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

In the Matter of:	)	Docket No. 50-346-L
FirstEnergy Nuclear Operating Company Davis-Besse Nuclear Power Station, Unit 1	)	December 30, 2014
	)	
	)	

INTERVENORS' SECOND MOTION TO SUPPLEMENT CONTENTION NO. 7 ON WORSENING SHIELD BUILDING CRACKING AND INADEQUATE AMPS IN SHIELD BUILDING MONITORING PROGRAM

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 move for a second time to amend and supplement their September 2, 2014 "Motion to Admit Contention No. 7 on Worsening Shield Building Cracking and Inadequate AMPs in Shield Building Monitoring Program." FirstEnergy Nuclear Operating Company ("FENOC") has modified its Aging Management Plans ("AMPs") within its Shield Building Monitoring Program in response to a worsening cracking problem in the reactor Shield Building at the Davis-Besse Nuclear Power Station, Unit 1 ("Davis-Besse").

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MEMORANDUM

AMENDED CONTENTION

Intervenors amended their contention with the filing on September 8, 2014 of "Intervenors' Motion to Amend and Supplement Contention No. 7 on Worsening Shield Building Cracking and Inadequate AMPs in Shield Building Monitoring Program." That amended contention remains the same and reads as follows:

> FENOC's revisions to the AMPs in its Shield Building Monitoring Program, dated July 3, 2014,[1] acknowledge not only the risk, but the reality, of aging-related cracking propagation - that is, worsening - in the already severely cracked Shield Building, an admission which brings the issue within the scope of this License Renewal Application proceeding. FENOC's proposed modifications to its Shield Building Monitoring Program AMPs, regarding the scope (areas of the Shield Building to be examined), sample size (number of tests to be performed), and the frequency of its surveillance activities, are woefully inadequate. Significantly more core bores, as well as a broader diversity of complementary testing methods should be required, and at a much greater frequency than FENOC has proposed. The cracking phenomena must be identified, analyzed and addressed within the Final Supplemental Environmental Impact Statement for the license renewal both in the consideration of alternatives to granting the 20-year license extension for Davis-Besse as well as in the Severe Accident Mitigation Alternatives analysis (SAMA). The cracking problems do not support a conclusion that there is "reasonable assurance" that Davis-Besse can be operated in a manner protective of the public health and safety under the Atomic Energy Act during the 20-year proposed license extension period.

Intervenors hereby supplement their Contention No. 7 by bringing to the attention of the Atomic Safety and Licensing Board certain criticisms of FENOC's proposed monitoring of rebar deterioration in the Shield Building, which Intervenors link to the other weaknesses of Aging

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[1]See FENOC's "Reply to Request for Additional Information for the Review of the Davis-Besse Nuclear Power Station, Unit No. 1, License Renewal Application (TAC No. ME4640) and License Renewal Application Amendment No. 51," Davis-Besse Nuclear Power Station, Unit No. 1, Docket No. 50-346, License Number NPF-3, sent by FENOC to the attention of the Document Control Desk at the U.S. Nuclear Regulatory Commission on July 3, 2014, per 10 CFR 54, Enclosure: Davis-Besse Nuclear Power Station, Unit No. 1 (Davis-Besse), Letter L-14-224, Enclosures 1 and 2, ADAMS No. ML14184B184 (hereinafter referenced as "FENOC's RAI Letter, July 3, 2014").

Management Plans (AMPs) for that structure.

BACKGROUND

In LBP-12-27 (December 28, 2012), the Atomic Safety and Licensing Board rejected Intervenors' Contention 5 and its associated amending and supplemental filings, by which Intervenors sought consideration of widespread laminar cracking and other concrete cracking and damage in the Shield Building walls to be viewed as aging-related problems falling within the parameters of this license renewal proceeding. The ASLB said in its ruling:

> . . . Intervenors must point to the specific ways in which the Shield Building Monitoring AMP is wrong or inadequate to raise a genuine dispute with FENOC's LRA. This they have failed to do. ***Intervenors have provided no support for their argument that the cracking (1) is aging-related*,** and (2) prevents safe operation of the plant. These claims amount to bare assertions, which the Commission has made clear "are insufficient to support a contention.". . . However, a petitioner "'must present sufficient information to show a genuine dispute' and reasonably 'indicating that a further inquiry is appropriate.'"

(Emphasis added). *Id*., LBP-12-27 at 30 (32 of .pdf).

However, in their "Motion for Admission of Contention No. 7" filed September 2, 2014, Intervenors' formerly "bare assertions" were clothed with a distinct change of position of FENOC, which had finally conceded that significant mistakes were made in remediation and in understanding the implications of the cracking phenomena which were first noticed in 2011. FENOC's 2014 "ice-wedging" cracking propagation root cause is an admission that the Shield Building cracking is aging-related, which brings it within the scope of this LRA proceeding. FENOC acknowledged worsening cracking in August/September 2013; on July 8, 2014, FENOC provided, at long last, the supposed root cause of this worsening, or "propagating," cracking - ice-wedging, per PII's 9/11/13 RCA-3. So now, the calculations of NRC staff engineers which

suggest that the Shield Building is permeated by cracking which threatens the continued usefulness and stability of the structure itself, and the burgeoning evidence of increasing cracking, must be conceded validity. There remain growing, not lessening, questions surrounding the basis for granting a 20-year extension of Davis-Besse's operating life.

Intervenors moved to amend Contention 7 via the aforementioned September 8, 2014 motion filing. The document identified as "Enclosure 2," the "Full Apparent Cause Evaluation" (hereinafter "FACE") which is part of the FENOC RAI Letter dated July 3, 2014[2] but not disclosed to the ASLB, Intervenors and the public until July 8, 2014, was the focus.

Intervenors brought to the ASLB's attention in that filing that water is saturating the shield building walls and that FENOC has not adequately considered the sources of it. FENOC's consultant, Performance Improvement International ("PII"), reported in the FACE that there is water saturating the Shield Building concrete at 10 inches of depth. FACE, p. 34/98 of .pdf. PII concluded that coating the outer walls of the Davis-Besse Shield Building has "prevented a finite amount of moisture from leaving the structure," which will contribute to the water accumulation mechanism required for Ice-Wedging for some time to come. *Id.* at 35/98 of .pdf. The FACE also revealed that a Scanning Electron Microscope (SEM) revealed the presence of microcracks in concrete bore samples. FACE at 34/98 of .pdf. At multiple depths, evidence of Freeze-Thaw damage and evidence of water transport in the form of Ettringite crystals formation and microcracks emanating from pores was found. *Id.* The maximum microcrack density is near the outermost layer of the concrete (within the first 2 in). *Id*. The presence of excess water was confirmed and is indisputable. *Id.* A high content of salt was identified within the structure's

[2]NRC ADAMS No. ML14184B184.

walls and credited for having an ongoing water-borne corrosive effect which exceeds the corrosion from outside the Shield Building. FACE, p. 39/98 of .pdf. The presence of corrosive agents was noted as having serious implications for rebar embedded in the Shield Building walls:

> Corrosion of embedded metal is one of the main causes of failure of concrete structures (ACI 201.2R, ACI 222R). The critical elements needed for corrosion to occur are water, oxygen, and chloride ions, which in turn makes permeability the main concrete property that influences corrosion resistance. The high alkalinity (pH>12.5) of the concrete protects the thin iron-oxide film on the surface of the steel, thus making the steel passive to corrosion.

"FENOC-Davis-Besse Nuclear Power Station, Unit 1, Submittal of Contractor Root Cause Assessment Report - Section 1," ADAMS No. ML12138A037, pp. 180-181/257[3] of .pdf.

As Intervenors had warned in 2012, the whitewashing of the Shield Building has now locked the water in the walls. Every time it freezes, another 0.4 to 0.7 inches of circumferential ice-wedging crack spreading takes place, which is aging-related and worsens with each winter freeze-thaw cycle. PII concluded in the FACE that "the [exterior Shield Building] coating has. . . locked in moisture or water existing in the structure prior to the coating." FACE, p. 41/98 of pdf. PII observed that "Until this moisture dissipates it provides the water accumulation mechanism required for Ice-Wedging, and therefore is identified as Causal Factor 2." FACE, p. 55/98 of .pdf. PII reached this conclusion after admitting gravely mistaken assumptions at the time the decision to coat the Shield Building was taken, ruefully acknowledging that "the belief was that had the water come from inside of the shield building, the amounts discovered were small

[3] At 180-181/257 of .pdf, 2012 Revised Root Cause Analysis by PII: "Corrosion of embedded metal is one of the main causes of failure of concrete structures (ACI 201.2R, ACI 222R). The critical elements needed for corrosion to occur are water, oxygen, and chloride ions, which in turn makes permeability the main concrete property that influences corrosion resistance. The high alkalinity (pH>12.5) of the concrete protects the thin iron-oxide film on the surface of the steel, thus making the steel passive to corrosion."

enough to present no adverse effect to the shield building." FACE, p. 63/98 of .pdf.

The Intervenors also pointed out in their September 8 Motion that FENOC's inaction on identifying and ameliorating the cracking is not an effective response. The FACE recommended merely "monitoring the crack propagation condition." FACE, p. 66/98 of .pdf. This left in place FENOC's policy of opposing repairs of small exterior cracks in the belief that the October 2012 application of shield building coating would prevent subsequent water intrusion while ignoring the potential for new outer-wall cracks as fissures to continue to foster water intrusion. *Id.*, 40/98 of .pdf. Davis-Besse's maintenance rule manual states that cracks 1/16" or less do not need to be repaired. *Id.*

In 2012, Intervenors sought adjudication to investigate in detail the possibility that the cracking problems were not contained by coating the Shield Building and that they were indeed aging-related and that there may be micro-cracking. Two years of concealment of the presence of increased water concentrations in the Shield Building walls from 2012 to 2014, which extended through the uniquely severe winter of 2013-2014, has almost certainly worsened the spread of cracking. PII's September 2013 FACE admits that there is 0.4 to 0.7 inches of circumferential crack growth per freeze and acknowledges up to 10.8 inches of additional cracking per two years because of the water presence and ice-wedging it causes.

I. NEWLY-DISCOVERED SUPPLEMENTAL FACTS

FENOC's October 28, 2014 "Reply to Request for Additional Information for the Review of the Davis-Besse Nuclear Power Station, Unit No. 1, License Renewal Application," which was provided to the ASLB by FENOC on October 29, 2014, is the source of the additional facts with which Intervenors propose to supplement Contention No. 7. The October 28 letter will

hereinafter be called "RAI Responses".

A. Dangerous Denial of Extent of Cracking Propagation

In its "RESPONSE RAI B.2.3-5 (follow-up)," FENOC states "*Crack perimeters were identified to be slowly expanding or propagating* during routine long term monitoring inspections in 2013." (Point #1, Timothy Matthews, Morgan Lewis, on behalf of FENOC, to ASLBP, p. 6/12 on .pdf counter). (Emphasis added). FENOC is suffering from a dangerous denial of the significance of the cracking propagation. Previously, FENOC and NRC staff pointedly denied that cracking propagation was even possible. Intervenors disputed such optimistic assumptions and wishful thinking in numerous cracking contentions filed throughout 2012. FENOC could no longer deny it, after observing cracking propagation in August-September, 2013. The very belated root cause analysis regarding the cracking propagation, released in July 2014, was the basis for Intervenors' latest previous contention.

It appears now that FENOC has resorted to denying, not the existence of cracking propagation, but rather its significance. FirstEnergy asserts that the "Crack perimeters were identified to be *slowly expanding or propagating*…". But 0.4 to 0.7 inches of cracking propagation each and every time it freezes at Davis-Besse is a remarkably *fast* rate, portending functional and structural failure sooner rather than later.

At p.9/12 of the .pdf, FENOC cites the NRC Staff's own minimization of the significance of the cracking propagation. In its "Question RAI B.2.43-6 (follow-up)…Issue," when it describes the "existing *potentially* propagating laminar cracks…". (emphasis added) As cited by Intervenors in previous 2014 contention filings, FENOC belatedly admitted in July 2014 that the laminar cracks are not "potentially" propagating, they are *in fact* propagating, 0.4" to 0.7" every

time the Shield Building freezes. This high cracking rate raises deep concern about the functional capability and structural integrity of the Shield Building for the next 22.5 years.

B. Air and Water Infiltration of the Shield Building Wall

However, the NRC Staff's main point is apt. Staff warns "The presence of water and air trapped within the existing potentially *[sic]* propagating laminar cracks of the coated shield building wall increases the potential for corrosion of the adjacent rebar layers." The Staff "also noted in LRA Section 3.5.2.2.1.1 that the groundwater chemistry at the Davis-Besse site is considered to be aggressive (*i.e.*, chlorides = 2,870 ppm (max) and sulfates = 1,700 ppm (max)) which may also be indicative that the shield building is or has been exposed to potentially aggressive (high chloride content) air-outdoor environment that favors potential for rebar corrosion." RAI Responses, p. 9/12 of .pdf. The Staff requested "additional technical justification and basis regarding the AMP's justification of opportunistic inspections to monitor aging effects in the rebar located near the laminar cracking." *Id.*

NRC Staff expressly requested as follows:

> Considering the plant-specific conditions of the shield building wall associated with existing laminar cracking that may propagate; presence of trapped water and air in the laminar cracks; and potentially aggressive environmental conditions; explain, with sufficient technical details and basis, the following:
>
> 1) How opportunistic inspection of rebar when exposed will adequately manage potential aging effects of rebar corrosion for rebar layers located near laminar cracking, or
>
> 2) Any modifications or enhancements that will be made to the Shield Building Monitoring Program or any other applicable AMP to address the staff's concern regarding the implementation of opportunistic inspection of rebar when exposed to manage potential aging effects of rebar corrosion for rebar layers located near laminar cracking.

Id. at 9-10/12 of .pdf. In response, FENOC asserted that no modifications or enhancements to Davis-Besse License Renewal Aging Management Programs are necessary, claiming that

opportunistic inspection will be adequate; that there will be no interaction between chemically aggressive groundwater and laminar cracking; that there is minimal corrosion of rebar due to the weather sealant precluding any additional moisture or oxygen; and that the water in the walls has high pH and thus is not "conducive to generate corrosion in the rebar." RAI Response p. 10/12 of .pdf. FENOC further stated:

> Corrosion of rebar would result in visual indications such as staining, cracking and spalling on the exterior of the structure or in core bores that are located near rebar. These indications are aspects that are monitored under the Structures Monitoring Program to adequately manage aging of the structure, inclusive of potential rebar corrosion.

Id. at p. 11/12 of .pdf.

FENOC's responses to the NRC Staff's requests are severely wanting. The inadequacy of opportunistic visual inspection is clear from Davis-Besse's own recent operating experience: sub-surface laminar cracking of the Shield Building went undetected from 1978 to 2011 (33 years); the air void or wall gap in the Shield Building wall went undetected, despite extending 24 of 30 inches (80% of the way) through the Shield Building wall, from early December, 2011 to early 2014 (for over two years of full power operations).

FENOC's only opportunity to visually inspect rebar was during the October-November 2011 construction opening (after more than 30 years of operation). Reality dictates that only a very small fraction of the entire rebar skeleton of the Shield Building walls will be available, on an irregular and unpredictable basis, for opportunistic inspection.

Further, FENOC's conclusion of impossibility of water transporting from the ground into the Shield Building walls[4] is not credible, if the Shield Building cracking extends down to the

[4] "[P]ostulated scenarios of interaction between groundwater and the laminar cracking condition are not considered credible." RAI Responses at p. 10/12 of .pdf.

ground, creating a capillary action, or wicking mechanism, that creates a direct pathway for chemically aggressive groundwater to move up the shield building to corrode rebar. Besides, the only evidence FENOC has which indicates the cracking does not reach to the ground are impulse response tests from 2011 which are no longer credible.

Intervenors have previously in this proceeding identified other pathways for water (and hence air) infiltration into the Shield Building walls: a pathway from the ground up, via wicking or capillary action; cracks less than a certain size (1/16" in width) on the Shield Building exterior not being required to be sealed; a top-down pathway, via atmospheric precipitation deposition (rain, melting snow and ice) and infiltration; also, moisture can enter the Shield Building walls via the Inner Face, inside the SB, from the annulus, because that wall is not sealed. This last point begs the question, if the Inner Face is not sealed, how is air infiltration precluded?

At RAI Responses p.11/12 of .pdf, FENOC states "It was concluded that the water constituents were 'typical of water that was in contact with the concrete for a period of time.'" More specific information on the age of the water in the walls is needed to preclude the possible conclusion that the Outer Face weather sealant is not working, as well as to determine if other pathways (such as those mentioned immediately above) might be the source, either recently or on an ongoing basis.

On the same page, FENOC states "Water samples collected exhibited high pH values (average greater than 10). It is therefore documented that the "…water itself with salt and high pH is not conducive to generate corrosion in the rebar." Such optimistic assumptions by FENOC about high alkalinity protecting the rebar are suspect. *The Shield Building is not intact, but rather is severely cracked*, with propagating cracking that grows 0.4" to 0.7" every single time it

freezes. The more cracking that occurs, the more infiltration of moisture and oxygen which follows, all the way to the structural rebar. This is part of a vicious cycle of degradation that will ultimately lead to loss of safety function, and perhaps even collapse of Shield Building walls.

Intervenors have previously pointed out that there are ongoing water problems around the Shield Building foundation. In one of their 2012 filings on cracking, they stated:

> Moreover, Davis-Besse has other water problems inside the shield building. In RAI responses dated May 24, 2011 (ML 11151A90), the NRC staff had noted a "history of ground water infiltration into the annular space between the concrete shield building and steel containment." During a 2011 AMP audit, NRC staff also reviewed documentation that: [I]ndicated the presence of standing water in the annulus sand pocket region. The standing water appears to be a recurring issue of ground water leakage and areas of corrosion were observed on the containment vessel. In addition, during the audit the staff reviewed photographs that indicate peeling of clear coat on the containment vessel annulus area, and degradation of the moisture barrier, concrete grout, and sealant in the annulus area that were installed in 2002-2003.

www.beyondnuclear.org/storage/June%204%202012%20Motn%20to%20Amend%20Supp%20Contn%205%20COMPLETE-1.pdf, p.12/16 of .pdf.

In another 2012 cracking filing, Intervenors asserted:

> At its base, in the sand bed region, it has been exposed to standing water, "aggressive" groundwater containing dissolved chemicals that make it a high risk for corrosion, which in fact has been observed in that portion of the steel containment. But other areas of the steel containment have also exhibited corrosion, as towards the top, due to a corrosive boric acid leak from the refueling channel associated with the reactor cavity. A leak from the refueling channel would also likely contain tritium, itself highly corrosive to steel. This steel containment documented degradation makes its failure during an accident more likely.

http://www.beyondnuclear.org/storage/FOIA%20Appendix%20B%20contention%20supplement%208%2016%202012.pdf, p.67/101 of .pdf.

FENOC denies the possibility of water infiltration upward through the Shield Building wall structures, and the potential for chloride-laden water vapor being found in concentrations

around the base of the building. Trivialization of the possibilities, without adequate investigation, is an unfortunate hallmark of the company's aging management of the Shield Building.

3. Disputed Corrosion-Inhibiting Alkalinity

As a result of the hydration reactions of cement, the pore solution of concrete tends to be alkaline, with pH values typically in the range 12.5-13.6. Under such alkaline conditions, reinforcing steel tends to passivate and display negligible corrosion rates. However, due to the porous nature of concrete, corrosive species and chemical species supporting corrosion reactions can enter the concrete and lead to corrosion problems. Furthermore, corrosive species can enter the mix if 'contaminated' mix ingredients are used (water, aggregates, additives). *See* Corrosion-Club.com (http://www.corrosion-club.com/concretecorrosion.htm), which states. "Corrosion damage to the reinforcing steel results in the build-up of voluminous corrosion products, generating internal stresses and subsequent cracking and spalling of the concrete…." *Id.* The fact is, reinforcing steel is more vulnerable to further corrosion damage after the protective concrete cover has been compromised.

Two important rebar corrosion mechanisms are chloride induced rebar corrosion and carbonation. *Id.* FENOC asserts that bore hole water with "average greater than 10" pH values are high enough to preclude significant rebar corrosion. However, the above Corrosion-Club citation indicates that a pH value of at least 12.5, or even higher, is needed to preclude rebar corrosion. Thus, it appears that FENOC's confidence level with the current situation is misplaced. Davis-Besse's Shield Building rebar appears to be quite vulnerable to worsening corrosion.

Regarding "chloride induced rebar corrosion," FENOC's admission that "the groundwater

chemistry at the Davis-Besse site is considered to be aggressive (*i.e.*, chlorides = 2,870 ppm (max)…) which may also be indicative that the shield building is or has been exposed to potentially aggressive (high chloride content) air-outdoor environment that favors potential for rebar corrosion," the low pH value of somewhat more than 10 raises concern that the Davis-Besse Shield Building rebar is in fact very vulnerable to airborne or waterborne chloride-induced corrosion, despite FENOC's assurances to the contrary.

Regarding the carbonation rebar corrosion mechanism, U.S. Representative Dennis Kucinich, citing an Oak Ridge National Laboratory report, pointed out the significance of carbonation vis-a-vis Davis-Besse's Shield Building cracking in 2011. Intervenors cited Congressman Kucinich's revelations in their first cracking contention on January 10, 2012. See, for example, ¶ 26,[5] on pages 26-29 of 61 on PDF counter of Intervenors' January 10, 2012 Contention No. 5 motion.[6]

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[5]"Concrete carbonation is a process of deterioration of concrete that is caused by the seepage of CO2 through the concrete wall. As the CO2 seeps through the concrete wall, it creates a chemical reaction that lowers the alkalinity of the concrete. On average, CO2 seepage occurs at a rate of approximately 1 mm per year.[3] The problem arises when the CO2 seepage reaches the steel rebar, because it is the high alkalinity of the concrete that protects the steel from corrosion. When carbonation lowers the alkalinity of the surrounding concrete, the steel can begin to corrode. As the steel corrodes, it expands and creates cracks in the concrete that run along the line of the steel rebar.[4]

Obviously, the outermost rebar is the first steel that the carbonation would reach. The rebar in the "wings" of the wall is the closest to the surface and would be affected first, followed shortly thereafter by the rebar at the midpoint between the wings where the main circumferential rebar is closest to the outside surface of the wall. And, since this process should be occurring uniformly around the circumference of the building, it should exist to about the same extent in all the "wings."

This scenario seems to fit the situation discovered at Davis-Besse perfectly. Cracks have been discovered in 15 of the 16 wings, and the process of carbonation almost certainly has reached the rebar in the 16th wing, but corrosion of the rebar there has not yet progressed enough to open cracks in the adjoining concrete."

[6]http://www.beyondnuclear.org/storage/FINAL%20Contention%205%20Cracking%20January%2010%202012.pdf.

Congressman Kucinich's allegations about the carbonation rebar corrosion mechanism were compelling enough that it prompted NRC staff to echo it, in a Request for Additional Information dated December 12, 2011, as documented by Intervenors in their initial, January 10, 2012 cracking contention motion. (*Id.*, ¶ 45, beginning at p. 42/61 of .pdf counter).

"Corrosion of embedded metal components, especially reinforcing bars, is a principal cause of deterioration and failure in concrete structures. Corrosion expands the diameter of the rebar, which puts pressure on the surrounding concrete and leads to cracks, delamination, and spalls." Kenneth E. Hooker, "Rebar Without Corrosion: Alternative reinforcing materials can improve concrete performance in harsh conditions and critical applications" (June 2013), at http://www.concreteconstruction.net/reinforcement/rebar-without-corrosion_1.aspx.

And, as stated at ConcreteConstruction.net http://www.concreteconstruction.net/zinc/galvanized-rebar.aspx), "Depending on the oxidation state, *the corrosion products of steel can occupy more than 6 times the volume of the original steel*." (Emphasis added). The voluminous expansion of corroding rebar in the Davis-Besse Shield Building walls could be among the additional "even… small loads" that NRC staff warned about in late 2011, as all that would be needed to cause a failure of the outer 27 inches of the 30 inch thick Shield Building wall. (NRC FOIA response Appendix B, Document B/26, 11/22/11 Email from A. Sheikh, NRR to E. Sanchez Santiago, RIII on Questions for the Conference Call, 1 page; and pages 23-24 of 43, "Intervenors' Fourth Motion to Amend and/or Supplement Proposed Contention No. 5 (Shield Building Cracking) July 23, 2012. (http://www.beyondnuclear.org/storage/4th%20Motion%20PII%20COMPLET.pdf).

FENOC's conclusion that, "Corrosion of rebar would result in visual indications such as

staining, cracking and spalling on the exterior of the structure or in core bores that are located near rebar," is alarming and unacceptable as an aspect of aging management monitoring. Long before such severe degradation of the structural rebar becomes visible, and undeniable, on the exterior surface of the Shield Building, its capability to fulfill design and safety functions will have long since ceased. Such undeniable rebar corrosion, as indicated by "staining, cracking and spalling on the exterior of the structure" will in fact raise concerns about the structural integrity of the Shield Building itself, such as the risk of it collapsing under its own immense weight.

D. Shield Building Cracking Links to Rebar Degradation

From the very beginning, the Shield Building cracking, since it has been closely associated with the outer rebar mat, is inextricably interlinked with rebar degradation. For example, as cited by Intervenors in their February 27, 2012 cracking contention supplement (at p.2/102 of .pdf),[7] Congressman Kucinich had stated on February 8, 2012:

> …The NRC allowed my staff to review those documents. The reports showed conclusively that the cracking was not in 'architectural' or 'decorative' elements of the wall, as FirstEnergy publicly claimed, but *ran throughout the line of the main outer rebar. In fact, the cracking is so extensive that the NRC required FirstEnergy to assume, in its calculations of the strength of the wall, that the vertical outer rebar mat did not even exist."* (Emphasis added).

In the same February 27, 2012 contention filing, Intervenors also cited an NRC inspection report dated January 31, 2012 (Davis-Besse Nuclear Power Station Integrated Inspection Report 05000346/2011005). At pp. 26-27/102 on .pdf counter, the NRC inspection report states that defective rebar would have been installed by FENOC in the Davis-Besse Shield Building construction opening patch, if NRC staff had not intervened. Such defective rebar, in violation of

[7] http://www.beyondnuclear.org/storage/Coalition%20filing%20contention%20amdt%202%2027%202012.pdf

NRC regulations, could have made Davis-Besse's Shield Building vulnerable to failure of its design and safety function, NRC staff warned.

Citing a Japanese study, Intervenors warned in their June 4, 2012 motion to supplement[8] that the drama of FENOC's purported Blizzard of 1978 root cause theory for Shield Building cracking was not necessary, but rather that corrosive water could be "supplied to the rebar with few minutes' scattered showers." (*Id.*, p.6/16 on .pdf counter, quoting "Quantification of Water Penetration Into Concrete Through Cracks by Neutron Radiography," The 3rd ACF International Conference-ACF/VCA 2008, 925, M. Kanematsu, Ph.D., I. Maruyama, Ph.D., T. Noguchi, Ph.D., H. Iikura, Ph.D. and N. Tuchiya, posted online at http://www.degas.nuac.nagoya-u.ac.jp/ippei/paper_e/200811_ACF_Kanematsu.pdf).

This warning is all the more relevant, given FENOC's refusal to repair exterior surface cracking less than 1/16" inch in width. Such cracks will allow water – and hence air -- infiltration into the Shield Building wall, another matter which can enable rebar corrosion.

In the June 4, 2012 filing, Intervenors also cited FENOC's own Root Cause Analysis (FENOC's February 27, 2012 "Root Cause Analysis Report" ("Root Cause Analysis" or "RCA") at p. 96). which contains the admission that: "Rebar was installed too densely in areas opened for maintenance over the plant's history and a spacing sensitivity study established that a higher density of rebar could propagate laminar cracking beyond the architectural flute region with a given stress condition." (http://www.beyondnuclear.org/storage/June%204%202012%20Motn%20to%20Amend%20Supp%20Contn%205%20COMPLETE-1.pdf, p.8/16 of .pdf).

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[8]http://www.beyondnuclear.org/storage/June%204%202012%20Motn%20to%20Amend%20Supp%20Contn%205%20COMPLETE-1.pdf.

Intervenors further noted that "Rebar was also installed too densely at the main steam line penetration blackouts. This was done as an earthquake protection for the shield building structure, because the concrete was more vulnerable there due to the 'discontinuities.' But ironically, it facilitated crack propagation."

At p. 10/16 of the June 4 filing, Intervenors expressed concern about "swollen and bursting rebar" associated with the Shield Building cracking. At p. 13/16, they warned, "What is missing is an analysis which considers and if warranted, refutes, any connection between the cracking, and spalling or the placement of too-dense rebar or the potential for moisture-caused damage to the interior of the shield building from moisture which even now may be wicking into interior concrete. The potential for concrete damage emanating outward from inside the shield building has not been addressed at all by FENOC." Such analysis has still not been done and the risks have still not been addressed, two a half years later.

In their July 16, 2012 filing, Intervenors warned (at p. 9, "Ettringite Penetration Beyond Outer Rebar Layer"):

> The root cause report did not document the depth of the core samples at which ettringite was present in samples that contained ettringite deposits. Ettringite is a hydrous calcium aluminium sulfate mineral. FENOC asserted in its February 2012 RCA that when ettringite is found lining the air voids in shield building concrete it 'suggests long-term exposure to moisture migrating through the concrete.' RRCA at 25.

Information added to the Revised RCA states (RRCA at 25) that:

> Core F2-792.3-4.5 was approximately 4-3/4 inches long and the secondary deposits [of ettringite] thinly lined virtually all of the air voids throughout the concrete. Core F4-791.0-2.5 was approximately 4 inches long with both ends saw cut. The air voids in core F4-791.0-2.5 contained secondary deposit linings in the same abundance and pattern as those of core F2-792.3-4.5.

Ettringite 4-3/4 inches deep indicates "long-term exposure to moisture migrating through the

concrete," then, in FENOC's own words. Intervenors pointed out in the July 16 filing that:

> The outer rebar mat is only 3 inches beneath the concrete surface. Finding ettringite at 4 3/4" would seem to indicate potential for rebar corrosion, which would seriously worsen cracking and loss of bond strength between concrete and rebar. FENOC's conclusion that there is no problem with rebar corrosion whatsoever is not consistent with the conclusion to be drawn from the utility's core-bore samples.

(http://www.beyondnuclear.org/storage/3rd%20%20Motion%20COMPLET%20supp%20cracked%20concrete%20containment%20contention%20July%2016%202012.pdf, pp. 10-11 of .pdf).

Intervenors' July 23, 2012 contention filing contains around 65 references to the word "rebar" in its 56 pages. This document analyzed 27 areas of questioning posed by NRC staff to FENOC, in the form of Requests for Additional Information regarding the utility's Shield Building cracking root cause analysis. (http://www.beyondnuclear.org/storage/4th%20Motion%20PII%20COMPLET.pdf).

Another 54 instances of the word "rebar" appear in Intervenors' 101-page-long August 16, 2012 contention filing. (http://www.beyondnuclear.org/storage/FOIA%20Appendix%20B%20contention%20supplement%208%2016%202012.pdf). "Rebar" appears 67 times in Intervenors' 39-page-long April 21, 2014 contention filing [http://www.beyondnuclear.org/storage/kk-links/4%2021%2014%20Motion%20to%20admit%20new%20contentio%20FINAL-2.pdf). "Rebar" appears 21 times in Intervenors' September 2, 2014 first filing of Contention 7. (http://www.beyondnuclear.org/storage/kk-links/9%202%2014%20Final%20Contn%207%20COMPLET%20FINAL.pdf). And "rebar" turns up three (3) times in their second, September 8, 2014 filing. http://www.beyondnuclear.org/storage/kk-links/9%208%2014%20Contn%207%20Motn%20Amd%20or%20Supp%20FINAL-1.pdf).

II. LEGAL STANDARDS

A. Timeliness of This Supplementation

Intervenors admit that by filing their petition on December 30, 2014, they are one (1) day outside of the deadline for amendment of contentions specified in the ASLB's June 15, 2011 Initial Scheduling Order ("ISO"). The deadline would have been December 26, 2014, which was extended to December 29 by President Obama's issuance a few weeks before Christmas of an order declaring December 26 to be a federal holiday. The 60-day period commenced with FENOC's October 29, 2014 deposit of the RAI Responses into the docket. The ISO requires that a new contention must meet the requirements of the former (that is, pre-August 2012) 10 C.F.R. § 2.309(f)(2)(i) through (iii).[9]

The presiding ALSB in this case stated at p. 12 of the Initial Scheduling Order, ASLBP No. 11-907-01-LR-BD01 (June 15, 2011) that "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."

Intervenors respectfully submit that their supplementation of Contention 7, filed one day beyond the ISO deadline, should be admitted. Applying the pre-2012 factors of 10 C.F.R, § 2.309(c) in effect at the time the ISO was entered, the determination of whether a petition is "nontimely" filed must be based on a balancing of those factors, the most important of which is "good cause, if any, for the failure to file on time." *Crow Butte Res., Inc*. (North Trend

[9] Licensing Board Order (Initial Scheduling Order) at 12 (June 15, 2011) (unpublished) [hereinafter ISO].

Expansion Project), LBP-08-6, 67 NRC 241 (2008). 10 C.F.R. § 2.309(c) (formerly § 2.714(a)) provides that nontimely petitions to intervene or requests for hearing will not be considered absent a determination that the petition or request should be granted based upon a balancing of the following factors:

(1) good cause, if any, for failure to file on time;

(2) the nature of the petitioner's right under the Act to be made a party to the proceeding;

(3) the nature and extent of the petitioner's property, financial or other interest in the proceeding;

(4) the possible effect of any order that may be entered in the proceeding on the petitioner's interest;

(5) the availability of other means for protecting the petitioner's interests;

(6) the extent to which the petitioner's interest will be represented by existing parties;

(7) the extent to which petitioner's participation will broaden the issues or delay the proceeding; and

(8) the extent to which petitioner's participation might reasonably assist in developing a sound record.

At this late date in this four-year-long proceeding, there can be little question but that Intervenors have participated meritoriously and that factors 2 through 8 should be resolved in their favor. The remaining, first, factor - good cause for failure to file on time - likewise should be. Intervenors have patiently waited for the determination by the ASLB on their pending Contention 7. The ASLB stated at the November 2014 hearing on Contention 7 admissibility that its ruling would be forthcoming in 45 days, a period which ended on December 26, 2014

(extended to December 29, 2014 when President Obama declared December 26 to be a federal holiday shortly before Christmas). Intervenors decided to prepare this filing for submission when there was no ruling by the close of business on December 29. They realized, belatedly, that they had not undertaken the requisite 10 C.F.R. §2.323 consultation with opposing counsel, and so requested that consultation via email sent late in the evening of December 29. Intervenors' counsel and lead lay representative have been occupied with both work and celebratory events during the December 2014 holidays, and represent that there is no prejudice which the NRC Staff or FENOC can show as a result of this filing being tendered into the docket one day late.

Intervenors have managed to meet the perceived timeliness requirements in multiple filings earlier in this case, and have displayed no pattern of habitually late filings. They respectfully submit that the circumstances surrounding the present filing should augur in favor of allowing it into the record for consideration with other evidence.

1) 10 C.F.R. § 2.309 (f)(2) Factors: Information not previously available

Applying the factors of the former 10 C.F.R. § 2.309(f)(2)(i-iii), the information upon which Intervenors' amendment and supplemental facts are based was available for the first time when distributed to the ASLB and the parties by FENOC's counsel on October 29, 2014. Intervenors could not file this contention regarding rebar problems and interpretations concerning Davis-Besse's Shield Building until the RAI Responses from FENOC were placed in the public domain on October 29, 2014.

If a contention satisfies the timeliness requirement of 10 C.F.R. § 2.309(f)(2)(iii), then, by definition, it is not subject to 10 C.F.R. 2.309(c), which specifically applies to nontimely filings. The three (f)(2) factors are not mere elaborations on the "good cause" factor of § 2.309(c)(1)(i),

since "good cause" to file a nontimely contention may have nothing to do with the factors set forth in (f)(2). *Entergy Nuclear Vermont Yankee, LLC, and Entergy Nuclear Operations, Inc*. (Vermont Yankee Nuclear Power Station), LBP-06-14, 63 NRC 568, 573 (2006).

2) Materially different information

The information upon which this new contention is based is materially different than information previously available respecting rebar problems in the Shield Building prior to October 29, 2014. In particular, FENOC's considerable stretch to make "opportunistic monitoring" of rebar corrosion a serious method of Shield Building cracking investigation is counters common sense and ignores the technical literature which explains rebar corrosion's effects upon concrete. It further confounds PII's "Full Apparent Cause Evaluation" discussion of the factors present which could be promoting accelerated rebar corrosion.

3) Timeliness of the amended or new contention

This new contention has been submitted in a practical, timely fashion, one day outside the sixty (60) day period allowed (since the 60th day after October 29, 2014 fell on a weekend, and December 26, 2014 was designated a federal holiday a couple of weeks before Christmas, December 29 became the deadline day).

B. Admissibility Criteria

Contentions and amendments must meet the admissibility criteria set forth in 10 C.F.R. § 2.309(f)(1), which requires each contention to: (1) provide a specific statement of the issue of law or fact to be raised; (2) provide a brief explanation of the basis for the contention; (3) demonstrate that the issue raised in the contention is within the scope of the proceeding; (4) demonstrate that the issue raised in the contention is material to the findings the NRC must make

to support the licensing action; (5) provide a concise statement of the alleged facts or expert opinions in support of the petitioner's position on the issue and on which the petitioner intends to rely at hearing; and (6) provide sufficient information to show that a genuine dispute exists with the applicant/licensee on a material issue of law or fact, with reference to specific disputed portions of the application. A failure to meet any of these criteria renders the contention inadmissible. 10 C.F.R. § 2.309(f)(1)(I)-(vi). These admissibility criteria are addressed in turn below.

1) Specific statement of the issue of law or fact to be raised

The proposed contention appears below. Amended wording appears in italics.

FENOC's revisions to the AMPs in its Shield Building Monitoring Program, dated July 3, 2014,[10] acknowledge not only the risk, but the reality, of aging-related cracking propagation - that is, worsening - in the already severely cracked Shield Building, an admission which brings the issue within the scope of this License Renewal Application proceeding. FENOC's proposed modifications to its Shield Building Monitoring Program AMPs, regarding the scope (areas of the Shield Building to be examined), sample size (number of tests to be performed), and the frequency of its surveillance activities, are woefully inadequate. Significantly more core bores, as well as a broader diversity of complementary testing methods should be required, and at a much greater frequency than FENOC has proposed. The cracking phenomena must be identified, analyzed and addressed within the Final Supplemental Environmental Impact Statement for the license renewal both in the consideration of alternatives to granting the 20-year license extension for Davis-Besse as well as in the Severe Accident Mitigation Alternatives analysis (SAMA). The cracking problems do not support a conclusion that there is "reasonable assurance" that Davis-Besse can be operated in a manner protective of the public health and safety under the Atomic Energy Act during the 20-year proposed license extension period.

The FACE evaluation provided as Enclosure 2 to FENOC's July 3 RAI letter verifies to a degree of scientific certainty that aging-related cracking is spreading through the Shield Building walls, which buttresses Intervenors' September 2, 2014 Contention 7 filing and ensures that this issue falls within the scope of this License Renewal Application proceeding. FENOC's proposed

[10] *See* "FENOC's RAI Letter, July 3, 2014," Enclosure 2.

modifications to its Shield Building Monitoring Program AMPs, regarding the scope (areas of the Shield Building to be examined), sample size (number of tests to be performed), and the frequency of its surveillance activities, are woefully inadequate. The inadequacy also includes a misunderstanding of the possible-probable enhancement of laminar cracking which is happening from rebar corrosion. The cracking phenomena - including damage from expanding corroded rebar in and near existing cracks - must be identified, analyzed and addressed within the Final Supplemental Environmental Impact Statement for the license renewal, both as part of the Severe Accident Mitigation Alternatives analysis (SAMA) and as part of the consideration of alternatives to a 20-year operating license extension. The presence of unresolved and continuing cracking of the Shield Building, including underestimation or denial by FENOC of the role of corroding rebar, is not being managed in such a way as to provide "adequate assurance" per 10 C.F.R. § 54.29.[11]

2) Provide a brief explanation of the basis for the contention

In light of the revelations in August-September 2013 of previously undetected cracks and the conclusion that they were worsening (propagating), Intervenors challenge the adequacy of FENOC's Shield Building Monitoring Program AMPs proposed for the 2017-2037 license extension period. Specifically, FENOC's testing frequency is inadequate, and may become less

[11]"A renewed license may be issued by the Commission up to the full term authorized by § 54.31 if the Commission finds that:

(a) Actions have been identified and have been or will be taken with respect to the matters identified in Paragraphs (a)(1) and (a)(2) of this section, such that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the CLB, and that any changes made to the plant's CLB in order to comply with this paragraph are in accord with the Act and the Commission's regulations. These matters are:

(1) managing the effects of aging during the period of extended operation on the functionality of structures and components that have been identified to require review under § 54.21(a)(1); . . . ."

adequate over time (via relaxed, less frequent testing). The Shield Building walls are saturated with water, and there is no formal explanation as to how that circumstance, which helps to cause cracking of the concrete walls, will be remedied. In light of recently-misidentified cracking, which was underestimated, investigatory inspections and concrete sample analysis must take place on a more frequent basis than biannually or every fourth year, which FENOC proposes. The number of core bores to be examined should be significantly increased over the meager number proposed by FENOC. Vast areas of the Shield Building surface area fall outside of FENOC's Monitoring Program AMPs, as currently construed, in light of the meager sampling program proposed. The scope of the testing should also be significantly expanded.

Given the importance of the Shield Building to radiological containment, such as the proper functioning of the Emergency Ventilation System,[12] as well as a biological shield, and a tornado-driven missile shield,[13] and thus to public health, safety, and environmental protection, and in consideration of the already severe, and worsening, cracking of the Shield Building, these

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[12] Davis-Besse Nuclear Power Station/License Renewal Application/Technical Information, section 2.3.3.13 Emergency Ventilation System. Page 2.3-88 [184/1,810 on pdf counter]. This document, dated August 30, 2010, appears to have not been posted at ADAMS nor assigned an ML number. However, it is posted at the following link on NRC's website: http://www.nrc.gov/reactors/operating/licensing/renewal/applications/davis-besse/davis-besse-lra.pdf.

[13] At section 2.4.1 CONTAINMENT (INCLUDING CONTAINMENT VESSEL, SHIELD BUILDING, AND CONTAINMENT INTERNAL STRUCTURES)–SEISMIC CLASS I, of the Davis-Besse Nuclear Power Station/License Renewal Application/Technical Information, FENOC states: "The Shield Building is a concrete structure surrounding the Containment Vessel. It is designed to provide biological shielding during normal operation and from hypothetical accident conditions. The building provides a means for collection and filtration of fission product leakage from the Containment Vessel following a hypothetical accident through the Emergency Ventilation System, an engineered safety feature designed for that purpose. In addition, the building provides environmental protection for the Containment Vessel from adverse atmospheric conditions and external missiles." Page 2.4-3 [263 of 1,810 on PDF counter] This Davis-Besse NPS/LRA/Tech. Info. document, dated August 2010, is posted at http://www.nrc.gov/reactors/operating/licensing/renewal/applications/davis-besse/davis-besse-lra.pdf.

inadequacies in the Monitoring Program AMPs are unacceptable, and must be rectified.

3) Demonstration that the issue raised in the contention is within the scope of the proceeding

FENOC has reversed its former position on cracking of the Shield Building and considers there to be aging-related risks of cracking propagation. As previously noted, 10 C.F.R. § 54.29 allows a license renewal if the Commission finds that "(a) Actions have been identified and have been or will be taken . . . such that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the CLB, and that any changes made to the plant's CLB in order to comply with this paragraph are in accord with the Act and the Commission's regulations." These matters include "(1) managing the effects of aging during the period of extended operation on the functionality of structures and components. . . ."

Respecting the NEPA portions of the contention, Intervenors seek Severe Accident Mitigation Alternatives (SAMAs). FENOC's consulting contractor, PII, considers the cracking of the Davis-Besse Shield Building to be "unique." FACE, p. 63/98 of .pdf. Since the cracking is clearly site-specific, NEPA requires SAMAs as a Category 2, site-specific, consideration. 10 C.F.R. § 51.53(c)(3)(ii)(L). SAMAs are the only Category 2 issue with respect to severe accidents. *Florida Power & Light Co.* (Turkey Point Nuclear Generating Plant, Units 3 & 4), LBP-01-6, 53 NRC 138, 160-161 (2001).

Respecting a more serious inquiry into alternatives to continued operation of Davis-Besse, the compromised Shield Building requires that "reasonable consideration of alternatives" should mean that an accurate economic costing of the replacement of the Shield Building be included in the NEPA analysis, along with other remedial steps, such as replacement of portions of the reinforced concrete walls. "Reasonable alternatives for license renewal proceedings are

limited to discrete options that are feasible technically and available commercially, as well as the GEIS requirement that the "no-action" alternative address energy conservation. *Entergy Nuclear Operations, Inc.* (Indian Point Nuclear Generating Units 2 & 3), LBP-08-13, 68 NRC 43, 205 (2008).

Intervenors' contention, as supplemented by factual allegations concerning rebar corrosion and FENOC's suspect management of it, fall within the scope of this LRA proceeding.

4. Demonstration that the issue raised is material to the findings the NRC must make to support the licensing action

The NRC is mandated by the Atomic Energy Act and National Environmental Policy Act to provide reasonable assurance of public health and safety, and environmental protection, during the proposed 20-year license extension at Davis-Besse, and to take a "hard look" at environmental impacts, as by making predictive safety findings and conducting an environmental analysis regarding the safety and environmental impacts of the 20-year license extension.

The Shield Building at Davis-Besse is critical to radiological containment during reactor emergencies, such as meltdowns or other radioactive releases. It can filter radioactivity to a certain extent before it is expelled to the external atmosphere, and it is also essential to defending the Inner Steel Containment Vessel, and Reactor Pressure Vessel against external threats, such as tornado-driven missiles. The Shield Building further provides biological shielding during normal operations. (See fns. 12 and 13 *infra*).

The severe, and finally-admitted increased cracking of the Shield Building, especially when better understood as to rebar corrosion, threatens to fail the Shield Building from performing its vital design safety and environmental functions. Intervenors challenge the adequacy of FENOC's Shield Building Monitoring Program AMPs to guarantee the Shield

Building will remain structurally sound enough to fulfill its vital safety functions, as required by applicable laws and regulations.

The NEPA document here requires a realistic Severe Accident Mitigation Alternatives analysis which includes among its assumptions a flawed Shield Building which may not meet its current licensing basis (CLB). The requisite decisions on the issues raised by this contention are directly material to a license extension decision for Davis-Besse.

5. Concise statement of the alleged facts or expert opinions in support of the petitioner's position and on which the petitioner intends to rely at hearing

Intervenors incorporate herein by reference and re-allege the rebar facts mentioned *infra* as if written herein, as well as "Intervenors' Motion for Admission of Contention No. 7 on Worsening Shield Building Cracking and Inadequate AMPs in Shield Building Monitoring Program," and the section *infra* entitled "Facts Which Require Expanded NEPA Consideration and/or Undercut a Finding of 'Reasonable Assurance.'" They also incorporate herein by reference and re-allege as if written herein "Intervenors' Motion to Amend and Supplement Contention No. 7 on Worsening Shield Building Cracking and Inadequate AMPs in Shield Building Monitoring Program," and specifically the section entitled "Facts Which Require Expanded NEPA Consideration and/or Undercut a Finding of 'Reasonable Assurance.'" This evidence comprises the base on which Intervenors will rely at hearing.

6. Showing of a genuine dispute between the licensee on a material issue of law or fact, with reference to specific disputed portions of the application

There are several genuine disputes. FENOC's credibility as nuclear manager and operator of Davis-Besse is brought squarely into focus by the revelations that the root cause(s) (for there have been two prior to the current "apparent cause") do not adequately encompass or explain the

cracking phenomenon. Addition of rebar corrosion - meaningfully understood - adds to the disputes of fact.

There is a dispute over whether Davis-Besse conforms to its current licensing basis (CLB) merely by providing a slightly more engaged monitoring program. Part of that dispute is how and why FENOC intends principally to take samples from areas where there already are known cracks, as opposed to sampling from a more dispersed set of locations on the Shield Building exterior.

The scope of causation of the water saturation within the Shield Building walls is disputed; Intervenors contend that insufficiently-inclusive analysis of potential water sources has been undertaken and the ongoing and increasing damage to rebar, which loops back into causation of expanded cracking, is being underestimated and trivialized by FENOC's approach.

There is a dispute over whether the SAMA portion of the NEPA document for the license renewal must take cognition of the deteriorating state of the Shield Building. There is a dispute over whether the NEPA-required "hard look" at alternatives to a 20-year license extension has been achieved in light of the reversal of position by FENOC that admits the cracking problems are likely to be permanent and increasingly intrusive into the structural integrity of the Shield Building.

CONCLUSION

If FENOC cannot assure Davis-Besse's safety, then the plant must be permanently shut down, not granted a 20-year license extension. It has become increasingly clear that Davis-Besse fails the reasonable assurance of adequate protection test, given its Shield Building's aging-related degradation, its severe and worsening cracking, and its susceptibility to rebar corrosion as

a contributing but underestimated cause and promoter of expanded cracking.

WHEREFORE, Petitioners pray the Atomic Safety and Licensing Board panel allow the supplementation which they have detailed hereinabove, and that it admit Contention 7 as amended and supplemented for full adjudication.

Executed according to 10 C.F.R. § 2.304(d).

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CONSULTATION PURSUANT TO 10 C.F.R. § 2.323(b)

Undersigned counsel hereby certifies that he made a sincere attempt to consult with opposing counsel for the Nuclear Regulatory Commission Staff and for FirstEnergy Nuclear Operating Company in an effort to resolve the concerns raised in the foregoing Motion by sending an email requesting consultation on December 29, 2014.

Counsel for the NRC Staff stated by email response that the Staff "does not oppose the filing of your motion, but based on the information contained in your e-mail message, the Staff does not have enough information at this time to take a position on the proposed supplement to your earlier filings or the timeliness of the supplement. The Staff will respond to the contention in accordance with 10 C.F.R. 2.309, when filed."

FENOC participated in a telephone conference consultation and objects to the filing one day after the ISO period to be untimely, and will oppose the basis for supplementation.

Executed in Accord with 10 C.F.R. § 2.304(d)

/s/ Terry J. Lodge
Terry J. Lodge
Counsel for Intervenors

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

In the Matter of:	)	Docket No. 50-346-L
FirstEnergy Nuclear Operating Company Davis-Besse Nuclear Power Station, Unit 1	)	December 30, 2014
	)	
	)	

CERTIFICATE OF SERVICE

I hereby certify that a copy of the foregoing "INTERVENORS' SECOND MOTION TO SUPPLEMENT CONTENTION NO. 7 ON WORSENING SHIELD BUILDING CRACKING AND INADEQUATE AMPS IN SHIELD BUILDING MONITORING PROGRAM" was deposited in the NRC's Electronic Information Exchange this 30th day of December, 2014 and was served upon all parties of record.

Executed in Accord with 10 C.F.R. § 2.304(d)

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