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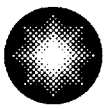

Constellation
Nuclear

Nine Mile Point
Nuclear Station

A Member of the
Constellation Energy Group

June 27, 2002
NMP2L 2063

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

RE: Nine Mile Point Unit 2
Docket No. 50-410
NPF-69

Subject: ***Request for Exemption from the Requirements of 10 CFR §54.17(c), TAC No. MB3532 – Response to Request for Additional Information***

In a letter dated January 4, 2002 (Reference 1), Nine Mile Point Nuclear Station, LLC (NMPNS) submitted to the Nuclear Regulatory Commission (NRC) a request for exemption from the conditions of 10 CFR §54.17(c) requiring that an application for a renewed operating license be submitted for approval to the NRC not "earlier than 20 years before the expiration of the operating license currently in effect." Approval of this exemption request is required by NMPNS to complete feasibility determinations of filing concurrent applications with the NRC in 2003 for the renewal of the operating licenses for Nine Mile Point Unit 1 (NMP1) and Nine Mile Point Unit 2 (NMP2). With existing operating license expirations for NMP1 and NMP2 scheduled in 2009 and 2026, respectively, satisfaction of the 20-year requirement for NMP2 cannot be attained prior to 2006. However, in order to satisfy the timely renewal requirements of 10 CFR §2.109(b), NMPNS must submit the license renewal application for NMP1 by 2004. Thus, absent an exemption, 10 CFR §54.17(c) would preclude NMPNS from filing a joint license renewal application for NMP1 and NMP2.

Conference calls with the NRC on this request were held on April 17, 2002, and May 13, 2002. Based on these conference calls, the NRC issued a Request for Additional Information (RAI) on May 15, 2002 (Reference 2). NMPNS's response to the NRC RAI is attached.

Sincerely,

John T. Conway
Site Vice President

JTC/RW/jm

A001

Attachment: Nine Mile Point Unit 2 Response to NRC Request for Additional Information.

References:

1. Letter from NMPNS to NRC, letter No. NMP2L 2042, J.T. Conway to Document Control Desk, dated January 4, 2002, "Request for Exemption from the Requirements of 10 CFR §54.17(c), TAC No. MB3532."

2. NRC letter dated May 15, 2002, P.S. Tam to J.T. Conway, "Nine Mile Point Nuclear Station, Unit No. 2 - Request for Additional Information, Schedular Exemption to 10 CFR 54.17(c) Re: License Renewal Application (TAC No. MB3532)."

cc: Mr. H. J. Miller, NRC Regional Administrator, Region I
Mr. G. K. Hunegs, NRC Senior Resident Inspector
Mr. P. S. Tam, Senior Project Manager, NRR (2 copies)
Mr. P. T. Kuo, Program Director License Renewal and Environmental Impacts
Records Management

ATTACHMENT

NINE MILE POINT UNIT 2
RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION

Restatement of the NRC Request for Additional Information (RAI)

"Your request did not provide sufficient information to justify the bases for granting the schedular exemption. Specifically, the application did not address how the operating experience of Nine Mile Point Nuclear Station, Unit No. 1 (NMP-1), which is a Boiling Water Reactor (BWR)/2 design, can be applied to NMP-2, which is a BWR/5 design. The containment designs and thermal output of these two designs are significantly different. Consequently, additional information is needed to either justify the applicability of NMP-1's BWR/2 operating experience as the basis for the exemption request, or discuss how industry-wide BWR/5 operating experience can make up for NMP-2's lack of sufficient operating experience. In the May 13, 2002, telephone conference, we discussed a few options with your staff, including possibly using additional operating experience in the relevant areas of other BWR plants with Mark II containments that may have 20 or longer years of operating experience."

Nine Mile Point Nuclear Station (NMPNS) Response to the RAI

I. Background

In the submittal requesting an exemption from 10 CFR §54.17(c)[1], NMPNS recognized the design differences between Nine Mile Point Unit 1 (NMP1) and Nine Mile Point Unit 2 (NMP2) and their effect on the license renewal process. Specifically, NMP1 operating experience can be applied towards NMP2 if it can be demonstrated that the units experience similar aging effects. The existence of aging effects is primarily a function of the materials used and the environment to which those materials are subjected. NMP1 and NMP2 not only share some common facilities that are within the scope of the license renewal review, but also have many similar components and materials.

As noted in the above NRC RAI, the significant differences between NMP1 and NMP2 are BWR type, containment designs, and thermal output.[2] NMPNS has evaluated these design differences and their impact on the materials and aging effects between NMP1 and NMP2. Additionally, NMPNS has also evaluated industry-wide BWR operating

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[1] Letter from NMPNS to NRC, letter No. NMP2L 2042, J.T. Conway to Document Control Desk, dated January 4, 2002, "Request for Exemption from the Requirements of 10 CFR §54.17(c), TAC No. MB3532."

[2] NMP1 is a BWR/2 reactor with a Mark I containment design and has a thermal output of 1850 MWt; NMP2 is a BWR/5 reactor with a Mark II containment design and has a thermal output of 3467 MWt.

experience and, in particular, operating experience in the relevant areas of other BWR plants with Mark II containments. Accordingly, the following sections provide this evaluation.

II. Applicability of NMP1 Operating Experience to NMP2

A. Evaluation of NMP1 and NMP2 Containment Designs

A review was performed of the NRC Generic Aging Lessons Learned (GALL) Report (NUREG-1801) to determine how the differences in the BWR containment types might affect the evaluation and final conclusions reached in a License Renewal Application (LRA). The GALL Report is a technical basis document to the Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants (NUREG-1800) that provides the NRC with guidance in reviewing an LRA. The GALL report contains the NRC's evaluations of the aging effects on components and structures, identifies the relevant existing programs, and evaluates the program attributes to manage aging effects for license renewal. The GALL Report incorporates industry-wide operating experience on plant aging information obtained from industry reports addressing license renewal, Licensee Event Reports (LERs), NRC Information Notices, NRC Generic Letters, and NRC Bulletins.[3]

The only place in the GALL Report where a distinction is made between the different BWR types is in Section IIB, "BWR Containments," which has separate sections for the Mark I, II, and III primary containments. Specifically, GALL Report Table II.B.1.1 addresses the elements of BWR Mark I containment structures, which applies to NMP1. GALL Report Table II.B.2.2 addresses the elements of BWR Mark II concrete containments, which is applicable to NMP2.

NMPNS is currently in the process of identifying the NMP1 and NMP2 structures and components that are within scope of the license renewal rule, their materials, aging effects, and the programs needed to manage the aging effects. NMPNS compared the NMP1 and NMP2 containment structures and components to those in the above referenced GALL Report tables (see Table 1). As shown in this table, the aging effects for the NMP1 and NMP2 containment designs are comparable to those in the GALL Report.

[3] See NUREG-1801, page 1, "GALL Report Evaluation Process."

B. Evaluation of NMP Thermal Output Differences

NMPNS evaluated the differences in thermal output for NMP1 and NMP2 with regards to aging effects. The differences in thermal output between NMP1 and NMP2 result in differences in neutron flux and fluence to which the reactor vessel internals (RVI) and reactor vessels are exposed. Flux is a measure of the number of neutrons passing through a unit area per unit time and is measured in neutrons per square centimeter per second, while fluence is the flux integrated over time, measured in neutrons per square centimeter. The differences in thermal output do not significantly affect the reactor coolant temperature. In fact, the NMP1 and NMP2 reactor vessel operating temperatures are similar and closely match that specified in the GALL Report for the BWR reactor vessel environment.

In general, as a result of the higher power density, the NMP2 RVI experience greater neutron flux than the NMP1 RVI. However, as a result of reactor vessel geometry (specifically a larger annulus between the core shroud and the vessel wall), the NMP2 reactor vessel actually experiences a lower flux than the NMP1 reactor vessel resulting in a lower predicted end of life fluence.

Reactor Vessel Internals

With regard to the RVI, the higher core power density and correspondingly higher fluence for NMP2 may result in the manifestation of certain aging effects earlier in plant life than would be the case for NMP1. However, there are no unique aging effects for the NMP2 RVI. The same basic set of aging effects will require management for both units.

On an industry-wide basis, the BWR Vessel and Internals Project (BWRVIP) addresses RVI. The BWRVIP reviewed the function of each internal BWR component (including the BWR/2 and BWR/5 designs). For those internals that could impact safety, the BWRVIP considered the aging mechanisms that might cause degradation of such components and developed an inspection program that would enable degradation to be detected before the component function was adversely affected. Therefore, the operating experience gained from the BWRVIP can be applied to NMP2 in assisting in the identification of plant-specific concerns regarding aging.

Reactor Vessel

The highest beltline fluence values for NMP1 and NMP2 are specified in the NRC's Reactor Vessel Integrity Database (RVID). The neutron flux is obtained by dividing these fluence values by 32 effective full power years (EFPY), which is also specified in the RVID[4].

GALL Report Table IV.A.1 addresses the BWR Reactor Vessel, Internals, and Reactor Coolant System. The Environment column of this table for the Reactor Vessel Shell[5] specifies a maximum flux of $5x10^8$-$5x10^9$n/cm^2/sec. The neutron flux values for NMP1 and NMP2, as derived from the above paragraph, are within the range specified in the GALL Report Table. Therefore, the aging effects are expected to be similar for both plants and no unique aging affects are expected to occur, despite the differences in thermal output.

III. Industry-Wide Operating Experience

The above paragraphs demonstrate that while there are design (BWR/2 versus BWR/5 and Mark I versus Mark II containments) and operating differences (e.g., thermal output) between NMP1 and NMP2, the aging mechanisms and effects are similar. Thus, operating experience for NMP1 can be applied towards NMP2 in satisfying the 20-year requirement of 10 CFR §54.17 (c). As was indicated in the supplementary information accompanying the 1991 publication of 10 CFR 54[6], operating experience from other industry sources will also be used by the NRC in evaluating the adequacy of the licensee proposed activities to address age-related degradation.

NMPNS also evaluated operating experience in the relevant areas of other BWR plants with Mark II containments that may have 20 or longer years of operating experience. Other BWR plants that have Mark II containments and their years of operating experience are listed in Table 2:

[4] The 32 EFPY assumes an 80% capacity factor over the life of the plant.

[5] See pages IV.A1-4, IV.A1-5, and IV.A1-6 of the GALL Report,

[6] 56 Federal Register at 64963, December 13, 1991.

TABLE 2: BWRS WITH MARK II CONTAINMENTS

Plant	Type	Date Operating License (OL) was Issued	Years of Operating Experience[7]
Columbia	BWR/5	12/20/83	18
LaSalle 1	BWR/5	4/17/82	20
LaSalle 2	BWR/5	12/16/83	18
Limerick 1	BWR/4	10/26/84	17
Limerick 2	BWR/4	6/22/89	12
Susquehanna 1	BWR/4	7/17/82	19
Susquehanna 2	BWR/4	3/23/84	18

As can be seen from the above table, La Salle 1, which is a BWR/5 similar to NMP2, currently has 20 years of operating experience. Additionally, Susquehanna 1 will have accumulated 20 years of operating experience in July 2002. Furthermore by October 2003, when NMPNS anticipates submitting the LRA for NMP2, two other BWRs will be close to 20 years of operating experience (i.e., Columbia and LaSalle 2). As noted earlier in this document, the GALL Report incorporates industry-wide operating experience on plant aging information. The NMP2 LRA will include information contained in the GALL Report, thus NMP2 will have the benefit of its industry-wide operating experience.

NMPNS performed an industry-wide search, typical to the one that will be performed as part of the LRA process, of any aging related concerns for the above BWR plants since the issuance of the GALL Report (April 2001). A search was performed of NRC Generic Communications, LERs, Institute of Nuclear Power Operations (INPO) Documents, and General Electric Service Information Letters. No aging related information was found concerning the Mark II containments.

IV. Actual Years of Operating Experience

NMPNS currently plans to submit the LRA for NMP2 in October 2003. Based on the date of the issuance of the Operating License (OL)[8], NMP2 will have accumulated 17 years of operating experience by the time the LRA is submitted to the NRC. In addition, the NRC may take up to 30 months to review an LRA. This means that NMP2 will have almost 20 years of operating experience by the time NRC finishes their review of the LRA. Furthermore, by the time the LRA is submitted to the NRC, NMP will apply

[7] The 10 CFR 54.17(c) exemption requests granted for Duke Energy, Florida Power and Light, and First Energy also used the OL date as the basis for determining years of operating experience.

[8] The initial OL for NMP2 was issued on October 31, 1986.

operating experience from other BWRs that have submitted LRAs (currently Hatch and Peach Bottom), and any other additional plants that have LRAs submitted by that date. Moreover, any new aging concerns will be addressed as part of the update to the LRA while NRC is completing their review.

V. Conclusion

The basis for establishing the 20-year limit contained in 10 CFR §54.17(c), as discussed in the 1991 Statements of Consideration for Part 54 (56 FR 64963), is "to ensure that substantial operating experience was accumulated by a licensee before a renewal application is submitted such that any plant-specific concerns regarding aging would be disclosed."

Although there are differences in design and thermal output between NMP1 and NMP2, both plants exhibit similar aging effects. Thus, the operating experience from NMP1 is applicable to NMP2 for purposes of license renewal specifically with regards to identifying aging effects. In addition to plant specific operating experience, NMP2 also has the benefit of industry operating experience particularly for those BWRs that also have Mark II containments. By October 2003, when NMPNS anticipates submitting the LRA for NMP2, two BWRs with Mark II containments will have accumulated 20 years or more of operating experience (LaSalle 1 and Susquehanna 1) and two other plants will be close to 20 years of operating experience (Columbia and LaSalle 2). The NMP2 LRA will also reflect industry-operating experience identified in the NRC GALL Report, as well as other industry programs (particularly the BWRVIP Program). Additionally, the lessons learned from other BWRs that have submitted LRAs to the NRC will be reviewed and incorporated into the NMP LRA, as applicable. Furthermore, by the time the NRC completes its review of the LRA, NMP2 will have accumulated almost 20 years of operating experience.

NMPNS concludes, based on the similarity in aging effects between NMP1 and NMP2, the industry-wide BWR operating experience, and the actual years of operating experience, that NMP2 has accumulated more than enough operating experience to satisfy the underlying purpose of the license renewal schedular requirement of 10 CFR §54.17(c). Therefore, NMPNS believes that pursuant to 10 CFR §50.12, special circumstances exist to warrant the approval of this request; namely, that the application of 10 CFR §54.17(c) to NMP2 is not necessary to achieve the underlying purpose of the rule.

TABLE 1: COMPARISON OF NMP1 AND NMP2 CONTAINMENTS TO THE GALL REPORT[9]

Primary Containment Structures					
Applicable GALL Table	Structure and /or Component[10]	Applicable Unit	Material[10]	Environment	GALL Aging Effect/Mechanism
II.B1.1.1-a (Mark I)	Drywell; torus; drywell head	NMP1	Carbon Steel	Inside Containment	Loss of Material/Corrosion
II.B2.2.2-a (Mark II)	Drywell; drywell head, drywell floor	NMP2	Carbon Steel	Inside Containment	Loss of Material/Corrosion
II.B1.1.1-b (Mark I)	Torus	NMP1	Carbon Steel	Inside Containment	Cracking/cyclic loading or Cumulative fatigue damage/Fatigue
II.B2.2.2-b (Mark II)	Suppression chamber liner (interior surface)	NMP2	Stainless Steel	Inside Containment	Crack initiation and growth/Stress corrosion cracking
II.B1.1.1-c (Mark I)	Vent header; downcomers	NMP1	Carbon Steel	Inside Containment	Crackling/cyclic loading or Cumulative fatigue damage/Fatigue
II.B2.2.2-d (Mark II)	Vent header; downcomers	NMP2	Stainless Steel	Inside Containment	Crackling/cyclic loading or Cumulative fatigue damage/Fatigue

[9] The GALL report contains the NRC's evaluations of the aging effects on components and structures, identifies the relevant existing programs, and evaluates the program attributes to manage aging effects for license renewal. The GALL Report incorporates industry-wide operating experience on plant aging information.

[10] The information contained in the columns titled "Structure and/or Component," and "Material" is specific to Nine Mile Point, based on the License Renewal scoping and screening that has been completed to date, and does not include all the structures or components contained in the applicable GALL tables.