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Dresden Nuclear Power Station, Unit 2
Renewed Facility Operating License No. DPR-19
NRC Docket No. 50-237

Subject: Core Operating Limits Report for Unit 2 Cycle 22 Revision 1

The purpose of this letter is to transmit the Core Operating Limits Report (COLR) for Dresden Nuclear Power Station (DNPS) Unit 2 operating cycle 22 (D2C22), Revision 1, in accordance with Technical Specifications Section 5.6.5, "CORE OPERATING LIMITS REPORT (COLR)."

This COLR change was required to add information into the D2C22 COLR detailing the treatment of legacy GE14 fuel for determining the Operating Limit Minimum Critical Power Ratio (OLMCPR). No thermal limits or other numerical values were changed in this COLR revision.

Should you have any questions concerning this letter, please contact Ms. Marri Marchionda at 815-416-2800.

Respectfully,

Tim Hanley
Site Vice President
Dresden Nuclear Power Station

Attachment: COLR for Dresden Unit 2 Cycle 22 Revision 1

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

A001
NRR

ATTACHMENT

Core Operating Limits Report

For

Dresden Unit 2 Cycle 22

Revision 1

Core Operating Limits Report

For

Dresden Unit 2 Cycle 22

Revision 1

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1. Terms and Definitions

ADSOOS	Automatic depressurization system out of service
DLO	Dual loop operation
EFPH	Effective full power hours
EOC	End of cycle
EOOS	Equipment out of service
FFTR	Final feedwater temperature reduction
FWHOOS	Feedwater heater out of service
GE14	GE14C fuel
GNF	Global Nuclear Fuel
ICF	Increased core flow
ISS	Intermediate scram speed
LHGR	Linear heat generation rate
LHGRFAC(F)	Flow dependent LHGR multiplier
LHGRFAC(P)	Power dependent LHGR multiplier
LPRM	Local power range monitor
MAPLHGR	Maximum average planar linear heat generation rate
MCPR	Minimum critical power ratio
MCPR(F)	Flow dependent MCPR
MCPR(P)	Power dependent MCPR
MELLLA	Maximum extended load line limit analysis
MSIV	Main steam isolation valve
NFWT	Nominal feedwater temperature
NSS	Nominal scram speed
OLMCPR	Operating limit minimum critical power ratio
OPRM	Oscillation power range monitor
PBDA	Period based detection algorithm
PLUOOS	Power load unbalance out of service
PCOOS	Pressure controller out of service
RFWT	Reduced feedwater temperature
RWCU	Reactor water clean-up
RWE	Rod withdrawal error
SLO	Single loop operation
TBVOOS	Turbine bypass valve out of service
TBV	Turbine bypass valve
TCV	Turbine control valve
TCVOOS	Turbine control valves out of service
TIP	Traversing incore probe
TSSS	Technical Specification scram speed
TSV	Turbine stop valve
TSVOOS	Turbine stop valve out of service

2. General Information

Power and flow dependent limits are listed for various power and flow levels. Linear interpolation is to be used to find intermediate values.

Rated core flow is 98 Mlb/hr. Operation up to 108% rated flow (ICF) is analyzed but not licensed for this cycle. Licensed rated thermal power is 2957 MWth. For allowed operating regions, see applicable power/flow map.

Coastdown 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.

MCPR(P) and MCPR(F) values are independent of scram speed.

LHGRFAC(P) and LHGRFAC(F) values are independent of scram speed.

All thermal limits are analyzed to either NSS, ISS, and TSSS. Only MCPR limits vary with scram speed.

For thermal limit monitoring above 100% rated power or 100% rated core flow, the 100% rated power and the 100% core flow thermal limit values, respectively, can be used unless otherwise indicated in the applicable table.

Asymmetric inlet enthalpy distribution produced by RWCU injection does not have a substantial impact on thermal limits; therefore no adjustments to the thermal limits are required (Reference 16).

3. Average Planar Linear Heat Generation Rate

The DLO MAPLHGR values for all lattices of the GE14 bundle types as a function of average planar exposure are given in Table 3-1. During single loop operation, these limits are multiplied by the SLO multiplier listed in Table 3-26.

For Optima2 bundle types, lattice-specific MAPLHGR values for DLO are provided in Tables 3-2 through 3-25. During single loop operation, these limits are multiplied by the SLO multiplier listed in Table 3-26. The MAPLHGR limits for the top and bottom natural uranium lattices (lattices 81 and 89) will be set equal to the most restrictive data points of all Optima2 lattices, which consist of data points from lattices 82, 90, and 95. This is a conservative treatment of these lattices, as the RLR (Reference 16) states that the natural uranium lattice of each bundle should be set to the most restrictive limits of its respective bundle only.

Table 3-1 MAPLHGR for bundle(s):
GE14-P10DNAB390-16GZ-100T-145-T6-2851
GE14-P10DNAB397-18GZ-100T-145-T6-2852
(Reference 11)

Avg. Planar Exposure (GWd/MT)	DLO MAPLHGR (kW/ft)
0.00	11.68
16.00	11.68
55.12	8.02
63.50	6.97
70.00	4.36

Table 3-2 MAPLHGR for bundle/lattice:
Opt2-3.97-11G8.00-4GZ8.00-3G6.00
Opt2-4.04-10G7.00-2GZ7.00-2G6.00
Opt2-4.02-18GZ8.00-14GZ5.50
Opt2-4.03-16GZ8.00-14GZ5.50
Opt2-4.07-14G5.50-2GZ5.50
Lattices 81 and 89
(References 3, 15, 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	8.69
2500	8.87
5000	8.99
7500	9.07
10000	9.10
17500	9.10
24000	9.48
58000	9.48
70000	7.31

Table 3-3 MAPLHGR for bundle/lattice:
Opt2-3.97-11G8.00-4GZ8.00-3G6.00
Lattices 82, 83, and 84
(References 3 and 15)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	9.23
7500	9.10
17500	9.10
24000	9.48
58000	9.48
70000	7.34

Table 3-4 MAPLHGR for bundle/lattice:
Opt2-3.97-11G8.00-4GZ8.00-3G6.00
Lattices 85 and 87
(References 3 and 15)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	9.56
7500	9.28
17500	9.28
24000	9.58
58000	9.58
70000	7.34

Table 3-5 MAPLHGR for bundle/lattice:
Opt2-3.97-11G8.00-4GZ8.00-3G6.00
Lattice 88
(References 3 and 15)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	10.13
10000	9.68
20000	9.68
24000	9.84
58000	9.84
70000	7.38

Table 3-6 MAPLHGR for bundle/lattice:
Opt2-4.04-10G7.00-2GZ7.00-2G6.00
Lattices 90 and 91
(References 3 and 15)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	9.85
10000	9.52
58000	9.52
70000	7.31

Table 3-7 MAPLHGR for bundle/lattice:
Opt2-4.04-10G7.00-2GZ7.00-2G6.00
Lattices 92 and 93
(References 3 and 15)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	10.03
10000	9.60
58000	9.60
70000	7.32

Table 3-8 MAPLHGR for bundle/lattice:
Opt2-4.04-10G7.00-2GZ7.00-2G6.00
Lattice 94
(References 3 and 15)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	10.64
10000	9.91
58000	9.91
70000	7.37

Table 3-9 MAPLHGR for bundle/lattice:
Opt2-4.02-18GZ8.00-14GZ5.50
Lattice 95
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	8.69
2500	8.87
5000	8.99
7500	9.07
10000	9.11
12000	9.16
15000	9.32
17000	9.41
20000	9.58
22000	9.72
24000	9.79
30000	9.70
36000	9.65
42000	9.66
50000	9.73
60000	9.71
72000	9.93

Table 3-10 MAPLHGR for bundle/lattice:
Opt2-4.02-18GZ8.00-14GZ5.50
Lattice 96
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	8.72
2500	8.90
5000	9.03
7500	9.12
10000	9.17
12000	9.24
15000	9.41
17000	9.51
20000	9.68
22000	9.83
24000	9.88
30000	9.79
36000	9.74
42000	9.74
50000	9.79
60000	9.74
72000	9.97

Table 3-11 MAPLHGR for bundle/lattice:
Opt2-4.02-18GZ8.00-14GZ5.50
Lattice 97
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	8.70
2500	8.88
5000	9.02
7500	9.13
10000	9.18
12000	9.25
15000	9.42
17000	9.52
20000	9.70
22000	9.85
24000	9.88
30000	9.78
36000	9.73
42000	9.73
50000	9.77
60000	9.73
72000	9.98

Table 3-12 MAPLHGR for bundle/lattice:
Opt2-4.02-18GZ8.00-14GZ5.50
Lattice 98
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	8.82
2500	9.02
5000	9.15
7500	9.28
10000	9.32
12000	9.41
15000	9.59
17000	9.71
20000	10.02
22000	10.09
24000	10.07
30000	9.99
36000	9.94
42000	9.95
50000	9.91
60000	9.91
72000	10.24

Table 3-13 MAPLHGR for bundle/lattice:
Opt2-4.02-18GZ8.00-14GZ5.50
Lattice 99
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	8.87
2500	9.05
5000	9.18
7500	9.26
10000	9.27
12000	9.34
15000	9.52
17000	9.68
20000	10.04
22000	10.06
24000	10.05
30000	9.98
36000	9.92
42000	9.93
50000	9.87
60000	9.88
72000	10.24

Table 3-14 MAPLHGR for bundle/lattice:
Opt2-4.02-18GZ8.00-14GZ5.50
Opt2-4.03-16GZ8.00-14GZ5.50
Lattice 100
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	9.66
2500	9.79
5000	9.82
7500	9.76
10000	9.70
12000	9.73
15000	10.03
17000	10.19
20000	10.21
22000	10.19
24000	10.18
30000	10.08
36000	10.02
42000	10.02
50000	9.96
60000	9.97
72000	10.32

Table 3-15 MAPLHGR for bundle/lattice:
Opt2-4.03-16GZ8.00-14GZ5.50
Lattice 101
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	8.97
2500	9.13
5000	9.21
7500	9.25
10000	9.24
12000	9.27
15000	9.39
17000	9.45
20000	9.58
22000	9.70
24000	9.81
30000	9.73
36000	9.68
42000	9.69
50000	9.74
60000	9.71
72000	9.93

Table 3-16 MAPLHGR for bundle/lattice:
Opt2-4.03-16GZ8.00-14GZ5.50
Lattice 102
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	9.02
2500	9.17
5000	9.27
7500	9.31
10000	9.33
12000	9.35
15000	9.47
17000	9.54
20000	9.68
22000	9.81
24000	9.90
30000	9.82
36000	9.78
42000	9.78
50000	9.78
60000	9.74
72000	9.98

Table 3-17 MAPLHGR for bundle/lattice: Opt2-4.03-16GZ8.00-14GZ5.50 Lattice 103
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	9.01
2500	9.15
5000	9.26
7500	9.33
10000	9.34
12000	9.37
15000	9.49
17000	9.56
20000	9.69
22000	9.83
24000	9.89
30000	9.82
36000	9.77
42000	9.77
50000	9.76
60000	9.73
72000	9.98

Table 3-18 MAPLHGR for bundle/lattice: Opt2-4.03-16GZ8.00-14GZ5.50 Lattice 104
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	9.15
2500	9.32
5000	9.41
7500	9.49
10000	9.49
12000	9.54
15000	9.66
17000	9.75
20000	10.00
22000	10.10
24000	10.10
30000	10.03
36000	9.98
42000	9.96
50000	9.90
60000	9.90
72000	10.24

Table 3-19 MAPLHGR for bundle/lattice:
Opt2-4.03-16GZ8.00-14GZ5.50
Lattice 105
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	9.19
2500	9.35
5000	9.44
7500	9.47
10000	9.45
12000	9.48
15000	9.60
17000	9.71
20000	10.01
22000	10.08
24000	10.08
30000	10.02
36000	9.96
42000	9.92
50000	9.86
60000	9.87
72000	10.25

Table 3-20 MAPLHGR for bundle/lattice:
Opt2-4.07-14G5.50-2GZ5.50
Lattice 106
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	8.95
2500	9.12
5000	9.25
7500	9.32
10000	9.34
12000	9.37
15000	9.54
17000	9.70
20000	9.86
22000	9.90
24000	9.89
30000	9.79
36000	9.74
42000	9.74
50000	9.79
60000	9.78
72000	9.98

Table 3-21 MAPLHGR for bundle/lattice:
Opt2-4.07-14G5.50-2GZ5.50
Lattice 107
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	9.00
2500	9.16
5000	9.31
7500	9.39
10000	9.41
12000	9.46
15000	9.64
17000	9.81
20000	9.98
22000	10.01
24000	9.99
30000	9.89
36000	9.83
42000	9.83
50000	9.88
60000	9.81
72000	10.03

Table 3-22 MAPLHGR for bundle/lattice:
Opt2-4.07-14G5.50-2GZ5.50
Lattice 108
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	8.99
2500	9.15
5000	9.30
7500	9.39
10000	9.42
12000	9.47
15000	9.66
17000	9.82
20000	9.99
22000	10.00
24000	9.98
30000	9.88
36000	9.82
42000	9.82
50000	9.86
60000	9.80
72000	10.03

Table 3-23 MAPLHGR for bundle/lattice:
Opt2-4.07-14G5.50-2GZ5.50
Lattice 109
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	9.15
2500	9.31
5000	9.47
7500	9.57
10000	9.58
12000	9.66
15000	9.95
17000	10.16
20000	10.24
22000	10.22
24000	10.20
30000	10.11
36000	10.04
42000	10.04
50000	10.02
60000	9.98
72000	10.29

Table 3-24 MAPLHGR for bundle/lattice:
Opt2-4.07-14G5.50-2GZ5.50
Lattice 110
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	9.18
2500	9.35
5000	9.49
7500	9.53
10000	9.53
12000	9.60
15000	9.95
17000	10.16
20000	10.22
22000	10.20
24000	10.19
30000	10.09
36000	10.03
42000	10.02
50000	9.97
60000	9.96
72000	10.29

Table 3-25 MAPLHGR for bundle/lattice:
Opt2-4.07-14G5.50-2GZ5.50
Lattice 111
(References 16 and 17)

Average Planar Exposure (MWd/MTU)	DLO MAPLHGR (kW/ft)
0	9.55
2500	9.68
5000	9.76
7500	9.75
10000	9.68
12000	9.69
15000	9.96
17000	10.15
20000	10.23
22000	10.22
24000	10.20
30000	10.11
36000	10.04
42000	10.04
50000	9.97
60000	9.96
72000	10.30

Table 3-26 MAPLHGR multipliers
(References 11 and 16)

Fuel Type	DLO	SLO Multiplier
GE14	1.00	0.77
Optima2 Base	1.00	0.86

4. Operating Limit Minimum Critical Power Ratio

The Operating Limit Minimum Critical Power Ratios (OLMCPRs) for D2C22 were established to protect the Safety Limit Minimum Critical Power Ratio (SLMCPR) for the abnormal operational occurrences. The SLMCPR values for DLO and SLO for D2C22 were determined to be 1.12 and 1.14 (Reference 16), respectively, which are unchanged from the NRC-approved values for the previous operating cycle (i.e., D2C21). Likewise, the conservative OLMCPR adder applied to the GE14 fuel for D2C22 remains unchanged at the NRC-approved value of 0.934 (Reference 16).

In determining the SLMCPR values for D2C22, Westinghouse applied the methodologies from CENPD-300-P-A, consistent with the manner specified in Limitations 1 through 6 and 8 of the NRC Safety Evaluation Report (SER) approving CENPD-300-P-A (References 12 and 14). The application of these methodologies was previously approved by the NRC for D2C21 in license amendment 224 to Renewed Facility Operating License DPR-19 (Reference 18).

Similarly, in both the determination and justification of the conservative adder applied to the GE14 fuel for D2C22, Westinghouse complied with Limitation 7 of the SER approving CENPD-300-P-A (References 22 and 14). The NRC previously approved Westinghouse and Exelon compliance with Limitation 7 (i.e., for determination and justification of the conservative adder) in Reference 18.

In that the conservative adder for D2C22, and its justification, have not changed from previously-approved operating cycles, the NRC has already approved this determination and justification, as stated in Reference 23.

4.1. Manual Flow Control MCPR Limits

The OLMCPR is determined for a given power and flow condition by evaluating the power-dependent MCPR and the flow-dependent MCPR and selecting the greater of the two.

4.1.1. Power-Dependent MCPR

For operation less than or equal to 38.5% core thermal power, the OLMCPR as a function of core thermal power is shown in Tables 4-7 and 4-8. 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 rated condition OLMCPR limit shown in Tables 4-2 through 4-6 by the applicable MCPR multiplier given in Tables 4-7 and 4-8.

4.1.2. Flow-Dependent MCPR

Table 4-9 gives the MCPR(F) limit as a function of the flow based on the applicable plant condition. The MCPR(F) limit determined from this table is the flow dependent OLMCPR.

4.2. Automatic Flow Control MCPR Limits

Automatic Flow Control MCPR Limits are not provided.

4.3. Scram Time

TSSS, ISS, and NSS refer to scram speeds. TSSS is the Technical Specification Scram Speed, ISS is the Intermediate Scram Speed, and NSS is the Nominal Scram Speed. The scram time values are shown in Table 4-1.

The NSS scram times are based on a conservative interpretation of scram time surveillance measurements. In the event that plant surveillance shows these scram insertion times to be exceeded, the MCPR limits are to default to the values which correspond to the ISS scram time. The ISS times have been chosen to provide an intermediate value between the NSS and TSSS, but interpolation between these values is not supported by Westinghouse methodology. In the event that the ISS times are exceeded, MCPR limits for the TSSS apply.

Table 4-1 Scram Times
(References 5 and 16)

Control Rod Insertion Fraction (%)	TSSS (seconds)	ISS (seconds)	NSS (seconds)
5	0.48	0.360	0.324
20	0.89	0.720	0.700
50	1.98	1.580	1.510
90	3.44	2.740	2.635

4.4. Recirculation Pump Motor Generator Settings

Cycle 22 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% (107.8 Mlb/hr) for all runout events (Reference 10). This value is consistent with the analyses of Reference 16.

Table 4-2 MCPR TSSS Based Operating Limits – NFWT and RFWT
(Reference 16)

EOOS Combination	Fuel Type	Cycle Exposure	
		≤ 12000 MWd/MTU	> 12000 MWd/MTU
BASE	Optima2	1.83	1.85
	GE14	1.80	1.80
BASE SLO	Optima2	1.87	1.89
	GE14	1.84	1.84
PLUOOS	Optima2	1.88	1.92
	GE14	1.85	1.85
PLUOOS SLO	Optima2	1.92	1.96
	GE14	1.89	1.89
TBVOOS	Optima2	1.96	1.96
	GE14	1.92	1.92
TBVOOS SLO	Optima2	2.00	2.00
	GE14	1.96	1.96
TCV SLOW CLOSURE	Optima2	1.90	1.93
	GE14	1.86	1.86
TCV SLOW CLOSURE SLO	Optima2	1.94	1.97
	GE14	1.90	1.90
TCV STUCK CLOSED	Optima2	1.83	1.85
	GE14	1.80	1.80
TCV STUCK CLOSED SLO	Optima2	1.87	1.89
	GE14	1.84	1.84

Table 4-3 MCPR ISS Based Operating Limits – NFWT
(Reference 16)

EOOS Combination	Fuel Type	Cycle Exposure	
		≤ 12000 MWd/MTU	> 12000 MWd/MTU
BASE	Optima2	1.49	1.53
	GE14	1.66	1.66
BASE SLO	Optima2	1.52	1.56
	GE14	1.69	1.69
PLUOOS	Optima2	1.56	1.62
	GE14	1.66	1.66
PLUOOS SLO	Optima2	1.59	1.65
	GE14	1.69	1.69
TBVOOS	Optima2	1.62	1.65
	GE14	1.66	1.69
TBVOOS SLO	Optima2	1.65	1.68
	GE14	1.69	1.72
TCV SLOW CLOSURE	Optima2	1.58	1.62
	GE14	1.66	1.66
TCV SLOW CLOSURE SLO	Optima2	1.61	1.65
	GE14	1.69	1.69
TCV STUCK CLOSED	Optima2	1.49	1.53
	GE14	1.66	1.66
TCV STUCK CLOSED SLO	Optima2	1.52	1.56
	GE14	1.69	1.69

Table 4-4 MCPR ISS Based Operating Limits – RFWT
(Reference 16)

EOOS Combination	Fuel Type	Cycle Exposure	
		≤ 12000 MWd/MTU	> 12000 MWd/MTU
BASE	Optima2	1.49	1.54
	GE14	1.66	1.66
BASE SLO	Optima2	1.52	1.57
	GE14	1.69	1.69
PLUOOS	Optima2	1.56	1.62
	GE14	1.66	1.66
PLUOOS SLO	Optima2	1.59	1.65
	GE14	1.69	1.69
TBVOOS	Optima2	1.63	1.69
	GE14	1.66	1.70
TBVOOS SLO	Optima2	1.66	1.72
	GE14	1.69	1.74
TCV SLOW CLOSURE	Optima2	1.58	1.62
	GE14	1.66	1.66
TCV SLOW CLOSURE SLO	Optima2	1.61	1.65
	GE14	1.69	1.69
TCV STUCK CLOSED	Optima2	1.49	1.54
	GE14	1.66	1.66
TCV STUCK CLOSED SLO	Optima2	1.52	1.57
	GE14	1.69	1.69

Table 4-5 MCPR NSS Based Operating Limits – NFWT
(Reference 16)

EOOS Combination	Fuel Type	Cycle Exposure	
		≤ 12000 MWd/MTU	> 12000 MWd/MTU
BASE	Optima2	1.44	1.49
	GE14	1.66	1.66
BASE SLO	Optima2	1.47	1.52
	GE14	1.69	1.69
PLUOOS	Optima2	1.52	1.56
	GE14	1.66	1.66
PLUOOS SLO	Optima2	1.55	1.59
	GE14	1.69	1.69
TBVOOS	Optima2	1.57	1.61
	GE14	1.66	1.66
TBVOOS SLO	Optima2	1.60	1.64
	GE14	1.69	1.69
TCV SLOW CLOSURE	Optima2	1.53	1.58
	GE14	1.66	1.66
TCV SLOW CLOSURE SLO	Optima2	1.56	1.61
	GE14	1.69	1.69
TCV STUCK CLOSED	Optima2	1.44	1.49
	GE14	1.66	1.66
TCV STUCK CLOSED SLO	Optima2	1.47	1.52
	GE14	1.69	1.69

Table 4-6 MCPR NSS Based Operating Limits – RFWT
(Reference 16)

EOOS Combination	Fuel Type	Cycle Exposure	
		≤ 12000 MWd/MTU	> 12000 MWd/MTU
BASE	Optima2	1.46	1.53
	GE14	1.66	1.66
BASE SLO	Optima2	1.49	1.56
	GE14	1.69	1.69
PLUOOS	Optima2	1.52	1.56
	GE14	1.66	1.66
PLUOOS SLO	Optima2	1.55	1.59
	GE14	1.69	1.69
TBVOOS	Optima2	1.58	1.66
	GE14	1.66	1.67
TBVOOS SLO	Optima2	1.61	1.69
	GE14	1.69	1.70
TCV SLOW CLOSURE	Optima2	1.53	1.58
	GE14	1.66	1.66
TCV SLOW CLOSURE SLO	Optima2	1.56	1.61
	GE14	1.69	1.69
TCV STUCK CLOSED	Optima2	1.46	1.53
	GE14	1.66	1.66
TCV STUCK CLOSED SLO	Optima2	1.49	1.56
	GE14	1.69	1.69

Table 4-7 MCPR(P) for GE and Westinghouse Fuel – NFWT
(Reference 16)

EOOS Combination	Core Flow (% of rated)	Core Thermal Power (% of rated)								
		0	25	≤ 38.5	> 38.5	50	60	80	100	102
		Operating Limit MCPR			Operating Limit MCPR Multiplier					
Base	≤ 60	2.78	2.35	2.12	1.31	1.21	1.15	1.05	1.00	1.00
	> 60	3.30	2.72	2.41						
Base SLO	≤ 60	2.83	2.40	2.16	1.31	1.21	1.15	1.05	1.00	1.00
	> 60	3.36	2.77	2.46						
PLUOOS	≤ 60	2.78	2.35	2.12	1.53	1.41	1.29	1.05	1.00	1.00
	> 60	3.30	2.72	2.41						
PLUOOS SLO	≤ 60	2.83	2.40	2.16	1.53	1.41	1.29	1.05	1.00	1.00
	> 60	3.36	2.77	2.46						
TBVOOS	≤ 60	3.94	2.97	2.45	1.31	1.21	1.15	1.05	1.00	1.00
	> 60	4.26	3.28	2.75						
TBVOOS SLO	≤ 60	4.01	3.03	2.50	1.31	1.21	1.15	1.05	1.00	1.00
	> 60	4.34	3.34	2.80						
TCV Slow Closure	≤ 60	2.78	2.35	2.12	1.53	1.41	1.29	1.05	1.00	1.00
	> 60	3.30	2.72	2.41						
TCV Slow Closure SLO	≤ 60	2.83	2.40	2.16	1.53	1.41	1.29	1.05	1.00	1.00
	> 60	3.36	2.77	2.46						
TCV Stuck Closed	≤ 60	2.78	2.35	2.12	1.31	1.21	1.15	1.05	1.00	1.00
	> 60	3.30	2.72	2.41						
TCV Stuck Closed SLO	≤ 60	2.83	2.40	2.16	1.31	1.21	1.15	1.05	1.00	1.00
	> 60	3.36	2.77	2.46						

Table 4-8 MCPR(P) for GE and Westinghouse Fuel – RFWT
(Reference 16)

EOOS Combination	Core Flow (% of rated)	Core Thermal Power (% of rated)								
		0	25	≤ 38.5	> 38.5	50	60	80	100	102
		Operating Limit MCPR			Operating Limit MCPR Multiplier					
Base	≤ 60	2.78	2.35	2.12	1.36	1.26	1.18	1.06	1.00	1.00
	> 60	3.30	2.72	2.41						
Base SLO	≤ 60	2.83	2.40	2.16	1.36	1.26	1.18	1.06	1.00	1.00
	> 60	3.36	2.77	2.46						
PLUOOS	≤ 60	2.78	2.35	2.12	1.53	1.41	1.29	1.06	1.00	1.00
	> 60	3.30	2.72	2.41						
PLUOOS SLO	≤ 60	2.83	2.40	2.16	1.53	1.41	1.29	1.06	1.00	1.00
	> 60	3.36	2.77	2.46						
TBVOOS	≤ 60	4.27	3.15	2.55	1.36	1.26	1.18	1.06	1.00	1.00
	> 60	4.44	3.35	2.76						
TBVOOS SLO	≤ 60	4.35	3.21	2.60	1.36	1.26	1.18	1.06	1.00	1.00
	> 60	4.52	3.42	2.81						
TCV Slow Closure	≤ 60	2.78	2.35	2.12	1.53	1.41	1.29	1.06	1.00	1.00
	> 60	3.30	2.72	2.41						
TCV Slow Closure SLO	≤ 60	2.83	2.40	2.16	1.53	1.41	1.29	1.06	1.00	1.00
	> 60	3.36	2.77	2.46						
TCV Stuck Closed	≤ 60	2.78	2.35	2.12	1.36	1.26	1.18	1.06	1.00	1.00
	> 60	3.30	2.72	2.41						
TCV Stuck Closed SLO	≤ 60	2.83	2.40	2.16	1.36	1.26	1.18	1.06	1.00	1.00
	> 60	3.36	2.77	2.46						

Table 4-9 MCPR(F) for GE and Westinghouse Fuel
(Reference 16)

Flow-Dependent MCPR for Base Case and EOOS				
Flow (% of 98 Mlbm/hr)	SVEA-96 Optima2 MCPR		GE14 MCPR	
	DLO	SLO	DLO	SLO
0	1.98	2.02	2.04	2.08
100	1.38	1.41	1.44	1.47
110	1.38	1.41	1.44	1.47

5. Linear Heat Generation Rate

The maximum Steady-State LHGR shall not exceed the limit of 13.4 KW/ft for the following fuel bundles (Reference 9).

GE14-P10DNAB390-16GZ-100T-145-T6-2851
GE14-P10DNAB397-18GZ-100T-145-T6-2852

The thermal mechanical operating limit at rated conditions for the Optima2 fuel is established in terms of the maximum LHGR given in Table 5-2 as a function of rod nodal (pellet) exposure. The limit applies to all Optima2 bundle designs.

The linear heat generation rate (LHGR) limit is the product of the exposure dependent LHGR limit from Tables 5-1 through 5-2 and the minimum of: the power dependent LHGR Factor, LHGRFAC(P), the flow dependent LHGR Factor, LHGRFAC(F); or the single loop operation (SLO) multiplication factor where applicable. The LHGRFAC(P) is determined from Tables 5-3 through 5-5, as applicable. The LHGRFAC(F) is determined from Table 5-6 or 5-7.

Table 5-1: LHGR Limit for GE14-P10DNAB390-16GZ-100T-145-T6-2851 and GE14-P10DNAB397-18GZ-100T-145-T6-2852, all Lattices
(References 13 and 21)

Composite Limit (kW/ft), all Lattices WCMS Lattice Numbers 1, 6, 22, 23, 24, 25, 26, 27, 28, 29, 30 and 31	
UO2 Pellet Burnup (GWd/MTU)	**Composite Limit (kW/ft)**
0.0	13.4
16.0	13.4
63.5	8.0
70.0	5.0

Table 5-2 LHGR Limit for Westinghouse Optima2 Fuel
Opt2-3.97-11G8.00-4GZ8.00-3G6.00
Opt2-4.04-10G7.00-2GZ7.00-2G6.00
Opt2-4.02-18GZ8.00-14GZ5.50
Opt2-4.03-16GZ8.00-14GZ5.50
Opt2-4.07-14G5.50-2GZ5.50
WCMS Lattices 81, 82, 83, 84, 85, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110 and 111
(References 3, 15, 16 and 17)

Rod Nodal Exposure (GWd/MTU)	LHGR Limit (kW/ft)
0.00	13.11
14.00	13.11
72.00	6.48

Table 5-3 LHGRFAC(P) for Optima2 Fuel – DLO and SLO
(Reference 16)

SVEA-96 Optima2 Power-Dependent Multipliers for the LHGR Limits									
EOOS Combination	**Core Thermal Power (% of rated)**								
	0	25	≤ 38.5	> 38.5	50	60	80	100	102
Base	0.54	0.64	0.69	0.75	0.81	0.84	0.86	1.00	1.00
Base SLO	0.54	0.64	0.69	0.75	0.81	0.84	0.86	1.00	1.00
PLUOOS	0.54	0.64	0.69	0.69	0.74	0.79	0.81	1.00	1.00
PLUOOS SLO	0.54	0.64	0.69	0.69	0.74	0.79	0.81	1.00	1.00
TBVOOS	0.33	0.46	0.53	0.66	0.71	0.72	0.72	1.00	1.00
TBVOOS SLO	0.33	0.46	0.53	0.66	0.71	0.72	0.72	1.00	1.00
TCV Slow Closure	0.54	0.64	0.69	0.69	0.74	0.79	0.81	1.00	1.00
TCV Slow Closure SLO	0.54	0.64	0.69	0.69	0.74	0.79	0.81	1.00	1.00
TCV Stuck Closed	0.54	0.64	0.69	0.75	0.81	0.84	0.86	1.00	1.00
TCV Stuck Closed SLO	0.54	0.64	0.69	0.75	0.81	0.84	0.86	1.00	1.00

Table 5-4 LHGRFAC(P) for GE14 Fuel - DLO
(Reference 16)

GE14 Power-Dependent Multipliers for LHGR Limits DLO									
EOOS Combination		**Core Thermal Power (% of rated)**							
		0	25	≤ 38.5	> 38.5	70	70	80	100	102
Base DLO		0.50	0.56	0.59	0.68			0.86	1.00	1.00
PLUOOS DLO		0.54	0.54	0.54	0.54	0.73	0.78		1.00	1.00
TBVOOS DLO	≤60% core flow	0.22	0.39	0.48	0.54				1.00	1.00
	>60% core flow	0.33		0.42						
TCV Slow Closure DLO		0.54	0.54	0.54	0.54	0.73	0.78		1.00	1.00
TCV Stuck Closed DLO		0.50	0.56	0.59	0.68			0.86	1.00	1.00

Table 5-5 LHGRFAC(P) for GE14 Fuel - SLO
(Reference 16)

GE14 Power-Dependent Multipliers for the LHGR Limits SLO								
EOOS Combination		**Core Thermal Power (% of rated)**						
		0	25	≤ 38.5	> 38.5	70	CP*	100	102
Base SLO		0.50	0.56	0.59	0.68		0.77	0.77	0.77
PLUOOS SLO		0.54	0.54	0.54	0.54	0.73	0.77	0.77	0.77
TBVOOS SLO	≤60% core flow	0.22	0.39	0.48	0.54		0.77	0.77	0.77
	>60% core flow	0.33		0.42					
TCV Slow Closure SLO		0.54	0.54	0.54	0.54	0.73	0.77	0.77	0.77
TCV Stuck Closed SLO		0.50	0.56	0.59	0.68		0.77	0.77	0.77

* CP is the cutoff power level and is equal to 59.25% for Base Case SLO and TCV Stuck Closed SLO, 70% for PLUOOS SLO, 69.25% for TBVOOS SLO, and 70% for TCV Slow Closure SLO.

Table 5-6 LHGRFAC(F) for Optima2 Fuel
(Reference 16)

SVEA-96 Optima2 Flow-Dependent LHGR Multipliers for Base and all EOOS Conditions							
EOOS Condition	**Flow (% of 98 Mlb/hr)**						
	0	**20**	**40**	**60**	**80**	**100**	**110**
Base Case and all EOOS Conditions	0.27	0.43	0.59	0.80	1.00	1.00	1.00

Table 5-7 LHGRFAC(F) for GE14 Fuel
(Reference 16)

GE14 Flow-Dependent LHGR Multipliers for Base Case and all EOOS Conditions				
Flow (% of 98.0 Mlbm/hr)	**DLO All except TCV Stuck Closed**	**DLO TCV Stuck Closed**	**SLO All except TCV Stuck Closed**	**SLO TCV Stuck Closed**
100.00	1.00	1.00	0.77	0.77
98.30	1.00	1.00	0.77	0.77
80.00	1.00	0.86	0.77	0.77
68.30			0.77	0.77
50.00	0.77	0.63	0.77	0.63
40.00	0.64	0.50	0.64	0.50
30.00	0.55	0.41	0.55	0.41
0.00	0.28	0.14	0.28	0.14

6. Rod Block Monitor

The Rod Block Monitor Upscale Instrumentation Setpoints are determined from the relationships shown below (Reference 6):

ROD BLOCK MONITOR UPSCALE TRIP FUNCTION	ALLOWABLE VALUE
Two Recirculation Loop Operation	0.65 W_d + 55%
Single Recirculation Loop Operation	0.65 W_d + 51%

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

W_d – percent of recirculation loop drive flow required to produce a rated core flow of 98.0 Mlb/hr.

7. Stability Protection Setpoints

The OPRM PBDA Trip Settings (Reference 16):

PBDA Trip Amplitude Setpoint (Sp)	Corresponding Maximum Confirmation Count Setpoint (Np)
1.13	15

The PBDA is the only OPRM setting credited in the safety analysis as documented in the licensing basis for the OPRM system.

The OPRM PBDA trip settings are based, in part, on the cycle specific OLMCPR and the power dependent MCPR limits. Any change to the OLMCPR values and/or the power dependent MCPR limits should be evaluated for potential impact on the OPRM PBDA trip settings.

The OPRM PBDA trip settings are applicable when the OPRM system is declared operable, and the associated Technical Specifications are implemented.

8. Modes of Operation

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

EOOS Options	Thermal Limit Sets
Base	Base (DLO or SLO)
PLUOOS	PLUOOS (DLO or SLO)
TBVOOS	TBVOOS (DLO or SLO) ➢ See Table 8-1 for power restrictions
TCV slow closure	TCV Slow Closure (DLO or SLO)
TCV Stuck Closed	TCV stuck closed (DLO or SLO) ➢ Not applicable to combination of one TCV and one TSV stuck closed ➢ See Table 8-2 for power restrictions
TSV Stuck Closed	TCV stuck closed (DLO or SLO) ➢ Not applicable to combination of one TCV and one TSV stuck closed ➢ See Table 8-2 for power restrictions
PCOOS	TCV Slow Closure (DLO or SLO)
PCOOS and PLUOOS	PLUOOS (DLO or SLO)
PCOOS and TCV slow closure	TCV Slow Closure (DLO or SLO)
PCOOS and TCV Stuck Closed	➢ Operation is only allowed at or below thermal power as specified in Table 8-2 and ➢ The more restrictive of the flow-dependent limits (established by TCV Stuck Closed) and power-dependent limits (established by one TCV Stuck Closed, TCV Slow Closure and PLUOOS limits) apply.
PLUOOS and TCV Stuck Closed	➢ Operation is only allowed at or below thermal power as specified in Table 8-2 and ➢ The more restrictive of the flow-dependent limits (established by TCV Stuck Closed) and power-dependent limits (established by one TCV Stuck Closed, TCV Slow Closure and PLUOOS limits) apply.

Common Notes – Applicable to all EOOS Combination

1. All modes are allowed for operation at MELLLA and coastdown (full power operation up to a cycle exposure of 16114 MWD/MTU + 25 EFPD) subject to restrictions in Tables 8-1 and 8-2. Each OOS Option may be combined with each of the following conditions provided the requirements of References 19 and 20 are met:
    - A maximum of 18 TIP channels OOS (Up to 2 common TIP channels may be OOS, in combination with a maximum of 16 TIP channels OOS in locations outside of the common TIP channel location of 32-33).
    - Up to 50% LPRMs OOS
    - An LPRM calibration frequency of up to 2500 EFPH (2000 EFPH + 25%)

2. All analyses support the fastest Turbine Bypass Valve (assumed to be #1) OOS, with the remaining 8 Turbine Bypass Valves meeting the assumed opening profile in Reference 7. The analyses also support Turbine Bypass flow of 29.8% of vessel rated steam flow, equivalent to one Turbine Bypass Valve OOS (or partially closed Turbine Bypass Valves

equivalent to one closed Turbine Bypass Valve), if the assumed opening profile (Reference 7) for the remaining Turbine Bypass Valves is met. If the opening profile is **NOT** met, or if the Turbine Bypass Valve system cannot pass an equivalent of 29.8% of vessel rated steam flow, utilize the TBVOOS condition.

3. For both Base and EOOS DLO/SLO conditions, for operation at NFWT, the OLMCPR limit is applicable to a variation of +10°F/-30°F in feedwater temperature, and an operating steam dome pressure region bounded by the maximum value of 1020 psia and the minimum pressure curve in Reference 8. For operation outside of NFWT, RFWT of up to 120°F is also supported for cycle operation through EOC subject to the restriction in Reference 4 for feedwater temperature reductions of greater than 100 °F. The restriction is to maintain less than 100% rod line. This includes, but is not limited to FWHOOS and FFTR. For a feedwater temperature reduction of between 30°F and 120°F, the RFWT limits should be applied.

4. For all cases, equivalent of 2 of the first 3.5 Turbine Bypass Valves must be capable of opening via the pressure control system while Turbine Bypass Valves #5-9 are allowed to be out of service. For all cases except TBVOOS, the equivalent of 8 of 9 Turbine Bypass Valves (as stated in Note 2 above) are required to trip open on Turbine Control Valve fast closure or on Turbine Stop Valve closure. The TBVOOS condition assumes that all of the Turbine Bypass Valves do not trip open on Turbine Control Valve fast closure or on Turbine Stop Valve closure.

5. A single MSIV may be taken OOS (shut) under all OOS Options, as long as core thermal power is maintained ≤ 75% of 2957 MWth (Reference 16).

Table 8-1 Core Thermal Power Restriction for TBVOOS
(Reference 16)

Core Thermal Power Restriction (% of Rated Power)	Cycle Exposure (MWd/MTU)	Number of Safety Valves Available
≤ 100	Entire Cycle	9 of 9
≤ 100	≤ 15570	8 of 9
≤ 98	> 15570	8 of 9

Table 8-2 Core Thermal Power Restriction for One TCV/TSV Stuck Closed with TBV's Credited to Prevent System Pressurization
(Reference 16)

Core Thermal Power Restriction (% of Rated Power)	Number of TBV's Required to Prevent System Pressurization
≤ 80	4
≤ 85	6
≤ 90	7

9. Methodology

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. 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.

2. NEDE-24011-P-A-15 (Revision 15), "General Electric Standard Application for Reactor Fuel (GESTAR)," September 2005.

3. NEDO-32465-A, "Reactor Stability Detect and Suppress Solutions Licensing Basis Methodology for Reload Applications," August 1996.

4. Westinghouse Report WCAP-15682-P-A, "Westinghouse BWR ECCS Evaluation Model: Supplement 2 to Code Description, Qualification and Application," April 2003.

5. Westinghouse Report WCAP-16078-P-A, "Westinghouse BWR ECCS Evaluation Model: Supplement 3 to Code Description, Qualification and Application to SVEA-96 Optima2 Fuel," November 2004.

6. Westinghouse Report WCAP-16081-P-A, "10x10 SVEA Fuel Critical Power Experiments and CPR Correlation: SVEA-96 Optima2," March 2005.

7. Westinghouse Topical Report CENPD-300-P-A, "Reference Safety Report for Boiling Water Reactor Reload Fuel," July 1996.

8. Westinghouse Topical Report CENPD-390-P-A, "The Advanced PHOENIX and POLCA Codes for Nuclear Design of Boiling Water Reactors," December 2000.

9. Westinghouse Topical Report WCAP-15836-P-A, "Fuel Rod Design Methods for Boiling Water Reactors – Supplement 1," April 2006.

10. Westinghouse Topical Report WCAP-15942-P-A, "Fuel Assembly Mechanical Design Methodology for Boiling Water Reactors Supplement 1 to CENP-287," March 2006.

11. Westinghouse Report WCAP-16081-P-A, Addendum 1-A, Revision 0, "SVEA-96 Optima2 CPR Correlation (D4): High and Low Flow Applications," March 2009.

12. Westinghouse Report WCAP-16081-P-A, Addendum 2-A, Revision 0, "SVEA-96 Optima2 CPR Correlation (D4): Modified R-factors for Part-Length Rods," February 2009.

10. References

1. Exelon Generation Company, LLC, Docket No. 50-237, Dresden Nuclear Power Station, Unit 2 Renewed Facility Operating License, License No. DPR-19.
2. Letter from D. M. Crutchfield to All Power Reactor Licensees and Applicants, Generic Letter 88-16; Removal of Cycle-Specific Parameter Limits from Tech Specs, October 3, 1988.
3. Westinghouse Document NF-BEX-07-187 Rev. 3, "Dresden Nuclear Power Station Unit 2 Cycle 21 Reload Licensing Report," June 2008 (TODI NF0700236 Rev. 2). (Attachment 13 of EC 368557)
4. Exelon Letter, NF-MW:02-0081, "Approval of GE Evaluation of Dresden and Quad Cities Extended Final Feedwater Temperature Reduction," Carlos de la Hoz to Doug Wise and Alex Misak, August 27, 2002.
5. Technical Specifications for Dresden 2 and 3, Table 3.1.4-1, "Control Rod Scram Times."
6. GE DRF C51-00217-01, "Instrument Setpoint Calculation Nuclear Instrumentation, Rod Block Monitor, Commonwealth Edison Company, Dresden 2 & 3," December 15, 1999.
7. Exelon TODI Ops Ltr: 09-17 Revision 0, "OPL-W Parameters for Dresden Unit 2 Cycle 22 Transient Analysis," 3/16/09. (Attachment 6 to FCP 373427)
8. Exelon TODI ES0800005, Revision 0, "Dresden Unit 2 Cycle 22 Licensing Generic Input Report," February 2009. (Attachment 5 to FCP 373427)
9. GE Design Basis Document, DB-0012.03 Revision 2, "Fuel-Rod Thermal-Mechanical Performance Limits for GE14C," September 2006.
10. Westinghouse Document NF-BEX-09-47 Rev. 1, "Final Task Report for Dresden Unit 2 Cycle 22 Reload Licensing Analysis Plan, Revision 1," 7/16/09. (Attachment 7 to EC 373427)
11. GNF Document 0000-0035-6363-SRLR, Rev. 1, "Supplemental Reload Licensing Report for Dresden 2 Reload 19 Cycle 20," October 2005 (TODI NF0500248, Revision 0).
12. Exelon Letter RS-05-078, "Request for Licensing Amendment Regarding Transition to Westinghouse Fuel," Patrick R. Simpson to U.S. Nuclear Regulatory Commission, June 15, 2005. (Available in EDMS)
13. GNF Letter, MJM-EXN-EB2-05-108, "TSD B263: Dresden Unit 2 C20 LHGR Limits and R-Factors Data," October 7, 2005.
14. Westinghouse Document, NF-BEX-09-97, "Dresden Unit 2 Cycle 22 SLMCPR," E. J. Mercier to Ed McVey July 6, 2009. (Attachment 16 to EC 373427)
15. Westinghouse Document NF-BEX-07-62, "Final Report for Dresden 2 Cycle 21 Bundle Designs," 4/10/07. (Attachment 4 to EC 364025)
16. Westinghouse Document NF-BEX-09-118 Rev. 1, "Dresden Nuclear Power Station Unit 2 Cycle 22 Reload Licensing Report," October 2009 (TODI ES0900022 Rev. 0). (Attached to EC 373427)
17. Westinghouse Document NF-BEX-09-64, "Bundle Design Report for Dresden 2 Cycle 22," April 22, 2009. (Attachment 3 to EC 373427)
18. NRC Letter, "Dresden Nuclear Power Station, Units 2 and 3 – Issuance of Amendments Regarding Safety Limit Minimum Critical Power Ratio (TAC Nos. MD6013 and MD6602)," Christopher Gratton (NRC) to Charles Pardee, November 6, 2007. (Available in EDMS)
19. Westinghouse Document BTD 09-0311, Revision 1, "Westinghouse CMS – Operation Guidelines for Dresden and Quad Cities Plants," July 20, 2009.

20. Westinghouse Document BTD 09-0723, Revision 0, "Westinghouse CMS – Core Monitoring Strategy for Dresden 3 Cycle 21," July 3, 2009.

21. Dresden Calculation DRE08-0034, Rev 0. "Dresden 2 Cycle 21 Westinghouse Core Monitoring System Databank," June 5, 2009.

22. Exelon Letter RS-06-009, "Additional Information Supporting Request for Licensing Amendment Regarding Transition to Westinghouse Fuel," Patrick R. Simpson to U.S. Nuclear Regulatory Commission, January 26, 2006. (Available in EDMS)

23. NRC Memo, "Staff Position Regarding the Use of Methods Described In ABB/Westinghouse Topical Report CENPD-300-P-A, "Reference Safety Report for Boiling Water Reactor Reload Fuel," for Safety Limit Minimum Critical Power Ratio Determinations," Benjamin T. Parks (NRC) to Gregory Cranston (NRC), August 13, 2008. (Attachment 23 to FCP 368721)