



November 2, 2004

10 CFR 50.91(a)(5)

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Palisades Nuclear Plant
Docket 50-255
License No. DPR-20

License Amendment Request: Additional Restrictions to Primary Coolant System
Cooldown Rate Limits

Pursuant to 10 CFR 50.91(a)(5), Nuclear Management Company, LLC (NMC) requests Nuclear Regulatory Commission (NRC) review and approval of a proposed emergency license amendment for the Palisades Nuclear Plant. NMC proposes additional restrictions to the cooldown rate limits in Appendix A, Technical Specifications (TS), Limiting Condition for Operation (LCO) 3.4.3, "Primary Coolant System (PCS) Pressure and Temperature (P/T) Limits." This proposed change is needed to support plant restart following repairs of two reactor vessel closure head control rod drive nozzle penetrations at the Palisades Nuclear Plant. The repairs are being performed in accordance with relief requests submitted to the NRC on August 2, 2004, and authorized on October 28, 2004.

Enclosure 1 provides a detailed description of the proposed change, background and technical analysis, No Significant Hazards Consideration Determination, and Environmental Review Consideration. Enclosure 2 provides the revised TS page reflecting the proposed change. Enclosure 3 provides the annotated TS page showing the changes proposed. Enclosure 4 provides two Framatome analyses that support the proposed license amendment. The analyses are as follows:

AREVA Document 32-5044089-03, "Palisades Unit 1 CRDM Nozzle IDTB Weld Repair Analysis," dated October 2004 (Proprietary)

AREVA Document 32-5044161-02, "Palisades CRDM Nozzle IDTB J-groove Weld Flaw Evaluation," dated October 2004 (Proprietary)

APD1

A Framatome proprietary authorization affidavit supporting the above calculations is included with the AREVA documents. The affidavit sets forth the basis on which the information may be withheld from public disclosure by the Commission and addresses with specificity the considerations listed in 10 CFR 2.390.

NMC requests that Enclosure 4, which is proprietary to Framatome, be withheld from public disclosure in accordance with 10 CFR 2.390. Correspondence regarding the proprietary aspects of the items listed above, or the supporting Framatome affidavit, should reference the affidavit and be addressed to J.F. Mallay, Director Regulatory Affairs, Framatome ANP, Inc., 3315 Forest Road, P.O. Box 10935, Lynchburg, Virginia, 24506-0935.

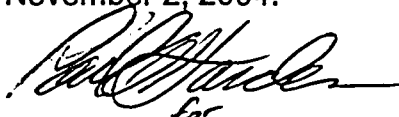
NMC requests approval of this proposed license amendment by November 5, 2004, with the amendment being implemented within seven days. The approval date supports plant restart from the current refueling outage at the Palisades Nuclear Plant.

A copy of this request has been provided to the designated representative of the State of Michigan.

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments. However, this request completes the commitment made by letter dated October 28, 2004, from NMC to the NRC, to provide this license amendment request.

I declare under penalty of perjury that the foregoing is true and correct. Executed on November 2, 2004.



^{for}
Daniel J. Malone
Site Vice-President, Palisades Nuclear Plant
Nuclear Management Company, LLC

Enclosures (4)

cc: (with Enclosure 4)
Project Manager, Palisades, USNRC

cc: (without Enclosure 4)
Administrator, Region III, USNRC
Resident Inspector, Palisades, USNRC

ENCLOSURE 1

DESCRIPTION OF REQUESTED CHANGES

1.0 DESCRIPTION

Nuclear Management Company, LLC (NMC) requests to amend Operating License DPR-20 for the Palisades Nuclear Plant. The proposed change would augment the cooldown rate limits in Appendix A, Technical Specifications (TS), Limiting Condition for Operation (LCO) 3.4.3, "Primary Coolant System (PCS) Pressure and Temperature (P/T) Limits." These proposed additional restrictions are needed to support plant restart following repairs to the reactor vessel closure head (RVCH) control rod drive (CRD) nozzles at the Palisades Nuclear Plant.

2.0 PROPOSED CHANGE

NMC proposes to revise TS LCO 3.4.3, Figure 3.4.3-2 (Page 1 of 1) with the following additional restrictions when the head is on the reactor vessel:

1. Maintain average core exit temperature:
 $135^{\circ}\text{F} \geq T \geq 110^{\circ}\text{F}$ for ≥ 3 hours.
2. Following completion of item 1, maintain average hourly cooldown (C/D) limit of $20^{\circ}\text{F}/\text{hour}$ based on core exit temperature indication.

3.0 BACKGROUND

NMC requested relief from the ASME Code Section XI, IWA-3300(b), IWB-3142.4, and IWB-3420 requirement for characterization of any flaws discovered during examinations required by the NRC Order EA-03-009, "Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors," dated February 20, 2004. The Nuclear Regulatory Commission (NRC) verbally authorized the requested relief on October 28, 2004. NMC completed volumetric examinations and discovered that CRD nozzles #29 and #30 had indications that required further evaluation and repair. In lieu of characterizing potential flaws in the remnant of the J-groove material left after repairing these CRD nozzles, and in accordance with the requested relief, analytical evaluations were completed that conservatively assumed that a worst-case flaw exists in the remnant of the weld and extends from the weld surface to the RVCH low alloy steel base material interface.

These evaluations included a finite element analysis provided by Framatome Advanced Nuclear Products (FANP) and a fracture mechanics analysis provided by FANP. The initial input assumptions of these evaluations included the cooldown pressure and temperature curves provided in Figure 3.4.3-2 of TS LCO 3.4.3. The results from initial evaluations concluded that the Code-required

fatigue crack growth rate could be satisfied. However, the fracture toughness criteria of the 1989 ASME Section XI Code could not be met. Additional cooldown limits were required to meet the ASME Section XI fracture toughness criteria.

4.0 TECHNICAL ANALYSIS

Analyses have been performed to demonstrate that plant operation will continue to meet applicable Code requirements. The finite element analysis is provided in Enclosure 4. The inputs to the finite element analysis were revised to include additional restrictions for the cooldown limits for reactor coolant water temperature. The additional restrictions for cooldown limits consist of (1) an addition of a three-hour hold period between 110°F and 135°F and (2) an average cooldown rate of 20°F/hour thereafter. The purpose of the three-hour hold period is to reduce the thermal gradient across the RVCH material resulting from the TS allowed average cooldown rate of 40°F/hour. The proposed temperature band for the three-hour hold period was developed to provide plant operations staff flexibility while continuing to meet the applicable Code requirements. The 135°F maximum temperature was chosen as a time in the cooldown process occurring after the initiation of the TS rate limit of 40°F/hour. The 110°F minimum temperature was chosen to provide an acceptable operating band for control of the plant during the hold period. The subsequent average cooldown rate of 20°F/hour prevents the thermal gradient and the resultant stresses across the RVCH material from being re-established. The average cooldown rate of 40°F/hour measured at the reactor vessel inlet continues to apply.

Two cases of the finite element analysis were completed using the additional restrictions for the cooldown process. One case included a hold on cooldown at 135°F for three hours with a subsequent average cooldown rate of 20°F/hour. The other case included a hold on cooldown at 110°F with a subsequent average cooldown rate of 20°F/hour.

The fracture mechanics analysis is provided in Enclosure 4. The results of the finite element analysis were provided as inputs to the fracture mechanics analysis. The results of the fracture mechanics analysis demonstrate that a postulated radial crack in the remnant of the original J-groove weld and butter would satisfy the 1989 ASME Code Section XI criteria. IWB-3612 requires the fracture toughness margin to be greater than $\sqrt{10}$ (3.16). The analysis was completed for 27 years of plant operation with a minimum fracture toughness margin of 3.51. The 27-year duration corresponds to the expiration of the Palisades current operating license and beyond.

Consequently, these analyses require additional restrictions during cooldown operations to ensure Code requirements are met. NMC proposes to add the restrictions to TS 3.4.3. By requiring a three-hour hold period between reactor

coolant temperatures of 110°F to 135°F, and an average cooldown rate that is limited to 20°F/hour thereafter, the repairs to CRD nozzles #29 and #30 will satisfy the 1989 Section XI Code criteria for a fracture toughness margin.

The additional average cooldown limit of 20°F/hour for the RVCH materials will be implemented by monitoring core exit temperature by one of the following two means: (1) the average of qualified core exit thermocouples when available, or (2) the shutdown cooling inlet temperature when the core exit thermocouples are disconnected in preparation for RVCH removal or during RVCH reinstallation.

The TS LCO 3.4.3 pressure and temperature limits with the existing cooldown rate limits will be maintained for the reactor vessel inlet. The additional restrictions only apply when the RVCH is on the reactor vessel. The purpose of the additional PCS cooldown restrictions is to protect the RVCH repair. Once the head is removed, PCS temperature does not impact the thermal gradient across the RVCH.

Therefore, these proposed changes will have no adverse effect on plant safety.

5.0 REGULATORY SAFETY ANALYSIS

5.1 No Significant Hazards Consideration

Nuclear Management Company, LLC (NMC) has evaluated whether or not a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

1. Does the proposed amendment involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The proposed license amendment provides additional restrictions to the cooldown rate limits in Technical Specification (TS) Limiting Condition for Operation (LCO) 3.4.3, "Primary Coolant System (PCS) Pressure and Temperature (P/T) Limits." The proposed cooldown rate limits are in addition to the present cooldown rate limits provided by LCO 3.4.3. Operating the facility in accordance with the proposed additional restrictions on cooldown rate will ensure that stresses caused by the thermal gradient through the reactor vessel closure head (RVCH) remain bounded by the stress analyses.

The proposed amendment does not involve operation of required structures, systems, or components (SSCs) in a manner or configuration different than previously recognized or evaluated.

Therefore, operation of the facility in accordance with the proposed amendment would not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed amendment create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The proposed amendment does not involve a physical alteration of any SSC or a change in the way any SSC is operated. The proposed amendment does not involve operation of any required SSCs in a manner or configuration different from those previously recognized or evaluated. No new failure mechanisms will be introduced by the changes being requested.

Therefore, the proposed amendment does not create the possibility of a new or different kind of accident from any accident previously evaluated.

3. Does the proposed amendment involve a significant reduction in a margin of safety?

Response: No.

The proposed amendment does not affect any margin of safety. The proposed additional restrictions to the cooldown requirements ensure that stresses caused by the thermal gradient through the RVCH remain bounded by the stress analyses.

Therefore, the proposed amendment would not involve a significant reduction in a margin of safety.

Based on the evaluation above, NMC concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

The proposed additional restrictions are necessary to satisfy the fracture toughness criteria of the 1989 ASME Section XI Code, IWB-3612 fracture toughness margin of greater than $\sqrt{10}$ (3.16). With the additional restrictions in place, the minimum fracture toughness margin calculated is 3.51 for the duration of the Palisades current operating license and beyond.

In conclusion, based on the considerations described above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

6.0 ENVIRONMENTAL CONSIDERATION

NMC has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

7.0 BASES FOR REQUESTING EMERGENCY APPROVAL

NMC considers that emergency circumstances exist in that the condition was unavoidable and that compliance with the current TS will be insufficient to assure plant safety. Additional restrictions are needed for PCS cooldown to protect the integrity of the repairs of the RVCH. On October 28, 2004, the NRC verbally authorized two relief requests to support repairs to two control rod drive nozzle penetrations on Palisades' RVCH. NMC had submitted the relief requests to the NRC on August 2, 2004. The NRC's authorization was contingent on NMC submitting a license amendment request to include the additional cooldown requirements in the Palisades TS, and the NRC approving the license amendment request (Reference 2). Therefore, NRC approval of the license amendment is required for resumption of Plant operation.

NMC could not have avoided the situation. NMC did not recognize the need to put additional restrictions on the TS cooldown limits during contingency planning for the 2004 refueling outage. When crack indications were identified, detailed engineering packages were subsequently developed to address the technical concerns for the identified repair locations. On October 26, 2004, when engineers were completing final reviews of the weld repair implementation modification package, it became apparent that additional restrictions were required in the TS. The concern was entered into the corrective action program and discussed with the NRC project manager. NMC also began work on the

license amendment request. Additional vendor support was required to demonstrate that the desired operating band met applicable ASME Code requirements. This information was needed to support the license amendment request and operating procedures that would implement the change.

The RVCH nozzle repairs are currently in progress, and they have been progressing faster than originally planned. The current schedule shows that the plant will enter Mode 5 as early as 0200 hours on November 7, 2004, with plant restart activities to continue immediately thereafter. Due to the late discovery of the condition and the current restart schedule, NMC cannot avoid the emergency situation.

NMC considers that emergency circumstances exist in that the condition was unexpected. NRC approval of the license amendment is required for resumption of Plant operation. Therefore, NMC requests NRC approval of this amendment on an emergency basis in accordance with 10 CFR 50.91(a)(5).

8.0 REFERENCES

1. Letter, Daniel J. Malone (NMC) to USNRC, "Request for Relief from ASME Section XI Code Requirements for Repair of Reactor Pressure Vessel Head Penetrations," dated August 2, 2004.
2. Letter, Daniel J. Malone (NMC) to USNRC, "Request for Relief from ASME Section XI Code Requirements for Repair of Reactor Pressure Vessel Head Penetrations – Commitment for License Amendment Request," dated October 28, 2004.

ENCLOSURE 2

**LICENSE AMENDMENT REQUEST: ADDITIONAL RESTRICTIONS TO TECHNICAL
SPECIFICATION COOLDOWN RATE LIMITS**

**REVISED TECHNICAL SPECIFICATION PAGE
3.4.3-4
AND
OPERATING LICENSE PAGE CHANGE INSTRUCTIONS**

2 Pages Follow

ATTACHMENT TO LICENSE AMENDMENT NO.

FACILITY OPERATING LICENSE NO. DPR-20

DOCKET NO. 50-255

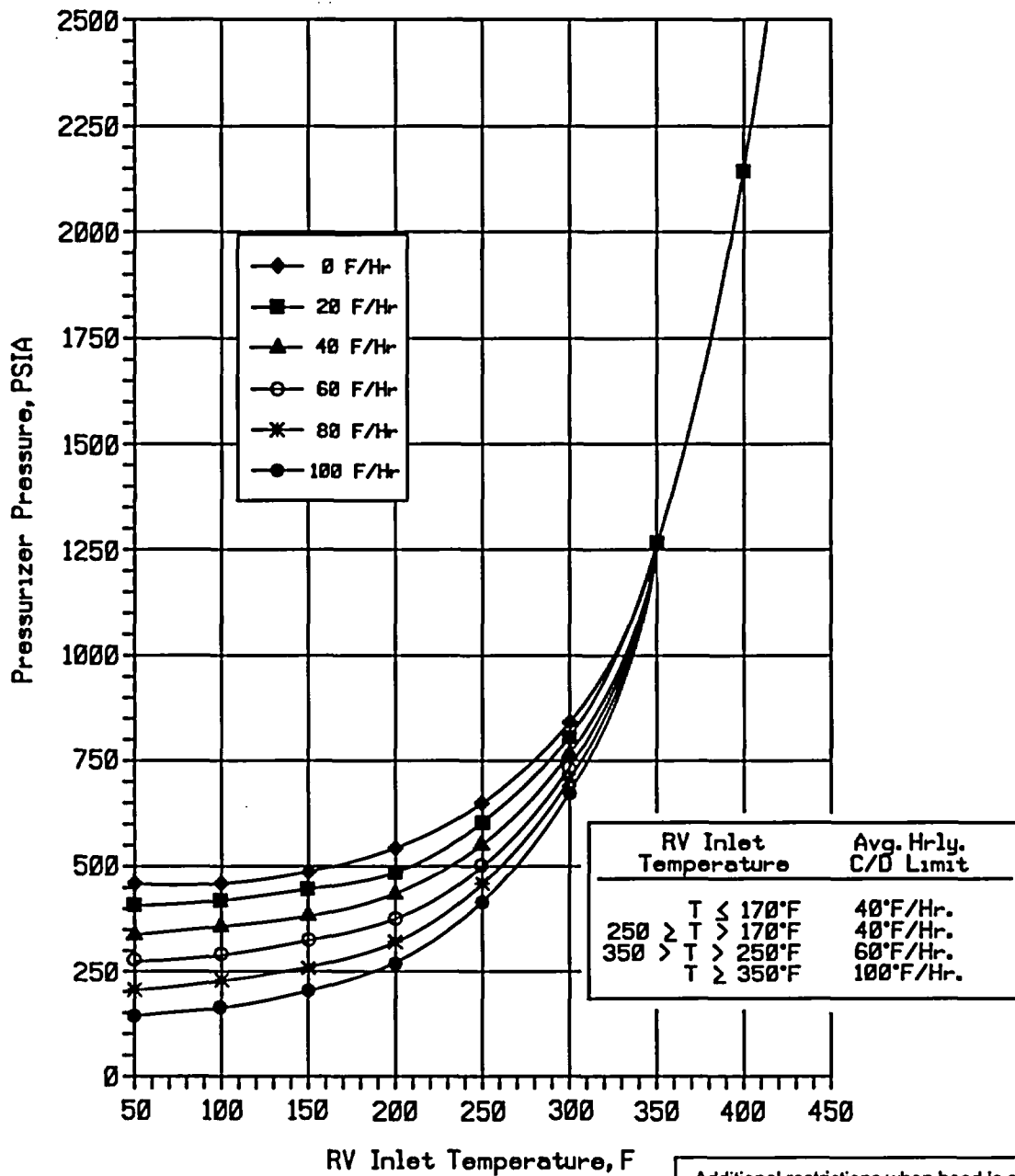
Remove the following page of Appendix A Technical Specifications and replace with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

REMOVE

3.4.3-4

INSERT

3.4.3-4



Additional restrictions when head is on reactor vessel:

1. Maintain average core exit temperature:
 $135^{\circ}\text{F} \geq T \geq 110^{\circ}\text{F}$ for ≥ 3 hours.
2. Following completion of Item 1, maintain average hourly cooldown (C/D) limit of 20°F/hour based on core exit temperature indication.

Figure 3.4.3-2 (Page 1 of 1)
Pressure – Temperature Limits for Cooldown

ENCLOSURE 3

**LICENSE AMENDMENT REQUEST: ADDITIONAL RESTRICTIONS TO TECHNICAL
SPECIFICATION COOLDOWN RATE LIMITS**

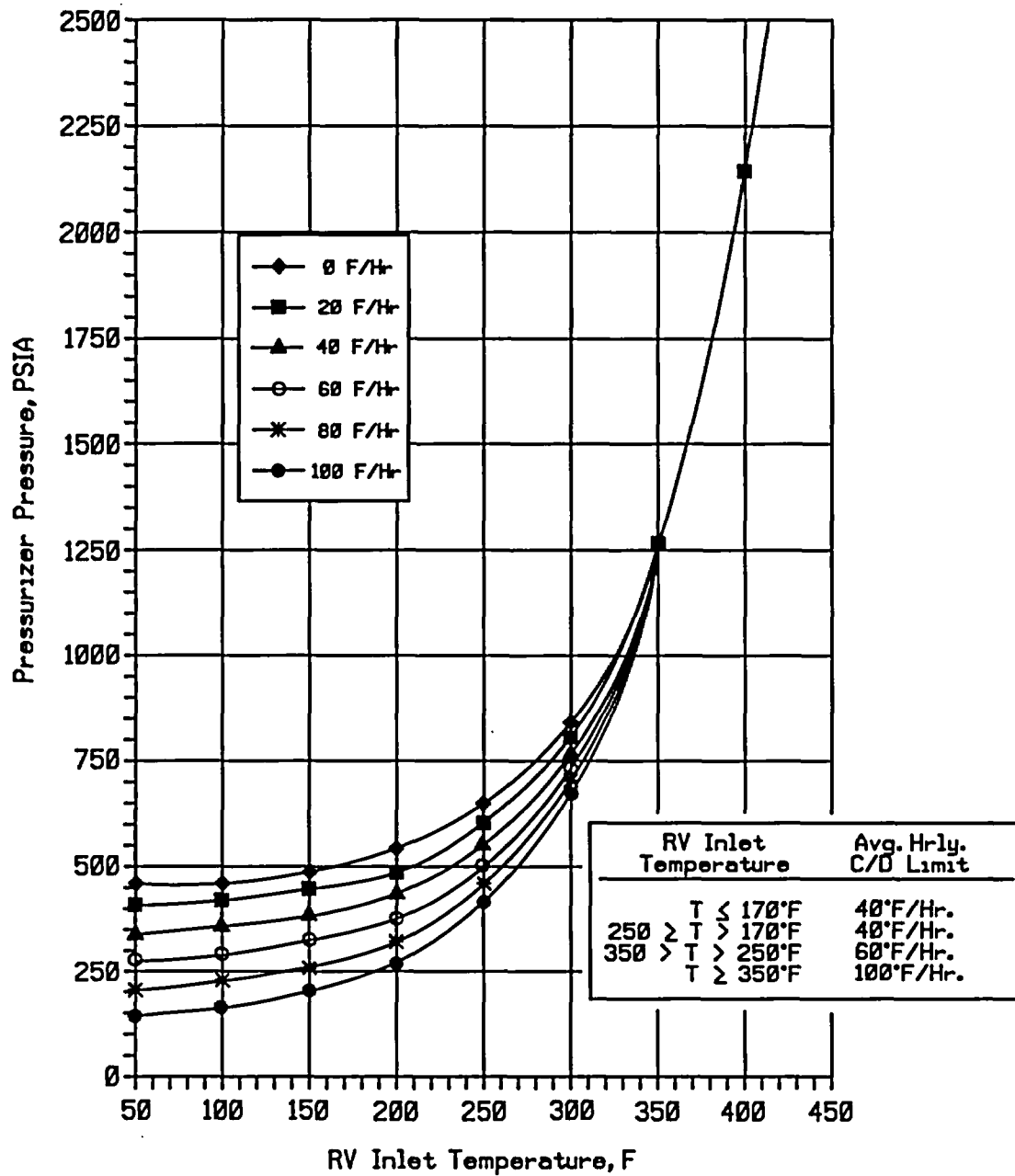
MARK-UP OF TECHNICAL SPECIFICATION PAGE

3.4.3-4

(showing proposed changes)

(additions are highlighted; deletions are strikethrough)

1 Page Follows



Additional restrictions when head is on reactor vessel:

1. Maintain average core exit temperature:
 $135^{\circ}\text{F} \geq T \geq 110^{\circ}\text{F}$ for ≥ 3 hours.
2. Following completion of item 1, maintain average hourly cooldown (C/D) limit of 20°F/hour based on core exit temperature indication.

Figure 3.4.3-2 (Page 1 of 1)
Pressure – Temperature Limits for Cooldown

A F F I D A V I T

COMMONWEALTH OF VIRGINIA)
) ss.
CITY OF LYNCHBURG)

1. My name is James F. Mallay. I am Director, Regulatory Affairs, for Framatome ANP ("FANP"), and as such I am authorized to execute this Affidavit.

2. I am familiar with the criteria applied by FANP to determine whether certain FANP information is proprietary. I am familiar with the policies established by FANP to ensure the proper application of these criteria.

3. I am familiar with the FANP information contained in two calculation summary sheets (including attachments) concerning weld repairs and flaw evaluations at Palisades (documents indentifiers 32-5044161-02 and 32-5044089-03). These documents are being sent to the NRC by NMC in support of certain technical specification changes. These two evaluations are referred to herein as "Documents." Information contained in these Documents has been classified by FANP as proprietary in accordance with the policies established by FANP for the control and protection of proprietary and confidential information.

4. These Documents contain information of a proprietary and confidential nature and is of the type customarily held in confidence by FANP and not made available to the public. Based on my experience, I am aware that other companies regard information of the kind contained in these Documents as proprietary and confidential.

5. These Documents have been made available to the U.S. Nuclear Regulatory Commission in confidence with the request that the information contained in these Documents be withheld from public disclosure.

6. The following criteria are customarily applied by FANP to determine whether information should be classified as proprietary:

- (a) The information reveals details of FANP's research and development plans and programs or their results.
- (b) Use of the information by a competitor would permit the competitor to significantly reduce its expenditures, in time or resources, to design, produce, or market a similar product or service.
- (c) The information includes test data or analytical techniques concerning a process, methodology, or component, the application of which results in a competitive advantage for FANP.
- (d) The information reveals certain distinguishing aspects of a process, methodology, or component, the exclusive use of which provides a competitive advantage for FANP in product optimization or marketability.
- (e) The information is vital to a competitive advantage held by FANP, would be helpful to competitors to FANP, and would likely cause substantial harm to the competitive position of FANP.


7. These Documents meet the five criteria set forth in Paragraph 6 of this affidavit (namely, (a) through (e)). Specifically, the methodology contained in these Documents was developed at significant cost under FANP's research and development program and if copied by a competitor would allow the competitor to design and market a similar product while substantially reducing its expenditures. While there are several uses of generic equations in the evaluations, including information from the ASME B&PV Code, the overall approach and analytical techniques used in these Documents provide a competitive advantage for FANP because the exclusive use of this methodology permits FANP to hold a competitive advantage in the market. These Documents contain information concerning the details of the methodology

that would be helpful to FANP's competitors and would substantially degrade FANP's competitive position.

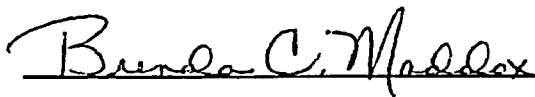
8. In accordance with FANP's policies governing the protection and control of information, proprietary information contained in these Documents has been made available, on a limited basis, to others outside FANP only as required and under suitable agreement providing for nondisclosure and limited use of the information.

9. FANP policy requires that proprietary information be kept in a secured file or area and distributed on a need-to-know basis.

10. The foregoing statements are true and correct to the best of my knowledge, information, and belief.



SUBSCRIBED before me this 2nd
day of November, 2004.



Brenda C. Maddox
NOTARY PUBLIC, STATE OF VIRGINIA
MY COMMISSION EXPIRES: 7/31/07