFN) - UNITS 1, 2, AND 3 - TECHNICAL SPECIFICATIONS (TS) CHANGES TS-431 AND TS-418 - EXTENDED POWER UPRATE (EPU) - RESPONSE TO ROUND 15 REQUEST FOR ADDITIONAL INFORMATION (RAI) - APLA-38/40, SRXB-71, AND SRXB-72 (TAC NOS. MD5262, MD5263 AND MD5264)

By letters dated June 28, 2004 and June 25, 2004 (ADAMS Accession Nos. ML041840109 and ML041840301), TVA submitted license amendment applications to the NRC for the EPU of BFN Unit 1 and BFN Units 2 and 3, respectively. The proposed amendments would change the operating licenses to increase the maximum authorized core thermal power level of each reactor by approximately 14 percent to 3952 megawatts. On December 14, 2007, the NRC staff issued a Round 15 RAI (ML073450725) regarding the EPU license amendment requests.

Enclosure 1 to this letter provides TVA's responses to the Round 15 RAI questions APLA-38/40, SRXB-71, and SRXB-72. The remaining Round 15 RAI questions are exclusively related to steam dryers. As indicated in TVA's December 14, 2008, letter to NRC (ML0735101801) regarding steam dryer analysis schedules, TVA plans to provide a response to the Round 15 steam dryer RAIs by January 31, 2008, which will include a schedule for responding to the remainder of the RAIs.

D030

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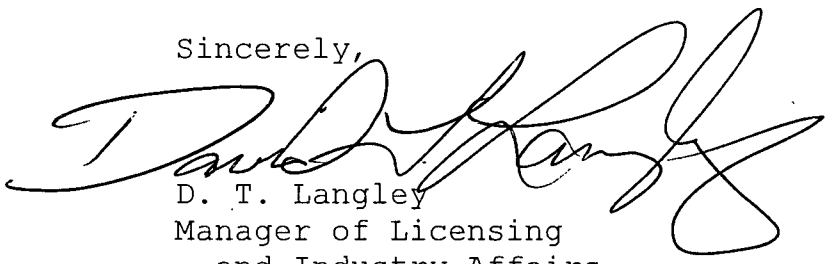
Note that Enclosure 1 is a proprietary response to the RAI and contains information that Global Nuclear Fuel (GNF) considers to be proprietary in nature and subsequently, pursuant to 10 CFR 9.17(a)(4), 2.390(a)(4) and 2.390(d)(1), GNF requests that such information be withheld from public disclosure. Enclosure 2 is a redacted version of Enclosure 1 with the proprietary material removed and is suitable for public disclosure. Enclosure 3 contains an affidavit from GNF supporting this request for withholding from public disclosure.

TVA has determined that the additional information provided by this letter does not affect the no significant hazards considerations associated with the proposed TS changes. The proposed TS changes still qualify for a categorical exclusion from environmental review pursuant to the provisions of 10 CFR 51.22(c)(9).

No new regulatory commitments are made in this submittal. If you have any questions regarding this letter, please contact me at (256)729-2636.

I declare under penalty of perjury that the foregoing is true and correct. Executed on this 25th day of January, 2008.

Sincerely,



D. T. Langley
Manager of Licensing
and Industry Affairs

Enclosures:

1. Response to Round 15 Request for Additional Information APLA-38/40, SRXB-71, and SRXB-72 (Proprietary Information Version)
2. Response to Round 15 Request for Additional Information APLA-38/40, SRXB-71, and SRXB-72 (Non-proprietary Information Version)
3. GNF Affidavit

cc (Enclosures):
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ENCLOSURE 2

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNITS 1, 2, AND 3

TECHNICAL SPECIFICATIONS (TS) CHANGES TS-431 AND TS-418
EXTENDED POWER UPRATE (EPU)

RESPONSE TO ROUND 15 REQUEST FOR ADDITIONAL INFORMATION
APLA-38/40, SRXB-71, and SRXB-72

(NON-PROPRIETARY INFORMATION VERSION)

This enclosure provides TVA's response to NRC's December 14, 2007, Round 15 Request for Additional Information (RAI) questions APLA-38/40, SRXB-71, and SRXB-72.

NRC RAI APLA-38/40

In the human reliability analysis, there are two operator actions related to depressurization following a failure of high pressure coolant injection (HPCI) and reactor core injection cooling (RCIC):

- HPRVD1,"Operator fails to depressurize given HPCI/RCIC hardware failed (OHPR=S)," apparently addresses HPCI/RCIC failure to due hardware failure. This event has a Fussell-Vesely importance of about 0.2 for Unit 2 and about 0.3 for Unit 3, and a risk achievement worth (RAW) of about 1560 for Unit 2 and about 864 for Unit 3.

- ORVD2, "Operator fails to depressurize given HPCI/RCIC hardware failed (OHPR=F)," apparently addresses HPCI/RCIC failure due to an operator control failure. This event has a Fussell-Vesely importance of about 0.13 for Unit 2 and about 0.07 for Unit 3, and a RAW of about 1.8 for Unit 2 and about 1.4 for Unit 3.

Address why these two events do not have similar RAW values. Briefly discuss how these events are incorporated into the probabilistic risk assessment logic structure, and how the RISKMAN software computes Fussell-Vesely important measures and RAWs.

TVA Response to APLA-38/40

Action Discussion

Operator manual action HPRVD1 models one of two aspects of manual depressurization of the reactor pressure vessel (RPV). For HPRVD1, initial operation of high pressure injection sources has been successful, but the high pressure injection (HPI) sources subsequently fail in the longer term such that manual RPV depressurization is required later in the event sequence to allow utilization of low pressure injection (LPI) systems.

Operator manual action ORVD2 models the other aspect of RPV manual depressurization. For ORVD2, initial operation of high pressure injection sources fails and manual RPV depressurization is required early in the event sequence to allow utilization of LPI sources.

In both cases, the manual depressurization action is accomplished in the same way, by opening main steam safety/relief valves via operation of the main control room

panel handswitches. However, because the event situations under which this action is required are markedly different, the failure probabilities of the two situations are also markedly different.

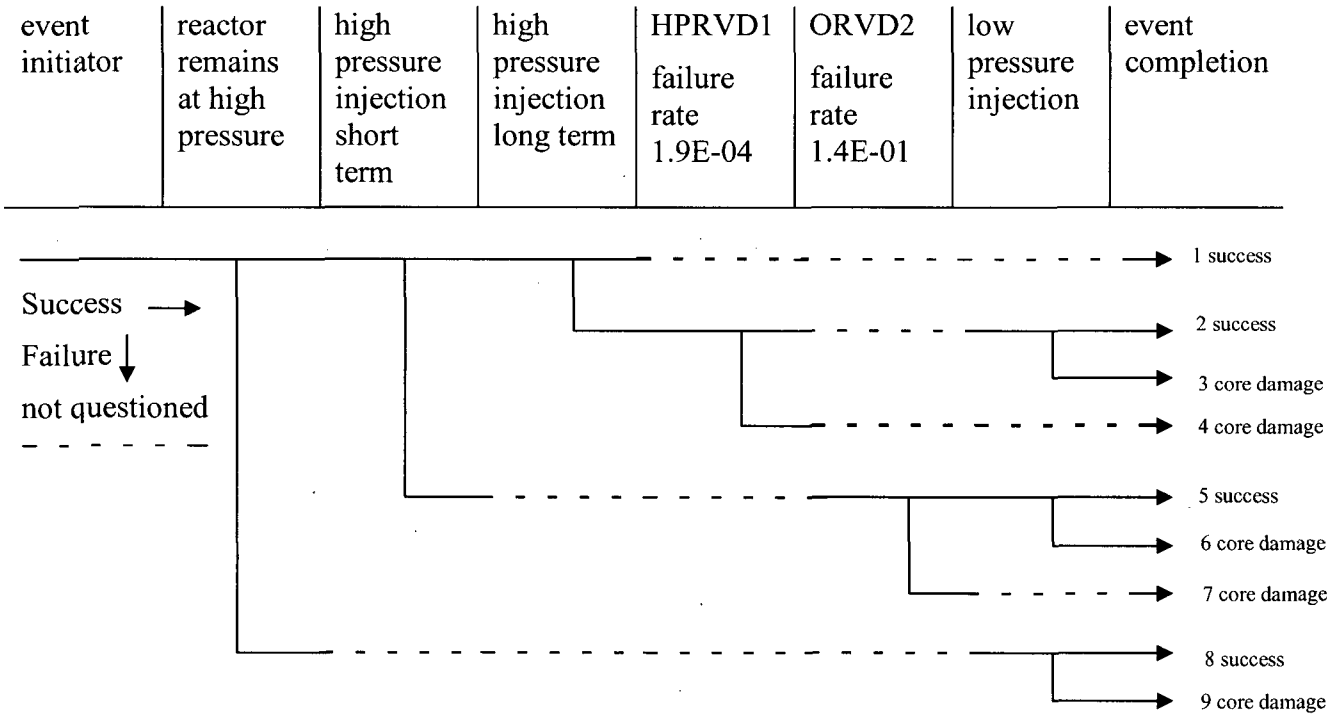
For HPRVD1, since HPI is initially successful, the subsequent failure occurs when initial reactor water levels are relatively high and the core decay heat has decreased. So the rate of water level loss is lower and significantly longer time is available to identify the need for manual RPV depressurization and to accomplish this depressurization. The probability of failure of this action is assessed in the BFN model probabilistic risk assessment (PRA) as 1.9E-04 (i.e., 1 failure in 5263 demands).

For ORVD2, since HPI fails initially, no significant sources of injection are available to provide core cooling. Core decay heat is high and water inventory is lost at a rapid rate. A relatively short time is available for the operator to identify, diagnose and respond with very little allowance for recovery. The probability of failure of this action is assessed in the BFN PRA model as 1.4E-01 (i.e., 1 failure in 7 demands).

PRA Logic Structure Incorporation

A complete presentation of all factors impacting the risk importance of operator actions HPRVD1 and ORVD2 would be impractical to present here, however, the following simplified event tree below illustrates the fundamental relationships between high HPI, manual depressurization operator actions, and LPI.

NON-PROPRIETARY VERSION



Sequences 1, 2, and 5 above result in successful event mitigation, wherein HPI was successful, or successful manual depressurization together with successful LPI occurred. Sequences 3, 4, 6, and 7 result in core damage, because HPI failed (either short or long term) and successful manual depressurization together with successful LPI did not occur. Sequences 8 and 9, included here for completeness, do not involve HPI or manual depressurization, but rather depend on LPI success.

From inspection of the above event tree, it can be seen that ORVD2 is only questioned if short term HPI has failed, and since HPI reliability is good, ORVD2 plays no role in most sequences. HPRVD1 is questioned, however, if long term HPI fails, therefore HPRVD1 will be involved in a greater number of event sequences. Because HPRVD1 appears in a greater number of event sequences and because its actual failure probability is low, arbitrarily setting its failure rate to 100% for purposes of the RAW calculation will significantly impact the Core Damage Frequency (CDF) calculation, resulting in a large RAW value. Conversely, since ORVD2 appears in fewer sequences and its actual failure probability is high, the arbitrary setting of its failure rate to 100% will have a smaller impact on the CDF calculation resulting in a smaller RAW value.

RISKMAN Importance Measure Computations

RAW = $R_{(1)}/R_{(fi)}$, where:

- $R_{(1)}$ is the total CDF as calculated with the split fraction of interest fixed at 1.0 (i.e., failure probability of 100%)
- $R_{(fi)}$ is the total CDF as calculated with the split fraction of interest left at its nominal probabilistic value

Fussel-Vesely (FVI) = $\{R_{(1)}-R_{(0)}\}^*$ fi/$R_{(fi)}$ where

- $R_{(1)}$ is the total CDF as calculated with the split fraction of interest fixed at 1.0
- $R_{(0)}$ is the total CDF as calculated with the split fraction of interest fixed at 0.0 (i.e., failure probability of 0%)
- fi is the split fraction's nominal probabilistic value
- $R_{(fi)}$ is the total CDF as calculated with the split fraction of interest left at its nominal probabilistic value

NRC RAI SRXB-71 (Unit 1 only)

Provide the Cycle 8 core load map and a description of each type of bundle that will be used.

TVA Response to SRXB-71 (Unit 1 only)

See the following Cycle 8 quarter core maps and bundle descriptions. The core loading and bundle designs are representative of typical reload cores. The design and quantity of each type of fresh fuel bundle are set. The core loading map is from the fuel cycle analysis used to release the Cycle 8 fresh fuel for fabrication. It should be noted that the final locations of the bundles could differ slightly between the fuel cycle loading and the final Reference Loading Pattern.

Cycle 8 - Bundle ID / Average Exposure (GWd/ST) / IAT

Cycle Exposure: 0.000 GWd/ST

Bundle ID
Average Exposure (GWd/ST)
IAT

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
1									JLX181 8.785 12	JLX121 8.843 3	JLX175 9.652 12	JLX177 9.624 12	JLX171 8.141 12	JLX115 7.933 3	60
2								JLX123 8.866 3	JLX179 8.248 12	JLX625 11.960 9	JLX621 11.960 9	JLX627 11.912 9	JLX623 12.309 9	JLX665 12.169 10	58
3						JLX127 8.951 3	JLX125 8.875 3	JLX478 12.890 5	JLX660 11.977 10	C08058 0.000 17	JLX541 12.547 6	C08057 0.000 17	JLX469 12.771 5	C08070 0.000 17	56
4						JLX172 9.298 12	JLX725 11.955 11	C08063 0.000 17	C08005 0.000 17	C08017 0.000 18	C08253 0.000 16	C08303 0.000 18	C08322 0.000 18	C08296 0.000 18	54
5					JLX169 9.432 12	JLX119 7.159 3	JLX543 12.394 6	C08228 0.000 16	JLX458 14.041 5	C08255 0.000 14	JLX461 12.638 5	C08276 0.000 18	JLX457 13.961 5	C08137 0.000 16	52
6			JLX105 8.998 3	JLX167 9.413 12	JLX101 7.257 3	JLX533 13.027 6	C08077 0.000 17	C08150 0.000 18	C08143 0.000 16	JLX440 14.284 5	C08152 0.000 18	JLX750 14.089 13	C08147 0.000 14	JLX472 13.159 5	50
7			JLX104 8.942 3	JLX717 12.144 11	JLX530 12.494 6	C08075 0.000 17	JLX467 13.254 5	C08161 0.000 18	JLX655 13.827 10	C08045 0.000 15	JLX561 11.455 7	C08105 0.000 15	JLX678 12.885 10	C08001 0.000 15	48
8		JLX103 8.954 3	JLX477 12.794 5	C08222 0.000 17	C08190 0.000 16	C08214 0.000 16	C08162 0.000 18	JLX537 12.823 6	C08248 0.000 16	JLX749 14.229 13	C08109 0.000 15	JLX435 12.750 5	C08041 0.000 15	JLX653 13.014 10	46
9	JLX158 8.919 12	JLX157 8.376 12	JLX666 11.795 10	C08006 0.000 17	JLX453 13.526 5	C08144 0.000 16	JLX649 14.105 10	C08280 0.000 16	JLX464 13.642 5	C08113 0.000 15	JLX539 13.386 6	C08009 0.000 15	JLX755 13.318 13	C08049 0.000 15	44
10	JLX102 8.969 3	JLX615 12.020 9	C08064 0.000 17	C08018 0.000 18	C08256 0.000 14	JLX445 14.573 5	C08046 0.000 15	JLX741 14.462 13	C08114 0.000 15	JLX570 11.045 7	C08013 0.000 15	JLX723 11.745 11	C08163 0.000 15	JLX671 13.204 10	42
11	JLX164 9.753 12	JLX613 12.203 9	JLX529 12.764 6	C08263 0.000 16	JLX433 12.920 5	C08146 0.000 16	JLX573 11.443 7	C08110 0.000 15	JLX534 13.827 6	C08014 0.000 15	JLX439 13.977 5	C08149 0.000 15	JLX753 13.426 13	C08053 0.000 14	40
12	JLX161 9.731 12	JLX616 11.937 9	C08225 0.000 17	C08321 0.000 18	C08250 0.000 18	JLX743 13.853 13	C08106 0.000 15	JLX471 12.677 5	C08010 0.000 15	JLX719 11.844 11	C08151 0.000 15	JLX574 11.061 7	C08142 0.000 16	JLX209 11.447 4	38
13	JLX163 8.218 12	JLX614 12.570 9	JLX434 12.938 5	C08282 0.000 18	JLX449 13.444 5	C08148 0.000 14	JLX677 12.972 10	C08042 0.000 15	JLX744 13.549 13	C08164 0.000 15	JLX759 13.430 13	C08254 0.000 16	JLX563 10.932 7	C08065 0.000 14	36
14	JLX113 7.978 3	JLX659 12.338 10	C08210 0.000 17	C08290 0.000 18	C08139 0.000 16	JLX450 13.317 5	C08002 0.000 15	JLX654 12.920 10	C08050 0.000 15	JLX645 13.489 10	C08054 0.000 14	JLX283 11.130 4	C08066 0.000 14	JLX569 12.262 7	34
	01	03	05	07	09	11	13	15	17	19	21	23	25	27	

Bundle Name	IAT	# in Core	# Fresh	AvgWt KG	AvgExp GWd/ST	AvgRea	Avg Power
GE13-P9DTB156-NOG-100T-146-T6-2887	3	56	0	176.600	8.403	1.038	1.000
GE14-P10DNAB157-NOG-100T-150-T6-2889	4	9	0	183.166	11.210	1.018	1.000
GE14-P10DNAB377-16GZ-100T-150-T6-2890	5	95	0	178.754	13.298	1.141	1.000
GE14-P10DNAB402-16GZ-100T-150-T6-2891	6	32	0	179.264	12.903	1.151	1.000
GE14-P10DNAB350-16GZ-100T-150-T6-2892	7	32	0	178.760	11.411	1.123	1.000
GE14-P10DNAB419-16GZ-100T-150-T6-2894	9	32	0	179.188	12.104	1.158	1.000
GE14-P10DNAB368-15GZ-100T-150-T6-2895	10	72	0	179.017	12.709	1.139	1.000
GE14-P10DNAB402-19GZ-100T-150-T6-2896	11	24	0	178.439	12.139	1.148	1.000
GE13-P9DTB163-NOG-100T-146-T6-2888	12	52	0	176.656	9.040	1.041	1.000
GE14-P10DNAB377-17GZ-100T-150-T6-2897	13	32	0	178.711	13.830	1.142	1.000
GE14-P10DNAB406-16GZ-100T-150-T6-3078	14	48	48	178.506	0.000	1.007	1.000
GE14-P10DNAB400-17GZ-100T-150-T6-3081	15	96	96	178.568	0.000	1.007	1.000
GE14-P10DNAB406-15GZ-100T-150-T6-3079	16	64	64	178.794	0.000	1.048	1.000
GE14-P10DNAB417-16GZ-100T-150-T6-3082	17	48	48	178.809	0.000	1.026	1.000
GE14-P10DNAB418-16GZ-100T-150-T6-3080	18	72	72	178.506	0.000	1.019	1.000
	Total	764	328	178.503	6.700	1.074	1.000

NON-PROPRIETARY VERSION

Cycle 8 - Bundle ID / Average Exposure (GWd/ST) / IAT

Cycle Exposure: 0.000 GWd/ST

	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
1	JLX139 7.927 3	JLX141 7.925 3	JLX191 8.109 12	JLX187 9.601 12	JLX189 9.630 12	JLX135 8.840 3	JLX183 8.786 12									60
2	JLX688 12.282 10	JLX691 12.162 10	JLX633 12.314 9	JLX629 11.905 9	JLX635 11.964 9	JLX631 11.948 9	JLX185 8.257 12	JLX133 8.850 3			Bundle ID Average Exposure (GWd/ST) IAT					58
3	JLX730 12.542 11	C08100 0.000 17	JLX491 12.756 5	C08099 0.000 17	JLX547 12.523 6	C08069 0.000 17	JLX698 11.982 10	JLX482 12.886 5	JLX131 8.879 3	JLX129 8.946 3						56
4	C08237 0.000 18	C08304 0.000 18	C08312 0.000 18	C08319 0.000 18	C08226 0.000 16	C08019 0.000 18	C08007 0.000 17	C08234 0.000 17	JLX729 11.953 11	JLX192 9.268 12						54
5	JLX514 13.198 5	C08139 0.000 16	JLX501 13.934 5	C08320 0.000 18	JLX499 12.610 5	C08261 0.000 14	JLX502 14.017 5	C08192 0.000 16	JLX545 12.396 6	JLX137 7.155 3	JLX195 9.406 12					52
6	C08232 0.000 14	JLX486 13.144 5	C08153 0.000 14	JLX762 14.087 13	C08191 0.000 16	JLX518 14.246 5	C08157 0.000 16	C08189 0.000 16	C08251 0.000 17	JLX553 13.001 6	JLX147 7.248 3	JLX197 9.422 12	JLX151 9.002 3			50
7	JLX487 13.115 5	C08003 0.000 15	JLX682 12.895 10	C08107 0.000 15	JLX591 11.451 7	C08047 0.000 15	JLX705 13.821 10	C08167 0.000 18	JLX493 13.227 5	C08249 0.000 17	JLX558 12.492 6	JLX739 12.131 11	JLX150 8.930 3			48
8	C08221 0.000 18	JLX703 13.012 10	C08043 0.000 15	JLX525 12.735 5	C08111 0.000 15	JLX761 14.220 13	C08318 0.000 16	JLX551 12.817 6	C08173 0.000 18	C08247 0.000 16	C08283 0.000 16	C08293 0.000 17	JLX481 12.792 5	JLX149 8.934 3		46
9	JLX699 11.490 10	C08051 0.000 15	JLX757 13.312 13	C08011 0.000 15	JLX549 13.379 6	C08115 0.000 15	JLX509 13.420 5	C08317 0.000 16	JLX711 14.075 10	C08179 0.000 16	JLX505 13.503 5	C08029 0.000 17	JLX692 11.784 10	JLX205 8.369 12	JLX206 8.926 12	44
10	C08119 0.000 15	JLX687 13.206 10	C08165 0.000 15	JLX733 11.727 11	C08015 0.000 15	JLX582 11.045 7	C08121 0.000 15	JLX771 14.461 13	C08083 0.000 15	JLX513 14.558 5	C08277 0.000 14	C08023 0.000 18	C08281 0.000 17	JLX639 11.988 9	JLX148 8.948 3	42
11	JLX709 13.490 10	C08035 0.000 14	JLX747 13.706 13	C08227 0.000 15	JLX517 13.937 5	C08021 0.000 15	JLX554 13.803 6	C08123 0.000 15	JLX577 11.440 7	C08183 0.000 16	JLX523 12.904 5	C08279 0.000 16	JLX557 12.757 6	JLX637 12.192 9	JLX200 9.760 12	40
12	C08061 0.000 14	JLX212 11.443 4	C08271 0.000 18	JLX578 11.058 7	C08159 0.000 15	JLX735 11.835 11	C08025 0.000 15	JLX485 12.663 5	C08125 0.000 15	JLX767 13.850 13	C08216 0.000 18	C08326 0.000 18	C08273 0.000 17	JLX640 11.915 9	JLX203 9.727 12	38
13	JLX585 11.768 7	C08067 0.000 14	JLX589 10.923 7	C08171 0.000 16	JLX765 13.714 13	C08181 0.000 15	JLX768 13.555 13	C08073 0.000 15	JLX681 12.963 10	C08185 0.000 14	JLX496 13.619 5	C08311 0.000 18	JLX524 12.921 5	JLX638 12.529 9	JLX199 8.219 12	36
14	C08218 0.000 18	JLX581 12.261 7	C08079 0.000 14	JLX429 11.451 4	C08087 0.000 14	JLX715 13.462 10	C08071 0.000 15	JLX704 12.914 10	C08027 0.000 15	JLX495 12.972 5	C08187 0.000 16	C08295 0.000 18	C08275 0.000 17	JLX697 12.340 10	JLX143 7.975 3	34
15	JLX510 13.305 5	C08085 0.000 18	JLX586 11.316 7	C08087 0.000 14	JLX710 13.430 10	C08127 0.000 15	JLX693 11.211 10	C08219 0.000 18	JLX506 13.344 5	C08268 0.000 14	JLX519 13.041 5	C08297 0.000 18	JLX736 12.625 11	JLX685 12.185 10	JLX145 8.024 3	32
	31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	

Bundle Name	IAT	# in Core	# Fresh	AvgWt KG	AvgExp GWd/ST	AvgRea	Avg Power
GE13-P9DTB156-NOG-100T-146-T6-2887	3	56	0	176.600	8.403	1.038	1.000
GE14-P10DNAB157-NOG-100T-150-T6-2889	4	9	0	183.166	11.210	1.018	1.000
GE14-P10DNAB377-16GZ-100T-150-T6-2890	5	95	0	178.754	13.298	1.141	1.000
GE14-P10DNAB402-16GZ-100T-150-T6-2891	6	32	0	179.264	12.903	1.151	1.000
GE14-P10DNAB350-16GZ-100T-150-T6-2892	7	32	0	178.760	11.411	1.123	1.000
GE14-P10DNAB419-16GZ-100T-150-T6-2894	9	32	0	179.188	12.104	1.158	1.000
GE14-P10DNAB368-15GZ-100T-150-T6-2895	10	72	0	179.017	12.709	1.139	1.000
GE14-P10DNAB402-19GZ-100T-150-T6-2896	11	24	0	178.439	12.139	1.148	1.000
GE13-P9DTB163-NOG-100T-146-T6-2888	12	52	0	176.656	9.040	1.041	1.000
GE14-P10DNAB377-17GZ-100T-150-T6-2897	13	32	0	178.711	13.830	1.142	1.000
GE14-P10DNAB406-16GZ-100T-150-T6-3078	14	48	48	178.506	0.000	1.007	1.000
GE14-P10DNAB400-17GZ-100T-150-T6-3081	15	96	96	178.568	0.000	1.007	1.000
GE14-P10DNAB406-15GZ-100T-150-T6-3079	16	64	64	178.794	0.000	1.048	1.000
GE14-P10DNAB417-16GZ-100T-150-T6-3082	17	48	48	178.809	0.000	1.026	1.000
GE14-P10DNAB418-16GZ-100T-150-T6-3080	18	72	72	178.506	0.000	1.019	1.000
	Total	764	328	178.503	6.700	1.074	1.000

Cycle 8 - Bundle ID / Average Exposure (GWd/ST) / IAT

Cycle Exposure: 0.000 GWd/ST

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
16	JLX112 8.029 3	JLX676 12.188 10	JLX721 12.639 11	C08238 0.000 18	JLX442 13.057 5	C08230 0.000 14	JLX455 13.364 5	C08223 0.000 18	JLX668 11.207 10	C08120 0.000 15	JLX652 13.508 10	C08062 0.000 14	JLX567 11.326 7	C08078 0.000 18	JLX287 10.577 4	30
17	JLX114 7.978 3	JLX664 12.334 10	C08224 0.000 17	C08240 0.000 18	C08140 0.000 16	JLX451 13.326 5	C08004 0.000 15	JLX657 12.919 10	C08052 0.000 15	JLX646 13.491 10	C08056 0.000 14	JLX347 11.134 4	C08068 0.000 14	JLX572 12.270 7	C08086 0.000 18	28
18	JLX166 8.206 12	JLX619 12.561 9	JLX437 12.938 5	C08242 0.000 18	JLX452 13.441 5	C08154 0.000 14	JLX680 12.965 10	C08044 0.000 15	JLX745 13.552 13	C08186 0.000 15	JLX748 13.708 13	C08175 0.000 16	JLX564 10.931 7	C08080 0.000 14	JLX568 11.777 7	26
19	JLX162 9.729 12	JLX617 11.936 9	C08265 0.000 17	C08244 0.000 18	C08260 0.000 18	JLX746 13.845 13	C08108 0.000 15	JLX476 12.673 5	C08012 0.000 15	JLX722 11.845 11	C08145 0.000 15	JLX575 11.060 7	C08170 0.000 16	JLX294 11.137 4	C08088 0.000 14	24
20	JLX165 9.739 12	JLX620 12.190 9	JLX532 12.760 6	C08246 0.000 16	JLX438 12.923 5	C08156 0.000 16	JLX576 11.442 7	C08112 0.000 15	JLX535 13.827 6	C08016 0.000 15	JLX444 13.964 5	C08245 0.000 15	JLX754 13.437 13	C08082 0.000 14	JLX651 13.453 10	22
21	JLX109 8.960 3	JLX618 12.013 9	C08266 0.000 17	C08020 0.000 18	C08262 0.000 14	JLX448 14.577 5	C08048 0.000 15	JLX742 14.458 13	C08118 0.000 15	JLX571 11.050 7	C08022 0.000 15	JLX724 11.744 11	C08182 0.000 15	JLX674 13.200 10	C08128 0.000 15	20
22	JLX159 8.914 12	JLX160 8.361 12	JLX669 11.790 10	C08008 0.000 17	JLX456 13.524 5	C08158 0.000 16	JLX650 14.097 10	C08172 0.000 16	JLX465 13.635 5	C08122 0.000 15	JLX540 13.397 6	C08028 0.000 15	JLX756 13.329 13	C08072 0.000 15	JLX662 11.486 10	18
23		JLX108 8.936 3	JLX447 13.216 5	C08257 0.000 17	C08264 0.000 16	C08160 0.000 16	C08168 0.000 18	JLX538 12.827 6	C08178 0.000 16	JLX752 14.227 13	C08124 0.000 15	JLX436 12.754 5	C08074 0.000 15	JLX658 13.014 10	C08213 0.000 18	16
24			JLX107 8.938 3	JLX718 12.152 11	JLX531 12.496 6	C08268 0.000 17	JLX468 13.252 5	C08174 0.000 18	JLX656 13.827 10	C08084 0.000 15	JLX562 11.453 7	C08126 0.000 15	JLX679 12.888 10	C08028 0.000 15	JLX474 13.122 5	14
25			JLX106 9.011 3	JLX168 9.414 12	JLX110 7.264 3	JLX536 13.013 6	C08270 0.000 17	C08176 0.000 16	C08180 0.000 16	JLX443 14.269 5	C08184 0.000 16	JLX751 14.097 13	C08186 0.000 14	JLX475 13.150 5	C08212 0.000 14	12
26					JLX170 9.434 12	JLX120 7.167 3	JLX544 12.394 6	C08272 0.000 16	JLX459 14.043 5	C08276 0.000 14	JLX462 12.637 5	C08286 0.000 18	JLX460 13.963 5	C08188 0.000 16	JLX480 12.795 5	10
27						JLX173 9.284 12	JLX728 11.961 11	C08274 0.000 17	C08030 0.000 17	C08024 0.000 18	C08284 0.000 16	C08288 0.000 18	C08292 0.000 18	C08294 0.000 18	C08298 0.000 18	08
28						JLX128 8.962 3	JLX126 8.886 3	JLX479 12.893 5	JLX663 11.971 10	C08229 0.000 17	JLX542 12.551 6	C08231 0.000 17	JLX470 12.770 5	C08233 0.000 17	JLX727 12.542 11	06
29			Bundle ID Average Exposure (GWd/ST) IAT					JLX124 8.866 3	JLX180 8.251 12	JLX626 11.963 9	JLX622 11.966 9	JLX628 11.915 9	JLX624 12.324 9	JLX670 12.163 10	JLX673 12.283 10	04
30									JLX182 8.806 12	JLX122 8.856 3	JLX176 9.657 12	JLX178 9.618 12	JLX174 8.137 12	JLX116 7.936 3	JLX118 7.927 3	02
	01	03	05	07	09	11	13	15	17	19	21	23	25	27	29	

Bundle Name	IAT	# in Core	# Fresh	AvgWt KG	AvgExp GWd/ST	AvgRea	Avg Power
GE13-P9DTB156-NOG-100T-146-T6-2887	3	56	0	176.600	8.403	1.038	1.000
GE14-P10DNAB157-NOG-100T-150-T6-2889	4	9	0	183.166	11.210	1.018	1.000
GE14-P10DNAB377-16GZ-100T-150-T6-2890	5	95	0	178.754	13.298	1.141	1.000
GE14-P10DNAB402-16GZ-100T-150-T6-2891	6	32	0	179.264	12.903	1.151	1.000
GE14-P10DNAB350-16GZ-100T-150-T6-2892	7	32	0	178.760	11.411	1.123	1.000
GE14-P10DNAB419-16GZ-100T-150-T6-2894	9	32	0	179.188	12.104	1.158	1.000
GE14-P10DNAB368-15GZ-100T-150-T6-2895	10	72	0	179.017	12.709	1.139	1.000
GE14-P10DNAB402-19GZ-100T-150-T6-2896	11	24	0	178.439	12.139	1.148	1.000
GE13-P9DTB163-NOG-100T-146-T6-2888	12	52	0	176.656	9.040	1.041	1.000
GE14-P10DNAB377-17GZ-100T-150-T6-2897	13	32	0	178.711	13.830	1.142	1.000
GE14-P10DNAB406-16GZ-100T-150-T6-3078	14	48	48	178.506	0.000	1.007	1.000
GE14-P10DNAB400-17GZ-100T-150-T6-3081	15	96	96	178.568	0.000	1.007	1.000
GE14-P10DNAB406-15GZ-100T-150-T6-3079	16	64	64	178.794	0.000	1.048	1.000
GE14-P10DNAB417-16GZ-100T-150-T6-3082	17	48	48	178.809	0.000	1.026	1.000
GE14-P10DNAB418-16GZ-100T-150-T6-3080	18	72	72	178.506	0.000	1.019	1.000
	Total	764	328	178.503	6.700	1.074	1.000

NON-PROPRIETARY VERSION

Cycle 8 - Bundle ID / Average Exposure (GWd/ST) / IAT

Cycle Exposure: 0.000 GWd/ST

16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	
JLX498 12.974 5	C08089 0.000 18	JLX588 11.774 7	C08091 0.000 14	JLX714 13.490 10	C08129 0.000 15	JLX694 11.205 10	C08217 0.000 18	JLX507 13.346 5	C08287 0.000 14	JLX520 13.041 5	C08299 0.000 18	JLX737 12.623 11	JLX686 12.191 10	JLX146 8.010 3	16
C08090 0.000 18	JLX584 12.258 7	C08093 0.000 14	JLX432 11.444 4	C08095 0.000 14	JLX716 13.469 10	C08101 0.000 15	JLX707 12.923 10	C08033 0.000 15	JLX511 13.307 5	C08193 0.000 16	C08301 0.000 18	C08269 0.000 17	JLX702 12.337 10	JLX144 7.974 3	17 28
JLX587 11.314 7	C08094 0.000 14	JLX590 10.926 7	C08169 0.000 16	JLX766 13.714 13	C08199 0.000 15	JLX769 13.552 13	C08103 0.000 15	JLX684 12.969 10	C08196 0.000 14	JLX512 13.420 5	C08305 0.000 18	JLX527 12.919 5	JLX643 12.555 9	JLX202 8.207 12	18 26
C08092 0.000 14	JLX358 11.128 4	C08177 0.000 16	JLX579 11.062 7	C08155 0.000 15	JLX738 11.832 11	C08037 0.000 15	JLX490 12.664 5	C08131 0.000 15	JLX764 14.232 13	C08307 0.000 18	C08309 0.000 18	C08267 0.000 17	JLX641 11.939 9	JLX204 9.729 12	19 24
JLX713 13.431 10	C08096 0.000 14	JLX760 13.429 13	C08141 0.000 15	JLX522 13.940 5	C08039 0.000 15	JLX555 13.796 6	C08133 0.000 15	JLX580 11.439 7	C08197 0.000 16	JLX528 12.898 5	C08313 0.000 16	JLX560 12.776 6	JLX644 12.184 9	JLX201 9.762 12	20 22
C08130 0.000 15	JLX690 13.204 10	C08200 0.000 15	JLX734 11.724 11	C08040 0.000 15	JLX583 11.048 7	C08135 0.000 15	JLX772 14.460 13	C08097 0.000 15	JLX516 14.546 5	C08315 0.000 14	C08035 0.000 18	C08252 0.000 17	JLX642 12.022 9	JLX155 8.948 3	21 20
JLX700 11.494 10	C08102 0.000 15	JLX758 13.317 13	C08038 0.000 15	JLX550 13.387 6	C08136 0.000 15	JLX497 13.616 5	C08201 0.000 16	JLX712 14.077 10	C08203 0.000 16	JLX508 13.503 5	C08031 0.000 17	JLX695 11.789 10	JLX208 8.362 12	JLX207 8.918 12	22 18
C08215 0.000 18	JLX708 13.007 10	C08104 0.000 15	JLX526 12.729 5	C08134 0.000 15	JLX770 13.846 13	C08202 0.000 16	JLX552 12.809 6	C08205 0.000 18	C08207 0.000 16	C08323 0.000 16	C08325 0.000 17	JLX515 13.197 5	JLX154 8.928 3		23 16
JLX488 13.114 5	C08034 0.000 15	JLX683 12.891 10	C08132 0.000 15	JLX592 11.450 7	C08098 0.000 15	JLX706 13.820 10	C08206 0.000 18	JLX494 13.223 5	C08327 0.000 17	JLX559 12.497 6	JLX740 12.130 11	JLX153 8.926 3			24 14
C08291 0.000 14	JLX489 13.148 5	C08195 0.000 14	JLX763 14.092 13	C08198 0.000 16	JLX521 14.249 5	C08204 0.000 16	C08208 0.000 16	C08328 0.000 17	JLX556 13.006 6	JLX156 7.240 3	JLX198 9.417 12	JLX152 8.995 3			25 12
JLX484 12.793 5	C08194 0.000 16	JLX504 13.943 5	C08308 0.000 18	JLX500 12.616 5	C08316 0.000 14	JLX503 14.014 5	C08324 0.000 16	JLX546 12.397 6	JLX138 7.154 3	JLX196 9.407 12					26 10
C08300 0.000 18	C08302 0.000 18	C08306 0.000 18	C08310 0.000 18	C08314 0.000 16	C08036 0.000 18	C08032 0.000 17	C08243 0.000 17	JLX732 11.961 11	JLX193 9.286 12						27 08
JLX731 12.543 11	C08239 0.000 17	JLX492 12.756 5	C08241 0.000 17	JLX548 12.522 6	C08259 0.000 17	JLX701 11.978 10	JLX483 12.887 5	JLX132 8.875 3	JLX130 8.956 3						28 06
JLX689 12.291 10	JLX696 12.167 10	JLX634 12.299 9	JLX630 11.908 9	JLX636 11.973 9	JLX632 11.956 9	JLX186 8.253 12	JLX134 8.859 3								29 04
JLX140 7.933 3	JLX142 7.934 3	JLX194 8.140 12	JLX188 9.598 12	JLX190 9.630 12	JLX136 8.838 3	JLX184 8.778 12									30 02
31	33	35	37	39	41	43	45	47	49	51	53	55	57	59	

Bundle ID
Average Exposure (GWd/ST)
IAT

Bundle Name	IAT	# in Core	# Fresh	AvgWt KG	AvgExp GWd/ST	AvgRea	Avg Power
GE13-P9DTB156-NOG-100T-146-T6-2887	3	56	0	176.600	8.403	1.038	1.000
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GE14-P10DNAB402-16GZ-100T-150-T6-2891	6	32	0	179.264	12.903	1.151	1.000
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GE14-P10DNAB368-15GZ-100T-150-T6-2895	10	72	0	179.017	12.709	1.139	1.000
GE14-P10DNAB402-19GZ-100T-150-T6-2896	11	24	0	178.439	12.139	1.148	1.000
GE13-P9DTB163-NOG-100T-146-T6-2888	12	52	0	176.656	9.040	1.041	1.000
GE14-P10DNAB377-17GZ-100T-150-T6-2897	13	32	0	178.711	13.830	1.142	1.000
GE14-P10DNAB406-16GZ-100T-150-T6-3078	14	48	48	178.506	0.000	1.007	1.000
GE14-P10DNAB400-17GZ-100T-150-T6-3081	15	96	96	178.568	0.000	1.007	1.000
GE14-P10DNAB406-15GZ-100T-150-T6-3079	16	64	64	178.794	0.000	1.048	1.000
GE14-P10DNAB417-16GZ-100T-150-T6-3082	17	48	48	178.809	0.000	1.026	1.000
GE14-P10DNAB418-16GZ-100T-150-T6-3080	18	72	72	178.506	0.000	1.019	1.000
	Total	764	328	178.503	6.700	1.074	1.000

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NRC RAI SRXB-72 (Unit 1 only)

Provide the calculated cold critical eigenvalue (demonstration eigenvalue) for each startup that has occurred during Cycle 7 thus far (beginning of cycle to midcycle). Also, provide the exposure dependent cold critical design basis eigenvalue for Cycle 7. Provide a plot of each demonstration eigenvalue on the same graph as the exposure dependent cold critical design basis eigenvalue.

TVA Response to SRXB-72 (Unit 1 only)

Figure A is a graph of the two cold critical eigenvalues as a function of cycle exposure for Cycle 7 compared to the design basis eigenvalues as a function of cycle exposure for Cycle 7.

Figure A

[[

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ENCLOSURE 3

TENNESSEE VALLEY AUTHORITY
BROWNS FERRY NUCLEAR PLANT (BFN)
UNITS 1, 2, AND 3

TECHNICAL SPECIFICATIONS (TS) CHANGES TS-431 AND TS-418
EXTENDED POWER UPRATE (EPU)

RESPONSE TO ROUND 15 REQUEST FOR ADDITIONAL INFORMATION
APLA-38/40, SRXB-71, and SRXB-72

AFFIDAVIT

This enclosure provides GNF's affidavit for Enclosure 1.

Global Nuclear Fuel – Americas

AFFIDAVIT

I, Anthony P. Reese, state as follows:

(1) I am Reload Licensing Manager, Fuel Engineering, Global Nuclear Fuel–Americas, LLC ("GNF-A"), 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 attachment, "NRC Requests for Additional Information (RAIs) for Browns Ferry 1 Cycle 8 Shut Down Margin Designs" dated January 4, 2008. GNF proprietary information is identified by a dotted underline inside double square brackets. [[This sentence is an example.[3]]] In each case, the superscript notation [3] refers to Paragraph (3) of this affidavit, which provides the basis for the proprietary determination.

(3) In making this application for withholding of proprietary information of which it is the owner or licensee, GNF-A 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 2.390(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 GNF-A's competitors without license from GNF-A 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 GNF-A customer-funded development plans and programs, resulting in potential products to GNF-A;

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 2.390 (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 GNF-A, 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 GNF-A, 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, or subject to the terms under which it was licensed to GNF-A. Access to such documents within GNF-A 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 GNF-A 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) is classified as proprietary because it contains details of GNF-A's fuel design and licensing methodology.

The development of the methods used in these analyses, along with the testing, development and approval of the supporting methodology was achieved at a significant cost, on the order of several million dollars, to GNF-A or its licensor.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GNF-A's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GNF-A'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 GNF-A.

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.

GNF-A's competitive advantage will be lost if its competitors are able to use the results of the GNF-A 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 GNF-A 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 GNF-A of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing and obtaining 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 4th day of January 2008.

Anthony P. Reese
Reload Licensing Manager, Fuel Engineering
Global Nuclear Fuel – Americas, LLC