Exelon.[SM]
Nuclear

Exelon Generation
Quad Cities Generating Station
22710 206th Avenue North
Cordova, IL 61242-9740
Tel 309-654-2241

www.exeloncorp.com

May 19, 2001

SVP-01-063

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

Quad Cities Nuclear Power Station, Units 1 and 2
Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Revision to Core Operating Limits Report for Quad Cities Units 1 and 2

In accordance with Technical Specifications section 5.6.5 "Core Operating Limits Report (COLR)" revisions to each units COLR are provided in the attachments. These revision were required to support implementation of the Improved Technical Specifications (ITS) which occurred on May 19, 2001.

The changes included updating references to ITS, nomenclature changes to identify the terminology "Allowable Value" for the rod block monitor, addition of Bypass Valve Out of Service Operating Limits and the addition of methodologies listed in ITS section 5.6.5.

Should you have any questions concerning this letter, please contact Mr. W. J. Beck at (309) 654-2800.

Respectfully,

George P. Barnes for
Timothy J. Tulon
Site Vice President
Quad Cities Nuclear Power Station

Attachments:

Attachment A: Quad Cities Unit 1, Core Operating Limits Report Cycle 17
Attachment B: Quad Cities Unit 1, Core Operating Limits Report Cycle 16

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

A001

Attachment A
Quad Cities Unit 1
Core operating limits report cycle17

ISSUANCE OF CHANGES SUMMARY

Affected Section	Affected Pages	Summary of Changes	Date
All	All	Original Issue (Cycle 17)	10/00
Special Instructions 1, 2, 3, 4 and 5	iii, 1-1, 2-1, 3-1, 4-1, 4-2, and 5-1	Updated for ITS	4/01

SPECIAL INSTRUCTIONS

1. This Core Operating Limits Report (COLR) contains the applicable reactor core limits and operational information mandated by Technical Specifications Section 5.6.5. When the COLR is referenced by applicable Technical Specifications or procedures for Technical Specification compliance, a controlled copy of this report shall be used as the official source of the applicable limit or requirement.

1.0 CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

1.1 TECHNICAL SPECIFICATION REFERENCE:

TS 3.3.2.1, Table 3.3.2.1-1 (COLR 1.2) and
TS 3.4.1 (COLR 1.3)

1.2 DESCRIPTION (TLO):

The Rod Withdrawal Block Monitor Upscale Instrumentation Allowable Value for two recirculation loop operation is determined from the following relationship:

$$\leq (0.65)Wd + 56.1\% \,**$$

1.3 DESCRIPTION (SLO):

The Rod Withdrawal Block Monitor Upscale Instrumentation Allowable Value for Single Loop Operation (SLO) is determined from the following relationship:

$$\leq (0.65)Wd + 51.4\% \,**$$

** Clamped with an allowable value not to exceed the allowable value for recirculation loop drive flow (Wd) of 100%

Wd is the percent of drive flow required to produce a rated core flow of 98 million lb/hr. Trip level setting is in percent of rated power (2511 MWth).

2.0 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)

2.1 TECHNICAL SPECIFICATION REFERENCE:

TS 3.2.1 (COLR 2.2.b) and
TS 3.4.1 (COLR 2.3)

2.2 DESCRIPTION:

a. For operation with uncalibrated LPRMs from BOC to 500 MWd/MT a penalty of 15.52% must be applied to all MAPLHGR limits.

b. The base MAPLHGR limits are determined as follows:

The Maximum Average Planar Linear Heat Generation Rates (MAPLHGR) vs. Average Planar Exposure for GE10-P8HXB311-8GZ-100M-145-CECO is determined from Table 2-1.

The Maximum Average Planar Linear Heat Generation Rates (MAPLHGR) vs. Average Planar Exposure for GE10-P8HXB312-7GZ-100M-145-CECO is determined from Table 2-2.

The Maximum Average Planar Linear Heat Generation Rates (MAPLHGR) vs. Average Planar Exposure for GE10-P8HXB332-8G5.0-100M-145-CECO is determined from Table 2-3.

The Maximum Average Planar Linear Heat Generation Rates (MAPLHGR) vs. Average Planar Exposure for GE10-P8HXB333-4G5.0/6G4.0-100M-145-CECO is determined from Table 2-4.

The Maximum Average Planar Linear Heat Generation Rates (MAPLHGR) vs. Average Planar Exposure for SPCA9-3.48B-11G6.5-ADV, SPCA9-3.60B-11G6.5-ADV, SPCA9-383B-11GZH-ADV, and SPCA9-382B-12GZL-ADV is determined from Table 2-5.

2.3 SINGLE LOOP OPERATION MULTIPLIER:

The tabulated values are multiplied by 0.85 for GE fuel and 0.90 for SPC fuel whenever Quad Cities enters Single Loop Operation.

3.0 LINEAR HEAT GENERATION RATE (LHGR)

3.1 TECHNICAL SPECIFICATION REFERENCE:

TS 3.2.3 and
TS 3.2.4

3.2 DESCRIPTION

A. For operation with with uncalibrated LPRMs from BOC to 500 MWd/MT a penalty of 15.52% must be applied to all LHGR limits.

B. The LHGR limit for the GE fuel types in the Q1C17 core are as follows:

GE10-P8HXB311-8GZ-100M-145-CECO

NODAL EXPOSURE (GWD/MTU)	LHGR (KW/ft)
0.0	14.40
12.87	14.40
27.16	12.31
48.91	10.80
60.61	6.00

GE10-P8HXB312-7GZ-100M-145-CECO

NODAL EXPOSURE (GWD/MTU)	LHGR (KW/ft)
0.0	14.40
13.00	14.40
27.27	12.31
49.01	10.80
60.70	6.00

GE10-P8HXB332-8G5.0-100M-145-CECO

NODAL EXPOSURE (GWD/MTU)	LHGR (KW/ft)
0.0	14.40
12.75	14.40
27.25	12.31
48.97	10.8
60.62	6.00

GE10-P8HXB333-4G5.0/6G4.0-100M-145-CECO

NODAL EXPOSURE (GWD/MTU)	LHGR (KW/ft)
0.0	14.40
12.69	14.40
27.11	12.31
48.87	10.80
60.54	6.00

4.0 MINIMUM CRITICAL POWER RATIO (MCPR)

4.1 TECHNICAL SPECIFICATION REFERENCE:

TS 2.1.1.2,
TS 3.2.2 and
TS 3.4.1

4.2 DESCRIPTION

The MCPR Operating Limits are based on the dual loop MCPR Safety Limit of 1.11. For Single Loop Operation the MCPR Safety Limit is 1.12 which increases the MCPR Operating Limit by 0.01. The MCPR Safety Limit is based on the following equipment conditions:

50% of the LPRMs out of service
40% of the TIPs out of service
2500 EFPH LPRM calibration interval
Operation with uncalibrated LPRMs at startup
Single Loop Operating
No reused channels

NOTE: For operation with uncalibrated LPRMs at BOC, analysis results support these limits for cycle exposures up to 500.0 MWd/MTU and therefore, the Q1C17 MCPR Operating Limits are bounding.

The MCPR Operating Limits are based on a 15 psi reduction in steam dome pressure and Technical Specification SCRAM speeds.

The Operating Limit MCPR shall be determined as follows:

1. During steady-state operating at rated core flow, the Operating Limit MCPR shall be greater than or equal to the limits provided in Table 4-1 for the appropriate operating conditions.

2. During off-rated flow conditions in Manual Flow Control Mode, the Operating Limit MCPR for each fuel type at a specific core flow condition shall be determined from the greater of the following:

   a. Table 4-2 using the appropriate flow rate, or

   b. Table 4-1 using the appropriate operating condition.

Percent Rated Recirculation Flow based on 98 MLB/hr with 110% Maximum Flow in Manual Flow Control. (Technical Requirements Manual 2.1.a.1 and Bases of TS 3.2.2)

3. During off-rated flow conditions in Automatic Flow Control Mode, the Operating Limit MCPR for each fuel type at a specific core flow condition shall be determined from Table 4-3 or Table 4-4 using the appropriate operating conditions. *Percent Rated Recirculation Flow based on 98 MLB/hr with 108% Maximum Flow in Automatic Flow Control Operation* (Technical Requirements Manual 2.1.a.1 and Bases of TS 3.2.2).

4. During PLU Out of Service Conditions a 0.979 MFLCPR Administrative Limit shall be used during operation up to EOFP and a 0.980 MFLCPR Administrative Limit shall be used during coastdown.

TABLE 4-1

Q1C17 Operating Limit MCPRs based on 1.11 SLMCPR

	GE10 OLMCPR	ATRIUM-9B OLMCPR
Normal Operation (Supports ICF and RVOOS)	1.51	1.46
EOD/EOOS Operation (FFTR, FHOOS, Coastdown, or any combination thereof)	1.55	1.50
1 Bypass Valve OOS	1.51	1.47
All Bypass Valves OOS	1.52	1.51

TABLE 4-2

Q1C17 Operating Limit MCPRs for Manual Flow Control
(For Normal Operation or EOD/EOOS Operation)

Total Core Flow (% of Rated)	GE10 OLMCPR	ATRIUM-9B Offset OLMCPR
110	1.11	1.11
30	2.00	2.05
0	2.56	2.59

TABLE 4-3

Q1C17 Operating Limit MCPRs for Automatic Flow Control (Base Case OLMCPR)

Total Core Flow (% of Rated)	GE10 OLMCPR	ATRIUM-9B Offset OLMCPR
108	1.51	1.46
30	2.83	2.81
0	3.73	3.66

TABLE 4-4

Q1C17 Operating Limit MCPRs for Automatic Flow Control EOD/EOOS

Total Core Flow (% of Rated)	GE10 OLMCPR	ATRIUM-9B Offset OLMCPR
108	1.55	1.50
30	2.91	2.89
0	3.82	3.77

5.0 ANALYTICAL METHODS

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, "General Electric Standard Application for Reactor Fuel," June 2000.

2. Commonwealth Edison Topical Report NFSR-0085, "Benchmark of BWR Nuclear Design Methods," Revision 0, November 1990.

3. Commonwealth Edison Topical Report NFSR-0085, Supplement 1, "Benchmark of BWR Nuclear Design Methods - Quad Cities Gamma Scan Comparisons," Revision 0, April 1991.

4. Commonwealth Edison Topical Report NFSR-0085, Supplement 2, "Benchmark of BWR Nuclear Design Methods – Neutronic Licensing Analyses," Revision 0, April 1991.

5. Advanced Nuclear Fuels Methodology for Boiling Water Reactors, XN-NF-80-19 (P)(A), Volume 1, Supplement 3, Supplement 3 Appendix F, and Supplement 4, Advanced Nuclear Fuels Corporation, November 1990.

6. Exxon Nuclear Methodology for Boiling Water Reactors" Application of the ENC Methodology to BWR Reloads, XN-NF-80-19 (P)(A), Volume 4, Revision 1, Exxon Nuclear Company, June 1986.

7. Exxon Nuclear Methodology for Boiling Water Reactors THERMEX: Thermal Limits Methodology Summary Description, XN-NF-90-19 (P)(A), Volume 3, Revision 2, Exxon Nuclear Company, January 1987.

8. Exxon Nuclear Methodology for Boiling Water Reactors – Neutronic Methods for Design and Analysis, XN-NF-80-19 (P)(A), Volume 1 and Supplements 1 and 2, Exxon Nuclear Company, March 1983.

9. Generic Mechanical Design for Exxon Nuclear Jet Pump BWR Reload Fuel, XN-NF-85-67 (P)(A), Revision 1, Exxon Nuclear Company, September 1986.

10. Qualification of Exxon Nuclear Fuel for Extended Burnup Supplement 1: Extended Burnup Qualification of ENC 9x9 BWR Fuel, XN-NF-82-06 (P)(A), Supplement 1, Revision 2, Advanced Nuclear Fuels Corporation, May 1988.

11. Advanced Nuclear Fuels Corporation Generic Mechanical Design for Advanced Nuclear Fuels 9x9-IX and 9x9-9X BWR Reload Fuel, ANF-89-014 (P)(A), Revision 1, and Supplements 1 and 2, Advanced Nuclear Fuels Corporation, October 1991.

12. Generic Mechanical Design Criteria for BWR Fuel Designs, ANF-89-98 (P)(A), Revision 1, and Revision 1 Supplement 1, Advanced Nuclear Fuels Corporation, May 1995.

13. Exxon Nuclear Plant Transient Methodology for Boiling Water Reactors, XN-NF-79-71 (P)(A), Revision 2 Supplements 1, 2 and 3, Exxon Nuclear Company, March 1986.

14. ANFB Critical Power Correlation, ANF-1125 (P)(A) and Supplements 1 and 2, Advanced Nuclear Fuels Corporation, April 1990.

15. Advanced Nuclear Fuels Corporation Critical Power Methodology for Boiling Water Reactors/Advanced Nuclear Fuels Corporation Critical Power Methodology for Boiling Water Reactors: Methodology for Analysis of Assembly Channel Bowing Effects/NRC Correspondence, ANF-524 (P)(A), Revision 2, Supplement 1 Revision 2, Supplement 2, Advanced Nuclear Fuels Corporation, November 1990.

16. COTRANSA 2: A Computer Program for Boiling Water Reactor Transient Analyses, ANF-913 (P)(A) Volume 1 Revision 1 and Volume 1 Supplements 2, 3, and 4, Advanced Nuclear Fuels Corporation, August 1990.

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

18. Commonwealth Edison Topical Report NFSR-0091, "Benchmark of CASMO/MICROBURN BWR Nuclear Design Methods," Revision 0, Supplements 1 and 2, December 1991, March 1992, and May 1992, respectively; SER letter dated March 22, 1993.

19. ANFB Critical Power Correlation Application for Coresident Fuel, EMF-1125 (P)(A), Supplement 1, Appendix C, Siemens Power Corporation, August 1997.

20. ANFB Critical Power Correlation Determination of ATRIUM-9B Additive Constant Uncertainties, ANF-1125 (P)(A), Supplement 1, Appendix E, Siemens Power Corporation, September 1998.

Attachment B
Quad Cities Unit 2
Core operating limits report cycle16

ISSUANCE OF CHANGES SUMMARY

Affected Section	Affected Pages	Summary of Changes	Date
All	All	Original Issue, Cycle 16	1/2000
Special Instructions, 1, 2, 3, 4, and 5	iii, 1, 2, 3, 4, 4-1, 4-2, and 5	Updated for ITS	4/01

SPECIAL INSTRUCTIONS

1. This Core Operating Limits Report (COLR) contains the applicable reactor core limits and operational information mandated by Technical Specifications Section 5.6.5. When the COLR is referenced by applicable Technical Specifications or procedures for Technical Specification compliance, a controlled copy of this report shall be used as the official source of the applicable limit or requirement.

1.0 CONTROL ROD WITHDRAWAL BLOCK INSTRUMENTATION

1.1. TECHNICAL SPECIFICATION REFERENCE:

Technical Specification: 3.3.2.1, Table 3.3.2.1-1 [COLR 1.2], and TS 3.4.1 [COLR 1.3]

1.2. DESCRIPTION (TLO):

The Rod Withdrawal Block Monitor Upscale Instrumentation Allowable Value for Two Recirculation Loop Operation is determined from the following relationship:

$\leq$ (0.65)Wd + 56.1% **

1.3. DESCRIPTION (SLO):

The Rod Withdrawal Block Monitor Upscale Instrumentation Allowable Value for Single Recirculation Loop Operation (SLO) is determined from the following relationship.

$\leq$ (0.65)Wd + 51.4% **

** Clamped, with an allowable value not to exceed the allowable value for recirculation loop drive flow (Wd) of 100%.

Wd is the percent of drive flow required to produce a rated core flow of 98 million lb/hr. Trip level setting is in percent of rated power (2511 MWth).

2.0 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)

2.1 TECHNICAL SPECIFICATION REFERENCE:

Technical Specification 3.2.1 (COLR 2.2) and 3.4.1 (COLR 2.3)

2.2 DESCRIPTION:

MAPLHGR versus Average Planar Exposure for GE9B-P8DWB310-7G3.0-80M-145-T is determined from Table 2-1.

MAPLHGR versus Average Planar Exposure for GE9B-P8DWB308-10GZ1-80M-145-T is determined from Table 2-2.

MAPLHGR versus Average Planar Exposure for GE10-P8HXB316-8GZ-100M-145-T is determined from Table 2-3.

MAPLHGR versus Average Planar Exposure for GE10-P8HXB312-7GZ-100M-145-T is determined from Table 2-4.

MAPLHGR versus Average Planar Exposure for SPCA9-372B-11GZH-ADV is determined from Table 2-5.

MAPLHGR versus Average Planar Exposure for SPCA9-358B-11GZL-ADV is determined from Table 2-5.

MAPLHGR versus Average Planar Exposure for SPCA9-383B-11GZH-ADV is determined from Table 2-5.

MAPLHGR versus Average Planar Exposure for SPCA9-381B-12GZL-ADV is determined from Table 2-5.

2.3 SINGLE LOOP OPERATION MULTIPLIER:

The tabulated values are multiplied by 0.85 for GE fuel and 0.90 for SPC fuel whenever Quad Cities operates in Single Loop.

3.0 LINEAR HEAT GENERATION RATE (LHGR)

3.1 TECHNICAL SPECIFICATION REFERENCE:

Technical Specification 3.2.3 and Technical Specification 3.2.4

3.2 DESCRIPTION:

A. The LHGR limit is 14.4 Kw/ft for all GE fuel types:

1. GE9B-P8DWB310-7G3.0-80M-145-T
2. GE9B-P8DWB308-10GZ1-80M-145-T
3. GE10-P8HXB316-8GZ-100M-145-T
4. GE10-P8HXB312-7GZ-100M-145-T

B. The LHGR limits are provided in the table below for all of the SPC fuel types:

1. SPCA9-372B-11GZH-ADV
2. SPCA9-358B-11GZL-ADV
3. SPCA9-383B-11GZH-ADV
4. SPCA9-381B-12GZL-ADV

Average Planar Exposure (GWd/MTU)	ATRIUM-9B LHGR (kW/ft)
0.0	14.4
15.0	14.4
61.1	8.32

C. The Protection Against Power Transient LHGR Limit for ATRIUM-9B Offset fuel is provided in in the table below:

Average Planar Exposure (GWd/MTU)	LHGR (kW/ft)
0.0	19.4
15.0	19.4
61.1	11.2

4.0 MINIMUM CRITICAL POWER RATIO (MCPR)

4.1 TECHNICAL SPECIFICATION REFERENCE:

Technical Specifications 2.1.1.2, 3.2.2, and 3.4.1

4.2 DESCRIPTION:

The MCPR Operating Limits are based on the dual loop MCPR Safety Limit of 1.11. For Single Loop Operation the MCPR Safety Limit is 1.12 which increases the MCPR operating limit by 0.01. The MCPR Operating Limits are also based on a 15 psi reduction in steam dome pressure and Technical Specification SCRAM speeds. EOD/EOOS conditions that require MCPR penalties are FHOOS, FFTR and coastdown or any combination thereof. Other analyzed EOD/EOOS conditions (per EMF-2299 Rev. 0) do not require a MCPR penalty.

The Operating Limit MCPR shall be determined as follows:

1. During steady-state operation at rated core flow, the Operating Limit MCPR shall be greater than or equal to the limits provided in Table 4-1 for the appropriate operating conditions.

2. During off-rated flow conditions in Manual Flow Control Mode, the Operating Limit MCPR for each fuel type at a specific core flow condition shall be determined from the greater of the following:

   a. Table 4-2 or 4-3 using the appropriate operating condition and flow rate, or

   b. Table 4-1 using the appropriate operating condition.

Percent Rated Recirculation Flow based on 98 MLB/hr with 110% Maximum Flow in Manual Flow Control. (Technical Requirements Manual 2.1.a.1 and Bases of TS 3.2.2)

3. During off-rated flow conditions in Automatic Flow Control Mode, the Operating Limit MCPR for each fuel type at a specific core flow condition shall be determined from table 4-4 or 4-5 using the appropriate operating conditions. *Percent Rated Recirculation Flow based on 98 MLB/hr with 110% Maximum Flow in Manual Flow Control.* (Technical Requirements Manual 2.1.a.1 and Bases of TS 3.2.2)

4. During PLU Out of Service conditions a 0.973 MFLCPR multiplier shall be used during operation up to EOFP and a 0.969 MFLCPR multiplier shall be used during coastdown.

TABLE 4-1
Steady State MCPR Operating Limits

Operating Condition	**GE9**	**GE10**	**ATRIUM-9B**
Normal Operation (1.11 SLMCPR)	1.53	1.49	1.46
Single Loop Operation (1.12 SLMCPR)	1.54	1.50	1.47
EOD/EOOS Dual Loop Operation (1.11 SLMCPR) to suport FFTR, FHOOS, coastdown or any combination therof. Other EOD/EOOS conditons require no MCPR penalty.	1.55	1.59	1.49
EOD/EOOS Single Loop Operation (1.12 SLMCPR) to support FFTR, FHOOS, coastdown or any combination thereof in single loop operation. Other EOD/EOOS conditions require no MCPR penalty.	1.56	1.60	1.50
One Bypass Valve Out of Service	1.54	1.51	1.47
All Bypass Valves Out of Service	1.55	1.53	1.49

For core flows less than rated, reduced flow $MCPR_f$ curves for Manual Flow Control are provided in Tables 4-2 and 4-3. $MCPR_f$ values for Automatic Flow Control are provided in Tables 4-4 and 4-5. ***Percent Rated Recirculation Flow based on 98 MLB/hr with 110% Maximum Flow in Manual Flow Control and 108% Maximum Flow in Automatic Flow Control operation (Requirements Manual TSR 2.1.a.1 and Bases of TS 3.2.2).***

TABLE 4-2
Reduced Flow $MCPR_f$ Limit for Manual Flow Control based on 1.11 SLMCPR
(Two-Loop Operation)

Recirculation Flow (% of rated)	GE 9 $MCPR_f$ Limit	GE 10 $MCPR_f$ Limit	ATRIUM-9B Offset $MCPR_f$ Limit
110	1.11	1.11	1.11
30	1.98	1.96	2.02
0	2.54	2.52	2.57

TABLE 4-3
Reduced Flow $MCPR_f$ Limit for Manual Flow Control based on 1.12 SLMCPR
(Single-Loop Operation)

Recirculation Flow (% of rated)	GE 9 $MCPR_f$ Limit	GE 10 $MCPR_f$ Limit	ATRIUM-9B Offset $MCPR_f$ Limit
110	1.12	1.12	1.12
30	1.99	1.97	2.03
0	2.55	2.53	2.58

TABLE 4-4
Reduced Flow $MCPR_f$ Limit for Automatic Flow Control based on 1.11 SLMCPR
(Two-Loop Operation)

Recirculation Flow (% of rated)	GE 9 Base Case	GE 9 EOD/ EOOS	GE 10 Base Case	GE 10 EOD/ EOOS	ATRIUM-9B Base Case	ATRIUM-9B EOD/ EOOS
108	1.53	1.55	1.49	1.59	1.46	1.49
30	2.84	2.87	2.75	2.93	2.78	2.83
0	3.76	3.80	3.65	3.87	3.65	3.72

TABLE 4-5
Reduced Flow $MCPR_f$ Limit for Automatic Flow Control based on 1.12 SLMCPR
(Single-Loop Operation)

Recirculation Flow (% of rated)	GE 9 Base Case	GE 9 EOD/ EOOS	GE 10 Base Case	GE 10 EOD/ EOOS	ATRIUM-9B Base Case	ATRIUM-9B EOD/ EOOS
108	1.54	1.56	1.50	1.60	1.47	1.50
30	2.85	2.88	2.76	2.94	2.79	2.84
0	3.77	3.81	3.66	3.88	3.66	3.73

5.0 Analytical Methods

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, "General Electric Standard Application for Reactor Fuel," June 2000.
2. Commonwealth Edison Topical Report NFSR-0085, "Benchmark of BWR Nuclear Design Methods,", Revision 0, November 1990.
3. Commonwealth Edison Topical Report NFSR-0085, Supplement 1, "Benchmark of BWR Nuclear Design Methods - Quad Cities Gamma Scan Comparisons," Revision 0, April 1991.
4. Commonwealth Edison Topical Report NFSR-0085, Supplement 2, "Benchmark of BWR Nuclear Design Methods – Neutronic Licensing Analyses," Revision 0, April 1991.
5. Advanced Nuclear Fuels Methodology for Boiling Water Reactors, XN-NF-80-19 (P)(A), Volume 1, Supplement 3, Supplement 3 Appendix F, and Supplement 4, Advanced Nuclear Fuels Corporation, November 1990.
6. Exxon Nuclear Methodology for Boiling Water Reactors" Application of the ENC Methodology to BWR Reloads, XN-NF-80-19 (P)(A), Volume 4, Revision 1, Exxon Nuclear Company, June 1986.
7. Exxon Nuclear Methodology for Boiling Water Reactors THERMEX: Thermal Limits Methodology Summary Description, XN-NF-90-19 (P)(A), Volume 3, Revision 2, Exxon Nuclear Company, January 1987.
8. Exxon Nuclear Methodology for Boiling Water Reactors – Neutronic Methods for Design and Analysis, XN-NF-80-19 (P)(A), Volume 1 and Supplements 1 and 2, Exxon Nuclear Company, March 1983.
9. Generic Mechanical Design for Exxon Nuclear Jet Pump BWR Reload Fuel, XN-NF-85-67 (P)(A), Revision 1, Exxon Nuclear Company, September 1986.
10. Qualification of Exxon Nuclear Fuel for Extended Burnup Supplement 1: Extended Burnup Qualification of ENC 9x9 BWR Fuel, XN-NF-82-06 (P)(A), Supplement 1, Revision 2, Advanced Nuclear Fuels Corporation, May 1988.
11. Advanced Nuclear Fuels Corporation Generic Mechanical Design for Advanced Nuclear Fuels 9x9-IX and 9x9-9X BWR Reload Fuel, ANF-89-014 (P)(A), Revision 1, and Supplements 1 and 2, Advanced Nuclear Fuels Corporation, October 1991.
12. Generic Mechanical Design Criteria for BWR Fuel Designs, ANF-89-98 (P)(A), Revision 1, and Revision 1 Supplement 1, Advanced Nuclear Fuels Corporation, May 1995.
13. Exxon Nuclear Plant Transient Methodology for Boiling Water Reactors, XN-NF-79-71 (P)(A), Revision 2 Supplements 1, 2 and 3, Exxon Nuclear Company, March 1986.
14. ANFB Critical Power Correlation, ANF-1125 (P)(A) and Supplements 1 and 2, Advanced Nuclear Fuels Corporation, April 1990.
15. Advanced Nuclear Fuels Corporation Critical Power Methodology for Boiling Water Reactors/Advanced Nuclear Fuels Corporation Critical Power Methodology for Boiling Water Reactors: Methodology for Analysis of Assembly Channel Bowing Effects/NRC Correspondence, ANF-524 (P)(A), Revision 2, Supplement 1 Revision 2, Supplement 2, Advanced Nuclear Fuels Corporation, November 1990.
16. COTRANSA 2: A Computer Program for Boiling Water Reactor Transient Analyses, ANF-913 (P)(A) Volume 1 Revision 1 and Volume 1 Supplements 2, 3, and 4, Advanced Nuclear Fuels Corporation, August 1990.
17. Advanced Nuclear Fuels Corporation Methodology for Boiling Water Reactors EXEM BWR Evaluation Model, ANF-91-048 (P)(A), Advanced Nuclear Fuels Corporation, January 1993.
18. Commonwealth Edison Topical Report NFSR-0091, "Benchmark of CASMO/MICROBURN BWR Nuclear Design Methods," Revision 0, Supplements 1 and 2, December 1991, March 1992, and May 1992, respectively; SER letter dated March 22, 1993.
19. ANFB Critical Power Correlation Application for Coresident Fuel, EMF-1125 (P)(A), Supplement 1, Appendix C, Siemens Power Corporation, August 1997.
20. ANFB Critical Power Correlation Determination of ATRIUM-9B Additive Constant Uncertainties, ANF-1125 (P)(A), Supplement 1, Appendix E, Siemens Power Corporation, September 1998.