

This letter forwards proprietary information in accordance with 10 CFR 2.390. The balance of this letter may be considered non-proprietary upon removal of Attachments 7 and 8.

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**NINE MILE POINT
NUCLEAR STATION**

September 26, 2012

U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

ATTENTION: Document Control Desk

SUBJECT: Nine Mile Point Nuclear Station
Unit No. 2; Docket No. 50-410

Submittal of Extended Power Uprate Steam Dryer Power Ascension Testing Information in Accordance with Operating License Conditions 2.C.(20)(b)5 and 2.C.(20)(e)

REFERENCE: (a) Letter from R. V. Guzman (NRC) to K. Langdon (NMPNS), dated December 22, 2011, Nine Mile Point Nuclear Station, Unit No. 2 – Issuance of Amendment Re: Extended Power Uprate (TAC No. ME1476)

By letter dated December 22, 2011 (Reference a), the NRC issued Amendment No. 140 to Renewed Facility Operating License No. NPF-69 for Nine Mile Point Unit 2 (NMP2). The amendment authorized an increase in the maximum steady-state reactor core power level for NMP2 to 3,988 megawatts thermal (MWt). This letter provides power ascension testing information in accordance with the following NMP2 license conditions associated with the issuance of Amendment No. 140:

License Condition 2.C.(20)(b)5 – *“NMPNS shall submit the final EPU steam dryer load definition for the facility to the NRC upon completion of the power ascension test program.”*

License Condition 2.C.(20)(e) – *“The results of the power ascension testing to verify the continued structural integrity of the steam dryer and the final steam dryer load definition shall be submitted to the NRC staff in a report within 60 days following the completion of all 120 percent OLTP (EPU) power ascension testing.”*

The information required by these license conditions is provided in the attachments to this letter. A discussion of the NMP2 extended power uprate (EPU) steam dryer power ascension test program is provided in Attachment 2. Attachment 3 (non-proprietary) and Attachment 7 (proprietary) provide the final EPU steam dryer load definition. Attachment 4 (non-proprietary) and Attachment 8 (proprietary) provide steam dryer limit curves and minimum calculated alternating stress ratios based on in-plant main

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steam line strain gage data that was collected at the power levels prescribed by the power ascension test program, as required by the NMP2 EPU Operating License conditions.

Attachments 7 and 8 are considered to contain proprietary information exempt from public disclosure pursuant to 10 CFR 2.390. Therefore, on behalf of Continuum Dynamics, Incorporated (CDI), Nine Mile Point Nuclear Station, LLC (NMPNS) hereby makes application to withhold these attachments from public disclosure in accordance with 10 CFR 2.390(b)(1). The affidavits from CDI detailing the reasons for the request to withhold proprietary information are provided in Attachments 5 and 6. A list of regulatory commitments contained in this submittal is provided in Attachment 1.

Should you have any questions regarding the information in this submittal, please contact John J. Dosa, Director Licensing, at (315) 349-5219.

Very truly yours,



Paul M. Swift
Manager Engineering Services

PMS/DEV

- Attachments:
1. List of Regulatory Commitments
 2. Discussion of the EPU Steam Dryer Power Ascension Test Program
 3. Final EPU Steam Dryer Load Definition, CDI Report No. 12-20NP (Non-Proprietary)
 4. Steam Dryer Limit Curves (Non-Proprietary)
 5. Affidavit from Continuum Dynamics, Incorporated (CDI) Justifying Withholding Proprietary Information (CDI Report No. 12-20P)
 6. Affidavits from Continuum Dynamics, Incorporated (CDI) Justifying Withholding Proprietary Information (Steam Dryer Limit Curve Documents)
 7. Final EPU Steam Dryer Load Definition, CDI Report No. 12-20P (Proprietary)
 8. Steam Dryer Limit Curves (Proprietary)

cc: Regional Administrator, Region I, NRC
Project Manager, NRC
Resident Inspector, NRC
A. L. Peterson, NYSERDA (w/o Attachments 7 and 8)

ATTACHMENT 1

LIST OF REGULATORY COMMITMENTS

The following table identifies the regulatory commitments in this document. Any other statements in this submittal represent intended or planned actions. They are provided for information purposes and are not considered to be regulatory commitments.

REGULATORY COMMITMENT	SCHEDULED COMPLETION DATE
The final steam dryer stress analysis report and the full startup test report will address the observed power ascension steam flow test condition at EPU rated power.	October 26, 2012

ATTACHMENT 2

**DISCUSSION OF THE EPU STEAM DRYER
POWER ASCENSION TEST PROGRAM**

ATTACHMENT 2
DISCUSSION OF THE EPU STEAM DRYER POWER ASCENSION TEST PROGRAM

A. Steam Dryer Power Ascension Testing Summary

Baseline Testing

The Nine Mile Point Unit 2 (NMP2) extended power uprate (EPU) power ascension test program reached 100% of the current licensed thermal power (CLTP – 3467 MWt) on June 25, 2012. At each 2.5% increment above 100% CLTP, Nine Mile Point Nuclear Station, LLC (NMPNS) performed an assessment of the top 100 steam dryer stress locations and redefined the limit curves. At 105% and 110% CLTP, the power ascension was placed on a 96-hour hold for NRC review of the test results.

Baseline steam dryer test data collection from 100% through 110% CLTP was completed on July 10, 2012. The test program was interrupted at 110% CLTP by a manual reactor scram on July 12, 2012 as a result of lowering condenser vacuum (reference Licensee Event Report 2012-004 submitted on September 10, 2012). The power ascension testing for the steam dryer resumed on July 18, 2012 after NMP2 restored reactor power to 100% CLTP. NMP2 achieved the EPU rated thermal power of 3988 MWt for the first time on July 21, 2012 and completed the baseline testing of the steam dryer on July 28, 2012.

The steam dryer loads and limiting stress ratio followed the expected trend as steam flow was increased up to the final 3988 MWt test plateau. The loads remained within the limit curve Level 1 and Level 2 criteria and the alternating stress ratio remained above the required 2.0 value at all test plateaus. The post-scram steam dryer loads at 100%, 105% and 110% CLTP were compared with the pre-scram baseline loads established for these power levels and the loads were confirmed to be consistent.

Table A1-1 below outlines the interim test reports that were prepared to evaluate the testing performed during the steam dryer power ascension test program. Copies of the referenced test reports are provided in Attachment 4 (non-proprietary) and Attachment 8 (proprietary).

Table A1-1: Test Report Summary Table

Item No.	Power Level (% CLTP)	Date of Test Completion	Description ⁽³⁾	CDI Document No. ⁽¹⁾
1	100	6/25/2012	Baseline 100% CLTP Limit Curves	TN 12-13, Rev.1 ⁽²⁾
2	102.5	6/28/2012	102.5% Limit Curves	TM 12-18, Rev.0 ⁽²⁾
3	105	6/30/2012	Baseline 105% Limit Curves	TN 12-14, Rev.0 ⁽²⁾
4	105	7/3/2012	105% Limit Curves for RCIC Steam Supply Isolation Valve Closed	TN 12-23, Rev.0
5	107.5	7/8/2012	107.5% Limit Curves	TN 12-22, Rev.0 ⁽²⁾
6	110	7/10/2012	Baseline 110% Limit Curves	TN 12-15, Rev.0 ⁽²⁾
7	112.5	7/19/2012	112.5% Limit Curves	TN 12-24, Rev.0 ⁽²⁾
8	115	7/21/2012	Baseline 115% Limit Curves	TN 12-16, Rev.0 ⁽²⁾
9	115	7/21/2012	Baseline Composite 115% and 110% (92.5Hz) Limit Curves	TN 12-28, Rev.0
10	110	7/28/2012	110% Limit Curves for RCIC Steam Supply Isolation Valve Closed	TN 12-26, Rev.0
11	115	9/4/2012	115% Limit Curves for RCIC Steam Supply Isolation Valve Closed	TN 12-30, Rev.0

Notes: (1) TN = Technical Note; TM = Technical Memorandum

(2) These documents were informally provided to the NRC for review during the test program.

(3) For baseline testing, the RCIC system was in its normal standby alignment, with the steam supply isolation valve open.

ATTACHMENT 2
DISCUSSION OF EPU STEAM DRYER POWER ASCENSION TEST PROGRAM

The baseline 100% CLTP to 105% CLTP tests performed June 25 through June 30 contained a frequency peak at 92.5Hz on the "B" main steam line (MSL-B) upper and lower strain gauge locations that was not evident in the previous baseline data acquired in 2008 and 2010. NMPNS reviewed the system lineups and the possible sources of the frequency and determined that the source was likely related to the Reactor Core Isolation Cooling (RCIC) system steam supply line connection that is unique to MSL-B. Monitoring of the strain gauge loads showed the amplitude was increasing consistent with the expected trend, indicating no evidence of a standing wave resonance.

On July 3, additional monitoring of the steam dryer loads was performed at 105% CLTP during two anticipated RCIC system operating conditions:

- (1) RCIC operating in test mode, and
- (2) RCIC steam supply isolation valve closed.

The results showed that the frequency content on the MSL-B strain gauges was reduced when the RCIC turbine was in service (approximately 31,000 lbm/hr flow). With the RCIC steam supply line isolated, the frequency response on MSL-B increased at 89.25Hz and the 92.5Hz content was reduced. These tests confirmed that variations in the RCIC steam supply line conditions impacted the MSL-B strain gauge loads and that additional monitoring of these configurations was needed to ensure the steam dryer load definition bounds the possible RCIC lineups.

Following post-scrum recovery to EPU test conditions on July 18, comparison of the steam dryer loads to the pre-scrum loads at 100%, 105%, and 110% CLTP was performed. At 100% CLTP, the comparison showed that the post-scrum steam dryer loads remained essentially unchanged throughout the frequency range except that the measured amplitude at 92.5Hz was reduced from that measured during the June 25 baseline testing, and that the amplitude was consistent with that measured during the original 2008 and 2010 CLTP baseline testing. The post-scrum testing at 105% and 110% CLTP showed the same trend observed at 100% CLTP; i.e., the frequency and amplitude across all the MSL strain gauge locations remained essentially the same as the baseline from the June 30 and July 10 data sets, with the exception that the 92.5Hz content previously evident was significantly reduced in amplitude.

Testing to Assess the Impact of Different RCIC System Configurations

Additional testing was conducted on July 28 and September 4, 2012 to examine the effect of RCIC system configuration changes on main steam line response.

July 28, 2012 Testing

The July 28 testing at 110% CLTP repeated the two alternate RCIC system lineup tests that had been performed at 105% CLTP on July 3. The July 28 test with the RCIC system operating in the test mode resulted in MSL-B 92.5Hz loads that were essentially the same as those measured previously at 105% CLTP. The July 28 test with the RCIC system isolated resulted in MSL-B 89.25Hz loads that were essentially the same as those measured previously at 105%. Monitoring performed during the return of the RCIC system to the normal standby alignment on July 28 confirmed that the loads returned to the July 18 baseline values.

ATTACHMENT 2
DISCUSSION OF EPU STEAM DRYER POWER ASCENSION TEST PROGRAM

September 4, 2012 Testing

The September 4 testing at 115% CLTP was performed for the following two RCIC system isolation conditions:

- (1) RCIC steam supply isolation valve closed (same as the July 3 (105% CLTP) and July 28 (110% CLTP) tests, and
- (2) RCIC steam supply isolation valve open, and RCIC steam line drains and steam trap isolated such that zero flow conditions exist in the RCIC steam supply line.

The results of the first test (RCIC steam supply isolation valve closed) showed that the amplitude of the 89.25Hz peak remained consistent with the amplitude measured during the previous 105% and 110% CLTP tests and that the 89.25Hz load followed the expected trend with steam flow.

The results of the second test (RCIC steam line zero-flow condition) showed that this configuration resulted in an increased 92.5Hz peak similar to that evident during the pre-scrum baseline testing performed from June 25 through July 10, thereby confirming that the 92.5Hz amplitude source is the RCIC steam supply line acoustics and that the isolated RCIC steam line drain condition results in the increased 92.5Hz amplitude.

Conclusions

The September 4 testing has demonstrated that the steam flow conditions in the RCIC steam supply line changes the acoustic response measured on MSL-B. Although the exact RCIC steam supply line conditions that existed during the initial baseline testing performed on June 25 through July 10 have not been determined, the testing performed from 100% CLTP through 110% CLTP has demonstrated that the 92.5Hz load, when present, scales with velocity as expected and that the loads on the steam dryer remain within all acceptance criteria. Limit curves and stress analysis for 115% CLTP conditions that include the 92.5Hz amplitude adjusted for the potential increased amplitude at 115% CLTP have demonstrated that, although the resultant loads on the steam dryer are higher with the RCIC steam supply line isolated, the loads and stresses remain within all associated Level 1 and Level 2 criteria and the alternating stress ratio remains above the required 2.0 value. Operation with the RCIC steam supply line isolated causes the RCIC system to be inoperable, is not considered a normal system lineup, and is limited to 14 days by the NMP2 Technical Specifications.

Testing to Assess the Impact of Main Steam Line Drain Configuration

Review of the main steam line drain configuration in place during the July 21 testing noted differences in system lineups between the pre-scrum baseline and post-scrum baseline data sets. The steam supply to the turbine gland sealing steam system was not from the clean steam reboilers (the normal source) and several normally closed 2" drain line bypass valves were open. On July 28, power was reduced to 110% CLTP, the drain line bypass valves were closed, and the clean steam reboilers were returned to service. The steam dryer loads were monitored during each of these MSL configuration changes. The monitoring confirmed that these variations did not alter the steam dryer loads and did not change the 92.5Hz content.

ATTACHMENT 2
DISCUSSION OF EPU STEAM DRYER POWER ASCENSION TEST PROGRAM

B. EPU Load Definition

The NMP2 EPU rated thermal power load definition is provided in CDI Report No. 12-20 (see Attachment 3 (non-proprietary) and Attachment 7 (proprietary)). The load definition is based on the power ascension testing completed on July 21, 2012. The testing performed on July 28, 2012 and September 4, 2012 to assess the impact of different RCIC system configurations has confirmed that the July 21 data set best represents normal plant operation at the 3988 MWt (115% CLTP) power level. The impact of the different RCIC system configurations is on MSL-B only, and the load variations consist of narrow peaks at 92.5Hz and 89.25Hz. The method for assessing these two load variations is described in CDI Report No. 12-20.

C. Reactor Steam Flow Achieved at EPU Rated Thermal Power

The EPU steam dryer analysis is based on the EPU (3988 MWt) design basis reactor rated heat balance which defined the normal rated reactor steam flow as 17.636E6 lbm/hr. This steam flow represents 117.56% of the previous rated steam flow defined for CLTP (3467 MWt) and assumes optimum feedwater heater performance, with a reactor inlet final feedwater temperature of 440°F. During power ascension testing at the EPU rated thermal power of 3988 MWt, the maximum measured steam flow was 17.33E6 lbm/hr (115.5% of CLTP steam flow). The reduced steam flow at EPU rated thermal power is primarily the result of a lower than expected final feedwater temperature of 430.5°F. The final steam dryer stress analysis report and the full startup test report, to be submitted by October 26, 2012, will address this observed test program condition.