

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of )  
 )  
AMERGEN ENERGY COMPANY, LLC ) Docket No. 50-219-LR  
 )  
(Oyster Creek Nuclear Generating Station) )

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NRC STAFF'S RESPONSE IN OPPOSITION TO CITIZENS' MOTION TO REOPEN THE  
RECORD AND FOR LEAVE TO FILE AND ADD A NEW CONTENTION

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April 28, 2008

TABLE OF CONTENTS

	<u>Page</u>
TABLE OF AUTHORITIES .....	iii
INTRODUCTION .....	1
BACKGROUND .....	1
DISCUSSION.....	4
I. Citizens' Motion Does Not Satisfy the Commission's Requirements for Reopening the Record .....	4
A. Citizens' Motion to Reopen Does Not Address a Significant Safety Issue .....	6
B. Citizens' Motion to Reopen is Not Timely.....	9
C. Citizens Have Not Demonstrated that a Materially Different Result is Likely .....	12
II. Citizens Have Not Met the Eight-Factor Balancing Test of 10 C.F.R. § 2.309 (c).....	14
A. Citizens Have Not Demonstrated Good Cause for Failure to File a New Contention on Time .....	16
B. Granting Citizens' Motion to File a New Contention Will Broaden The Issues and Delay the Proceedings.....	17
III. Citizens' New Contention is Inadmissible .....	18
A. Citizens Fail to Meet the Requirements of § 2.309(f)(2).....	20
B. Citizens Fail to Meet the Requirements of § 2.309(f)(1).....	22
CONCLUSION .....	24

TABLE OF AUTHORITIES

Page

JUDICIAL DECISIONS

*San Luis Obispo Mothers for Peace v. NRC*, 751 F.2d 1287 (D.C. Cir. 1984) ..... 4

*San Luis Obispo Mothers for Peace v. NRC*, 789 F.2d 26 (D.C. Cir. 1986) ..... 5

ADMINISTRATIVE DECISIONS

Commission:

*Private Fuel Storage, LLC* (Independent Spent Fuel Storage Installation), CLI-06-03, 63 NRC 19 (2006)..... 5

*Private Fuel Storage, LLC* (Independent Spent Fuel Storage Installation), CLI-05-12, 21 NRC 345 (2005)..... 6

*Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit 1) CLI-85-7, 21 NRC 1104 (1985)..... 6

*Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2 and 3), CLI-99-11, 49 NRC 328 (1999)..... 9

*Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 & 3), CLI-06-4, 63 NRC 32 (2006)..... 15

*State of New Jersey* (Department of Law and Public Safety), CLI-93-25, 38 NRC 289 (1993)..... 16

*Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 & 3), CLI-05-24, 62 NRC 551 (2005)..... 16, 17, 18

*Duke Energy Corp.* (McGuire Nuclear Station, Units 1 & 2; Catawba Nuclear Station, Units 1 & 2), CLI-02-28, 56 NRC 373 (2002) ..... 23

Atomic Safety and Licensing Appeal Board:

*Public Service Co. of New Hampshire* (Seabrook Station, Units 1 & 2), ALAB-949, 33 NRC 484 (1991)..... 4

*Pacific Gas & Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), ALAB-775, 19 NRC 1361 (1984) ..... 4, 5, 9, 19

*Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit 2) ALAB-486, 8 NRC 9 (1978)..... 5

<i>Public Service Co. of New Hampshire</i> (Seabrook Station, Units 1 & 2), ALAB-940, 32 NRC 225 (1990).....	6
---	---

Atomic Safety and Licensing Board:

<i>AmerGen Energy Co., LLC</i> (Oyster Creek Nuclear Generating Station), LBP-07-17, 66 NRC 327 (2007).....	2
--	---

<i>AmerGen Energy Co., LLC</i> (Oyster Creek Nuclear Generating Station), LBP-06-22, 64 NRC 229 (2006).....	2
--	---

<i>Pacific Gas &amp; Electric, Co.</i> (Diablo Canyon Nuclear Power Plant, Units 1 & 2), LBP-94-35, 40 NRC 180 (1994).....	4
---	---

<i>Public Service Co. of New Hampshire</i> (Seabrook Station, Units 1 & 2), LBP-89-38, 30 NRC 725 (1989).....	4
--	---

<i>Florida Power &amp; Light Co.</i> (Turkey Point Nuclear Generating Plant, Units 3 & 4), LBP-87-21, 25 NRC 958 (1987).....	5
---	---

<i>Houston Lighting and Power Co.</i> (South Texas Project, Units 1 & 2), LBP-85-19, 21 NRC 1707 (1985).....	5
---	---

<i>Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc.</i> (Vermont Yankee Nuclear Power Station), LBP-07-15, 66 NRC 261 (2007).....	11
--	----

<i>Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc.</i> (Vermont Yankee Nuclear Power Station), LBP-05-32, 62 NRC 813 (2005).....	16
--	----

<i>Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc.</i> (Vermont Yankee Nuclear Power Station), LBP-06-14, 63 NRC 568 (2006).....	16, 17
--	--------

<i>Entergy Nuclear Vermont Yankee, LLC and Entergy Nuclear Operations, Inc.</i> (Vermont Yankee Nuclear Power Station), LBP-05-24, 62 NRC 429 (2005).....	23
--	----

<i>Duke Cogema Stone &amp; Webster</i> (Savannah River Mixed Oxide Fuel Fabrication Facility), LBP-04-9, 59 NRC 286 (2004) .....	23
---	----

<i>Duke Energy Corp.</i> (Catawba Nuclear Station, Units 1 & 2), LBP-04-7, 59 NRC 259 (2004) ....	23
---	----

REGULATIONS

10 C.F.R. § 2.309(c) .....	5, 15, 19, 22
----------------------------	---------------

10 C.F.R. § 2.309(c)(1).....	15, 16
------------------------------	--------

10 C.F.R. § 2.309(c)(1)(ii) – (iv) .....	15, 16
--	--------

10 C.F.R. § 2.309(c)(1)(v).....	15, 16
---------------------------------	--------

10 C.F.R. § 2.309(c)(1)(vi).....	15, 16
10 C.F.R. § 2.309(c)(1)(vii).....	16
10 C.F.R. § 2.309(c)(1)(viii).....	16
10 C.F.R. § 2.309(c)(2).....	15
10 C.F.R. § 2.309(f).....	4
10 C.F.R. § 2.309(f)(iv).....	22
10 C.F.R. § 2.309(f)(vi).....	22
10 C.F.R. § 2.309(f)(1).....	19, 22
10 C.F.R. § 2.309(f)(2).....	5, 15, 19, 20, 21, 22
10 C.F.R. § 2.309(f)(2)(i) – (iii).....	19
10 C.F.R. § 2.323(c).....	1
10 C.F.R. § 2.326.....	5, 22
10 C.F.R. § 2.326(a).....	4, 6, 7
10 C.F.R. § 2.326(a)(1).....	6, 9, 11, 12, 17
10 C.F.R. § 2.326(a)(3).....	12
10 C.F.R. § 2.326(b).....	4, 6, 7, 12
10 C.F.R. § 2.326(d).....	5, 15, 19
10 C.F.R. § 2.337.....	19
10 C.F.R. § 2.337(a).....	5
10 C.F.R. § 54.....	1
10 C.F.R. § 54.21(c)(1).....	23
10 C.F.R. § 54.21(c)(1)(ii).....	14
10 C.F.R. § 54.21(c)(1)(iii).....	22
10 C.F.R. § 54.29(a).....	13

MISCELLANEOUS

Letter from C.N. Swenson, AmerGen, to NRC (July 22, 2005)..... 1

Memorandum from Samson S. Lee, NRR, to the Commission (April 3, 2008)..... 2

Regulatory Information Summary 2008-01 “Fatigue Analysis of Nuclear Plant Components (“RIS”) (April 11, 2008) ..... 3, 8, 9

Proposed Generic Communication Fatigue Analysis of Nuclear Power Plant Components,..... 3 (April 23, 2008)

Revisions to Generic Communication Program (SECY-99-143) (May 26, 1999) ..... 3

51 Fed. Reg. 19,535, 19,538 (May 30, 1986)..... 5, 6

Todd B. Bates, NRC Wants Nuclear Plant’s Water Nozzles Rechecked, Asbury Park Press, (April 7, 2008) – <http://www.app.com/apps/pbcs.dll/article?AID=/20080407/NEWS/804070368> . 8

Summary of January 8, 2008 Meeting between the NRC Staff and Entergy Nuclear Operations (Jan. 31, 2008) ..... 9

Presentation to NRC Staff Regarding Reactor Pressure Vessel Nozzle Environmental Fatigue Analysis for License Renewal (January 8, 2008)..... 10

549<sup>th</sup> ACRS Meeting Transcript (February 7, 2008)..... 10

Response to RAI dated March 30, 2006 Related to Oyster Creek License Renewal Application (May 1, 2006) ..... 10

RAI Table 4.3.4-1 ..... 10

NUREG/CR 6909 “Effect of LWR Coolant Environments on the Fatigue Life of Reactor Materials” (Feb. 2007) ..... 10, 12

Safety Evaluation Related to the Vermont Yankee License Renewal Application, (issued Feb. 26, 2008) ..... 11

550<sup>th</sup> ACRS Meeting Transcript (March 6, 2008)..... 11

Request for Additional Information for the Renewal of Wolf Creek Generating Station, Unit 1, License Renewal Application (June 22, 2007) ..... 11

New England Coalition, Inc.’s Motion to File New or Amended Contention (July 2, 2007)..... 10

New England Coalition, Inc.’s Motion to File a Timely New or Amended Contention (Sept. 4, 2007) ..... 11

Oyster Creek LRA Section 4.3.1 ..... 21

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INTRODUCTION

Pursuant to 10 C.F.R. § 2.323(c), the Staff of the U.S. Nuclear Regulatory Commission ("Staff") hereby responds to "Motion by [Citizens<sup>1</sup>] to Reopen the Record and For Leave to File a New Contention, and Petition to Add a New Contention" ("Motion") dated April 18, 2008. For the reasons set forth herein, Citizens' Motion should be denied.

BACKGROUND

On July 22, 2005, AmerGen submitted to the U.S. Nuclear Regulatory Commission ("NRC") an application for renewal,<sup>2</sup> pursuant to 10 C.F.R. Part 54, of Operating License No. DPR-16 for the Oyster Creek Nuclear Generating Station ("Oyster Creek"). The current license expires April 9, 2009. On September 24 and 25, 2007, the Atomic Safety and Licensing Board ("Board") held an evidentiary hearing on the only remaining contention in the proceeding,

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<sup>1</sup> "Citizens" comprise Nuclear Information and Resource Service ("NIRS"), Jersey Shore Nuclear Watch, Inc., Grandmothers, Mothers and More for Energy Safety, New Jersey Public Interest Research Group, New Jersey Sierra Club, and New Jersey Environmental Federation.

<sup>2</sup> Letter from C. N. Swenson, AmerGen, to NRC (July 22, 2005) (Agencywide Documents and Access Management System ("ADAMS") Accession No. ML052080172).

Citizens' contention concerning the drywell shell.<sup>3</sup> On December 18, 2007, the Board issued an initial decision resolving Citizens' drywell contention in AmerGen's favor. *AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), LBP-07-17, 66 NRC 327, 372 (2007). An appeal of the Board's initial decision,<sup>4</sup> as well as two other motions filed by Citizens,<sup>5</sup> are pending before the Commission.

On April 3, 2008, the Staff notified the Commission, the Board, and the parties that it "is reviewing the use of a simplified method to calculate cumulative usage factors ["CUF"] that may not be conservative," and that because Oyster Creek used the simplified method to calculate the CUF for one type of nozzle, the recirculation nozzle, the Staff "plans to ask AmerGen to perform a confirmatory analysis."<sup>6</sup> The Notification stated that the Staff was informing the Commission of its review because of potential public interest. The Notification further stated that the issue is irrelevant to the litigated contention in the proceeding and that, "based on the

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<sup>3</sup> As admitted by the Board, the Contention read:

[I]n light of the uncertain corrosive environment and correlative uncertain corrosion rate in the sand bed region of the drywell shell, AmerGen's proposed plan to perform UT tests prior to the period of extended operations, two refueling outages later, and thereafter at an appropriate frequency not to exceed 10-year intervals is insufficient to maintain an adequate safety margin.

*AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), LBP-06-22, 64 NRC 229, 255-56 (2006).

<sup>4</sup> Citizens' Petition for Review of LBP-07-17 and Interlocutory Decisions in the Oyster Creek Proceeding (Jan. 14, 2008).

<sup>5</sup> The two motions are (1) Petition by Nuclear Information and Resource Service [*et al.*] to Suspend License Renewal Reviews for Oyster Creek, Indian Point, Pilgrim and Vermont Yankee Nuclear Power Plants Pending Investigation of NRC Staff Review Process and Correction of Deficiencies (Jan. 3, 2008) ("Petition to Suspend") and (2) Motion by Nuclear Information and Resource Service [*et al.*] to Stay License Renewal Proceedings for Oyster Creek Nuclear Power Plant Pending Resolution of the Significant New Issue Notified by the Staff" (April 11, 2008) ("Motion to Stay"). The "Petition to Suspend" was filed jointly by the intervenor groups in the Pilgrim, Indian Point, and Vermont Yankee license renewal proceedings.

<sup>6</sup> Memorandum from Samson S. Lee, Acting Director of the Division of License Renewal, to the Commission, the Atomic Safety and Licensing Board, and the Parties, Board Notification 2008-01 (April 3, 2008) (ADAMS Accession No. ML080930335) ("Notification").

risk assessments performed by the staff in resolving generic safety issues (GSI)-166 and GSI-190 . . . the safety significance of using the simplified method is low.”

Since the Notification, the Staff has prepared Regulatory Issue Summary<sup>7</sup> 2008-01 “Fatigue Analysis of Nuclear Plant Components” (April 11, 2008) (ADAMS Accession No. ML080950235) (“RIS”). The RIS acknowledges that a confirmatory analysis can demonstrate that the nozzle has acceptable fatigue usage.” *Id.* at 2. The Staff plans to publish a notice of opportunity for public comment on the RIS in the Federal Register. See Proposed Generic Communication—Fatigue Analysis of Nuclear Power Plant Components (April 23, 2008) (ADAMS Accession No. ML081080562).

Citizens’ April 18, 2008 Motion seeks reopening of the record in the Oyster Creek license renewal proceeding and admission of the following contention:

The predictions of metal fatigue for at least the recirculation nozzles at Oyster Creek are not conservative. A confirmatory analysis using a conservative method is required to establish whether these nozzles could exceed the allowable metal fatigue limits during any extended period of reactor operation. In addition, similar confirmatory analyses must be carried out for other structures for which the non-conservative analysis was used. Finally, the current stress-based metal fatigue monitoring program at Oyster Creek is inadequate because it relies upon non-conservative analysis techniques.

Motion at 12. This proposed new contention appears to include three parts: (1) the metal fatigue predictions for Oyster Creek’s reactor recirculation nozzles; (2) the metal fatigue predictions for any other structures whose predictions were derived via the same method

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<sup>7</sup> The Staff issues three types of generic communications depending on the significance of the issue addressed in the communication. See Revisions to Generic Communication Program (SECY-99-143) (May 26, 1999) (ADAMS Accession No. ML992850037). The Staff issues Bulletins to address “significant issues that also have great urgency.” *Id.* at 5. The Staff issues Generic Letters to address “routine” matters and request information and/or action on the part of licensees. *Id.* at 6. Regulatory Issue Summaries are for communicating with the nuclear power industry “on a variety of matters for which no response or action is requested.” See *id.* at 6 (listing examples of the types of information conveyed by a Regulatory Issue Summary). The use of a regulatory issue summary, rather than a Bulletin, further confirms that this is not a significant issue of great urgency.

used to predict metal fatigue for the reactor recirculation nozzles; and (3) Oyster Creek's stress-based fatigue monitoring program.

### DISCUSSION

I. Citizens' Motion Does Not Satisfy the Commission's Requirements for Reopening the Record

Citizens have failed to meet a number of the requirements they must satisfy in order to reopen the record in this proceeding and gain admission of their proposed new contention.

Pursuant to 10 CFR § 2.326(a), a motion to reopen a closed record to consider additional evidence will not be granted unless all of the following criteria are satisfied:

(1) The motion must be timely, except that an exceptionally grave issue may be considered in the discretion of the presiding officer even if untimely presented.

(2) The motion must address a significant safety issue.

(3) The motion must demonstrate that a materially different result would be or would have been likely had the newly proffered evidence been considered initially.

10 C.F.R. § 2.326(a). See also *Pacific Gas & Electric Co.* (Diablo Canyon Nuclear Power Plant, Units 1 & 2), LBP-94-35, 40 NRC 180 (1994).

In addition to the standards of 10 C.F.R. § 2.326(a), the motion must be accompanied by one or more affidavits—given by “competent individuals with knowledge of the facts alleged” or by experts in the appropriate disciplines—which set forth the factual or technical bases, or both, for the movant's claims. 10 C.F.R. § 2.326(b). See also *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 & 2), LBP-89-38, 30 NRC 725, 734 (1989), *aff'd on other grounds*, ALAB-949, 33 NRC 484 (1991). The new material in support of a motion to reopen must be set forth with a degree of particularity in excess of the basis and specificity requirements contained in 10 C.F.R. § 2.309(f) for admissible contentions. See *Pacific Gas and Electric Co. (Diablo Canyon Nuclear Power Plant, Units 1 & 2)*, ALAB-775, 19 NRC 1361, 1366 (1984), *aff'd sub. nom.*; *San Luis Obispo Mothers for Peace v. NRC*, 751 F.2d 1287 (D.C. Cir. 1984), *aff'd on*

*reh'g en banc*, 789 F.2d 26 (D.C. Cir. 1986). Furthermore, the supporting information must be more than a mere allegation; it must be tantamount to evidence. *See id.*; *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), LBP-87-21, 25 NRC 958, 963 (1987). To satisfy this requirement, the supporting material must possess the attributes set forth in 10 C.F.R. § 2.337(a), which defines admissible evidence as "relevant, material, and reliable." *Diablo Canyon*, ALAB-775, 19 NRC at 1366-67.

Finally, § 2.326(d) expressly requires that any motion to reopen that addresses a new contention "must satisfy the requirements for nontimely contentions in § 2.309(c)."<sup>8</sup> As the Commission has recognized, these reopening requirements pose a "stiff test" for parties seeking to reopen closed adjudicatory records. *Private Fuel Storage, LLC* (Independent Spent Fuel Storage Installation), CLI-06-03, 63 NRC 19, 25 (2006). Indeed, this "heavy burden" created by the regulations is intentional. *See* Final Rule, Criteria for Reopening Records in Formal Licensing Proceedings, 51 Fed. Reg. 19,535, 19,538 (May 30, 1986). The Board and the Atomic Safety and Licensing Appeal Board ("Appeal Board") have also noted that the reopening requirements apply to all issues for which reopening is sought, meaning that the reopened record is open solely to those matters which have been found to satisfy the § 2.326 reopening requirements. *Houston Lighting and Power Co.* (South Texas Project, Units 1 and 2), LBP-85-19, 21 NRC 1707, 1720 (1985) (*citing Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit 2), ALAB-486, 8 NRC 9, 22 (1978)).<sup>9</sup>

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<sup>8</sup> Citizens dispute that 10 C.F.R. § 2.309(c) applies to their proposed contention, *see* Motion at 15-16, even though the text of § 2.326(d) explicitly makes that provision applicable to any "motion to reopen which relates to a contention not previously in controversy." Given the clear, unambiguous language in § 2.326(d), the Staff disagrees with Citizens' position on this issue. Therefore, in the Staff's view, Citizens must satisfy both § 2.309(c) and § 2.309(f)(2).

<sup>9</sup> Thus, if the Commission grants this motion, the record would only be reopened to allow additional evidence on the issue raised by Citizens' Motion. If Citizens sought to raise any other issues, they would have to satisfy § 2.326 as to those issues as well.

As a result, even if a contention meets the ordinary requirements for contention admissibility, that contention will be inadmissible if the proponent fails to satisfy the stricter requirements for admission of new contentions after the record has closed. *Private Fuel Storage, LLC* (Independent Spent Fuel Storage Installation), CLI-05-12, 61 NRC 345, 350 (2005). Moreover, the burden is on the moving party to meet the standards for reopening, and "the movant is not entitled to engage in discovery in order to support a motion to reopen." *Metropolitan Edison Co.* (Three Mile Island Nuclear Station, Unit 1), CLI-85-7, 21 NRC 1104, 1106 (1985).

A. Citizens' Motion to Reopen Does Not Address a Significant Safety Issue

Citizens' Motion does not satisfy the requirements set forth in 10 C.F.R. § 2.326(b), because the Motion is not accompanied by affidavits setting forth factual or technical bases for the Motion's assertion<sup>10</sup> that the issue raised is a significant safety issue. The "most important of the three [§ 2.326(a) elements]" to be addressed is that the motion raises a safety (or environmental) issue that is significant. *Public Service Company of New Hampshire* (Seabrook Station, Units 1 and 2), ALAB-940, 32 NRC 225, 243-44 (1990).<sup>11</sup> Citizens' failure to make this demonstration via affidavit or otherwise necessitates denial of their Motion.

The lone supporting documentation provided by Citizens, the Declaration of Dr. Joram Hopenfeld<sup>12</sup> ("Hopenfeld Declaration"), does not explain the safety significance of AmerGen's use of the simplified method. The declaration merely alleges that one or more of AmerGen's

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<sup>10</sup> Motion at 7-9.

<sup>11</sup> This case interpreted the former 10 C.F.R. § 2.734, which contained the same three factors, in substantially identical form, that are now found at 10 C.F.R. § 2.326(a). The only difference between the two sets of factors is a minor grammatical change that broke up the one sentence-long 10 C.F.R. § 2.734(a)(1) into two sentences to form the current § 2.326(a)(1). Compare 51 Fed. Reg. at 19,539 (containing text of § 2.734(a)(1)) with 10 C.F.R. § 2.326(a)(1).

<sup>12</sup> Exhibit MFC-1 to Motion.

metal fatigue calculations, which Dr. Hopenfeld states he has not actually reviewed, "may not be conservative."<sup>13</sup> How exactly this possible lack of conservatism in certain metal fatigue calculations would relate to plant safety at Oyster Creek during the period of extended operation is left unexplained. The same is true for the separate issue raised in ¶11 of the declaration, which discusses environmental correction factors that Dr. Hopenfeld states are "probably non-conservative" but does not attempt to explain how this "probable" non-conservatism relates to plant safety.<sup>14</sup> Citizens' supporting documentation, therefore, completely fails to show that the Motion raises a "significant safety issue." Thus, the § 2.326(b) affidavit requirement with respect to the most important of the three mandatory § 2.326(a) criteria is not satisfied.

Moreover, the Notification upon which Citizens so heavily rely explicitly states that the Staff believes that use of the simplified method is of low safety significance. In their Motion, Citizens speculate that the CUF for the reactor recirculation nozzles could be 40% higher than the previously calculated value of 0.978, resulting in a CUF of approximately 1.4, which would exceed the American Society of Mechanical Engineers ("ASME") Code limit of 1.0. Motion at 3. While the burden is on Citizens to demonstrate a significant safety issue, the Staff has included the attached Affidavit of Mr. John R. Fair ("Fair Affidavit") to explain the basis for the Staff's statement in the Notification that the safety significance of this issue is low. The Fair Affidavit demonstrates that Citizens' reliance on the Notification to demonstrate the safety significance of this issue is misplaced. Mr. Fair explains that the Staff has assessed the safety significance of CUFs far exceeding 1.4 and concluded that the safety significance of even very excessive CUFs (e.g., CUF of 4.75 for a reactor vessel feedwater nozzle in a plant similar to Oyster Creek)

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<sup>13</sup> Hopenfeld Declaration ¶¶7, 9.

<sup>14</sup> The declaration makes only an unexplained, bare assertion that the feedwater and spray nozzles are "safety-critical components." Even assuming this to be true, however, the relevant issue is not the safety significance of the components per se, but rather the safety significance of the alleged *probable non-conservatism* as it relates to these components.

is low. Fair Affidavit ¶¶6-9. Thus, Mr. Fair concludes that neither Oyster Creek's use of the simplified method nor the possibility that the CUF for the recirculation nozzle exceeds the ASME code limit by 40% constitute significant safety issues. *Id.* Citizens therefore provide no material and relevant information that would challenge this Staff conclusion.

Furthermore, in lieu of using their declaration to set forth factual or technical bases for their assertion that Oyster Creek's use of a simplified method to calculate the CUF for the reactor recirculation nozzles raises a significant safety issue, Citizens reference a newspaper article quoting an NRC "spokesman" as saying "that if a recirculation nozzle breaks, 'it could lead to a severe accident, it would be a challenging situation for the control room operators.'" Motion at 2. This quotation of a NRC "spokesman" is not evidence. Furthermore, Citizens' use of this quotation is selective and incomplete, omitting other quotations of the "spokesman" contained in the same article, such as the statement, "We have decided to have AmerGen and other companies do this re-analysis out of an *abundance of caution*."<sup>15</sup> Thus, the newspaper article does not demonstrate a significant safety issue.

Finally, Citizens also reference the RIS in support of their Motion. The Staff's preparation of the RIS does not, however, demonstrate that the Staff views the use of the simplified method as a significant safety issue, given no licensee action or response is requested in response to a regulatory issue summary.<sup>16</sup> Furthermore, the RIS acknowledged that notwithstanding the use of the simplified method, the one confirmatory analysis performed to date by a licensee "still demonstrated that the nozzle had acceptable fatigue usage." See

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<sup>15</sup> Todd B. Bates, *NRC Wants Nuclear Plant's Water Nozzles Recheck*, Asbury Park Press (April 7, 2008) (emphasis added), <http://www.app.com/apps/pbcs.dll/article?AID=/20080407/NEWS/804070368>.

<sup>16</sup> See *supra* note 7. If the Staff considered this a significant issue it would have prepared a Bulletin, which does request urgent action, or, at a minimum, a Generic Letter, which requests licensee action and/or a response.

RIS at 2.

Consequently, Citizens have failed to demonstrate that they are raising a significant safety issue. Therefore, their Motion must be denied.

B. Citizens' Motion to Reopen is Not Timely

Citizens' Motion is not timely, and it does not present the sort of exceptionally grave issue that could exempt it from the timeliness requirements applicable to reopening records. Accordingly, it does not satisfy 10 C.F.R. § 2.326(a)(1).

"[F]or a reopening motion to be timely presented, the movant must show that the issue sought to be raised could not have been raised earlier." *Diablo Canyon*, ALAB-775, 19 NRC at 1366. In addition, parties to NRC proceedings have "an ironclad obligation" to examine the application, and other publicly available documents, with sufficient care to uncover any information which could serve as the foundation for a contention. *Duke Energy Corp.* (Oconee Nuclear Station, Units 1, 2, and 3), CLI-99-11, 49 NRC 328, 338 (1999).

Citizens assert that their Motion is timely because it was filed promptly following the Staff's April 3, 2008 Notification to the Commission and that prior to the Notification, they could not have raised their concerns about metal fatigue. See Motion at 4. Yet, in addition to the Staff's Notification, the information Citizens rely on in their Motion, by their own admission, "has emerged over the last several months." See Motion at 6. Citizens rely on a January 8, 2008 public meeting attended by Dr. Hopenfeld<sup>17</sup> in his capacity as expert witness for the New England Coalition ("NEC") in support of its contention challenging Vermont Yankee's calculation of CUFs. According to the publicly available slides from that meeting, Vermont Yankee selected

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<sup>17</sup> See Summary of January 8, 2008 Meeting Between the NRC Staff and Entergy Nuclear Operations (Jan. 31, 2008) (ADAMS Accession No. ML080220508) (listing "Joe Hopenfeld" as an attendee). It should be noted that Dr. Rudolf Hausler, who served as Citizens' expert witness for their sole admitted contention, also attended the January 8, 2008 meeting via telephone. See *id.* (listing "Rudolf Hausler" as an attendee).

the method for calculating CUFs that was used at Oyster Creek. See Presentation to NRC Staff Regarding Reactor Pressure Vessel Nozzle Environmental Fatigue Analysis for License Renewal (Jan. 8, 2008) (ADAMS Accession No. ML080100282) ("Presentation") at slide 20. Citizens also rely on the publicly available transcript of the February 7, 2008 Advisory Committee on Reactor Safeguards ("ACRS") Meeting (ADAMS Accession No. ML080500208). At the meeting, the Staff informed the ACRS that the simplified methodology used by Vermont Yankee may not be conservative, and therefore the Staff asked Vermont Yankee to perform a confirmatory analysis. 549th ACRS Meeting Transcript (ADAMS Accession No. ML080500208) at 8-10, 82-87. Citizens also reference a nearly two year-old AmerGen response to a request for additional information ("RAI") in which AmerGen revised upward the CUF and CUFen calculations for the reactor recirculation nozzles. See Response to RAI Dated March 30, 2006 Related to Oyster Creek License Renewal Application (May 1, 2006) (ADAMS Accession No. ML061240217) at RAI Table 4.3.4-1.<sup>18</sup> Thus Citizens could have raised concerns about Oyster Creek's calculation of cumulative usage factors as early as March 2006 instead of waiting until April 18, 2008.

In addition to the information referenced in their Motion, Citizens fail to mention additional publicly available information which could have allowed them to raise the metal fatigue issue earlier than April 18, 2008. In fact, the Staff's review of the simplified method to calculate CUFs is a matter of public record in docketed correspondence between the Staff and license renewal applicants for the Wolf Creek<sup>19</sup> and Vermont Yankee nuclear power facilities, as

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<sup>18</sup> Paragraph 11 of Dr. Hopenfeld's declaration raises concerns about the environmental correction factors ("Fens") used by Oyster Creek. The concern is based on RAI Table 4.3.4-1 from May 2006 and NUREG/CR 6909 "Effect of LWR Coolant Environments on the Fatigue Life of Reactor Materials," Feb. 2007. Given that this information is more than a year old, this concern is not timely.

<sup>19</sup> The Staff first raised questions about the simplified methodology while reviewing Wolf Creek Nuclear Generating Station's application for license renewal, an application that has not been challenged. See, e.g., Request for Additional Information for the Renewal of Wolf Creek Generating Station, Unit 1, (continued. . .)

well as in filings and disclosures in the Vermont Yankee license renewal proceeding, including the filing of and admission of a contention on this precise issue.<sup>20</sup> If Citizens were uncertain whether Oyster Creek used the simplified methodology, they were on notice following the January 8, 2008 public meeting that Oyster Creek did in fact use the method and, to be prompt, should have presented this Motion soon thereafter. If Citizens were still uncertain, the Staff explained its concerns about the use of the simplified analysis at the February 7, 2008 ACRS meeting, in detail in its Safety Evaluation Related to the Vermont Yankee License Renewal Application (issued Feb. 26, 2008) (ADAMS Accession No. ML0805604621) in Section 4.3.3.1, and a third time at the 550th ACRS Meeting on March 6, 2008. See Transcript 550th ACRS Meeting (ADAMS Accession No. ML080740427) at 119-130. Thus, Citizens have not demonstrated that they could not have raised the metal fatigue issue much sooner.

Because Citizens' Motion is not timely, a motion to reopen cannot be granted unless, in the discretion of the presiding officer, the issue presented is exceptionally grave. See 10 C.F.R. § 2.326(a)(1). The possibility that the method used by Oyster Creek to calculate the CUF for the reactor recirculation nozzles "may not be conservative," as explained previously in

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(. . .continued)

License Renewal Application (June 22, 2007) (ML071730352) (requesting additional information about Wolf Creek's metal fatigue analysis). The Staff's requests for additional information from Wolf Creek pre-date "New England Coalition, Inc.'s (NEC) Motion to File New or Amended Contention" filed July 2, 2007. Counsel for the Staff referred Citizens to the Vermont Yankee license renewal proceeding because the issue is being litigated in that proceeding and the Staff has completed its Safety Evaluation Report Related to the License Renewal of Vermont Yankee Nuclear Power Station (Feb. 2008) (ML0805604621).

<sup>20</sup> On September 4, 2007, NEC submitted a motion to file a new contention in the *Vermont Yankee* adjudication that claimed Vermont Yankee's original CUF calculations "were flawed by numerous uncertainties, unjustified assumptions and insufficient conservatism, and produced unrealistically optimistic results." New England Coalition, Inc.'s Motion to File a Timely New or Amended Contention (Sept. 4, 2007) (ADAMS Accession No. ML072530900) at 3. This Motion was made publicly available in ADAMS on September 17, 2007. The *Vermont Yankee* Atomic Safety and Licensing Board admitted the contention on this issue in a decision made publicly available on November 8, 2007. *Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), LBP-07-15, 66 NRC 261 (2007).

Section I.A, is not a significant safety issue. Therefore, it cannot reasonably qualify as an “exceptionally grave” issue. Notification; Fair Affidavit ¶¶6-9. Citizens’ Motion to reopen accordingly should be denied because it does not satisfy 10 C.F.R. § 2.326(a)(1).

Dr. Hopenfeld’s declaration, at paragraph 11, also appears to raise a new and separate issue that, according to Dr. Hopenfeld, is not based upon AmerGen’s use of the simplified method for calculating CUFs at Oyster Creek.<sup>21</sup> Citizens’ Motion, however, never references this paragraph of Dr. Hopenfeld’s declaration, leaving it unclear as to what role this issue is meant to play in Citizens’ effort to reopen the record. In any event, Dr. Hopenfeld claims to base this alleged concern (regarding environmental correction factors) upon a February 2007 NUREG/CR and a May 2006 Response to Request for Additional Information. Hopenfeld Declaration ¶11. These two documents have long been publicly available,<sup>22</sup> a fact that Citizens do not attempt to dispute. Therefore, the new claims being raised in this paragraph of Dr. Hopenfeld’s declaration are clearly untimely. Further, Dr. Hopenfeld does not attempt to characterize this claim as raising an “exceptionally grave” issue. Accordingly, 10 C.F.R. § 2.326(a)(1) is not satisfied with respect to this claim either.

C. Citizens Have Not Demonstrated that a Materially Different Result is Likely

Citizens’ Motion further fails to satisfy § 2.326(b) because it fails to demonstrate via affidavit that the proposed contention would “likely” lead to a “materially different result” in the Oyster Creek license renewal proceeding, as is required under § 2.326(a)(3). Citizens’ challenge to AmerGen’s method for calculating this CUF, which forms parts one and two of the

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<sup>21</sup> See Hopenfeld Declaration ¶11 (“Therefore, regardless of whether AmerGen uses the ASME Section III NB-3200 methodology or the simplified analysis to calculate the CUFs, the environmental factors in the LRA and RAI are probably non-conservative and did not adequately differentiate between laboratory and reactor conditions.”) (emphasis added).

<sup>22</sup> The May 2006 response to a request for additional information is available at ADAMS Accession No. ML061240217, while NUREG/CR 6909 “Effect of LWR Coolant Environment on the Fatigue Life of Reactor Materials (Feb. 2007) is available at ADAMS Accession No. ML070660620.

proposed contention, does not demonstrate that AmerGen's analysis of this component is likely to be inadequate. Dr. Hopenfeld's declaration nowhere attempts to demonstrate that the possible lack of conservatism identified in the Staff's Notification and reiterated in the affidavit (i.e. that the simplified method "may not be conservative") would justify a finding that AmerGen has failed, with respect to the recirculation nozzle, to satisfy the "reasonable assurance" standard that governs NRC license renewal decisions. See 10 C.F.R. § 54.29(a). As explained in the Notification, "the staff believes that the safety significance of using the simplified analysis method is low based on the risk assessments performed by the staff in resolving generic safety issues (GSI)-166 and GSI-190."<sup>23</sup> Dr. Hopenfeld's declaration makes no attempt to controvert this Staff position. Citizens also provide no basis, whether in Dr. Hopenfeld's declaration or elsewhere, for their speculative suggestion in part two of their proposed contention that Oyster Creek used the simplified method to calculate CUFs for components other than the recirculation nozzles. Therefore, Citizens have not demonstrated that reopening the record to adjudicate the first two issues raised in their three-part contention would likely lead to a materially different result in these proceedings.

In addition, Citizens' challenge to AmerGen's stress-based metal fatigue monitoring program,<sup>24</sup> which forms the third and final part of the proposed contention, does not demonstrate that a materially different result is likely in this proceeding. Contrary to Dr. Hopenfeld's assertion in ¶10 of his declaration, the NRC has not determined that the approach used by AmerGen in its monitoring program is inadequate.<sup>25</sup> As explained by John Fair in his affidavit, the Notification addresses AmerGen's method for calculating CUFs for the Oyster

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<sup>23</sup> Notification at 1 (emphasis added). See also Fair Affidavit ¶¶ 6-9.

<sup>24</sup> For a description of Oyster Creek's Metal Fatigue of Reactor Coolant Pressure Boundary Program, see Oyster Creek SER at Section 3.0.3.2.29.

<sup>25</sup> Fair Affidavit ¶10.

Creek recirculation nozzles.<sup>26</sup> Meanwhile, AmerGen's stress-based metal fatigue monitoring program is being used exclusively for the feedwater nozzle.<sup>27</sup> AmerGen performed a fatigue calculation for the feedwater nozzle that did not use the simplified calculation.<sup>28</sup> This calculation, which aims to satisfy § 54.21(c)(1)(ii),<sup>29</sup> is sufficient on its own to comply with the time-limited aging analysis ("TLAA") requirements for the feedwater nozzle, thus rendering the stress-based monitoring program for this nozzle unnecessary for purposes of the NRC's required license renewal findings. Citizens have not challenged the type of fatigue calculation method used by AmerGen for the feedwater nozzle, making it unnecessary to determine the adequacy of the monitoring program, which, for license renewal purposes, is simply a redundant measure with regard to that nozzle. Because Dr. Hopfenfeld's criticism of the monitoring program is based entirely upon his unsupported and incorrect assertion that the NRC has found the program inadequate, and because it is unnecessary for the NRC to find the program adequate in order to make necessary findings regarding the one nozzle that it addresses, Citizens have failed to demonstrate that a materially different result is likely.

In sum, Citizens have failed to show that reopening the record to adjudicate any of the three parts of their proposed contention would likely lead to a materially different result in these license renewal proceedings. Citizens' Motion must therefore be denied.

II. Citizens Have Not Met the Eight-Factor Balancing Test of 10 C.F.R. § 2.309(c)

Citizens argue that when motions to reopen the record are accompanied by petitions to add new contentions, 10 C.F.R. § 2.326(d) requires petitioners to meet either 10 C.F.R.

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<sup>26</sup> *Id.*

<sup>27</sup> *Id.*

<sup>28</sup> *Id.*

<sup>29</sup> *Id.*

§ 2.309(f)(2) or (c), but not both, depending on whether the request is timely. However, 10 C.F.R. § 2.326(d) could not be more clear when it states that “[a] motion to reopen which relates to a contention not previously in controversy among the parties must also satisfy the requirements for nontimely contentions in § 2.309(c).” Further, the Commission has reiterated this exact requirement when it stated:

Thus, Section 2.326(d) of our regulations requires that a motion to reopen that proceeding address the provisions for filing a late-filed contention in 10 C.F.R. § 2.309(c). Quite simply, if a party seeks to reopen a closed record and, in the process raises an issue that was not an admitted contention in the initial proceeding, it must demonstrate that raising this issue satisfies the requirements for a non-timely or “late-filed” contention.

*Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 & 3), CLI-06-4, 63 NRC 32, 37 (2006). Therefore, in addition to meeting the timeliness requirements of 10 C.F.R. § 2.309(f)(2),<sup>30</sup> petitioners must also meet 10 C.F.R. § 2.309(c).

Petitioners must address all eight factors in its non-timely filing in order for the presiding officer to consider any request to reopen the record or petition to add a non-timely contention.

10 C.F.R. § 2.309(c)(2). The eight factors are:

- (i) Good cause, if any, for the failure to file on time;
- (ii) The nature of the requestor's/petitioner's right under the Act to be made a party to the proceeding;
- (iii) The nature and extent of the requestor's/petitioner's property, financial or other interest in the proceeding;
- (iv) The possible effect of any order that may be entered in the proceeding on the requestor's/petitioner's interest;
- (v) The availability of other means whereby the requestor's/petitioner's interest will be protected;
- (vi) The extent to which the requestor's/petitioner's interests will be

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<sup>30</sup> See *supra* n.8.

represented by existing parties;

(vii) The extent to which the requestor's/petitioner's participation will broaden the issues or delay the proceeding; and

(viii) The extent to which the requestor's/petitioner's participation may reasonably be expected to assist in developing a sound record.

10 C.F.R. § 2.309(c)(1). While petitioners must show "favorable balance among the following factors," the first factor is given the most weight.<sup>31</sup> If a petitioner cannot show good cause, the balance of the other factors must be "compelling." *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 & 3), CLI-05-24, 62 NRC 551, 565 (2005).

Citizens argue that while they do not have to meet the § 2.309(c)(1) balancing test, they still meet the requirements. Motion at 16. Nevertheless, although Citizens have "addressed" each of the eight factors, the motion to reopen and petition to add a new contention should be denied because the requirements do not balance in favor of admission.<sup>32</sup>

A. Citizens Have Not Demonstrated Good Cause for Failure to File a New Contention on Time

Citizens claim good cause by stating that "they could not have filed the proposed contention before the NRC Staff issued its notification on April 3, 2008, and they have filed this

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<sup>31</sup> *Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), LBP-05-32, 62 NRC 813 (2005) (citing *State of New Jersey* (Department of Law and Public Safety), CLI-93-25, 38 NRC 289, 296 (1993)); *Vermont Yankee* LBP-06-14, 63 NRC at 581.

<sup>32</sup> The Staff does not contest Citizens' arguments regarding 10 C.F.R. § 2.309(c)(1)(ii)-(iv) requirements as Boards have previously found these criteria to be "not particularly 'applicable' given that they focus on the status of the requestor/petitioner seeking admission to a proceeding (e.g., standing, nature of the requestor/petitioner's affected interest) rather than on new contentions submitted by admitted parties." *Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), LBP-06-14, 63 NRC 568, 581 (2006). Further, the Staff does not contest Citizens on § 2.309(c)(1)(vi) because they have shown that their "interests are not adequately represented by the other parties" since they are the only intervenors remaining in the proceeding. *Id.* Finally, the Staff does not contest Citizens on § 2.309(c)(v) or (viii); however, the Staff maintains that given the weight afforded the good cause and broadening/delaying factors, Citizens have failed to pass the balancing test.

motion promptly thereafter.” Motion at 17. However, as explained above in Section I.B. (discussing 10 C.F.R. § 2.326(a)(1)), information sufficient to put Citizens on notice about the simplified CUF calculations was available by early February, 2008. Therefore, Citizens fail to show good cause.

B. Granting Citizens’ Motion to File a New Contention Will Broaden the Issues and Delay the Proceedings

Although the Commission does not afford 10 C.F.R. § 2.309(c)(1)(vii) the same amount of weight as the good cause factor, the Commission has placed a significant amount of weight on this factor due to the “policy of expediting the handling of license renewal applications – which rests on the lengthy lead time necessary to plan available sources of electricity.” *Millstone*, CLI-05-24, 62 NRC at 566-67. Where the granting of a petition to reopen the record and add a new contention would “necessarily broaden the issues . . . and delay the proceeding” thus requiring “the reopening [of] a closed administrative adjudicatory record” the Commission has found § 2.309(c)(1)(vii) to weigh against the petitioner. *Id.* at 566. Further, a Licensing Board in the *Vermont Yankee* case expanded on this idea when it declined to admit a new, late-filed contention even before the hearing had begun, stating:

Among the remaining factors, NEC’s greatest stumbling block is 10 C.F.R. § 2.309(c)(1)(vii) - the fact that admission of this nontimely contention at this late date will substantially broaden and delay this proceeding. If NEC Contention 5 were admitted, the Board either would be forced to significantly delay the litigation and hearing on the admitted contentions, or would need to set a second, later schedule for the litigation of Contention 5. NEC’s suggestion that the new contentions could be admitted without substantially disrupting the existing schedule is plainly wrong.

*Vermont Yankee LBP-06-14*, 63 NRC at 581 (internal citations omitted).

Citizens apparently do not contend that the addition of this new contention will not broaden the issues. Considering that the one admitted, argued, decided, and appealed contention concerns the drywell shell and that this proposed new contention relates to metal fatigue and CUF calculations, admitting this new contention would most certainly broaden the

issue.

To counter this, Citizens assert that “if AmerGen performs a *satisfactory* confirmatory analysis for all the components for which it used the simplified fatigue analysis and *properly* amends the fatigue monitoring program, [Citizens’] request will not unduly delay this proceeding because AmerGen will be able to move for summary disposition of the proposed contention or argue that it has become moot.” Motion at 18 (emphasis added). However, their reasoning depends on two events happening that meet their requirements: (1) Citizens’ concession that the confirmatory analysis is satisfactory and (2) Citizens’ concession that AmerGen’s LRA amendment is proper. Should neither of those occur, the proceeding will most certainly be delayed far beyond the Commission’s schedule for issuing the renewed license. Further, even if Citizens’ two requirements are addressed to their satisfaction and the issue can be resolved on summary disposition, that process would still take time, thus significantly delaying the proceeding. Finally, there is nothing that would bind Citizens to their current statement that they would be amenable to summarily disposing of this contention should that criteria be met. Thus, the addition of this contention would broaden the issues and delay the proceeding.

Therefore, by failing to first meet the good cause requirement and then to demonstrate a “compelling” balance of the other factors, *Millstone*, CLI-05-24, 62 NRC at 565, Citizens have not satisfactorily met the eight-factor balancing test.

### III. Citizens’ New Contention Is Inadmissible

In their Motion, Citizens propose to add a late-filed contention. See Motion at 11-12. As discussed earlier, the proposed contention has three parts: (1) the predictions of metal fatigue for at least the recirculation nozzles at Oyster Creek are not conservative, therefore, a confirmatory analysis using a conservative method is required to establish whether these nozzles could exceed allowable metal fatigue limits during the period of extended operation; (2) similar confirmatory analyses should be carried out for other structures for which the non-conservative analysis was used; (3) the current stress-based metal fatigue monitoring program

at Oyster Creek is inadequate because it relies upon non-conservative analysis techniques. See Motion at 12.

In order to be admissible, Citizens' contention must satisfy the requirements not only of § 2.309(c), in accordance with § 2.326(d), but also of 10 C.F.R. § 2.309(f)(1)<sup>33</sup> and § 2.309(f)(2).<sup>34</sup> In addition, because the record in this proceeding is closed, Citizens must set forth the basis of their contention with "a degree of particularity in excess of the basis and specificity requirements contained in 10 C.F.R. § 2.714(b) [now § 2.309(f)(1)] for admissible contentions." *Diablo Canyon*, ALAB-775, 19 NRC at 1366. Evidence in support of Citizens' new contention must "be more than mere allegations; it must be tantamount to evidence." *Id.* In other words, the evidence must comport with the requirements for admissible evidence at hearing in § 2.337—it must be relevant, material, and reliable. See *id* at 1366-67.

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<sup>33</sup> Section 2.309(f)(1) requires a petition to file a new contention to:

- (i) Provide a specific statement of the issue of law or fact to be raised or controverted;
- (ii) Provide a brief explanation of the basis for the contention;
- (iii) Demonstrate that the issue raised in the contention is within the scope of the proceeding;
- (iv) Demonstrate that the issue raised in the contention is material to the findings the NRC must make to support the action that is involved in the proceeding;
- (v) Provide a concise statement of the alleged facts or expert opinions which support the requestor's/petitioner's position on the issue and on which the petitioner intends to rely at hearing, together with references to the specific sources and documents on which the requestor/petitioner intends to rely to support its position on the issue; and
- (vi) Provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact.

<sup>34</sup> Because the initial time for filing contentions in this proceeding is long since past, Citizens' new proposed contention must satisfy § 2.309(f)(2). Section 2.309(f)(2) provides after the initial filing, contentions may be amended or new contentions filed only with leave of the presiding officer upon a showing that:

- (i) The information upon which the amended or new contention is based was not previously available;
- (ii) The information upon which the amended or new contention is based is materially different than information previously available;
- (iii) The amended or new contention has been submitted in a timely fashion based on the availability of the subsequent information.

10 C.F.R. § 2.309(f)(2).

A. Citizens Fail to Meet the Requirements of § 2.309(f)(2)

Citizens assert that their new contention meets the requirements of § 2.309(f)(2)(i) and (ii) because it is based on new information that was not previously available and is materially different than information previously available. They assert that their contention also meets § 2.309(f)(2)(iii) because it was filed within 30 days of the date of the Notification, a time period which the Commission has found acceptable. Motion at 15. However, neither of Citizens' interpretations of the facts is correct and none of the three parts of their contention meets the requirements of § 2.309(f)(2)(i)-(iii).

The first part of Citizens' new contention alleges that because the predictions of metal fatigue for at least the recirculation nozzles at Oyster Creek are not conservative, a confirmatory analysis using a conservative method is required. This part of the contention does not satisfy § 2.309(f)(2) because it is not based on new information that materially differs from previously available information. Citizens rely on the Notification to satisfy the requirements of § 2.309(f)(2). Motion at 15. The Notification, however, did not provide new information materially different than information previously available. As discussed above, the information that Oyster Creek used the simplified methodology was available no later than January 2008 and the Staff concern that the methodology might not provide conservative results has long been available. Further, the assertion is based in large part on Oyster Creek's CUFen calculations, which have been available since 2006, and the results of Vermont Yankee's confirmatory analysis, which were available in February 2008. Thus, Citizens' claim in support of their contention that analysis of Oyster Creek's recirculation nozzle using a conservative method might result in a 40% higher CUFen is based not on the Notification, but on the results of Vermont Yankee's confirmatory analysis, and, therefore, is not timely.

The second part of Citizens' new contention, which alleges that "similar confirmatory analyses should be carried out for other structures for which the non-conservative analysis was used," Motion at 12, is also inadmissible because Citizens have not demonstrated that this

assertion is based on new and materially different information. While Citizens' Motion alleges that at a January 8, 2008 "hearing related to the Vermont Yankee proceeding, a consultant stated that it had used the same simplified methods to calculate fatigue for the feedwater and spray nozzles at Vermont Yankee and Oyster Creek," Motion at 6, Dr. Hopenfled, who actually attended the event, declares that "the consultant that did the metal fatigue analysis for Vermont Yankee, [] stated that the simplified methodology was also used by Oyster Creek." Hopenfled Declaration ¶4. Thus, the assertion in Citizens' Motion is wholly unsupported. Furthermore, the Staff's Notification stated that Oyster Creek used the simplified method for only one type of nozzle. Without any factual support, Citizens have failed to demonstrate that this assertion is based on new information.

The third part of Citizens' new contention, which alleges that the current stress-based metal fatigue monitoring program at Oyster Creek is inadequate because it relies upon non-conservative analysis techniques, also fails to meet the requirements of § 2.309(f)(2). In support of this assertion, Citizens reference Section 4.3.1 of Oyster Creek's LRA, which states that Oyster Creek's fatigue monitoring program uses the simplified method to monitor metal fatigue, and that "[b]ecause the NRC has now concluded that this approach is inadequate, the entire stress-based fatigue monitoring program at Oyster Creek . . . must be reassessed." Hopenfled Declaration ¶10. The information in Oyster Creek's LRA is not new, and the Staff's Notification, which is allegedly the basis for Citizens' new contention, concerned the use of a simplified method to calculate CUFs and stated that the use of a simplified method to calculate CUFs *may* not be conservative. Contrary to Dr. Hopenfled's assertions in ¶¶5 and 10 of his Declaration, the Staff did not conclude that the simplified analysis to monitor metal fatigue is inadequate. As discussed at Part I.C., *supra*, Dr. Hopenfled provides no viable basis for his assertion that the NRC has deemed AmerGen's approach to stress-based metal fatigue monitoring to be inadequate. Thus, this portion of Citizens' new contention is inadmissible

because Citizens have not demonstrated that this assertion is based on new information that was not previously available and its only support is a baseless allegation.

B. Citizens Fail to Meet the Requirements of § 2.309(f)(1)

Because Citizens have failed to meet the requirements of § 2.309(f)(2) for admission of late-filed contentions, there is no need to consider whether Citizens' new contention meets the requirements of § 2.309(f)(1). Nevertheless were the Commission to find that Citizens have met the reopening standard of § 2.326 (including a finding that the balancing test of § 2.309(c) favored admitted a new contention) and that Citizens' new contention satisfies § 2.309(f)(2), the Commission must also find that the requirements of § 2.309(f)(1) are satisfied.

Citizens' new contention asserts that "similar confirmatory analyses should be carried out for other structures for which the non-conservative analysis was used." Motion at 12. As stated above, this assertion is pure speculation. In the absence of evidence that Oyster Creek used the simplified methodology on any structure other than the recirculation nozzles, Citizens have failed to provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of fact, as required by § 2.309(f)(vi). Therefore, this portion of their contention is inadmissible.

Citizens' new contention also asserts that Oyster Creek's current stress-based metal fatigue monitoring program is inadequate and does not satisfy the requirements of 10 C.F.R. § 54.21(c)(1)(iii) because it relies upon non-conservative analysis techniques. Motion at 12. Here again, Citizens have failed to demonstrate a genuine dispute with the applicant or the application as required by § 2.309(f)(vi). Citizens have also failed to satisfy § 2.309(f)(iv) by showing that the issue raised is material to the findings the Staff must make to support renewal of Oyster Creek's operating license. As explained above in Sections I.C. and III.A., AmerGen has used its stress-based monitoring program solely for the Oyster Creek feedwater nozzle, a component for which AmerGen has also performed a fatigue calculation that can serve on its own to satisfy the relevant license renewal requirements for this nozzle. AmerGen has not

indicated that it used the simplified method for this feedwater nozzle calculation,<sup>35</sup> Citizens have provided no basis to conclude otherwise, and the Staff's Notification raised no concerns regarding this nozzle.<sup>36</sup> Because Citizens have thus challenged only one of the two independently sufficient means by which AmerGen seeks to demonstrate § 54.21(c)(1) compliance with respect to the feedwater nozzle, Citizens have failed to raise a genuine dispute on a material issue of law or fact. Thus, this portion of Citizens' new contention is inadmissible.

Finally, Citizens' new contention appears to be a contention of omission. The Commission distinguishes contentions that merely allege an omission of information from those that make specific, substantive challenges to how particular information is discussed in an application. *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 & 2; Catawba Nuclear Station, Units 1 & 2), CLI-02-28, 56 NRC 373, 382-83 (2002). Where contentions allege the "omission of particular information or an issue from an application, and the information is later supplied by the applicant . . . the contention is moot." *Id.* at 383; *see also Vermont Yankee*, LBP-05-24, 62 NRC 429; *Duke Cogema Stone & Webster* (Savannah River Mixed Oxide Fuel Fabrication Facility), LBP-04-9, 59 NRC 286 (2004); *Duke Energy Corp.* (Catawba Nuclear Station, Units 1 & 2), LBP-04-7, 59 NRC 259 (2004). Thus this portion of Citizens' contention would likely become moot once the Staff carries out its plan to request that AmerGen provide a confirmatory calculation.

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<sup>35</sup> Fair Affidavit ¶10.

<sup>36</sup> See Notification.

CONCLUSION

For the reasons set forth above, the Commission should deny Citizens' Motion.

Respectfully submitted,



Mary C. Baty  
Counsel for NRC Staff



James E. Adler  
Counsel for NRC Staff



Kimberly A. Sexton  
Counsel for NRC Staff

Dated at Rockville, Maryland  
this 28th day of April 2008

April 28, 2008

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of )  
 )  
AMERGEN ENERGY COMPANY, LLC ) Docket No. 50-219-LR  
 )  
(Oyster Creek Nuclear Generating Station) )

AFFIDAVIT OF JOHN R. FAIR

I, John R. Fair, do hereby declare under penalty of perjury that the following statement and my attached statement of my professional qualifications are true and correct to the best of my knowledge and belief:

1. My name is John R. Fair. I am employed by the U.S. Nuclear Regulatory Commission as a Senior Mechanical Engineer in the Office of Nuclear Reactor Regulation's Division of Engineering.
2. The purpose of this affidavit is to address the "Motion by Nuclear Information and Resource Service [et al.] to Reopen the Record and For Leave to File a New Contention, and Petition to Add New Contention" dated April 18, 2008 ("Motion"). I will explain the basis for the staff's conclusion of the low safety significance stated in the "Memorandum from Samson S. Lee, Acting Director of the Division of License Renewal, to the Commissioners, Atomic Safety and Licensing Board, and the parties," dated April 3, 2008 ("Notification"), notifying the Commission of Oyster Creek's use of a simplified method to calculate the cumulative usage factor (CUF) for the reactor recirculation nozzle, and I will further address why this issue does not present a significant safety issue.
3. I was involved in the preparation of the Notification and I have read Citizens' April 18, 2008 Motion, including the Declaration of Dr. Joram Hopenfeld.

4. The issue involves the fatigue analysis of the low alloy steel reactor pressure vessel recirculation outlet nozzles considering the effects of the reactor coolant system environment on their fatigue life. The effects of the reactor water environment were evaluated by AmerGen using correlations developed by Argonne National Laboratory published in NUREG/CR-6583, "Effects of LWR Environments on Fatigue Design Curves of Carbon and Low-Alloy Steels," March 1998 (ML031480391). The original fatigue analysis of the reactor pressure vessel components did not include the effects of the reactor water environment discussed in NUREG/CR-6583.
5. Section III of the American Society of Mechanical Engineers (ASME) Boiler & Pressure Vessel Code contains fatigue curves used for the design reactor pressure vessel components. The ASME Code does not require that the fatigue analysis include a correction to account for the effects of the reactor water environment. NUREG/CR-6583 indicates that the ASME design fatigue curves were based primarily on the testing of small polished specimens in air. The best-fit curves to the experimental data were lowered by a factor of 2 on stress or 20 on cycles, whichever was more conservative, to obtain the design curves. These adjustments were made to account for the difference between small test specimens and actual reactor components and to account for the experimental data scatter. Later specimen tests in simulated reactor coolant system environments found that the fatigue lives could be much shorter than those obtained from corresponding tests in air. This raised a concern as to whether existing components in operating plants had adequate fatigue lives.
6. The staff developed Generic Safety Issue (GSI) 166, "Adequacy of Fatigue Life of Metal Components," in order to address the concern regarding the fatigue life of components in reactor water environments. Idaho National Engineering Laboratory evaluated several components at seven nuclear power plants to assess the significance of the issue and published the results of the evaluations in NUREG/CR-6260, "Application of NUREG/CR-

5999 Interim Fatigue Curves to Selected Nuclear Power Plant Components," March 1995 (ML031480219). The staff conclusions regarding the evaluation were documented in SECY-95-245, "Completion of the Fatigue Action Plan," September 25, 1995 (ML031480210). SECY-95-245 indicated that there may be some locations at which the ASME Code fatigue limit of 1.0 may be exceeded prior to the end of the current design life using fatigue curves that account for reactor coolant environments. SECY-95-245 further stated, "The NRC Office of Nuclear Regulatory Research (RES) risk study indicates that a fatigue failure of piping is not a significant contributor to the core-melt frequency." SECY-95-245 used the term core-melt frequency which is the same as core damage frequency (CDF). CDF was the measure used to assess the safety significance of the concern. The RES risk study result is due to contributing reasons in the risk assessment which include the fact that while fatigue cracks may occur if the CUF exceeds 1.0, they may not propagate through the pressure boundary leading to leakage or failure of the component and, even if failure of the component did occur, safety systems, such as the emergency core cooling system (ECCS), mitigate the consequences. The staff did not recommend further actions to address environmental fatigue at operating plants because the risk study indicated that the environmental fatigue issue was not a significant safety concern. However, SECY-95-245 indicated that the staff would consider the need to evaluate a sample of components with high fatigue usage for any proposed period of extended operation.

7. The staff developed GSI-190, "Fatigue Evaluation of Metal Components for 60-year Plant Life," in order to assess the issue of the fatigue life of components in reactor water environments for the license renewal period of extended operation. Pacific Northwest National Laboratory performed a risk assessment that included most locations evaluated in NUREG/CR-6260 and published the results in NUREG/CR-6674, "Fatigue Analysis of Components for 60-Year Plant Life", June 2000 (ML003724215). The staff's conclusions

from the study were documented in a memorandum to W. Travers from A. Thadani, "Closeout of Generic Safety Issue 190, 'Fatigue of Metal Components for 60-Year Plant Life,'" December 26, 1999 (ML031480383). Attachment 1 of the memorandum concluded that the estimated contribution to CDF from fatigue failures of the evaluated components was small even though several components had estimated 60-year CUFs above the ASME Code fatigue limit of 1.0. The reason for the small CDF contribution was that the consequence of exceeding the ASME Code fatigue limit of 1.0 is an increased probability of initiating a small, 1/8 inch deep, fatigue crack. The probability that this small crack, if initiated, would grow to a size that would challenge plant safety systems was low. The more probable scenario was that, if a fatigue crack initiated and grew through the pressure boundary, a small leak would occur that would be detected and repaired. A small leak would not present a challenge to the plant safety systems. The GSI-190 study reaffirmed the SECY-95-245 conclusion that fatigue failure of the piping is not a significant safety concern. The closeout memorandum recommended applicants address the effects environment on the fatigue life of components as aging management programs for license renewal because of the potential for an increase frequency of pipe leaks as plants continue to operate.

8. Several components evaluated in the NUREG/CR-6674 study had estimated CUFs that were well above the ASME Code limit of 1.0 when the effect of the environment was included. The older vintage BWR reactor vessel feedwater nozzle had an estimated 60-year CUF of 4.75 for 60 years. However, even with this high usage factor, the estimated CDF was negligible. The negligible CDF results, in part, from the low probability that a small fatigue crack would grow through the thick nozzle to a size that would challenge plant safety systems, even though there is a relatively high probability of initiating a fatigue crack at a CUF of 4.75.
9. The Commission Notification referred to Oyster Creek's use of a simplified method to

calculate the CUF for the reactor recirculation nozzle. The concern was that the simplified method used to calculate the CUF may not be conservative. However, a recent detailed analysis of a Vermont Yankee reactor vessel feedwater nozzle was performed in an attempt to confirm that the simplified method provided acceptable results. The results of the detailed analysis indicated that simplified method could under-predict the CUF by 40%. The detailed confirmatory analysis still demonstrated that the nozzle had an acceptable CUF. If the Oyster Creek reactor vessel recirculation nozzle CUF was under-predicted by a similar amount, the resulting CUF would be less than 1.4, and would be well within the CUF values evaluated in the NUREG/CR-6674 risk study. The CUF of 1.4 would result in a lower probability of fatigue crack initiation than the CUF of 4.75 reported for the feedwater nozzle evaluated in NUREG/CR-6674. On the basis of risk assessment performed in NUREG/CR-6674, I concluded that the potential under-prediction of the reactor vessel recirculation nozzle CUF does not present a significant safety concern.

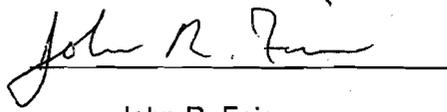
10. The Hoppenfeld Declaration at paragraph 10 asserts that the NRC has concluded that the approach used at Oyster Creek in its fatigue monitoring program to track stress histories is inadequate. Table 4.3.1-2 of the Oyster Creek LRA lists the fatigue monitoring locations for the reactor pressure vessel components. The only component identified by AmerGen where stress time history is being monitored is the feedwater nozzle. The NRC has not concluded that the approach used to track stress histories at Oyster Creek is inadequate. AmerGen monitors cycles at the other locations. AmerGen's May 1, 2006 response to additional information (ML061240217) described its analysis of the feedwater nozzle. The projected 60-year CUF from this analysis was within the acceptance criteria of 1.0. Therefore, AmerGen performed a calculation to demonstrate that the fatigue usage of the feedwater nozzle was acceptable for the period of extended operation in accordance with 10 CFR 54.21(c)(1)(ii). AmerGen committed to monitor the feedwater nozzle to provide additional assurance that the fatigue usage will remain within acceptable limits for the period

of extended operation. The only component identified by AmerGen where the simplified analysis methodology was used to demonstrate that the fatigue usage would remain within acceptable limits for the period of extended operation was the reactor vessel recirculation outlet nozzle. The NRC staff has requested that AmerGen perform a confirmatory analysis of the reactor vessel recirculation outlet nozzle to demonstrate the adequacy of the calculation.

11. The Hoppenfeld Declaration at paragraph 11 asserts that non-conservative assumptions were used in the calculation of the environmental correction factor. The Declaration cites a statement from NUREG/CR-6909, "Effect of LWR Coolant Environments on the Fatigue Life of Reactor Vessel Material," February 2007 (ML070660620), but does not show the relevance of this statement to the Oyster Creek calculation. The staff discussed the basis for the environmental correction factors in Section 4.3 of "Safety Evaluation Report Related to the License Renewal of Oyster Creek Generation," available at ML070890637. The Declaration further asserts that the calculation did not adequately differentiate between laboratory and reactor conditions. As discussed in my affidavit at paragraph 5, the ASME design curves account for the difference between small laboratory test specimens and reactor components for air environments. The environmental correction factor, which is applied to the CUF calculated using the ASME design curves, accounts for the difference between the fatigue life in an air environment and the fatigue life in a reactor coolant system environment.

12. In conclusion, the use of a simplified method to calculate the cumulative usage factor for the reactor recirculation nozzle does not present a significant safety issue. Moreover, a recent analysis of a Vermont Yankee reactor vessel nozzle was performed in confirming that the simplified method provided acceptable results. A requested confirmatory analysis of the Oyster Creek reactor nozzle should also serve to demonstrate the adequacy of the simplified calculation.

This affidavit was executed this 28<sup>th</sup> day of April, 2008, at Rockville, Maryland.

A handwritten signature in cursive script, reading "John R. Fair", is written above a solid horizontal line.

John R. Fair

**John R. Fair**  
**Statement of Professional Qualifications**

**CURRENT POSITION:**

Senior Mechanical Engineer: Division of Engineering, Office of Nuclear Reactor Regulation,  
U.S. Nuclear Regulatory Commission, Rockville, MD

**EDUCATION:**

B.S. Mechanical Engineering, University of Maryland, 1972  
M.S. Mechanical Engineering, University of Maryland, 1973  
Advanced Graduate Studies, Engineering Mechanics, University of Maryland, 1975-76

**SUMMARY:**

Over 35 years of experience in the nuclear power industry, including 31 years at the Nuclear Regulatory Commission. Significant experience in the following areas:

- Development of staff technical position regarding fatigue evaluation of ASME Code components
- Member of ASME Code working groups on seismic design environmental fatigue
- Review of topics related to the mechanical design of ASME Code components
- Review of fatigue TLAA evaluations for several license renewal applications
- Design analysis of ASME Code and ANSI B31.1 piping systems

**EXPERIENCE:**

**U.S. Nuclear Regulatory Commission, 1977 - Present**

**1990-present Senior Mechanical Engineer - Office of Nuclear Reactor Regulation**

- Responsible for review and preparation of safety evaluation reports on topics related to the mechanical design of components at nuclear power plants
- The primary areas of review include ASME Code analyses of components (including the fatigue analyses of Class 1 components) and the seismic analysis of piping systems
- Participated as a member of ASME special working groups developing piping seismic design criteria and component fatigue design criteria
- Developed a Commission paper to address technical concerns related to the fatigue analysis of nuclear power plant components (SECY-95-245)
- Presented and defended NRC staff positions regarding mechanical design criteria at numerous ACRS and public meetings
- Developed NRC review criteria for license renewal fatigue evaluations

- Provided technical input for the update of licensing guidance documents related to the design of mechanical components, including development of a new SRP section to address piping design acceptance criteria

**1987-1990 Senior Mechanical Engineer - Office of Special Projects**

- Responsible for review and preparation of safety evaluation reports related to the restart and licensing of TVA nuclear power plants
- Lead several team inspections of TVA's mechanical and civil/structural design calculation reconstitution effort at the Sequoyah, Browns Ferry and Watts Bar nuclear power plants

**1981-1987 Senior Mechanical Engineer - Office of Inspection and Enforcement**

- Responsible for review of events reported at nuclear power plants in the area of mechanical engineering
- Developed bulletins and address safety concerns identified at operating nuclear power plants
- Provided technical support to regions and other NRC offices in the area of mechanical component and piping design

**1978-1981 Senior Mechanical Engineer - Office of Nuclear Reactor Regulation**

- Responsible for review and preparation of safety evaluation reports related to issues identified at operating nuclear power plants
- Developed the criteria for the evaluation of pipe supports using concrete expansion anchor bolts (NRC Bulletin 79-02)

**1977-1978 Mechanical Engineer - Office of Standards Development**

- Responsible for the development of rules and regulatory guides for nuclear power plants in the area of mechanical engineering

**Bechtel Power Corporation 1974-1977, Senior Mechanical Engineer**

- Responsible for ASME and ANSI B31.1 design and evaluation of nuclear power plant piping systems
- Developed a design guide for the routing and evaluation of small bore piping
- Performed as-built inspections of installed piping systems
- Resolved thermal expansion measurement discrepancies identified during the Hatch Nuclear Plant, Unit 1 startup thermal monitoring program

**University of Maryland 1972-1973, Graduate Teaching Assistant**

- Responsible for teaching fluid mechanics laboratory courses

**MPR Associates, 1971-1973, Engineering Aide (part-time)**

- Performed structural analysis of nuclear power plant components

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE COMMISSION

In the Matter of )  
 )  
AMERGEN ENERGY COMPANY, LLC ) Docket No. 50-219-LR  
 )  
(Oyster Creek Nuclear Generating Station) )

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF'S RESPONSE IN OPPOSITION TO CITIZENS' MOTION TO REOPEN THE RECORD AND FOR LEAVE TO FILE AND ADD A NEW CONTENTION" and "AFFIDVAIT OF JOHN R. FAIR" in the above-captioned proceeding have been served on the following by electronic mail with copies by deposit in the NRC's internal mail system or, as indicated by an asterisk, by electronic mail, with copies by U.S. mail, first class, this 28th day of April 2008.

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Counsel for the NRC Staff