UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
Before the Atomic Safety and Licensing Board

In the Matter of	)	
		Docket No. 50-346-LR
First Energy Nuclear Operating Company	)	
(Davis-Besse Nuclear Power Station, Unit 1)		August 24, 2012
	)	

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INTERVENORS' COMBINED REPLY TO NRC AND FENOC ANSWERS TO INTERVENORS' THIRD AND FOURTH MOTIONS TO AMEND AND/OR SUPPLEMENT PROPOSED CONTENTION NO. 5 (SHIELD BUILDING CRACKING)

Now come Beyond Nuclear, Citizens Environment Alliance of Southwestern Ontario (CEA), Don't Waste Michigan, and the Green Party of Ohio (collectively, "Intervenors"), by and through counsel, and reply to "NRC Staff's Answer to Intervenors' Third and Fourth Motions to Amend and/or Supplement Proposed Contention No. 5" (hereinafter "NRC Staff Answer" and "FENOC's Answer Opposing Intervenors' Third and Fourth Motions to Amend and/or Supplement Proposed Contention No. 5" (hereinafter "FENOC Answer"), both of which were filed on August 17, 2012.

A. Reply to NRC Staff Answer

The central themes of the Staff's Answer, that the FOIA response, May 16, 2012 Revised Root Cause analysis ("RRCA") and Performance Improvement International ("PII") root cause analysis documents do not contain materially different information, and Intervenors' claims about shield building cracking are current operations issues and thus not aging-related, are incorrect, and given the enormous *prima facie* showing articulated by Intervenors, specious. The Staff and FENOC have the root cause wrong, or at least incomplete, and consequently the

corrective actions need, and the aging management plan ("AMP") in general are also wrong or incomplete. The AMP as written focuses narrowly on sub-surface laminar cracking to the exclusion of other significant evidence of cracking attributable to concrete drying and shrinkage, accumulations of snow and moisture on the roof of the shield building, weathering, the out-of-plumb construction of the shield building, and changes in weight distribution in the shield building ("SB") walls at the times when hydro-demolition is used to make openings for maintenance and access for reactor parts replacement.

1. The NRC Staff's Failure to Excercise Independent Regulatory Judgment

It is striking and confusing that the Staff, which has "recognized that a limited portion of Contention 5, as revised by the Staff, could be admitted by the Board as a contention of omission," argues that Intervenors' proposed additional bases for Contention 5 are not based on new and materially different information from information previously available, because surely the Staff, when it required revisions by FENOC to the February 2012 Root Cause analysis ("RCA"), and put tough questions to Performance Improvement International concerning matters omitted from the RCA, certainly thought the information it sought was material and different from the explanations hitherto given by FENOC.

Instead of exercising independent judgment, the NRC Staff shows repeatedly that its perception of the cracking root cause is indistinguishable from FENOC's. At p. 7 of its Answer, the NRC recites that FENOC's revisions to the RCA as a result of the Staff's insistence "did not affect the overall conclusions [of the Root Cause Report] or the corrective actions being taken." Similarly, the Staff accepts the conclusions - ignoring the controversial admissions - of PII at face value, concluding, *ipse dixit*, that "Intervenors *[sic]* claims that the [PII] redactions are

'aimed at thwarting public access to embarrassing truths about the shabby state of the shield building,' Intervenors' Fourth Motion to Supplement at 29, are baseless." Staff Answer p. 7 fn. 34.

2. The Root Cause of Cracking Is Material to the Findings the Commission Must Make

The Staff's assertion (Answer p. 12) that "Intervenors repeatedly stated purpose for these serial motions is not to identify material issues of dispute with FENOC's LRA, but to catalog for the Board and parties 'discrepancies' between two related documents on the mechanism of crack initiations propagating in the shield building" misses the point of the extensive factual supplements Intervenors have proffered. Intervenors' aim is not to expose discrepancies between the analyses themselves. It is to inform the ASLB of considerable evidence that the root cause selected by FENOC was chosen, not in light of the facts, but *despite* the facts of multiple types of cracking, *despite* the evidence that damage from cracking is probably much more than is acknowledged by FENOC and the Staff to the public (and to FENOC's investors), and *despite* the calculations of NRC engineers that the shield building could collapse in circumstances of a low to moderate earthquake, shedding 90% of its mass. The apparent objective of the whole root cause exercise seems to be deflection of scrutiny away from the reality that a structure not built even in conformity with design expectations of the 1970's has further departed from them during the decades of unsupervised decay, and that the AMP proposed in April is grossly inadequate.

Likewise, the Staff's insistence (Answer p. 12) that "Intervenors' intense focus on the consistency of these two reports and its impact on FENOC's ability to fully understand the mechanism of the shield building cracking is at odds with their proposed contention, which states that the cause of cracking is not material" is, of course, ludicrous. Proposed Contention 5

(Intervenor's proposal, not the scarecrow suggested by the Staff) states:

> Intervenors contend that FirstEnergy's recently-discovered, extensive cracking of unknown origin in the Davis-Besse shield building/secondary reactor radiological containment structure is an aging-related feature of the plant, the condition of which precludes safe operation of the atomic reactor beyond 2017 for any period of time, let alone the proposed 20-year license period.

Intervenors obviously believe that the cause of the cracking needs to be genuinely understood for there to be meaningful corrective actions instead of complacent placation about the most safety-significant structure at the Davis-Besse complex.

3. Contention 5 Adequacy of Ongoing Management of Component Functionality

Another component of the Staff's argumentative misdirections is the fragmentary reference (Answer pp. 12-13) to the NRC's "Nuclear Power Plant License Renewal; Revisions" regulations at 60 Fed. Reg. 22461, 22488 (May 8, 1995). The Staff argues that Contention No. 5 "is also at odds with the Staff's aging management review, which focuses on 'managing the functionality of systems, structures, and components [SSCs] in the face of detrimental aging effects as opposed to identification and mitigation of aging mechanisms,'" citing the 1995 regulation. The full paragraph from which the Staff extracted that internal quotation, however, states:

> With respect to the form of the aging management review, the proposed rule would establish a clear focus on managing the functionality of systems, structures, and components in the face of detrimental aging effects as opposed to identification and mitigation of aging mechanisms. *The Commission concluded that the focus on identification of aging mechanisms is not necessary because regardless of the aging mechanism, only those that lead to degraded component performance or condition (i.e., potential loss of functionality) are of concern. Therefore, the Commission concluded that an aging management review that seeks to ensure a component's functionality is a more efficient and appropriate review. This change only improves the efficiency of the licensee's aging management review*. Therefore, the environmental impacts would be similar to those under the previous rule.

(Emphasis supplied). Intervenors stridently maintain that the misleading refusals of the Staff and FENOC to focus on the multiple root causes leading to an understanding of the comprehensive cracking - *i.e.,* more than sub-surface laminar cracking, but including sub-surface laminar cracking - coupled with the NRC's prediction of potential failure of the shield building, are "aging mechanisms . . . that lead to degraded component performance or condition," and consequently they "are of concern." The problem is, the lack of proper identification of all aging mechanisms has led to a gross underestimate of the loss of "component[] functionality," *viz*., no examination of the validity or implications flowing from the NRC staff calculation that the shield building could collapse and shed perhaps 90% of its mass under comparatively small stresses. The cracking problem and implications - regardless of cause (which is not an admission of the irrelevance of cause at all) - is significantly underestimated and under-admitted.

Intervenors' position is thus within the sweep of aging management review, while the artful dodges and concealments of discrepancies between the facts as found by the Staff's investigating experts, and the Commission's acquiescence in the suspect root cause finding by FENOC, have not produced a complete understanding of the degraded component condition and heightened potential for failure of the shield building.

Important support for Intervenors' position is found in the timeline provided by FENOC in its Answer (pp. 62-63), discussed *infra* at pp. 16-17, which exposes NRC's rushed grant of permission for the restart of Davis-Besse on December 2, 2011, three days *before* the NRC approved FENOC's calculations on hoop reinforcement rebar on December 5, 2011, which were provided to justify the startup request. In light of this revelation, exposed to the public for the very first time in FENOC's Answer, the Staff's taunting observation (Answer p. 14) that

"[m]erely electing to obtain documents through the FOIA process does not establish that the information is new and material" is rather cynical. The NRC forced Intervenors to FOIA the information after they were refused, at the NRC's January 5, 2012 public meeting by the Region III Acting Administrator, the documents upon which the December 2, 2011 confirmatory action letter granting restart approval was based.

4. 'New and Material' Allegations From RRCA's Changed Perspectives

The NRC's comment (Answer p. 17 fn. 82) that Intervenors wrongfully challenge the concrete tensile strength values used in the root cause analysis, responding that "the revisions made to the Root Cause Report and the PII Report did not involve changes in the tensile strength values used. Instead, more detail was provided on the values, but this did not change the analyses or conclusions." This exemplifies the circular argument method invoked by the Staff. The Intervenors could not have commented on the issue as expressed in the February 28 RCA. The added details in the May 16 Revised Root Cause analysis ("RRCA") are indeed "new and material" and fit within the additional 60 day period to supplement. If the added details are so trifling, it is a mystery why the NRC bothered to require inclusion of such information in the RRCA in the first place. The NRC Staff repeatedly accuses Intervenors of citing to passages from the RRCA which are supposedly identical to passages from the February RCA, and by doing so, having failed to allege new and materially different information. A fair reading of Intervenors' pleadings shows that they extracted revisions that were new from both PII's Revised Root Cause Assessment Report ("RRCAR") as well as from FENOC's RRCA. In both instances, Intervenors extracted and commented upon only those changes/revisions identified by FENOC and PII, respectively.

5. NRC's Out-of-Context Manipulations

In another cynical misdirection, the Staff reproduces a slide which was referenced by Intervenors at p. 8 of their Third Motion to try to make the point that "information in the January 2012 slide is not new information and Intervenors have not indicated how information in the slide is materially different than information previously available." Staff Answer p. 19. Such out-of-context manipulation bespeaks a level of desperation in the Staff's point of view. The context in which the slide was referenced appears on p. 8 of Intervenors' Third Motion as follows:

> FENOC states (RRCA at 56) that there was no previous experience with shield building concrete laminar cracking, and that the 2002 temporary access opening for replacing the reactor pressure vessel head "was confined within the blockout used for the original construction opening and was not in an area exposed to similar regions where laminar cracks were found in 2011." A slide FENOC displayed during its January 5, 2012 Camp Perry presentation (see http://pbadupws.nrc.gov/docs/ML1200/ML120050146.pdf, slide #18) shows that the 2002 temporary access opening for the lid swap out was located about equidistant between two flute shoulders of the building. There evidently has been no re-examination of this access opening since October 2011 to confirm that there is no cracking of any type in that area using impulse response testing or core-bore sampling. The presence of cracking there might suggest either that it was missed in 2002, or was noticed but not reported officially.

Intervenors' reference to the slide was ancillary to the point that the April 2012 AMP does not provide for comprehensive inspection of the shield building for evidence of cracking that predates the October 2011 discovery of same. It is certainly permissible to relate new and material evidence to other evidence in the case. A new or amended contention may be timely for purposes of 10 C.F.R. 2.309(f)(2)(iii) if the new and material information was revealed in a piecemeal fashion, and where the foundation for the contention is not reasonably available until the later pieces fall into place. In such cases, the Licensing Board must determine when, as a cumulative matter, the separate pieces of the information puzzle were sufficiently in place to

make the particular concerns readily apparent. *Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc.* (Vermont Yankee Nuclear Power Station), LBP-06-14, 63 NRC 568, 579 (2006).

Likewise, only by removing things from the context in which Intervenors presented them can the Staff try to make palpable responses to the new supplement. At pp. 19-20 of their Answer, the staff accuses Intervenors as follows: "Intervenors note that the Revised Root Cause Report 'contains an apparent commitment from FENOC' to complete 'a Maintenance Rule Structures evaluation inspection of the shield building exterior sealant system. . . .'" That is correct, but only so far as it goes. The paragraph preceding Intervenors' recitation of the commitment in the RRCA says:

> *For the first time in the RRCA, FENOC admits that the shield building dome, built in 1973, was sealed in 1976 but not before it had displayed cracking.* Further, FENOC asserts that a waterproofing membrane was installed below-grade on the shield building exterior. RRCA 33. The RRCA also reveals that the decision was taken in 1969 to not seal the interior or exterior of the shield building, nor the below-grade shield building walls. *Despite these signs from 40 years ago, FENOC has illogically excluded from the AMP any examination of the dome or the below-grade shield building walls.*

(Emphasis supplied). Intervenors, citing favorably the commitment by FENOC to inspect the waterproofing membrane, were arguing the case that despite revealing for the first time in the RRCA that there was no exterior or interior sealant applied to the shield building's below-grade walls, ***the AMP was not consequently modified to include the inspection of the walls in that part of the shield building.*** This quotation-out-of-context is a hoodwink.

6. Inspecting the Below-Grade SB Walls Under Moisture Barrier, and Dome

And notwithstanding the haggle about the below-ground shield building moisture barrier, the Staff says nothing about Intervenors' recitation of 1976 damage to the SB dome, which was

brand new information. The ASLB should conclude that the Staff's silence means they agree with Intervenors. Respecting the Staff's concern (Answer p. 20) that "Intervenors do not indicate what these claims have to do with their proposed Contention 5 or the adequacy of the Shield Building Monitoring AMP," Intervenors submit that it might be a good idea if the dome is closely monitored from 2017-2037, since it has been cracked for 36 years (unbeknownst to the public, indeed everyone other than FENOC, its corporate predecessor and member utilities, and their contractors), and because both NRC and FENOC have acknowledged a top-down moisture penetration pathway into the SB sidewalls.

7. The Lack of Specificity of Corrective Actions for the Shield Building

Intervenors make a similar "context" rebuttal respecting the Staff's challenge to their point (Third Motion to Supplement p. 11) that the RRCA "Extent of Condition Corrective Action #1 for additional investigation of the Shield Building (RRCA at 59) contains no detail." While it is identical to the RCA wording, the essence of Intervenors' claim is that in light of the new revelations in the RRCA, such as but not limited to, cracking in the SB dome, much specificity and detail of the "additional investigation of the Shield Building" is required. The Staff is deliberately misunderstanding Intervenors. Ironically, Intervenors' point is *shared* by the Staff. A request for additional information (RAI) from the Staff, ML12191A192,[1] calls for greater detail from FENOC about its future plans, which led to the production on August 16, 2012 of an expanded AMP by the NRC, which Intervenors have not yet closely scrutinized. It appears that the NRC has requested details as to how shield building coating will prevent recurrence or worsening of the cracking, and also, the agency has called for shield building-specific AMP.

[1]http://pbadupws.nrc.gov/docs/ML1219/ML12191A192.pdf

Intervenors will timely review this August 16, 2012 AMP, and possibly seek to further supplement Contention No. 5 following that review.

8. NRC's Denial of Micro-Cracking as Being 'New and Material'

At Staff Answer pp. 21-22, the NRC attempts to deny that an indisputable issue of fact - the revelation of CTL Group's documentation of micro cracking on the exterior of the shield building, which was flagged by NRC Staff itself as significant, yet significantly missing from FENOC's RRCA - is new and material. The Staff quotes PII's denial, but FENOC's other consultant, CTL, clearly identified microcracks. This news is material because even micro-cracks allow penetration of carbon dioxide into the layers of concrete to do its damage; wide cracks are not necessary. PII and FENOC not only deny the significance of the micro-cracking, but also deny that any significant carbonation damage has occurred, is occurring, or will occur. That is not a legitimate conclusion, if CTL's evidence is correct.[2] There is an issue of material fact expressed by Intervenors as against the renewal application.

Nor is it enough, as the Staff suggests, that AMP visual inspections would catch surface micro-cracks if they were to grow worse. FENOC has already shown it doesn't care about them, so would likely downplay to the point of outright denial from here forward. But as mentioned

[2]The Staff's gratuitous assertion (Answer p. 22) that "Intervenors could have timely raised a complaint that the April 5, 2012 Shield Building Monitoring AMP contained no reference to micro-cracking on or before June 4, 2012," had Intervenors done so, would have been rejected as specious and theoretical. It took CTL's discovery of micro-cracking and its report by PII for Intervenors to have a basis. The 1989 revisions to the NRC's contention rules effectively work to bar ill-defined "anticipatory" contentions. *See Union of Concerned Scientists v. NRC,* 920 F.2d 50, 53 (D.C. Cir. 1990); Final Rule, Contentions, 54 Fed. Reg. at 33,171. The revised rules do not permit "vague, unparticularized content-ions," or "notice pleading, with details to be filled in later." *See North Atlantic Energy Serv. Corp*. (Seabrook Station, Unit 1), CLI-99-6, 49 NRC ___ (Mar. 5, 1999), *slip op.*

above, even tight microcracks would allow CO2 to penetrate and inflict carbonation damage. That process likely is already underway. And despite the application of weatherproofing sealant in 2012, the degree of carbonation damage from micro-cracking has been denied and is thus not quantified. Incidentally, FENOC also has not quantified carbonation damage possibly ongoing from the aforementioned cracks in the below-ground foundation and the dome, which supply additional pathways for the entry of CO2 into the SB wall. It is not known whether the 2012 painting on of sealant to the SB addresses either area, so they remain pathways of concern about carbonation.

9. Concrete Shrinkage Cracking

The Staff's argument (Answer pp. 22-23) that the RRCA added new and material information about the cause of the radial cracking – concrete shrinkage – underscores Intervenors' contention that FENOC and NRC have focused their respective tunnel vision apparatus on sub-surface SB side wall laminar cracking. Intervenors urge that all kinds of cracking, and all root causes, across the entire SB, and their associated and cumulative risks must be the focus of the low-amperage AMP. Radial cracks of concrete shrinkage origin are on Intervenors' radar screen of concern, even if they are not on NRC's or FENOC's screens. They should be. After all, cracking from shrinkage on the dome in 1976 (if not earlier) suggests a top-down moisture penetration pathway. All cracks of all origins must be identified and addressed in aging management form.

10. Rebar Management Inspections

To require Intervenors to have to explain or justify (Staff Answer 23) the deletion from the RRCA of rebar management and inspection from the February RCA is bemusing. FENOC,

itself, had determined that rebar inspection was pertinent, but without explanation, tracking the condition of the rebar of the SB has been rendered irrelevant to aging management objectives. This change creates an issue of fact for hearing. The "attorney speculation" of which Intervenors stand accused is a misnomer for *res ipsa loquitur*. It is a fallacy to assume that if the concrete is cracked, the rebar will remain intact. If the concrete fails, that creates an open pathway for radioactivity to escape, unfiltered, into the environment. Despite considerable evidence that the outer rebar layer is nonfunctional - and against the findings of its own engineers - the NRC engages in attorney speculation that the rebar is secure.

11. Main Steam Line Room Penetration Blockouts

Even FENOC, as footnoted by the Staff, admits that the MSL room cracking is significant, perhaps as much so as outer rebar layer SB sidewall cracking in the flute shoulders or the upper 20' of the SB wall. So it seems obvious to Intervenors that there is importance to fully understanding the root cause of the cracking in the Main Steam Line room areas. Since FENOC and/or PII provided new and material information on this significant issue, Intervenors included it within its Motion, and have also taken seriously the related matter of dense rebar and its narrow spacing.

12. Dome Cracking 36 Years and 61 Days Ago

Perhaps for comic relief, the NRC Staff deliberately misread (Answer p. 25) a statement by Intervenors[3] as a tactic to infer that they knew in 1976 of the dome cracking and thus are foreclosed by the ISO from raising it as part of Contention No. 5. The Staff persisted with its

[3]At p. 12 of their Third Motion to Supplement, "these cracks were documented as early as 1976" - referring, in context (something that the NRC Staff has a habit of ignoring) to FENOC's admitted documentation of the cracks in the dome in 1976.

slapstick by suggesting that because Intervenors raised the 1976 fact in an earlier filing (also within the 60-day ISO period), that somehow they should be precluded from raising it in their Third Supplement. Intervenors timely raised the point, and it was new information, covered up for 36 years by FENOC. It is material. The PII root cause revision report points out repeatedly that the dome cracking, combined with standing water, may indicate a scenario for SB side wall cracking, *i.e.*, the top-down moisture penetration pathway, which FENOC didn't mention in its RCA or RRCA despite that likelihood. The scenario is also neglected in the April 2012 AMP.

There is unmistakable incongruity in the fact that the NRC Staff attacks Intervenors on the matter of the 1976 dome cracking, because it was the Staff's questioning of FENOC that led, finally, to this 2012 admission of 1976 dome parapet cracking for the first time.

13. Ettringite Is a Deep Subject

The Staff misunderstands the significance of the new information on ettringite. Its presence reveals that moisture penetration extended down into and even deeper than the outer rebar layer, which makes corrosion likely if there is correspondingly deeper rebar latticework. It has been admitted, then denied, that the outer rebar layer is structurally nonfunctional because the cracking has detached it, un-bonded it, from the concrete. The new information suggesting non-investigated rebar corrosion potentially makes matters worse, and could even supply an additional root cause explanation for the cracking.

14. The Leaning Tower of FENOC

The Staff obfuscates the issue of fact raised by Intervenors as to the out-of-plumb shield building "slip-form induced friction forces resulting in laminar cracking as a potential failure mode. . . ." Nowhere throughout its height is the shield building within the required 1" plumb

tolerance. According to measurements at the time of the concrete pours for the building, the "[o]ut of tolerance exceeds the 1 inch in 25 feet specified by 2-3/4 inches." RRCA at 95.

FENOC considered the hypothesis to be "refuted" because "[t]he rate of slip-form movement was fast enough to minimize friction problems" PII analyzed the SB's verticality problem and concurred that the out-of-plumb issues did not cause the laminar cracks, but afterward disclaimed its opinion:

> Documentation of the Out of Plumb condition was limited to the documents provided. We do not have information regarding the method of correcting the problem and whether it caused excessive friction forces.

PII report, ML12138A037 at Appendix VI-34 (159/257 of .pdf). So FENOC's second, more authoritative opinion was issued with a poison pill, making its affirmance of FENOC suspect. This comprises an issue of fact. The Staff did not respond to this portion of Intervenors' argument, lending credence to the perception that it does not object.

Intervenors remain concerned about the unaddressed and uncalculated cumulative effects of all stresses on the SB walls which might add up to fail it. Although PII, FENOC, and the NRC Staff wish to discount the possibility entirely, there still must be an accounting within the AMP or some other document. The NRC and FENOC impulses to subdivide all structural stressors into compartments that are never viewed *in toto* leaves another issue of fact open.

15. Timely-Filed Motions to Supplement

Contrary to the NRC's shotgun arguments alleging noncompliance with 10 C.F.R. §2.309 (c), both Intervenors' Third and Fourth Supplements were timely filed, obviating the need to complete a recitation of fulfillment of the untimely filing factors. At pp. 2-3 of their Third Motion to Supplement, Intervenors assert, "Intervenors are timely moving to amend/supplement

their contention within the 60-day period identified in the Initial Scheduling Order in this case."[4] Similarly, at p. 2 of their Fourth Motion to Supplement, Intervenors state, "Intervenors are timely acting to itemize the divergences and issues of fact between the proposed license action and the true status of the Davis-Besse shield building by making this filing within the 60 day period set forth in the Initial Scheduling Order in this case."[5]

16. Contention of Omission vs. Contention of Inadequacy

The Staff insists (Answer p. 33) that "Because the LRA now includes a discussion of the recently identified shield building cracks and FENOC's plans to address these cracks during the period of extended operation, Intervenors must challenge the adequacy of the Shield Building Monitoring AMP." They have done so repeatedly in the Third and Fourth Motions to Supplement. But more importantly, the ASLB has not yet ruled on Intervenors' January 10, 2012 "contention of inadequacy," nor on the Staff's suggested "contention of omission." Intervenors fully intend to review and critique FENOC's August 16, 2012 AMP, which appears to supersede the April 5, 2012 AMP. There remains considerable time in the 60-day ISO period for them to do that, and Intervenors will fulfill that responsibility. When in doubt, the Staff has an endless

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[4]From p. 12 of Initial Scheduling Order, ASLBP No. 11-907-01-LR-BD01 (June 15, 2011): "The Board directs that a motion and proposed new contention shall be deemed timely under 10 C.F.R. § 2.309(f)(2)(iii) if it is filed within sixty (60) days of the date when the material information on which it is based first becomes available to the moving party through service, publication, or any other means. If filed thereafter, the motion and proposed contention shall be deemed nontimely under 10 C.F.R. § 2.309©. If the movant is uncertain, it may file pursuant to both sections."

[5]From p. 12 of Initial Scheduling Order, ASLBP No. 11-907-01-LR-BD01 (June 15, 2011): "The Board directs that a motion and proposed new contention shall be deemed timely under 10 C.F.R. § 2.309(f)(2)(iii) if it is filed within sixty (60) days of the date when the material information on which it is based first becomes available to the moving party through service, publication, or any other means. If filed thereafter, the motion and proposed contention shall be deemed nontimely under 10 C.F.R. § 2.309©. If the movant is uncertain, it may file pursuant to both sections."

supply of diversions.

17. 'In-Process Review' Emails and the Root Cause Report

The Staff's conclusory allegation (Answer p. 31) that the FOIA'd emails among NRC Staff "were preliminary discussions among Staff regarding the December 2011 restart of the reactor, not the conclusions of the Root Cause Report" and "could not ever stand as Staff's concerns with that analysis" nevertheless are pertinent to the later Root Cause Report. They reveal the nonconformance with NRC standards of the shield building since its construction in the mid-1970's. The calculations of structural inadequacy at present of the SB surely suggest that the cracking phenomenon is more diverse as to cause, and more widespread as to location, than FENOC's RCA and RRCA reveal. And there is no reconciliation - not even acknowledgment within the RCA - of the truly-shocking Staff engineers' reckonings as to the true state of the shield building. Especially given the rush to restart Davis-Besse, discussed elsewhere in this memorandum, the lack of forthright discussion and discounting of those fall 2011 communications prompts the belief that the issues must go to hearing. Otherwise, the public is left to believe that the NRC occasionally asks tough questions, but is indifferent to whether there are tough, indeed, any, answers required.

B. Reply to the FENOC Answer

1. Restart Approval Granted by NRC Before All Matters Verified

Even as it asservates (FENOC Answer pp. 62-63) that the emails relied on by Intervenors are mere "in-process reviews," FirstEnergy Nuclear Operating Company ("FENOC") makes a judicial admission that the Nuclear Regulatory Commission violated its own enforcement protocols in the heated rush to restore the Davis-Besse cash cow to mooing operability:

> Intervenors' discussion of these e-mails does not support an admissible contention. The e-mails are dated November 2011, and represent an in-process review by the NRC of Calculations C-CSS-099.20-054 and -056, not the final calculations that were reviewed and determined to provide a reasonable basis for functionality. ***The Revised Root Cause Evaluation demonstrates that the final versions of Calculations C-CSS-099.20-054 [vertical reinforcement] and -056 [hoop reinforcement] were approved on December 1, 2011 and December 5, 2011, respectively, which is after the interactions with the Staff on the calculations***.

The December 5 approval was also 3 days after the December 2, 2011 confirmatory action letter from the NRC to FENOC granting restart approval, in a great big hurry. The NRC Staff granted CAL restart approval three days BEFORE signing off on the safety confirmation for shield building rebar hoop reinforcement. Davis-Besse was actually restarted on December 5, 2011. This is another example of the NRC putting "production" - FENOC's bottom-line profits - ahead of safety.

It is further an issue of fact whether calculation C-CSS-099.20-056 properly supported the reactor restart on December 5. This is the very calculation that NRC engineer Abdul Sheikh was discussing in FOIA response document B/26 (copy attached), where he states: "I am ***concerned that the concrete will fail in this region due to bending in this region even under small loads***." Intervenors know from FOIA Response Number 1, Appendix B that on December 2, 2011, literally at the moment the CAL allowing restart issued, Mr. Sheikh was physically present at Davis-Besse, going over safety calculations. Presently, Intervenors have found no information in the public domain that reveals Mr. Sheikh to have been persuaded not to worry about the very significant -056 analysis. Now that the timing of the restart and these associated events are better understood, it becomes clearer why NRC regulatory activities regarding the shield building have a schizophrenic flavor. The agency is compelled to give its approval to all shield building matters even if it should not, because the agency blessed the restart based upon a

suspicious basis.

2. Sub-Surface Laminar Cracks Are Aging-Related

Evidence of the NRC's schizoid approach appears in another argument by FENOC (Answer pp. 9-10): "Of note, the April RAI Response reiterates the Root Cause Evaluation's conclusion that 'there are no direct aging effects associated with the identified laminar cracks." But the April RAI Response explains that the Shield Building AMP "is provided to periodically inspect the structure to confirm that there are no changes in the nature of the identified laminar cracks." Perhaps the underlying meaning of this admission is that the root cause explanation is not genuinely embraced by the regulator.

3. Davis-Besse's Current Licensing Basis Does Not Provide Acceptable Safety Level

FENOC adds to the confusion with its admission (Answer p. 23) that "[t]he NRC's license renewal framework is premised upon the notion that, with the exception of aging management issues, the NRC's ongoing regulatory process is adequate to ensure that the current licensing basis ("CLB") of operating plants provides and maintains an acceptable level of safety." Davis-Besse's current licensing basis does not provide an acceptable level of safety. As admitted by both FENOC the NRC Staff, Davis-Besse's design and licensing bases are violated by its shield building cracking. NRC has allowed the plant to operate any way, and generously given FENOC until December 2012 to come up with a plan to restore conformance, somehow. So FENOC's reliance on the CLB concept is hollow, relying as it does on a cracked shell that can be induced to collapse.

4. FENOC Falls into the Micro-Cracks

FENOC castigates the Intervenors (Answer p. 28 fn. 137) for making "the unsupported

claim that '[t]here is indisputably a connection between micro-cracking and age-related degradation' and this was admitted by PII." But PII does say that. The NRC's fourth question to PII was:

> 4. Item 21: States that the lack of micro-cracks on the fracture surfaces eliminates a progressive aging failure mechanism or fatigue. However, in PII repot *[sic]*; Exhibit 2; page 20 Figure 6b for cores A and D identified micro-cracks and Exhibit 2 Page 30 describes these cracks. Explain the presence/cause of these micro-cracks and why they are not considered or discussed in your conclusions in the RCR [Root Cause Report] on page 25?

PII responded by adding to Section 2.01 - Laboratory Tests and Examination to Test for Concrete Integrity (3rd paragraph) the following:

> The core-bores showed no signs of micro-cracking which, in combination with factors to be discussed in subsequent sections, eliminates a fatigue/progressive failure mechanism. The micro-cracks observed in the CTL report (Exhibit 2) are not representative of the areas observed by PII. The cores observed by PII were from locations exposed to repetitive loading and not the near-surface concrete observed by CTL.

So FENOC's contractor considered micro-cracking to be a "fatigue/progressive failure mechanism," and scored the absence of micro-cracks as meaning that any other cracking may not be aging-related. Hence the contradiction between FENOC's two contractors, CTL & PII regarding micro-cracking is quite significant and constitutes an issue of fact. The near-surface concrete micro-cracking observed by CTL may be aging related, and should be scrutinized for risk significance in a hearing on the merits of this contention. This is especially so given the extensive nature of various types of cracking observed at numerous locations across the shield building, to which list must now be added nearsurface concrete micro-cracking.

Incidentally, if the CTL micro-cracking is not aging related, then what is its root cause? FENOC gives none. Yet FENOC wishes for the ASLB and the public to believe that the April 5,

2012 AMP is sufficient when the power plant operator doesn't even know the root cause of the micro cracking.

CONCLUSION

Davis-Besse's licensing and design bases are violated by the severe, but unacknowledged, shield building cracking. FENOC has been given until December 2012 to even begin to cure these hapless difficulties by "restoring conformance." It remains to be seen whether the cure will be achieved by mere pencil whipping, or whether reconstruction of a new shield building is the only means of regaining an appropriate CLB. Until then, Davis-Besse's CLB is a moving target. Davis-Besse's current and extended operations have become uncharted, and unchartable, territory.

WHEREFORE, Intevenors pray the Licensing Board grant them leave to amend and/or supplement their proffered Contention 5 as they have requested in their Third and Fourth Motions to Supplement.

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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION
Before the Atomic Safety and Licensing Board

In the Matter of	)	
		Docket No. 50-346-LR
First Energy Nuclear Operating Company	)	
(Davis-Besse Nuclear Power Station, Unit 1)		August 24, 2012
.	)	

* * * * *

CERTIFICATE OF SERVICE

We hereby certify that a copy of the "INTERVENORS' COMBINED REPLY TO NRC AND FENOC ANSWERS TO INTERVENORS' THIRD AND FOURTH MOTIONS TO AMEND AND/OR SUPPLEMENT PROPOSED CONTENTION NO. 5 (SHIELD BUILDING CRACKING)" was sent by me to the following persons via electronic deposit filing with the Commission's EIE system on the 24th day of August, 2012:

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Sakai, Stacie

From: Sheikh, Abdul NRR
Sent: Tuesday, November 22, 2011 10:51 AM
To: Sanchez Santiago, Elba
Cc: Hoang, Dan; Manoly, Kamal; Sakai, Stacie
Subject: Questions for the Conference Call

There are several documents (summary report, new calculation 056) that have different assumptions and approaches. I did not have enough time to review the calculation (196 pages). However, the basic questions are as follows:

1. What is the actual condition of the concrete 20 feet below the spring line based on field verification.
2. Calculation C-CSS-089.20-056, page 5 states in the assumption section that, "because the bond strength of reinforcement with laminar cracking next to it cannot be quantified, outside face hoop reinforcement in these regions is treated as ineffective --- for ultimate strength calculations." If this assumption is correct only 3-4 inches of the concrete on the inside face can be used in the structural analysis. In the response to the questions, the applicant stated that, " Since we assume that outside reinforcement is to be treated ineffective in carrying any additional stress beyond 12.4 ksi, under accident thermal loads that may cause stresses in excess of what the rebar can carry (assumed 12.4 ksi), the reinforcement is assumed to detach itself from the outer section of the shell." These statements seems to be contradictory. In addition, I am concerned that the concrete will fail in this region due to bending in this region even under small loads.
3. Lap splice issue. ACI 318-63, section 805 (b) states that, "---however, length of lap for deformed bars shall be not less than 24, 30, and 36 bar diameters for specified yield strength of 40,000, 50,000, and 60,000 psi, respectively."
4. At places in the licensee documents, it is stated that due to staggered lap rebar splices, only 50 percent of the rebars are considered effective. If this is the assumption, stress used for lap splice calculation should account for 100 percent increase in the stress.
5. The licensee justification for ignoring the dead (DL) and normal thermal (To) in calculation of rebars splice does not appear to be justified. The stresses due to dead load and thermal loads will be locked in the rebars and cannot be ignored.
6. The licensee considers the allowable stress in the rebar to be 60 ksi and ignores a phi factor (0.9) in his evaluation for lap splice. In addition, the licensee has not accounted for any additional uncertainty due the field conditions.
7. Licensee response to question 1 states, "On a conference call with Drs Darwin and Sozen both indicated that the capacity of the reinforcement steel after the concrete is cracked (in the 5-10 mil range) is still 20 to 30%. This is based on pull tests of straight bars under tensile loads." I am not aware of any pull tests carried out with a crack in the plane of the rebar. Can the licensee provide any documentation for this statement.
8. The licensee is using numerous assumptions in his summary report and calculations that are not described in the UFSAR and ACI 318-63, and still calls it a design basis calculation. Can the licensee provide justification for this approach.

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