FENOC™
FirstEnergy Nuclear Operating Company

5501 North State Route 2
Oak Harbor, Ohio 43449

Brian D. Boles
Vice President,
Nuclear

419-321-7676
Fax: 419-321-7582

October 6, 2015
L-15-310

10 CFR 54

ATTN: Edwin M. Hackett, Executive Director
Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT:
Davis-Besse Nuclear Power Station, Unit No. 1
Docket No. 50-346, License Number NPF-3
Additional Information for the Advisory Committee on Reactor Safeguards Review of the Davis-Besse Nuclear Power Station, Unit No. 1, License Renewal Application (TAC No. ME4640)

By letter dated August 27, 2010 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML102450565), FirstEnergy Nuclear Operating Company (FENOC) submitted an application pursuant to Title 10 of the *Code of Federal Regulations*, Part 54 for renewal of Operating License NPF-3 for the Davis-Besse Nuclear Power Station, Unit No. 1 (Davis-Besse). During the September 23, 2015 meeting between FENOC and the Advisory Committee on Reactor Safeguards (ACRS) License Renewal Subcommittee, the members requested additional information to complete their review of the License Renewal Application (LRA).

The Attachment provides the FENOC response to questions raised by the ACRS Subcommittee members regarding the Shield Building and the license renewal Shield Building Monitoring Program.

The Enclosure provides a compact disk containing an electronic copy of the following documents:

- Calculation C-CSS-099.20-055, "II/I Evaluation for Architectural Flute Shoulder," Revision 0
- Calculation C-CSS-099.20-063, "Shield Building Design Calculation," Revision 1
- Calculation C-CSS-099.20-069, "Shield Building Laminar Cracking Limits," Revision 0

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NRR

There are no regulatory commitments contained in this letter. If there are any questions or if additional information is required, please contact Mr. Clifford I. Custer, Fleet License Renewal Project Manager, at 724-682-7139.

I declare under penalty of perjury that the foregoing is true and correct. Executed on October 6, 2015.

Sincerely,

Brian D. Boles

Brian D. Boles

Attachment:
FENOC Response to Questions Raised by the Advisory Committee on Reactor Safeguards (ACRS) Regarding the Shield Building and the License Renewal Shield Building Monitoring Program

Enclosure:
Compact disk containing an electronic copy of the following documents:

- Calculation C-CSS-099.20-055,
  "II/I Evaluation for Architectural Flute Shoulder," Revision 0
- Calculation C-CSS-099.20-063,
  "Shield Building Design Calculation," Revision 1
- Calculation C-CSS-099.20-069,
  "Shield Building Laminar Cracking Limits," Revision 0

cc: NRC DLR Project Manager
NRC Region III Administrator
NRC Document Control Desk

cc: w/o Attachment or Enclosure
NRC DLR Director
NRR DORL Project Manager
NRC Resident Inspector
Utility Radiological Safety Board

Several questions associated with the Shield Building have been raised by the ACRS Subcommittee. This paper is meant to address these questions collectively. By providing the necessary background information, it will help facilitate a solid understanding of how Davis-Besse is currently managing the Shield Building laminar crack issue and how the Shield Building Monitoring Program will ensure that the identified aging mechanism will be managed through the Period of Extended Operation.

This paper will provide a description of the current Shield Building margin and the controlling parameters defined in various calculations, to address the Shield Building margin associated with laminar crack propagation, and to provide the basis for the Davis-Besse Shield Building Monitoring Program.

A. Identification of Laminar Cracking and Evaluation of Functionality

Laminar cracking in the Shield Building was first identified in October 2011. Initial investigation, using Impulse Response testing and core bores, determined the cracking was confined to the outer mat of the main reinforcing steel in the shoulder areas, near the top of the Shield Building barrel area, and in two areas of the main steam penetration areas. Core bores confirmed the depth and width of the crack. The crack width is very tight usually 0.010 inches or less.

To address this condition for functionality prior to restarting the unit, a series of calculations were performed to establish reasonable assurance that the Shield Building would perform its design function. The design function being: 1) Provide biological shielding, 2) Provide environment protection for the containment vessel, and 3) Provide for a controlled release of annulus atmosphere under an accident condition. Since the rebar capacity was not known at this time, these calculations made a lower bound assumption that all outside face vertical rebar in all 16 shoulders areas, the main steam line areas, and the spring line (elevation 778' – 801') would be considered ineffective. In addition, one half of the outside face hoop reinforcement was considered ineffective in the shoulder areas. These calculations provided the basis for restarting the unit. Although these calculations are not considered design basis calculations, they do indicate that there is significant margin in the design of the Shield Building. (Reference Calculations C-CSS-099.20-054 (Evaluation of Shield Building for the Permanent Condition with Outside Vertical Reinforcement Removed at Cracking Areas) and C-CSS-099.20-056 (Evaluation of Shield Building Hoop Reinforcement with Observed Cracking).

B. Shield Building Concrete Spalling

Concrete spalling was also addressed as part of the assessment of Shield Building functionality performed prior to restarting the plant in December 2011. It was identified at that time that safety related structures including the Auxiliary Building and possibly the Borated Water Storage Tank (BWST) could be affected by falling concrete sections or even by the separation of an entire shoulder.

Calculation C-CSS-099.20-055 II/I Evaluation for Architectural Flute Shoulder Rev 0 Dated 10/31/2011

This calculation was performed as part of plant restart in 2011. The purpose of this calculation was to demonstrate that during a seismic event with a laminar crack in the architectural flute shoulder, that the existing rebar have sufficient capacity to prevent the cracked concrete shoulder from falling.

Applicable dead and seismic loads in all three directions were considered in the seismic II/I analysis. The shoulder reinforcing steel includes #8 rebar (1" in diameter) at each side of the shoulder that is tied back to the main section of the Shield Building. These #8 rebars are spaced vertically 12" on center the entire height of the shoulders. The analysis showed that for the Seismic II/I condition, there is a Margin of Safety of 4.46. Therefore, shoulder separation from the Shield Building is not credible (See Exhibit A).

Concrete spalling outside the shoulder areas was also considered. For these areas the location of the laminar cracking within the Shield Building reinforcing steel mat was concluded to prevent concrete spalling of a size that could damage safety related structures. The concrete clear cover for the outer mat of reinforcing steel in the Shield Building shell is approximately three inches and in most cases the core bores (11 of the 13 core bores) indicate the crack depth is either within or behind the reinforcing steel mat indicating that the concrete is firmly attached to the reinforcement. Exhibit B provides the location of the 13 core bores as well as the depth of the crack at those locations. As a point of reference, with concrete cover of 3 inches, the centerline of the horizontal steel bar is 3.7 inches from the exterior surface and the centerline of the vertical steel bar is 5 inches from the exterior surface.

Rebar capacity tests later performed independently at both Purdue University (Purdue) and University of Kansas (Kansas) confirm that there is nearly full design rebar capacity (55ksi) in the presence of laminar cracking. Therefore the rebar can adequately restrain any concrete that is attached to it.

Although the attachment of concrete to the reinforcement was determined adequate to prevent spalling of large concrete sections the possibility that small pieces of concrete might be separated could not be eliminated. There are Safety Related structures in the immediate vicinity of the Shield Building that could be impacted by spalling (i.e. Auxiliary

Building, electrical manholes, and Containment emergency airlock enclosure). Safety Related structures are designed for tornado missile impacts including a 12 in diameter pipe 15 feet long traveling 104 mph. An informal evaluation was performed and determined that a concrete section that would generate the same amount of impact energy would be a concrete section approximately 6 ft. x 6 ft. x 3 inches. Based on the attachment of the concrete to the reinforcing steel spaced at 12 inch maximum centers it is not considered credible for a large size concrete section that could damage a Safety Related structure to separate from the Shield Building and fall.

C. Design Basis Calculation

To establish a design basis calculation, two key pieces of information would be required:

1) The extent of laminar cracking had to be established, and
2) The capacity of rebar in a cracked plane had to be established.

i. Impulse Response Mapping

Impulse Response techniques were used to map the entire accessible areas of the exterior Shield Building wall. This map (Exhibit C) shows the extent of laminar cracking. Core bores were used to validate areas of cracking as well as areas of uncracked concrete. The Impulse Response map completed in 2012 is consistent with the 2011 assumptions related to the extent of cracking. This Impulse Response map is used in subsequent analyses.

ii. Rebar Capacity Tests

Two university professors, nationally recognized for their expertise in reinforced concrete, were retained to provide an independent opinion on the effect of laminar cracking on the structural capacity of the Shield Building reinforcing steel. Both professors recommended that the only issue to be evaluated would be the effect of laminar cracking on the lap splices of No.11 rebars especially for the outer hoop reinforcement.

Both professors have extensive experience in testing concrete/rebar and are /were committee members of the American Concrete Institute (ACI). Each professor independently established their own testing program at Purdue and Kansas. Both of the Purdue and Kansas test beams consisted of 2 reinforcement splices side by side (i.e. non-staggered) within 6 inches of each other which presents a conservative condition and likely to give lower bound capacity results. Note, the splices in the Shield Building are actually staggered by at least 12 inches. Also, the outer hoop splices in the Shield Building conform to the curvature of the building which provides an additional confinement effect not included in the straight beam tests. Concrete strength values used in both Purdue and Kansas tests were also lower values than the existing concrete strength in the Shield Building. This lower concrete strength also provides another layer of conservatism in the test.

Tests performed at Purdue and Kansas showed that nearly full design capacity (55ksi) would be achieved in regions of laminar cracking with cracks width significantly larger than what is in the Shield Building.

iii. **Calculation C-CSS-099.20-063** (Shield Building Design Calculation)

Rev 0 Dated Sept 10, 2013 evaluated the existing condition of Shield Building prior to the discovery that the laminar crack is propagating.
Rev 1 Dated Sept 03, 2014 evaluated the effects from the 2013 Monitoring Program.

The structural analysis of the Shield Building is contained in Calculation C-CSS-099.20-063. This calculation is a three dimensional (3D) linear elastic Finite Element model of the Shield Building using the ANSYS computer program. The model represents the entire Shield Building structure above the foundation including the cylindrical wall, spring line area, and dome area. The effect of the observed laminar cracking as identified by the Impulse Response testing is incorporated into the analysis by addressing the effect of the laminar cracking on stiffness, strength, serviceability and long term durability. All applicable design loads and load combinations specified in the USAR are included in this analysis.

This calculation also incorporates the rebar capacity tests results developed at Purdue and Kansas. Although both Purdue and Kansas indicated that full design capacity of the reinforcing steel could be used, the Kansas professor indicated that it would be prudent to use a stress limit of 55 ksi in lieu of 60 ksi for the 79 inch outside hoop reinforcing splices in the cracked regions. This would result in a capacity reduction of approximately 8% at these locations. All other splices will have their full specified yield strength available for design as demonstrated by the testing results. Since this reduced allowable stress (55 ksi) is applied over the entire outside circumference, it essentially considers that the laminar crack is along the entire outside circumference. Therefore, it is not necessary to assess where the crack is located, since all locations have been reduced accordingly.

Attachment A of Calculation C-CSS-099.20-063 evaluates the impact of the seismic analysis loading for the observed laminar cracking with the focus on verifying that the original seismic analysis loading is still acceptable for the existing Shield Building structural analysis with the laminar cracks. Model 1 was a base line model with no laminar cracking; Model 2 only modeled the shoulders as cracked; and Model 3 was based on the Impulse Response map with the applicable shoulders and the top region modeled as cracked. The models used are consistent with the stick model used in the original Shield Building design with the same methodology and the same modeling parameters with only one exception that the cross sectional properties are updated to account for the effect of different levels of the laminar cracking to assess its impact on the dynamic characteristics of the Shield Building.

Based on the Impulse Response map, four regions were assigned in Model 3 with various percent of areas cracked. These percentages are:

Region	Elevation	% of areas cracked
1	801-812.75	N/A (Dome)
2	774.5-801	70
3	643-774.5	20
4	565 - 643	0

Model 3 generated natural frequencies very similar to the base line model. Model 1 had a first mode frequency of 2.97Hz with 74% mass participation where Model 3 resulted in 2.90 Hz, with 73% mass participation factor. The calculation concluded that the Shield Building seismic loads are not adversely affected by the laminar crack and the existing seismic loads remain applicable and appropriate to use in the structural calculation.

Calculation C-CSS-099.20-063 concludes that laminar cracking will not affect the in-plane stiffness of the shell, which is the primary force transfer mechanism for the design basis seismic event (SSE) and wind loadings.

The controlling load combinations using the Allowable Working Stress are:

a. Circumferential reinforcement – outside face: 0.76 of design allowable
b. Meridional reinforcement – outside face: 0.75 of design allowable
c. Circumferential reinforcement – inside face: 0.83 of design allowable
d. Meridian reinforcement – inside face: 0.88 of design allowable
e. Concrete: 0.81 of design allowable

Note: The maximum concrete and steel interaction ratios are 0.81 and 0.88 respectively which occur in meridional direction in the region close to the base mat elevation under load combinations D + E +T_o and D + E, respectively, where no laminar cracking exists.

Where: D = Dead Load
E = Maximum Probable Earthquake (Operating Based Earthquake)
T_o = Thermal loads during operational conditions.

Subsequent to the generation of Calculation C-CSS-099.20-063, a more accurate assessment of the Impulse Response map for the percent of areas cracked was performed. The results of this assessment, shown below, showed that the original values used in the analysis were reasonable.

Region	Elevation	% of areas cracked
1	801-812.75	N/A (Dome)
2	774.5-801	38
3	643-774.5	12
4	565 - 643	1

D. Calculation C-CSS-099.20-069 (Shield Building Laminar Cracking Limits)

Rev 0 dated May 6, 2015 Sensitivity Analysis for Various Percentages of Cracking

The purpose of this calculation is to establish an upper-bound modal analysis of the Shield Building to estimate an approximate extent of cracking, for which the seismic loads derived from the original designs still remain valid. Laminar cracking affects the stiffness of the Shield Building and this could have a direct impact on the seismic loads that are used in the structural analysis. Several different analyses were performed using the same methodology found in Attachment A of calculation C-CSS-099.20-063. A conservative upper-bound crack criterion was established in this calculation, which can be used as a basis to verify compliance of the Shield Building against the ongoing crack monitoring program. The limit of crack propagation has been established as following:

Region	Elevation	% of assumed cracked areas
1	801-812.75	N/A (Dome)
2	774.5-801	100
3	643-774.5	50
4	565 - 643	20

Using the above percentage of crack propagation results in natural frequencies that remain very similar to the original model and, therefore, the existing seismic loads remain applicable and can be used directly in the Shield Building structural analysis. Therefore, the structural calculation C-CSS-099.20-0063 remains valid and no revision to that calculation is warranted.

It should be noted that this calculation identifies the percentages of cracking where the existing seismic input remains the same. There is significantly more margin in the Shield Building that is not accounted for in these analyses. For instance, significantly increasing the above percentages of cracking could result in a shift in natural frequencies and result in higher seismic loads to be addressed in the structural calculation. As shown in the structural Calculation C-CSS-099.20-063, there is additional margin in this calculation to accommodate these additional increases in seismic loads.

E. Shield Building Margin

Based on Davis-Besse's Monitoring Program, Davis-Besse identified crack propagation in several locations. Crack propagation in Shoulders 5, 7, and 15 provided the means to establish a crack growth rate of 9 inches (0.75 ft.) per year. It is important to note that there are many more core bores adjacent to laminar crack areas that have not exhibited any crack propagation.

Calculation C-CSS-099.20-069 establishes an upper-bound modal analysis of the extent of cracking. Comparing this information to the Impulse Response map, Shield Building margin can be quantified as a % of cracked area.

Region	Elevation	% of areas cracked from IR Map	% of areas cracked from calculation C-CSS-099.20-069	% of Margin
1	801-812.75	N/A (Dome	N/A (Dome)	N/A
2	774.5-801	38	100	62
3	643-774.5	12	50	38
4	565 - 643	1	20	19

This discussion will focus on the most dominant area - Region 3. Region 2 is already postulated as 100% cracked so no further discussion is needed. Region 4 has a very small amount of cracking.

Region 3 consist of approximately 59,438 ft^2 [(774.5-643) x (452)] and with 38% margin, this would equate to 22,586 ft^2. A simplified way to explain the margin is by looking at the Impulse Response map (Exhibit C) and locating the areas of existing cracks. These areas are where crack propagation is postulated to occur and propagate out from these areas (Exhibit F). There is presently approximately 1300 linear feet of cracking in Region 3 where crack propagation into the barrel section could originate from. With a crack growth of 0.75 ft. per year originating from these areas, the area that the crack would occupy in one year is postulated to be approximately 1300 ft. x 0.75 ft. = 975 ft^2.

Region 3 has 22,586 ft^2 of crack margin, and each year crack propagation is postulated to increase 975 ft^2. This would equate to approximately 22,586 / 975 = 23 years at the current postulated rate. This value is considered a simplified yet conservative value since the root cause for the crack propagation determined the cause for the crack propagation to be a result of ice wedging which requires water accumulation into an existing crack. Laboratory tests have shown the Shield Building concrete relative humidity is in a lowering trend and the crack propagation should stop well before the crack prorogation limit is reached.

F. Shield Building Monitoring Program

Based on the first root cause conclusions, the laminar cracking was considered passive. A monitoring program was established to monitor the Shield Building as a method to confirm the conclusion of the root cause. Twelve core bores were selected for this monitoring program. The location of these core bores were chosen based on where the areas experienced the most cracking (i.e. Shoulder areas facing the Southern exposure), in areas adjacent to the main steam line penetration and near the top of the Shield Building wall. Both cracked and uncracked areas were monitored. These 12 core bores represent the areas of most interest in the behavior of the Shield Building.

Monitoring in 2012 did not identify any changes in cracking. However, in 2013, a new crack was identified in a core bore that previously did not have indications of cracking. As a result of this indication, all core bores (80 in total) were inspected to determine what changes were occurring in the Shield Building (See Exhibit D). As a result of this inspection, 8 core bore with changes were identified, (5 core bore with propagation and 3 core bores with changes). This inspection provided a comprehensive assessment of the condition of the Shield Building. As a result of this new discovery of crack propagation: 1) A second root cause was performed, 2) The monitoring program was revised to address this new condition, and 3) The structural calculation C-CSS-099.20-063 was revised to address this new condition.

The Shield Building Monitoring Program was revised to increase the number of cores to be inspected to 23 core bores. These nine additional core bores were added to monitor the condition.

The Shield Building Monitoring Program was revised in 2015 to address changes in the Shield Building. Currently the program is monitoring a total of 28 core bores (Exhibit E). Five additional core bores were added to monitor the leading edges of areas of crack propagation.

The Shield Building Monitoring Program was designed based on our in-depth investigation performed as part of the two root causes and the Impulse Response map that identified areas of higher crack prevalence to monitor laminar cracking. The extent of laminar cracking is understood based on examinations of 80 core bores that represent the entire surface in combination with complete Impulse Response mapping performed in 2012, and selected areas in 2013 and 2015. The Shield Building is a heavily reinforced concrete structure with significant margin in both the structural calculation and in the percent allowable cracking. This margin provides ample time before any limits are met.

The current sample size of the 28 core bores is designed to monitor areas of known cracking, to monitor propagation rates, to monitor different regions (shoulders, Main Steam Line Rooms and areas in the top twenty feet of Shield Building elevation), and to monitor characteristics of existing laminar cracks. The basis for the selection of the core bores to monitor is based on monitoring potential areas of crack propagation and areas of known cracking as follows:

1. Fourteen areas of potential crack propagation
   a) Six core bore located in areas adjacent to known cracks to monitor crack propagation (Shoulder 4, 8, 9, 10, 11, and 12).
   b) Four shoulders monitoring the leading edge where crack propagation has been identified (Shoulders 5, 7, 13, and 15).
   c) Three core bores in areas greater than 780 feet. One of these core bore in the top region is also monitoring the leading edge where crack propagation has been identified.
   d) One core bore in the Main Steam Line penetration areas.

2. Fourteen core bores in various areas of existing laminar cracking to monitor any changes in crack characteristics. These include a range of crack widths including the widest crack initially observed in flute 5.

In total, these 28 core bores provide a compressive monitoring program for the Shield Building. Additional core bores may be added to the population pending the results of the inspection. All changes past and present are evaluated as Operating Experience in conjunction with the Corrective Action Program. This is done in accordance with the site procedures so that the appropriate changes to the Shield Building Monitoring Program are made to ensure that all aging mechanism are effectively managed.

In summary, the implementation of the Shield Building Monitoring Program will provide reasonable assurance that the existing environmental conditions will not cause aging effects that could result in a loss of component intended function. Aging effects that are discovered will be managed such that the Shield Building intended functions will be maintained consistent with the current licensing basis during the period of extended operation.

G. Enhancement to the Shield Building Monitoring Program.

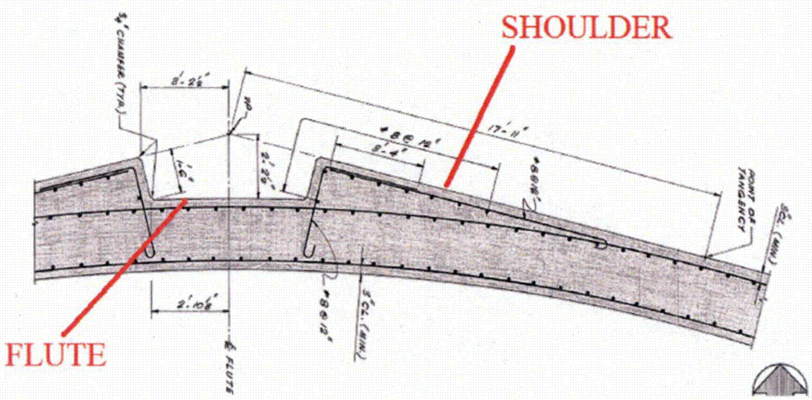
To specifically address the ACRS Subcommittee concerns about expanding the use of Impulse Response testing, the Shield Building Monitoring Program will be revised to specifically address two issues.

1) Davis-Besse will implement Impulse Response mapping on conditional basis in areas where changes in planar crack expansions are identified. The Impulse Response testing will be completed on a minimum of 100 ft^2 area in the vicinity of the core bore to characterize the extent of cracking propagation.

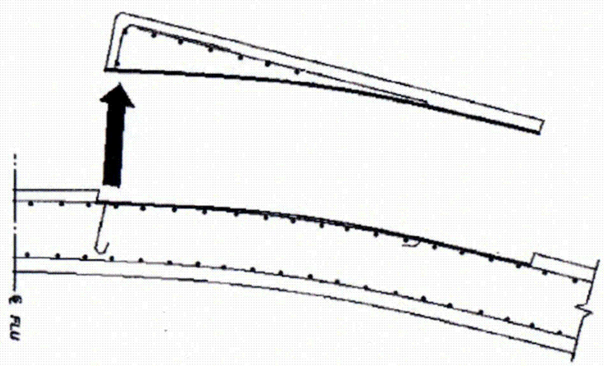
2) Davis-Besse will perform additional Impulse Response mapping as follows:
A set of four (4) 10 ft. by 10 ft. grids to be performed in 2016 and a different set of four (4) 10 ft. by 10 ft. grids to be performed in 2018 for a total of 8 grids. Two of these grids will be in areas away from existing core bores but in known crack areas to monitor any changes in the leading edges. Two of these grids will be in areas not currently known to contain laminar cracking and away from existing core bores to establish cracking has not expanded into these area.

It is recognized that the above additional sample areas are not statistically based, however, they are considered adequate to provide additional assurance that the Shield Building Monitoring Program is effective. A statistical sample was considered but a targeted approach was determined to be appropriate based on the following:

1. The current analysis has determined that the Shield Building retains significant margin even if cracking continues to propagate.
2. Impulse Response mapping was performed on the entire Shield Building and has established known areas of cracking.
3. The laminar cracking propagation is not a random phenomenon and requires existing cracks to initiate. The crack propagation has been observed propagating from existing cracked areas, therefore these areas are targeted for monitoring.



Case 1: Horizontal seismic load normal to the potential crack path of the leg (seismic force out of SB)



Case 2: Horizontal seismic load parallel to the potential crack path of the leg

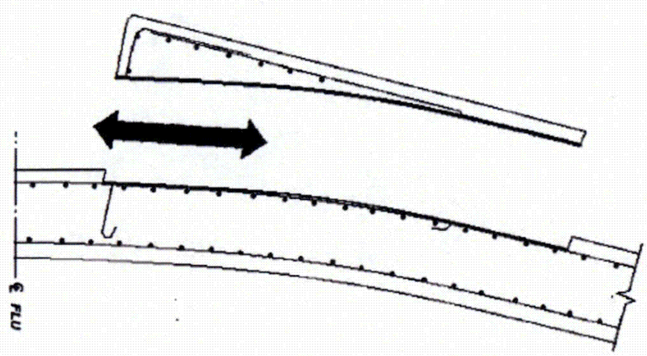
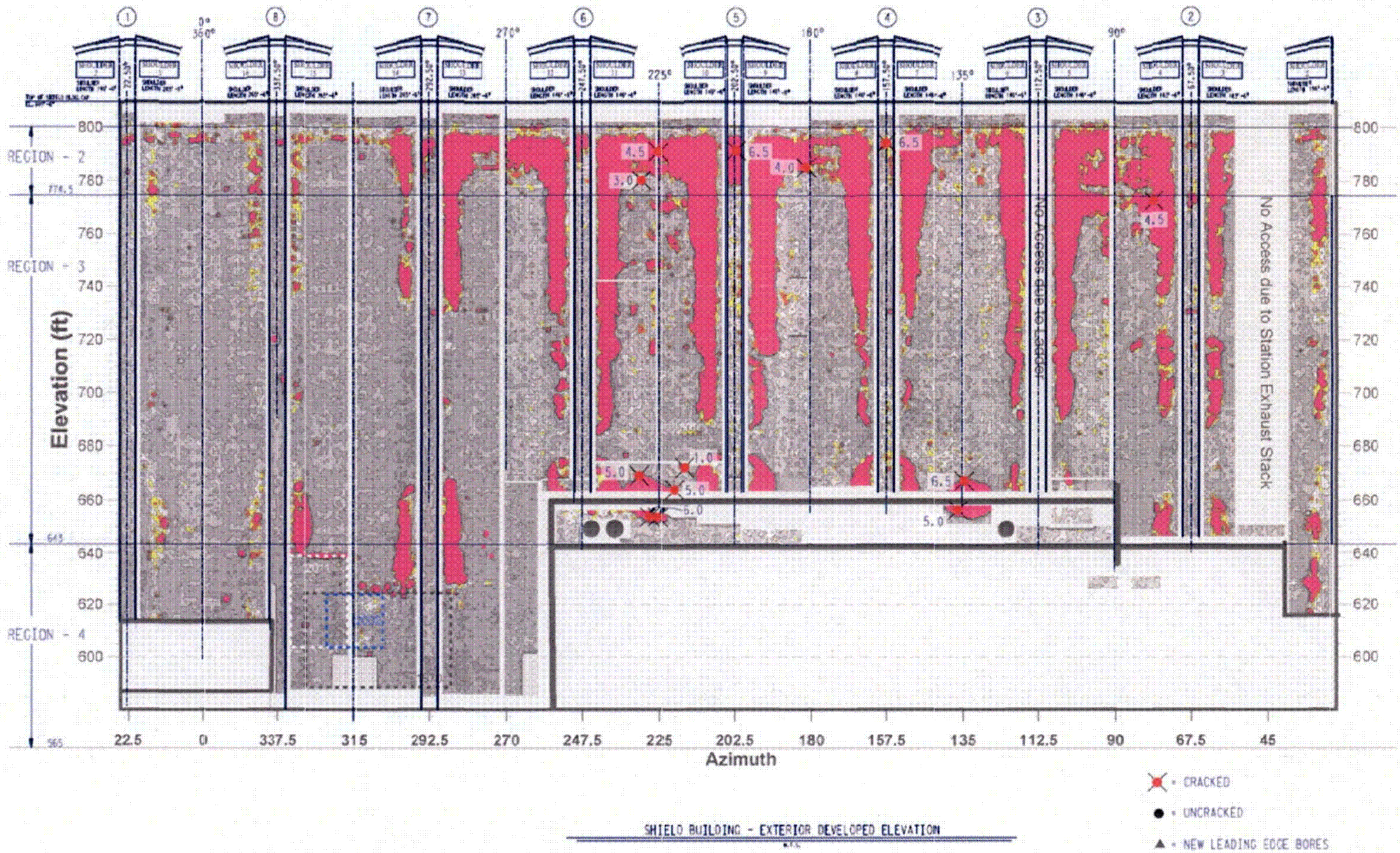


Exhibit A



SHIELD BUILDING - EXTERIOR DEVELOPED ELEVATION

Exhibit B

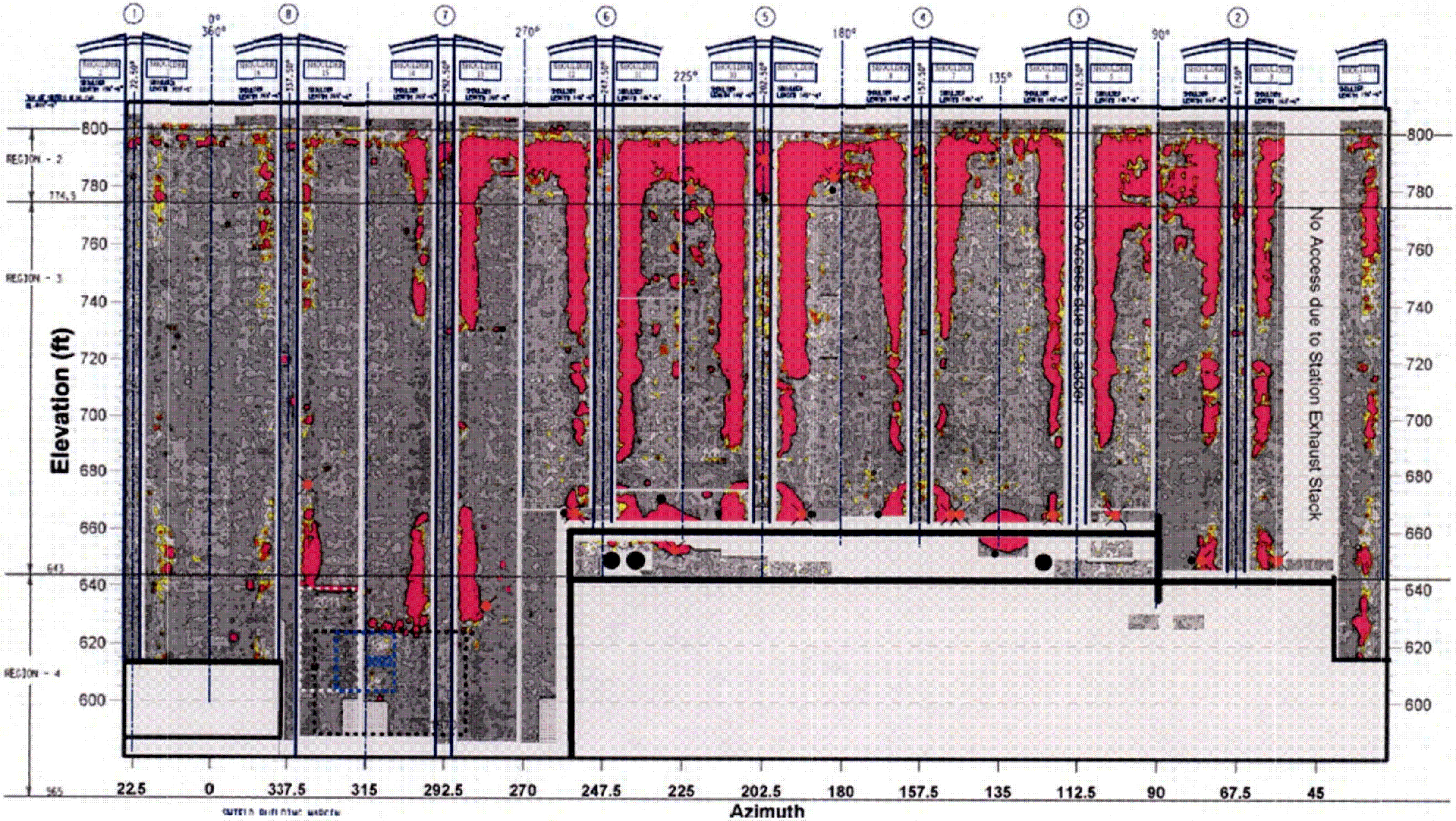

Elevation (ft)
Azimuth
REGION - 2
REGION - 3
REGION - 4
800
780
760
740
720
700
680
660
640
620
600
22.5
0
337.5
315
292.5
270
247.5
225
202.5
180
157.5
135
112.5
90
67.5
45
0°
360°
270°
225°
180°
135°
90°
No Access due to Ladder
No Access due to Station Exhaust Stack

Exhibit C

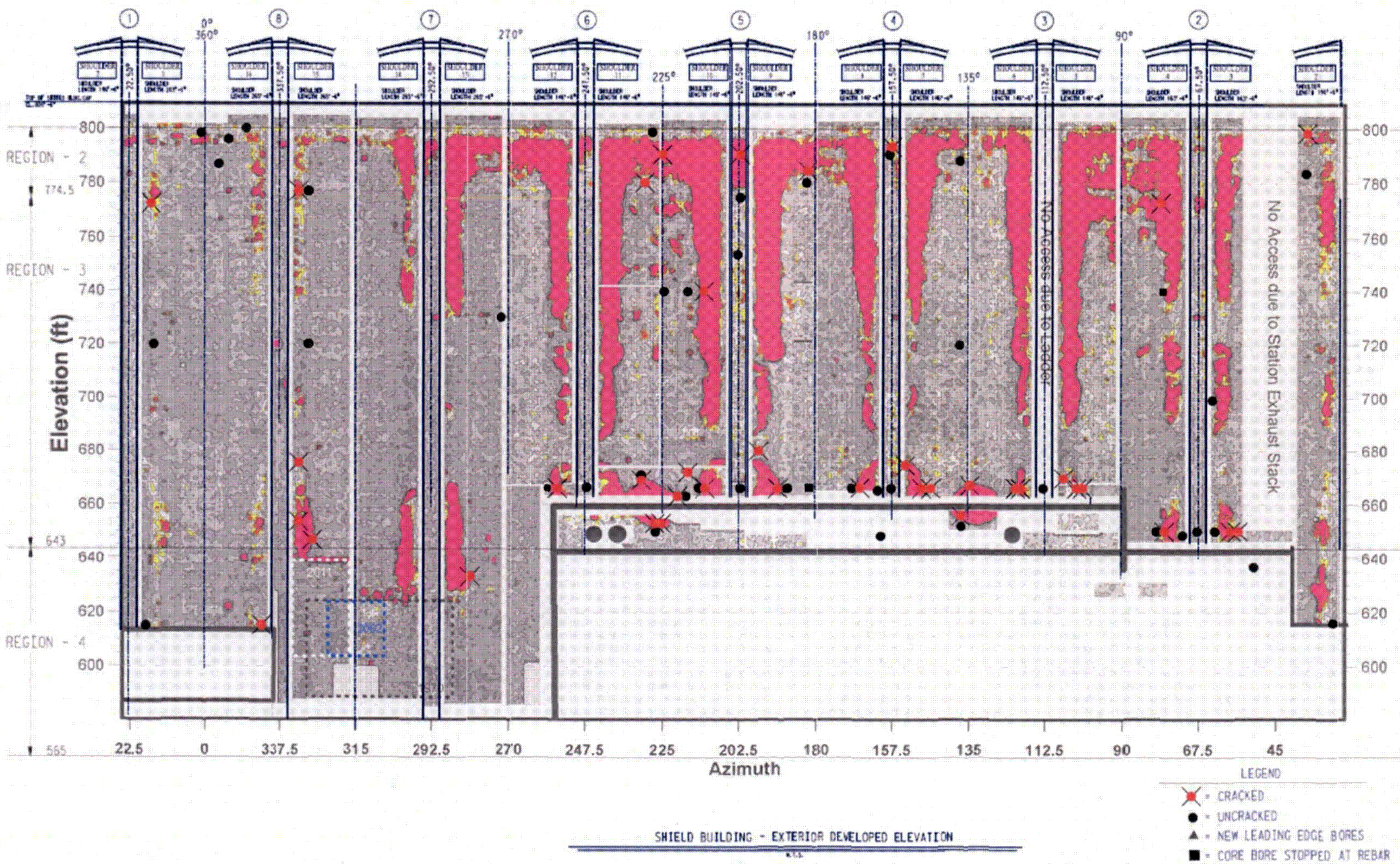

Elevation (ft)
Azimuth
REGION - 2
REGION - 3
REGION - 4
No Access due to Ladder
No Access due to Station Exhaust Stack
LEGEND
= CRACKED
= UNCRACKED
= NEW LEADING EDGE BORES
= CORE BORE STOPPED AT REBAR
SHIELD BUILDING - EXTERIOR DEVELOPED ELEVATION

Exhibit D

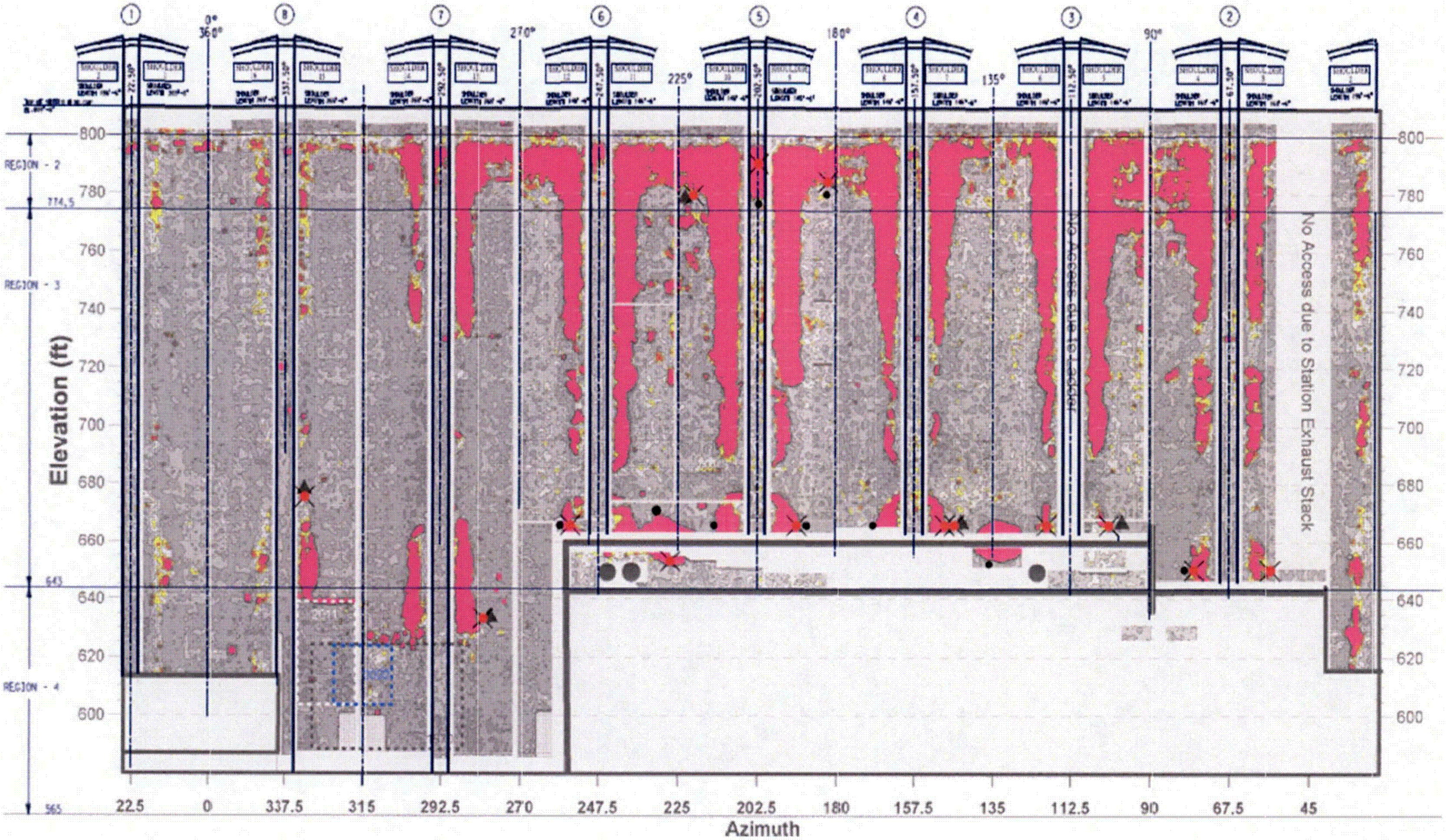

Elevation (ft)
Azimuth
800
780
760
740
720
700
680
660
640
620
600
REGION - 2
REGION - 3
REGION - 4
774.5
643
565
22.5
0
337.5
315
292.5
270
247.5
225
202.5
180
157.5
135
112.5
90
67.5
45
0°
360°
270°
225°
180°
135°
90°
No Access due to Station Exhaust Stack
No Access due to Ladder

Exhibit E

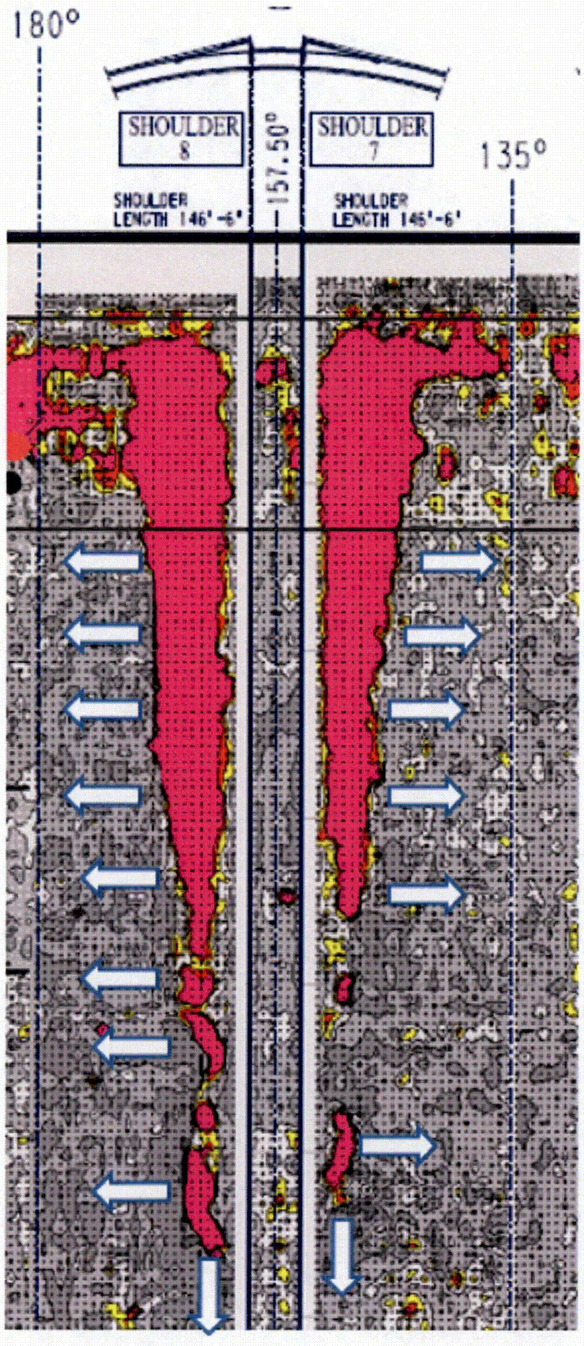

180°
SHOULDER 8
157.50°
SHOULDER 7
135°
SHOULDER LENGTH 146'-6"
SHOULDER LENGTH 146'-6"

Exhibit F

Enclosure

Davis-Besse Nuclear Power Station, Unit No. 1 (Davis-Besse)

Letter L-15-310

Compact disk containing an electronic copy of the following documents:

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File Name	Size
001 C-CSS-099.20-055 R00.pdf	892 KB
002 C-CSS-099.20-063 R01 Part 1 of 7.pdf	40,591 KB
003 C-CSS-099.20-063 R01 Part 2 of 7.pdf	30,227 KB
004 C-CSS-099.20-063 R01 Part 3 of 7.pdf	18,465 KB
005 C-CSS-099.20-063 R01 Part 4 of 7.pdf	41,304 KB
006 C-CSS-099.20-063 R01 Part 5 of 7.pdf	33,741 KB
007 C-CSS-099.20-063 R01 Part 6 of 7.pdf	25,037 KB
008 C-CSS-099.20-063 R01 Part 7 of 7.pdf	31,895 KB
009 C-CSS-099.20-069 R00.pdf	5,848 KB