NMC
Committed to Nuclear Excellence

Duane Arnold Energy Center
3277 DAEC Road
Palo, IA 52324-9785

Operated by Nuclear Management Company LLC

November 16, 2000
NG-00-1900

Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station 0-P1-17
Washington, DC 20555-0001

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Technical Specification Change Request (TSCR-042): "Extended Power Uprate"

References:
1. G. Van Middlesworth (NMC) to USNRC, "Supplement to Duane Arnold Energy Center Environmental Report," NG-00-1504, September 22, 2000.
2. G. Van Middlesworth (NMC) to USNRC, "Technical Specification Change Request (TSCR-037): 'Alternative Source Term'," NG-00-1589, October 19, 2000.
3. G. Van Middlesworth (NMC) to USNRC, "Technical Specification Change Request (TSCR-014) – Increase Standby Liquid Control Minimum Boron Concentration," NG-00-1501, September 19, 2000.
4. G. Van Middlesworth (NMC) to USNRC, "Request for Operating License Change (TSCR-040) – Revised Thermal-Hydraulic Analysis for the Spent Fuel Pool," NG-00-1904, November 17, 2000.
5. G. Van Middlesworth (NMC) to USNRC, "Technical Specification Change Request (TSCR-038): 'Revised Pressure Temperature Curves'," NG-00-1717, October 16, 2000.

File: A-117, SPF-189

In accordance with the Code of Federal Regulations, Title 10, Sections 50.59 and 50.90, Nuclear Management Company, LLC (NMC) hereby requests revision to the authorized maximum reactor power level for the Duane Arnold Energy Center (DAEC). The proposed change increases the maximum power level authorized by Section 2.C.(1) of Operating License # DPR-49, to 1912 MWt. This application also includes supporting Technical Specifications (TS) changes and a revision of license condition, 2.C.(2)(a) to Operating License # DPR-49, which are necessary to implement this increase in licensed power level. APO1

This application was prepared following the guidelines contained in the NRC-approved, General Electric licensing topical reports for Extended Power Uprate (EPU) safety analyses, NEDC-32424P-A (ELTR-1) and NEDC-32523P-A, and its Supplement, Volumes I and II (ELTR-2). Attachment 6 to this letter (General Electric Report, NEDC-32980P, "Safety Analysis Report for Duane Arnold Energy Center Extended Power Uprate," Revision 0, dated November 2000) is a summary of the results of the safety analyses performed for the DAEC EPU and is referred to, herein, as the Power Uprate Safety Analysis Report (PUSAR). It should be noted that this license application, performed in accordance with these ELTRs, is not being submitted as a "risk informed licensing action," as defined by Regulatory Guide 1.174. This application has endeavored to incorporate the "lessons learned" from Staff Requests for Additional Information (RAIs) on prior power uprate submittals and from our pre-submittal meetings with the Staff regarding this application's content. For example, Attachment 7 contains specific, additional details of the piping stress analysis results that have been the subject of previous Staff RAIs. They have been provided here, proactively, to assist the Staff in its review, but are considered to be too detailed for inclusion in the PUSAR, which is intended to conform to ELTR-1.

The ELTRs justify increases in reactor thermal power of up to 20% from the original rated thermal power (ORTP). For the DAEC, the ORTP, as defined in the DAEC TS, was 1593 MWt, with an authorized maximum licensed power level of 1658 MWt. Amendment # 115 to the DAEC Operating License approved the first power uprate for the DAEC, by revising the TS definition of Rated Thermal Power (RTP) to agree with the licensed power level of 1658 MWt and represented a 4.1% increase in ORTP (corresponding to 105% of rated steamflow). Amendment # 115 was implemented in 1985. Since that time, the DAEC has routinely operated at the 104.1% of ORTP level with no major equipment problems due to this increase in thermal power. Consequently, this application seeks to increase the authorized maximum licensed power level up to the 120% ORTP level, in accordance with the ELTRs, a 15.3% increase above current licensed power level.

In order to assure that the engineering evaluations performed by General Electric, and its subcontractors, in support of this EPU application appropriately conformed to the DAEC design and licensing basis, strict controls were implemented on the inputs, assumptions and methods to be used by them to perform these evaluations. These evaluations were extensively reviewed by cognizant DAEC personnel as part of the acceptance process of General Electric's engineering reports and often included technical audits of the detailed design record files in General Electric's offices. Supporting engineering evaluations performed by DAEC personnel were done in conformance to our 10 CFR Part 50, Appendix B, Quality Assurance Program.

Attachment 1 to this letter provides the list of requested changes to the Operating License and TS, a brief description of each and their corresponding justifications, while Attachment 2 contains the "pen & ink" revisions to those Operating License and TS pages. Supporting changes to the DAEC TS BASES, Updated Final Safety Analysis Report (UFSAR) and Technical Requirements Manual (TRM) will be prepared as part of

the implementation of this license amendment request, pursuant to DAEC TS 5.5.10 and 10 CFR 50.71(e), respectively, and are not included with this application.

The TS contain numerous references to percentages of RTP. Some of these percentage values are not being changed by this license amendment request, because it was determined that EPU either does not directly influence the percentage involved, or the increase in actual thermal power was supported by analysis at the EPU conditions. A list of these items, along with a brief explanation, is given in Attachment 3.

Based upon feedback received from the Staff in our pre-submittal meetings mentioned above, we have submitted under separate cover, specific evaluations and TS change requests in support of this application (References 1-5). In particular, the Reference 1 environmental assessment per §51.41 concludes that this application does not have a significant adverse impact on the environment and justifies this application for a categorical exclusion as provided by §51.21.

Attachment 4 presents the currently-identified hardware modifications necessary to achieve the requested EPU power level at the DAEC. These modifications are basic component upgrades or replacements and do not constitute a "material alteration of the facility," which would require the issuance of a Construction Permit, pursuant to §50.54(n) or §50.92(a). Because some of the existing fuel loaded in the core (GE10) cannot support the full uprated power level of 1912 MWt, the average power level for the initial operating cycle is estimated to be 1790 MWt. Table 1 in Attachment 4 contains a list of the initial set of modifications planned for implementation during the upcoming refueling outage (RFO17), which supports operation at the 1790 MWt power level and beyond. The remaining modifications currently anticipated to be required to achieve the full uprated power level of 1912 MWt are listed in Table 2 in Attachment 4. They are scheduled to be implemented during the subsequent refueling outage (RFO18), when the GE10 fuel is planned to be discharged from the core. Additional modifications may be identified based on operating plant data collected during the initial cycle of operation above the current 1658 MWt power level. Consequently, we consider the Attachment 4 list to constitute "planned actions" which do not represent formal commitments on NMC's part to implement them exactly as described or on this proposed schedule.

The PUSAR (Attachment 6) contains information which General Electric considers to be proprietary. General Electric requests that the proprietary information in the report be withheld from public disclosure, in accordance with 10 CFR 9.17(a)(4), 2.790(a)(4) and 2.790(d)(1). An affidavit supporting this request is provided as Attachment 5 to this letter.

To support implementation of this change request, NMC requests that the NRC allow an implementation period of 120 days after issuance of the license amendment. In addition, to aid in implementation, existing license condition 2.C.(2)(a) is being modified to allow existing Surveillance Requirements (SRs), whose acceptance criteria is affected by this increase in authorized power level, to be considered to be performed per TS SR 3.0.1, upon implementation of the license amendment approving this application, until their

next scheduled performance, in accordance with TS SR 3.0.2. The purpose for this request is to preclude having to perform these affected SRs prior to their next scheduled performance solely for the purpose of documenting compliance. This does not supercede that aspect of TS SR 3.0.1 that governs cases where it is believed that, if the SR were performed, it would not be met, i.e., we have high confidence that the SR would be found to meet its acceptance criteria, even though it has not been performed to actually demonstrate compliance to the new requirements. For example, it should not be necessary to perform leak rate tests for every valve in the TS 5.5.12 program, as part of implementation of this amendment, solely because the definition of P_a is slightly increased by the EPU, when there is significant margin to the acceptance limits (L_a), based upon the current leakrate test results.

This application has been reviewed by the DAEC Operations Committee and the Safety Committee. A copy of this submittal, along with the 10CFR50.92 evaluation of "No Significant Hazards Consideration," is being forwarded to our appointed state official pursuant to 10 CFR Section 50.91.

This letter is true and accurate to the best of my knowledge and belief.

Nuclear Management Company, LLC

By Gary Van Middlesworth
Gary Van Middlesworth
DAEC Site General Manager

State of Iowa
(County) of Linn

Signed and sworn to before me on this 16th day of November, 2000,

by Gary Van Middlesworth.

Nancy S. Franck
Notary Public in and for the State of Iowa

NOTARIAL SEAL IOWA NANCY S. FRANCK

9-28-01
Commission Expires

Attachments:

1. Proposed Change TSCR-042 to the Duane Arnold Energy Center Operating License and Technical Specifications
2. DAEC Operating License and Technical Specification Pages "Pen & Ink" Revisions
3. Justification for TS Items Related to Rated Thermal Power (RTP) That Will Not Change
4. List of Planned Modifications
5. General Electric Affidavit of Proprietary Information
6. General Electric Report, NEDC-32980P, Revision 0, November 2000
7. Additional Supporting Information on Piping Stress Analyses

cc: T. Browning (w/a)
M. Wadley (w/o)
B. Mozafari (NRC-NRR) (w/a)
T. J. Kim (NRC-NRR) (w/a)
J. Dyer (Region III) (w/a)
D. McGhee (State of Iowa) (w/o Attachment 6)
NRC Resident Office (w/a)
Docu (w/a)

Proposed Change TSCR-042 to the Duane Arnold Energy Center

Operating License and Technical Specifications

The holders of license DPR-49 for the Duane Arnold Energy Center propose to amend the Operating License and Technical Specifications by deleting the referenced page and replacing it with the enclosed new page.

Operating License DPR-49, Section 2.C.(1)

Page 3

Description of Change:

Revised the Maximum Power Level to be 1912 MWt.

Justification for Change:

This is the new maximum licensed power level, based on the enclosed safety analysis and balance-of-plant evaluations.

(Reference PUSAR Section 1.2.1)

Operating License DPR-49, Section 2.C.(2)(a)

Page 4

Description of Change:

Existing license condition 2.C.(2)(a) is being modified to allow existing Surveillance Requirements (SRs), whose acceptance criteria is affected by this increase in authorized power level, to be considered to be performed per TS SR 3.0.1, upon implementation of the license amendment approving this application, until their next scheduled performance, in accordance with TS SR 3.0.2.

Justification for Change:

The purpose for this request is to preclude having to perform these affected SRs prior to their next scheduled performance solely for the purpose of documenting compliance. This does not supercede that aspect of TS SR 3.0.1 that governs cases where it is believed that, if the SR were performed, it would not be met, i.e., we have high confidence that the SR would be found to meet its acceptance criteria, even though it has not been performed to actually demonstrate compliance to the new requirements. Performance of the SRs merely to document compliance would unnecessarily divert resources, interfere with plant operations, potentially incur additional personnel dose and would not improve plant safety.

Section 1.1, Definitions

Page 1.1-5

Description of Change:

Revised the definition of RATED THERMAL POWER to be the Extended Power Uprate (EPU) maximum licensed power level of 1912 MWt.

Justification for Change:

This is the new maximum licensed power level, based on the enclosed safety analysis and balance-of-plant evaluations.

(Reference PUSAR Section 1.2.1)

SL 2.1.1.1

Page 2.0-1

Description of Change:

Revised the Safety Limit (SL) for fuel cladding integrity at low core flow and reactor pressure from the current 25% Rated Thermal Power (RTP) to 21.7% RTP (25% x 1658/1912).

Justification for Change:

The basis for this SL is the transition to the Safety Limit Minimum Critical Power Ratio (SLMCPR), which is based on the GE GEXL correlation. This correlation ensures that above this SLMCPR, 99.9% of the fuel rods will avoid boiling transition during plant transients. This correlation is only valid for a range of power densities (kW/l). Thus, the percentage of RTP is being revised to be consistent with the new RTP value of 1912 MWt, to maintain the current absolute thermal power value in MWt, such that the current power density is maintained.

(Reference PUSAR Section 9.1)

LCO 3.2.1: Applicability, Required Action B.1, and SR 3.2.1.1

Page 3.2-1

Description of Change:

Revised the percentage of RTP value related to thermal limits monitoring from 25% RTP to 21.7% RTP.

Justification for Change:

This change is being made for consistency with the SL change above.

(Reference PUSAR Section 9.1)

LCO 3.2.2: Applicability, Required Action B.1, and SR 3.2.2.1

Page 3.2-2

Description of Change:

Revised the percentage of RTP value related to thermal limits monitoring from 25% RTP to 21.7% RTP.

Justification for Change:

This change is being made for consistency with the SL change above.

(Reference PUSAR Section 9.1)

LCO 3.3.1.1: SR 3.3.1.1.2

Page 3.3-3

Description of Change:

Revised the percentage of RTP value related to deferral of the SR until 12 hours after reaching 25% RTP during plant startup, from 25% RTP value to 21.7%. The RTP value being changed is contained in the SR and the associated NOTE.

Justification for Change:

The existing value is based on the point in the plant startup sequence where an accurate heat balance calculation can be performed by the plant process computer and is generally tied to sufficient steamflow through the turbine to synchronize the main generator to the grid. This steamflow, and in turn, reactor power level in MWt, is not being changed by EPU. Thus, the percentage of RTP is being revised to be consistent with the new RTP value of 1912 MWt, to maintain the current absolute thermal power value.

(Reference PUSAR Section 9.1)

LCO 3.3.1.1: Required Action E.1, SR 3.3.1.1.16, and Table 3.3.1.1-1 Functions 8 and 9

Pages 3.3-2, 3.3-5, and 3.3-9

Description of Change:

Revised the percentage of RTP value corresponding to the power level where the direct Reactor Protection System (RPS) trips, i.e., scram, on Turbine Stop Valve (TSV) or Turbine Control Valve (TCV) fast closure are automatically bypassed from 30% RTP to 26% RTP.

Justification for Change:

These direct scram signals are automatically bypassed at a low reactor thermal power level where the turbine bypass steamflow capacity is sufficient to mitigate a TSV or TCV closure transient. Because the turbine bypass capacity is not being changed by EPU, the corresponding percentage of RTP is being revised to maintain the current absolute thermal power value in MWt, corresponding to the existing bypass steamflow capacity.

(Reference PUSAR Section 5.3.11 and Table 5-1)

LCO 3.3.4.1: Applicability, Required Action C.2, and SR 3.3.4.1.4

Pages 3.3-27, 3.3-28, and 3.3-29

Description of Change:

Revised the percentage of RTP value corresponding to the power level where the End-of-Cycle Recirculation Pump Trip (EOC-RPT) on TSV or TCV fast closure is automatically bypassed from 30% RTP to 26% RTP.

Justification for Change:

These values are being revised for consistency with the RPS trips above, as the EOC-RPT function is not required when its companion RPS functions are not required to be OPERABLE.

(Reference PUSAR Section 5.3.11)

LCO 3.3.1.1: Table 3.3.1.1-1 Function 2b

Page 3.3-7

Description of Change:

Replaced the current Allowable Values (AVs) for the Two-loop Operation (TLO) Average Power Range Monitor (APRM) Flow-Biased, High RPS trip with the equation for the AV to implement the Maximum Extended Load Line Limit Analysis (MELLLA). A new footnote (c) is being added to define the term "W" used in the AV equation.

Justification for Change:

Adoption of the MELLLA is integral to the implementation of the EPU. All safety analyses in the PUSAR were performed consistent with the MELLLA power/flow map and corresponding APRM RPS AV changes.

(Reference PUSAR Section 5.3.5 and Table 5-1)

LCO 3.3.1.1: Table 3.3.1.1-1 Footnote (b)

Page 3.3-7

Description of Change:

Replaced the current AVs for the Single-loop Operation (SLO) APRM Flow Biased – High RPS trip with the equation for the AV to implement the MELLLA. The new footnote (c) identified above is used to define the term "W" used in the AV equation.

Justification for Change:

The AVs for the TLO APRM Flow-biased trip are adjusted to account for the difference in recirculation drive flow to core flow relationship in SLO. The higher core pressure drop associated with EPU necessitates a different adjustment factor than that currently used.

(Reference PUSAR Section 5.3.5 and Table 5-1)

LCO 3.4.1: SR 3.4.1.1 a & b

Page 3.4-3

Description of Change:

Revised the percentage of RTP value corresponding to the power level where a recirculation pump speed mismatch surveillance is performed from 80% RTP to 69.4% RTP.

Justification for Change:

This SR ensures that the speeds of the two operating recirculation pumps are matched to within a specified tolerance. This ensures that the Low Pressure Coolant Injection (LPCI) Loop Selection Logic will correctly identify the "broken" recirculation loop in the event of a pipe rupture in the reactor recirculation system piping, i.e., a hypothetical Loss-of-Coolant Accident (LOCA). The original supporting LOCA analysis was not revised for EPU. Thus, the percentage of RTP is being revised to be consistent with the new RTP value of 1912 MWt, to maintain the current absolute thermal power value used in the LOCA analysis.

(Reference PUSAR Section 3.4)

LCO 3.4.2: SR 3.4.2.1

Page 3.4-5

Description of Change:

Revised the percentage of RTP value contained in NOTE 2 corresponding to the power level where the evaluation of jet pump performance can be deferred for up to 24 hours from 25% RTP to 21.7% RTP.

Justification for Change:

The basis for the existing deferral is that it is necessary to reach a stable power and flow condition to allow meaningful data to be taken to perform this evaluation of jet pump performance. At low power and flow conditions, there is considerable noise in this measurement such that it is not a reliable indicator of jet pump performance. The absolute conditions of thermal power and flow necessary to obtain adequate data are not being revised by the EPU. Thus, the percentage of RTP is being revised to be consistent with the new RTP value of 1912 MWt, to maintain the current absolute thermal power value.

(Reference PUSAR Section 3.4)

LCO 3.6.3.1: SR 3.6.3.1.1

Page 3.6-33

Description of Change:

Revised the volume requirement for nitrogen storage for the Containment Atmospheric Dilution (CAD) system from 50,000 scf to 67,000 scf.

Justification for Change:

This SR ensures that sufficient nitrogen volume is available for 7 days of CAD operation following a hypothetical LOCA. This volume is increased based on the analysis performed at EPU conditions that concluded additional nitrogen would be needed for maintaining the oxygen concentration below 5% following a LOCA.

(Reference PUSAR Section 4.7)

LCO 3.6.3.1: SR 3.6.3.1.2

Page 3.6-33

Description of Change:

Add a "comma" to clearly delineate the requirement for performing the SR for both manual and power-operated valves in the CAD system.

Justification for Change:

This is an editorial change to correct a typographical error in the SR introduced during the final comment resolution period for the conversion to Improved TS (Amendment #223).

LCO 3.7.7: Applicability and Required Action B.1

Page 3.7-16

Description of Change:

Revised the percentage of RTP value where the Main Turbine Bypass Valve system is required to be OPERABLE from 25% RTP to 21.7% RTP.

Justification for Change:

This change is for consistency with the change in percentage of RTP for the TSV and TCV RPS and EOC-RPT trips discussed above.

(Reference PUSAR Section 9.1)

Section 5.5.12, Primary Containment Leakage Testing Program

Page 5.0-18

Description of Change:

Revise the peak calculated containment pressure (P_a) from 43 psig to 45.7 psig.

Justification for Change:

This value for P_a is being revised to reflect the increased Design Basis Accident (DBA) - LOCA peak drywell pressure from the containment analysis performed at EPU conditions.

(Reference PUSAR Sections 4.1.1 and 10.4.2 and Table 4-1)

DAEC
Operating License
and
Technical Specification Pages
"Pen & Ink" Revisions

2.B.(2) NMC, pursuant to the Act and 10 CFR Part 70, to receive, possess and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Updated Final Safety Analysis Report, as supplemented and amended as of June 1992 and as supplemented by letters dated March 26, 1993, and October 3, 1997;

2.B.(3) NMC, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use at any time any byproduct, source and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;

2.B.(4) NMC, pursuant to the Act and 10 CFR Parts 30, 40 and 70, to receive, possess and use in amounts as required any byproduct, source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated radioactive apparatus components;

2.B.(5) NMC, pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not to separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

C. This license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations in 10 CFR Chapter I; Part 20, Section 30.34 of Part 30, Section 40.41 of Part 40, Sections 50.54 and 50.59 of Part 50, and Section 70.32 of Part 70; is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

Maximum Power Level

2.C.(1) NMC is authorized to operate the Duane Arnold Energy Center at steady state reactor core power levels not in excess of ~~1658~~ 1912 megawatts (thermal).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 234, are hereby incorporated in the license. NMC shall operate the facility in accordance with the Technical Specifications.

TSCR-042

INSERT to Operating License DPR-49, Section 2.C(2)(a)

(a) For Surveillance Requirements (SRs) that are new in Amendment 223 to Final Operating License DPR-49, the first performance is due at the end of the first surveillance interval that begins at implementation of Amendment 223. For SRs that existed prior to Amendment 223, including SRs with modified acceptance criteria and SRs whose frequency of performance is being extended, the first performance is due at the end of the first surveillance interval that begins on the date the Surveillance was last performed prior to implementation of Amendment 223.

(3) Fire Protection

NMC shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report for the Duane Arnold Energy Center and as approved in the SER dated June 1, 1978, and Supplement dated February 10, 1981, subject to the following provision:

NMC may make changes to the approved fire protection program without prior approval of the Commission only if those changes would not adversely affect the ability to achieve and maintain safe shutdown in the event of a fire.

(4) The licensee is authorized to operate the Duane Arnold Energy Center following installation of modified safe-ends on the eight primary recirculation system inlet lines which are described in the licensee letter dated July 31, 1978, and supplemented by letter dated December 8, 1978.

(5) Physical Protection

NMC shall fully implement and maintain in effect all provisions of the Commission-approved physical security, guard training and qualification, and safeguards contingency plans including amendments made pursuant to provisions of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The plans, which contain Safeguards Information protected under 10 CFR 73.21, are entitled: "Duane Arnold Energy Center Security Plan," with revisions submitted through December 17, 1987; "Duane Arnold Energy Center Guard Training and Qualification Plan," with revisions submitted through October 18, 1985; and "Duane Arnold Energy Center Safeguards Contingency Plan," with revisions submitted through December 5, 1986. Changes made in accordance with 10 CFR 73.55 shall be implemented in accordance with the schedule set forth therein.

T5CR-042

INSERT to Operating License DPR-49, Section 2.C.(2)(a)

(a) For Surveillance Requirements (SRs) whose acceptance criteria are modified, either directly or indirectly, by the increase in authorized maximum power level in 2.C.(1) above, in accordance with Amendment ### to Final Operating License DPR-49, those SRs are not required to be performed until their next scheduled performance, which is due at the end of the first surveillance interval that begins on the date the Surveillance was last performed prior to implementation of Amendment ###.

1.1 Definitions (continued)

MINIMUM CRITICAL POWER RATIO (MCPR) (continued)	film boiling occur intermittently with neither type being completely stable.
MODE	A MODE shall correspond to any one inclusive combination of mode switch position, average reactor coolant temperature, and reactor vessel head closure bolt tensioning specified in Table 1.1-1 with fuel in the reactor vessel.
OPERABLE — OPERABILITY	A system, subsystem, division, component, or device shall be OPERABLE or have OPERABILITY when it is capable of performing its specified safety function(s) and when all necessary attendant instrumentation, controls, normal or emergency electrical power, cooling and seal water, lubrication, and other auxiliary equipment that are required for the system, subsystem, division, component, or device to perform its specified safety function(s) are also capable of performing their related support function(s).
RATED THERMAL POWER (RTP)	RTP shall be a total reactor core heat transfer rate to the reactor coolant of ~~1658~~ 1912 MWt.
REACTOR PROTECTION SYSTEM (RPS) RESPONSE TIME	The RPS RESPONSE TIME shall be that time interval from when the monitored parameter exceeds its RPS trip setpoint at the channel sensor until de-energization of the scram pilot valve solenoids. The response time may be measured by means of any series of sequential, overlapping, or total steps so that the entire response time is measured.

(continued)

2.0 SAFETY LIMITS (SLs)

2.1 SLs

2.1.1 Reactor Core SLs

2.1.1.1 Fuel Cladding Integrity - With the reactor steam dome pressure < 785 psig or core flow < 10% rated core flow:

THERMAL POWER shall be ≤ ~~25%~~ 21.7% RTP.

2.1.1.2 MCPR - With the reactor steam dome pressure ≥ 785 psig and core flow ≥ 10% rated core flow:

MCPR shall be ≥ 1.10 for two recirculation loop operation or ≥ 1.12 for single recirculation loop operation.

2.1.1.3 Reactor Vessel Water Level - Reactor vessel water level shall be greater than 15 inches above the top of active irradiated fuel.

2.1.2 Reactor Coolant System Pressure SL

Reactor steam dome pressure shall be ≤ 1335 psig.

2.2 SL Violations

With any SL violation, the following actions shall be completed within 2 hours:

2.2.1 Restore compliance with all SLs; and

2.2.2 Fully insert all insertable rods.

TSCR-042
~~Amendment No. 229~~

3.2 POWER DISTRIBUTION LIMITS

3.2.1 AVERAGE PLANAR LINEAR HEAT GENERATION RATE (APLHGR)

LCO 3.2.1 All APLHGRs shall be less than or equal to the limits specified in the COLR.

APPLICABILITY: THERMAL POWER ≥ ~~25%~~ 21.7% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Any APLHGR not within limits.	A.1 Restore APLHGR(s) to within limits.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to < ~~25%~~ 21.7% RTP.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.2.1.1	Verify all APLHGRs are less than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ ~~25%~~ 21.7% RTP AND 24 hours thereafter

TSCR-042
~~Amendment 223~~

3.2 POWER DISTRIBUTION LIMITS

3.2.2 MINIMUM CRITICAL POWER RATIO (MCPR)

LCO 3.2.2 All MCPRs shall be greater than or equal to the MCPR operating limits specified in the COLR.

APPLICABILITY: THERMAL POWER ≥ ~~25%~~ 21.7% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Any MCPR not within limits.	A.1 Restore MCPR(s) to within limits.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to < ~~25%~~ 21.7% RTP.	4 hours

SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.2.2.1 Verify all MCPRs are greater than or equal to the limits specified in the COLR.	Once within 12 hours after ≥ ~~25%~~ 21.7% RTP AND 24 hours thereafter

(continued)

TSCR-042
~~Amendment 223~~

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
C. One or more Functions with RPS trip capability not maintained.	C.1 Restore RPS trip capability.	1 hour
D. Required Action and associated Completion Time of Condition A, B, or C not met.	D.1 Enter the Condition referenced in Table 3.3.1.1-1 for the channel.	Immediately
E. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	E.1 Reduce THERMAL POWER to < ~~30%~~ 26% RTP.	4 hours
F. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	F.1 Be in MODE 2.	8 hours
G. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	G.1 Be in MODE 3.	12 hours
H. As required by Required Action D.1 and referenced in Table 3.3.1.1-1.	H.1 Initiate action to fully insert all insertable control rods in core cells containing one or more fuel assemblies.	Immediately

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SURVEILLANCE REQUIREMENTS

----------NOTES----------

1. Refer to Table 3.3.1.1-1 to determine which SRs apply for each RPS Function.

2. When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains RPS trip capability.

	SURVEILLANCE	FREQUENCY
SR 3.3.1.1.1	Perform CHANNEL CHECK.	12 hours
SR 3.3.1.1.2	----------NOTE---------- Not required to be performed until 12 hours after THERMAL POWER ≥ ~~25%~~ 21.7% RTP. ---------- Verify the absolute difference between the Average Power Range Monitor (APRM) channels and the calculated power is ≤ 2% RTP plus any gain adjustment required by LCO 3.4.1, "Recirculation Loops Operating," while operating at ≥ ~~25%~~ 21.7% RTP.	24 hours
SR 3.3.1.1.3	Perform a functional test of each automatic scram contactor.	7 days
SR 3.3.1.1.4	----------NOTE---------- Not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ---------- Perform CHANNEL FUNCTIONAL TEST.	7 days

(continued)

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.1.1.12	----------NOTES---------- 1. Neutron detectors are excluded. 2. For Function 2.a, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ---------- Perform CHANNEL CALIBRATION.	184 days
SR 3.3.1.1.13	Perform CHANNEL FUNCTIONAL TEST.	24 months
SR 3.3.1.1.14	----------NOTES---------- 1. Neutron detectors are excluded. 2. For Function 1, not required to be performed when entering MODE 2 from MODE 1 until 12 hours after entering MODE 2. ---------- Perform CHANNEL CALIBRATION.	24 months
SR 3.3.1.1.15	Perform LOGIC SYSTEM FUNCTIONAL TEST.	24 months
SR 3.3.1.1.16	Verify Turbine Stop Valve-Closure and Turbine Control Valve Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ ~~30%~~ 26% RTP.	24 months

(continued)

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Table 3.3.1.1-1 (page 1 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
1. Intermediate Range Monitors					
a. Neutron Flux - High	2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.4 SR 3.3.1.1.6 SR 3.3.1.1.7 SR 3.3.1.1.14 SR 3.3.1.1.15 SR 3.3.1.1.19	≤ 125/125 divisions of full scale
	5[a]	2	H	SR 3.3.1.1.1 SR 3.3.1.1.5 SR 3.3.1.1.14 SR 3.3.1.1.15 SR 3.3.1.1.19	≤ 125/125 divisions of full scale
b. Inop	2	2	G	SR 3.3.1.1.4 SR 3.3.1.1.15 SR 3.3.1.1.19	NA
	5[a]	2	H	SR 3.3.1.1.5 SR 3.3.1.1.15 SR 3.3.1.1.19	NA
2. Average Power Range Monitors					
a. Neutron Flux - Upscale, Startup	2	2	G	SR 3.3.1.1.1 SR 3.3.1.1.4 SR 3.3.1.1.7 SR 3.3.1.1.8 SR 3.3.1.1.12 SR 3.3.1.1.15 SR 3.3.1.1.19	≤ 16.6% RTP
b. Flow Biased - High	1	2	F	SR 3.3.1.1.1 SR 3.3.1.1.2 SR 3.3.1.1.3 SR 3.3.1.1.8 SR 3.3.1.1.9 SR 3.3.1.1.12 SR 3.3.1.1.15 SR 3.3.1.1.17 SR 3.3.1.1.19	(Continued)

(b)(c) ≤ (0.55W + 67.7)

% Recirc. Flow	% RTP(b)
0	≤ 63.4
25	≤ 77.7
50	≤ 92.5
75	≤ 107.1
100	≤ 121.6

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

applies:

(b) When reset for single loop operation per LCO 3.4.1, "Recirculation Loops Operating," the following Allowable Values apply:

% Recirc. Flow	% RTP
0	≤ 59.9
25	≤ 74.3
50	≤ 89.0
75	NA
100	NA

≤ (0.55W + 61.4)(c)

The trip setpoints may be reset by adjusting APRM gain or by recalibrating the APRMs.

Insert for Table 3.3.1.1-1

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Insert for Table 3.3.1.1-1

(c) W is equal to the percentage of the drive flow, where 100% drive flow is that required to achieve 100% core flow at 100% RTP.

Table 3.3.1.1-1 (page 3 of 3)
Reactor Protection System Instrumentation

FUNCTION	APPLICABLE MODES OR OTHER SPECIFIED CONDITIONS	REQUIRED CHANNELS PER TRIP SYSTEM	CONDITIONS REFERENCED FROM REQUIRED ACTION D.1	SURVEILLANCE REQUIREMENTS	ALLOWABLE VALUE
7. Scram Discharge Volume Water Level - High					
a. Resistance Temperature Detector	1,2	2	G	SR 3.3.1.1.3 SR 3.3.1.1.10 SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15 SR 3.3.1.1.19	≤ 769 ft – 3.0 inches
	5(a)	2	H	SR 3.3.1.1.3 SR 3.3.1.1.10 SR 3.3.1.1.13 SR 3.3.1.1.14 SR 3.3.1.1.15 SR 3.3.1.1.19	≤ 769 ft – 3.0 inches
b. Float Switch	1,2	2	G	SR 3.3.1.1.3 SR 3.3.1.1.9 SR 3.3.1.1.14 SR 3.3.1.1.15 SR 3.3.1.1.19	≤ 769 ft – 2.8 inches
	5(a)	2	H	SR 3.3.1.1.3 SR 3.3.1.1.9 SR 3.3.1.1.14 SR 3.3.1.1.15 SR 3.3.1.1.19	≤ 769 ft – 2.8 inches
8. Turbine Stop Valve - Closure	≥ ~~30%~~ RTP 26%	4	E	SR 3.3.1.1.3 SR 3.3.1.1.9 SR 3.3.1.1.14 SR 3.3.1.1.15 SR 3.3.1.1.16 SR 3.3.1.1.19	≤ 10% closed
9. Turbine Control Valve Fast Closure, Trip Oil Pressure - Low	≥ ~~30%~~ RTP	2	E	SR 3.3.1.1.3 SR 3.3.1.1.9 SR 3.3.1.1.14 SR 3.3.1.1.15 SR 3.3.1.1.16 SR 3.3.1.1.19	≥ 465 psig
10. Reactor Mode Switch – Shutdown Position	1,2	1	G	SR 3.3.1.1.13 SR 3.3.1.1.15	NA
	5(a)	1	H	SR 3.3.1.1.13 SR 3.3.1.1.15	NA
11. Manual Scram	1,2	1	G	SR 3.3.1.1.9 SR 3.3.1.1.15	NA
	5(a)	1	H	SR 3.3.1.1.9 SR 3.3.1.1.15	NA

(a) With any control rod withdrawn from a core cell containing one or more fuel assemblies.

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3.3 INSTRUMENTATION

3.3.4.1 End of Cycle Recirculation Pump Trip (EOC-RPT) Instrumentation

LCO 3.3.4.1 a. Two channels per trip system for each EOC-RPT instrumentation Function listed below shall be OPERABLE:

1. Turbine Stop Valve (TSV) - Closure; and

2. Turbine Control Valve (TCV) Fast Closure, Trip Oil Pressure-Low.

OR

b. LCO 3.2.2 "MINIMUM CRITICAL POWER RATIO (MCPR)," limits for inoperable EOC-RPT as specified in the COLR are made applicable.

APPLICABILITY: THERMAL POWER ≥ ~~30%~~ 26 % RTP.

ACTIONS

---NOTE---
Separate Condition entry is allowed for each channel.

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. One or more channels inoperable.	A.1 Restore channel to OPERABLE status.	72 hours
	OR	
	A.2 --------NOTE-------- Not applicable if inoperable channel is the result of an inoperable breaker. ---------- Place channel in trip.	72 hours

(continued)

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ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
B. One or more Functions with EOC-RPT trip capability not maintained. AND MCPR limit for inoperable EOC-RPT not made applicable.	B.1 Restore EOC-RPT trip capability. OR B.2 Apply the MCPR limit for inoperable EOC-RPT as specified in the COLR.	2 hours 2 hours
C. Required Action and associated Completion Time not met.	C.1 Remove the associated recircluation pump from service. OR C.2 Reduce THERMAL POWER to < ~~30%~~ 26% RTP.	4 hours 4 hours

SURVEILLANCE REQUIREMENTS

----------NOTE----------
When a channel is placed in an inoperable status solely for performance of required Surveillances, entry into associated Conditions and Required Actions may be delayed for up to 6 hours provided the associated Function maintains EOC-RPT trip capability.

SURVEILLANCE	FREQUENCY
SR 3.3.4.1.1 Perform CHANNEL FUNCTIONAL TEST.	92 days

(continued)

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SURVEILLANCE REQUIREMENTS (continued)

SURVEILLANCE		FREQUENCY
SR 3.3.4.1.2	Perform CHANNEL CALIBRATION. The Allowable Values shall be: TSV - Closure: ≤ 10% closed; and TCV Fast Closure, Trip Oil Pressure - Low: ≥ 465 psig.	24 months
SR 3.3.4.1.3	Perform LOGIC SYSTEM FUNCTIONAL TEST including breaker actuation.	24 months
SR 3.3.4.1.4	Verify TSV - Closure and TCV Fast Closure, Trip Oil Pressure - Low Functions are not bypassed when THERMAL POWER is ≥ ~~30 %~~ 26% RTP.	24 months
SR 3.3.4.1.5	Verify the EOC-RPT SYSTEM RESPONSE TIME is within limits.	24 months on a STAGGERED TEST BASIS

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SURVEILLANCE REQUIREMENTS

	SURVEILLANCE	FREQUENCY
SR 3.4.1.1	----------NOTE---------- Not required to be performed until 24 hours after both recirculation loops are in operation. ----------	
	Verify recirculation pump speed mismatch with both recirculation pumps at steady state operation is as follows:	24 hours
	a. The speed of the faster pump shall be ≤ 135% of the speed of the slower pump when operating at < ~~80 %~~ RTP.	
	b. The speed of the faster pump shall be ≤ 122% of the speed of the slower pump when operating at ≥ ~~80 %~~ RTP.	69.4%
SR 3.4.1.2	Verify core flow as a function of core THERMAL POWER is outside the Exclusion Region shown in the COLR.	24 hours

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE	FREQUENCY
SR 3.4.2.1 ----------NOTES---------- 1. Not required to be performed until 4 hours after the associated recirculation loop is in operation. 2. Not required to be performed until 24 hours after > ~~25%~~ 21.7% RTP. 3. Criterion c is only applicable when pump speed is ≤ 60% rated speed. ---------- Verify at least one of the following criteria (a, b or c, as applicable) is satisfied for each operating recirculation loop: a. Recirculation pump flow to speed ratio differs by ≤ 5% from established patterns, and jet pump loop flow to recirculation pump speed ratio differs by ≤ 5% from established patterns. b. Each jet pump diffuser to lower plenum differential pressure differs by ≤ 20% from established patterns. c. The recirculation pump flow to speed ratio, jet pump loop flow to recirculation pump speed ratio, and jet pump diffuser to lower plenum differential pressure ratios are evaluated as being acceptable.	24 hours

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SURVEILLANCE REQUIREMENTS

SURVEILLANCE		FREQUENCY
SR 3.6.3.1.1	Verify ≥ ~~50,000~~ 67,000 scf of nitrogen is contained in the CAD System.	31 days
SR 3.6.3.1.2	Verify by administrative means that each CAD System manual, power operated and automatic valve in the required flowpath(s) that is not locked, sealed, or otherwise secured in position is in the correct position or can be aligned to the correct position.	31 days

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3.7 PLANT SYSTEMS

3.7.7 The Main Turbine Bypass System

LCO 3.7.7 The Main Turbine Bypass System shall be OPERABLE.

OR

LCO 3.2.2, "MINIMUM CRITICAL POWER RATIO (MCPR)," limits for an inoperable Main Turbine Bypass System, as specified in the COLR, are made applicable.

APPLICABILITY: THERMAL POWER ≥ ~~25%~~ 21.7% RTP.

ACTIONS

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. Requirements of the LCO not met.	A.1 Satisfy the requirements of the LCO.	2 hours
B. Required Action and associated Completion Time not met.	B.1 Reduce THERMAL POWER to < ~~25%~~ 21.7% RTP.	4 hours

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5.5 Programs and Manuals

5.5.12 Primary Containment Leakage Rate Testing Program (continued)

The peak calculated containment internal pressure for the design basis loss of coolant accident, P_a, is ~~43~~ 45.7 psig.

The maximum allowable primary containment leakage rate, L_a, at P_a, shall be 2.0% of primary containment air weight per day.

Leakage Rate acceptance criteria are:

a. Primary Containment leakage rate acceptance criterion is $\leq 1.0\ L_a$. During the first startup following testing in accordance with this program, the leakage rate acceptance criteria are: $\leq 0.60\ L_a$ for the Type B and Type C tests; and, $\leq 0.75\ L_a$ for the Type A tests; and

b. The air lock testing acceptance criterion is overall air lock leakage rate $\leq 0.05\ L_a$ when tested at $\geq P_a$.

The provisions of SR 3.0.3 are applicable to the Primary Containment Leakage Rate Testing Program.

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Justification for TS Items Related to Rated Thermal Power (RTP) That Will Not Change

Item #	TS Section #	TS Page #	Justification
1.	LCO 3.1.3, Condition D	3.1-9	The NOTE to this condition is referenced to 10% RTP. The basis for this value is the Low Power Setpoint (LPSP) for the Control Rod Drop Accident (CRDA). The LPSP at the uprated 10% RTP was validated as part of the CRDA evaluation for EPU (PUSAR Section 5.3.12). Thus, this value remains appropriate for the EPU.
2.	SR 3.1.3.2 and SR 3.1.3.3	3.1-10	Both SRs contain a NOTE that is referenced to 20% RTP. The basis for this value is also tied to the LPSP and allows for uncertainty in thermal power measurements at low power conditions to preclude the need for "out of sequence" rod withdrawals, which would lead to nuisance rod blocks. As discussed in Item #1, the LPSP of 10% RTP is not being modified for EPU. In addition, the uncertainty allowance is also not changing for EPU. Thus, this value remains appropriate for the EPU.
3.	SR 3.1.4.1 and SR 3.1.4.2	3.1-12 and 3.1-13	The Frequency for both SRs contains a reference to 40% RTP. This value is not directly based on any safety analysis, but upon engineering judgement to provide a reasonable window above the 20% RTP discussed in Item #2, to preclude the need for "out of sequence" rod withdrawals, and the need to perform the SR within a reasonable time after startup from a refuel outage, shutdowns greater than 120 days, maintenance on the components and fuel movement within the vessel. Thus, this value remains appropriate for the EPU.
4.	LCO 3.1.6, Applicability	3.1-18	The Applicability for the Rod Pattern Control LCO is referenced to 10% RTP. The basis for this value is the LPSP for the CRDA. As discussed in Item #1, the LPSP for the CRDA is not being changed. Thus, this value remains appropriate for the EPU.
5.	SR 3.3.1.1.2	3.3-3	This SR contains a reference to 2% RTP for the tolerance band on the Average Power Range Monitor (APRM) indications for requiring adjustment. This 2% value is generic and not scaled to the actual rated power level (MWt). Thus, this value remains appropriate for the EPU.

6.	Table 3.3.1.1-1, Item 2.a	3.3-7	This Allowable Value (AV) is for the APRM upscale trip during Startup. The existing AV is ≤16.6% RTP. This trip function is not credited in any safety analysis. However, it indirectly ensures that reactor power does not exceed the Safety Limit (SL) at low pressure and flow conditions (i.e., SL 2.1.1.1) prior to placing the reactor mode switch in the Run position. Although this SL is being lowered for EPU, (25% RTP pre-EPU to 21.7% RTP for EPU), this AV contains adequate margin to the revised SL. In addition, no hardware changes to this trip function are proposed. Thus, this AV remains appropriate for the EPU.
7.	Table 3.3.1.1-1, Item 2.c	3.3-8	This AV is for the APRM high value clamp. The existing AV is ≤121.6% RTP, which supports an Analytical Limit (AL) of 126% RTP. This AL value was validated as part of the EPU safety analyses (PUSAR Section 5.3.5 and Table 5-1). No hardware changes to this trip function are proposed. Thus, this AV remains appropriate for the EPU.
8.	SR 3.3.2.1.2, SR 3.3.2.1.3 and Table 3.3.2.1-1, Item 2, footnote (f)	3.3-18 and 3.3-20	Both SRs contain a NOTE that is referenced to 10% RTP, as does the Applicability specified in Table 3.3.2.1-1 for the Rod Worth Minimizer. The basis for the 10% RTP value is the LPSP, discussed in Item #1 above. Because the LPSP is not being revised, this value remains appropriate for the EPU.
9.	SR 3.3.2.1.4 and Table 3.3.2.1-1, Item 1, footnotes (a) – (e)	3.3.18 and 3.3-20	The Rod Block Monitor's Applicability is expressed as a series of power ranges, with their corresponding AVs in SR 3.3.2.1.4 and Table 3.3.2.1-1, in percent of RTP. These power ranges and AVs were validated at EPU conditions (PUSAR Sections 5.1.2 and 5.3.5). Thus, these values remain appropriate for the EPU.
10.	LCO 3.6.3.2, Applicability and Required Action B.1	3.6-34	The LCO Applicability and Required Action are referenced to 15% RTP. This value is not based on any analysis, but represents a window of operational convenience for inerting and de-inerting the containment during plant startups and shutdowns. The 15% RTP value is approximately the transition point from Mode 2 to Mode 1. Thus, this value remains appropriate for the EPU.

List of Planned Modifications

Table 1

Plant Hardware Modifications planned for RFO17 (May 2001) to achieve 1790 MWt

1	Replace Main High Pressure Turbine rotor/buckets.
2	Higher capacity coolers for the Main Transformer.
3	Convert the Turbine Control Valves to Partial Arc admission – control system logic and valve internal modifications.
4	Main Generator Hydrogen Cooler capacity increase.
5	Larger General Service Water piping to Main Generator Hydrogen Coolers.
6	Replace the Average Power Range Monitor flow-biased trip circuit cards to implement the Maximum Extended Load Line Limit Analysis setpoint changes.
7	Main Steamline Flow - High isolation instrumentation replacement to accommodate new setpoint.
8	Increase the sizing on Feedwater heater dump and drain valves.
9	Condensate Demineralizer septa replacement to improve flow capacity.
10	Expand indicating range on various Control Room and in-plant instrumentation.
11	Increase setpoint on two of four Low Pressure Turbine crossaround piping relief valves to accommodate both 1790 MWt and 1912 MWt operation.
12	Install new Main Condenser high backpressure alarm and trip units that have power-variable setpoints.
13	Upgrade one snubber on one Main Steam Safety/Relief Valve discharge pipe to restore stresses to within design limits.

Table 2

Plant Hardware Modifications planned for RFO18 (March 2003) to achieve the EPU rating of 1912 Mwt

1	Main Transformers capacity increase (MVA).
2	Isophase Bus Cooling capacity increase.
3	Condensate and Feedwater system flow capacity increase.
4	Increase setpoint on remaining two of four Low Pressure Turbine crossaround piping relief valves to accommodate 1912 MWt operation.
5	Feedwater Heaters 3 A/B, 4 A/B and 5 A/B capacity increase.

Attachment 5 to

NG-00-1900

General Electric Affidavit of Proprietary Information

General Electric Company

AFFIDAVIT

I, George B. Stramback, being duly sworn, depose and state as follows:

(1) I am Project Manager, Regulatory Services, General Electric Company ("GE") and have been delegated the function of reviewing the information described in paragraph (2) which is sought to be withheld, and have been authorized to apply for its withholding.

(2) The information sought to be withheld is contained in the GE proprietary report NEDC-32980P, *Safety Analysis Report for Duane Arnold Energy Center Extended Power Uprate,* Class III (GE Proprietary Information), dated November 2000. This document, taken as a whole, constitutes a proprietary compilation of information, some of it also independently proprietary, prepared by the General Electric Company. The independently proprietary elements are identified by bars marked in the margin adjacent to the specific material.

(3) In making this application for withholding of proprietary information of which it is the owner, GE relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4), and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10 CFR 9.17(a)(4), 2.790(a)(4), and 2.790(d)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

(4) Some examples of categories of information which fit into the definition of proprietary information are:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by General Electric's competitors without license from General Electric constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product;

c. Information which reveals cost or price information, production capacities, budget levels, or commercial strategies of General Electric, its customers, or its suppliers;

d. Information which reveals aspects of past, present, or future General Electric customer-funded development plans and programs, of potential commercial value to General Electric;

e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

Both the compilation as a whole and the marked independently proprietary elements incorporated in that compilation are considered proprietary for the reason described in items (4)a. and (4)b., above.

(5) The information sought to be withheld is being submitted to NRC in confidence. That information (both the entire body of information in the form compiled in this document, and the marked individual proprietary elements) is of a sort customarily held in confidence by GE, and has, to the best of my knowledge, consistently been held in confidence by GE, has not been publicly disclosed, and is not available in public sources. All disclosures to third parties including any required transmittals to NRC, have been made, or must be made, pursuant to regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within GE is limited on a "need to know" basis.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his delegate), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside GE are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information identified by bars in the margin is classified as proprietary because it contains detailed results and conclusions from these evaluations, utilizing analytical models and methods, including computer codes, which GE has developed, obtained NRC approval of, and applied to perform evaluations of transient and accident events in the GE Boiling Water Reactor ("BWR"). The development and approval of these system, component, and thermal hydraulic models and computer codes was achieved at a significant cost to GE, on the order of several million dollars.

The remainder of the information identified in paragraph (2), above, is classified as proprietary because it constitutes a confidential compilation of information, including detailed results of analytical models, methods, and processes, including computer codes, and conclusions from these applications, which represent, as a whole, an integrated process or approach which GE has developed, obtained NRC approval of, and applied to perform evaluations of the safety-significant changes necessary to demonstrate the regulatory acceptability of a given increase in licensed power output for a GE BWR. The development and approval of this overall approach was achieved at a significant additional cost to GE, in excess of a million dollars, over and above the very large cost of developing the underlying individual proprietary analyses.

To effect a change to the licensing basis of a plant requires a thorough evaluation of the impact of the change on all postulated accident and transient events, and all other regulatory requirements and commitments included in the plant's FSAR. The analytical process to perform and document these evaluations for a proposed power uprate was developed at a substantial investment in GE resources and expertise. The results from these evaluations identify those BWR systems and components, and those postulated events, which are impacted by the changes required to accommodate operation at increased power levels, and, just as importantly, those which are <u>not</u> so impacted, and the technical justification for not considering the latter in changing the licensing basis. The scope thus determined forms the basis for GE's offerings to support utilities in both performing analyses and providing licensing consulting services. Clearly, the scope and magnitude of effort of any attempt by a competitor to effect a similar licensing change can be narrowed considerably based upon these results. Having invested in the initial evaluations and developed the solution strategy and process described in the subject document GE derives an important competitive advantage in selling and performing these services. However, the mere knowledge of the impact on each system and component reveals the process, and provides a guide to the solution strategy.

(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to GE's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of GE's comprehensive BWR 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, including justifications for not including certain analyses in applications to change the licensing basis.

GE's competitive advantage will be lost if its competitors are able to use the results of the GE experience to avoid fruitless avenues, or to normalize or verify their own process, or to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions. In particular, the specific areas addressed by any document and submittal to support a change in the safety or licensing bases of the plant will clearly reveal those areas where detailed evaluations must be performed and specific analyses revised, and also, by omission, reveal those areas not so affected.

While some of the underlying analyses, and some of the gross structure of the process, may at various times have been publicly revealed, enough of both the analyses and the detailed structural framework of the process have been held in confidence that this information, in this compiled form, continues to have great competitive value to GE. This value would be lost if the information as a whole, in the context and level of detail provided in the subject GE document, were to be disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources, including that required to determine the areas that are not affected by a power uprate and are therefore blind alleys, would unfairly provide competitors with a windfall, and deprive GE of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing its analytical process.

STATE OF CALIFORNIA)
) ss:
COUNTY OF SANTA CLARA)

George B. Stramback, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated therein are true and correct to the best of his knowledge, information, and belief.

Executed at San Jose, California, this 14th day of November 2000.

George B. Stramback
General Electric Company

Subscribed and sworn before me this 14th day of November 2000.

Notary Public, State of California

VICKY D. SCHROER
Commission # 1224251
Notary Public - California
Santa Clara County
My Comm. Expires Jun 12, 2003

Additional Supporting Information on Piping Stress Analyses

Maximum Usage Factors for the Piping Subsystems Impacted by the EPU			
Subsystem	**Analysis Code**	**Node Number**	**Maximum Usage Factor**
Feedwater	ANSI-B31.7	140	0.308
RWCU	ASME, Sec. III NB-3600	188	0.001
RWCU	ASME, Sec. III NB-3600	216	0.046
RCIC	ASME, Sec. III NB-3600	250	0.090
Reactor Head Vent	ASME, Sec. III NB-3600	N/A	N/A
Press. above Core Plate L.P.	ASME, Sec. III NB-3600	N/A	N/A
MS D / Instrument Piping	ASME, Sec. III NB-3600	N/A	N/A
MS C / Instrument Piping	ASME, Sec. III NB-3600	N/A	N/A
MS B / Instrument Piping	ASME, Sec. III NB-3600	N/A	N/A
MS A / Instrument Piping	ASME, Sec. III NB-3600	N/A	N/A
RCIC Steam Piping (Instrumentation)	ASME, Sec. III NB-3600	N/A	N/A
HPCI Steam Piping (Instrumentation)	ASME, Sec. III NB-3600	N/A	N/A
MS Drain Lines	ASME, Sec. III NB-3600	N/A	N/A
Steam to RCIC Turbine Vent Line	ASME, Sec. III NB-3600	N/A	N/A
HPCI Turbine Piping	ANSI-B31.7	127	0.097

Maximum Stresses and Stress Ratios to Allowable for the Piping Subsystems Impacted by the EPU				
Subsystem	**Analysis Code**	**Condition**	**Stress (psi)**	**Ratio**
MS Line A with SRV lines	ASME-Sec. III NC-3600	Eq. 9C	26,741	0.99
MS Line B with SRV lines	ASME-Sec. III NC-3600	Eq. 9C	26,375	0.98
MS Line C with SRV lines	ASME-Sec. III NC-3600	Eq. 9C	26,582	0.98
MS Line D with SRV lines	ASME-Sec. III NC-3600	Eq. 9C	26,905	0.996
Reactor Head Vent	ASME-Sec. III NB-3600	Eq. 9 Emergency	30,002	0.877
		Eq. 10	94,821	1.638[1]
		Eq. 12	18,860	0.344
		Eq. 13	50,890	0.879
Press. above Core Plate L.P.	ASME-Sec. III NB-3600	Eq. 9 Emergency	6,119	0.140
		Eq. 10	53,192	0.907
MS D / Instrument Piping	ASME-Sec. III NB-3600	Eq. 9 Emergency	23,179	0.617
		Eq. 10	82,752	1.604[1]
		Eq. 12	15,800	0.306
		Eq. 13	41,230	0.799
MS C / Instrument Piping	ASME-Sec. III NB-3600	Eq. 9 Emergency	30,701	0.817
		Eq. 10	86,475	1.676[1]
		Eq. 12	41,320	0.801
		Eq. 13	38,320	0.752
MS B / Instrument Piping	ASME-Sec. III NB-3600	Eq. 9 Emergency	21,662	0.494
		Eq. 10	79,649	1.543[1]
		Eq. 12	12,900	0.250
		Eq. 13	40,380	0.783
MS A / Instrument Piping	ASME-Sec. III NB-3600	Eq. 9 Emergency	24,836	0.661
		Eq. 10	91,372	1.771[1]
		Eq. 12	17,960	0.348
		Eq. 13	48,370	0.937

[1] When the ratio for equation 10 is over 1.0 then the ratios for equations 12 and 13 shall be less than 1.0.

Maximum Stresses and Stress Ratios to Allowable for the Piping Subsystems Impacted by the EPU				
Subsystem	**Analysis Code**	**Condition**	**Stress (psi)**	**Ratio**
RCIC Steam Piping (Instrumentation)	ASME-Sec. III NB-3600	Eq. 9 Emergency	36,168	0.962
		Eq. 10	96,814	1.876[1]
		Eq. 12	45,480	0.777
		Eq. 13	49,770	0.965
HPCI Steam Piping (Instrumentation)	ASME-Sec. III NB-3600	Eq. 9 Emergency	34,629	0.789
		Eq. 10	87,827	1.702[1]
		Eq. 12	35,660	0.876
		Eq. 13	45,180	0.876
MS Drain Lines	ASME-Sec. III NB-3600	Eq. 9 Emergency	29,464	0.720
		Eq. 10	51,264	0.966
Steam to RCIC Turbine Vent Line	ASME-Sec. III NB-3600	Eq. 9 Emergency	11,579	0.277
		Eq. 10	30,995	0.584
HPCI Turbine Piping	ANSI-B31.7	Eq. 9 Faulted	36,513	0.70
		Eq. 10	50,010	0.96
		Eq. 12	13,740	0.26
		Eq. 13	50,648	0.98
MS Lines Outside Containment (20" Pipe)	ANSI-B31.1	SUS+OBE+TSV	17,768	0.99
		SUS+DBE+TSV	25,463	0.94
MS Lines Outside Containment (6" Pipe)	ANSI-B31.1	SUS+OBE+TSV	18,081	1.0
		SUS+DBE+TSV	25,204	0.93
Feedwater	ANSI-B31.7	Eq. 9	37,999	0.85
		Eq. 10	121,292	2.19[1]
		Eq. 12	3,686	0.07
		Eq. 13	47,590	0.86
RWCU	ASME, Sec. III NB-3600	Eq. 9 A	8,836	0.37
		Eq. 9 B	8,168	0.31
		Eq. 9 C	9,036	0.28
		Eq. 9 D	12,553	0.26
		Eq. 10	45,096	0.95

[1] When the ratio for equation 10 is over 1.0 then the ratios for equations 12 and 13 shall be less than 1.0.

Maximum Stresses and Stress Ratios to Allowable for the Piping Subsystems Impacted by the EPU				
Subsystem	**Analysis Code**	**Condition**	**Stress (psi)**	**Ratio**
RCIC Discharge	ASME, Sec. III NB-3600	Eq. 9 A	12,496	0.47
		Eq. 9 B	11,895	0.37
		Eq. 9 C	12,496	0.21
		Eq. 9 D	16,977	0.32
		Eq. 10	45,971	0.86