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a joint venture of
Constellation Energy
eDF

NINE MILE POINT
NUCLEAR STATION

August 12, 2011

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

Supplement 1 to Licensee Event Report 2011-001, As-Found Safety Relief Valve Lift Setpoints Exceed Technical Specification Allowable Values

Licensee Event Report (LER) 2011-001, "As-Found Safety Relief Valve Lift Setpoints Exceed Technical Specification Allowable Values," was submitted on May 31, 2011 in accordance with 10 CFR 50.73(a)(2)(i)(B). Attached is Supplement 1 to LER 2011-001. This supplement contains the cause and associated corrective actions that were not available at the time that the initial LER was submitted.

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,

TLynch

TAL/DEV

Attachment: Supplement 1 to Licensee Event Report 2011-001, As-Found Safety Relief Valve Lift Setpoints Exceed Technical Specification Allowable Values

cc: Regional Administrator, NRC
Project Manager, NRC
Resident Inspector, NRC

IE22
NRR

ATTACHMENT

SUPPLEMENT 1 TO LICENSEE EVENT REPORT 2011-001

AS-FOUND SAFETY RELIEF VALVE LIFT SETPOINTS EXCEED TECHNICAL SPECIFICATION ALLOWABLE VALUES

Nine Mile Point Nuclear Station, LLC
August 12, 2011

NRC FORM 366 (10-2010) U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB: NO. 3150-0104 EXPIRES: 10/31/2013

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

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4. TITLE

As-Found Safety Relief Valve Lift Setpoints Exceed Technical Specification Allowable Values

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME: None	DOCKET NUMBER: NA
04	01	2011	2011	001	01	08	12	2011	FACILITY NAME: None	DOCKET NUMBER: NA

9. OPERATING MODE: 1

10. POWER LEVEL: 100

11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR§: *(Check all that apply)*

☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(i)(C)	☐ 50.73(a)(2)(vii)
☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☐ 50.73(a)(2)(v)(C)	☐ OTHER
☐ 20.2203(a)(2)(vi)	☒ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(v)(D)	Specify in Abstract below or in NRC Form 366A

12. LICENSEE CONTACT FOR THIS LER

NAME	TELEPHONE NUMBER (Include Area Code)
John J. Dosa, Director Licensing	(315) 349-5219

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	SB	RV	Dikkers	Y					

14. SUPPLEMENTAL REPORT EXPECTED		15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)*	☒ NO				

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On April 1, 2011, Nine Mile Point Nuclear Station, LLC (NMPNS) determined that, based on the results of completed as-found testing, four (4) of eighteen (18) Main Steam Safety Relief Valves (SRVs) mechanically actuated at pressures that exceeded the allowable Technical Specification (TS) limit, which is the TS-specified setpoint plus or minus 3 percent. These 18 SRVs had been removed and replaced with pre-tested, certified SRVs during the 2010 Nine Mile Point Unit 2 (NMP2) refueling outage. NMP2 TS 3.4.4 requires the safety function of sixteen (16) SRVs to be operable in reactor operating modes 1, 2, and 3. Since the as-found testing determined that 4 of the 18 SRVs were inoperable for an indefinite period of time during the operating cycle that preceded the 2010 refueling outage, it is probable that NMP2 operated longer than the TS allowed Completion Time.

This event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as any operation or condition which was prohibited by the plant's Technical Specifications.

The cause for the 4 SRVs exceeding the allowable as-found setpoint tolerance is attributed to inaccurate as-left lift pressure settings that resulted from the use of nitrogen as the test medium for SRV testing performed onsite prior to the 2010 refueling outage. Nitrogen testing of the NMP2 SRVs is no longer being performed. The SRV testing is now being conducted at an offsite test facility using saturated steam as the test medium.

NARRATIVE

I. DESCRIPTION OF EVENT

A. PRE-EVENT PLANT CONDITIONS:

At the time of discovery, Nine Mile Point Unit 2 (NMP2) was operating at 100 percent power. Operation of NMP2 was unaffected by the event since the entire compliment of eighteen (18) Main Steam Safety Relief Valves (SRVs) had been replaced with pre-tested, certified spare SRVs during the prior 2010 refueling outage.

B. EVENT:

During the 2010 NMP2 refueling outage, all 18 of the SRVs were removed and replaced with pre-tested, certified SRVs. The removed SRVs were sent to an offsite test facility for as-found testing, refurbishment, and re-certification. In accordance with the American Society of Mechanical Engineers (ASME) Operation and Maintenance Code, for replacement of a full complement of SRVs, the SRVs removed from service must be tested within 12 months of removal from the system. On April 1, 2011, Nine Mile Point Nuclear Station, LLC (NMPNS) determined that, based on the results of the completed as-found testing, four (4) SRVs mechanically actuated at pressures that exceeded the allowable Technical Specification (TS) limit, which is the TS-specified setpoint plus or minus 3 percent. The following is a tabulation of the as-found test results for the 18 SRVs:

SRV ID No.	SRV Serial No.	TS Setpoint (psig)	TS Setpoint Acceptance Band (psig)	As-Found Setpoint (psig) (1)	Percent Difference (1)
2MSS*PSV120	160953	1185	1149 - 1221	1229	3.7
2MSS*PSV121	160967	1195	1159 - 1231	1226	2.6
2MSS*PSV122	160952	1185	1149 - 1221	1217	2.7
2MSS*PSV123	160914	1175	1140 - 1210	1193	1.5
2MSS*PSV124	160906	1175	1140 - 1210	1212	3.1
2MSS*PSV125	160950	1185	1149 - 1221	1220	3.0
2MSS*PSV126	160939	1195	1159 - 1231	1229	2.8
2MSS*PSV127	160905	1205	1169 - 1241	1234	2.4
2MSS*PSV128	160903	1165	1130 - 1200	1196	2.7
2MSS*PSV129	160904	1205	1169 - 1241	1234	2.4
2MSS*PSV130	160976	1195	1159 - 1231	1226	2.6
2MSS*PSV131	160974	1175	1140 - 1210	1192	1.4
2MSS*PSV132	160969	1185	1149 - 1221	1197	1.0
2MSS*PSV133	160959	1165	1130 - 1200	1214	4.2
2MSS*PSV134	160955	1205	1169 - 1241	1211	0.5
2MSS*PSV135	160936	1195	1159 - 1231	1222	2.3
2MSS*PSV136	160962	1175	1140 - 1210	1204	2.5
2MSS*PSV137	160970	1205	1169 - 1241	1245	3.3

(1) The shaded values indicate the as-found test results that exceeded the TS-required 3 percent setpoint tolerance.

NARRATIVE

NMP2 TS 3.4.4 requires the safety function of sixteen (16) SRVs to be operable in reactor operating modes 1, 2, and 3. With one or more required SRVs inoperable, the unit is required to be placed in Mode 3 (hot shutdown) within 12 hours and in Mode 4 (cold shutdown) within 36 hours. Since the as-found testing determined that 4 of the 18 SRVs were inoperable for an indefinite period of time during the operating cycle that preceded the 2010 refueling outage, it is probable that NMP2 operated longer than the TS allowed Completion Time.

C. INOPERABLE STRUCTURES, COMPONENTS, OR SYSTEMS THAT CONTRIBUTED TO THE EVENT:

None

D. DATES AND APPROXIMATE TIMES OF MAJOR OCCURRENCES:

April 2010	During the 2010 refueling outage, all 18 SRVs are removed and replaced with pre-tested SRVs that had completed set pressure certification lifts within plus 1 percent to minus 0.5 percent of the specified set pressure.
5/2/2010	NMP2 startup from the 2010 refueling outage commences with replacement SRVs installed.
4/1/2011	NMPNS documents in Condition Report 2011-003045 that the as-found lift pressure for 4 SRVs removed during the 2010 refueling outage exceeded the TS-specified setpoint plus or minus 3 percent.

E. OTHER SYSTEMS OR SECONDARY FUNCTIONS AFFECTED:

None

F. METHOD OF DISCOVERY:

The out-of-tolerance SRV lift setpoints were discovered during the performance of as-found testing conducted at NWS Technologies in Spartanburg, South Carolina.

G. MAJOR OPERATOR ACTION:

None. No operational conditions requiring operator action occurred as a result of this event.

H. SAFETY SYSTEM RESPONSES:

None. No operational conditions requiring the response of safety systems occurred as a result of this event.

NARRATIVE

II. CAUSE OF EVENT:

The immediate cause for this reportable condition is out-of-tolerance lift pressures that exceeded the TS-allowed values for 4 of 18 SRVs, and which existed for longer than the TS allowed Completion Time. The 4 SRVs that failed the as-found test were disassembled and inspected at NWS Technologies in Spartanburg, SC, using the guidance provided in the Dikkers instruction manual and Electric Power Research Institute (EPRI) TR-105872, "Safety and Relief Valve Testing and Maintenance Guide." There was no evidence of degradation, corrosion, binding, rubbing, foreign material intrusion, or parts out of adjustment noted during the inspections, and no test method irregularities at the NWS test facility were identified that would account for the test failures. The cause for the 4 as-found test failures is attributed to inaccurate as-left lift pressure settings that resulted from the use of nitrogen as the test medium for SRV testing performed prior to the 2010 refueling outage. Onsite nitrogen testing of the NMP2 SRVs was conducted from 1997 to 2008. Prior to commencing nitrogen testing, NMPNS performed analyses to establish a nitrogen-steam correlation that, when combined with a 95% confidence limit, would provide conservative nitrogen pressure limits for establishing an equivalent SRV steam set pressure within the TS as-left set pressure tolerance limit of plus or minus 1 percent. The analyses considered the concerns expressed in General Electric Service Information Letter (SIL) No. 577, "Nitrogen Setting of the Dikkers SRV," and incorporated the implementation considerations described in the SIL. The testing of the 18 SRVs removed during the 2010 refueling outage, performed at NWS Technologies using saturated steam as the test medium, indicates that all of the lift pressures were greater than the nominal TS setpoint values; therefore, it appears that the nitrogen-steam correlation was not sufficiently conservative. Onsite nitrogen testing of the NMP2 SRVs is no longer being performed.

III. ANALYSIS OF THE EVENT:

This event is reportable in accordance with 10 CFR 50.73(a)(2)(i)(B) as an operation or condition prohibited by the NMP2 TS. NMP2 TS 3.4.4 requires the safety function of 16 SRVs to be operable in reactor operating modes 1, 2, and 3. With one or more required SRVs inoperable, the unit is required to be placed in Mode 3 (hot shutdown) within 12 hours and in Mode 4 (cold shutdown) within 36 hours. The as-found testing determined the lift pressures for 4 of the 18 SRVs to be outside of the TS requirements. Consistent with the guidance provided in NUREG-1022, Revision 2, Section 3.2.2 (Example (3), Multiple Test Failures), the condition is considered to have existed during the plant operating cycle preceding the 2010 refueling outage (Cycle 12) and is reportable under 10 CFR 50.73(a)(2)(i)(B).

The ASME Boiler and Pressure Vessel Code requires that the reactor pressure vessel be protected from overpressure during upset conditions by self-actuated safety valves. As part of the nuclear pressure relief system, the size and number of SRVs are selected such that peak pressure in the nuclear system will not exceed the ASME Code limits for the reactor coolant pressure boundary. The NMP2 SRVs are Dikkers Model G471-6 valves. There are a total of 18 installed SRVs divided into 5 groups, with each group having a different lift pressure setpoint, as follows:

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NARRATIVE

Number of SRVs	Setpoint (psig)
2	1165 +/- 35.0
4	1175 +/- 35.0
4	1185 +/- 36.0
4	1195 +/- 36.0
4	1205 +/- 36.0

The SRVs are located on the main steam lines between the reactor vessel and the first isolation valve within the drywell. Each SRV discharges steam through a discharge line to a point below the minimum water level in the suppression pool.

The overpressure protection system must accommodate the most severe pressure transient. For NMP2, the most severe transient is the closure of all main steam isolation valves (MSIVs) followed by a reactor scram on high neutron flux (assumes failure of the direct scram associated with MSIV position). The analysis results demonstrate that the design SRV capacity is capable of maintaining reactor pressure below the ASME Code limit of 1375 psig (110 percent of the 1250 psig vessel design pressure). For the purpose of the overpressure protection analysis, 16 of the SRVs with the highest setpoints are assumed to operate in the safety mode (i.e., operation of the two SRVs with setpoints of 1165 psig is not credited in the analysis), with assumed setpoints that are about 3 percent above the nominal setpoints. Since the SRV with the largest deviation from the TS-required lift pressure has a TS-required setpoint of 1165 psig, the as-found setpoint deficiency for this SRV has no impact on the overpressure protection analysis. The setpoints for the other 3 SRVs with out-of-tolerance lift pressures exceeded the TS required as-found values (including 3 percent tolerance) by only small amounts, which would have a minimal impact on the overpressure protection analysis results. In addition, parametric analyses presented in Appendix 15C of the NMP2 Updated Safety Analysis Report (USAR) demonstrate that if only 14 SRVs are assumed to operate rather than 16 SRVs, the peak calculated vessel pressure increases by less than 10 psig. Based on the above discussion, the margin between the calculated peak vessel pressure evaluated for Cycle 12 (1301 psig) and the ASME Code limit of 1375 psig, and the fact that all 18 SRVs actually lifted during the as-found testing, the peak vessel pressure would not have exceeded 1375 psig had an overpressure transient occurred that required SRV operation. Furthermore, the peak reactor steam dome pressure would also have remained below the TS safety limit of 1325 psig.

Overpressure analyses for the limiting NMP2 Anticipated Transients Without Scram (ATWS) event (MSIV closure) have also previously been performed to demonstrate that the reactor pressure does not exceed the ASME Service Level C design limit of 1500 psig. For this analysis, two SRVs were assumed to be unavailable. The analysis results, presented in NMP2 USAR Appendix 15C, showed a peak calculated vessel bottom head pressure of 1279 psig. Based on the margin between this calculated value and the 1500 psig limit, the small amount by which the 4 SRVs exceeded the TS setpoint limits, and the fact that all 18 SRVs actually lifted during the as-found testing, the peak vessel pressure would not have exceeded 1500 psig had an ATWS event occurred that required SRV operation.

One of the 4 SRVs with an out-of-tolerance lift pressure (ID No. 2MSS*PSV137; Serial No. 160970) is also an Automatic Depressurization System (ADS) valve. The lift pressure deficiency had no impact on the ADS function of this SRV.

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NARRATIVE

Based on the above, it is concluded that the safety significance of this event is low and the event did not pose a threat to the health and safety of the public or plant personnel.

IV. CORRECTIVE ACTIONS:

A. ACTION TAKEN TO RETURN AFFECTED SYSTEMS TO PRE-EVENT NORMAL STATUS:

During the 2010 NMP2 refueling outage, all 18 of the SRVs were removed and replaced with pre-tested SRVs that had completed set pressure certification lifts within plus 1 percent to minus 0.5 percent of the specified set pressure, thereby meeting the NMP2 TS 3.4.4 requirements. The replacement SRVs were all tested using saturated steam as the test medium. The removed SRVs will be refurbished, tested, and certified prior to future use at NMP2.

B. ACTION TAKEN OR PLANNED TO PREVENT RECURRENCE:

- The 4 SRVs that failed the as-found set pressure test were disassembled and inspected to identify any conditions that would cause the out-of-tolerance test results.
- Onsite testing of the SRVs using nitrogen as the test medium has been discontinued. Testing of the SRVs is now being conducted at an offsite test facility using saturated steam as the test medium.

V. ADDITIONAL INFORMATION:

A. FAILED COMPONENTS:

The identified condition for the 4 SRVs is considered to be a Maintenance Rule functional failure since the 4 SRVs did not lift within the setpoint tolerance requirements of the ASME Operation and Maintenance (OM) Code - 2004 Edition.

B. PREVIOUS LERs ON SIMILAR EVENTS:

None

C. THE ENERGY INDUSTRY IDENTIFICATION SYSTEM (EIIS) COMPONENT FUNCTION IDENTIFIER AND SYSTEM NAME OF EACH COMPONENT OR SYSTEM REFERRED TO IN THIS LER:

COMPONENT	IEEE 803 FUNCTION IDENTIFIER	IEEE 805 SYSTEM IDENTIFICATION
Reactor Pressure Vessel	RPV	AD
Main Steam Lines	---	SB
Safety Relief Valve	RV	SB

D. SPECIAL COMMENTS:

None