

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

COMMISSIONERS:

Dale E. Klein, Chairman  
Gregory B. Jaczko  
Peter B. Lyons  
Kristine L. Svinicki

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In the Matter of )

AMERGEN ENERGY COMPANY, LLC<sup>1</sup> )

(License Renewal for Oyster Creek Nuclear )  
Generating Station) )

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) Docket No. 50-219-LR  
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**CLI-09-07**

**MEMORANDUM AND ORDER**

Nuclear Information and Resource Service, 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

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<sup>1</sup> Applicant AmerGen Energy Company (AmerGen) merged into its parent, Exelon Generation Company, LLC (Exelon), and ceased to exist as a separate entity on January 8, 2009. The operating license for the Oyster Creek Nuclear Generating Station was amended to reflect the transfer of the operating license to Exelon on that date. See Letter to Mr. Charles G. Pardee, Chief Nuclear Officer, AmerGen Energy Company, LLC from Christopher Gratton, Senior Project Manager, Division of Operating Reactor Licensing, Office of Nuclear Reactor Regulation, Subject: *Clinton Power Station, Unit 1; Oyster Creek Nuclear Generating Station; and Three Mile Island Nuclear Generating Station, Unit 1 — Issuance of Conforming Amendments Re: Direct Transfer of Facility Operating License to Exelon Generation Company, LLC (TAC Nos. MD9012, MD9013, and MD9014) (with enclosures)*, available at ADAMS Accession No. ML082770568. For purposes of convenience and ease of reference to prior decisions and pleadings, we generally refer to the Applicant as “AmerGen” in today’s decision.

(collectively, Citizens) have petitioned for Commission review of the Initial Decision of the Atomic Safety and Licensing Board, as well as “the many interlocutory decisions in this proceeding.”<sup>2</sup> In its decision, LBP-07-17,<sup>3</sup> the Board rejected Citizens’ challenge to the renewal of AmerGen’s operating license for its Oyster Creek Nuclear Generating Station (Oyster Creek). AmerGen<sup>4</sup> and the NRC Staff<sup>5</sup> filed answers opposing the petition for review. Citizens replied to AmerGen’s and the Staff’s filings.<sup>6</sup>

As part of our review of Citizens’ Petition and the Board’s decision in LBP-07-17, in CLI-08-10 we requested additional briefs<sup>7</sup> on a single limited issue derived from a discussion contained in an “Additional Statement”<sup>8</sup> appended to LBP-07-17 by Judge

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<sup>2</sup> *Citizens’ Petition for Review of LBP-07-17 and the Interlocutory Decisions in the Oyster Creek Proceeding* (Jan. 14, 2008) (Petition). Initially, petitioners referred to themselves collectively as “NIRS” — for ease of reference we use their later choice, “Citizens,” throughout this decision.

<sup>3</sup> *AmerGen Energy Co. LLC (Oyster Creek Nuclear Generating Station)*, LBP-07-17, 66 NRC 327 (2007).

<sup>4</sup> *AmerGen’s Answer Opposing Citizens’ Petition for Review of LBP-07-17 and the Interlocutory Decisions in the Oyster Creek Proceeding* (Jan. 24, 2008) (AmerGen Answer).

<sup>5</sup> *NRC Staff’s Answer to Citizens’ Petition for Review of LBP-07-17* (Jan. 24, 2008) (Staff Answer).

<sup>6</sup> *Citizens’ Consolidated Reply Regarding Petition for Review of LBP-07-17 and the Interlocutory Decisions in the Oyster Creek Proceeding* (Jan. 29, 2008) (Citizens’ Reply).

<sup>7</sup> CLI-08-10, 67 NRC 357 (2008).

<sup>8</sup> LBP-07-17 at 373 (Additional Statement).

Baratta (who joined with his colleagues in the decision). Citizens,<sup>9</sup> AmerGen<sup>10</sup> and the NRC Staff<sup>11</sup> all filed initial and reply briefs in response to the Commission's request. We referred the limited issue specified in CLI-08-10 and addressed in these briefs to the Board for resolution.<sup>12</sup> The Board heard oral argument on the issue<sup>13</sup> and received supplemental briefs after the argument from Citizens,<sup>14</sup> AmerGen,<sup>15</sup> and the NRC Staff.<sup>16</sup> The Board subsequently issued a Memorandum<sup>17</sup> presenting its recommendations to the Commission (Advisory Memorandum), with a "Separate Advisory Opinion of Judge Abramson" (Separate Opinion) appended to it.

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<sup>9</sup> *Citizens' Response to Commission Order Dated May 28, 2008* (June 11, 2008) (Citizens' June 11 Brief); *Nuclear Information and Resource Service, Jersey Shore Nuclear Watch, Grandmothers, Mothers and More for Energy Safety, New Jersey Public Interest Research Group, New Jersey Sierra Club and New Jersey Environmental Federation (Collectively "Citizens") Reply to NRC Staff and AmerGen Responses to Commission Order Dated May 28, 2008* (June 18, 2008).

<sup>10</sup> *AmerGen's Initial Brief in Response to CLI-08-10* (June 11, 2008); *AmerGen's Reply to Citizens' Response to CLI-08-11* (June 18, 2008).

<sup>11</sup> *NRC Staff's Brief Responding to the Commission's Order* (June 11, 2008); *NRC Staff's Reply in Response to Citizens' Response to Commission Order Dated May 28, 2008* (June 18, 2008).

<sup>12</sup> Order (Aug. 21, 2008) (unpublished) (August 21 Order) (ML082341051).

<sup>13</sup> See Tr. at 907-1048.

<sup>14</sup> *Citizens' Supplemental Brief Regarding Commission Questions on Structural Analysis and Board Follow Up Questions* (Oct. 1, 2008).

<sup>15</sup> *AmerGen's Supplemental Brief Following Oral Argument* (Oct. 1, 2008) (AmerGen Oct. 1 Supplemental Brief).

<sup>16</sup> *NRC Staff's Supplemental Brief on Commission-Referred Question* (Oct. 1, 2008).

<sup>17</sup> Memorandum (Addressing [t]he Issue Referred [b]y [t]he Commission Regarding [t]he Adequacy [o]f AmerGen's Proposed 3-D Finite Element Structural Analysis Studies) (Oct. 29, 2008) (unpublished) (ML083030436).

For the reasons stated below, and for the reasons given by the Board itself — reinforced by the Board's analysis in its Advisory Memorandum — we find the Board's decisions in LBP-07-17 reasonable and decline to disturb them.

## I. BACKGROUND

This proceeding arises from AmerGen's application to renew the operating license for its Oyster Creek plant, due to expire on April 9, 2009, for an additional twenty years.<sup>18</sup> The sole admitted contention relates to the adequacy of AmerGen's aging management program for the sand bed region of the steel drywell liner (or shell) that encloses the reactor. This drywell liner was the subject of corrective action in the late 1980s and early 1990s after corrosion was discovered in a region of the liner in contact with sand that became dampened when water leaked into the gap between the drywell liner and its surrounding concrete shield wall during refueling outages. At that time, the sand was removed, the corrosion was cleaned up, and a multi-layer epoxy sealant was applied to the affected region of the drywell liner. During refueling outages, prior to flooding the reactor cavity, the refueling cavity is now sealed with stainless steel tape and a strippable coating to prevent water from entering the gap between the drywell liner and the concrete shield wall.<sup>19</sup>

### A. Litigation History

Citizens first attempted to intervene in this proceeding in November 2005, submitting a contention challenging the drywell liner corrosion management program for

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<sup>18</sup> LBP-07-17, 66 NRC at 330.

<sup>19</sup> See *id.* at 330-34, for a more detailed description of the drywell shell and corrective actions taken to remedy the corrosion discovered in the late 1980s.

Oyster Creek's license extension.<sup>20</sup> The Board found that the contention was "overbroad to the extent it challenges AmerGen's aging management program above the sand bed region" but admitted a narrowed version of the contention.<sup>21</sup> At the same time, the Board also denied intervention to the State of New Jersey on its proposed contentions.<sup>22</sup>

In February 2006, Citizens filed a motion to add contentions or to supplement the basis of the admitted contention.<sup>23</sup> In this motion, Citizens asked that "previously unavailable information"<sup>24</sup> regarding problems with monitoring inaccessible areas of the drywell liner, as revealed in a conference call on modifying the Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants (SRP-LRA), NUREG-1800, Rev. 1, and the Generic Aging Lessons Learned (GALL) Report, NUREG-1801, Rev. 1,<sup>25</sup> "be added to the basis originally submitted for the initial contention," or alternatively, that two new contentions be admitted.<sup>26</sup> The Board denied Citizens' motion.<sup>27</sup> Essentially, since it had already admitted a contention challenging the adequacy of the program for monitoring corrosion in the sand bed region of the drywell

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<sup>20</sup> *Request for Hearing and Petition to Intervene* (Nov. 14, 2005), at 3.

<sup>21</sup> LBP-06-7, 63 NRC 188, 216 (2006).

<sup>22</sup> New Jersey's contentions are not part of today's decision.

<sup>23</sup> *Motion for Leave to Add Contentions or Supplement the Basis of the Current Contention* (Feb. 7, 2006).

<sup>24</sup> *Id.* at 10.

<sup>25</sup> *See id.*, Exh. B at 11-12.

<sup>26</sup> *Id.* at 10.

<sup>27</sup> LBP-06-11, 63 NRC 391 (2006).

liner, the Board viewed Citizens' motion as an effort to add a contention extending the monitoring to the regions above and below the sand bed region.<sup>28</sup> The Board denied a subsequent motion for reconsideration of this decision.<sup>29</sup>

Citizens "appealed" the Board decisions. We rejected Citizens' "appeal," which, we reasoned, should have been couched as a petition for interlocutory review under 10 C.F.R. § 2.341(f).<sup>30</sup> As noted in that decision, Citizens' appeal did not meet the standards for interlocutory review in any case.<sup>31</sup>

Citizens' next motion was to apply our Subpart G rules — providing for full-scale adversarial hearings — to this proceeding.<sup>32</sup> The Board found that Citizens did not meet the 10 C.F.R. § 2.310(d)<sup>33</sup> standard for a Subpart G hearing. The Board found, among other things, that Citizens' general assertion that AmerGen (and its parent company) are

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<sup>28</sup> *Id.* at 396 n.4. This Board decision is not challenged directly in the petition for review that we address today.

<sup>29</sup> Memorandum and Order (Denying NIRS's Motion for Reconsideration) (April 27, 2006) (unpublished). In denying Citizens' motion, the Board found that the 10 C.F.R. § 2.323(e) requirements for seeking reconsideration had not been met.

<sup>30</sup> CLI-06-24, 64 NRC 111 (2006).

<sup>31</sup> *Id.* at 126.

<sup>32</sup> *Motion to Apply Subpart G Procedures* (May 5, 2006).

<sup>33</sup> 10 C.F.R. § 2.310(d) provides:

In proceedings for the . . . renewal . . . of licenses or permits for nuclear power reactors, where the presiding officer by order finds that resolution of the contention or contested matter necessitates resolution of issues of material fact relating to the occurrence of a past activity, where the credibility of an eyewitness may reasonably be expected to be at issue, and/or issues of motive or intent of the party or eyewitness material to the resolution of the contested matter, the hearing for resolution of that contention or contested matter will be conducted under subpart G of this part.

not trustworthy did not satisfy the requirement that the contention involve “issues of material fact relating to the occurrence of a past activity, where the credibility of an eyewitness may reasonably be expected to be at issue.”<sup>34</sup> The Board noted that Citizens did not argue the alternative ground for a Subpart G hearing — that there were “issues of motive or intent of the party or eyewitness material to the resolution of the contested matter” — but found that Citizens would not have prevailed on that argument either.<sup>35</sup>

In April 2006 AmerGen filed a motion to dismiss Citizens’ admitted contention as moot, based on new ultrasonic testing commitments the company made on December 9, 2005, (“to perform a one-time [ultrasonic testing] examination of the sand bed region prior to the period of extended operation”) and April 4, 2006, (“to perform additional [ultrasonic testing] examinations in the sand bed region of the drywell *once every ten years during the period of extended operation*”).<sup>36</sup> The Board found that AmerGen’s commitment to perform periodic ultrasonic testing in the sand bed region of the drywell liner during the renewal period rendered Citizens’ original contention of omission moot.<sup>37</sup> The Board deferred issuing an order dismissing the proceeding, giving Citizens 20 days to file a new contention “raising a specific substantive challenge” to the new periodic ultrasonic testing program.<sup>38</sup>

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<sup>34</sup> 10 C.F.R. § 2.310(d).

<sup>35</sup> Memorandum and Order (Denying NIRS’ Motion to Apply Subpart G Procedures) (June 5, 2006) (unpublished) (Subpart G Decision).

<sup>36</sup> *AmerGen’s Motions to Dismiss Drywell Contention as Moot and to Suspend Mandatory Disclosures* (April 25, 2006) at 2-3 (emphasis in original).

<sup>37</sup> LBP-06-16, 63 NRC 737, 739, 745 (2006).

<sup>38</sup> *Id.* at 744.

Citizens filed a timely petition to add a new contention on June 23, 2006, and also filed a motion for leave to supplement this petition based on another new commitment regarding AmerGen's aging management program.<sup>39</sup> This AmerGen commitment was docketed on June 20, 2006, three days before the deadline set by the Board for Citizens' new petition. In it, AmerGen committed to "perform an additional set of [ultrasonic testing] measurements during the second refueling outage following the [ultrasonic testing] measurements that will be taken prior to the period of extended operation (*i.e.*, approximately four years after those pre-renewal period measurements)."<sup>40</sup> The Board granted the motion, but limited the supplement to new information in AmerGen's new commitment.<sup>41</sup>

Citizens' new contention, as later supplemented and reworded, read:

AmerGen must provide an aging management plan for the sand bed region of the drywell shell that ensures that safety margins are maintained throughout the term of any extended license, but the proposed plan fails to do so because the acceptance criteria are inadequate, the scheduled [ultrasonic testing] monitoring frequency is too low in the absence of adequate monitoring for moisture and coating integrity and is not sufficiently adaptive to possible future narrowing of the safety margins, the monitoring for moisture and coating integrity is inadequate, the response to wet conditions and coating failure is inadequate, the scope of the [ultrasonic testing] monitoring is insufficient to systematically identify and sufficiently test all the degraded areas of the shell in the sand bed region, the quality assurance for the measurements is inadequate, and

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<sup>39</sup> *Petition to Add a New Contention* (June 23, 2006); *Motion for Leave to Supplement the Petition* (June 23, 2006).

<sup>40</sup> *AmerGen's Answer to Citizens' Motion for Leave to Supplement the Petition* (June 27, 2006) at 2.

<sup>41</sup> *Order (Granting NIRS's Motion for Leave to Submit a Supplement to its Petition)* (July 5, 2006) at 3 (unpublished).



the methods proposed to analyze the [ultrasonic testing] results are flawed.<sup>42</sup>

For analytical convenience, the Board divided the contention into seven discrete challenges (reformulating the second challenge to eliminate overlap with the third challenge):

1. AmerGen's acceptance criteria are inadequate to ensure adequate safety margins.
2. AmerGen's scheduled [ultrasonic testing] monitoring frequency in the sand bed region is insufficient to maintain an adequate safety margin.
3. AmerGen's monitoring in the sand bed region for moisture and coating integrity is inadequate.
4. AmerGen's response to wet conditions and coating failure in the sand bed region is inadequate.
5. AmerGen's scope of [ultrasonic testing] monitoring is insufficient to systematically identify and sufficiently test all the degraded areas in the sand bed region.
6. AmerGen's quality assurance for the measurements in the sand bed region is inadequate.
7. AmerGen's methods for analyzing [ultrasonic testing] results in the sand bed region are flawed.<sup>43</sup>

The Board admitted challenge 2 and rejected all of the others:

1. Rejected. Information on the acceptance criteria was not "new"; analyses were the same as in the early 1990s.<sup>44</sup>
2. Admitted. The company's testing commitment was "new," an explanation was provided as required under 10 C.F.R. § 2.309(f), the contention is within the scope of the proceeding, the issue is material, the contention is supported by alleged facts and expert opinion, and there is a sufficient showing that a genuine dispute exists.<sup>45</sup>
3. Rejected. Information on the inspection program for the epoxy coating was not "new"; contention effectively challenges a

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<sup>42</sup> *Supplement to Petition to Add a New Contention* (July 25, 2006) at 7; LBP-06-22, 64 NRC 229, 233 (2006).

<sup>43</sup> LBP-06-22, 64 NRC at 236.

<sup>44</sup> *Id.* at 238-40.

<sup>45</sup> *Id.* at 240-44.

program described in the License Renewal Application. Since the inspection program conforms to NRC regulations, the contention was also an impermissible challenge to NRC regulations. Inspection program is not new — it is over a decade old. Improvements to an existing program cannot be challenged where the existing program was not challenged.<sup>46</sup>

4. Rejected. Bases largely the same as for 3.<sup>47</sup>
5. Rejected. Locations where measurements would be taken were known and have not changed, so the information was not “new.”<sup>48</sup>
6. Rejected. Information on the inspection program underlying the contention was not “new.” Current licensing basis is outside the scope of a license renewal proceeding. No identification of the portions of the license renewal application that Citizens disputes.<sup>49</sup>
7. Rejected. Knowledge of statistical techniques for analyzing the ultrasonic testing measurements was not “new.”<sup>50</sup>

Citizens sought reconsideration of the Board’s rejection of four of its proposed “contentions” (as divided by the Board).<sup>51</sup> The Board found that Citizens had not satisfied the requirements for seeking reconsideration.<sup>52</sup>

During Oyster Creek’s 2006 refueling outage, water was found in two trenches that had been excavated to permit AmerGen to take ultrasonic testing measurements. AmerGen deepened one of the trenches and took additional measurements. AmerGen concluded after analysis that the drywell liner would be sufficiently thick to remain safe even assuming a conservative (that is, relatively high) estimate on the rate of corrosion.

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<sup>46</sup> *Id.* at 244-48.

<sup>47</sup> *Id.* at 248-49.

<sup>48</sup> *Id.* at 249-51.

<sup>49</sup> *Id.* at 251-53.

<sup>50</sup> *Id.* at 254-55.

<sup>51</sup> The four “contentions” for which Citizens sought reconsideration were challenges 1, 5, 6, and 7, as numbered by the Board in LBP-06-22.

<sup>52</sup> Memorandum and Order (Denying Citizens’ Motion for Reconsideration) (Nov. 20, 2006) (unpublished).

Nonetheless, AmerGen made an additional commitment — this time to take comparative measurements in the same locations in these trenches.<sup>53</sup> Citizens asserted that this new monitoring plan was flawed and asked that two new contentions be admitted.<sup>54</sup> The Board found that both were untimely and would have been inadmissible even if timely.<sup>55</sup>

Later, the Board declined to admit yet another new contention proposed by Citizens.<sup>56</sup> Citizens requested that the following contention be admitted:

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<sup>53</sup> See Memorandum and Order (Denying Citizens' Motion for Leave to Add Contentions and Motion to Add Contention) (Feb. 9, 2007) at 3-5 (unpublished) (February 2007 Decision).

<sup>54</sup> *Motion for Leave to Add Contentions and Motion to Add Contentions* (Dec. 20, 2006). These two proposed contentions were:

1. The proposed [ultrasonic testing] monitoring program for the embedded region of the drywell shell is inadequate to ensure that safety margins will be maintained for any extended licensing period because the spatial scope of the monitoring is too restricted, a reasonable potential corrosion rate has not been developed, the proposed frequency of monitoring is not justified, and the monitoring could cease if AmerGen filled in the trench from which it proposes to do the monitoring. *Id.* at 4.
2. The proposed [ultrasonic testing] monitoring program for monitoring the lower portion of the [sand bed] region from the outside of the shell is inadequate to ensure that safety margins will be maintained for any extended licensing period because it fails to provide systematic monitoring of potential corrosion occurring from the inside of the drywell shell in the [sand bed] region. *Id.* at 5.

<sup>55</sup> With respect to timeliness, for both contentions the Board reasoned that information on corrosion in the embedded portion of the drywell liner was addressed in the GALL Report in 2005 and, as such, was not "new". Citizens should have challenged the first, "unenhanced" version of AmerGen's monitoring program, which would have been likewise inadequate. February 2007 Decision at 7-10, 16. With respect to admissibility, for both contentions the Board found that Citizens proffered inadequate facts and/or arguments to demonstrate a genuine dispute. *Id.* at 10-19.

<sup>56</sup> Memorandum and Order (Denying Citizens' Motion for Leave to Add a Contention and Motion to Add a Contention) (Apr. 10, 2007) (unpublished) (April 2007 Decision).

The computer modeling undertaken by General Electric, upon which the disputed acceptance criteria are based, used unjustified factors leading to underestimation of the uniform required thickness by over 0.108 inches and of the small area required thickness by over 0.082 inches. For this reason, the acceptance criterion for the average thickness of each bay of the drywell shell should be increased to around 0.844 inches to ensure that the applicable [American Society of Mechanical Engineers (ASME)] Code safety requirements are met or should be replaced with a set of criteria based on accurate and realistic three dimensional modeling of further degradation in the [sand bed]. For similar reasons, the acceptance criterion for small area thicknesses should be increased to at least 0.618 inches or integrated into the acceptance criteria derived from further three dimensional modeling.<sup>57</sup>

Citizens based this new contention on a Sandia National Laboratories (Sandia) study issued in January 2007, commissioned by the NRC's Office of Nuclear Reactor Regulation to evaluate conclusions reached by General Electric Nuclear Energy (GE) in a 1991 study of the structural integrity of the Oyster Creek drywell liner. The difference in the GE and Sandia calculations came from differences in the "capacity reduction factor" used; GE used an increased factor (.340 rather than the .207 factor Sandia used).<sup>58</sup> The Board found the proposed contention untimely because the increased capacity reduction factor used by GE was not new information.<sup>59</sup> The Board also considered the 10 C.F.R. § 2.309(c)(1) factors for late-filed contentions, finding no good cause for late filing, which tipped the balance against admitting the contention.<sup>60</sup>

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<sup>57</sup> *Motion for Leave to Add a Contention and Motion to Add a Contention* (Feb. 6, 2007) at 6.

<sup>58</sup> April 2007 Decision at 2-4.

<sup>59</sup> *Id.* at 6-7.

<sup>60</sup> *Id.* at 8-12.

After denying a motion made by AmerGen for summary disposition,<sup>61</sup> the Board clarified that at hearing Citizens' use of AmerGen's 2006 ultrasonic testing measurements as evidence regarding the frequency of the monitoring program would be limited to challenges related to the period of extended operation.<sup>62</sup> The Board also clarified that Citizens *could not* argue "that the methods of calculation or uncertainties contained in AmerGen's Statistical Analysis are inadequate, or that AmerGen must consider additional uncertainties in performing its analysis."<sup>63</sup> But, the Board stated, Citizens *was permitted* to "argue that AmerGen has not been consistent in applying the above-referenced Statistical Analysis and, accordingly, that AmerGen's asserted corrosion rate is suspect."<sup>64</sup>

Prior to the evidentiary hearing, the Board denied Citizens' motion to cross-examine AmerGen's witness, Mr. Peter Tamburro. The Board concluded that Citizens had not made the showing required under 10 C.F.R. § 2.1204(b)(3), which allows cross-examination by the parties only when the presiding officer decides that such cross-examination is "necessary to ensure an adequate record for decision." Citizens had the opportunity to provide proposed questions to the Board for the Board's use in conducting its cross-examination.<sup>65</sup> The Board also denied, in full, AmerGen's and the NRC Staff's

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<sup>61</sup> Memorandum and Order (Denying AmerGen's Motion for Summary Disposition) (June 19, 2007) at 14 (unpublished).

<sup>62</sup> Memorandum and Order (Clarifying Memorandum and Order Denying AmerGen's Motion for Summary Disposition) (July 11, 2007) at 4-5 (unpublished) (July 2007 Decision).

<sup>63</sup> *Id.* at 4.

<sup>64</sup> *Id.*

<sup>65</sup> Memorandum and Order (Ruling on Motion to Conduct Cross-Examination and Motions in Limine) (Sept. 12, 2007) at 3-4 (unpublished) (September 2007 Decision).

motions to strike or accord no weight to portions of Citizens' testimony.<sup>66</sup> The Board accepted into evidence as exhibits the pre-filed testimony of fifteen AmerGen witnesses, five Staff witnesses, and one Citizens witness.<sup>67</sup> The Board heard testimony from witness panels on six topics during the evidentiary hearing held on September 24-25, 2007.<sup>68</sup> In accordance with Subpart L procedures, the witness panels were questioned "in those areas that, in the Board's judgment, required additional clarification."<sup>69</sup> The parties provided proposed written questions both before and during the hearing in order to assist the Board in its questioning.<sup>70</sup>

The final AmerGen testing commitment was addressed in detail at the evidentiary hearing, and reflected AmerGen's ultimate decision to perform ultrasonic testing measurements on a four-year cycle, beginning with the 2006 refueling outage. This testing complemented AmerGen's plan for visual inspections of the epoxy coating to monitor and verify the coating's continued integrity. Other components of AmerGen's monitoring program included continued application of a strippable coating to prevent water from leaking into the space between the drywell liner and the concrete wall that surrounds it when the reactor cavity is flooded during refueling outages; monitoring of the drains in the sand bed region for leakage, daily during refueling outages, otherwise quarterly; and visual inspections of the epoxy coating applied to the exterior of the drywell shell in all ten bays on a four-year cycle beginning with the 2006 refueling

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<sup>66</sup> *Id.* at 5, 9.

<sup>67</sup> LBP-07-17, 66 NRC at 337.

<sup>68</sup> *Id.* at 338.

<sup>69</sup> *Id.*

<sup>70</sup> *Id.*; see generally 10 C.F.R. § 2.1207.

outage.<sup>71</sup> AmerGen also committed to take the following action prior to the period of extended operation:

AmerGen will perform a 3-D finite element structural analysis of the primary containment drywell shell using modern methods and current drywell shell thickness data to better quantify the margin that exists above the Code required minimum for buckling. The analysis will include sensitivity studies to determine the degree to which uncertainties in the size of thinned areas affect Code margins. If the analysis determines that the drywell shell does not meet required thickness values, the NRC will be notified in accordance with 10 [C.F.R. Part] 50 requirements.<sup>72</sup>

[AmerGen will] [p]erform the full scope of drywell sand bed region inspections prior to the period of extended operation and then every other refueling outage thereafter. The full scope is defined as:

- [Ultrasonic testing] measurements from inside the drywell . . .
- Visual inspections of the drywell external shell epoxy coating in all 10 bays . . .
- Inspection of the seal at the junction between the sand bed region concrete and the embedded drywell shell . . . [and]
- [Ultrasonic testing] measurements at the external locally thinned areas inspected in 2006[.]<sup>73</sup>

AmerGen's testing commitment is reflected in Commitment No. 27,<sup>74</sup> which will become a license condition when the renewed license is issued.<sup>75</sup>

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<sup>71</sup> Applicant's Exh. 10, encl. at 1-4.

<sup>72</sup> Applicant's Exh. 10, encl. at 11.

<sup>73</sup> Applicant's Exh. 10, encl. at 12-13.

<sup>74</sup> See Staff Exh. 1, *Safety Evaluation Report Related to the License Renewal of Oyster Creek Generating Station*, NUREG-1875, Vol. 2, Appendix A (*Commitments for License Renewal of OCGS*), A-18 to A-33 (Apr. 2007); *Safety Evaluation Report Related to the License Renewal of Oyster Creek Generating Station*, Supplement 1, Appendix A (*Commitments for License Renewal of OCGS*), A-2 (Sept. 2007).

<sup>75</sup> See Staff Exh. 1, at 1-18 (the Staff summarizes the proposed license conditions, stating that "[t]he seventh license condition requires the applicant to perform a 3-D (dimensional) finite-element analysis of the drywell shell prior to entering the period of extended operation.").

**B. Board Decision (LBP-07-17)**

Two months after the hearing, the Board issued its initial decision on the merits of the admitted contention.<sup>76</sup> Based upon its analysis of the record evidence before it, including exhibits and written and oral testimony, the Board reached the following conclusion:

[W]e find that AmerGen has demonstrated that the frequency of its planned [ultrasonic testing] measurements, in combination with the other elements of its aging management program, provides reasonable assurance that the sand bed region of the drywell shell will maintain the necessary safety margin during the period of extended operation.<sup>77</sup>

To arrive at this conclusion, the Board first identified the acceptance criteria for the thickness of the drywell liner and found that the remaining available margin was not less than 0.064 inch.<sup>78</sup> Next, the Board found that there was no reasonable likelihood of additional corrosion during the period of extended operation because of the corrective actions taken and the protection provided by the triple-layered epoxy coating on the outer wall, and because there is no evidence of measurable past corrosion on the inside wall, where the benign environment precludes significant risk of future corrosion.<sup>79</sup> The Board found that even if additional corrosion occurred, the planned ultrasonic testing intervals would be sufficiently frequent because the drywell liner “will experience an annual corrosion rate, *at most*, of about 0.0035 inch per year, resulting in corrosion of about 0.014 inch during the four-year interval between [ultrasonic testing]

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<sup>76</sup> LBP-07-17, 66 NRC 327 (2007).

<sup>77</sup> *Id.*, 66 NRC at 330.

<sup>78</sup> *Id.* at 341, 344-45, 346-48.

<sup>79</sup> *Id.* at 341, 356, 363, 365, 371.



measurements, which does not even approach the minimum available margin of 0.064 inch.”<sup>80</sup> The Board also found that if additional corrosion were to occur, it would not occur in the most heavily corroded areas because the sand had been removed, meaning that moisture will not be retained in that region, but rather will flow to the bottom of the region where the available margin is at least 0.229 inch, or 300 percent greater than at the top — thus increasing the Board’s confidence that the planned ultrasonic testing program is sufficient.<sup>81</sup>

The initial decision included an “Additional Statement” by Judge Baratta, in which he expressed his agreement with the majority’s findings of fact with a single exception regarding whether there is reasonable assurance that the safety factor required by NRC regulations will be met throughout the period of extended operation under a four-year inspection cycle.<sup>82</sup> Judge Baratta would have expanded the 3-D analysis to be performed by the Applicant before the period of extended operation, to include a “conservative best estimate analysis of the actual drywell shell.”<sup>83</sup> This analysis “technique might be similar to the one suggested by Citizens’ expert, Dr. Hausler, that uses contour plots generated from known thicknesses both interior and exterior.”<sup>84</sup>

### **C. Subsequent Litigation**

Our order requesting additional briefs, CLI-08-10, was directed toward the issue Judge Baratta raised in his Additional Statement. Specifically, we asked the parties to:

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<sup>80</sup> *Id.* at 371, *see also id.* at 341, 366.

<sup>81</sup> *Id.* at 341, 368, 371.

<sup>82</sup> *Id.* at 373 (Additional Statement).

<sup>83</sup> *Id.* at 376 (Additional Statement).

<sup>84</sup> *Id.* (Additional Statement).

Explain whether the structural analysis that AmerGen has committed to perform, and that is reflected in the Staff's proposed license condition, matches or bounds the sensitivity analyses that Judge Baratta would impose. In any event, explain whether additional analysis is necessary.<sup>85</sup>

Citizens, AmerGen, and the NRC Staff all filed initial and reply briefs<sup>86</sup> in response to the Commission's direction in CLI-08-10. Affidavits or declarations of experts were attached to all three of the initial briefs and to Citizens' reply brief. We referred the limited issue specified in CLI-08-10, together with the parties' responsive pleadings, to the Board for resolution.<sup>87</sup>

After hearing oral argument and receiving supplemental briefs,<sup>88</sup> the Board issued an Advisory Memorandum, in which the majority concluded that it was "satisfied that AmerGen's proposed approach to performing the structural analysis will likely — subject to [certain] suggestions discussed [later in the memorandum] — match or bound the sensitivity analysis contemplated by Judge Baratta in his Additional Statement."<sup>89</sup> In reaching its conclusions and making its suggestions, the majority noted:

To be clear, this Board ruled in LBP-07-17 that AmerGen has demonstrated that its aging management plan will ensure that the drywell shell maintains an adequate safety margin during the renewal period. *Pursuant to that ruling, AmerGen's decision to perform a structural analysis of the drywell shell prior to the renewal period — albeit sensible for purposes of providing a model that better quantifies the available margin and enhances public confidence in the continued safe operation of the plant — was not essential to the granting of its renewal application.*<sup>90</sup>

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<sup>85</sup> CLI-08-10, 67 NRC at 359.

<sup>86</sup> See nn. 8-10, *supra*.

<sup>87</sup> August 21 Order.

<sup>88</sup> See nn. 13-15, *supra*.

<sup>89</sup> Advisory Memorandum at 2.

<sup>90</sup> *Id.* at 2 n.2 (emphasis added).

The Board majority determined that “. . . AmerGen’s proposal for creating the base case model appears to use modern methods and sound engineering judgment to generate a 3-D model of the drywell shell that will better quantify the available margin in a manner that is consistent with what Judge Baratta recommended in his Additional Statement in LBP-07-17.”<sup>91</sup> With respect to the sensitivity analyses that will augment the base-case analysis, “[i]n the Board [majority]’s judgment, AmerGen’s proposed sensitivity analyses appear to match or bound what Judge Baratta would impose.”<sup>92</sup> According to the Board majority, Judge Baratta identified Dr. Hausler’s contour plot technique as an example of one possible technique AmerGen could employ. AmerGen’s choice to use a different technique “does not compel the conclusion that AmerGen’s proposed sensitivity analysis fails to match or bound what Judge Baratta would impose.”<sup>93</sup> In the majority’s view, “the approach and models proposed by AmerGen are consistent with the approaches described in [the article attached as an exhibit to Citizens’ June 11 Brief<sup>94</sup>] and, moreover, . . . they comport with sound engineering judgment.”<sup>95</sup> Finally, contrary to the Staff’s current plan for reviewing AmerGen’s sensitivity analyses, “[g]iven the unique circumstances of this case, including the Commission’s apparent interest in the adequacy of AmerGen’s analysis, . . . an in-

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<sup>91</sup> *Id.* at 11.

<sup>92</sup> *Id.* at 14.

<sup>93</sup> *Id.*

<sup>94</sup> See Citizens’ June 11 Brief at 9, referencing Joshua M. Reinhart & George E. Apostolakis, *Including Model Uncertainty in Risk-Informed Decision Making*, 33 *Annals of Nuclear Energy* 354 (2006) (Reinhart/Apostolakis Article, attached to the brief as Exh. CR 3).

<sup>95</sup> Advisory Memorandum at 14-15.

depth review of AmerGen's completed analysis is warranted. . . ."<sup>96</sup> To this end, the Board majority "recommend[ed] that the Commission require the Staff to perform, or have performed, a comprehensive and in-depth review of the work done by AmerGen to confirm that it provides, with reasonable assurance, an estimate of the amount of margin that exists, and to confirm that the analysis, as performed, is in fact a conservative best estimate analysis."<sup>97</sup> The Board majority also made a series of specific technical suggestions regarding AmerGen's planned sensitivity analyses:

1. . . . Citizens' comment concerning the size of the regions in the model is consistent with good engineering practice and has sufficient merit to warrant further action by AmerGen in its development of a conservative best estimate model of the drywell shell. Some of the bays exhibit regions that show little or no corrosion, yet these are modeled as thinned regions in the proposed AmerGen model . . . . While this may seem conservative, it may or may not be depending on how the thicknesses of these regions were used. Because there are visual observations of the corrosion, it should be possible to estimate the size of these regions and — informed by engineering judgment — to further subdivide the model where warranted to account for them.
2. . . . [T]he NRC Staff stated . . . that in a letter to the [Advisory Committee on Reactor Safeguards (ACRS)] Chairman . . . , the Director of License [R]enewal recounted communications with Sandia where Sandia stated it did not have access to the test results used to justify modification of the capacity reduction factor and had no position on whether [certain] data . . . satisfies use of the modified capacity reduction factor. We suggest that the Commission consider directing the Staff to have Sandia review the test results and report whether use of the modified factor is justified.
3. It is unclear as to how AmerGen factored into the averaging process [ultrasonic testing] data that show near-original thickness in development of the average thicknesses used for bays that have heavily corroded areas. We suggest that a sensitivity study be performed to assess the impact of any outlier data on the averages used in the model as outlier data might cause the averages to be biased thick or even thin.

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<sup>96</sup> *Id.* at 15.

<sup>97</sup> *Id.* at 18.

4. The proposed general area reduction of 0.050 inch in the lower half of Bay 19 does not appear to encompass the uncertainty introduced when the external points are compared with the thicknesses proposed by AmerGen in its second sensitivity study. To evaluate the sensitivity of the results, we suggest the reduction in thickness should be increased to 0.075 inch. This value is about equal to the average value of the differences between AmerGen's proposed lower area model input averages and the lower area measured data averages as calculated by Citizens for all ten bays. . . .

5. . . . AmerGen [should] not limit the second sensitivity study to just . . . Bay 19. Rather, AmerGen should also look at the effect of decreasing the thickness in at least one of the other corroded bays, such as Bay 1. It should then look at the combined effect of decreasing the thickness in both Bays 1 and 19 to determine what effect reducing the thickness has on the safety factor.<sup>98</sup>

In a Separate Opinion, Judge Abramson states his view that there is “no material relationship between the referred question and the appeal of LBP-07-17 awaiting decision by the Commission. The simple answer to the Commission’s inquiry . . . is that no additional analysis is required with respect to, and there is nothing raised by the referred question that [affects], in any way, the license renewal proceeding before this Board or this Board’s determination that the challenge should be resolved in favor of [AmerGen].”<sup>99</sup> Judge Abramson added that in his opinion, holding an evidentiary adjudication before the sensitivity analyses have been performed would not produce a definitive answer to the Commission’s specific inquiry. In Judge Abramson’s view, AmerGen’s commitment would be reflected in a condition to any renewed license, which the Staff will enforce through existing mechanisms (in particular, the Staff’s established licensing review, inspection and enforcement practices). Like the Board majority, he

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<sup>98</sup> *Id.* at 16-17 (internal citations omitted).

<sup>99</sup> Separate Opinion at 2.

recommends that the Commission direct the Staff to “engage appropriate expertise to conduct a thorough examination of the analyses when submitted.”<sup>100</sup>

Thereafter, Citizens filed a motion seeking clarification of the record basis for certain “findings of fact” made by the Board in that memorandum.<sup>101</sup> Citizens’ questions related to the Board majority’s description of comparisons AmerGen made between external and internal ultrasonic testing data, and to the majority’s citation to the hearing transcript, rather than to exhibits, in that description.<sup>102</sup> AmerGen opposed Citizens’ motion, pointing to Citizens’ Exhibit 46 as the record evidence underlying the Board majority’s discussion of the comparison between external and internal thickness measurements.<sup>103</sup> The Board denied Citizens’ motion, stating that the Advisory Memorandum makes no findings of fact but instead provides the majority’s judgment, based on information in the existing evidentiary record, on the issue referred by the Commission. The Board noted that Citizens’ Exhibit 46 provided the requisite

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<sup>100</sup> *Id.* at 4.

<sup>101</sup> *Citizens’ Motion for Clarification of Certain Findings of Fact and Other Appropriate Relief* (Nov. 10, 2008) (Citizens’ Record Clarification Motion).

<sup>102</sup> Citizens’ Record Clarification Motion at 2, citing Advisory Memorandum at 9. Before filing the motion, at Citizens’ request, AmerGen pointed out additional places in the transcript where AmerGen’s counsel, on rebuttal, clarified that his statements (in the portion of the transcript cited by the Board majority) were based on Citizens’ Exhibit 46, page 3. Citizens’ Record Clarification Motion at 3 (describing requests from Citizens to AmerGen and AmerGen’s email responses). Additionally, AmerGen pointed to AmerGen’s Oct. 1 Supplemental Brief at 7 n.33, where AmerGen referred to Citizens’ Exhibit 46, page 3 and to AmerGen’s Exhibit 20 at 50. *Id.* Citizens argued that neither of these exhibits shows that the comparison of external and internal data was carried out in the manner the Board described.

<sup>103</sup> *AmerGen’s Answer Opposing Citizens’ Motion for Clarification* (Nov. 19, 2008). The NRC Staff also opposed Citizens’ motion, also pointing to Exhibit 46 as the record evidence underlying the Board majority’s discussion. *NRC Staff’s Answer in Opposition to Citizens’ November 10, 2008 Motion for Clarification* (Nov. 19, 2008).

evidentiary support and declined to modify the language of the Advisory Memorandum.<sup>104</sup>

#### **D. Post-Hearing Notifications**

Following issuance of the Board's Advisory Memorandum, AmerGen<sup>105</sup> and the Staff<sup>106</sup> notified the Commission and the Board of developments relevant to this proceeding that came to light during the most recent refueling outage.<sup>107</sup> AmerGen reported that visual inspection of the drywell shell in Bay 11 identified a six-inch long rust stain, dry to the touch, and a small isolated area (one-quarter inch in diameter) at the top of the stain where the epoxy coating was blistered. Three bumps, similar in size to the blister but with no evidence of associated brown stains, were observed in the same area. Visual inspection also identified several cracks in the moisture seal at the drywell shell interface with the exterior floor of the sand bed region at one location in Bay 3. AmerGen reviewed the "as left" video recording of drywell shell surface in Bay 11 made during the 2006 outage and found an area that appeared to be the same six-inch rust stain as the stain found during the 2008 outage inspection.

For its part, the Staff stated that the blister, stain, and three additional "bumps" were located very close to one of the ultrasonic testing locations in Bay 11. The Staff

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<sup>104</sup> Order (Denying Citizens' Motion Seeking Clarification and Other Appropriate Relief) (Nov. 25, 2008) (unpublished) (ML083300381).

<sup>105</sup> AmerGen's *Commission Notification* (Nov. 6, 2008) (AmerGen Notification).

<sup>106</sup> Letter from Mary C. Baty to the Administrative Judges, enclosing Memorandum from Brian E. Holian, Director, Division of License Renewal, Office of Nuclear Reactor Regulation, to Chairman Klein, Commissioner Jaczko, Commissioner Lyons, Commissioner Svinicki, the Atomic Safety and Licensing Board, and All Parties, *Notification of Information in the Matter of Oyster Creek Nuclear Generating Station License Renewal Application* (Nov. 6, 2008) (Staff Notification).

<sup>107</sup> The outage spanned October 24 through November 18, 2008.

reported that AmerGen was investigating the cause of the blister and that the Staff was monitoring the investigation and the repair of the affected area. The Staff also stated that the issue “is considered to be of very low safety significance.”<sup>108</sup>

AmerGen later updated the Commission on the status of its investigation, concluding that very small deposits of soluble salts may have remained in small crevices in the steel surface or in the steel grain boundaries themselves after it was cleaned prior to the application of the epoxy coating in 1992.<sup>109</sup> “Soluble salts can draw moisture through the coating via osmosis, and AmerGen believes that this is the most likely corrosion mechanism that caused the blistered area, because no pinholes were identified in the blister samples when viewed under a stereoscope.”<sup>110</sup> AmerGen concluded that the corrosion under the Bay 11 blistered area is not a significant safety issue:

Based on the measured thickness of the corrosion byproducts recovered from the underside of the blistered area, only 3.4 mils of drywell shell metal is calculated to have been lost to corrosion. This suggests that, even when corrosion occurs under the epoxy coating over a long period of time, the attendant wastage of metal is of no engineering significance. Dynamic-scan ultrasonic testing . . . from the inside of the drywell in the areas behind and around the blistered area showed a minimum thickness of 750 mils, which meets all applicable acceptance criteria.<sup>111</sup>

AmerGen confirmed that the six inch stain is the same as that seen in the 2006 “as left” video “taken for informational purposes, and not as part of the visual inspection” at the

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<sup>108</sup> Staff Notification, Enclosure at 2.

<sup>109</sup> AmerGen’s *Updated Commission Notification* (Nov. 17, 2008) (AmerGen Updated Notification).

<sup>110</sup> Amergen Updated Notification at 2-3.

<sup>111</sup> *Id.* at 3.



conclusion of the 2006 outage.<sup>112</sup> AmerGen also stated that it repaired and restored the affected area of the epoxy coating in Bay 11.

AmerGen stated that the cracks in the moisture seal resulted from uncured epoxy caulk caused by an incorrect component ratio or incomplete mixing at the time the caulk was applied in 1992. AmerGen repaired the affected region of the moisture seal in Bay 3. According to AmerGen, “the uncured caulk will not have any adverse impact on the integrity of the drywell shell because concentrations of the impurities identified through laboratory analysis are too low to raise corrosion concerns for the carbon steel drywell.”<sup>113</sup>

AmerGen added that it repaired some small chips in the epoxy coating in Bays 3, 5, and 7 that likely were caused during inspection and repairs performed during the 2008 outage.<sup>114</sup> AmerGen stated that it is investigating the cause and the solution of the delamination of the strippable coating applied to the reactor fuel cavity to prevent water from entering the gap between the drywell shell and the surrounding concrete shield that occurred during the refueling outage. This de-lamination apparently allowed water to enter Bays 11, 13, 15, and 17. After refueling was completed and the reactor cavity was drained, AmerGen re-inspected the epoxy coating and the moisture seal and “confirmed that no coating or shell degradation occurred as a result of the water leakage.”<sup>115</sup>

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<sup>112</sup> *Id.*

<sup>113</sup> *Id.* at 4.

<sup>114</sup> *Id.*

<sup>115</sup> *Id.* at 5.

The Staff also updated the Commission on the results of its recent inspection related to AmerGen's license renewal commitments.<sup>116</sup> The Staff stated that it completed the on-site portion of its inspection of the three aging management programs associated with the drywell liner and that an inspection report would be issued once the inspection was finished.

Based on this portion of its inspection and its review of the technical information, the Staff concluded that there were no safety significant conditions relating to the drywell shell that would prohibit restarting the plant<sup>117</sup> and "determined that AmerGen has provided an adequate basis to conclude the drywell primary containment [(the shell)] will remain operable during the period until the next scheduled examination, in the 2012 refueling outage."<sup>118</sup> The Staff concluded that, with respect to AmerGen's implementation of its license renewal commitments:

1. All drywell shell [ultrasonic testing] thickness measurements satisfied AmerGen's acceptance criteria to ensure current licensing basis design requirements . . . for the thickness of the steel plate are satisfied.
2. There were no identified significant conditions affecting the drywell shell structural integrity.
3. AmerGen's inspection of the as-found condition of the external drywell shell epoxy coating, in the sand bed regions, was acceptable. In Bay 11, four small blisters (three of which were initially identified as bumps) on the coating, including a small amount of surface rust under the blisters, were identified and repaired. AmerGen reported that some blistering was expected,

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<sup>116</sup> *Preliminary Notification of Event or Unusual Occurrence (PNO-1-08-012), Results of Implementation of Oyster Creek License Renewal Commitments Related to the Drywell Primary Containment* (Nov. 17, 2008) (ML083220240).

<sup>117</sup> PNO-1-08-012 at 1.

<sup>118</sup> *Id.* at 2.

and would be identified during routine visual examinations. The NRC Staff will review AmerGen's apparent cause evaluation after it is completed.

4. AmerGen's inspection of the as-found condition of the external drywell shell moisture barrier seal, between the shell and the sand bed floor, was acceptable. Surface cracks, which did not appear to completely penetrate the seal, were identified in multiple bays, and were adequately repaired. During one crack repair in Bay 3, some drywell shell surface corrosion was also identified and repaired.
5. AmerGen's activities to monitor and mitigate water leakage from the reactor refueling cavity onto the external surface of the drywell shell and into the sand bed regions are still under evaluation.<sup>119</sup>

The Staff stated that AmerGen inspected the sand bed bays after the reactor cavity was drained to assess whether the leakage that occurred despite the application of the strippable coating had an effect on the sand bed region of the drywell shell and identified no significant concerns. The Staff stated that AmerGen identified and repaired the problems with the moisture seal in Bay 3 and the epoxy coating in Bay 11 as part of AmerGen's aging management program implementation. The Staff further noted that these problems "had a minimal impact on the drywell steel shell and the projected shell corrosion rate remains very small, as confirmed by NRC [S]taff review of [ultrasonic testing] data."<sup>120</sup>

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<sup>119</sup> *Id.*

<sup>120</sup> *Id.*

The Staff subsequently completed its inspection and confirmed these conclusions (and provided additional details on the inspection, the Staff's observations, corrective actions, and future inspection plans) in its inspection report.<sup>121</sup>

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<sup>121</sup> See Letter to Mr. Charles G. Pardee, Chief Nuclear Officer . . . and Senior Vice President, [Exelon] from Darrell J. Roberts, Director, Division of Reactor Safety, Subject: *Oyster Creek Generating Station — NRC License Renewal Follow-up Inspection Report 05000219/2008007 (with Enclosure: Inspection Report No. 05000219/200807 (Inspection Report))* (Jan. 21, 2009) (ML090210106). Citizens made a filing notifying the Commission of the Staff's Inspection Report. See *Commission Notification* (Jan. 23, 2009) (Citizens' January 23 Notification). In its filing, Citizens argues that information in the Inspection Report "contradicts" certain findings made by the Board in LBP-07-17, and makes the rudiments of a new argument regarding aging management for certain piping systems. See *id.* at 8 n.5. Citizens subsequently duplicated these claims in a motion to reopen. See Section V, *infra*. Because the arguments in Citizens' January 23 Notification are subsumed in its motion to reopen, we do not address them separately.

Citizens also filed a *Petition by Nuclear Information and Resource Service; 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 to Require Supplementation of the Safety Evaluation Report for Oyster Creek Nuclear Power Plant* (Feb. 19, 2009) (Citizens' February 2009 SER Supplementation Petition). In this filing, Citizens states: "Citizens have never claimed and do not now claim that . . . this Petition is filed as part of their appeal of LBP-07-17." Citizens' February 2009 SER Supplementation Petition at 6. The relief requested is that "the Commission should order the Staff to revise the [safety evaluation report] to incorporate the operating experience found in the report and then determine whether the [aging management programs] for the sand[ ]bed region and the small bore piping remain adequate to provide reasonable assurance of adequate protection." *Id.* at 17. As Citizens makes clear, this petition is not part of this adjudication and the relief requested is also extra-adjudicatory. Moreover, the relief requested is consistent with actions the Staff would undertake as part of its normal regulatory activities (*e.g.*, inspection and enforcement) should experience prove that changes, for example, to aging management programs are necessary. Consequently, we resolve this petition — in our supervisory role — by directing the Staff to consider Citizens' points in the context of its ongoing regulatory activities. (Exelon and the Staff filed responses in opposition to Citizens' February 2009 SER Supplementation Petition. See *Exelon's Answer Opposing Citizens' Petition to Require the NRC to Supplement the Safety Evaluation Report for Oyster Creek* (Feb. 27, 2009); *NRC Staff's Response in Opposition to Citizens' Petition to Require Supplementation of the Safety Evaluation Report for Oyster Creek* (Mar. 2, 2009).)

Citizens also filed a *Commission Notification and Submission of Supplemental Information in Support of Pending Motion and Petition* (Mar. 30, 2009).

## II. LEGAL STANDARDS

### A. Petitions for Review

Under our rules, the granting of petitions for review is discretionary:

[A] petition for review may be granted in the discretion of the Commission, giving due weight to the existence of a substantial question with respect to the following considerations:

- (i) A finding of material fact is clearly erroneous or in conflict with a finding as to the same fact in a different proceeding;
- (ii) A necessary legal conclusion is without governing precedent or is a departure from or contrary to established law;
- (iii) A substantial question of law, policy, or discretion has been raised;
- (iv) The conduct of the proceeding involved a prejudicial procedural error; or
- (v) Any other consideration which the Commission may deem to be in the public interest.<sup>122</sup>

Under our adjudicatory scheme, the licensing board's chief function is carefully to review all of the evidence, including testimony and exhibits, and to resolve any factual disputes.<sup>123</sup> While we have the authority to make *de novo* findings of fact, we do not do so "where a Licensing Board has issued a plausible decision that rests on carefully rendered findings of fact."<sup>124</sup> "Our standard of 'clear error' for overturning a Board's

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<sup>122</sup> 10 C.F.R. § 2.341(b)(4).

<sup>123</sup> *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-05-19, 62 NRC 403, 411 (2005).

<sup>124</sup> *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), CLI-03-8, 58 NRC 11, 25-26 (2003). See also *General Public Utilities Nuclear Corp.* (Three Mile Island Nuclear Station, Unit No. 1) ALAB-881, 26 NRC 465, 473 (1987); *Louisiana Energy Services, L.P.* (National Enrichment Facility), CLI-05-28, 62 NRC 721, 723 (2005).

factual finding is quite high,”<sup>125</sup> and we defer to our boards’ findings unless “clearly erroneous” — that is, “not even plausible in light of the record viewed in its entirety.”<sup>126</sup> “[U]nless there is strong reason to believe that in a particular case a board has overlooked or misunderstood important evidence, we will defer to its findings of fact.”<sup>127</sup> “As for conclusions of law, our standard of review is more searching. We review legal questions *de novo*. We will reverse a licensing board’s legal rulings if they are ‘a departure from or contrary to established law.’”<sup>128</sup>

## B. Contention Admissibility

Our contention admissibility “requirements are deliberately strict, and we will reject any contention that does not satisfy the requirements.”<sup>129</sup> “We give ‘substantial deference’ to our boards’ determinations on threshold issues, such as standing and contention admissibility,”<sup>130</sup> and we will affirm “decisions on the admissibility of contentions where the appellant ‘points to no error of law or abuse of discretion.’”<sup>131</sup>

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<sup>125</sup> *Private Fuel Storage*, CLI-03-8, 58 NRC at 26.

<sup>126</sup> *Tennessee Valley Authority* (Watts Bar Nuclear Plant, Unit 1; Sequoyah Nuclear Plant, Units 1 and 2; Browns Ferry Nuclear Plant, Units 1, 2 and 3), CLI-04-24, 60 NRC 160, 189 (2004) (internal quotation marks omitted), referring to *Louisiana Energy Services, L.P.* (Claiborne Enrichment Center), CLI-98-3, 47 NRC 77, 93-94 (1998). See also *Hydro Resources, Inc.* (P.O. Box 777, Crownpoint, NM 87313), CLI-06-1, 63 NRC 1, 2 (2006).

<sup>127</sup> *Private Fuel Storage*, CLI-05-19, 62 NRC at 411.

<sup>128</sup> *Watts Bar*, CLI-04-24, 60 NRC at 190.

<sup>129</sup> *USEC, Inc.* (American Centrifuge Plant), CLI-06-9, 63 NRC 433, 437 (2006).

<sup>130</sup> *AmerGen Energy Co., LLC* (Oyster Creek Nuclear Generating Station), CLI-06-24, 64 NRC 111, 121 (2006).

<sup>131</sup> *USEC, Inc.*, 63 NRC at 439 n.32, citing *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-04-36, 60 NRC 631, 637 (2004).

While a board may view a petitioner's supporting information in a light favorable to the petitioner, it cannot do so by ignoring our contention admissibility rules, which require the petitioner (not the board) to supply all of the required elements for a valid intervention petition.<sup>132</sup> Under our rules:

A request for hearing or petition for leave to intervene must set forth with particularity the contentions sought to be raised. For each contention, the request or petition must:

- (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>133</sup>

Our "requirements for untimely filings (10 C.F.R. § 2.309(c)) and late-filed contentions (10 C.F.R. § 2.309(f)(2))" are "stringent."<sup>134</sup> "Section 2.309(c)(2) clearly

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<sup>132</sup> See *Arizona Public Service Co.* (Palo Verde Nuclear Generating Station, Units 1, 2, and 3), CLI-91-12, 34 NRC 149, 155 (1991); *Duke Cogema Stone & Webster* (Savannah River Mixed Oxide Fuel Fabrication Facility), LBP-01-35, 54 NRC 403, 422 (2001) ("A licensing board is not free to supply missing information or draw factual inferences on the petitioner's behalf."), citing *Palo Verde*, CLI-91-12, 34 NRC at 155-56; *PPL Susquehanna LLC* (Susquehanna Steam Electric Station, Units 1 and 2), LBP-07-10, 66 NRC 1, 23 (2007).

<sup>133</sup> 10 C.F.R. § 2.309(f)(1).

<sup>134</sup> *Florida Power & Light Co., FPL Energy Seabrook, LLC, FPL Energy Duane Arnold, LLC, Constellation Energy Group, Inc.* (Calvert Cliffs Nuclear Power Plant, Units 1 and 2; Calvert Cliffs Independent Spent Fuel Storage Installation; Nine Mile Point Nuclear  
Continued . . .

provides that a petitioner ‘shall address’ all eight factors set forth in section 2.309(c)(1). . . . [F]ailure to comply with our pleading requirements for late filings constitutes sufficient grounds for rejecting . . . intervention and hearing requests.”<sup>135</sup> Decisions on nontimely filings require a balancing of the eight factors set forth in Section 2.309(c)(1), the first of which, good cause for failure to file on time, is the most important.<sup>136</sup>

Regarding new and amended contentions, 10 C.F.R. § 2.309(f)(2) provides that:

[C]ontentions may be amended or new contentions filed after the initial filing only with leave of the presiding officer upon a showing that —

- (i) The information on which the amended or new contention is based was not previously available;
- (ii) The information upon which the new contention is based is materially different than information previously available; and
- (iii) The amended or new contention has been submitted in a timely fashion based on the availability of the subsequent information.<sup>137</sup>

Moreover, “[n]ew bases for a contention cannot be introduced in a reply brief, or any other time after the date the original contentions are due, unless the petitioner meets the late-filing criteria set forth in 10 C.F.R. § 2.309(c), (f)(2).”<sup>138</sup> And, even if the late-filed contention criteria are satisfied, proposed contentions still must meet the threshold

Station, Units 1 and 2; R.E. Gina Nuclear Power Plant; Turkey Point Nuclear Generating Plant, Units 3 and 4; St. Lucie Nuclear Power Plant, Units 1 and 2; Seabrook Station; Duane Arnold Energy Center), CLI-06-21, 64 NRC 30, 33 (2006).

<sup>135</sup> *Id.* at 34.

<sup>136</sup> See *Dominion Nuclear Connecticut, Inc.* (Millstone Nuclear Power Station, Units 2 and 3), CLI-05-24, 62 NRC 551, 564-65 (2005). See also *Commonwealth Edison Co.* (Braidwood Nuclear Power Station, Units 1 and 2), CLI-86-8, 23 NRC 241, 244 (1986); *Private Fuel Storage, L.L.C.* (Independent Spent Fuel Storage Installation), LBP-01-37, 54 NRC 476, 483 (2001), *review declined*, CLI-02-3, 55 NRC 155, 156 n.9 (2002).

<sup>137</sup> 10 C.F.R. § 2.309(f)(2).

<sup>138</sup> *Nuclear Management Co., LLC* (Palisades Nuclear Plant), CLI-06-17, 63 NRC 727, 732 (2006).



admissibility standards contained in 10 C.F.R. § 2.309(f)(1). The Board's decisions on the admissibility of contentions in this proceeding, whether late-filed or new, were governed by these standards.

### III. ANALYSIS OF CITIZENS' PETITION FOR REVIEW

Citizens groups the arguments in its petition for review into four categories: first, purported errors in the Board's final decision; second, purported errors in the Board's decisions regarding the multiplicity of intervention petitions and "new" contentions submitted by Citizens during the course of the proceeding; third, errors that purportedly "pervaded" the proceeding; and finally, a summary of reasons why the Commission should exercise review. Citizens asks the Commission either to deny the license renewal application or remand to the Board for further proceedings "after the Commission has corrected the many legal and factual errors" in the Board's decision.<sup>139</sup>

We take review of LBP-07-17, pursuant to 10 C.F.R. § 2.341(b)(4)(v),<sup>140</sup> solely to clarify the Board's decision in light of the views on proposed License Condition 7, directing AmerGen to perform a 3-D finite element structural analysis of the drywell shell (per Commitment 27), expressed by Judge Baratta in his Additional Statement, by the Board in its Advisory Memorandum, and by Judge Abramson in his Separate Opinion. As discussed further below, we direct the Staff to enhance its review and enforcement of the license condition. Aside from review of this limited structural analysis issue, we find that Citizens has not met its burden of showing that a petition for review should be

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<sup>139</sup> Petition at 25.

<sup>140</sup> The Commission has discretion to take review for "[a]ny other consideration which the Commission may deem to be in the public interest." 10 C.F.R. § 2.341(b)(4)(v).

granted. Nonetheless, we look briefly at the individual arguments Citizens puts forward in its petition for review before turning to the structural analysis issue.<sup>141</sup>

**A. Alleged Errors in the Board’s Final Decision**

**1. “Reasonable Assurance” and Burden of Proof**

Citizens argues that the Board misinterpreted the NRC’s “reasonable assurance” standard,<sup>142</sup> mistakenly equating it with “adequate protection”<sup>143</sup> by virtue of the Board’s acceptance of AmerGen’s showing that it complied with certain acceptance criteria by a preponderance of the evidence. According to Citizens, the correct approach would have been to require “a preponderance of the evidence to show *reasonable assurance of compliance* with all the acceptance criteria and the other relevant [current licensing basis] requirements.”<sup>144</sup> Citizens argues that the Commission should decide the level of confidence needed in this case, asserting that in connection with corrosion in the sand bed region of the drywell shell, the Applicant and the Staff have indicated that reasonable assurance requires a 95% confidence level that the minimum thickness

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<sup>141</sup> In the final section of its petition for review, Citizens links the balance of its petition to the specific requirements listed in 10 C.F.R. § 2.341(b) in summary fashion. We address the Petition’s compliance with our requirements in the context of Citizens’ individual points rather than in a separate section of this decision.

<sup>142</sup> To meet its evidentiary burden, an applicant is “not obliged to meet an absolute standard but to provide ‘reasonable assurance’ that public health, safety and environmental concerns were protected, and to demonstrate that assurance ‘by a preponderance of the evidence.’” *Commonwealth Edison Co.* (Zion Station, Units 1 and 2), ALAB-616, 12 NRC 419, 421 (1980).

<sup>143</sup> Determinations regarding the meaning of “adequate protection” under the Atomic Energy Act are exactly the kinds of determinations “where the Commission should be permitted to have discretion to make case-by-case judgments based on its technical expertise and on all the relevant information,” *Union of Concerned Scientists v. Nuclear Regulatory Commission*, 880 F.2d 552, 558 (D.C. Cir. 1989), “rather than by a mechanical verbal formula or a set of objective standards,” *id.*

<sup>144</sup> Petition at 4 (emphasis in original).

requirements will not be violated.<sup>145</sup> But neither the Applicant nor the Staff made this statement; instead, both testified that no rule, ASME Code, or industry practice calls for analyzing ultrasonic testing measurements using 95% confidence intervals.<sup>146</sup>

In making these arguments, Citizens impermissibly attempts to add an additional requirement to our well-established legal standards —correctly stated by the Board<sup>147</sup> — that is not supported by Commission case law and regulations.<sup>148</sup> “Reasonable assurance” is not quantified as equivalent to a 95% (or any other percent) confidence level, but is based on sound technical judgment of the particulars of a case and on compliance with our regulations. As the Board stated, our applicable regulations, 10 C.F.R. §§ 54.21 and 54.29, read together, “require AmerGen to establish an aging management program that provides ‘reasonable assurance’ that the Oyster Creek drywell shell will continue to perform its intended function consistent with the [current licensing basis] during the period of extended operation.”<sup>149</sup> To satisfy this “reasonable assurance” standard, AmerGen must make a showing that meets the “preponderance of the evidence” threshold of compliance with the applicable regulations — *not* a 95% confidence level of compliance, as Citizens would have it. Subject to the considerations we discuss below in connection with our discussion of the structural analysis issue,<sup>150</sup> we agree with the Board’s finding that the ultrasonic testing program provides

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<sup>145</sup> *Id.* at 4-5.

<sup>146</sup> See Applicant Exh. C, Pt. 3, at A.29, Staff Exh. C at Response A.10, Tr. at 562.

<sup>147</sup> LBP-07-17, 66 NRC at 338-40.

<sup>148</sup> See *Union of Concerned Scientists*, 880 F.2d at 557-58.

<sup>149</sup> LBP-07-17, 66 NRC at 340.

<sup>150</sup> See Section D, *infra*.

reasonable assurance that the drywell liner will not violate the acceptance criteria during the period of extended operation.<sup>151</sup>

## **2. Findings of Fact**

Citizens also argues that the Board made a number of “fact-finding” errors. These “errors” concern particular findings the Board made as part of its overall finding regarding the adequacy of AmerGen’s planned ultrasonic testing and aging management program, which “provides reasonable assurance that the sand bed region of the drywell shell will maintain the necessary safety margin during the period of extended operation.”<sup>152</sup> Citizens argues that the Board erred in its findings regarding: the elements of the current licensing basis; compliance with the local acceptance criterion; the utility of internal versus external testing data on thickness for determining available margin; selection bias in the external testing measurements; present satisfaction of the current licensing basis safety factor; and placement of the burden of proof regarding certain issues.

We find that Citizens has failed to show “clear error”<sup>153</sup> that compels a different result,<sup>154</sup> and, further, has failed to demonstrate that the Board’s findings are “not even plausible in light of the record viewed in its entirety.”<sup>155</sup> Citizens’ dissatisfaction with the Board’s findings of fact is not enough. The Board’s findings of fact are supported by and

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<sup>151</sup> LBP-07-17, 66 NRC at 350.

<sup>152</sup> *Id.* at 330.

<sup>153</sup> *Private Fuel Storage*, CLI-03-8, 58 NRC at 27.

<sup>154</sup> *Three Mile Island*, ALAB-881, 26 NRC at 473.

<sup>155</sup> *Private Fuel Storage*, CLI-03-8, 58 NRC at 26.

are consistent with the record,<sup>156</sup> and Citizens provides no evidence or arguments that justify substituting our judgment for the Board's considerable technical expertise. We review Citizens' arguments on particular fact-finding "errors" below.

a. The Board concluded that the current licensing basis requires Oyster Creek to maintain a safety factor of 2.0, which "means that the actual stresses the shell would experience during a postulated accident scenario are only half of what would cause it to fail."<sup>157</sup> "In other words, complying with the acceptance criteria derived from the GE analyses provides reasonable assurance that the shell can, without failing, withstand twice the stresses it would experience during the postulated scenario."<sup>158</sup> The Board found that the drywell shell's safety factor is currently greater than 2.0, because the GE analysis assumed a uniform thickness thinned to 0.736 inch throughout the sand bed region, while actual measurements show a "thickness . . . on average substantially greater than 0.736 inch."<sup>159</sup> The Board concluded that the current licensing basis also includes three acceptance criteria derived from GE analyses predicated on maintaining the 2.0 safety factor: a "general buckling criterion" that "requires that the shell maintain an *average* thickness across the entire sand bed region of 0.736 inch";<sup>160</sup> a "local

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<sup>156</sup> The Board cites heavily to both the exhibits and the transcript throughout its decision.

<sup>157</sup> LBP-07-17, 66 NRC at 343 & n.20.

<sup>158</sup> *Id.* at 343, referring to AmerGen Exh. B, Pt.2, A.11. The "postulated scenario" referred to is "[t]he limiting buckling scenario [which] occurs during a postulated accident when, simultaneously, the reactor is shut down and the refueling cavity is filled with water, an earthquake occurs, and the drywell is under a negative pressure of 2 psi." *Id.* Under these postulated accident conditions, the weight of the water in the reactor cavity results in compressive stresses on the drywell shell." AmerGen Exh. B, Pt.2, A.9.

<sup>159</sup> LBP-07-17, 66 NRC at 343 n.20.

<sup>160</sup> *Id.* at 344.

buckling criterion” that allows thinning down to 0.536 inch over a one-square-foot area “which transitions to a surrounding shell thickness of 0.736 inch over a linear distance of [one] foot in each direction, resulting in a localized area of [nine] square feet that has an average thickness of less than 0.736 inch”;<sup>161</sup> and a “pressure criterion” that allows localized thinning down to 0.490 inch, provided the area of the thinning has a diameter of not more than 2.5 inches.<sup>162</sup> The Board concluded that these “acceptance criteria are part of Oyster Creek’s [current licensing basis] in that they are ‘plant-specific design-basis information defined in 10 [C.F.R. §] 50.2 as documented in the most recent final safety analysis report . . . as required by 10 C.F.R. [§] 50.71 . . . and, accordingly, they properly guide our analysis in this proceeding.”<sup>163</sup>

Citizens argues that the Board’s finding is incorrect because compliance with the acceptance criteria is insufficient, by itself, to ensure that the current licensing basis is not violated. Citizens says that compliance with those criteria is not inconsistent with a safety factor reduced below the required 2.0.<sup>164</sup> In making this argument, Citizens misrepresents the Board’s position — the Board clearly stated that compliance is required not just with the acceptance criteria, but also with the safety factor of 2.0.<sup>165</sup> For the safety factor to fall below 2.0, the drywell shell would have to suffer additional corrosion that thins the shell to less than 0.736 inch (under the GE analysis 0.736 inch is

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<sup>161</sup> *Id.*

<sup>162</sup> *Id.*

<sup>163</sup> *Id.* at 344-45, citing 10 C.F.R. § 54.3 and Tr. at 420-23.

<sup>164</sup> Petition at 7.

<sup>165</sup> LBP-07-17, 66 NRC at 342, 343 n.20.

the figure that equates to a 2.0 safety factor<sup>166</sup>) *uniformly* throughout the sand bed region of the drywell shell — and the Board did not find that further corrosion in a pattern that could accomplish that kind of uniform thinning will occur. In fact, the Board agreed with Dr. Hausler that any future corrosion would not be significant in the upper part of the former sand bed region with the heaviest existing thinning. Instead, because the sand is no longer present, any future corrosion of potential significance would occur predominantly towards the bottom of the former sand bed region, where the metal is thicker and the “remaining available margin is 0.229 inch . . . which is more than 300% greater than the 0.064 inch of available margin based on measurements taken at the top.”<sup>167</sup>

In short, far from identifying any errors in the Board’s conclusions regarding the requirements of the current licensing basis, we find that Citizens’ arguments amount only to a misstatement of the Board’s conclusions. Citizens also misstates Judge Baratta’s views — while Judge Baratta did not believe we have sufficient information to know the actual safety factor, he concurred that “when all things are taken into account, including the actual thickness, the safety factor is likely to be greater than [2.0].”<sup>168</sup>

*b.* According to Citizens, the Board erred when it found that the drywell shell is in compliance with the local acceptance criterion because “no data has been presented to this Board indicating that such a large area [18 inches by 18 inches] in the

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<sup>166</sup> *Id.* at 343 n.20, citing AmerGen Exh. B, Pt. 2, A.10, A.11.

<sup>167</sup> LBP-07-17, 66 NRC at 368, citing Tr. at 323-25, 344-45, 680-82.

<sup>168</sup> *Id.* at 375 (Additional Statement).

sand bed region is degraded to 0.800 inches on average”<sup>169</sup> and when it failed to require AmerGen to carry its “burden of calculating the margin above the local acceptance criterion.”<sup>170</sup> To support the first aspect of this argument, Citizens points not to data, but to Dr. Hausler’s interpretation of certain AmerGen data, as “corrected” by Dr. Hausler.<sup>171</sup> This merely sets forth Citizens’ disagreement with the Board’s fact findings, but does not demonstrate “clear error” by the Board. We defer to the Board’s expertise as the fact finder and decline to substitute the judgment of Dr. Hausler for that of the Board.

With respect to the second aspect of its argument, Citizens criticizes the Board for not using the external (as opposed to the internal) testing results to calculate the remaining local acceptance margin, pointing to the hearing transcript<sup>172</sup> where AmerGen’s witness stated that “[t]he external data was used to demonstrate compliance with the local buckling criteria.”<sup>173</sup> The Board’s view of the purpose and significance of the external testing measurements differed, but that does not mean the Board ignored relevant data or misplaced the burden of proof. For example, citing to the record, the Board explained the limitations of using the external testing results for purposes of calculating the buckling margin:

[The] single [ultrasonic testing] measurements taken on the exterior of the shell were not averaged and compared to the general buckling criterion, because each point was selected based on its thinness. Moreover, these points had to be ground flat to allow proper placement of the [ultrasonic testing] probe and consequently, they were made even thinner by about

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<sup>169</sup> Petition at 8, quoting LBP-07-17, 66 NRC at 348 n.25.

<sup>170</sup> *Id.* at 9.

<sup>171</sup> *Id.* at 8.

<sup>172</sup> *Id.* at 9, citing Tr. at 633.

<sup>173</sup> Tr. at 633.



100 to 200 mils, or 0.10 to 0.20 inch (Tr. at 604-05) (Polaski, Tamburro). These points are thus not representative of the overall shell thickness and do not provide a basis for determining available buckling margin. Rather they are representative of the most severely corroded areas, which were then thinned even further by the grinding process (Tr. at 603-04) (Polaski). An average of these measurements would reflect this bias, resulting in a skewed and unrealistic assessment of the shell. See AmerGen Exh. B, Pt. 3, A.22, A.23. Accordingly these points are used to provide individual snapshot indicators of whether the shell complies with the pressure acceptance criterion, not to calculate available margin until the general buckling criterion is violated (AmerGen Exh. B, Pt. 3, A.30).<sup>174</sup>

The Board's finding rests on expert testimony in the record.<sup>175</sup> Thus, again, Citizens has failed to show "clear error" in the Board's findings of fact. We defer to the Board's careful, record-based analysis of the information before it.

c. According to Citizens, the Board erred when it "used the internal grid data alone to establish the most limiting margin, . . . because according to AmerGen's own assessment, the internal grids in some of the most corroded bays lie above the severely corroded area, and so are not representative of the condition of the shell."<sup>176</sup> Instead, Citizens argues, the Board should have found that AmerGen failed to meet its burden of showing that the sample bays were representative and its burden of establishing the most limiting margin. Contrary to Citizens' argument, the Board did not shift the burden of proof here. Instead, the Board found that the external data was of value in defining the pressure criterion, but not the buckling criteria. The Board found that the internal grid locations, which were based on over 1,000 ultrasonic testing measurements to identify the thinnest areas in each bay, were centered in the part of the sand bed region

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<sup>174</sup> LBP-07-17, 66 NRC at 349 n.30.

<sup>175</sup> See Section IV, *infra*.

<sup>176</sup> Petition at 10.

where the observed corrosion was concentrated (namely, the upper portion of the sand bed region)<sup>177</sup> and concluded “that AmerGen [had] demonstrated by a preponderance of the evidence that the sand bed region satisfies the acceptance criteria, and that there will be an available margin of at least 0.064 inch when Oyster Creek enters the renewal period.”<sup>178</sup>

d. According to Citizens, the Board erred when it decided “[c]ontrary to the evidence presented, . . . that it could not use the results from the external measurement points to determine margin above the mean criterion, because the results contained significant selection bias of between 0.1 and 0.2 inches.”<sup>179</sup> But the Board relied on oral<sup>180</sup> and written<sup>181</sup> testimony for its finding on bias: a series of micrometer readings, in approximately 20 locations, were taken in 1992 that showed measurements in the 0.1 to 0.2 range. In short, the Board’s finding was not contrary to the evidence presented and was in fact supported by the evidence.

e. According to Citizens, the Board erred in finding that the current licensing basis safety factor of 2.0 was met despite “contradictory” testimony from the Staff’s

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<sup>177</sup> LBP-07-17, 66 NRC at 346, citing Tr. at 601; AmerGen Exh. B, Pt. 3, A.13; AmerGen Exh. B, Pt. 3, A.12; Tr. at 324; Tr. at 344-45.

<sup>178</sup> LBP-07-17, 66 NRC at 345; See discussion at 345-48, citing, e.g., AmerGen Exh. B, Pt. 3, A.9; A.10, A.11, A.12, A.38, A.5, A.29, A.15; Tr. at 601, 324, 344-45; NRC Staff Exh. 1 at 3-120. See Table incorporating measurement data, LBP-07-17, 66 NRC at 347. See also *id.* at 348 n.27 (“Our conclusion that the sand bed region has an available margin of 0.064 inch is based on the assumption that the entire sand bed region has a uniform thickness of 0.800 inch. Because all the other average grid measurements were greater than 0.800 inch, it may be seen that our conclusion is based on a significantly conservative assumption. See AmerGen Exh. B, Pt.3, A.31).”).

<sup>179</sup> Petition at 10.

<sup>180</sup> Tr. at 604-05.

<sup>181</sup> AmerGen Exh. 16 at 101-02.

witness, unsupported testimony from both the Staff witness and the GE witness, the Staff's failure to show that the contour plots prepared by Citizens' witness contained errors, and Citizens' demonstration that the Sandia Study showed that the drywell liner had degraded compared to its "as built" condition.<sup>182</sup> To support its argument, Citizens points to testimony by the Staff's witness Dr. Hartzman, where he appears to testify that the safety factor is 1.9, but also testifies that the safety factor is 2.0 or more, and to testimony by AmerGen's witness Dr. Mehta that the safety factor is greater than two. But as the Staff points out,<sup>183</sup> this testimony only appears to be contradictory because Citizens neglects to mention that the 1.9 figure was a calculation Dr. Hartzman made based on a hypothetical scenario that took, solely for the sake of argument, Citizens' witness Dr. Hausler's contour plots as a given,<sup>184</sup> whereas Dr. Hartzman's actual testimony was that the safety factor was greater than two.<sup>185</sup> And, because there is no dispute that the drywell shell experienced corrosion in the late 1980s, it is not surprising that the Sandia Study's modeling of the pre- and post-corrosion condition of the drywell shell would show an effect on the safety factor — what matters is that the Sandia Study supports the conclusion that the safety factor of 2.0 is met in spite of the corrosion that occurred before corrective measures were implemented. The Board's finding that the 2.0 safety factor is met is grounded on the evidence before it, and Citizens has failed to show clear error.

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<sup>182</sup> Petition at 11-12.

<sup>183</sup> Staff Answer at 10.

<sup>184</sup> Tr. at 450-51.

<sup>185</sup> *Id.* at 453-54.

f. Citizens characterizes the Board's decisions on certain factual issues as inappropriate shifts in the burden of proof away from AmerGen to Citizens. These factual questions related to: the purpose of the epoxy coating on the floor of the shell exterior, the modeling of the local areas of severe corrosion, evaporation rates and evaporative air flow in the upper drywell, the potential for deterioration of the water collection trough in the future, future leakage and the adequacy of leakage prevention measures, and the age of the water collected from the exterior sand bed area in 2006.<sup>186</sup>

We do not agree with Citizens' characterization. In our adjudications:

The ultimate burden of proof on the question of whether the permit or license should be issued is . . . upon the applicant. But where . . . one of the other parties contends that, for a specific reason . . . the permit or license should be denied, that party has the *burden of going forward* with evidence to buttress that contention. Once he has introduced sufficient evidence to establish a *prima facie* case, the burden then shifts to the applicant who, as part of his overall burden of proof, must provide sufficient rebuttal to satisfy the Board that it should reject the contention as a basis for denial of the permit or license.<sup>187</sup>

The Board's treatment of the evidence is consistent with this practice. Rather than shifting the burden of proof, the Board found, based on the evidence presented, that Citizens had not met its burden of going forward on these questions by providing probative evidence or expert testimony, and we see no reason to disturb the Board's rulings. Dr. Hausler attempted to use past (since corrected) deterioration of the floor outside the shell exterior to prove that the epoxy coating on the shell should be expected to deteriorate in the same way. However, the Board found that Dr. Hausler's inference

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<sup>186</sup> Petition at 12-13.

<sup>187</sup> *Louisiana Power and Light Co. (Waterford Steam Electric Station, Unit 3)*, ALAB-732, 17 NRC 1076, 1093 (1983), quoting *Consumers Power Co. (Midland Plant, Units 1 and 2)*, ALAB-123, 6 AEC 331, 345 (1973) (emphasis in original).

was contradicted by testimony in the record<sup>188</sup> that “the coating system on the concrete sand bed floor is materially different than the coating system on the drywell shell,” both in terms of the purpose of the coating and its method of application.<sup>189</sup> With respect to the modeling of local areas of corrosion, it was not unreasonable for the Board to discount Dr. Hausler’s testimony based upon his admission, on the record, that he is “not a structural engineer.”<sup>190</sup>

On the topic of evaporative flow, the Board evaluated Dr. Hausler’s written and oral testimony, and considered his “testimony at the hearing (Tr. at 687) as negating, and withdrawing, Citizens’ argument that condensation on the exterior of the drywell shell is a potential source of corrosion.”<sup>191</sup> The Board found that “Dr. Hausler failed to provide any probative evidence in support of his bare assertion that the sand bed region has a limited air exchange.”<sup>192</sup> And, while Citizens speculates that “the exterior of the sand bed region . . . *probably* has a limited air exchange,”<sup>193</sup> it offers no support for that speculation.

Citizens asserts that “because Dr. Hausler showed that . . . deterioration [of the trough capturing the water] had occurred in the past . . . it was AmerGen’s burden to

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<sup>188</sup> Tr. at 744-45.

<sup>189</sup> LBP-07-17, 66 NRC at 363 n.48.

<sup>190</sup> Tr. at 446, *see also* Tr. at 353-54, 479.

<sup>191</sup> LBP-07-17, 66 NRC at 353 n.35.

<sup>192</sup> *Id.*

<sup>193</sup> *Citizens’ Post-Hearing Proposed Findings of Fact and Conclusions of Law* (Oct. 10, 2007) at 43, cited by Petition at 13.

prove why deterioration in the future would be negligible.”<sup>194</sup> Just by making this assertion, Citizens concedes that it has not made a *prima facie* case that there will be deterioration in the future — that is, during the license renewal period. Without that *prima facie* case, AmerGen does not have any burden to address in the adjudication whether or not future deterioration would be negligible. Citizens’ arguments on future leakage, adequacy of leakage prevention measures, and the age of water collected in 2006 fail for the same reasons.

### **3. Current Licensing Basis**

Citizens argues that the Board failed to consider certain issues related to the current licensing basis that are relevant to extending the license of the facility.<sup>195</sup> Citizens concedes that under 10 C.F.R. § 54.30, compliance with the current licensing basis during the remainder of the initial license term is not part of a license renewal review. But Citizens argues that reasonable assurance of compliance with the current licensing basis during the period of extended operations *is* part of license renewal review under 10 C.F.R. § 54.29.<sup>196</sup> According to Citizens, “[t]he acceptance criteria derived by GE are not part of the [current licensing basis] because they were only referred to in a reference to a reference and the work deriving them was not approved by the NRC Staff

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<sup>194</sup> Petition at 13.

<sup>195</sup> *Id.* at 13.

<sup>196</sup> *Id.* at 14. “The licensee’s compliance with the obligation . . . to take measures under its current license is not within the scope of the license renewal review.” 10 C.F.R. § 54.30(b). “A renewed license may be issued . . . if the Commission finds that: . . . there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the [current licensing basis] . . .” 10 C.F.R. § 54.29(a).

at the time they were allegedly added.”<sup>197</sup> As a result, Citizens reasons, the Board’s conclusion that the derivation of these GE acceptance criteria was not within the scope of the proceeding was a mistake.<sup>198</sup> Pointing to exhibits and to the transcript, the Staff counters that “[t]he record supports the Board’s finding that the acceptance criteria derived from the GE analysis are plant-specific design-basis information documented in Oyster Creek’s final safety analysis report and [are], therefore, part of Oyster Creek’s [current licensing basis].”<sup>199</sup> We agree with the Staff. The Board’s conclusion that the GE-derived acceptance criteria are part of the current licensing basis is adequately supported by the record.<sup>200</sup>

Citizens argues alternatively that if the Board was correct in believing that the GE-derived acceptance criteria *are* part of the current licensing basis, then it should have considered the contour plots prepared by Citizens’ witness as part of its evaluation. According to Citizens, the contour plots provide a useful tool to assess compliance with the acceptance criteria, *not* a challenge to the acceptance criteria.<sup>201</sup> But, as the Board held, Citizens’ use of the contour plots to support its “argument that the available margin is less than 0.064 inch . . . . is effectively an attack on the derivation of Oyster Creek’s

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<sup>197</sup> Petition at 15.

<sup>198</sup> *Id.*

<sup>199</sup> Staff Answer at 6.

<sup>200</sup> LBP-07-17, 66 NRC at 342 & n.19, citing, *e.g.*, NRC Staff Exh. B, A.7; AmerGen Exh. B, Pt. 2, A.8 to A.10, A.12 to A.14, A.16; AmerGen Exh. C, Pt. 2, A.6; AmerGen Exh. 27 at 17-19; NRC Staff Exh. B, A.8; NRC Staff Exh. C.1, A.52; NRC Staff Exh. 1 at 4-71; Tr. at 399, 413, 415-16, 448, 848.

<sup>201</sup> Petition at 15.

[current licensing basis] and, thus, [is] beyond the scope of this proceeding.”<sup>202</sup> With respect to the utility of the contour plots as a tool for assessing compliance with the current licensing basis, the Board’s finding “[i]n any event, . . . that the contour plots are not reliable representations of the condition of the drywell shell, because they are based on the exterior [ultrasonic testing] measurements, which are significantly biased in the thin direction”<sup>203</sup> is adequately supported by the record.

**B. Asserted Errors in the Board’s Decisions Regarding Intervention Petitions and “New” Contentions**

**1. Timeliness Questions**

As we have stressed previously, our contention admissibility and timeliness rules require a high level of discipline and preparation by petitioners, “who must examine the publicly available material and set forth their claims and the support for their claims at the outset.”<sup>204</sup> “There simply would be ‘no end to NRC licensing proceedings if petitioners could disregard our timeliness requirements’”<sup>205</sup> and add new contentions at their convenience during the course of a proceeding based on information that could have formed the basis for a timely contention at the outset of the proceeding.<sup>206</sup> Our

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<sup>202</sup> LBP-07-17, 66 NRC at 349 n.30.

<sup>203</sup> *Id.*, citing AmerGen Exh. C, Pt. 2, A.7; AmerGen Exh. C, Pt. 3, A.10, A.40; NRC Staff Exh. C, A.26, A.27, A.12(d).

<sup>204</sup> *Louisiana Energy Services, L.P.* (National Enrichment Facility), CLI-04-25, 60 NRC 223, 224-25 (2004), quoting *Duke Energy Corp.* (McGuire Nuclear Station, Units 1 and 2; Catawba Nuclear Station, Units 1 and 2), CLI-03-17, 58 NRC 419, 428-29 (2003).

<sup>205</sup> *Louisiana Energy Services*, CLI-04-24, 60 NRC at 225.

<sup>206</sup> See *id.*; *McGuire*, CLI-03-17, 58 NRC at 428-29.



expanding adjudicatory docket makes it critically important that parties comply with our pleading requirements and that the Board enforce those requirements.<sup>207</sup>

Citizens argues that the Board erred in rejecting various “new” contentions it proposed during the course of this proceeding. A number of these issues were decided in LBP-06-22. First, according to Citizens, the Board erred when it rejected Citizens’ contention(s) concerning ultrasonic testing measurements, raised in response to the commitments AmerGen made in April and June 2006, on timeliness grounds. These issues were excluded, Citizens argues, on the erroneous theory that Citizens should have challenged the ultrasonic testing results acceptance criteria when it filed its initial petition — even though AmerGen had made no commitment to perform any ultrasonic testing during the period of extended operation at that point in time, rendering challenges to a measurement plan speculative then.<sup>208</sup> Citizens misconstrues the basis for the Board’s rejection of this contention. The Board correctly found that the acceptance criteria were not new — even if expanded commitments to apply these criteria were recent. The ultrasonic testing commitments AmerGen made in April and June of 2006 did not alter the acceptance criteria themselves. The acceptance criteria remained the same as they were in the early 1990s, so any challenge to the adequacy of the criteria<sup>209</sup> should have been made when Citizens filed its initial set of contentions.

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<sup>207</sup> *Louisiana Energy Services*, CLI-04-24, 60 NRC at 225.

<sup>208</sup> Petition at 16-17, referring to LBP-06-22 (slip op.) at 12-14 (64 NRC at 238-40).

<sup>209</sup> In any case, even had it been timely, a challenge to the adequacy of the acceptance criteria (or any other component of the current licensing basis) is not within the scope of the license renewal proceeding. See, e.g., *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 and 4), CLI-01-17, 54 NRC 3, 8-9 (2001).

The Board also erred, in Citizens' view, when it found that AmerGen's December 2005 commitment to make one more set of ultrasonic testing measurements before the initial license period expired triggered the time period for challenging the scope of ultrasonic testing.<sup>210</sup> Citizens argues that this is inconsistent with the Board's later ruling that challenges to testing occurring before the period of extended operation are not permitted.<sup>211</sup> Citizens argues, moreover, that it could not challenge the scope of the testing program until after April 4, 2006, when AmerGen first proposed to perform testing during the period of extended operation.<sup>212</sup> Again, Citizens misconstrues the basis for the Board's rejection of this contention. The "scope" of the ultrasonic testing refers to the portion of the drywell liner that will be tested. The locations on the drywell shell where the ultrasonic testing measurements are made are fixed. The same locations are used each time a set of measurements is made. As the Board found, the December 2005 commitment made no changes to these measurement locations, and thus provided no new information on which to base a new contention relevant to the scope of the testing.

Citizens argues that since AmerGen did not provide its methods for analyzing the results of ultrasonic testing during the period of extended operations until June 20, 2006, the Board erred when it found Citizens' June/July 2006 challenge to these methods untimely.<sup>213</sup> But again, as the Board correctly understood, the new commitment to make additional measurements during the period of extended operations did not alter the

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<sup>210</sup> *Id.* at 17, referring to LBP-06-22 (slip op.) at 29-30 (64 NRC at 250-51).

<sup>211</sup> *Id.* at 17, referring to July 2007 Decision, slip op. at 2.

<sup>212</sup> *Id.* at 17.

<sup>213</sup> *Id.*

statistical methodology for analyzing the results of the testing. With nothing about the methodology being new, this commitment provided no fresh basis for challenging the methodology. In fact, the original license renewal application itself (specifically, in “AmerGen’s ASME Section XI, Subsection IWE aging management program”) described the methodology for analyzing the testing results.<sup>214</sup> The Board found that Citizens failed “to provide any evidence that these stated statistical techniques . . . changed as a result of AmerGen’s April 4 or June 20 commitments,” and that the challenge was therefore untimely and inadmissible.<sup>215</sup> Citizens has provided no information in its Petition for Review to refute the Board’s conclusions.

The Board also erred, according to Citizens, when it found that enhancements to programs that already exist cannot be considered “new information” to support a new contention.<sup>216</sup> Citizens focuses on one of the Board’s reasons for rejecting a contention related to epoxy coating integrity and moisture-monitoring enhancements: the Board’s policy concern that conferring an automatic right to file a new contention whenever an applicant improves an existing program might have “the perverse effect of discouraging applicants from enhancing safety, health, and environmental programs on a voluntary

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<sup>214</sup> LBP-06-22, 64 NRC at 255. The Board also describes other documentation of the methodology, of which both Citizens and the Staff were aware, and all of which antedate Citizens’ original petition. See *id.* at 254-55, citing the license renewal application at 3.5-18, 4-55.

<sup>215</sup> *Id.* at 255. The Board also reasonably found that Citizens’ challenge to AmerGen’s statistical techniques was inadmissible on the additional grounds that “Citizens fail[ed] to reference, much less discuss, the ‘specific portions of the application’ that they dispute, nor do they adequately identify a ‘material issue of . . . [disputed] fact’ (10 C.F.R. § 2.309(f)(1)(vi)).” *Id.* at 255 n.29.

<sup>216</sup> Petition at 17, referring to LBP-06-22, slip op. at 23 (64 NRC at 246).

basis.”<sup>217</sup> In our view, the Board’s statement is sensible. All things being equal, we ought not establish disincentives to improvements. In any event, we find the Board’s additional basis for rejecting the new contention to be reasonable:

[A]s a matter of law and logic, if — as Citizens allege — AmerGen’s *enhanced* monitoring program is inadequate, then AmerGen’s *unenanced* monitoring program embodied in its [license renewal application] was *a fortiori* inadequate, and Citizens had a regulatory obligation to challenge it in their original Petition [t]o Intervene.<sup>218</sup>

We see no error in this reasoning and find it equally sound when the Board later applied it to reject a proposed contention concerning a new program for monitoring the embedded region of the drywell liner<sup>219</sup> and a proposed contention concerning enhancements to the scope of the monitoring of the exterior of the sand bed region.<sup>220</sup>

Citizens also argues that the Board was wrong when it found that a proposed contention based on new measurements taken in October 2006 and on a January 2007 Sandia study (and discussion of that study during a January 2007 meeting of the Advisory Committee on Reactor Safeguards Subcommittee on Plant License Renewal) was untimely because it was not based on new information. Citizens claims that the

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<sup>217</sup> LBP-06-22, 64 NRC at 246.

<sup>218</sup> *Id.* at 246 (emphasis in original). As a further basis, the Board pointed out that the proposed contention inappropriately challenged NRC regulations. *Id.* As the Board states: “[b]ecause AmerGen has committed to a program that incorporates the requirements of an ASME Code that is specifically referenced by 10 C.F.R. § 50.55a, Citizens [is] prohibited from challenging its adequacy.” *Id.* at 247. We agree with the Board’s reasoning.

<sup>219</sup> See Petition at 18, referring to Board Memorandum and Order dated December 20, 2006, slip op. at 8,16. Like the Staff, we find no record of a Board decision issued on December 20, 2006. Staff’s belief that Citizens intended to refer to the Board’s February 2007 Decision is plausible (see Staff Answer at 16 n.18), and we make the same assumption here, “correcting” Citizens’ references as required.

<sup>220</sup> See Petition at 18, referring to February 2007 Decision, slip op. at 8,16.

Board ignored the proposed contention’s discussion of “the need for an accurate realistic finite element analysis,” and imposed an unreasonably high burden by insisting that Citizens could have reviewed GE’s study independently prior to filing its initial contentions.<sup>221</sup> But Citizens’ proposed contention did not challenge the new measurements or the Sandia study — it challenged the underlying GE analysis: “[t]he computer modeling undertaken by General Electric, upon which the disputed acceptance criteria are based, used unjustified factors leading to underestimation of the uniform required thickness . . . .”<sup>222</sup> The GE study dates back to 1991.<sup>223</sup> As the Board noted in its decision, the Staff addressed the increased capacity reduction “factor” in its 1992 safety evaluation report, which Citizens clearly had access to since it was attached as Exh. 3 to their original petition to intervene. The safety evaluation report had attached to it a publicly available technical evaluation report prepared by Brookhaven National Laboratory that evaluated GE’s modification of the capacity reduction factor. According to the Board, therefore, a “simple reading” of these documents would have informed Citizens of the modified factor long before the Sandia Study came out.<sup>224</sup> We agree with the Board that the contention should have been filed as part of the original petition to intervene and that it was untimely when filed.

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<sup>221</sup> Petition at 18, referring to April 2007 Decision, slip op. at 2, 5-8.

<sup>222</sup> *Motion for Leave to Add a Contention and Motion to Add a Contention* (Feb. 6, 2007) at 6.

<sup>223</sup> April 2007 Decision at 2.

<sup>224</sup> *Id.* at 7.

## **2. Contention Admissibility and Factual Support**

In addition to these asserted errors, which Citizens categorized as errors related to timeliness decisions, Citizens argues that the Board made unsupported factual assumptions, prematurely adjudicating factual issues in the context of deciding contention admissibility. Citizens argues that at the contention admissibility stage the Board should construe the *facts* in favor of the petitioner, as a court does when considering motions to dismiss. This argument ignores our very explicit rules on contention admissibility. While a board may view supporting information in a light favorable to a petitioner, a board may not simply infer the bases for a contention. Failing to provide information required under 10 C.F.R. § 2.309(f)(1) bars admission of the contention.<sup>225</sup>

With respect to a proposed challenge to AmerGen's quality assurance program, Citizens argues that the Board should have accepted its initially unsupported assertion that it had been unable to obtain the results of the 1996 ultrasonic testing data, for which Citizens later provided exhibits showing that AmerGen had denied its September 2005 requests for the information.<sup>226</sup> But, as the Board noted,<sup>227</sup> Citizens did not complain about problems getting the 1996 testing data until a reply brief filed in August 2006. Because Citizens' supposed troubles date to before it filed its original petition, the arguments about lack of access to the information were untimely when finally raised.

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<sup>225</sup> See *Palo Verde*, CLI-91-12, 34 NRC at 155.

<sup>226</sup> Petition at 19-20.

<sup>227</sup> LBP-06-22, 64 NRC at 252-53 n.27.

Moreover, the exhibits supporting Citizens' argument were not provided until even later, as part of Citizens' October 2006 motion for reconsideration of LBP-06-22.<sup>228</sup>

Petitioners may not raise entirely new arguments in a reply brief unless the standards for late-filed contentions are met.<sup>229</sup> And even if those standards are satisfied, support for a contention must be provided when the contention is filed, not at some later date.<sup>230</sup>

According to Citizens, the Board made similar errors when it rejected a proposed contention concerning the embedded region of the drywell liner "by essentially adjudicating the issue instead of analyzing whether the basis set forth by Citizens was adequate,"<sup>231</sup> and when it rejected as untimely a proposed contention concerning the necessity of enhancing the scope of exterior monitoring of the sand bed region of the drywell liner.<sup>232</sup> With regard to the first of these, the Board found that Citizens failed "to provide any facts or arguments to suggest that the corrosive condition in the Bays chosen by AmerGen for the inspections . . . are not representative" and that "the record

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<sup>228</sup> See also Memorandum and Order (Denying Citizens' Motion for Reconsideration) (Nov. 20, 2006) at 7 (unpublished).

<sup>229</sup> *PPL Susquehanna LLC* (Susquehanna Steam Electric Station, Units 1 and 2), CLI-07-25, 66 NRC 101, 106 n.26 (2007), citing *Louisiana Energy Services, L.P.* (National Enrichment Facility), CLI-04-25, 60 NRC 223, 225 (2004) and *USEC Inc.* (American Centrifuge Plant), CLI-06-10, 63 NRC 451, 458 (2006).

<sup>230</sup> See 10 C.F.R. § 2.309(f)(1)(v).

<sup>231</sup> Petition at 20, referring to February 2007 Decision at 10-13. These pages of the Board's decision refer to Citizens' contention that the spatial scope of the monitoring program in the embedded region of the drywell liner is defective. February 2007 Decision at 10-13.

<sup>232</sup> Petition at 20, referring to February 2007 Decision at 17-19. Citizens' argument is confusing. These pages of the Board's decision actually deal with Citizens' contention that the monitoring program proposed for the outside of the shell is inadequate because it does not include systematic monitoring for corrosion occurring from the inside of the shell.

supports a contrary conclusion.”<sup>233</sup> The Board found that “Citizens . . . provided nothing that suggests the potential for — much less the existence of — such an extreme rate of corrosion in the embedded region” that the local acceptance criteria for buckling would be surpassed.<sup>234</sup> With regard to the second contention, the Board found that “Citizens . . . presented no actual evidence of corrosion on the *interior* of the drywell shell at Oyster Creek, but merely assert that such corrosion is a ‘possibility’.”<sup>235</sup> This was not a merits decision, as Citizens argues, but rather a determination that the information Citizens provided did not meet our strict contention admissibility standards. We will not second-guess the Board’s threshold assessment of the support Citizens provided absent clear error, which we do not find here.

### **3. Contention “Sub-Issues” and Admissibility**

Citing to parts of two unpublished Board decisions — one clarifying the scope of the admitted contention<sup>236</sup> and the other denying an AmerGen motion for summary disposition<sup>237</sup> — Citizens also makes an argument<sup>238</sup> that it calls “improper exclusion of twice raised issues.”<sup>238</sup> According to Citizens:

[T]he admitted contention implicitly raised the sub-issues of how the acceptance criteria were derived and how the [ultrasonic testing] results

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<sup>233</sup> February 2007 Decision at 11.

<sup>234</sup> *Id.* at 13.

<sup>235</sup> *Id.* at 17. Again, Citizens’ point is confusing, but since Citizens’ Petition refers to pp. 17-19, where this interior corrosion is discussed, we assume that Citizens misspoke in referring to the exterior monitoring. Petition at 20.

<sup>236</sup> July 2007 Decision.

<sup>237</sup> Memorandum and Order (Denying AmerGen’s Motion for Summary Disposition) (June 19, 2007) (unpublished).

<sup>238</sup> Petition at 20.



should be analyzed. These sub-issues were also explicitly raised by the proposed contention, but were rejected on timeliness grounds. The net result should have been that because these sub-issues were properly raised in a timely manner as part of the admitted contention, they could not be excluded by a simultaneous or subsequent failure to get a separate contention admitted. Therefore, the Board should have allowed all the sub-issues raised by the admitted contention to be fully litigated.<sup>239</sup>

The internal logic of this argument is elusive, as are the chronology and the identity of the “implicit” and “explicit” contentions — and Citizens’ citations to these two Board decisions, rather than to (a) contention-admissibility decision(s), adds further confusion. Because of this lack of clarity,<sup>240</sup> we find no basis in Citizens’ argument for granting review of any Board decision.

### **C. Asserted Errors Associated with the Commission’s Rules of Practice**

In 2004, we revised our procedural rules to streamline hearing processes that had become cumbersome, expensive, and inefficient. As part of the revision, reactor licensing proceedings, including license renewal proceedings, defaulted to a more informal process — spelled out in 10 C.F.R. Part 2, Subpart L — than the Subpart G process that formerly applied. Among other things, under Subpart L, mandatory disclosures replace traditional discovery and witness questioning is conducted by the presiding officer (here, the Board) rather than through cross-examination by the parties’ representatives. In *Citizens Awareness Network, Inc. v. Nuclear Regulatory*

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<sup>239</sup> *Id.* at 21.

<sup>240</sup> “The burden of setting forth a clear and coherent argument . . . is on the petitioner. ‘It should not be necessary to speculate about what a pleading is supposed to mean.’” *Commonwealth Edison Co.* (Zion Nuclear Power Station, Units 1 and 2), CLI-99-4, 49 NRC 185, 194 (1999) (citations omitted). See *Pa’ina Hawaii, LLC* (Material License Application), LBP-06-12, 63 NRC 403, 407 (2006). Cf. *Vermont Yankee Nuclear Power Corp. and AmerGen Vermont, LLC* (Vermont Yankee Nuclear Power Station), CLI-00-20, 52 NRC 151, 164 (2000) (“[T]he Commission will not accept ‘the filing of a vague, unparticularized’ issue”).

*Commission*,<sup>241</sup> the First Circuit rejected facial challenges to these two aspects of the revised rules, finding that the new rules complied with the requirements of the Administrative Procedure Act (APA),<sup>242</sup> were not arbitrary and capricious,<sup>243</sup> and were not unconstitutional.<sup>244</sup> The court understood the Commission's decision to reduce the amount of unnecessary cross-examination, stating that it could not find "that it is arbitrary and capricious for the Commission to leave the determination of whether cross-examination will further the truth-seeking process in a particular proceeding to the discretion of the individual hearing officer,"<sup>245</sup> provided cross-examination is "allowed in appropriate instances."<sup>246</sup> Our rules allow traditional cross-examination under certain circumstances defined in 10 C.F.R. § 2.700.

Citing *Citizens Awareness Network*, Citizens argues that the Board's decisions denying motions to apply Subpart G<sup>247</sup> and to allow a right to cross-examine an AmerGen witness<sup>248</sup> violated the APA. Further, the manner in which the Board conducted the proceeding violated the APA, Citizens argues, because it was not given the right to itself conduct the cross-examination of AmerGen's witnesses (which was

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<sup>241</sup> *Citizens Awareness Network, Inc. v. Nuclear Regulatory Commission*, 391 F.3d 338 (1<sup>st</sup> Cir. 2004).

<sup>242</sup> 391 F.3d at 351.

<sup>243</sup> *Id.* at 352.

<sup>244</sup> *Id.* at 355.

<sup>245</sup> *Id.* at 354.

<sup>246</sup> *Id.*

<sup>247</sup> See Subpart G Decision.

<sup>248</sup> See September 2007 Decision.

conducted by the Board in accordance with Subpart L procedures). Citizens argues first that the Board, in denying Citizens' request that the proceeding be conducted under Subpart G rules, "rigidly applied" the standard requiring that the credibility of an eyewitness be at issue.<sup>249</sup> Citizens argues that it raised the issue of AmerGen's "technical credibility" and that the Board "erroneously and prematurely" assumed that AmerGen would not present a witness on the (in Citizens' view) "overly optimistic" results relied on to establish the safety of the drywell liner.<sup>250</sup> Citizens misreads the regulation. The requirements for applying Subpart G to a particular proceeding are set out in 10 C.F.R. § 2.700, which provides that:

The provisions of this subpart apply to and supplement the provisions set forth in subpart C . . . with respect to . . . proceedings for the . . . renewal . . . of licenses or permits for nuclear power reactors, where the presiding officer by order finds that resolution of the contention necessitates resolution of: issues of material fact relating to the occurrence of a past event, where the credibility of an *eyewitness* may reasonably be expected to be at issue, and/or issues of motive or intent of the party or *eyewitness* material to the resolution of the contested matter. . . .<sup>251</sup>

The rule explicitly applies to *eyewitnesses*, not *expert witnesses*. The credibility of a witness testifying based on technical expertise is not the same as the credibility of an eyewitness to a past event. We would find that the Board properly denied the request for conducting the proceeding under Subpart G based on a straightforward application of the requirements of the rule — but, as it happens, Citizens' challenge to the choice of hearing procedure for this proceeding is also grossly out of time. Our rules, in 10 C.F.R. § 2.311(d), set a *ten-day* limit for appealing the Board's ruling:

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<sup>249</sup> Petition at 22.

<sup>250</sup> *Id.* at 22-23.

<sup>251</sup> 10 C.F.R. § 2.700 (emphasis added).

An order selecting a hearing procedure may be appealed by any party on the question as to whether the selection of the particular hearing procedures was in clear contravention of the criteria set forth in § 2.310. The appeal must be filed with the Commission no later than ten (10) days after issuance of the order selecting a hearing procedure.<sup>252</sup>

In other words, under our rule, the selection of a particular hearing procedure is a decision that must be appealed within ten days of the selection. It cannot wait until a board issues a decision on the merits of a contention. Here, the Board clearly stated, in LBP-06-7, issued on February 27, 2006, that “[t]he hearing shall be conducted in accordance with the informal adjudicatory procedures prescribed in Subpart L of 10 C.F.R. Part 2.”<sup>253</sup> An appeal of that decision was due ten days later, by March 9, 2006. An appeal now is untimely, and we reject it on that basis, as well as on the basis that the Board reasonably decided that Subpart L, not Subpart G, applied to this expert-driven dispute.

Citizens next complains that the Board denied its motion<sup>254</sup> seeking a limited right to cross-examine AmerGen witness Peter Tamburro, whom Citizens claimed had been inconsistent in his written documents. Citizens complains that the Board then failed to follow up on these inconsistencies when it conducted its own examination, utilizing a panel format rather than questioning Mr. Tamburro in depth.<sup>255</sup> Citizens also complains that the Board’s examination of other witnesses was inadequate. “[I]n practice, [Citizens argues,] the [Board’s] level of examination of witnesses was

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<sup>252</sup> 10 C.F.R. § 2.311(d).

<sup>253</sup> LBP-06-7, 63 NRC at 228.

<sup>254</sup> See September 2007 Decision at 3-4.

<sup>255</sup> Petition at 23.

insufficient to satisfy the requirements of the APA, because important issues of fact were not fully explored and Citizens [was] denied the ability to cross[-]examine witnesses.”<sup>256</sup>

We disagree. The parties repeatedly were permitted to submit detailed cross-examination questions for the Board’s use. While the Board did not follow Citizens’ questions as an actor would follow a script, the regulations do not require it to do so, and the Board did address a number of the areas upon which Citizens focused. Moreover, Citizens’ counsel frequently interrupted the hearing with his own questions,<sup>257</sup> often without objection,<sup>258</sup> sometimes with agreement,<sup>259</sup> and at times verging on providing testimony himself.<sup>260</sup> In addition to the testimony presented during the hearing, the Board had extensive written testimony in the record, and efficiency did not require an oral rehash of every line of written testimony. Citizens may wish the Board had made the findings Citizens preferred, but Citizens has not identified specific gaps in the record testimony and has not shown that issues material to the resolution of its contention were ignored or not explored fully. We find that the Board asked the questions pertinent to clarifying its understanding of the relevant, material issues in this proceeding, and

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<sup>256</sup> *Id.* at 24.

<sup>257</sup> *See, e.g.*, Tr. at 385-88, 400-04.

<sup>258</sup> *See, e.g., id.* at 517-19, 633-34, 636, 644-46.

<sup>259</sup> *See id.* at 446 (Judge Baratta, responding to Citizens’ counsel: “I share your concern. I’d like to have someone respond to that.”).

<sup>260</sup> *See, e.g., id.* at 503, 505-07.

therefore find no prejudicial procedural error justifying review under 10 C.F.R.

§ 2.341(b)(4)(iv).<sup>261</sup>

In addition to its Subpart G and cross-examination arguments, Citizens argues that the Board's application of our rules governing late-filed contentions violates the Atomic Energy Act (AEA). The question of whether our contention admissibility and late-filed contention requirements comply with the AEA (and with the APA and the National Environmental Policy Act (NEPA)) received scrutiny in *Union of Concerned Scientists v.*

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<sup>261</sup> The Commission noted in promulgating its revised rules in 2004 that NRC hearings, strictly speaking, are not APA-type "on-the-record" hearings triggering the APA's formal hearing requirements:

In contrast to informal hearings for which agencies have greater flexibility in shaping adjudicatory procedures, "on-the-record" hearings under the APA generally resemble adversarial trial-type proceedings with oral presentations by witnesses and cross-examination. . . . Section 189.a. of the AEA . . . declares only that "a hearing" (or an opportunity for a hearing) is required for certain types of agency actions. It does not state that such hearings are to be on-the-record proceedings. Furthermore, the legislative history for the AEA provides no clear guidance whether Congress intended agency hearings to be formal, on-the-record hearings. As a legal matter, where Congress provides for "a hearing," and does not specify that the adjudicatory hearings are to be "on-the-record," or conducted as an adjudication under 5 U.S.C. 554, 556, and 557 of the APA, it is presumed that informal hearings are sufficient. Final Rule, Changes to Adjudicatory Process, 69 Fed. Reg. 2182, 2183 (January 14, 2004) (citations omitted).

[N]either the AEA nor the APA require the use of the procedures provided in Subpart G, [so] they should be utilized only where the application of such procedures are necessary to reach a correct, fair and expeditious resolution of such matters. *Id.* at 2205.

The NRC raised this argument in *Citizens Awareness Network*, but the First Circuit did not reach it. 391 F.3d at 348. Thus, even if Citizens had shown an APA violation here — and we do not think it has — the violation would not matter because the APA requirements do not apply. NRC hearing regulations, not the APA, are controlling here.

*Nuclear Regulatory Commission (UCS)*.<sup>262</sup> There, the court held that our rules are “valid on their face”<sup>263</sup> and “that even the combined effect of the new contentions rule and the late-filing rule does not violate the Atomic Energy Act, the APA, or NEPA.”<sup>264</sup> Moreover, the balancing test in the Commission’s late-filed contention rule, properly applied, is consistent with the AEA.<sup>265</sup>

Citizens argues that all the issues it raised that the Board did not admit are material to safety and thus must be heard before a decision on renewing the license is made. We have already declined to overturn the Board’s admissibility decisions (see Section B, above). Citizens’ unsupported argument that the issues it raised are material to safety and contrary to the AEA does not provide a basis under our rules for overturning the Board’s admissibility and timeliness decisions and does not alter our view.<sup>266</sup> As the *UCS* court explained, new information concerning safety may be new “evidence,” but not necessarily raise a new “issue.” A new “issue” is raised “only when *the argument itself (as distinct from its chances of success)* was not apparent at the time

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<sup>262</sup> *Union of Concerned Scientists v. Nuclear Regulatory Commission*, 920 F.2d 50 (D.C.Cir. 1990).

<sup>263</sup> 920 F.2d at 57.

<sup>264</sup> *Id.* at 53 n.2.

<sup>265</sup> *See Id.* at 55-56.

<sup>266</sup> As part of its argument on materiality and the AEA, Citizens argues that information on the current condition of the drywell liner is insufficient because a conservative analysis of that condition has not yet been done, and that the structural analysis described by Judge Baratta in his Additional Statement should be performed. See Section III.D., *infra*, for our discussion of 3-D finite element structural analysis issue.

of the application.”<sup>267</sup> Additionally, “whether an actual new ‘issue’ is raised is a matter for the NRC to determine in the first instance and is reviewed deferentially.”<sup>268</sup>

Even when a particular contention proposed by a party is not admitted on pleading-sufficiency or timeliness grounds, the NRC does not ignore underlying safety or environmental issues. New material, such as (here) the additional commitments made by the Applicant during the course of this proceeding, must be evaluated by the Staff independent of whether a corresponding contention has been admitted, as the *UCS* court recognized.<sup>269</sup> NRC hearings provide an opportunity for concerned parties to raise particular issues and receive an independent adjudicatory review. The hearing process is not a substitute for the NRC Staff’s complete, top-to-bottom safety and environmental review, which it undertakes in all licensing cases.

Citizens also argues that affirming the Board’s decision would violate Citizens’ right to due process because Oyster Creek’s license should not be renewed “without full consideration of Citizens’ concerns that there is insufficient confidence that the reactor meets the safety requirements designed to protect Citizens’ lives and property.”<sup>270</sup> We have considered the contention properly admitted in this proceeding, satisfying Citizens’ due process rights. Moreover, the NRC’s oversight does not end once the license is renewed — we continue to exercise oversight during operation as required under our regulations and the AEA, just as we have since the plant was originally licensed.

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<sup>267</sup> 920 F.2d at 55 (emphasis in original).

<sup>268</sup> *Id.*

<sup>269</sup> *Id.*

<sup>270</sup> Petition at 25.



**D. AmerGen’s Commitment to Perform a 3-D Finite Element Structural Analysis**

We take partial review of LBP-07-17 *not* to overturn the Board’s fundamental conclusion “that AmerGen has demonstrated that the frequency of its planned [ultrasonic testing] measurements, in combination with the other elements of its aging management program, provides reasonable assurance that the sand bed region of the drywell shell will maintain the necessary safety margin during the period of extended operation,”<sup>271</sup> *but rather* for two very limited purposes: clarification and direction to the NRC Staff.

First, we clarify that the commitment made by AmerGen, which will be incorporated into the renewed license as a license condition,<sup>272</sup> is consistent with achieving Judge Baratta’s objective: enhancing the NRC’s “understanding of the drywell shell state” by performing “a conservative best estimate analysis of the actual drywell shell.”<sup>273</sup> As the Board majority confirms in its Advisory Memorandum, the majority opinion in LBP-07-17 (expressly endorsed by Judge Baratta) and Judge Baratta’s

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<sup>271</sup> LBP-07-17, 66 NRC at 330. Let us be clear: the Board’s fundamental conclusion in LBP-07-17, authorizing issuance of the renewed license, stands on its own. Citizens has not demonstrated a substantial question with respect to the any of the factors identified in 10 C.F.R. § 2.341(b)(4), nor do we identify any reason to overturn the Board’s determinations pursuant to those factors.

<sup>272</sup> See Additional Statement, 66 NRC at 376, citing NRC Staff Exh. 1, at 1-18, noting that the commitment will be reflected in the renewed license as License Condition 7.

<sup>273</sup> *Id.* at 376. Misconstruing Judge Baratta’s Additional Statement as a “dissent” (Petition at 5 n.6), Citizens argues in its Petition that “the Commission should agree with Judge Baratta that because there is no analysis that provides a showing of current compliance with the buckling criterion [sic] in the [current licensing basis] to a high degree of confidence, reasonable assurance of adequate protection is lacking.” *Id.* at 6. According to Citizens’ argument, we need a better understanding of the actual condition of the drywell shell, because if the drywell shell fails to meet the current licensing basis now, it will necessarily fail at the start of the license renewal period — and the extent of the failure will worsen since, in Citizens’ view, the drywell shell will continue to thin over time. *Id.* at 6 n.7. But contrary to Citizens’ interpretation, Judge Baratta makes quite  
Continued . . .

Additional Statement can be reconciled. Indeed, the Board majority concluded in the Advisory Memorandum “that AmerGen’s proposed approach for its 3-D model and analysis will likely, subject to [certain] recommendations . . . ‘match[] or bound[] the sensitivity analysis that Judge Baratta would impose.’”<sup>274</sup>

Our own review of the evidentiary record shows that AmerGen has committed to estimate the initial size of thin areas based on the ultrasonic testing measurements and using engineering judgment, and then perform a series of sensitivity analyses for the size of the thinned areas to determine the effect on the Code<sup>275</sup> margins. Because AmerGen’s commitment includes the performance of this series of sensitivity analyses, it is reasonable to conclude that AmerGen’s results will be more conservative than the results that would be produced by a sensitivity analysis using Dr. Hausler’s contour plot approach for the thin area estimate. As a result, we find that the results of the sensitivity study to which AmerGen has committed (see AmerGen Exh. 10, encl. at 11, reproduced *supra*, Section I.A.) would bound the results of a study that used the contour plots.

Additionally, as the Board stated, Dr. Hausler’s contour plot technique is in any case only

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clear that he agrees with the majority on all points but one. That one point, lack of “a complete understanding of the drywell shell state” (LBP-07-17, 66 NRC at 376 (Additional Statement)), which led him to question the sufficiency of the testing cycle, can be remedied, according to Judge Baratta, by the performance of “a conservative best estimate analysis of the actual drywell shell.” *Id.* And AmerGen asserts that “[i]n fact, AmerGen has committed to conduct such an analysis, including sensitivity analyses that Judge Baratta refers to in his Additional Statement.” AmerGen Answer at 9.

<sup>274</sup> Advisory Memorandum at 6 (second and third ellipses in original), citing CLI-08-10, 67 NRC at \_\_\_ (slip op. at 3). In our view, the Board’s assessment stands despite the arguments Citizens subsequently made in its Record Clarification Motion (discussed in Section IV, *infra*). In any event, the Advisory Memorandum does not make formal “findings of fact” and the advice it provides is tangential rather than central to the Board’s findings in LBP-07-17, which we affirm.

<sup>275</sup> ASME, Boiler and Pressure Vessel Code, Code Case N-284-1, AmerGen Exh. 42.

one example of possible techniques that AmerGen could employ in order to perform the analysis, and the approach AmerGen intends to take is conceptually consistent with the approach of using a sensitivity study to consider model uncertainty (in this case, the shell thickness) in risk evaluation described in the Reinhart/Apostolakis Article cited in Citizens' June 11 Brief.

Additionally, exercising our inherent supervisory authority over licensing proceedings,<sup>276</sup> we direct the Staff to ensure that Judge Baratta's objective is in fact achieved by enhancing its review of Exelon's compliance with proposed License Condition 7.<sup>277</sup> As indicated above, we agree with Judge Abramson that a complete review of Exelon's compliance with the license condition is *not* a precondition for granting the license renewal application and is *separate and apart* from the resolution of the contention at issue in Citizens' Petition — review and enforcement of license conditions is a normal part of the Staff's oversight function rather than an adjudicatory

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<sup>276</sup> See, e.g., *Public Service Co. of New Hampshire* (Seabrook Station, Units 1 and 2), CLI-90-3, 31 NRC 219, 229 (1990); *Carolina Power and Light Co.* (Shearon Harris Nuclear Power Plant, Units 1, 2, 3, and 4), CLI-80-12, 11 NRC 514, 516-17 (1980).

<sup>277</sup> Exelon recently notified the Staff that it completed a modern 3-D structural analysis of the Oyster Creek drywell shell. Exelon simultaneously submitted its summary of the results of this analysis, including the results of both the base case and the sensitivity analysis. See Letter to U.S. Nuclear Regulatory Commission from Michael P. Gallagher, Vice President, License Renewal Projects, [Exelon], Subject: *Results of Three-Dimensional Structural Analysis of the Oyster Creek Drywell Shell, Associated with AmerGen's License Renewal Application (TAC No. MC7624) (with enclosures)* (ML090290261 at 5). Shortly thereafter, Citizens' counsel transmitted a letter to Chairman Klein, principally arguing that Exelon's analysis "disregards" the recommendations made by the Board in its Advisory Memorandum. Letter to Chairman Dale E. Klein from Richard Webster, Eastern Environmental Law Center, (Jan. 26, 2009). This letter, which is not part of the adjudicatory record of this proceeding, is referred to the Staff for its consideration in conjunction with its review of Exelon's analyses. We expect that, following the completion of its review, the Staff will respond to Mr. Webster's letter. The NRC Staff subsequently filed *NRC Staff's Response to Recent Letters and Notification to the Commission* (Jan. 28, 2009).

matter. We direct the Staff, suitably informed by the recommendations in the Board's Advisory Memorandum,<sup>278</sup> to use its expertise and engineering judgment to scrutinize carefully Exelon's compliance as part of its oversight responsibilities. We adopt the recommendation that the Staff "engage appropriate expertise to conduct a thorough examination of the analyses when submitted."<sup>279</sup>

Our emphasis on the Staff's close scrutiny of Exelon's compliance with its drywell liner inspection and evaluation commitments, as expressed in License Condition 7, has intensified as a result of the information provided in the notifications recently provided to the Commission by the Staff and by Exelon and in the Staff's inspection report. While these notifications and the inspection report are not part of the evidentiary record — and consequently our comments here are not adjudicatory in nature — we note the apparent failure to locate the Bay 11 blisters and rust stain during the 2006 visual inspection of the condition of the drywell shell, even though the blisters and stain are visible on the "as left" video recording made at that time. The Staff's assessment that the epoxy coating blisters, stain, and moisture seal cracks are of "very low safety significance" is reasonable, in our opinion, based on the limited amount of damage<sup>280</sup> and the now completed repairs. But, as always, we expect the Staff's monitoring to be thorough and complete.

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<sup>278</sup> See Section I.C., *supra*.

<sup>279</sup> Separate Opinion at 4.

<sup>280</sup> The minimal damage confirms Citizens' and the Board's expectations that future corrosion would not be significant in the upper regions of the drywell shell. See discussion in Section III.A.2.a., *supra*.

#### IV. CITIZENS' FEBRUARY 27, 2008, MOTION FOR CLARIFICATION

Citizens filed a motion with the NRC complaining that the NRC Staff submitted to the Commission a document that Citizens believes constituted an *ex parte*, unauthorized submission.<sup>281</sup> The document in question is a February 14, 2008, memorandum from the Commission's Executive Director for Operations to the Commission on the subject of "Renewal of Full-Power Operating License for Oyster Creek Nuclear Generating Station" (SECY-08-0018). The Secretary of the Commission served SECY-08-0018 on the parties on February 21, 2008, and, on the same day, returned SECY-08-0018 to the Staff without action. Citizens seeks clarification on whether SECY-08-0018 was an *ex parte* and unauthorized communication between the NRC Staff and the Commission, and if yes, asks the Commission to instruct the Staff not to make further *ex parte* and unauthorized submissions.

As the NRC Staff pointed out in its response to Citizens' motion,<sup>282</sup> a petition for review does not automatically prevent issuance of a renewed operating license (see 10 C.F.R. §§ 2.340(c) and 54.31(c)). In uncontested operating license renewal proceedings, the Staff is authorized to issue a renewed license once the Director of the Office of Nuclear Reactor Regulation has made the appropriate findings.<sup>283</sup> When a proceeding is contested, the Staff, as a matter of policy, seeks Commission approval to

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<sup>281</sup> *Citizens' Motion for Clarification* (Feb. 27, 2008). See generally 10 C.F.R. § 2.347.

<sup>282</sup> *NRC Staff's Response in Opposition to Citizens' Motion for Clarification* (Mar. 4, 2008).

<sup>283</sup> See Staff Requirements Memorandum — SECY-02-0088 — Turkey Point Nuclear Plant, Units 3 and 4, Renewal of Full-Power Operating Licenses (June 5, 2002) (ML021560479).

issue the license, even though issuance of the license is not stayed by the petition for review. In this case, SECY-08-0018 is the document by which the Staff requested Commission authorization to issue the renewed license. Far from being an unauthorized submission, SECY-08-0018 was, therefore, a submission contemplated by Commission policy.

We need not reach Citizens' inquiry as to the nature of the communication. SECY-08-0018 was served on all of the parties. Even if we assumed, for the sake of argument, that there was a prohibited communication, it has been cured. As such, no further action need be taken with regard to Citizens' motion.

#### **V. CITIZENS' FEBRUARY 2009 MOTION TO REOPEN**

Subsequent to the Staff's completion of its post-outage Inspection Report,<sup>284</sup> Citizens filed a motion to reopen the record and postpone final disposition of this proceeding.<sup>285</sup> In its motion, Citizens argues that the Staff's Inspection Report contains facts that contradict the testimony of witnesses in the proceeding and invalidate the

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<sup>284</sup> See n.121, *supra*.

<sup>285</sup> *Motion by Nuclear Information and Resource Service; 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 to Reopen the Record and to Postpone Final Disposition of the Licensing Decision* (Feb. 2, 2009) (Citizens' February 2009 Motion to Reopen), with attached *Declaration of Dr. Rudolf Hausler* (Feb. 2, 2009) (Hausler February 2009 Declaration).

Board's decision in LBP-07-17.<sup>286</sup> Exelon<sup>287</sup> and the NRC Staff<sup>288</sup> opposed the motion.

Citizens subsequently sought leave to file a reply to the Staff's opposition.<sup>289</sup>

Motions to reopen are governed by 10 C.F.R. § 2.326, which provides:

- (a) A motion to reopen a closed record to consider additional evidence will not be granted unless the following criteria are satisfied:
  - (1) The motion must be timely. However, 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 or environmental issue; and
  - (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.
- (b) The motion must be accompanied by affidavits that set forth the factual and/or technical bases for the movant's claim that the criteria of paragraph (a) of this section have been satisfied. Affidavits must be given by competent individuals with knowledge of the facts alleged, or by experts in the disciplines appropriate to the issues raised. Evidence contained in affidavits must meet the admissibility standards of this subpart. Each of the criteria must be separately addressed, with a specific explanation of why it has been met. When multiple allegations are involved, the movant must identify with particularity each issue it seeks to litigate and

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<sup>286</sup> Citizens' February 2009 Motion to Reopen at 1.

<sup>287</sup> *Exelon's Answer to Citizens' Motion to Reopen the Record and to Postpone Final Disposition of the Licensing Decision* (Feb. 11, 2009) (Exelon Answer to February 2009 Motion to Reopen).

<sup>288</sup> *NRC Staff's Response in Opposition to Citizens' Motion to Reopen the Record and to Postpone Final Disposition of the Licensing Decision* (Feb. 12, 2009) (Staff Answer to February 2009 Motion to Reopen).

<sup>289</sup> *Motion for Leave to File a Reply to the NRC Staff's Opposition to Citizens' Motion to Reopen* (Feb. 19, 2009) (Citizens' February 2009 Leave to Reply Motion). (Exelon and the Staff opposed the motion. See *Exelon's Answer to Citizens' Motion for Leave to File a Reply* (Feb. 23, 2009); *NRC Staff's Response to Citizens' Motion for Leave to Reply to the Staff's Opposition to Citizens' Motion to Reopen* (Mar. 2, 2009).)

specify the factual and/or technical bases which it believes support the claim that this issue meets the criteria in paragraph (a) of this section.

“The burden of satisfying the reopening requirements is a heavy one,”<sup>290</sup> and “proponents of a reopening motion bear the burden of meeting all of [these] requirements.”<sup>291</sup> “Bare assertions and speculation . . . do not supply the requisite support.”<sup>292</sup> “Section 2.326(b) requires motions to reopen to be accompanied by affidavits of qualified experts presenting the factual and/or technical bases for the claim that there is a significant safety issue, together with evidence that satisfies our admissibility standards. A ‘mere showing’ of a possible violation is not enough.”<sup>293</sup>

Because a motion to reopen will not be granted unless the movant satisfies all three of the criteria listed in 10 C.F.R. § 2.326(a) and is accompanied by an affidavit that satisfies 10 C.F.R. § 2.326(b), we have considered Citizens’ motion in light of these criteria and the affidavit requirement. With respect to the first of the 10 C.F.R. § 2.326(a) criteria — timeliness — Citizens argues it did not know certain facts until the publication of the Staff’s Inspection Report on January 21, 2009. Exelon counters that the information Citizens relies heavily upon —for example, that the observed “bumps” near the broken blister in Bay 11 were unbroken corrosion blisters — has been available for

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<sup>290</sup> *Louisiana Power & Light Co. (Waterford Steam Electric Station, Unit 3)*, CLI-86-1, 23 NRC 1, 5 (1986).

<sup>291</sup> *Public Service Co. of New Hampshire (Seabrook Station, Units 1 and 2)*, CLI-90-10, 32 NRC 218, 221 (1990).

<sup>292</sup> CLI-08-28, slip op. at 22, 68 NRC at \_\_\_\_.

<sup>293</sup> *Id.*, slip op. at 16, 68 NRC at \_\_\_\_.



months.<sup>294</sup> While we agree that the bulk of the information relied on in the motion was available to Citizens by November 17, 2008, we cannot say with certainty that some details discussed by Citizens — like the water found in the bottle in Bay 11 on November 15, 2008 — were publicly available prior to the release of the Inspection Report.<sup>295</sup> As a result, solely for purposes of this analysis, we treat the motion as though it satisfied the timeliness requirement of 10 C.F.R. § 2.326(a).<sup>296</sup>

Citizens' motion to reopen fails, however, because it does not satisfy the other two criteria in 10 C.F.R. § 2.326(a), and because the affidavit attached to the motion does not comply with the requirements of 10 C.F.R. § 2.326(b). We therefore deny the motion.

To meet the second criterion of 10 C.F.R. § 2.326(a), a motion to reopen must raise a significant safety or environmental issue. Citizens contends that it raises a "significant unresolved safety question" because its arguments cast doubt on the Board's

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<sup>294</sup> See PNO-1-08-012 (n.116, *supra*), AmerGen Updated Notification. The Staff makes similar arguments. Staff Answer to February 2009 Motion to Reopen at 17-19.

<sup>295</sup> Indeed, in the Staff Answer to February 2009 Motion to Reopen at 5 n.9, the Staff reports without citation that "[i]t has been recently reported but not verified that on November 15, 2008, AmerGen employees found the funnel connected to the Bay 11 poly bottle clogged. These employees removed the clog upon inspection, which resulted in water draining to the poly bottle." This is a plausible explanation for the gap between the emptying of the reactor cavity and the appearance of water in the Bay 11 bottle. It provides confirmation that the source of the water is the reactor cavity, especially given the relative volumetric capacities of the funnel and the bottle, and controverts Citizens' unsupported argument that water must be reaching the drywell liner from elsewhere. It does not, however, provide a basis for stating with certainty that the information was publicly available in November.

<sup>296</sup> In its motion seeking leave to reply, Citizens argues, first, that the Staff makes new factual allegations relating to the clog in the tubing, and second, that the Staff used new information to argue that Citizens' motion to reopen was untimely. Because we find that the motion to reopen was timely, these arguments are moot. We therefore deny the motion for leave to reply.

findings that the source of water in the sand bed region is the reactor cavity (which is only filled during outages) and that water reaching the sand bed region would evaporate rapidly. This, Citizens argues, affects the Commission's ability to rely on the Board's reasoning and on its conclusion that the aging management program for the drywell liner is adequate.

Citizens' motion mischaracterizes the observations and the conclusions of the Inspection Report. It fails to address the Staff's determination that "[n]o findings of significance were identified,"<sup>297</sup> and provides no expert support to controvert that determination. Notably, Citizens' motion does not address the Staff's specific assessment of the condition of the drywell shell:

Monitoring of the condition of the primary containment drywell [the drywell shell or liner] is accomplished through Exelon's ASME Section XI, Subsection IWE monitoring program. The [Staff] inspectors determined Exelon provided an adequate basis to provide assurance that the drywell primary containment will remain operable throughout the period to the next scheduled examination (2012 refueling outage). This determination was based on the inspectors' evaluation of the drywell shell ultrasonic test . . . thickness measurements . . . , direct observations of drywell shell conditions both inside the drywell . . . , including the floor trenches . . . , and outside the drywell in the sand bed regions . . . , condition and integrity of the drywell shell epoxy coating . . . , and condition of the drywell shell moisture barrier seals. . . . On a sampling basis, the inspectors observed that the enhancements made as a result of license renewal activities were integrated into the existing program for the drywell structural integrity.

The drywell shell epoxy coating and the moisture barrier seal, both in the sand bed region, are barriers used to protect the drywell from corrosion. The problems identified with these barriers . . . were corrected and had a minimal impact on the drywell steel shell. The drywell shell corrosion rate remains very small, as confirmed by the inspectors' review of Exelon's technical evaluations of the 2008 [ultrasonic testing] data. The inspectors determined Exelon provided an adequate basis to conclude the likelihood of additional blisters or moisture barrier seal issues will not impact the

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<sup>297</sup> Inspection Report at iii.

containment safety function during the period before the next scheduled examination (2012 refueling outage). This is based on the inspectors' direct observations of four coating blisters and a number of moisture barrier seal issues, review of Exelon's repairs, and direct observation of the general conditions of the drywell shell, both inside the drywell and outside the drywell, in the sand bed regions, as well as the overall condition and integrity of the drywell shell epoxy coating.<sup>298</sup>

The Inspection Report details water observed in certain sand bed bays<sup>299</sup> and on the torus room floor.<sup>300</sup> Based on the existence of blisters in the epoxy coating and on these observations of water in the bays and on the torus room floor, Citizens argues that the refueling cavity cannot be the only source of water that could leak to the sand bed region of the drywell liner.<sup>301</sup> Citizens further argues that the water observed in drywell bays and on the torus room floor shows that water can be present in the sand bed region without being detected in the bottles connected to the drains.<sup>302</sup> From this, Citizens extrapolates that absence of water in the bottles during operation of the reactor does not mean that water is absent from the sand bed region during operation.<sup>303</sup> Extending this argument, Citizens states that water could be continually present on the exterior of the drywell shell rather than only for limited periods of time during refueling outages.<sup>304</sup>

We find that there is no technical basis for Citizens' layered argument or for Citizens' conclusion. Citizens fails to provide factual or expert evidence (see

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<sup>298</sup> *Id.* at 2 (citations to particular sections of the Inspection Report deleted).

<sup>299</sup> *Id.* at 4, 7-8.

<sup>300</sup> *Id.* at 6.

<sup>301</sup> Citizens' February 2009 Motion to Reopen at 5.

<sup>302</sup> *Id.* at 6.

<sup>303</sup> *Id.*

<sup>304</sup> *Id.* at 7.

10 C.F.R. § 2.326(b) and discussion *infra*) for its claim that the reactor cavity is not the source of water reaching the sand bed region. Further, its conclusions are directly contradicted by the Inspection Report. Water reached the sand bed region from the reactor cavity because of de-lamination of the strippable coating applied to prevent leakage from the reactor cavity (an issue that has been placed in the corrective action program).<sup>305</sup> And the water on the torus room floor is stated in the Inspection Report to have been due to other *identified* system leaks unrelated to the sand bed region of the dry well shell.<sup>306</sup> Citizens' motion to reopen does not attempt to controvert these findings.

As part of its "safety significance" argument, Citizens also argues that the Staff's finding in its Safety Evaluation Report that the monitoring program "will provide reasonable assurance that *any* further incidents of water in the sand bed region will be systematically evaluated" is undermined because the Inspection Report shows that monitoring the drains is not an effective way to tell if there is water in the sand bed region.<sup>307</sup> We find to the contrary that the Inspection Report demonstrates that, applied correctly, the aging management and inspection programs will detect problems with the drywell liner. Moreover, problems discovered during the implementation of these programs are routinely identified for corrective action.<sup>308</sup>

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<sup>305</sup> Inspection Report at 7.

<sup>306</sup> *Id.* at 6.

<sup>307</sup> *Id.* at 14, quoting Staff's Safety Evaluation Report at 4-69 (emphasis Citizens').

<sup>308</sup> See, e.g., Inspection Report at 3, *Id.* at 6 (tubes disconnected from funnels; water found in Bay 11 on November 15, 2008).

We also are not persuaded by Citizens' argument that because the visual inspection conducted in 2006 did not find the blister now known to have been present then, visual observation alone cannot provide reasonable assurance that ongoing corrosion will be detected. This argument fails to account for the fact that visual observation constituted only one aspect of the inspection undertaken during the 2008 outage and is just one of the forms of inspection that will take place in the future.<sup>309</sup> The Staff's Inspection Report confirms that the required testing, including ultrasonic testing, was performed and that corrective actions were undertaken as appropriate. Additionally, the discrepancy in the visual inspection results has been entered into Exelon's corrective action program.<sup>310</sup> Dr. Hausler does not dispute these points. For all of these reasons, we find that Citizens has not satisfied its burden to show that the information it flags is safety significant, thus failing to satisfy 10 C.F.R. § 2.326(a)(2).

Citizens similarly fails to satisfy 10 C.F.R. § 2.326(a)(3) — whether a materially different result would have been likely had the results of the Inspection Report been before the Board when the Board made its findings in LBP-07-17. Citizens simply reiterates its position that the Inspection Report contradicts some of the Board's factual findings, and then states that "this prong of the reopening test is met."<sup>311</sup> We find that

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<sup>309</sup> The complete testing process, set forth in Commitment 27, which will become License Condition 7, is described at 14-15, *supra*. The Board also described the testing process in detail, as well as the consequences and corrective actions required if problems are identified as a result of the testing. LBP-07-17, 66 NRC at 334-35 & 334 n.11 (citing AmerGen Exh. B, Pt. 1, A.27).

<sup>310</sup> Inspection Report at 11.

<sup>311</sup> Citizens' February 2009 Motion to Reopen at 14. In this portion of its motion, Citizens also resurrects its arguments on the hearing process and on cross-examination rights. We address these issues in Section III.C., *supra*.

Citizens' statement falls far short of meeting its burden to show that the Board's decision would have been materially different.

In addition to showing that the criteria of 10 C.F.R. § 2.326(a) are satisfied, a motion to reopen must be accompanied by the affidavit of an expert that satisfies the requirements of 10 C.F.R. § 2.326(b). The affidavit must contain specific factual and/or technical bases for the movant's argument that the three criteria of subpart (a) are satisfied. Expert affidavits must be presented by competent individuals with knowledge of the facts alleged or by experts in the appropriate disciplines and the evidence contained in an affidavit must meet our admissibility standards. In our view, Dr. Hausler's affidavit does not meet these requirements.<sup>312</sup> In his affidavit, Dr. Hausler critiques the inspection performed during the outage based on the fact that — fulfilling the purpose of conducting an inspection — the inspection uncovered minor problems,<sup>313</sup> all of which were then successfully and appropriately corrected or are being addressed. Dr. Hausler speculates regarding alternate causes for the observed and repaired blisters<sup>314</sup> and alternate sources of water on the exterior of the drywell shell and on the

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<sup>312</sup> We note that, in connection with Dr. Hausler's qualifications, the Board stated:

Because Dr. Hausler is not familiar with the specific composition of epoxy in use at Oyster Creek (Tr. at 734-35) (Hausler)), and because his expertise in oil field applications (Tr. at 667 (Hausler)) — which “generally involve continuous immersion service with highly corrosive pressurized fluids, corrosive gases and continuous fluid flow” (AmerGen Exh. C, Pt. 5, A.5) — is inapplicable to the benign operating environment at Oyster Creek, *we accord diminished weight* to his assertions attacking the reliability of AmerGen's coating inspection program. LBP-07-17, 66 NRC at 360-61 n.44 (emphasis added).

<sup>313</sup> See Hausler February 2009 Declaration at 2-3.

<sup>314</sup> *Id.* at 4-5.

torus floor,<sup>315</sup> but provides no supporting evidence. Further, Dr. Hausler makes recommendations<sup>316</sup> regarding the aging management program for the drywell shell that appear to disregard and seek to alter the existing requirements, including those set out through rulemaking in 10 C.F.R. § 50.55a.<sup>317</sup> None of these statements provides admissible evidentiary support for Citizens' arguments that our reopening standards have been met.<sup>318</sup>

Dr. Hausler also presents no evidence that corrosion has proceeded at a rate inconsistent with the Board's calculations. Nonetheless, Citizens speculates that the maximum corrosion rate might be higher than 0.039 inches per year (which would hypothetically use up the available thickness margin more rapidly). Based on this assertion, Citizens argues that a four-year inspection cycle is inadequate and that the

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<sup>315</sup> *Id.* at 5-6.

<sup>316</sup> *Id.* at 7-8.

<sup>317</sup> Our rules are not subject to challenge in an adjudicatory proceeding. *See generally* 10 C.F.R. § 2.335.

<sup>318</sup> We also note that, with respect to corrosion, Dr. Hausler states that he “agree[s] with the statements relating to corrosion in [Citizens’ January 23 Notification].” Hausler February 2009 Declaration at 1. By taking this position, Dr. Hausler in effect adopts argument of counsel, provided in extra-adjudicatory fashion prior to the filing of the motion to reopen, as his own testimony. This approach does not satisfy the requirements of 10 C.F.R. § 2.326(b). *Cf. Entergy Nuclear Vermont Yankee, L.L.C.* (Vermont Yankee Nuclear Power Station), LBP-04-28, 60 NRC 548, 560 n.16 (2004) (Expert affidavit prepared in support of a proposed contention stated that the expert “assisted in the preparation of the . . . pleading and simply endorses ‘[a]ll of the information given as supporting evidence . . .’ as ‘true and correct to the best of my knowledge.’” Board stated that “[s]uch wholesale endorsement of the pleadings seriously undermines our ability to differentiate between the legal pleadings and the facts and opinions expressed by the expert” and required the parties in future in the proceeding to “avoid the ‘wholesale endorsement’ approach and instead separately state the expert’s substantive opinions and whatever supporting facts the expert chooses to cite.”).

visual inspections should be augmented with other techniques.<sup>319</sup> As we pointed out above, the visual inspections already are augmented by other forms of inspection, including ultrasonic testing inspections. In fact, analysis of the blister samples “determined approximately 0.003 inches of surface corrosion had occurred directly under the broken blister”<sup>320</sup> and “[ultrasonic testing] dynamic scan thickness measurements under the four blisters, from inside the drywell, confirmed the drywell shell had no significant degradation as a result of the corrosion.”<sup>321</sup> Dr. Hausler provides no evidence to address or to controvert this point. Moreover, as Exelon points out,<sup>322</sup> even if the 0.003 inch worth of surface corrosion under the blisters occurred over the two-year period that Citizens assumes, the available margin of at least 0.064 would not be eroded over the course of the four year period between inspections. Further, the blistered area was within a 1 to 2 square inch area<sup>323</sup> — that is, an area smaller than 2.5 inches in diameter — which means that the applicable margin is 0.112 inches instead of 0.064 inches since the pressure criterion rather than the general buckling criterion applies.<sup>324</sup> This further justifies the conclusion that the corrosion found under the blisters is not safety significant and would not have materially affected the Board’s conclusions. Dr. Hausler does not address the Board’s findings that different margins apply depending upon the size of the area of potential corrosion and provides no evidence to show that

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<sup>319</sup> Citizens’ February 2009 Motion to Reopen at 7.

<sup>320</sup> Inspection Report at 11.

<sup>321</sup> *Id.*

<sup>322</sup> Exelon Answer to February 2009 Motion to Reopen at 4-5.

<sup>323</sup> Inspection Report at 11.

<sup>324</sup> See LBP-07-17, 66 NRC at 348-50.



larger areas of corrosion will be missed by the existing visual and ultrasonic testing inspection program.

Commissioner Jaczko's dissent proposes an alternate path, one with which we cannot agree. The dissent would have us take *sua sponte* review of the information contained in the Inspection Report, admit the report into evidence, and deem Citizens' motion to reopen moot. Based on the Inspection Report, the dissent would modify Commitment 27 (which will become Condition 7 of the renewed license) by moving Exelon's next full scope inspection forward by two years — from 2012 to 2010, and by requiring a full scope inspection at *every* refueling outage if commitments are not implemented effectively. In our view, the dissent's proposal would undermine our licensing and regulatory process by disregarding much of our Licensing Board's careful review of the drywell shell corrosion issue, by elevating the significance of the Inspection Report (which, after all, found no significant safety issue), and by ignoring our long-established standards for reopening closed adjudicatory records. Our core concern must be Oyster Creek's safety during the renewal period. Nothing in the Inspection Report or in Commissioner Jaczko's dissent disturbs our overall confidence that Oyster Creek can and will operate safely during the renewal period.

As discussed above, Citizens' motion to reopen falls short of our reopening standards in significant respects. But even putting aside those important legal criteria on reopening extensively-litigated cases, we are confident that the inspection frequency set forth in Commitment 27, starting with the next full scope inspection of the drywell in 2012, protects public health and safety fully and, therefore, see no reason to alter the commitment based upon a *sua sponte* review of the Inspection Report. Our primary consideration in making this determination is whether Commissioner Jaczko's proposed change to Commitment 27 is premised on a significant safety risk. It is not. The dissent

maintains simply that the Inspection Report introduces enough uncertainty about the sufficiency and implementation of Exelon's commitments to warrant that the Commission, on its own motion and notwithstanding safety findings by the Board and the NRC Staff, revise the license condition. We do not find Commissioner Jaczko's rationale compelling.

We do agree with Commissioner Jaczko to the extent he suggests that had the inspection results been available at the time of the hearing, some parts of the expert testimony before the Board might have addressed the problems uncovered during the 2008 refueling outage — and some details of the Board's analysis might have been modified. But, as explained above, we are not persuaded that this would have changed the Board's ultimate safety findings. For example, in a section of its decision entitled "Even If Corrosion Were To Occur In The Sand Bed Region, AmerGen's Plan To Take [Ultrasonic Testing] Measurements Every Four Years Provides Reasonable Assurance That The Shell Will Not Violate The Acceptance Criteria,"<sup>325</sup> the Board found that *even if* it applied Citizens' own proposed corrosion rate — an "enormously conservative" corrosion rate of 0.039 inch per year — ultrasonic testing measurements taken every four years (as provided in Commitment 27) still would be adequate to prevent the shell from exceeding the acceptance criteria.<sup>326</sup> This Board finding reinforces our confidence that at bottom, the performance deficiencies noted in the Inspection Report do not present significant safety risks<sup>327</sup> and would not have altered the Board's ruling.

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<sup>325</sup> LBP-07-17, 66 NRC at 366.

<sup>326</sup> *Id.* at 366 n.53 & 371.

<sup>327</sup> Our conclusion is bolstered by the plain language of the Inspection Report itself, which states that "[n]o findings of significance were identified." Inspection Report at iii.

Another reason for our confidence in the current inspection schedule is the myriad of related follow-up activities that will be conducted during the renewal period. Perhaps the most important is subsection 3 of Commitment 27, which requires quarterly monitoring of sand bed region drains during the plant operating cycle, and daily monitoring of these drains during refueling outages.<sup>328</sup> This commitment also ensures that if leakage is detected during the quarterly monitoring, the licensee will perform several actions during the next refueling outage: visual inspection of the drywell shell coating and moisture barrier (seal) in the affected bays of the sand bed region; ultrasonic testing of the sand bed areas where visual inspection has indicated damaged coating and corrosion; and ultrasonic testing of the upper drywell region consistent with the existing program.<sup>329</sup> In effect, this means that if any leakage is found during the quarterly drain monitoring between now and the next outage (scheduled for 2010), or if any leakage is found during the daily drain monitoring during the 2010 outage, actions identical to those Commissioner Jaczko would require will in fact be taken in 2010 for the bays where leakage is observed. Indeed, Exelon has stated that follow-up ultrasonic testing will be performed during the next refueling outage (2010) to evaluate the upper drywell shell for corrosion as a result of the 2008 outage water intrusion into the sand bed bays.<sup>330</sup>

Moreover, the multiple modes of protective action included in Exelon's commitments are for the very purpose of identifying problems and ensuring corrective

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<sup>328</sup> AmerGen Exh. 10, encl. at 3-4.

<sup>329</sup> *Id.* at 4.

<sup>330</sup> Inspection Report at 7.

action if, for example, leakage occurs — a point that the Board recognized.<sup>331</sup> In addition, it was Exelon itself that identified the deficiencies in performance at issue in the Inspection Report and performed follow-up repairs and evaluations consistent with commitments<sup>332</sup> the Board had before it in the record. We simply have no demonstration of a significant safety problem requiring a more extensive oversight program than already exists in the license renewal commitments and conditions.

Finally, to help ensure that the drywell corrosion issue remains under scrutiny, the concerns raised in the Inspection Report have been placed in Exelon's corrective action program.<sup>333</sup> The NRC's Inspection Report also designated these issues as unresolved items, which means that they will be reviewed in a future NRC inspection,<sup>334</sup> and that their resolution will be formally tracked. Based upon the results of future inspection of these items, NRC Staff has the ability to take appropriate action, if warranted. We expect nothing less than the Staff's rigorous review of the unresolved items in future inspections, and if the findings are not satisfactory, we fully expect Staff to follow up with necessary measures, which could include amended license conditions or enforcement action.

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<sup>331</sup> See, e.g., LBP-07-17, 66 NRC at 334 n.11 & 352 n.34.

<sup>332</sup> For example, the closed isolation valve for the reactor cavity trough drain line was identified by Exelon as part of its monitoring for clogging in the drain line. Inspection Report at 5.

<sup>333</sup> *Id.* at 3.

<sup>334</sup> *Id.*

In sum, for the reasons discussed above, we find that Citizens' motion to reopen fails to satisfy our reopening standards — specifically, 10 C.F.R. § 2.326(a)(2) and (3), and the requirements of 10 C.F.R. § 2.326(b) — and reject it on that basis.<sup>335</sup>

## VI. CONCLUSION

For the foregoing reasons, we find that Citizens has not met its burden of showing that a petition for review of LBP-07-17 and various interlocutory Board decisions should be granted. We nonetheless take review of LBP-07-17, pursuant to 10 C.F.R. § 2.341(b)(4)(v), for two limited purposes:

1. We clarify the Board's decision in light of the views expressed by Judge Baratta in his Additional Statement and the additional views and recommendations provided in the Board's Advisory Memorandum and Judge Abramson's Separate Opinion. We find the Board's decision and Judge Baratta's views not inconsistent and we *affirm* the Board's decision on this point.
2. In our supervisory role, we direct the NRC Staff to enhance its review and verification of Exelon's compliance with License Condition 7, appropriately informed by the recommendations in the Board's Advisory Memorandum, as discussed above.

Apart from this limited review, we *deny* Citizens' petition for review and *terminate* this proceeding.

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<sup>335</sup> In its motion to reopen, Citizens also requested that we postpone making a final decision on the license renewal application until the later of February 20, 2009, or until "Exelon resolves the outstanding issues regarding the [aging management program] for the sand[ ]bed region of the drywell, including carrying out the three dimensional analysis to the specifications of the Board and the [Advisory Committee on Reactor Safeguards]." Citizens' February 2009 Motion to Reopen at 16. February 20, 2009, has passed; the aging management program for the drywell liner is subject to the Staff's ongoing regulatory activities; and we provide specific guidance regarding review of the three dimensional analysis in today's decision. As a result, we deny Citizens' request for postponement.

We note that Citizens' motion to reopen also includes a Section III, in which Citizens indicates that it might file a new contention related to the aging management of piping. Citizens has not made such a filing.

IT IS SO ORDERED.

For the Commission

**(NRC SEAL)**

**/RA/**

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Annette L. Vietti-Cook  
Secretary of the Commission

Dated at Rockville, Maryland,  
this 1<sup>st</sup> day of April, 2009

**Commissioner Jaczko, Respectfully Dissenting in Part:**

I concur with my colleagues in large part on this order. I do, however, have a concern with the way in which the Order handles the recent Inspection Report. I believe that the Inspection Report provides evidence that directly contradicts evidence the Board relied upon in ruling against Citizens on its contention in this proceeding. Having contradictory evidence now before us, I believe the better approach would have been for the Commission to address the issue directly and transparently.

Therefore, I would have preferred that the Commission, on its own motion, admit the Inspection Report into evidence, rendering moot the motion to reopen. Considering the new information contained in the Inspection Report, I believe the Commission could support issuance of the renewed license with a relatively minor modification to Exelon's Commitment 27. The current commitment has Exelon perform a full scope sand bed region inspection during the 2008 refueling outage and thereafter at every other refueling outage throughout the renewal period. Based upon Exelon's failure to effectively implement its commitments in the 2008 refueling outage, I believe the commitment should be modified so that a full scope sand bed region inspection is required in the 2010 refueling outage throughout the renewal period; if not implemented effectively, then inspections should be performed in every outage. To say that this simple and straightforward solution would undermine our licensing and regulatory process, as argued by the majority, is hyperbole, at best.

The contention filed by Citizens raised safety concerns about Exelon's commitment to take ultrasonic testing (UT) measurements in the sand bed region every four years. Citizens argued this commitment was not sufficiently frequent to ensure an adequate safety margin is maintained between measurements due to the uncertain condition of the drywell shell, the uncertain corrosive environment, and the uncertain corrosion rate. Water could result in corrosion, and the subsequent deterioration of the

drywell shell could jeopardize the integrity of the drywell shell, which is a critical line of defense for preventing the release of radioactive material in the event of an accident.

The Board ultimately rejected Citizens' argument that the Applicant's commitments would not be effective in ensuring that water from the refueling cavity will not leak into the sand bed region. The Board concluded that the only source of corrosive-causing water on the external wall of the drywell shell in the sand bed region is the refueling cavity liner; that Exelon's commitments effectively eliminate the potential for water leakage from the refueling cavity liner into that area; and that in the absence of water, there will be no further corrosion. Without any evidence of further corrosion, the Board determined that the thickness of the shell in the sand bed region would not violate the acceptance criteria during the renewal period and, thus, the Board rejected Citizens' challenge to the frequency of Exelon's UT program.<sup>1</sup>

The Inspection Report now before us calls into question part of the Board's findings on this issue — namely that Exelon's commitments effectively eliminated the potential for water to leak into the sand bed region from the refueling cavity liner. This Board finding was premised upon a series of Exelon commitments, and the Inspection Report highlights a series of Exelon errors that now call into question Exelon's ability to implement its commitments in a manner that would ensure their effectiveness in eliminating the potential for water to leak from the refueling cavity area into the sand bed region.

Exelon's commitments attempt to establish a line of defense against water entering the sand bed region. The first line of defense is captured in Exelon's

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<sup>1</sup> LBP-07-17, 66 NRC at 356.



commitment to "apply stainless steel tape and a strippable coating to the refueling cavity liner prior to flooding the refueling cavity."<sup>2</sup> This is intended to minimize the amount of water that would leak into the cavity trough drain, and thus, ultimately, minimize or eliminate the amount of water that could enter the sand bed bays. In expert testimony introduced by Exelon, and cited by the Board in its decision, the expert clearly relies upon the past success demonstrated by the strippable coating in the 2006 refueling outage as evidence of future success. But the Inspection Report reveals that this commitment is not as fool-proof as the Board was led to believe by the expert testimony that supported it. In fact, the inspection found that a part of the strippable coating delaminated and water puddles were subsequently identified in four different sand bed bays.<sup>3</sup> Initial evaluations revealed that human error was probably largely to blame. Thus, the testimony relied upon by the Board would have been notably different had the expert been confronted with the evidence contained in the inspection report — evidence that clearly noted that human errors may compromise the effectiveness of the strippable coating to prevent water in the sand bed bays.

Perhaps most troubling, the Inspection Report also discloses that Exelon's action plan, as written, would not have required it to inspect the sand bed bays in this instance. Since the cavity trough drain flow did not exceed 12 gpm, the assumption was that water should not have entered the sand bed bays because the cavity trough could contain it. Thus, were it not for the blistering identified on the epoxy coating, the inspectors noted that Exelon employees would not have been in the bays to notice the water in the first

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<sup>2</sup> *Id.* at 354.

<sup>3</sup> Inspection Report at 4.

place; instead, employees were in the bays only by chance, and only because they had not met their original schedule to close out the sand bed bays.<sup>4</sup> None of this provides much confidence in Exelon's ability to ensure water remains out of the sand bed bays, as Exelon's experts testified before the Board.

The next two layers of Exelon's proposed defense against water in the sand bed region are Exelon's commitments to check the drains to make sure that, if water does end up in certain areas, the water drains appropriately, and that Exelon has the ability to monitor and measure its volume and flow rate. These commitments require Exelon to verify that the refueling cavity concrete trough drain is clear with no blockage, and to monitor the refueling cavity seal leakage trough drains and the drywell sand bed regions for leakage.<sup>5</sup> According to the Inspection Report, Exelon's drain lines were not originally set up in a manner that would allow for monitoring. Thus, in order to meet this commitment, Exelon isolated the cavity trough drain line to install a tygon hose to allow drain flow to be monitored. Yet, at least once after the reactor cavity was filled, an examination revealed that the isolation valve had been left closed preventing the water from draining.<sup>6</sup>

Moreover, the Inspection Report continues by explaining the importance of the tygon hose to the monitoring commitment. Exelon's plan was to remotely monitor sand bed drains by checking for the existence of water in poly bottles attached via tygon tubing to a funnel hung below each drain line. In order for the tygon hoses to work

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<sup>4</sup> Inspection Report at 7.

<sup>5</sup> LBP-07-17, 66 NRC at 354-55.

<sup>6</sup> Inspection Report at 4-5.

effectively, they would have to be connected to their funnels. Yet, Exelon found two of the five tygon tubes disconnected from their funnels and laying on the floor, obviously not fulfilling their intended purpose and thus, further invalidating the effectiveness of these procedures, and thus calling into question the expert testimony that the Board relied upon in making its findings.<sup>7</sup>

The final layer of defense relied upon by Exelon and accepted by the Board is the epoxy coating on the exterior of the drywell shell. In dismissing Citizens' claims that the thickness of the shell in the sand bed region needs to be more frequently monitored than Exelon's commitment requires, the Board concluded it was confident that additional monitoring was not necessary based on the "overwhelming record evidence" that there are no pinholes in the protective epoxy coatings, and that visual inspections indicate the epoxy coating is in "very good condition".<sup>8</sup> The theory was that early indications of coating failure would develop at a very slow rate and thus, visual inspections every four years would catch any deterioration in time to prevent failure.<sup>9</sup>

Yet, according to the Inspection Report, the results of a 2006 video inspection which reportedly identified no coating problems in any sand bed bay directly contradict more recent inspections that reveal one small broken blister and three small unbroken blisters in Bay 11. There was also minor chipping in the epoxy coating noted in three different bays, as well as a discoloration noted on Bay 9.<sup>10</sup> This evidence either demonstrates that visual inspections were not as useful as testimony led the Board to

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<sup>7</sup> *Id.* at 6.

<sup>8</sup> LBP-07-17, 66 NRC at 360-62.

<sup>9</sup> *Id.* at 361.

<sup>10</sup> Inspection Report at 10-12.

conclude, or that the defects noted were new, and thus, deterioration could be occurring much faster than the testimony led the Board to conclude. Either way, the Inspection Report does call into question the expert testimony the Board relied upon in its finding — testimony in which Exelon described the coating as being in "pristine condition".<sup>11</sup> It also provides strong evidence as to why more frequent monitoring of the thickness of the shell in the sand bed region may be necessary in order to ensure safety.

Although the Board ultimately concluded that even if water entered the sand bed region there was an adequate margin of safety to ensure the integrity of the drywell shell, its finding appears premised upon the testimony that indicates each of the layers of Exelon's defense against this would be effectively implemented. It is not clear if the Board would have been as comfortable with that margin knowing what we now know about Exelon's inability to meet its commitments to eliminate water from the sand bed region in the first place. The contention at issue was about the adequacy of the planned frequency of the UT monitoring commitment. Not even Citizens argued that the new information merits a decision to reject the license renewal application, but only that the monitoring should be required more frequently.

Effectively, in this case, Exelon persuaded the Board that water could only reach the exterior drywell shell from the reactor cavity liner, and that the commitments ensure that any water from this cavity liner will not flow through to the sand bed bays because of a strippable coating to minimize or eliminate leaks and because of monitoring that would identify water that in fact ended up in the sand bed region. The Inspection Report cites to a failure of the strippable coating to prevent water from entering the sand bed region

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<sup>11</sup> LBP-07-17, 66 NRC at 360.

and a failure of the monitoring commitments to alert Exelon to the presence of water in the sand bed region. As the Inspection Report makes clear, Exelon identified water in the sand bed region only accidentally and not because of an effective program to do so. In fact, Exelon's series of errors laid out in this Inspection Report provides evidence that directly contradicts Exelon's ability to meet the commitments. And it provides evidence that the expert testimony the Board found persuasive was optimistic, at best.

Therefore, I believe a reasonable safety solution in this instance is not to allow Exelon to rely upon the 2008 inspection in meeting its commitment for the renewed license. Instead, I believe the Commission should have modified the commitment to require Exelon to perform a full scope sand bed region inspection during the 2010 refueling outage. If Exelon implemented the commitments effectively at that time, then it could move to doing the inspection upon every other outage. This would have provided Exelon an opportunity to demonstrate it has the ability to implement its commitments effectively, and would have provided the Commission with the reasonable assurance it needs to have confidence that the conditions in the renewed license will be achieved.

Because the majority has not required a modification of Exelon's commitment in this area, I dissent from this portion of the Order.