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U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Quad Cities Nuclear Power Station, Unit 2
Facility Operating License No. DPR-30
NRC Docket Number 50-265

Subject: Core Operating Limits Report for Quad Cities Unit 2 Cycle 17

On February 12, 2002, Quad Cities Nuclear Power Station Unit 2 was shutdown for Refuel Outage 16 (Q2R16). In accordance with Technical Specifications Section 5.6.5.d, the Core Operating Limits Report (COLR) for Quad Cities Unit 2 Cycle 17 is provided in Attachment A.

Should you have any questions concerning this letter, please contact Mr. W. J. Beck at (309) 227-2800.

Respectfully,

Timothy J. Tulon
Site Vice President
Quad Cities Nuclear Power Station

Attachment A: Core Operating Limits Report for Quad Cities Unit 2 Cycle 17

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station

A001

Attachment A

Core Operating Limits Report

for

Quad Cities Unit 2 Cycle 17

Core Operating Limits Report

for

Quad Cities Unit 2 Cycle 17

2957MW$_{th}$ Rated Power

Revision 0

Issuance of Changes Summary

Affected Section	Affected Pages	Summary of Changes	Revision	Date
All	All	Original Issue (Cycle 17)	0	February 2002

Table of Contents

References

1. Exelon Generation Company, LLC and MidAmerican Energy Company, Docket No. 50-265, Quad Cities Nuclear Power Station, Unit 2, Facility Operating License, License No. DPR-30.

2. Letter from D. M. Crutchfield to All Power Reactor Licensees and Applicants, Generic Letter 88-16; Concerning the Removal of Cycle-Specific Parameter Limits from Tech Specs, October 3, 1988.

3. "Supplemental Reload Licensing Report for QUAD CITIES UNIT 2 Reload 16 Cycle 17," J11-03918-SRLR, Revision 1, December 2001 (TODI NFM0200001 Sequence 0).

4. "Q2 C17 MICROBURN-B DBLP Basedeck," BNDQ:01-014, Revision 0, February 2002.

5. "DRESDEN 2 and 3, QUAD CITIES 1 and 2, Equipment Out-Of-Service and Legacy Fuel Transient Analysis," GE-NE-J11-03912-00-01-R1, November 2001 (TODI NFM0100091 Sequence 01).

6. "Fuel Mechanical Design Report Exposure Extension for ATRIUM-9B Fuel Assemblies at Dresden, Quad Cities, and LaSalle Units," EMF-2563(P) Revision 1, August 2001 (TODI NFM0100107 Sequence 0).

7. "Instrument Setpoint Calculation Nuclear Instrumentation, Rod Block Monitor, Commonwealth Edison Company, Quad Cities 1 & 2," GE DRF C51-00217-01, December 14, 1999.

8. "General Electric Standard Application for Reactor Fuel," NEDE-24011-P-A-14, June 2000.

9. "Quad Cities 2 Cycle 17 FRED Form," TODI NFM0100073 Sequence 1, July 19, 2001.

10. "Q2C17 Turbine Bypass Performance Evaluation Data," TODI NFM 0200034 Sequence 00, February 7, 2002.

11. "Q2C17 Turbine Bypass Performance Evaluation," TODI NFM 0200037 Sequence 00, February 13, 2002.

12. "OPL-3 Parameters for Quad Cities Unit 2 Cycle 17 Transient Analysis," TODI NFM 0100103 Sequence 00, September 26, 2001.

1. Average Planar Linear Heat Generation Rate

1.1 Technical Specification Reference

Sections 3.2.1 and 3.4.1.

1.2 Description

Tables 1-1 and 1-2 are used to determine the maximum average planar linear heat generation rate (MAPLHGR) limit for each fuel type. Limits listed in Tables 1-1 and 1-2 are for dual reactor recirculation loop operation.

For single reactor recirculation loop operation (SLO), the MAPLHGR limits given in Tables 1-1 and 1-2 must be multiplied by a SLO MAPLHGR multiplier. The SLO MAPLHGR multiplier for ATRIUM-9B fuel is 0.84 (Reference 3 Section 16). The SLO MAPLHGR multiplier for GE14 fuel is 0.77 (Reference 3 Section 16).

Table 1-1
MAPLHGR Limits for SPC ATRIUM-9B Fuel
ATRM9-P9DATB372-11GZ-SPC100T-9WR-144-T6-3916
ATRM9-P9DATB358-11GZ-SPC100T-9WR-144-T6-3917
ATRM9-P9DATB383-11GZ-SPC100T-9WR-144-T6-3918
ATRM9-P9DATB381-13GZ-SPC100T-9WR-144-T6-3919
(Bundles 3916, 3917, 3918, & 3919, Bundle Types 3, 4, 5, & 6)
(Reference 3 Section 16)

Nodal Exposure (GWd/MTU)	MAPLHGR (kW/ft)
0.0	13.52
17.25	13.52
70.00	7.84

Table 1-2
MAPLHGR Limits for GE14 Fuel
GE14-P10DNAB409-15GZ-100T-145-T6-2507
GE14-P10DNAB406-16GZ-100T-145-T6-2508
(Bundles 2507 & 2508, Bundle Types 20 & 21)
(Reference 3 Section 16)

Nodal Exposure (GWd/MTU)	MAPLHGR (kW/ft)
0.0	11.68
16.00	11.68
22.05	11.34
55.12	8.19
63.50	6.97
70.00	4.36

2. Minimum Critical Power Ratio

2.1 Technical Specification Reference

Sections 2.1.1.2, 3.2.2, 3.4.1, and 3.7.7.

2.2 Description

The various MCPR limits are described below.

2.2.1 Manual Flow Control MCPR Limits

The operating limit MCPR (OLMCPR) is determined from either Section 2.2.1.1 or 2.2.1.2, whichever is greater at any given power and flow condition.

2.2.1.1 Power-Dependent MCPR

For operation at less than 38.5% core thermal power, the OLMCPR as a function of core thermal power is shown in Table 2-4. For operation at greater than 38.5% core thermal power, the OLMCPR as a function of core thermal power is determined by multiplying the applicable EOOS condition limit shown in Table 2-1 or 2-2 by the applicable MCPR multiplier K_P given in Table 2-4. For operation at exactly 38.5% core thermal power, the OLMCPR as a function of core thermal power is the higher of either of the two aforementioned methods evaluated at exactly 38.5% core thermal power.

2.2.1.2 Flow-Dependent MCPR

Tables 2-6, 2-7, and 2-8 give the $MCPR_F$ limit as a function of flow based on the EOOS condition. The $MCPR_F$ limit determined from these tables is the flow dependent OLMCPR.

2.2.2 Automatic Flow Control MCPR Limits

Operation in the automatic flow control mode is only allowed during dual recirculation loop operation.

Automatic flow control limits are only provided for Option A scram speeds.

The operating limit MCPR (OLMCPR) is determined from either section 2.2.2.1 or 2.2.2.2, whichever is greater at any given power and flow condition.

2.2.2.1 Power-Dependent MCPR

For operation at less than 38.5% core thermal power, the OLMCPR as a function of core thermal power is shown in Table 2-5. For operation at greater than 38.5% core thermal power, the OLMCPR as a function of core thermal power is determined by multiplying the applicable EOOS condition limit shown in Table 2-3 by the applicable MCPR multiplier K_P given in Table 2-5. For operation at exactly 38.5% core thermal power, the OLMCPR as a function of core thermal power is the higher of either of the two aforementioned methods evaluated at exactly 38.5% core thermal power.

2.2.2.2 Flow-Dependent MCPR

Table 2-6 gives the $MCPR_F$ limit as a function of flow. The $MCPR_F$ limit determined from this table is the flow dependent OLMCPR.

2.2.3 Option A and Option B

Option A and Option B refer to scram times.

Option A scram time is the Improved Technical Specification scram time. The core average scram insertion time for 20% insertion must be less than or equal to the Technical Specification scram time to utilize Option A MCPR limits. Reload analyses performed by Global Nuclear Fuel (GNF) for cycle 17 Option A MCPR limits utilized a 20% core average insertion time of 0.900 seconds (Reference 12 Page 6).

To utilize the MCPR limits for the Option B scram time, the core average scram insertion time for 20% insertion must be less than or equal to 0.694 seconds (Reference 12 Page 6). If the core average scram insertion time does not meet the Option B criteria, but is within the Option A criteria, the appropriate MCPR value may be determined from a linear interpolation between the Option A and B limits with standard mathematical rounding to two decimal places.

2.2.4 Recirculation Pump Motor Generator Settings

Cycle 17 was analyzed with a maximum core flow runout of 110%; therefore the recirculation pump motor generator scoop tube mechanical and electrical stops must be set to maintain core flow less than 110% (108.0 Mlb/hr) for all runout events (Reference 9 Section 15). This value is consistent with the analyses of Reference 5.

Table 2-1
MCPR Option A Based Operating Limits
Manual Flow Control Operation
(References 3 and 5)

EOOS Combination	Fuel Type	Cycle Exposure		
		<14,300 MWd/MT	≥14,300 MWd/MT and prior to Coastdown	Coastdown
Base Case	GE14	1.53	1.65	1.67
	ATRIUM-9B	1.53	1.62	1.62
Base Case SLO	GE14	1.54	1.66	1.68
	ATRIUM-9B	1.54	1.63	1.63

Table 2-2
MCPR Option B Based Operating Limits
Manual Flow Control Operation
(References 3 and 5)

EOOS Combination	Fuel Type	Cycle Exposure		
		<14,300 MWd/MT	≥14,300 MWd/MT and prior to Coastdown	Coastdown
Base Case	GE14	1.42	1.48	1.50
	ATRIUM-9B	1.42	1.45	1.45
Base Case SLO	GE14	1.43	1.49	1.51
	ATRIUM-9B	1.43	1.46	1.46
TBPOOS SLO	GE14	1.60	1.60	1.62
	ATRIUM-9B	1.54	1.54	1.56
TCV Slow Closure SLO	GE14	1.48	1.49	1.51
	ATRIUM-9B	1.44	1.46	1.46
PLUOOS SLO	GE14	1.54	1.54	1.54
	ATRIUM-9B	1.48	1.48	1.48
TCV Stuck Closed SLO	GE14	1.43	1.49	1.51
	ATRIUM-9B	1.43	1.46	1.46

Table 2-3
MCPR Option A Operating Limits
Automatic Flow Control Operation
(References 3 and 5)

EOOS Combination	Fuel Type	Cycle Exposure	
		<14,300 MWd/MT	≥14,300 MWd/MT (includes Coastdown)
Base Case	GE14	1.73	1.87
	ATRIUM-9B	1.73	1.82

Table 2-4
MCPR$_P$ for GE and SPC Fuel
Manual Flow Control Operation
(Reference 5 Figures 2-1, 2-3, and 2-5, and Section 2.3.9)

EOOS Combination	Core Flow (% of rated)	Core Thermal Power (% of rated)								
		0	25	38.5	38.5	45	60	70	70	100
		Operating Limit MCPR			Operating Limit MCPR Multiplier, K_P					
Base Case	≤ 60	3.19	2.61	2.29	1.32	1.28	1.15			1.00
	> 60	3.81	3.01	2.59						
Base Case SLO	≤ 60	3.22	2.63	2.31	1.32	1.28	1.15			1.00
	> 60	3.84	3.04	2.61						
TBPOOS SLO	≤ 60	5.65	3.84	2.87	1.37	1.28	1.15			1.00
	> 60	6.91	4.71	3.51						
TCV Slow Closure SLO	≤ 60	5.65	3.84	2.87	1.64		1.45	1.26	1.11	1.00
	> 60	6.91	4.71	3.51						
PLUOOS SLO	≤ 60	5.65	3.84	2.87	1.64		1.45	1.26	1.11	1.00
	> 60	6.91	4.71	3.51						
TCV Stuck Closed SLO	≤ 60	3.22	2.63	2.31	1.32	1.28	1.15			1.00
	> 60	3.84	3.04	2.61						

Notes for Table 2-4:
- Values are interpolated between relevant power levels.
- For thermal limit monitoring at greater than 100% core thermal power, the 100% core thermal power multiplier K_P should be applied.
- Allowable EOOS conditions are listed in Section 5.
- MCPR$_P$ is independent of scram speed.

Table 2-5
MCPR$_P$ for GE and SPC Fuel
Automatic Flow Control Operation
(Reference 5 Figure 2-1 and Section 2.3.9)

EOOS Combination	Core Flow (% of rated)	Core Thermal Power (% of rated)								
		0	25	38.5	38.5	45	60	70	70	100
		Operating Limit MCPR			Operating Limit MCPR Multiplier, K_P					
Base Case	≤ 60	3.19	2.61	2.29	1.32	1.28	1.15	[redacted]		1.00
	> 60	3.81	3.01	2.59						

Notes for Table 2-5:

- Values are interpolated between relevant power levels.
- For thermal limit monitoring at greater than 100% core thermal power, the 100% core thermal power multiplier K_P should be applied.
- MCPR$_P$ is independent of scram speed.

Table 2-6
MCPR$_F$ limits for GE and SPC Fuel
Dual Reactor Recirculation Loop Operation
Except TCV Stuck Closed
(Reference 5 Figure 3-2 and Section 2.3.9)

Flow (% rated)	MCPR$_F$
110	1.20
95.68	1.20
40	1.54
30	1.61
0	1.79

Table 2-7
MCPR$_F$ for GE and SPC Fuel
Single Reactor Recirculation Loop Operation
Except TCV Stuck Closed
(Reference 5 Figure 3-2 and Section 2.3.9)

Flow (% rated)	MCPR$_F$
110	1.20
97.41	1.20
40	1.56
30	1.62
0	1.81

Table 2-8
MCPR$_F$ limits for GE and SPC Fuel
Single Reactor Recirculation Loop Operation
with TCV Stuck Closed
(Reference 5 Table 2-16 and Section 2.3.9)

Flow (% rated)	MCPR$_F$
110	1.23
108.9	1.24
101	1.28
40	1.66
30	1.73
0	1.91

Notes for Tables 2-6, 2-7, and 2-8:

- Values are interpolated between relevant flow values.
- Rated flow is 98 Mlb/hr.
- MCPR$_F$ is independent of scram speed.

3. Linear Heat Generation Rate

3.1 Technical Specification Reference

Section 3.2.3.

3.2 Description

The LHGR Limit is the product of the LHGR Limit from Tables 3-1, 3-2, or 3-3 and the minimum of either the power dependent LHGR factor, $LHGRFAC_P$, or the flow dependent LHGR factor, $LHGRFAC_F$. The applicable power dependent LHGR factor ($LHGRFAC_P$) is determined from Tables 3-4 and 3-5. The applicable flow dependent LHGR factor ($LHGRFAC_F$) is determined from Tables 3-6 and 3-7.

Table 3-1
LHGR Limits for GE14 Fuel
GE14-P10DNAB409-15GZ-100T-145-T6-2507
(Bundle 2507, Bundle Type 20)
(Reference 4 Page 3.1)

Nodal Exposure (GWd/MTU)	LHGR Limit (kW/ft)
0	13.40
12.58	13.40
27.55	11.44
33.06	10.63
38.58	9.94
44.09	9.32
49.60	8.74
55.11	8.17
57.99	8.00
64.51	5.00

Table 3-2
LHGR Limits for GE14 Fuel
GE14-P10DNAB406-16GZ-100T-145-T6-2508
(Bundle 2508, Bundle Type 21)
(Reference 4 Page 3.4)

Nodal Exposure (GWd/MTU)	LHGR Limit (kW/ft)
0	13.40
12.46	13.40
22.04	12.13
27.55	11.35
33.06	10.63
38.58	9.90
44.09	9.21
49.60	8.52
55.11	7.89
57.86	7.96
64.27	5.00

Table 3-3
LHGR Limits for SPC ATRIUM-9B Fuel
ATRM9-P9DATB372-11GZ-SPC100T-9WR-144-T6-3916
ATRM9-P9DATB358-11GZ-SPC100T-9WR-144-T6-3917
ATRM9-P9DATB383-11GZ-SPC100T-9WR-144-T6-3918
ATRM9-P9DATB381-13GZ-SPC100T-9WR-144-T6-3919
(Bundles 3916, 3917, 3918, & 3919, Bundle Types 3, 4, 5, & 6)
(Reference 6 Figure 2.1)

Nodal Exposure (GWd/MTU)	LHGR Limit (kW/ft)
0.00	14.40
15.00	14.40
64.30	7.90

Table 3-4
LHGRFAC$_P$ multipliers for GE and SPC Fuel
Manual Flow Control
(Reference 5 Figures 2-2, 2-4, and 2-6)

EOOS Combination	Core Flow (% of rated)	Core Thermal Power (% of rated)							
		0	25	38.5	38.5	70	70	80	100
		LHGRFAC$_P$ multiplier							
Base Case	≤ 60	0.50	0.56	0.59	0.68			0.86	1.00
	> 60								
Base Case SLO	≤ 60	0.50	0.56	0.59	0.68			0.86	1.00
	> 60								
TBPOOS SLO	≤ 60	0.22	0.39	0.48	0.54				1.00
	> 60	0.33		0.42					
TCV Slow Closure SLO	≤ 60	0.22	0.39	0.48	0.54	0.73	0.78		1.00
	> 60	0.33		0.42					
PLUOOS SLO	≤ 60	0.22	0.39	0.48	0.54	0.73	0.78		1.00
	> 60	0.33		0.42					
TCV Stuck Closed SLO	≤ 60	0.50	0.56	0.59	0.68			0.86	1.00
	> 60								

Notes for Table 3-4:
- Values are interpolated between relevant power levels.
- For thermal limit monitoring at greater than 100% core thermal power, the 100% core thermal power LHGRFAC$_P$ multiplier should be applied.
- Allowable EOOS conditions are listed in Section 5.
- LHGRFAC$_p$ is independent of scram speed.

Table 3-5
$LHGRFAC_P$ multipliers for GE and SPC Fuel
Automatic Flow Control

(Reference 3 Page 62)

Power (% rated)	$LHGRFAC_P$
100	1.00
50	0.50
0	0.00

Notes for Table 3-5:

- Values are interpolated between relevant power levels.
- For thermal limit monitoring at greater than 100% core thermal power, the 100% core thermal power $LHGRFAC_P$ multiplier should be applied.
- $LHGRFAC_P$ is independent of scram speed.

Table 3-6
$LHGRFAC_F$ multipliers for GE and SPC Fuel Except TCV Stuck Closed

(Reference 5 Figure 3-3)

Flow (% rated)	$LHGRFAC_F$
100	1.00
80	1.00
50	0.77
40	0.64
30	0.55
0	0.28

Table 3-7
$LHGRFAC_F$ multipliers for GE and SPC Fuel TCV Stuck Closed

(Reference 5 Table 2-17)

Flow (% rated)	$LHGRFAC_F$
100	1.00
98.3	1.00
80	0.86
50	0.63
40	0.50
30	0.41
0	0.14

Notes for Tables 3-6 and 3-7:

- Values are interpolated between relevant flow values.
- 98 Mlb/hr is rated flow.
- For thermal limit monitoring at > 100% rated flow, the 100% rated flow multiplier should be used.
- $LHGRFAC_F$ is independent of scram speed.

4. Control Rod Withdrawal Block Instrumentation

4.1 Technical Specification Reference

Table 3.3.2.1-1

4.2 Description

The Rod Block Monitor Upscale Instrumentation Setpoints are determined from the relationships shown below (Reference 7 Page 11):

ROD BLOCK MONITOR UPSCALE TRIP FUNCTION	ALLOWABLE VALUE
Two Recirculation Loop Operation	$0.65\ W_d + 56.1\%$
Single Recirculation Loop Operation	$0.65\ W_d + 51.4\%$

The setpoint may be lower/higher and will still comply with the rod withdrawal error (RWE) analysis because RWE is analyzed unblocked.

The allowable value is clamped with a maximum value not to exceed the allowable value for a recirculation loop drive flow (W_d) of 100%

W_d – percent of recirculation loop drive flow required to produce a rated core flow of 98 Mlb/hr.

5. Allowed Modes of Operation (B 3.2.2, B 3.2.3, B 3.7.7)

The allowed modes of operation with combinations of equipment out-of-service (EOOS) are as described below:

Equipment Out of Service Options[1,5]	---------OPERATING REGION--------- ELLLA	MELLLA	ICF[7]	Coastdown[3]	POWERPLEX Thermal Limit Set Number Non-Coastdown	Coastdown
Base Case[2], Option A	Yes	Yes	Yes	Yes	1	9
Base Case SLO[2], Option A	Yes	Yes	Yes	Yes	2	10
Base Case[2], Option B	Yes	Yes	Yes	Yes	3	11
Base Case SLO[2], Option B	Yes	Yes	Yes	Yes	4	12
TBPOOS SLO[2], Option B	Yes	Yes	Yes	Yes	5	13
TCV Slow Closure SLO, Option B	Yes	Yes	Yes	Yes	6[4]	6[4]
PLUOOS SLO[6], Option B	Yes	Yes	Yes	Yes	6	6
TCV Stuck Closed SLO, Option B	Yes	Yes	Yes	Yes	7	14
Automatic Flow Control, Option A	Yes	Yes	Yes	Yes	8	8

[1] Each OOS Option may be combined with up to 18 TIP channels OOS (provided the requirements for utilizing SUBTIP methodology are met) with all TIPS available at startup from a refuel outage, a 100°F reduction in feedwater temperature throughout the cycle (Final Feedwater Temperature Reduction or Feedwater Heaters OOS), and up to 50% of the LPRMs OOS with an LPRM calibration frequency of 2500 Effective Full Power Hours (EFPH) (2000 EFPH +25%).

[2] The base case condition requires the opening profiles for the Turbine Bypass Valves provided in Reference 10 (as evaluated per Reference 11) to be met. The base case condition also supports 1 Turbine Bypass Valve OOS (TBPOOS) if the assumed opening profiles (Reference 10) for the remaining group of Turbine Bypass Valves is met. If the opening profiles are **not** met (with 8 or 9 operating Turbine Bypass Valves), or if more than one Turbine Bypass Valve is OOS, utilize the TBPOOS condition.

[3] Coastdown operation is defined as any cycle exposure beyond the full power, all rods out condition with plant power slowly lowering to a lesser value while core flow is held constant (Reference 8 Section 4.3.1.2.8). Up to a 15% overpower is analyzed per Reference 5.

[4] This thermal limit set conservatively implements the TCV Slow Closure limits.

[5] The thermal limit sets indicated as applying to SLO (single loop operation) can be applied during dual loop operation (DLO). If the SLO set is used, then the limits are conservative relative to DLO.

[6] If the Base Case (Option A or B) limit set is being used and the PLU is taken OOS for a surveillance and the surveillance is done at ≥80% rated reactor power and ≥80% rated reactor flow, an administrative limit of 0.89 on MFLCPR and 0.98 on FDLRX/MFPLD can be used instead of the PLUOOS SLO thermal limit set.

[7] Operation up to 108% rated core flow is licensed for this cycle.

6. Methodology (5.6.5)

The analytical methods used to determine the core operating limits shall be those previously reviewed and approved by the NRC, specifically those described in the following documents:

1. NEDE-24011-P-A-14 (Revision 14), "General Electric Standard Application for Reactor Fuel (GESTAR-II)," June 2000.
2. Commonwealth Edison Topical Report NFSR-0085, Revision 0, "Benchmark of BWR Nuclear Design Methods," November 1990.
3. Commonwealth Edison Topical Report NFSR-0085, Supplement 1 Revision 0, "Benchmark of BWR Nuclear Design Methods - Quad Cities Gamma Scan Comparisons," April 1991.
4. Commonwealth Edison Topical Report NFSR-0085, Supplement 2 Revision 0, "Benchmark of BWR Nuclear Design Methods – Neutronic Licensing Analyses," April 1991.
5. XN-NF-80-19(P)(A), Volume 1 and Supplements 1 and 2, "Exxon Nuclear Methodology for Boiling Water Reactors – Neutronic Methods for Design and Analysis," March 1983.
6. XN-NF-80-19(P)(A), Volume 1 Supplement 3, Supplement 3 Appendix F, and Supplement 4, "Advanced Nuclear Fuels Methodology for Boiling Water Reactors: Benchmark Results for CASMO-3G/MICROBURN-B Calculation Methodology," November 1990.
7. XN-NF-80-19(P)(A), Volumes 2, 2A, 2B, and 2C, "Exxon Nuclear Methodology for Boiling Water Reactors: EXEM BWR ECCS Evaluation Model," September 1982.
8. XN-NF-80-19(P)(A), Volume 3 Revision 2, "Exxon Nuclear Methodology for Boiling Water Reactors, THERMEX: Thermal Limits Methodology Summary Description," January 1987.
9. XN-NF-80-19(P)(A), Volume 4 Revision 1, "Exxon Nuclear Methodology for Boiling Water Reactors: Application of the ENC Methodology to BWR Reloads," June 1986.
10. XN-NF-85-67(P)(A), Revision 1, "Generic Mechanical Design for Exxon Nuclear Jet Pump BWR Reload Fuel," September 1986.
11. XN-NF-82-06(P)(A), Revision 1 and Supplements 2, 4, and 5, "Qualification of Exxon Nuclear Fuel for Extended Burnup," October 1986.
12. XN-NF-82-06(P)(A), Supplement 1 Revision 2, "Qualification of Exxon Nuclear Fuel for Extended Burnup," Supplement 1, "Extended Burnup Qualification of ENC 9x9 BWR Fuel," May 1988.
13. ANF-89-14(P)(A), Revision 1 and Supplements 1 & 2, "Advanced Nuclear Fuels Corporation Generic Mechanical Design for Advanced Nuclear Fuels Corporation 9X9 – IX and 9x9 – 9X BWR Reload Fuel," October 1991.
14. ANF-89-98(P)(A), Revision 1 and Supplement 1, "Generic Mechanical Design Criteria for BWR Fuel Designs," May 1995.
15. XN-NF-79-71(P)(A), Revision 2 and Supplements 1, 2, and 3, "Exxon Nuclear Plant Transient Methodology for Boiling Water Reactors," March 1986.
16. ANF-1125(P)(A) and Supplements 1 and 2, "ANFB Critical Power Correlation," April 1990.
17. ANF-1125(P)(A), Supplement 1 Appendix E, "ANFB Critical Power Correlation Determination of ATRIUM-9B Additive Constant Uncertainties," September 1998.

18. ANF-524(P)(A), Revision 2 and Supplements 1 and 2, "ANF Critical Power Methodology for Boiling Water Reactors," November 1990.

19. ANF-913(P)(A), Volume 1 Revision 1 and Volume 1 Supplements 2, 3, and 4, "COTRANSA2: A Computer Program for Boiling Water Reactor Transient Analyses," August 1990.

20. ANF-91-048(P)(A), "Advanced Nuclear Fuels Corporation Methodology for Boiling Water Reactors EXEM BWR Evaluation Model," January 1993.

21. ANF-91-048(P)(A), Supplements 1 and 2, "BWR Jet Pump Model Revision for RELAX," October 1997.

22. Commonwealth Edison Company Topical Report NFSR-0091, "Benchmark of CASMO/MICROBURN BWR Nuclear Design Methods," Revision 0 and Supplements on Neutronics Licensing Analysis (Supplement 1) and La Salle County Unit 2 benchmarking (Supplement 2), December 1991, March 1992, and May 1992, respectively.

23. EMF-1125(P)(A), Supplement 1 Appendix C, "ANFB Critical Power Correlation Application for Co-Resident Fuel," August 1997.

24. EMF-85-74(P), Revision 0. Supplement 1 (P)(A) and Supplement 2 (P)(A), "RODEX2A (BWR) Fuel Rod Thermal-Mechanical Evaluation Model," Siemens Power Corporation, February 1998.

25. NEDC-32981P, Revision 0, "GEXL96 Correlation for ATRIUM-9B Fuel," September 2000.