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)		July 16, 2012
	)	

* * * * *

INTERVENORS' THIRD MOTION 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 move the Board for leave to further supplement and amend their proposed Contention No. 5, which addresses the shield building cracking phenomena at the Davis-Besse Nuclear Power Station ("Davis-Besse").

A. Background

On January 10, 2012, Intervenors moved for admission of a new Contention No. 5, which 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.

The NRC Staff ("Staff") has proposed alternative wording which would transform the contention into a contention of omission. FirstEnergy Nuclear Operating Company ("FENOC") and the Staff timely responded to the original contention motion.

On February 28, 2012, First Energy Nuclear Operating Company ("FENOC") furnished the NRC with its "Root Cause Analysis Report" ("Root Cause Analysis" or "RCA"), ML120600056. Then, on April 5, 2012, FENOC promulgated an "aging management plan", or AMP (ML12097A216), the purpose of which is to specify arrangements prospectively to oversee and deal with the shield building's historic cracking phenomena.

Intervenors are supplementing their cracking contention for the purpose of exposing discrepancies between FENOC's February 29, 2012 "Root Cause Analysis Report" ("Root Cause Analysis" or "RCA"), and the AMP. They contend that there is serious incongruity between the cracking problems as defined by FENOC, and the proposed remedy, exemplified by the AMP. The scope of the admitted cracking is far narrower than the identified cracking, and the potential for further concrete and rebar problems in the Davis-Besse shield building may include the loss of up to 90% of the shield building walls with the collapse of outer layers of concrete and rebar, according to NRC documents.

In addition to this third motion to amend/supplement Contention 5, Intervenors intend to file, by July 23, 2012, an additional such motion which denominates inconsistencies between FENOC's February 2012 Root Cause Analysis and the findings of FENOC's consultant, Performance Improvement International. PII's report was added to the NRC's ADAMS system on May 24, 2012. Intervenors further reserve the right to supplement their Contention 5 filing with evidence from a January 26, 2012 FOIA request to which the NRC Staff has only partially responded as of this date.

B. Issues of Fact And Inconsistencies Between Revised Root Cause Analysis And AMP

On May 16, 2012, ADAMS reflected placement in its record a FENOC report entitled "Revision 1 of Shield Building Root Cause Evaluation" (ML12142A053). Intervenors are timely

moving to amend/supplement their contention within the 60-day period identified in the Initial Scheduling Order in this case.[1] This filing will address inconsistencies between the Revised Root Cause Analysis ("RRCA") and the proposed AMP, referencing additional matters of record as needed for explanatory purposes.

1. Microcracking Present in Core-Bore Samples

The NRC criticized FENOC (RRCA at 6) that "The root cause report did not address micro-cracking that was identified in PII Exhibit 2. The root cause report contradicts this evidence, and states that micro-cracking was not identified." FENOC has admitted in the revision that its contractor, CTL Group, observed micro-cracks via petrographic examination:[2]

> *The micro-cracks observed in the CTL Group petrographic examination are not representative of the areas examined by PhotoMetrics Laboratories from locations exposed to repetitive loading versus near surface concrete. The core bores with evidence of multiple laminar cracks in the same area of outside face reinforcement were considered part of a single delamination process.*

RRCA at 27.

FENOC's additional information fails to answer the NRC's question, *viz.*, why multiple laminar cracks occurred in the same area as micro-cracking, only repeating that they did.

There is indisputably a connection between micro-cracking and age-related degradation. FENOC's consultant, Performance Improvement International, tacitly admitted such in its report, "Root Cause Assessment: Davis-Besse Shield Building Laminar Cracking, Vol. 1,"

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[1]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(c). If the movant is uncertain, it may file pursuant to both sections."

[2]Italicized in original to indicate new material.

ML12138A037.[3] The AMP, however, contains literally no reference to micro-cracking. FENOC neither explains why the micro-cracking is present, nor why it is not significant, nor how it is not a sign of age-related degradation cracking. Moreover, it appears that some of the laboratory testing by FENOC's contractors resulted in destruction of the core-bores that contained evidence of micro-cracking, RRCA at 83,[4] which was in the original, February 2012 RCA. This information is significant, though, in light of the new information in the RRCA that "*Boroscope inspection of the holes from core bores F4-794.0-3.5 and F4-791.0-2.5 were not completed due to the weather conditions (high winds)"* (Italicized in original). RRCA at 83. FENOC has made some rather sweeping conclusions about the absence of micro-cracking on fewer laboratory samples than relied upon for its conclusions respecting laminar cracking. Notably, though, the six (6) core-bores taken of the shield building, while collected from different elevations on the exterior face, are not identified as to location on the shield building from which they were taken - but FENOC has

[3]At p. 3: "The propagation of cracks through aggregates is common in mature concrete. . . . In cases like this one, the location and direction of the stresses and resultant cracks is predetermined and, depending on the orientation of the aggregates, may make propagation through the aggregate the 'path of least resistance'. It is possible that propagation through the aggregate requires less energy than through the interface around it. This cracking through the aggregate does not provide any reliable information about the rate of crack propagation. 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."

From p. VII-39 (164/257 of .pdf): "The process of hydro-blasting exploits the existence of micro-cracks, voids, capillaries and cracks to enable concrete demolition using high pressure water jets. This raises the question of potential damage to concrete in adjoining area through direct pressure, vibrations, or crack propagation. This document is intended to determine if hydro-blasting can cause cracking and if any occurred at Davis-Besse." Intervenors assume, based on this explanation, that FENOC's choice to hydro-blast open the shield building was to take advantage of pre-existing micro-cracks.

[4]"Measurement of crack width was inconclusive in several bores due to the affect of the drilling equipment disturbing the crack surface in combination with the tight diameter of the hole complicating use of a crack comparator and boroscope."

concluded, again sweepingly, that they were all "*considered part of a single delamination process*" (Italicized in original). RRCA at 83. To FENOC, the only cracking worthy of note or analysis in the first 35 years of operations at Davis-Besse was laminar (and especially sub-surface laminar) cracking - a fallacious perspective. FENOC has given short shrift to surface cracking, dome cracking, micro-cracking, and radial cracking.

2. Radial Cracking

The NRC Staff found that "[t]he root cause report additionally did not discuss radial cracking identified in numerous core bores." RRCA at 5. The italicized wording below was added as part of the Revised RCA:

> Evidence of subsurface cracking, other than a laminar crack in the shield building concrete, was also identified on five core bores. Longitudinal/radial cracks, attributed to concrete shrinkage, were discovered in core bores F7-633.08 and F2-790.0-4.5 as described in Condition Reports 2011-04507 and 2011-05648. Longitudinal / radial cracks of the material extracted from core bores F4-794.0-3.5, and F5-791.0-4 *were seen which was also attributed to concrete shrinkage. The concrete in the shield building was reinforced to limit the size and confine the longitudinal / radial cracking observed attributed to shrinkage during the curing process.* Another imperfection located approximately one inch below the surface was discovered in core bore S10-672.0-34 as described in Condition Report 2011-04507. Each of these five cores, with indications other than laminar cracking in the shield building concrete, were sent off-site for further independent examination.

RRCA at 22.

Radial cracks run perpendicular to the cracking that FENOC addressed in the RCA - and radial cracks are the cracking next to, and parallel to, the outer rebar mat. Thus the RRCA identifies an entirely different cracking mode which is not explained by the "Blizzard of '78." There is no disclosure in the RRCA of the results of the additional tests performed on the five core-bores mentioned above. So the RCA and RRCA remain incomplete, even now.

In effect, FENOC admits to multiple forms of cracking from multiple root causes. The

Blizzard of '78 may have caused sub-surface laminar cracking in close proximity to and parallel to the outer rebar mat; but there was concrete shrinkage cracking "during the curing process," which apparently occurred back in the early to mid-1970's during the pours for the walls of the shield building. And the shield building concrete was reinforced to limit the size and confine the longitudinal/radial cracking.

3. Deletion of Need for Further Investigation of Reinforcing Steel

At the suggestion of the NRC Staff, the RRCA was revised at one point by deleting a statement from Section 3.3.9 - Failure Modes Analysis (pp. 50-51), which had stated that further investigation was needed regarding high-density reinforcing steel and small reinforcing steel spacing failure modes. Even FENOC had agreed that more investigation was needed; that statement was included in the February RCA.

Indisputably, the presence of high-density rebar, and small rebar spacing, causes cracking. Implicit in this truism is that all the areas of the shield building surface and subsurface which have such rebar are vulnerable to cracking and should be extensively checked for status, which was neither planned as part of the AMP, and for which the justification has since been deleted.

4. Laminar Cracking in Main Steam Line Room

The Revision contains this new passage (RRCA at 46):

> *The presence of laminar cracking in the main steam line room does not contradict the freezing mechanism. In places where there exists a very high density of reinforcing steel in a single plane (and therefore a very low density of concrete in that plane, like a perforated paper towel) it is possible for a crack to propagate due to initiation of cracking in an adjacent region. Based upon the Impulse Response test results, the cracking in the concrete adjacent to the main steam line penetration blockouts coincides with regions of very high density reinforcing steel and have arrested near the boundary of these regions.*

There is a significant contradiction here, given the presence of laminar cracking in dissimilar regions:

shoulders v. main steam line penetration blockouts. The NRC Staff pointed out (RRCA at 6) that "The root cause report has insufficient Impulse Response documentation to conclude that laminar cracking initiated in the shoulder regions and propagated to areas of high density reinforcement, specifically in the areas of the Main Steam Line Penetrations." FENOC has not provided the connection, only the conclusion.

5. Shield Building Dome Parapet Cracking

At RRCA 29, FENOC added this passage:

> *On August 15, 1976 the Toledo Edison Company construction superintendent documented an examination of the shield building dome parapet that found a cracked and broken architectural flute shoulder corner at approximately 292 degree azimuth. There were also other hairline shrinkage cracks in the dome parapet at both corners of each architectural flute shoulder, at mid-width of each flute, and vertical around the periphery of the parapet that should not affect the structural integrity of the shield building dome parapet. One small area of the latex coating at approximately 315 degrees mid-way up the shield building dome was found peeling and chipping from being applied too heavily (~1/4 inch). That coating was identified for removal with the area reapplied using a thinner layer of the same latex.*
>
> *None of the inspections of the shield building exterior surface identified any symptoms that would signify the presence of the concrete laminar cracking. None of the inspections of the other safety-related structures such as the auxiliary building or intake structure exterior identified any symptoms that would signify the presence of concrete laminar cracking or waterproof coating degradation.*

(Italicized in original). As Intervenors have demonstrated, the concern is not solely about sub-surface laminar cracking. The larger picture is that there are several forms of cracking, including an omission from public record documents until 2011-12 of pre-Blizzard, 1976 cracking of the shield building dome. But there is little discussion of the potential interrelations of those cracking types, and where they are physically proximate, FENOC trivializes the non-laminar cracks. The presence of so many different forms of cracking/degradation all across the shield building may comprise a cumulative effect wherein they could all add up (especially where they are close together) to "fail"

the shield building if a powerful enough force, such as an earthquake, tornado, internal meltdown related pressures, *etc*. would occur at Davis-Besse.

6. AMP Omits to Inspection of 2002 Shield Building Opening for Cracking

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.

7. No Examination of Admitted Cracking of SB Dome Or Below-Grade Shield Building Walls

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.

Notably, while the AMP does not address examination of the below-grade shield building walls, the RRCA does. At p. 72, the RRCA contains an apparent commitment from FENOC that states, "In accordance with NOBP-LP-2011 section 4.7.4: Complete a Maintenance Rule Structures evaluation inspection of the shield building exterior sealant system per procedure (EN-DP-01511) to ensure the moisture barrier is still effective with no areas of unacceptable degradation."

Again, the AMP is unduly narrow in scope, which provides a means of avoiding issues of aging management of the whole shield building and as well, other safety-related structures at Davis-Besse.

8. Use of Other Safety-Related Structures as Comparables Instead of as Inspection Targets

In the RRCA at 66, FENOC agreed to this confirmatory examination:

> ***Extent of Condition Corrective Action #3:*** *Confirmatory Examination of a Safety-Related Structure with Waterproof Coating*
>
> *Site Projects shall arrange access to the exterior face of a safety-related structure with waterproof coating in accordance with the corresponding Engineering Change Package.*
>
> *Engineering will specify the areas of access required and the necessary work scope, such as additional Impulse Response and core bores. Using an Impulse Response (IR) vendor and method approved by Design Engineering confirm the absence of laminar cracking in a safety-related structure with waterproof coating as directed by Design Engineering.*
>
> *Provide the necessary ground and/or suspended man-lifts required to access the safety-related structure wall exterior surface.*
>
> *Perform confirmatory core bores as directed by Design Engineering.*
>
> *Facilitate the examination of the core bores by Design Engineering.*
>
> *Repair/Rework core drill holes as described in the ECP for the core bore.*

But the NRC Staff called for investigation of multiple structures.[5] FENOC disclaims any knowledge

[5]From subsection 1 of the summary of NRC critiques at the beginning of the RRCA at 7: "Extent of Condition Corrective Action #1 for additional investigation of the Shield Building lacks detail, and need to be expanded to confirm the conclusions of the Root Cause Report. (That is, to perform Impulse Response Testing in other safety related structures not subject to the Root and/or contributing causes)."

of the cracking phenomena involving the shield building from 1978 through 2011, because the cracks were not visible to the naked eye, and upon investigation has identified cracking of various types which is invisible to the naked eye and which is attributable to factors other than the Blizzard of '78. Accordingly, the scope of the AMP is insufficiently narrow, if confined merely to using one other safety structure as a comparable, instead of inspecting all safety-related structures at the Davis-Besse site for potential cracking unrelated (or even related) to the Blizzard. Intervenors' argument finds support from FENOC's revision to Section 6.3.3 (RRCA at 60). In its "Root Cause Corrective Actions #3," FENOC appears to commit as follows: "*Also, the Maintenance Rule Structures evaluation procedure shall be updated to include examination of the similar exterior coating on the other safety-related concrete structure**s**.*" FENOC appears to be caught in a contradiction.

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," in FENOC's own words. 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.

10. Insufficiently-Detailed Extent of Condition Corrective Action #1

Extent of Condition Corrective Action #1 for additional investigation of the Shield Building (RRCA at 59) contains no detail; the entire Corrective Action simply says "Additional Examination of the Shield Building Exterior Wall." It needs considerable exposition in order to confirm or disaffirm the conclusions of the Root Cause Report - that is, to perform Impulse Response Testing and core-bore analysis in other safety-related structures. After what has happened, and given that what is at stake is the structural integrity of the shield building, FENOC should be required to monitor all safety-related structures.

11. Slip-Form Friction Fiction

The NRC Staff required FENOC to provide additional information in the RRCA " regarding 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. Bechtel Engineering concluded at the time of the 1971 construction that "The affect this has on the shield building structural integrity were found to be insignificant. Bechtel Engineering approves the Use As Is disposition for the structure and recommends that all interface work be adjusted to meet the as-built alignment of the structure." *Id.*

In conducting analysis of whether the out-of-plumb "lean" of the shield building might have influenced or caused some of the cracking, FENOC concluded in Attachment 12 to the RRCA in response to the hypothesis that "*[f]riction forces from geometry changes and the slip-form not in level have resulted in concrete delamination"* that:

> Existing data that tends to disprove this as the cause. Plumb tolerance issues oriented different than the laminar cracking locations. *The observed cracking through aggregate indicated the laminar cracking occurred after the concrete reached sufficient maturity and not during placement.* (Italics in original)

RRCA at 109. FENOC considered the hypothesis to be "refuted" because *"[t]he rate of slip-form movement was fast enough to minimize friction problems"* (Italicized in original). *Id.* Consequently, "[t]he effect of the out of tolerance plumb was insignificant to structure integrity."

Performance Improvement International also extensively reviewed the out-of-plumb issue. PII concurred that the out-of-plumb issues did not cause the laminar cracks, but only after stating this disclaimer:

> 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).

FENOC's major consulting engineer contracting on shield building cracking, then, admits that its very conclusion is suspect. PII and FENOC don't really know how bad the damage was, nor how to correct for it. PII effectively has admitted that the Davis-Besse shield building may have been out of licensing conformance since before the reactor was initially fired up. PII disclaims the ability to authoritatively concluded that there is no cracking at identified slipform excessive friction areas - and the consultant's illusory reinforcement of FENOC's position appears not to be backed up by Impulse Response testing and/or core bores.

Some years ago, Senator Daniel P. Moynihan observed that "We are each entitled to our own opinion, but no one is entitled to his own facts."[6] In a matter especially dependent on scientific and engineering findings of fact, FENOC, instead, appears to be trafficking only in opinion.

C. Legal Standards Regarding Admissibility Of Supplemental Information

A new contention may be filed after the deadline found in the notice of hearing with leave of the presiding officer upon a showing that: (i) The information upon which the amended or new contention is based was not previously available; (ii) The information upon which the amended or new contention is based is materially different than information previously available; and (iii) The amended or new contention has been submitted in a timely fashion based on the availability of the subsequent information. 10 C.F.R. § 2.309(f)(2).

Intervenors respectfully submit that their amended/supplemental facts are timely submitted under the Commission's standard in 10 C.F.R. § 2.309(f)(2)(i)-(iii). As supplemented/amended, Contention 5 meets the NRC's three-part standard for a timely contention. The information on which the contention is based was not previously available; the RRCA appeared in ADAMS on May 16, 2012 (Revision 1 RCA (ML 12142A053)). The information on which the contention is based is materially different than information previously available, *see* 10 C.F.R. § 2.309(f) (2)(ii), because it relates to findings and commitments that did not exist when Intervenors moved for admission of Contention 5 in January 2012. This amendment/supplementation of Contention 5 is timely because it is filed within sixty (60) days of the RRCA's May 16 posting date and conforms with the ASLB's Initial Scheduling Order. *Shaw Areva MOX Services, Inc.* (Mixed Oxide Fuel Fabrication Facility),

[6]James A. Thomson, "In Political Analysis, Just the Facts, Please," http://www.rand.org/commentary/030806TH.html.

LBP-08-10, 57 NRC 460, 493 (2008). Intervenors have acted in a manner which is timely according to 10 C.F.R. § 2.309(f)(2)(iii).

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 Section 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).

D. Certificate of 10 C.F.R. § 2.323(b) Consultation

Counsel for Intervenors, along with Beyond Nuclear's designated representative, participated in a telephone conference concerning the prospective contents of the within Motion on July 13, 2012 with counsel for the NRC Staff and counsel for FirstEnergy Nuclear Operating Corporation. Following that conference, FENOC's counsel has stated that FENOC will oppose this Motion. The NRC Staff's counsel indicated that NRC Staff does not oppose the filing of the motion, but that based on the information from the consultation email of Intervenors, and the phone conference, the Staff does not have enough information at this time to take a position on the admissibility of the proposed contention. Further, he stated that the Staff will respond to the contention in accordance with 10 C.F.R. 2.309, when filed.

E. Conclusion

Intervenors have met all preconditions to be granted leave for receipt of the within information into the record of this matter to amend and/or supplement their Motion for Admission of Contention 5. FENOC should not be allowed to take the "path of least resistance," like the

propagating cracks through the shield building concrete. FENOC must not be allowed to limit its AMP monitoring to comparisons with one single other safety-related concrete building on site, but must instead be required to inspect all other concrete buildings on site. All forms of structural degradation must be included, not just sub-surface laminar cracking.

WHEREFORE, Intevenors pray the Licensing Board grant them leave to amend and/or supplement their proffered Contention 5 in the particulars stated.

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CERTIFICATE OF SERVICE

I hereby certify that a copy of the "INTERVENORS' THIRD MOTION 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 16th day of July, 2012:

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