

From: Vaidya, Bhalchandra
Sent: Thursday, June 20, 2013 3:55 PM
To: 'Dosa, John J'; 'dennis.vandeputte@cengllc.com'; 'Darling, Theresa H'
Cc: Jackson, Christopher; Parks, Benjamin; Hardgrove, Matthew; McLellan, Thomas; Rosenberg, Stacey; Grover, Ravinder; Elliott, Robert; Beall, Robert; Poehler, Jeffrey
Subject: DRAFT RAIS, MF0345, LAR Re: Revising and Relocating PT Limit Curves to PRLR

SUBJECT: Nine Mile Point Nuclear Station, Unit No. 2, Docket No. 50-410, License Amendment Request Pursuant to 10 CFR 50.90: Relocation of Pressure and Temperature Limit Curves to the Pressure and Temperature Limits Report (TAC NO.MF0345)

By letter dated November 21, 2012, as supplemented by letter dated March 25, 2013, Nine Mile Point Nuclear Station, LLC (NMPNS, the Licensee), submitted a license amendment request (LAR) for Nine Mile Point Unit 2. The proposed amendment would modify Technical Specification (TS) Section 3.4.11, "RCS Pressure and Temperature (P/T) Limits," by replacing the existing reactor vessel heatup and cooldown rate limits and the pressure and temperature (P-T) limit curves with references to the Pressure and Temperature Limits Report (PTLR). In addition, a new definition for the PTLR would be added to TS Section 1.1, "Definitions," and a new section addressing administrative requirements for the PTLR would be added to TS Section 5.0, "Administrative Controls."

The Nuclear Regulatory Commission (NRC) staff has reviewed the information provided in that letter and has determined that additional information is needed to complete its review. The NRC staff's request for additional information (RAI) is provided below.

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REQUEST FOR ADDITIONAL INFORMATION (RAI) TO NINE MILE POINT UNIT 2 RELOCATION OF PRESSURE AND TEMPERATURE LIMIT CURVES TO THE PRESSURE AND TEMPERATURE LIMITS REPORT LICENSE AMENDMENT REQUEST (LAR)
NINE MILE POINT NUCLEAR STATION (NMPNS)
DOCKET NO. 50-410 TAC NO. MF0345

SRXB –RAI 1

The fluence calculations discussed in MPM-402781, "Benchmarking of Nine Mile Point Unit 1 and Unit 2 Neutron Transport Calculations" were completed prior to the implementation of an extended power uprate (EPU) for NMP Unit 2. Describe how the calculations account for the effects of the power uprate.

SRXB –RAI 2

The NRC staff understands that the calculational framework devised by MPM Technologies Inc., has been applied at other plants since its plant-specific approval at Nine Mile Point Nuclear Station. The final sentence of RG 1.190, Regulatory Position 1.4.2.1, "Operating Reactor Measurements," states that, "[a]s capsule and cavity measurements become available, they should be incorporated into the operating reactor measurements database and the calculational biases and uncertainties should be updated, as necessary." Provide information to update the operating reactor measurements database based on the more recently available operating reactor measurements, and confirm that the existing calculational bias and uncertainties established for this application of the MPM analytic methods remain qualified for use at NMPNS.

SRXB –RAI 3

Explain whether reactor vessel neutron fluence was calculated using any methods other than the referenced MPM Technologies, Inc. analytic methods described in MPM-402781 Revision 1.

EVIB - RAI 1

BACKGROUND

10 CFR Part 50, Appendix G, "Fracture Toughness Requirements," states, "*this appendix specifies fracture toughness requirements for ferritic materials of pressure-retaining components of the reactor coolant pressure boundary (RCPB) of light water nuclear power reactors to provide adequate margins of safety...*" In addition, 10 CFR Part 50, Appendix G, Paragraph IV.A states that, "*the pressure-retaining components of the RCPB that are made of ferritic materials must meet the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), supplemented by the additional requirements set forth in [paragraph IV.A.2, "Pressure-Temperature (P-T) Limits and Minimum Temperature Requirements"]...*" Therefore, 10 CFR Part 50, Appendix G requires that P-T limits be developed for the entire RCPB, consisting of ferritic RCPB materials in the reactor pressure vessel (RPV) beltline (neutron fluence $\geq 1 \times 10^{17}$ n/cm², E > 1 MeV), as well as ferritic RCPB materials not in the RPV beltline (neutron fluence < 1×10^{17} n/cm², E > 1 MeV).

ISSUE

P-T limit calculations for ferritic RCPB components that are not RV beltline shell materials, may define curves that are more limiting than those calculated for the RV beltline shell materials. This may be due to the following factors:

1. Some ferritic RCPB components that are not RPV beltline shell materials, such as nozzles, penetrations, and other discontinuities, are complex geometry components that exhibit significantly higher stresses than those for the RV beltline region. These higher stresses can potentially result in more restrictive P-T limits, even if the reference temperature (RT_{NDT}) for these components is not as high as that of RPV beltline materials that have simpler geometries.
2. Ferritic RCPB components that are not RPV beltline shell materials may have material properties, in particular initial RT_{NDT} values, which may define more restrictive P-T limits than those for the RPV beltline shell materials.

REQUEST

The methodology used to develop the proposed P-T limits for NMP2 is based on NRC-approved topical report NEDC-33178P-A, which addresses all relevant discontinuities in the RV. However, the topical report methodology does not address the evaluation of ferritic components or piping other than those making up the RPV. If NMP2 has ferritic components or piping in the RCPB that are not part of the RPV, describe how it was confirmed whether the P-T limit curves, and the methodology used to develop these curves, considered these materials, consistent with the requirements of 10 CFR Part 50, Appendix G.

EVIB - RAI 2

The proposed PTLR states on page 5 that for NMP2, the plate heat C3147-1 is the limiting material for the beltline region, that peak fluence values used in the development of the Pressure-Temperature curves are identified in Appendix B, and that the limiting adjusted reference temperature (ART) for the beltline LPCI N6 and Water Level Instrumentation N12 nozzle forgings and welds are also considered in the development of the beltline PT curves. The adjusted reference temperature (ART) for the N12 forging is 39 °F, compared to the limiting ART for the beltline region, which is 51 °F for beltline plate C3147-1.

- 1) Appendix J to NEDC-33178P-A describes the P-T limit methodology for the N12 nozzle. and provides a method for determining the nozzle-specific P-T curve if the instrument nozzle is found to exist in the beltline region of the RPV. Provide a summary of the calculation including the plant-specific inputs that would be needed by the staff to perform a confirmatory calculation using the approved methodology, and the resulting N12 nozzle P-T curve for NMP2.
- 2) Section 4.3.2.2 of NEDC-33178P-A indicates that in the event that a full penetration nozzle is the limiting material for the beltline region, the pressure test and the beltline core not critical P-T curves are calculated in the same manner as the Feedwater Nozzle pressure test and core not critical P-T curves as described in Section 4.3.2.1. Provide a summary of the calculation including the plant-specific inputs that would be needed by the staff to perform a confirmatory calculation using the approved methodology, and the resulting N6 nozzle P-T curve for NMP2.

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The NRC staff would like to receive the responses to the RAIs within 30 days from the date of this communication. Please contact me, ASAP, to schedule a tele-conference between the licensee and the NRC staff to ensure that the licensee clearly understands the RAIs and also, to obtain a firm commitment from the licensee for the Responses to these RAIs.

Please contact me, if you have any questions.

Thanks,

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