

OSHPD

Facilities Development Division

Attn: Timothy J. Piland

Senior Structural Engineer, Structural Support Unit

2020 West El Camino Avenue, 9th Floor

Sacramento, CA 95833

**Subject: ABB Class 1 / Class 2 / ISB Switchboard Product Line Seismic Certification Letter**

Dear OSHPD Structural Engineering Team,

I have prepared this letter to certify that the ABB (previously GE Zenith Controls) Class 1, Class 2, and ISB Switchboard product lines meets the requirements for Special Seismic Certification as detailed in Section 1705A.13.3 of the CBC 2019 and the 2015-ICC-ES AC156 standard. All components and subcomponents that are covered under this seismic certification are detailed in the attached matrices and UUT summary sheets. Shake table tests were performed on multiple switchboard configurations at Clark Testing Laboratories in Pittsburgh, PA and Environmental Test Laboratory in Dallas, TX. The results of the test are detailed in following test reports:

| Test Report No. | Test Laboratory          | Test Date     | Representative Units Under Test                                  |
|-----------------|--------------------------|---------------|------------------------------------------------------------------|
| 8055            | Clark Testing Laboratory | May 2006      | UUT <sub>y</sub> -1A / UUT <sub>y</sub> -1B                      |
| 8101            | Clark Testing Laboratory | August 2006   | UUT <sub>x</sub> -1 / UUT <sub>x</sub> -3 / UUT <sub>x</sub> -5  |
| 8480            | Clark Testing Laboratory | May 2008      | UUT <sub>z</sub> -1 / UUT <sub>z</sub> -2                        |
| 10164           | Clark Testing Laboratory | July 2012     | UUT <sub>u</sub> -1                                              |
| 10154           | Clark Testing Laboratory | July 2012     | UUT <sub>w</sub> -4 / UUT <sub>w</sub> -5                        |
| 10155           | Clark Testing Laboratory | July 2012     | UUT <sub>v</sub> -2A / UUT <sub>v</sub> -3 / UUT <sub>v</sub> -6 |
| 2346A Rev1      | Clark Testing Laboratory | July 2013     | UUT <sub>t</sub> -1 / UUT <sub>t</sub> -2                        |
| 15605 Rev. 1    | Environmental Test Lab   | February 2020 | UUT <sub>s</sub> -7 / UUT <sub>s</sub> -8 / UUT <sub>s</sub> -9  |

I have reviewed the test lab reports for conformance with the requirements for Special Seismic Certification detailed in CBC 2019 Section 1705A.13.3 and the 2015-ICC-ES AC156 standard. The Units Under Test were full of contents during testing and remained functional before and after the ICC-ES-AC156 test. The UUT's maintained structural integrity during and after the ICC-ES-AC156 test. Minor damage / anomalies occurred to several units during seismic testing that required modifications to the UUT's. All minor modifications are detailed on the UUT

summary sheet and the manufacturer has incorporated these modifications in their standard production units. The enveloping requirements of the ICC-ES-AC156 tests were met for seismic certification limits set for the Switchboard configurations, see matrices for details.

Based on my review of the Clark Testing Laboratory and Environmental Testing Laboratory Reports, the ABB Class 1, Class 2, and ISB Switchboard Product Lines (see attached matrices) meets the requirements for Special Seismic Certification as detailed in Section 1705A.13.3 of the CBC 2019.

Sincerely,

Travis E. Soppe, SE / PE / P.Eng  
California SE 6115  
President  
W.E. Gundy & Associates Inc.

Table 1

# ABB, INC. CLASS 1 SWITCHBOARD CERTIFIED PRODUCT LINE MATRICES



**Seismic Certification Limits:  $S_{DS} = 2.0g$  at  $\frac{z}{h} = 1 \rightarrow F_p = 1.50g$  and  $S_{DS} = 2.5$  at  $\frac{z}{h} = 0 \rightarrow F_p = 1.13g$**

| ID/Catalog Number <sup>1</sup>                                                  | Max Current Rating (A) | NEMA Enclosure | Equipment Dimensions (in) |       |        | Weight (lbs) | Representative UUT <sup>2</sup> |
|---------------------------------------------------------------------------------|------------------------|----------------|---------------------------|-------|--------|--------------|---------------------------------|
|                                                                                 |                        |                | Width                     | Depth | Height |              |                                 |
| Evolution, Spectra, Jiffy, GenTower, Integrated, Reliagear, Commercial Metering | 800-6000               | 1, 3R          | 30-60                     | 25-60 | 90-93  | 500-2711     |                                 |
| Evolution                                                                       | 800                    | 1              | 30"                       | 25"   | 90"    | 510          | UUT <sub>w</sub> -5             |
| Reliagear <sup>3</sup>                                                          | 800                    | 1              | 30"                       | 25"   | 90"    | 809          | UUT <sub>s</sub> -7             |
| Evolution                                                                       | 4000                   | 1              | 45"                       | 25"   | 90"    | 870          | UUT <sub>v</sub> -6             |
| Commercial                                                                      | NA                     | 3R             | 35"                       | 40"   | 93"    | 1020         | UUT <sub>t</sub> -2             |
| Evolution                                                                       | 4000                   | 1              | 45"                       | 25"   | 90"    | 1026         | UUT <sub>v</sub> -3             |
| Reliagear <sup>3</sup>                                                          | 4000                   | 1              | 50"                       | 50"   | 90"    | 1625         | UUT <sub>s</sub> -8             |
| Evolution                                                                       | 4000                   | 1              | 40"                       | 35"   | 90"    | 1176         | UUT <sub>w</sub> -4             |
| GenTower                                                                        | 4000                   | 3R             | 40"                       | 50"   | 93"    | 1852         | UUT <sub>t</sub> -1             |
| Reliagear <sup>3</sup>                                                          | 4000                   | 1              | 60"                       | 60"   | 90"    | 2711         | UUT <sub>s</sub> -9             |

## General Notes:

<sup>1</sup> Evolution is the newer version of the Spectra with only difference being the Evolution offers up to 6000A in the range.

<sup>2</sup> The units were tested at different times and the subscripts on the UUT's reference the following lab test reports:

<sub>s</sub> - 15605 / <sub>t</sub> - 2346A / <sub>u</sub> - 10164 / <sub>v</sub> - 10155 / <sub>w</sub> - 10154 / <sub>x</sub> - 8101 / <sub>y</sub> - 8055 / <sub>z</sub> - 8480

<sup>3</sup> Reliagear has both copper and aluminum bus. UUT<sub>s</sub>-1/3 are copper and UUT<sub>s</sub>-2 is aluminum.

<sup>4</sup> See Table 4 for listing of certified subcomponents of the Class 1 Switchboard product line.

Table 2

## ABB, INC. CLASS 2 SWITCHBOARD CERTIFIED PRODUCT LINE MATRICES



**Seismic Certification Limits:  $S_{DS} = 1.56g$  at  $z/h = 1 \rightarrow F_p = 1.17g$  and  $S_{DS} = 2.50g$  at  $z/h = 0 \rightarrow F_p = 1.13g$**

| ID/Catalog Number <sup>1</sup>                                                   | Max Current Rating (A) | NEMA Enclosure | Equipment Dimensions (in) |       |        | Weight (lbs) | Representative UUT <sup>2</sup> |
|----------------------------------------------------------------------------------|------------------------|----------------|---------------------------|-------|--------|--------------|---------------------------------|
|                                                                                  |                        |                | Width                     | Depth | Height |              |                                 |
| Evolution, Spectra, Jiffy, GenTower, Integrated, Commercial Metering, PowerBreak | 800-6000               | 1, 3R          | 15-60                     | 15-60 | 90-93  | 500-4500     |                                 |
| Integrated                                                                       | 4000                   | 1              | 25"                       | 15"   | 90"    | 380          | UUT <sub>x</sub> -5             |
| Integrated                                                                       | 4000                   | 1              | 20"                       | 30"   | 90"    | 405          | UUT <sub>x</sub> -3             |
| Integrated                                                                       | 4000                   | 1              | 40"                       | 15"   | 90"    | 435          | UUT <sub>x</sub> -1             |
| Evolution                                                                        | 800                    | 1              | 30"                       | 25"   | 90"    | 510          | UUT <sub>w</sub> -5             |
| Reliagear <sup>3</sup>                                                           | 800                    | 1              | 30"                       | 25"   | 90"    | 809          | UUT <sub>s</sub> -7             |
| Evolution                                                                        | 4000                   | 1              | 45"                       | 25"   | 90"    | 870          | UUT <sub>v</sub> -6             |
| Commercial                                                                       | NA                     | 3R             | 35"                       | 40"   | 93"    | 1020         | UUT <sub>t</sub> -2             |
| Evolution                                                                        | 4000                   | 1              | 45"                       | 25"   | 90"    | 1026         | UUT <sub>v</sub> -3             |
| AV-3 Stack                                                                       | 6000                   | 3R             | 15"                       | 50"   | 92"    | 1050         | UUT <sub>y</sub> -1a            |
| Reliagear <sup>3</sup>                                                           | 4000                   | 1              | 50"                       | 50"   | 90"    | 1625         | UUT <sub>s</sub> -8             |
| Evolution                                                                        | 4000                   | 1              | 40"                       | 35"   | 90"    | 1176         | UUT <sub>w</sub> -4             |
| Evolution                                                                        | 2000                   | 1              | 35"                       | 35"   | 90"    | 1435         | UUT <sub>v</sub> -2a            |
| GenTower                                                                         | 4000                   | 3R             | 40"                       | 50"   | 93"    | 1852         | UUT <sub>t</sub> -1             |
| PowerBreak II                                                                    | 6000                   | 3R             | 22"                       | 50"   | 92"    | 2129         | UUT <sub>y</sub> -1b            |
| Reliagear <sup>3</sup>                                                           | 4000                   | 1              | 60"                       | 60"   | 90"    | 2711         | UUT <sub>s</sub> -9             |
| Evolution                                                                        | 6000                   | 1              | 60"                       | 60"   | 90"    | 4463         | UUT <sub>u</sub> -1             |

### General Notes:

<sup>1</sup> Evolution is the newer version of the Spectra with only difference being the Evolution offers up to 6000A in the range.

<sup>2</sup> The units were tested at different times and the subscripts on the UUT's reference the following lab test reports:

<sub>s</sub> - 15605 / <sub>t</sub> - 2346A / <sub>u</sub> - 10164 / <sub>v</sub> - 10155 / <sub>w</sub> - 10154 / <sub>x</sub> - 8101 / <sub>y</sub> - 8055 / <sub>z</sub> - 8480

<sup>3</sup> Reliagear has both copper and aluminum bus. UUT<sub>s</sub>-1/3 are copper and UUT<sub>s</sub>-2 is aluminum.

<sup>4</sup> See Table 5 for listing of certified subcomponents of the Class 2 Switchboard product line.

Table 3

## ABB, INC. ISB SWITCHBOARD CERTIFIED PRODUCT LINE MATRICES



**Seismic Certification Limits:  $S_{DS} = 1.10g$  at  $z/h = 1 \rightarrow F_p = 0.83g$  and  $S_{DS} = 1.76g$  at  $z/h = 0 \rightarrow F_p = 0.79g$**

| ID/Catalog Number <sup>1</sup>                                                   | Max Current Rating (A) | NEMA Enclosure | Equipment Dimensions (in) |       |        | Weight (lbs) | Representative UUT <sup>2</sup> |
|----------------------------------------------------------------------------------|------------------------|----------------|---------------------------|-------|--------|--------------|---------------------------------|
|                                                                                  |                        |                | Width                     | Depth | Height |              |                                 |
| Evolution, Spectra, Jiffy, GenTower, Integrated, Commercial Metering, PowerBreak | 800-6000               | 1, 3R          | 15-60                     | 15-60 | 90-93  | 500-4500     |                                 |
| Integrated                                                                       | 4000                   | 1              | 25"                       | 15"   | 90"    | 380          | UUT <sub>x</sub> -5             |
| Integrated                                                                       | 4000                   | 1              | 20"                       | 30"   | 90"    | 405          | UUT <sub>x</sub> -3             |
| Integrated                                                                       | 4000                   | 1              | 40"                       | 15"   | 90"    | 435          | UUT <sub>x</sub> -1             |
| Evolution                                                                        | 800                    | 1              | 30"                       | 25"   | 90"    | 510          | UUT <sub>w</sub> -5             |
| Reliagear <sup>3</sup>                                                           | 800                    | 1              | 30"                       | 25"   | 90"    | 809          | UUT <sub>s</sub> -7             |
| Evolution                                                                        | 4000                   | 1              | 45"                       | 25"   | 90"    | 870          | UUT <sub>v</sub> -6             |
| Commercial                                                                       | NA                     | 3R             | 35"                       | 40"   | 93"    | 1020         | UUT <sub>t</sub> -2             |
| Evolution                                                                        | 4000                   | 1              | 45"                       | 25"   | 90"    | 1026         | UUT <sub>v</sub> -3             |
| AV-3 Stack                                                                       | 6000                   | 3R             | 15"                       | 50"   | 92"    | 1050         | UUT <sub>y</sub> -1a            |
| Evolution                                                                        | 4000                   | 1              | 40"                       | 35"   | 90"    | 1176         | UUT <sub>w</sub> -4             |
| Evolution                                                                        | 2000                   | 1              | 35"                       | 35"   | 90"    | 1435         | UUT <sub>v</sub> -2a            |
| Reliagear <sup>3</sup>                                                           | 4000                   | 1              | 50"                       | 50"   | 90"    | 1625         | UUT <sub>s</sub> -8             |
| GenTower                                                                         | 4000                   | 3R             | 40"                       | 50"   | 93"    | 1852         | UUT <sub>t</sub> -1             |
| Integrated                                                                       | 4000                   | 1              | 40"                       | 35"   | 90"    | 2125         | UUT <sub>z</sub> -1             |
| PowerBreak II                                                                    | 6000                   | 3R             | 22"                       | 50"   | 92"    | 2129         | UUT <sub>y</sub> -1b            |
| Integrated                                                                       | 4000                   | 1              | 40"                       | 35"   | 90"    | 2410         | UUT <sub>z</sub> -2             |
| Reliagear <sup>3</sup>                                                           | 4000                   | 1              | 60"                       | 60"   | 90"    | 2711         | UUT <sub>s</sub> -9             |
| Evolution                                                                        | 6000                   | 1              | 60"                       | 60"   | 90"    | 4463         | UUT <sub>u</sub> -1             |

**General Notes:**

<sup>1</sup> Evolution is the newer version of the Spectra with only difference being the Evolution offers up to 6000A in the range.

<sup>2</sup> The units were tested at different times and the subscripts on the UUT's reference the following lab test reports:

s - 15605 / t - 2346A / u - 10164 / v - 10155 / w - 10154 / x - 8101 / y - 8055 / z - 8480

<sup>3</sup> Reliagear has both copper and aluminum bus. UUT<sub>s</sub>-1/3 are copper and UUT<sub>s</sub>-2 is aluminum.

<sup>4</sup> See Table 6 for listing of certified subcomponents of the ISB Switchboard product line.

| Table 4                                                                                                                                                                                                         | ABB, INC. CLASS 1 SWITCHBOARD<br>CERTIFIED SUBCOMPONENT MATRICES |                   |                           | <br>W.E. GUNDY & ASSOCIATES, INC.<br>STRUCTURAL & EARTHQUAKE ENGINEERING |  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Seismic Certification Limits: $S_{DS} = 2.0g$ at $z/h = 1 \rightarrow F_p = 1.50g$ and $S_{DS} = 2.5$ at $z/h = 0 \rightarrow F_p = 1.13g$                                                                      |                                                                  |                   |                           |                                                                                                                                                            |  |
| Identification Number                                                                                                                                                                                           | Manufacturer                                                     | Description       | Approximate Weights (lbs) | Representative UUT <sup>1</sup>                                                                                                                            |  |
| Fusible Switches                                                                                                                                                                                                |                                                                  |                   |                           |                                                                                                                                                            |  |
| ADS36030HS                                                                                                                                                                                                      | GE                                                               | 30A               | 18.7                      | UUT <sub>v</sub> -6                                                                                                                                        |  |
| ADS*                                                                                                                                                                                                            | GE                                                               | 30-1200A          | 18.7-75                   | Interpolated                                                                                                                                               |  |
| ADS36120LB                                                                                                                                                                                                      | GE                                                               | 1200A             | 75                        | UUT <sub>v</sub> -6                                                                                                                                        |  |
| Fuses                                                                                                                                                                                                           |                                                                  |                   |                           |                                                                                                                                                            |  |
| ATDR1/2                                                                                                                                                                                                         | Mersen                                                           | 0.5A              | 0.9                       | UUT <sub>w</sub> -4                                                                                                                                        |  |
| AJT1-1/2                                                                                                                                                                                                        | Mersen                                                           | 1.5A              | 0.25                      | UUT <sub>v</sub> -2                                                                                                                                        |  |
| A4J6                                                                                                                                                                                                            | Mersen                                                           | 6.0A              | 0.12                      | UUT <sub>v</sub> -2                                                                                                                                        |  |
| AJT, A4J6, A4BY, ATDR                                                                                                                                                                                           | Mersen                                                           | 0.5A-4000A        | 0.9-25.5                  | Interpolated                                                                                                                                               |  |
| A4BY800                                                                                                                                                                                                         | Mersen                                                           | 800A              | 3.9                       | UUT <sub>w</sub> -5                                                                                                                                        |  |
| A4BY1200                                                                                                                                                                                                        | Mersen                                                           | 1200A             | 4.5                       | UUT <sub>v</sub> -6                                                                                                                                        |  |
| A4BY4000                                                                                                                                                                                                        | Mersen                                                           | 4000A             | 25.5                      | UUT <sub>w</sub> -4                                                                                                                                        |  |
| Record Plus Circuit Breakers                                                                                                                                                                                    |                                                                  |                   |                           |                                                                                                                                                            |  |
| NEFBV                                                                                                                                                                                                           | ABB                                                              | 15A               | 3                         | UUT <sub>s</sub> -7                                                                                                                                        |  |
| NEFBV                                                                                                                                                                                                           | ABB                                                              | 30A               | 3                         | Interpolated                                                                                                                                               |  |
| NEFB                                                                                                                                                                                                            | ABB                                                              | 15A - 100A        | 3-5                       | Interpolated                                                                                                                                               |  |
| NEFBV                                                                                                                                                                                                           | ABB                                                              | 50A               | 4                         | Interpolated                                                                                                                                               |  |
| NEFBV                                                                                                                                                                                                           | ABB                                                              | 100A              | 5                         | UUT <sub>s</sub> -7                                                                                                                                        |  |
| FBL36TE030R                                                                                                                                                                                                     | GE                                                               | F-type, 30A       | 5                         | UUT <sub>v</sub> -3                                                                                                                                        |  |
| FBH36TE035R2                                                                                                                                                                                                    | GE                                                               | F-type, 35A       | 4                         | UUT <sub>v</sub> -3                                                                                                                                        |  |
| F*                                                                                                                                                                                                              | GE                                                               | F-type, 30A-600A  | 1-22                      | Interpolated                                                                                                                                               |  |
| FGP36AA066R1                                                                                                                                                                                                    | GE                                                               | F-type, 600A      | 22                        | UUT <sub>v</sub> -3                                                                                                                                        |  |
| Spectra RMS Circuit Breakers                                                                                                                                                                                    |                                                                  |                   |                           |                                                                                                                                                            |  |
| SEHA36AT0030                                                                                                                                                                                                    | GE                                                               | S-type, 30A       | 5                         | UUT <sub>v</sub> -3                                                                                                                                        |  |
| S*                                                                                                                                                                                                              | GE                                                               | S-type, 30A-1200A | 5 - 42.8                  | Interpolated                                                                                                                                               |  |
| SKHA36AT1200                                                                                                                                                                                                    | GE                                                               | S-type, 1200A     | 42.8                      | UUT <sub>v</sub> -3                                                                                                                                        |  |
| Thermal Mag, Q-Line, Molded Case Switches                                                                                                                                                                       |                                                                  |                   |                           |                                                                                                                                                            |  |
| TEYF1015                                                                                                                                                                                                        | GE                                                               | T-type, 15A       | 2                         | UUT <sub>v</sub> -3                                                                                                                                        |  |
| TEYF2015                                                                                                                                                                                                        | GE                                                               | T-type, 15A       | 2                         | UUT <sub>v</sub> -3                                                                                                                                        |  |
| TEYF3015                                                                                                                                                                                                        | GE                                                               | T-type, 15A       | 2                         | UUT <sub>v</sub> -3                                                                                                                                        |  |
| T*                                                                                                                                                                                                              | GE                                                               | T-type, 15A-1200A | 2-37                      | Interpolated                                                                                                                                               |  |
| TKM3F                                                                                                                                                                                                           | GE                                                               | T-type, 1200A     | 37                        | UUT <sub>v</sub> -6                                                                                                                                        |  |
| XT Molded Case Switches                                                                                                                                                                                         |                                                                  |                   |                           |                                                                                                                                                            |  |
| XT1                                                                                                                                                                                                             | ABB                                                              | 160A              | 4                         | UUT <sub>s</sub> -7                                                                                                                                        |  |
| XT4                                                                                                                                                                                                             | ABB                                                              | 250A              | 7                         | UUT <sub>s</sub> -7, UUT <sub>s</sub> -8                                                                                                                   |  |
| XT5                                                                                                                                                                                                             | ABB                                                              | 360A              | 15                        | UUT <sub>s</sub> -8, UUT <sub>s</sub> -9                                                                                                                   |  |
| XT7                                                                                                                                                                                                             | ABB                                                              | 1200A             | 43                        | UUT <sub>s</sub> -8, UUT <sub>s</sub> -9                                                                                                                   |  |
| General Notes:                                                                                                                                                                                                  |                                                                  |                   |                           |                                                                                                                                                            |  |
| <sup>1</sup> The units were tested at different times and the subscripts on the UUT's reference the following lab test reports:<br>s - 15605 t - 2346A u - 10164 v - 10155 w - 10154 x - 8101 y - 8055 z - 8480 |                                                                  |                   |                           |                                                                                                                                                            |  |

| Table 4                                                                                                                                                                                                                       | ABB, INC. CLASS 1 SWITCHBOARD<br>CERTIFIED SUBCOMPONENT MATRICES |                           |                           | <br>W.E. GUNDY & ASSOCIATES, INC.<br>STRUCTURAL & EARTHQUAKE ENGINEERING |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|---------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seismic Certification Limits: $S_{DS} = 2.0g$ at $z/h = 1 \rightarrow F_p = 1.50g$ and $S_{DS} = 2.5$ at $z/h = 0 \rightarrow F_p = 1.13g$                                                                                    |                                                                  |                           |                           |                                                                                                                                                            |
| Identification Number                                                                                                                                                                                                         | Manufacturer                                                     | Description               | Approximate Weights (lbs) | Representative UUT <sup>1</sup>                                                                                                                            |
| Spectra Power Panels                                                                                                                                                                                                          |                                                                  |                           |                           |                                                                                                                                                            |
| APNB3812                                                                                                                                                                                                                      | GE                                                               | Spectra 1200A             | 150                       | UUT <sub>v</sub> -6                                                                                                                                        |
| APN*                                                                                                                                                                                                                          | GE                                                               | Spectra 1200A-2000A       | 150-175                   | Interpolated                                                                                                                                               |
| APNB3820                                                                                                                                                                                                                      | GE                                                               | Spectra 2000A             | 175                       | UUT <sub>v</sub> -3                                                                                                                                        |
| Reliagear Power Panels Bus Stack                                                                                                                                                                                              |                                                                  |                           |                           |                                                                                                                                                            |
| IN1604TX3H1                                                                                                                                                                                                                   | ABB                                                              | 400A, Aluminum            | 53                        | UUT <sub>s</sub> -7                                                                                                                                        |
| IN1604CC3H2                                                                                                                                                                                                                   | ABB                                                              | 400A, Copper              | 62                        | UUT <sub>s</sub> -7                                                                                                                                        |
| Inxx(04-40)xx(1,3,4)(Hx,Bx)                                                                                                                                                                                                   | ABB                                                              | 400A-4000A, CU & AL       | 53-510                    | Interpolated                                                                                                                                               |
| IN4030CC3H1                                                                                                                                                                                                                   | ABB                                                              | 3000A, Aluminum           | 280                       | UUT <sub>s</sub> -8                                                                                                                                        |
| IN5640CC4B3                                                                                                                                                                                                                   | ABB                                                              | 4000A, Copper             | 510                       | UUT <sub>s</sub> -9                                                                                                                                        |
| Surge Protection Device (SPD)                                                                                                                                                                                                 |                                                                  |                           |                           |                                                                                                                                                            |
| TPHE*, THE*, ATHE*, TPME*                                                                                                                                                                                                     | GE                                                               | 25-100kA/130-200kA        | 0-25                      | Extrapolated                                                                                                                                               |
| TPHE480D12PP                                                                                                                                                                                                                  | GE                                                               | 125kA/250kA               | 25                        | UUT <sub>v</sub> -3                                                                                                                                        |
| TPHE*, THE*, ATHE*, TPME*                                                                                                                                                                                                     | GE                                                               | 125-300kA/250-600kA       | 25                        | Interpolated                                                                                                                                               |
| TPHE480D30PP                                                                                                                                                                                                                  | GE                                                               | 300kA/600kA               | 25                        | UUT <sub>v</sub> -6                                                                                                                                        |
| SP120Y                                                                                                                                                                                                                        | ABB                                                              | 120Wye, SPD, Disconnect   | 50                        | UUT <sub>s</sub> -8                                                                                                                                        |
| SP277Y                                                                                                                                                                                                                        | ABB                                                              | 480/277Y, SPD, Disconnect | 50                        | Interpolated                                                                                                                                               |
| SP347Y                                                                                                                                                                                                                        | ABB                                                              | 600/347Y, SPD, Disconnect | 50                        | Interpolated                                                                                                                                               |
| SP480D                                                                                                                                                                                                                        | ABB                                                              | 480D, SPD, Disconnect     | 50                        | UUT <sub>s</sub> -8                                                                                                                                        |
| Meter Socket                                                                                                                                                                                                                  |                                                                  |                           |                           |                                                                                                                                                            |
| CM100A35K480V                                                                                                                                                                                                                 | GE                                                               | 480V                      | 8.4                       | UUT <sub>t</sub> -2                                                                                                                                        |
| CM200A65K480V                                                                                                                                                                                                                 | GE                                                               | 480V                      | 8.4                       | UUT <sub>t</sub> -2                                                                                                                                        |
| CM100, CM200                                                                                                                                                                                                                  | GE                                                               | 240V-600V                 | 6.7-10.2                  | Interpolated                                                                                                                                               |
| CM200MSJF240V                                                                                                                                                                                                                 | GE                                                               | 240V                      | 6.7                       | UUT <sub>t</sub> -2                                                                                                                                        |
| CM200MSJF600V                                                                                                                                                                                                                 | GE                                                               | 600V                      | 10.2                      | UUT <sub>t</sub> -2                                                                                                                                        |
| MT04AP                                                                                                                                                                                                                        | ABB                                                              | Pulse, Carbon Steel       | 16                        | UUT <sub>s</sub> -1                                                                                                                                        |
| MT04AM(AD)                                                                                                                                                                                                                    | ABB                                                              | ModBus, Carbon Steel      | 16                        | Interpolated                                                                                                                                               |
| MT04AB                                                                                                                                                                                                                        | ABB                                                              | BacNe, Carbon Steel       | 16                        | UUT <sub>s</sub> -8                                                                                                                                        |
| Generator Connectors                                                                                                                                                                                                          |                                                                  |                           |                           |                                                                                                                                                            |
| HBLFRSBN                                                                                                                                                                                                                      | Hubbell                                                          |                           | 0.1                       | UUT <sub>t</sub> -1                                                                                                                                        |
| HBL                                                                                                                                                                                                                           | Hubbell                                                          |                           | 0.1 - 1.54                | Interpolated                                                                                                                                               |
| HBLFRGN                                                                                                                                                                                                                       | Hubbell                                                          |                           | 1.54                      | UUT <sub>t</sub> -1                                                                                                                                        |
| Transfer Switches                                                                                                                                                                                                             |                                                                  |                           |                           |                                                                                                                                                            |
| OXA30U2X2QB                                                                                                                                                                                                                   | ABB                                                              | 30A 2 Pole ATS            | 25                        | UUT <sub>s</sub> -8                                                                                                                                        |
| OX*                                                                                                                                                                                                                           | ABB                                                              | TruONE ATS                | 25-125                    | Interpolated                                                                                                                                               |
| OXB1200U3S2QT                                                                                                                                                                                                                 | ABB                                                              | 1200A 4 pole ATS          | 125                       | UUT <sub>s</sub> -8                                                                                                                                        |
| General Notes:                                                                                                                                                                                                                |                                                                  |                           |                           |                                                                                                                                                            |
| <sup>1</sup> The units were tested at different times and the subscripts on the UUT's reference the following lab test reports:<br>s - 15605 / t - 2346A / u - 10164 / v - 10155 / w - 10154 / x - 8101 / y - 8055 / z - 8480 |                                                                  |                           |                           |                                                                                                                                                            |

|                                                                                                                                                                                                                                                        |                                                                                                                                            |              |                      |                                                                                    |                                 |
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| Table 4                                                                                                                                                                                                                                                | ABB, INC. CLASS 1 SWITCHBOARD<br>CERTIFIED SUBCOMPONENT MATRICES                                                                           |              |                      |  |                                 |
|                                                                                                                                                                                                                                                        | Seismic Certification Limits: $S_{DS} = 2.0g$ at $z/h = 1 \rightarrow F_p = 1.50g$ and $S_{DS} = 2.5$ at $z/h = 0 \rightarrow F_p = 1.13g$ |              |                      |                                                                                    |                                 |
| Identification Number                                                                                                                                                                                                                                  |                                                                                                                                            | Manufacturer | Description          | Approximate Weights (lbs)                                                          | Representative UUT <sup>1</sup> |
| Control Power Transformer                                                                                                                                                                                                                              |                                                                                                                                            |              |                      |                                                                                    |                                 |
| 9T58K2808                                                                                                                                                                                                                                              |                                                                                                                                            | GE           | 0.3 kVA 240/480      | 7                                                                                  | UUT <sub>v</sub> -2             |
| 9T58K28(08-15)                                                                                                                                                                                                                                         |                                                                                                                                            | GE           | 0.05kVA-3kVA 240/480 | 7-54                                                                               | Interpolated                    |
| 9T58K2815                                                                                                                                                                                                                                              |                                                                                                                                            | GE           | 3.0kVA 240/480       | 54                                                                                 | UUT <sub>s</sub> -7             |
| <b>General Notes:</b><br><sup>1</sup> The units were tested at different times and the subscripts on the UUT's reference the following lab test reports:<br>s - 15605 / t - 2346A / u - 10164 / v - 10155 / w - 10154 / x - 8101 / y - 8055 / z - 8480 |                                                                                                                                            |              |                      |                                                                                    |                                 |



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| Table 5                                                                                                                                                                                                                       | ABB, INC. CLASS 2 SWITCHBOARD<br>CERTIFIED SUBCOMPONENT MATRICES                                                                              |                    |                           | <br>W.E. GUNDY & ASSOCIATES, INC.<br>STRUCTURAL & EARTHQUAKE ENGINEERING |
|                                                                                                                                                                                                                               | Seismic Certification Limits: $S_{DS} = 1.56g$ at $z/h = 1 \rightarrow F_p = 1.17g$ and $S_{DS} = 2.50g$ at $z/h = 0 \rightarrow F_p = 1.13g$ |                    |                           |                                                                                                                                                            |
| Identification Number                                                                                                                                                                                                         | Manufacturer                                                                                                                                  | Description        | Approximate Weights (lbs) | Representative UUT <sup>1</sup>                                                                                                                            |
| High Pressure Contact Switch (HPC)                                                                                                                                                                                            |                                                                                                                                               |                    |                           |                                                                                                                                                            |
| THPR3608GA3                                                                                                                                                                                                                   | GE                                                                                                                                            | HPC, 800A          | 115                       | UUT <sub>w</sub> -5                                                                                                                                        |
| THPR*, THPC*                                                                                                                                                                                                                  | GE                                                                                                                                            | HPC, 800A-4000A    | 115-540                   | Interpolated                                                                                                                                               |
| THPC3640G3T                                                                                                                                                                                                                   | GE                                                                                                                                            | HPC, 4000          | 540                       | UUT <sub>w</sub> -4                                                                                                                                        |
| Fusible Switches                                                                                                                                                                                                              |                                                                                                                                               |                    |                           |                                                                                                                                                            |
| ADS36030HS                                                                                                                                                                                                                    | GE                                                                                                                                            | 30A                | 18.7                      | UUT <sub>v</sub> -6                                                                                                                                        |
| ADS*                                                                                                                                                                                                                          | GE                                                                                                                                            | 30-1200A           | 18.7-75                   | Interpolated                                                                                                                                               |
| ADS36120LB                                                                                                                                                                                                                    | GE                                                                                                                                            | 1200A              | 75                        | UUT <sub>v</sub> -6                                                                                                                                        |
| Fuses                                                                                                                                                                                                                         |                                                                                                                                               |                    |                           |                                                                                                                                                            |
| ATDR1/2                                                                                                                                                                                                                       | Mersen                                                                                                                                        | 0.5A               | 0.9                       | UUT <sub>w</sub> -4                                                                                                                                        |
| AJT1-1/2                                                                                                                                                                                                                      | Mersen                                                                                                                                        | 1.5A               | 0.25                      | UUT <sub>v</sub> -2                                                                                                                                        |
| A4J6                                                                                                                                                                                                                          | Mersen                                                                                                                                        | 6.0A               | 0.12                      | UUT <sub>v</sub> -2                                                                                                                                        |
| AJT, A4J6, A4BY, ATDR                                                                                                                                                                                                         | Mersen                                                                                                                                        | 0.5A-4000A         | 0.9-25.5                  | Interpolated                                                                                                                                               |
| A4BY800                                                                                                                                                                                                                       | Mersen                                                                                                                                        | 800A               | 3.9                       | UUT <sub>w</sub> -5                                                                                                                                        |
| A4BY1200                                                                                                                                                                                                                      | Mersen                                                                                                                                        | 1200A              | 4.5                       | UUT <sub>v</sub> -6                                                                                                                                        |
| A4BY4000                                                                                                                                                                                                                      | Mersen                                                                                                                                        | 4000A              | 25.5                      | UUT <sub>w</sub> -4                                                                                                                                        |
| Record Plus Circuit Breakers                                                                                                                                                                                                  |                                                                                                                                               |                    |                           |                                                                                                                                                            |
| NEFBV                                                                                                                                                                                                                         | ABB                                                                                                                                           | 15A                | 3                         | UUT <sub>s</sub> -7                                                                                                                                        |
| NEFBV                                                                                                                                                                                                                         | ABB                                                                                                                                           | 30A                | 3                         | Interpolated                                                                                                                                               |
| NEFB                                                                                                                                                                                                                          | ABB                                                                                                                                           | 15A - 100A         | 3-5                       | Interpolated                                                                                                                                               |
| NEFBV                                                                                                                                                                                                                         | ABB                                                                                                                                           | 50A                | 4                         | Interpolated                                                                                                                                               |
| NEFBV                                                                                                                                                                                                                         | ABB                                                                                                                                           | 100A               | 5                         | UUT <sub>s</sub> -7                                                                                                                                        |
| FBL36TE030R                                                                                                                                                                                                                   | GE                                                                                                                                            | F-type, 30A        | 2.7                       | UUT <sub>v</sub> -3                                                                                                                                        |
| FBH36TE035R2                                                                                                                                                                                                                  | GE                                                                                                                                            | F-type, 35A        | 4                         | UUT <sub>v</sub> -3                                                                                                                                        |
| F*                                                                                                                                                                                                                            | GE                                                                                                                                            | F-type, 30A-600A   | 2.7-22                    | Interpolated                                                                                                                                               |
| FGP36AA066R1                                                                                                                                                                                                                  | GE                                                                                                                                            | F-type, 600A       | 22                        | UUT <sub>v</sub> -3                                                                                                                                        |
| Spectra RMS Circuit Breakers                                                                                                                                                                                                  |                                                                                                                                               |                    |                           |                                                                                                                                                            |
| SEHA36AT0030                                                                                                                                                                                                                  | GE                                                                                                                                            | S*-type, 30A       | 5                         | UUT <sub>v</sub> -3                                                                                                                                        |
| SELA36AT0150                                                                                                                                                                                                                  | GE                                                                                                                                            | S*-type, 150A      | 5                         | UUT <sub>y</sub> -1a                                                                                                                                       |
| SFLA36AT0250                                                                                                                                                                                                                  | GE                                                                                                                                            | S*-type, 250A      | 9                         | UUT <sub>y</sub> -1a                                                                                                                                       |
| S*                                                                                                                                                                                                                            | GE                                                                                                                                            | S*-type, 30A-1200A | 5-42.8                    | Interpolated                                                                                                                                               |
| SGLA36AT0600                                                                                                                                                                                                                  | GE                                                                                                                                            | S*-type, 600A      | 13                        | UUT <sub>y</sub> -1a                                                                                                                                       |
| SKPA36AT1200                                                                                                                                                                                                                  | GE                                                                                                                                            | S*-type, 1200A     | 40                        | UUT <sub>y</sub> -1a                                                                                                                                       |
| SKHA36AT1200                                                                                                                                                                                                                  | GE                                                                                                                                            | S*-type, 1200A     | 42.8                      | UUT <sub>v</sub> -3                                                                                                                                        |
| General Notes:                                                                                                                                                                                                                |                                                                                                                                               |                    |                           |                                                                                                                                                            |
| <sup>1</sup> The units were tested at different times and the subscripts on the UUT's reference the following lab test reports:<br>s - 15605 / t - 2346A / u - 10164 / v - 10155 / w - 10154 / x - 8101 / y - 8055 / z - 8480 |                                                                                                                                               |                    |                           |                                                                                                                                                            |

|                                                                                                                                                                                                                               |                                                                                                                                               |                     |             |                                                                                                                                                            |                                 |
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| Table 5                                                                                                                                                                                                                       | ABB, INC. CLASS 2 SWITCHBOARD<br>CERTIFIED SUBCOMPONENT MATRICES                                                                              |                     |             | <br>W.E. GUNDY & ASSOCIATES, INC.<br>STRUCTURAL & EARTHQUAKE ENGINEERING |                                 |
|                                                                                                                                                                                                                               | Seismic Certification Limits: $S_{DS} = 1.56g$ at $z/h = 1 \rightarrow F_p = 1.17g$ and $S_{DS} = 2.50g$ at $z/h = 0 \rightarrow F_p = 1.13g$ |                     |             |                                                                                                                                                            |                                 |
| Identification Number                                                                                                                                                                                                         |                                                                                                                                               | Manufacturer        | Description | Approximate Weights (lbs)                                                                                                                                  | Representative UUT <sup>1</sup> |
| Thermal Mag, Q-Line, Molded Case Switches                                                                                                                                                                                     |                                                                                                                                               |                     |             |                                                                                                                                                            |                                 |
| TEYF1015                                                                                                                                                                                                                      | GE                                                                                                                                            | T-type, 15A         | 2           | UUT <sub>v</sub> -3                                                                                                                                        |                                 |
| TEYF2015                                                                                                                                                                                                                      | GE                                                                                                                                            | T-type, 15A         | 2           | UUT <sub>v</sub> -3                                                                                                                                        |                                 |
| TEYF3015                                                                                                                                                                                                                      | GE                                                                                                                                            | T-type, 15A         | 2           | UUT <sub>v</sub> -3                                                                                                                                        |                                 |
| T*                                                                                                                                                                                                                            | GE                                                                                                                                            | T-type, 15A-1200A   | 2-37        | Interpolated                                                                                                                                               |                                 |
| TKM3F                                                                                                                                                                                                                         | GE                                                                                                                                            | T-type, 1200A       | 37          | UUT <sub>v</sub> -6                                                                                                                                        |                                 |
| XT Molded Case Switches                                                                                                                                                                                                       |                                                                                                                                               |                     |             |                                                                                                                                                            |                                 |
| XT1                                                                                                                                                                                                                           | ABB                                                                                                                                           | 160A                | 4           | UUT <sub>s</sub> -7                                                                                                                                        |                                 |
| XT4                                                                                                                                                                                                                           | ABB                                                                                                                                           | 250A                | 7           | UUT <sub>s</sub> -7, UUT <sub>s</sub> -8                                                                                                                   |                                 |
| XT5                                                                                                                                                                                                                           | ABB                                                                                                                                           | 360A                | 15          | UUT <sub>s</sub> -8, UUT <sub>s</sub> -9                                                                                                                   |                                 |
| XT7                                                                                                                                                                                                                           | ABB                                                                                                                                           | 1200A               | 43          | UUT <sub>s</sub> -8, UUT <sub>s</sub> -9                                                                                                                   |                                 |
| EntelliGuard G (800A-4000A)                                                                                                                                                                                                   |                                                                                                                                               |                     |             |                                                                                                                                                            |                                 |
| G*                                                                                                                                                                                                                            | GE                                                                                                                                            | 800A-2000A          | 136.7-176.4 | Extrapolated                                                                                                                                               |                                 |
| GA20M2X                                                                                                                                                                                                                       | GE                                                                                                                                            | 2000A               | 176.4       | UUT <sub>v</sub> -2                                                                                                                                        |                                 |
| G*                                                                                                                                                                                                                            | GE                                                                                                                                            | 2500A-6000A         | 253.5-463.0 | Interpolated                                                                                                                                               |                                 |
| GA60M2X                                                                                                                                                                                                                       | GE                                                                                                                                            | 6000A               | 463         | UUT <sub>u</sub> -1                                                                                                                                        |                                 |
| PowerBreak II (800A-4000A)                                                                                                                                                                                                    |                                                                                                                                               |                     |             |                                                                                                                                                            |                                 |
| SSD30D30H                                                                                                                                                                                                                     | GE                                                                                                                                            | 3000A               | 353         | UUT <sub>y</sub> -1b                                                                                                                                       |                                 |
| SSD                                                                                                                                                                                                                           | GE                                                                                                                                            | 800A-3000A          | 166-353     | Interpolated                                                                                                                                               |                                 |
| SSD20D20H                                                                                                                                                                                                                     | GE                                                                                                                                            | 2000A               | 202         | UUT <sub>y</sub> -1b                                                                                                                                       |                                 |
| SSD08D08H                                                                                                                                                                                                                     | GE                                                                                                                                            | 800A                | 166         | UUT <sub>y</sub> -1b                                                                                                                                       |                                 |
| Power Panels                                                                                                                                                                                                                  |                                                                                                                                               |                     |             |                                                                                                                                                            |                                 |
| APNB3812                                                                                                                                                                                                                      | GE                                                                                                                                            | Spectra 1200A       | 150         | UUT <sub>v</sub> -6                                                                                                                                        |                                 |
| APN*                                                                                                                                                                                                                          | GE                                                                                                                                            | Spectra 1200A-2000A | 150-170     | Interpolated                                                                                                                                               |                                 |
| APNB3820                                                                                                                                                                                                                      | GE                                                                                                                                            | Spectra 2000A       | 170         | UUT <sub>v</sub> -3                                                                                                                                        |                                 |
| ALM3424MTX                                                                                                                                                                                                                    | GE                                                                                                                                            | A Series 225A       | 33          | UUT <sub>x</sub> -1                                                                                                                                        |                                 |
| AL*, AD*                                                                                                                                                                                                                      | GE                                                                                                                                            | A Series 225-600A   | 33-75       | Interpolated                                                                                                                                               |                                 |
| ADM3366MTX                                                                                                                                                                                                                    | GE                                                                                                                                            | A Series 600A       | 75          | UUT <sub>x</sub> -5                                                                                                                                        |                                 |
| Reliagear Power Panels Bus Stack                                                                                                                                                                                              |                                                                                                                                               |                     |             |                                                                                                                                                            |                                 |
| IN1604TX3H1                                                                                                                                                                                                                   | ABB                                                                                                                                           | 400A, Aluminum      | 53          | UUT <sub>s</sub> -7                                                                                                                                        |                                 |
| IN1604CC3H2                                                                                                                                                                                                                   | ABB                                                                                                                                           | 400A, Copper        | 62          | UUT <sub>s</sub> -7                                                                                                                                        |                                 |
| Inxx(04-40)xx(1,3,4)(Hx,Bx)                                                                                                                                                                                                   | ABB                                                                                                                                           | 400A-4000A, CU & AL | 53-510      | Interpolated                                                                                                                                               |                                 |
| IN4030CC3H1                                                                                                                                                                                                                   | ABB                                                                                                                                           | 3000A, Aluminum     | 280         | UUT <sub>s</sub> -8                                                                                                                                        |                                 |
| IN5640CC4B3                                                                                                                                                                                                                   | ABB                                                                                                                                           | 4000A, Copper       | 510         | UUT <sub>s</sub> -9                                                                                                                                        |                                 |
|                                                                                                                                                                                                                               |                                                                                                                                               |                     |             |                                                                                                                                                            |                                 |
|                                                                                                                                                                                                                               |                                                                                                                                               |                     |             |                                                                                                                                                            |                                 |
| General Notes:                                                                                                                                                                                                                |                                                                                                                                               |                     |             |                                                                                                                                                            |                                 |
| <sup>1</sup> The units were tested at different times and the subscripts on the UUT's reference the following lab test reports:<br>s - 15605 / t - 2346A / u - 10164 / v - 10155 / w - 10154 / x - 8101 / y - 8055 / z - 8480 |                                                                                                                                               |                     |             |                                                                                                                                                            |                                 |

| Table 5                                                                                                                                                                                                                       | ABB, INC. CLASS 2 SWITCHBOARD<br>CERTIFIED SUBCOMPONENT MATRICES |                           |                           | <br>W.E. GUNDY & ASSOCIATES, INC.<br>STRUCTURAL & EARTHQUAKE ENGINEERING |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|---------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seismic Certification Limits: $S_{DS} = 1.56g$ at $z/h = 1 \rightarrow F_p = 1.17g$ and $S_{DS} = 2.50g$ at $z/h = 0 \rightarrow F_p = 1.13g$                                                                                 |                                                                  |                           |                           |                                                                                                                                                            |
| Identification Number                                                                                                                                                                                                         | Manufacturer                                                     | Description               | Approximate Weights (lbs) | Representative UUT <sup>1</sup>                                                                                                                            |
| Surge Protection Device (SPD)                                                                                                                                                                                                 |                                                                  |                           |                           |                                                                                                                                                            |
| TPHE*, THE*, ATHE*, TPME*                                                                                                                                                                                                     | GE                                                               | 25-100kA/130-200kA        | 0-25                      | Extrapolated                                                                                                                                               |
| TPHE480D12PP                                                                                                                                                                                                                  | GE                                                               | 125kA/250kA               | 25                        | UUT <sub>v</sub> -3                                                                                                                                        |
| TPHE*, THE*, ATHE*, TPME*                                                                                                                                                                                                     | GE                                                               | 125-300kA/250-600kA       | 25                        | Interpolated                                                                                                                                               |
| TPHE480D30PP                                                                                                                                                                                                                  | GE                                                               | 300kA/600kA               | 25                        | UUT <sub>v</sub> -6                                                                                                                                        |
| SP120Y                                                                                                                                                                                                                        | ABB                                                              | 120Wye, SPD, Disconnect   | 50                        | UUT <sub>s</sub> -8                                                                                                                                        |
| SP277Y                                                                                                                                                                                                                        | ABB                                                              | 480/277Y, SPD, Disconnect | 50                        | Interpolated                                                                                                                                               |
| SP347Y                                                                                                                                                                                                                        | ABB                                                              | 600/347Y, SPD, Disconnect | 50                        | Interpolated                                                                                                                                               |
| SP480D                                                                                                                                                                                                                        | ABB                                                              | 480D, SPD, Disconnect     | 50                        | UUT <sub>s</sub> -8                                                                                                                                        |
| Strip Heaters                                                                                                                                                                                                                 |                                                                  |                           |                           |                                                                                                                                                            |
| CRX# OT-1225                                                                                                                                                                                                                  | Chromalox                                                        | Heater                    | 3                         | UUT <sub>v</sub> -2                                                                                                                                        |
| Transfer Switches                                                                                                                                                                                                             |                                                                  |                           |                           |                                                                                                                                                            |
| ZTG000A00020E                                                                                                                                                                                                                 | GE                                                               | Zenith Transfer Switch    | 60                        | UUT <sub>x</sub> -3                                                                                                                                        |
| ZTG*                                                                                                                                                                                                                          | GE                                                               | Zenith Transfer Switch    | 60-69                     | Interpolated                                                                                                                                               |
| ZTGD00A0U020E                                                                                                                                                                                                                 | GE                                                               | Zenith Transfer Switch    | 69                        | UUT <sub>x</sub> -3                                                                                                                                        |
| OXA30U2X2QB                                                                                                                                                                                                                   | ABB                                                              | 30A 2 Pole ATS            | 25                        | UUT <sub>s</sub> -8                                                                                                                                        |
| OX*                                                                                                                                                                                                                           | ABB                                                              | TruONE ATS                | 25-125                    | Interpolated                                                                                                                                               |
| OXB1200U3S2QT                                                                                                                                                                                                                 | ABB                                                              | 1200A 4 pole ATS          | 125                       | UUT <sub>s</sub> -8                                                                                                                                        |
| Meter Socket                                                                                                                                                                                                                  |                                                                  |                           |                           |                                                                                                                                                            |
| CM100A35K480V                                                                                                                                                                                                                 | GE                                                               | 480V                      | 8.4                       | UUT <sub>t</sub> -2                                                                                                                                        |
| CM200A65K480V                                                                                                                                                                                                                 | GE                                                               | 480V                      | 8.4                       | UUT <sub>t</sub> -2                                                                                                                                        |
| CM100, CM200                                                                                                                                                                                                                  | GE                                                               | 240V-600V                 | 6.7-10.2                  | Interpolated                                                                                                                                               |
| CM200MSJF240V                                                                                                                                                                                                                 | GE                                                               | 240V                      | 6.7                       | UUT <sub>t</sub> -2                                                                                                                                        |
| CM200MSJF600V                                                                                                                                                                                                                 | GE                                                               | 600V                      | 10                        | UUT <sub>t</sub> -2                                                                                                                                        |
| MT04AP                                                                                                                                                                                                                        | ABB                                                              | Pulse, Carbon Steel       | 16                        | UUT <sub>s</sub> -7                                                                                                                                        |
| MT04AM(AD)                                                                                                                                                                                                                    | ABB                                                              | ModBus, Carbon Steel      | 16                        | Interpolated                                                                                                                                               |
| MT04AB                                                                                                                                                                                                                        | ABB                                                              | BacNe, Carbon Steel       | 16                        | UUT <sub>s</sub> -8                                                                                                                                        |
| Generator Connectors                                                                                                                                                                                                          |                                                                  |                           |                           |                                                                                                                                                            |
| HBLFRSBN                                                                                                                                                                                                                      | Hubbell                                                          |                           | 0.1                       | UUT <sub>t</sub> -1                                                                                                                                        |
| HBL                                                                                                                                                                                                                           | Hubbell                                                          |                           | 0.1-1.54                  | Interpolated                                                                                                                                               |
| HBLFRGN                                                                                                                                                                                                                       | Hubbell                                                          |                           | 1.54                      | UUT <sub>t</sub> -1                                                                                                                                        |
| Control Power Transformer                                                                                                                                                                                                     |                                                                  |                           |                           |                                                                                                                                                            |
| 9T58K2808                                                                                                                                                                                                                     | GE                                                               | 0.3 kVA 240/480           | 7                         | UUT <sub>v</sub> -2                                                                                                                                        |
| 9T58K28(08-15)                                                                                                                                                                                                                | GE                                                               | 0.05kVA-3kVA 240/480      | 7-54                      | Interpolated                                                                                                                                               |
| 9T58K2815                                                                                                                                                                                                                     | GE                                                               | 3.0kVA 240/480            | 54                        | UUT <sub>s</sub> -7                                                                                                                                        |
| General Notes:                                                                                                                                                                                                                |                                                                  |                           |                           |                                                                                                                                                            |
| <sup>1</sup> The units were tested at different times and the subscripts on the UUT's reference the following lab test reports:<br>s - 15605 / t - 2346A / u - 10164 / v - 10155 / w - 10154 / x - 8101 / y - 8055 / z - 8480 |                                                                  |                           |                           |                                                                                                                                                            |

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| Table 6                                                                                                                                                                                                                       | ABB, INC. ISB SWITCHBOARD<br>CERTIFIED SUBCOMPONENT MATRICES                                                                                  |              |                    | <br>W.E. GUNDY & ASSOCIATES, INC.<br>STRUCTURAL & EARTHQUAKE ENGINEERING |                                 |
|                                                                                                                                                                                                                               | Seismic Certification Limits: $S_{DS} = 1.10g$ at $z/h = 1 \rightarrow F_p = 0.83g$ and $S_{DS} = 1.76g$ at $z/h = 0 \rightarrow F_p = 0.79g$ |              |                    |                                                                                                                                                            |                                 |
| Identification Number                                                                                                                                                                                                         |                                                                                                                                               | Manufacturer | Description        | Approximate Weights (lbs)                                                                                                                                  | Representative UUT <sup>1</sup> |
| High Pressure Contact Switch (HPC)                                                                                                                                                                                            |                                                                                                                                               |              |                    |                                                                                                                                                            |                                 |
| THPR3608GA3                                                                                                                                                                                                                   |                                                                                                                                               | GE           | HPC, 800A          | 115                                                                                                                                                        | UUT <sub>w</sub> -5             |
| THPR*, THPC*                                                                                                                                                                                                                  |                                                                                                                                               | GE           | HPC, 800A-4000A    | 115-540                                                                                                                                                    | Interpolated                    |
| THPC3640G3T                                                                                                                                                                                                                   |                                                                                                                                               | GE           | HPC, 4000          | 540                                                                                                                                                        | UUT <sub>w</sub> -4             |
| Fusible Switches                                                                                                                                                                                                              |                                                                                                                                               |              |                    |                                                                                                                                                            |                                 |
| ADS36030HS                                                                                                                                                                                                                    |                                                                                                                                               | GE           | 30A                | 18.7                                                                                                                                                       | UUT <sub>v</sub> -6             |
| ADS*                                                                                                                                                                                                                          |                                                                                                                                               | GE           | 30-1200A           | 18.7-75                                                                                                                                                    | Interpolated                    |
| ADS36120LB                                                                                                                                                                                                                    |                                                                                                                                               | GE           | 1200A              | 75                                                                                                                                                         | UUT <sub>v</sub> -6             |
| Fuses                                                                                                                                                                                                                         |                                                                                                                                               |              |                    |                                                                                                                                                            |                                 |
| ATDR1/2                                                                                                                                                                                                                       |                                                                                                                                               | Mersen       | 0.5A               | <10                                                                                                                                                        | UUT <sub>w</sub> -4             |
| AJT1-1/2                                                                                                                                                                                                                      |                                                                                                                                               | Mersen       | 1.5A               | <10                                                                                                                                                        | UUT <sub>v</sub> -2             |
| A4J6                                                                                                                                                                                                                          |                                                                                                                                               | Mersen       | 6.0A               | <10                                                                                                                                                        | UUT <sub>v</sub> -2             |
| AJT, A4J6, A4BY, ATDR                                                                                                                                                                                                         |                                                                                                                                               | Mersen       | 0.5A-4000A         | <10-25                                                                                                                                                     | Interpolated                    |
| A4BY800                                                                                                                                                                                                                       |                                                                                                                                               | Mersen       | 800A               | <10                                                                                                                                                        | UUT <sub>w</sub> -5             |
| A4BY1200                                                                                                                                                                                                                      |                                                                                                                                               | Mersen       | 1200A              | <10                                                                                                                                                        | UUT <sub>v</sub> -6             |
| A4BY4000                                                                                                                                                                                                                      |                                                                                                                                               | Mersen       | 4000A              | 25                                                                                                                                                         | UUT <sub>w</sub> -4             |
| Record Plus Circuit Breakers                                                                                                                                                                                                  |                                                                                                                                               |              |                    |                                                                                                                                                            |                                 |
| NEFBV                                                                                                                                                                                                                         |                                                                                                                                               | ABB          | 15A                | 3                                                                                                                                                          | UUT <sub>s</sub> -7             |
| NEFBV                                                                                                                                                                                                                         |                                                                                                                                               | ABB          | 30A                | 3                                                                                                                                                          | Interpolated                    |
| NEFB                                                                                                                                                                                                                          |                                                                                                                                               | ABB          | 15A - 100A         | 3-5                                                                                                                                                        | Interpolated                    |
| NEFBV                                                                                                                                                                                                                         |                                                                                                                                               | ABB          | 50A                | 4                                                                                                                                                          | Interpolated                    |
| NEFBV                                                                                                                                                                                                                         |                                                                                                                                               | ABB          | 100A               | 5                                                                                                                                                          | UUT <sub>s</sub> -7             |
| FBL36TE030R                                                                                                                                                                                                                   |                                                                                                                                               | GE           | F-type, 30A        | 5                                                                                                                                                          | UUT <sub>v</sub> -3             |
| FBH36TE035R2                                                                                                                                                                                                                  |                                                                                                                                               | GE           | F-type, 35A        | 4                                                                                                                                                          | UUT <sub>v</sub> -3             |
| F*                                                                                                                                                                                                                            |                                                                                                                                               | GE           | F-type, 30A-600A   | 3.3-22                                                                                                                                                     | Interpolated                    |
| FGP36AA066R1                                                                                                                                                                                                                  |                                                                                                                                               | GE           | F-type, 600A       | 22                                                                                                                                                         | UUT <sub>v</sub> -3             |
| Spectra RMS Circuit Breakers                                                                                                                                                                                                  |                                                                                                                                               |              |                    |                                                                                                                                                            |                                 |
| SEHA36AT0030                                                                                                                                                                                                                  |                                                                                                                                               | GE           | S*-type, 30A       | 5                                                                                                                                                          | UUT <sub>v</sub> -3             |
| SELA36AT0150                                                                                                                                                                                                                  |                                                                                                                                               | GE           | S*-type, 150A      | 5                                                                                                                                                          | UUT <sub>y</sub> -1a            |
| SFLA36AT0250                                                                                                                                                                                                                  |                                                                                                                                               | GE           | S*-type, 250A      | 9                                                                                                                                                          | UUT <sub>y</sub> -1a            |
| S*                                                                                                                                                                                                                            |                                                                                                                                               | GE           | S*-type, 30A-1200A | 5-42.8                                                                                                                                                     | Interpolated                    |
| SGLA36AT0600                                                                                                                                                                                                                  |                                                                                                                                               | GE           | S*-type, 600A      | 13                                                                                                                                                         | UUT <sub>y</sub> -1a            |
| SKPA36AT1200                                                                                                                                                                                                                  |                                                                                                                                               | GE           | S*-type, 1200A     | 40                                                                                                                                                         | UUT <sub>y</sub> -1a            |
| SKHA36AT1200                                                                                                                                                                                                                  |                                                                                                                                               | GE           | S*-type, 1200A     | 42.8                                                                                                                                                       | UUT <sub>v</sub> -3             |
| General Notes:                                                                                                                                                                                                                |                                                                                                                                               |              |                    |                                                                                                                                                            |                                 |
| <sup>1</sup> The units were tested at different times and the subscripts on the UUT's reference the following lab test reports:<br>s - 15605 / t - 2346A / u - 10164 / v - 10155 / w - 10154 / x - 8101 / y - 8055 / z - 8480 |                                                                                                                                               |              |                    |                                                                                                                                                            |                                 |

|                                                                                                                                                                                                                               |                                                                                                                                               |                     |                           |                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------|------------------------------------------------------------------------------------|
| Table 6                                                                                                                                                                                                                       | ABB, INC. ISB SWITCHBOARD<br>CERTIFIED SUBCOMPONENT MATRICES                                                                                  |                     |                           |  |
|                                                                                                                                                                                                                               | Seismic Certification Limits: $S_{DS} = 1.10g$ at $z/h = 1 \rightarrow F_p = 0.83g$ and $S_{DS} = 1.76g$ at $z/h = 0 \rightarrow F_p = 0.79g$ |                     |                           |                                                                                    |
| Identification Number                                                                                                                                                                                                         | Manufacturer                                                                                                                                  | Description         | Approximate Weights (lbs) | Representative UUT <sup>1</sup>                                                    |
| Thermal Mag, Q-Line, Molded Case Switches                                                                                                                                                                                     |                                                                                                                                               |                     |                           |                                                                                    |
| TEYF1015                                                                                                                                                                                                                      | GE                                                                                                                                            | T-type, 15A         | 2                         | UUT <sub>v</sub> -3                                                                |
| TEYF2015                                                                                                                                                                                                                      | GE                                                                                                                                            | T-type, 15A         | 2                         | UUT <sub>v</sub> -3                                                                |
| TEYF3015                                                                                                                                                                                                                      | GE                                                                                                                                            | T-type, 15A         | 2                         | UUT <sub>v</sub> -3                                                                |
| T*                                                                                                                                                                                                                            | GE                                                                                                                                            | T-type, 15A-1200A   | 2-36                      | Interpolated                                                                       |
| TKM3F                                                                                                                                                                                                                         | GE                                                                                                                                            | T-type, 1200A       | 36                        | UUT <sub>v</sub> -6                                                                |
| XT Molded Case Switches                                                                                                                                                                                                       |                                                                                                                                               |                     |                           |                                                                                    |
| XT1                                                                                                                                                                                                                           | ABB                                                                                                                                           | 160A                | 4                         | UUT <sub>s</sub> -7                                                                |
| XT4                                                                                                                                                                                                                           | ABB                                                                                                                                           | 250A                | 7                         | UUT <sub>s</sub> -7, UUT <sub>s</sub> -8                                           |
| XT5                                                                                                                                                                                                                           | ABB                                                                                                                                           | 360A                | 15                        | UUT <sub>s</sub> -8, UUT <sub>s</sub> -9                                           |
| XT7                                                                                                                                                                                                                           | ABB                                                                                                                                           | 1200A               | 43                        | UUT <sub>s</sub> -8, UUT <sub>s</sub> -9                                           |
| EntelliGuard G                                                                                                                                                                                                                |                                                                                                                                               |                     |                           |                                                                                    |
| G*                                                                                                                                                                                                                            | GE                                                                                                                                            | 800A-2000A          | 136.7-176.4               | Extrapolated                                                                       |
| GA20M2X                                                                                                                                                                                                                       | GE                                                                                                                                            | 2000A               | 176.4                     | UUT <sub>v</sub> -2                                                                |
| G*                                                                                                                                                                                                                            | GE                                                                                                                                            | 2500A-6000A         | 253.5-463.0               | Interpolated                                                                       |
| GA60M2X                                                                                                                                                                                                                       | GE                                                                                                                                            | 6000A               | 463                       | UUT <sub>u</sub> -1                                                                |
| PowerBreak II (800A-4000A)                                                                                                                                                                                                    |                                                                                                                                               |                     |                           |                                                                                    |
| SSD30D30H                                                                                                                                                                                                                     | GE                                                                                                                                            | 3000A               | 353                       | UUT <sub>y</sub> -1b                                                               |
| SSD                                                                                                                                                                                                                           | GE                                                                                                                                            | 800A-3000A          | 166-353                   | Interpolated                                                                       |
| SSD20D20H                                                                                                                                                                                                                     | GE                                                                                                                                            | 2000A               | 202                       | UUT <sub>y</sub> -1b                                                               |
| SSD08D08H                                                                                                                                                                                                                     | GE                                                                                                                                            | 800A                | 166                       | UUT <sub>y</sub> -1b                                                               |
| Dry Type Transformer                                                                                                                                                                                                          |                                                                                                                                               |                     |                           |                                                                                    |
| 9T84C9474G03                                                                                                                                                                                                                  | GE                                                                                                                                            | 75kVA               | 833                       | UUT <sub>z</sub> -1                                                                |
| 9T84C9474G03                                                                                                                                                                                                                  | GE                                                                                                                                            | 112.5kVA            | 833                       | UUT <sub>z</sub> -1                                                                |
| 9T45J0006                                                                                                                                                                                                                     | GE                                                                                                                                            | 150kVA              | 851                       | UUT <sub>z</sub> -2                                                                |
| 9T*                                                                                                                                                                                                                           | GE                                                                                                                                            | 75kVA-225kVA        | 833-851                   | Interpolated                                                                       |
| 9T45J0007                                                                                                                                                                                                                     | GE                                                                                                                                            | 225kVA              | 851                       | UUT <sub>z</sub> -2                                                                |
| Power Panels                                                                                                                                                                                                                  |                                                                                                                                               |                     |                           |                                                                                    |
| APNB3812                                                                                                                                                                                                                      | GE                                                                                                                                            | Spectra 1200A       | 150                       | UUT <sub>v</sub> -6                                                                |
| APN*                                                                                                                                                                                                                          | GE                                                                                                                                            | Spectra 1200A-2000A | 150-170                   | Interpolated                                                                       |
| APNB3820                                                                                                                                                                                                                      | GE                                                                                                                                            | Spectra 2000A       | 170                       | UUT <sub>v</sub> -3                                                                |
| ALM3424MTX                                                                                                                                                                                                                    | GE                                                                                                                                            | A Series 225A       | 33                        | UUT <sub>x</sub> -1                                                                |
| AL*, AD*                                                                                                                                                                                                                      | GE                                                                                                                                            | A Series 225-600A   | 33-75                     | Interpolated                                                                       |
| ADM3366MTX                                                                                                                                                                                                                    | GE                                                                                                                                            | A Series 600A       | 75                        | UUT <sub>x</sub> -5                                                                |
| General Notes:                                                                                                                                                                                                                |                                                                                                                                               |                     |                           |                                                                                    |
| <sup>1</sup> The units were tested at different times and the subscripts on the UUT's reference the following lab test reports:<br>s - 15605 / t - 2346A / u - 10164 / v - 10155 / w - 10154 / x - 8101 / y - 8055 / z - 8480 |                                                                                                                                               |                     |                           |                                                                                    |

| Table 6                                                                                                                                                                                                                       | ABB, INC. ISB SWITCHBOARD<br>CERTIFIED SUBCOMPONENT MATRICES |                           |                           | <br>W.E. GUNDY & ASSOCIATES, INC.<br>STRUCTURAL & EARTHQUAKE ENGINEERING |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|---------------------------|---------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Seismic Certification Limits: $S_{DS} = 1.10g$ at $z/h = 1 \rightarrow F_p = 0.83g$ and $S_{DS} = 1.76g$ at $z/h = 0 \rightarrow F_p = 0.79g$                                                                                 |                                                              |                           |                           |                                                                                                                                                            |
| Identification Number                                                                                                                                                                                                         | Manufacturer                                                 | Description               | Approximate Weights (lbs) | Representative UUT <sup>1</sup>                                                                                                                            |
| Reliagear Power Panels Bus Stack                                                                                                                                                                                              |                                                              |                           |                           |                                                                                                                                                            |
| IN1604TX3H1                                                                                                                                                                                                                   | ABB                                                          | 400A, Aluminum            | 53                        | UUT <sub>s</sub> -7                                                                                                                                        |
| IN1604CC3H2                                                                                                                                                                                                                   | ABB                                                          | 400A, Copper              | 62                        | UUT <sub>s</sub> -7                                                                                                                                        |
| Inxx(04-40)xx(1,3,4)(Hx,Bx)                                                                                                                                                                                                   | ABB                                                          | 400A-4000A, CU & AL       | 53-510                    | Interpolated                                                                                                                                               |
| IN4030CC3H1                                                                                                                                                                                                                   | ABB                                                          | 3000A, Aluminum           | 280                       | UUT <sub>s</sub> -8                                                                                                                                        |
| IN5640CC4B3                                                                                                                                                                                                                   | ABB                                                          | 4000A, Copper             | 510                       | UUT <sub>s</sub> -9                                                                                                                                        |
| Surge Protection Device (SPD)                                                                                                                                                                                                 |                                                              |                           |                           |                                                                                                                                                            |
| TPHE*, THE*, ATHE*, TPME*                                                                                                                                                                                                     | GE                                                           | 25-100kA/130-200kA        | 0-25                      | Extrapolated                                                                                                                                               |
| TPHE480D12PP                                                                                                                                                                                                                  | GE                                                           | 125kA/250kA               | 25                        | UUT <sub>v</sub> -3                                                                                                                                        |
| TPHE*, THE*, ATHE*, TPME*                                                                                                                                                                                                     | GE                                                           | 125-300kA/250-600kA       | 25                        | Interpolated                                                                                                                                               |
| TPHE480D30PP                                                                                                                                                                                                                  | GE                                                           | 300kA/600kA               | 25                        | UUT <sub>v</sub> -6                                                                                                                                        |
| SP120Y                                                                                                                                                                                                                        | ABB                                                          | 120Wye, SPD, Disconnect   | 50                        | UUT <sub>s</sub> -8                                                                                                                                        |
| SP277Y                                                                                                                                                                                                                        | ABB                                                          | 480/277Y, SPD, Disconnect | 50                        | Interpolated                                                                                                                                               |
| SP347Y                                                                                                                                                                                                                        | ABB                                                          | 600/347Y, SPD, Disconnect | 50                        | Interpolated                                                                                                                                               |
| SP480D                                                                                                                                                                                                                        | ABB                                                          | 480D, SPD, Disconnect     | 50                        | UUT <sub>s</sub> -8                                                                                                                                        |
| Strip Heaters                                                                                                                                                                                                                 |                                                              |                           |                           |                                                                                                                                                            |
| CRX# OT-1225                                                                                                                                                                                                                  | Chromalox                                                    | Heater                    | 3                         | UUT <sub>v</sub> -2                                                                                                                                        |
| Transfer Switches                                                                                                                                                                                                             |                                                              |                           |                           |                                                                                                                                                            |
| ZTG000A00020E                                                                                                                                                                                                                 | GE                                                           | Zenith Transfer Switch    | 60                        | UUT <sub>x</sub> -3                                                                                                                                        |
| ZTG*                                                                                                                                                                                                                          | GE                                                           | Zenith Transfer Switch    | 60-69                     | Interpolated                                                                                                                                               |
| ZTGD00A0U020E                                                                                                                                                                                                                 | GE                                                           | Zenith Transfer Switch    | 69                        | UUT <sub>x</sub> -3                                                                                                                                        |
| OXA30U2X2QB                                                                                                                                                                                                                   | ABB                                                          | 30A 2 Pole ATS            | 25                        | UUT <sub>s</sub> -8                                                                                                                                        |
| OX*                                                                                                                                                                                                                           | ABB                                                          | TruONE ATS                | 25-125                    | Interpolated                                                                                                                                               |
| OXB1200U3S2QT                                                                                                                                                                                                                 | ABB                                                          | 1200A 4 pole ATS          | 125                       | UUT <sub>s</sub> -8                                                                                                                                        |
| Meter Socket                                                                                                                                                                                                                  |                                                              |                           |                           |                                                                                                                                                            |
| CM100A35K480V                                                                                                                                                                                                                 | GE                                                           | 480V                      | 8.4                       | UUT <sub>t</sub> -2                                                                                                                                        |
| CM200A65K480V                                                                                                                                                                                                                 | GE                                                           | 480V                      | 8.4                       | UUT <sub>t</sub> -2                                                                                                                                        |
| CM100, CM200                                                                                                                                                                                                                  | GE                                                           | 240V-600V                 | 6.7 - 10.2                | Interpolated                                                                                                                                               |
| CM200MSJF240V                                                                                                                                                                                                                 | GE                                                           | 240V                      | 6.7                       | UUT <sub>t</sub> -2                                                                                                                                        |
| CM200MSJF600V                                                                                                                                                                                                                 | GE                                                           | 600V                      | 10.2                      | UUT <sub>t</sub> -2                                                                                                                                        |
| MT04AP                                                                                                                                                                                                                        | ABB                                                          | Pulse, Carbon Steel       | 16                        | UUT <sub>s</sub> -7                                                                                                                                        |
| MT04AM(AD)                                                                                                                                                                                                                    | ABB                                                          | ModBus, Carbon Steel      | 16                        | Interpolated                                                                                                                                               |
| MT04AB                                                                                                                                                                                                                        | ABB                                                          | BacNe, Carbon Steel       | 16                        | UUT <sub>s</sub> -8                                                                                                                                        |
| General Notes:                                                                                                                                                                                                                |                                                              |                           |                           |                                                                                                                                                            |
| <sup>1</sup> The units were tested at different times and the subscripts on the UUT's reference the following lab test reports:<br>s - 15605 / t - 2346A / u - 10164 / v - 10155 / w - 10154 / x - 8101 / y - 8055 / z - 8480 |                                                              |                           |                           |                                                                                                                                                            |

|                                                                                                                                                                                                                                                        |                                                                                                                                               |              |                      |                                                                                    |                                 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------------|------------------------------------------------------------------------------------|---------------------------------|
| Table 6                                                                                                                                                                                                                                                | ABB, INC. ISB SWITCHBOARD<br>CERTIFIED SUBCOMPONENT MATRICES                                                                                  |              |                      |  |                                 |
|                                                                                                                                                                                                                                                        | Seismic Certification Limits: $S_{DS} = 1.10g$ at $z/h = 1 \rightarrow F_p = 0.83g$ and $S_{DS} = 1.76g$ at $z/h = 0 \rightarrow F_p = 0.79g$ |              |                      |                                                                                    |                                 |
| Identification Number                                                                                                                                                                                                                                  |                                                                                                                                               | Manufacturer | Description          | Approximate Weights (lbs)                                                          | Representative UUT <sup>1</sup> |
| Generator Connectors                                                                                                                                                                                                                                   |                                                                                                                                               |              |                      |                                                                                    |                                 |
| HBLFRSBN                                                                                                                                                                                                                                               |                                                                                                                                               | Hubbell      |                      | 0.1                                                                                | UUT <sub>t</sub> -1             |
| HBL                                                                                                                                                                                                                                                    |                                                                                                                                               | Hubbell      |                      | 0.1-1.54                                                                           | Interpolated                    |
| HBLFRGN                                                                                                                                                                                                                                                |                                                                                                                                               | Hubbell      |                      | 1.54                                                                               | UUT <sub>t</sub> -1             |
| Control Power Transformer                                                                                                                                                                                                                              |                                                                                                                                               |              |                      |                                                                                    |                                 |
| 9T58K2808                                                                                                                                                                                                                                              |                                                                                                                                               | GE           | 0.3 kVA 240/480      | 7                                                                                  | UUT <sub>v</sub> -2             |
| 9T58K28(08-15)                                                                                                                                                                                                                                         |                                                                                                                                               | GE           | 0.05kVA-3kVA 240/480 | 7-54                                                                               | Interpolated                    |
| 9T58K2815                                                                                                                                                                                                                                              |                                                                                                                                               | GE           | 3.0kVA 240/480       | 54                                                                                 | UUT <sub>s</sub> -7             |
| <b>General Notes:</b><br><sup>1</sup> The units were tested at different times and the subscripts on the UUT's reference the following lab test reports:<br>s - 15605 / t - 2346A / u - 10164 / v - 10155 / w - 10154 / x - 8101 / y - 8055 / z - 8480 |                                                                                                                                               |              |                      |                                                                                    |                                 |



UUT<sub>s</sub>-7

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 8 bolts.



|                                                                                                                                                                                                                                                                                                                                |                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                                                                                                                                                                                                                 | <b>Test Location:</b> ETL            |
| <b>Product Line:</b> Class1, Class 2, ISB Switchboard                                                                                                                                                                                                                                                                          | <b>Report Number:</b> 15605, Rev 1   |
| <b>Model Number:</b> Reliagear, 800A                                                                                                                                                                                                                                                                                           | <b>UUT No. in Test Report:</b> UUT-7 |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                                                                                                                                                                                                                    |                                      |
| <b>UUT Description:</b> The unit is comprised of a standalone floor mounted NEMA type 1 enclosure with (2) Reliagear panelboards.                                                                                                                                                                                              |                                      |
| <b>UUT Components:</b> NEMA 1 12ga Carbon Steel Enclosure with a 400A aluminum Reliagear power panel bus stack (IN1604TX3H1), 400A copper Reliagear power panel bus stack (IN1604CC3H2), Record plus breakers (NEFBV-15A, NEFBV-100A), XT molded case switches (2x XT1, 2x XT4), CPT (9T58K2815) and metering socket (MT04AP). |                                      |

## UUT PROPERTIES

| Weight<br>(lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |     |      |
|----------------|---------------------|-----------------|------------------|------------------------|-----|------|
|                | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS  | V    |
| 809            | 30.0"               | 25.0"           | 90.0"            | 6.9                    | 9.7 | 24.0 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 2.00                | 1.00  | 1.50           | 3.20g              | 2.40g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.



**UUT<sub>s</sub>-8**

# **UNIT UNDER TEST (UUT) SUMMARY SHEET**



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 8 bolts.



|                                                                                                                                                                                                                                                                                              |                                       |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                                                                                                                                                                               | <b>Test Location:</b> ETL             |
| <b>Product Line:</b> Class1, Class 2, ISB Switchboard                                                                                                                                                                                                                                        | <b>Report Number:</b> 15605, Rev 1    |
| <b>Model Number:</b> Reliaguard, 4000A                                                                                                                                                                                                                                                       | <b>UUT No. in Test Report:</b> UUT-8C |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                                                                                                                                                                                  |                                       |
| <b>UUT Description:</b> The unit is comprised of a standalone floor mounted NEMA type 1 enclosure with (1) Reliaguard panelboard.                                                                                                                                                            |                                       |
| <b>UUT Components:</b> NEMA 1 12ga Carbon Steel Enclosure with a 3000A aluminum Reliaguard power panel bus stack (IN4030CC3H1), XT molded case switches (2x XT4, 3x XT5, 2x XT7), surge protection devices (SP120Y, SP480D), ATS (OXA30U2X2QB, OXB1200U3S2QT), and metering socket (MT04AB). |                                       |

## **UUT PROPERTIES**

| Weight<br>(lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |     |      |
|----------------|---------------------|-----------------|------------------|------------------------|-----|------|
|                | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS  | V    |
| 1,625          | 50.0"               | 50.0"           | 90.0"            | 4.8                    | 6.9 | 12.5 |

## **SEISMIC TEST PARAMETERS**

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 2.00                | 1.00  | 1.50           | 3.20g              | 2.40g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT<sub>s</sub>-9

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 8 bolts.



|                                                                                                                                                                             |                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                                                              | <b>Test Location:</b> ETL             |
| <b>Product Line:</b> Class1, Class 2, ISB Switchboard                                                                                                                       | <b>Report Number:</b> 15605, Rev 1    |
| <b>Model Number:</b> Reliagear, 4000A                                                                                                                                       | <b>UUT No. in Test Report:</b> UUT-9B |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                                                                 |                                       |
| <b>UUT Description:</b> The unit is comprised of a standalone floor mounted NEMA type 1 enclosure with (1) Reliagear panelboard.                                            |                                       |
| <b>UUT Components:</b> NEMA 1 12ga Carbon Steel Enclosure with a 4000A copper Reliagear power panel bus stack (IN5640CC4B3), and XT molded case switches (11x XT5, 7x XT7). |                                       |

## UUT PROPERTIES

| Weight (lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |     |     |
|-------------|---------------------|-----------------|------------------|------------------------|-----|-----|
|             | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS  | V   |
| 2,711       | 60.0"               | 60.0"           | 90.0"            | 4.8                    | 3.5 | 9.9 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 2.00                | 1.00  | 1.50           | 3.20g              | 2.40g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT<sub>t</sub>-1

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.

**Required Modification:** Door hinge bolts replaced with 1/4-20 bolts.



UUT-1 on the right

|                                                                                                                                                    |                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                                     | <b>Test Location:</b> Clark Test Laboratory |
| <b>Product Line:</b> Class 1, Class 2, ISB Switchboard                                                                                             | <b>Report Number:</b> 2346A-R Rev.1         |
| <b>Model Number:</b> GenTower Switchboard, 4000A                                                                                                   | <b>UUT No. in Test Report:</b> UUT1         |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                                        |                                             |
| <b>UUT Description:</b> The unit is comprised of a standalone floor mounted NEMA type 3R enclosure with (2) Generator Connection Receptacle Studs. |                                             |
| <b>UUT Components:</b> NEMA 3R 12ga Carbon Steel Enclosure with (2) Generator Connection Receptacles Studs (HBLFRSBN, HBLFRGN)                     |                                             |

## UUT PROPERTIES

| Weight (lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |      |      |
|-------------|---------------------|-----------------|------------------|------------------------|------|------|
|             | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS   | V    |
| 1,852       | 40.0"               | 50.0"           | 93.0"            | 11.5                   | 7.57 | 32.8 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 2.00                | 1.00  | 1.50           | 3.20g              | 2.40g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT<sub>t</sub>-2

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.



UUT-2 on the left

|                                                                                                                                                                                   |                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                                                                    | <b>Test Location:</b> Clark Test Laboratory |
| <b>Product Line:</b> Class1, Class 2, ISB Switchboard                                                                                                                             | <b>Report Number:</b> 2346A-R Rev.1         |
| <b>Model Number:</b> Commercial Metering Switchboard                                                                                                                              | <b>UUT No. in Test Report:</b> UUT2         |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                                                                       |                                             |
| <b>UUT Description:</b> The unit is comprised of a standalone floor mounted NEMA type 3R enclosure with (4) meter sockets.                                                        |                                             |
| <b>UUT Components:</b> NEMA 3R 12ga Carbon Steel Enclosure with (4) meter sockets ( (2) CM100A35K480V, (2) CM200A65K600V) and (2) FD1 meter sockets(CM200MSJF600V, CM200MSJF240V) |                                             |

## UUT PROPERTIES

| Weight<br>(lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |      |      |
|----------------|---------------------|-----------------|------------------|------------------------|------|------|
|                | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS   | V    |
| 1,020          | 35.0"               | 40.0"           | 93.0"            | 17.2                   | 11.5 | 32.0 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 2.00                | 1.00  | 1.50           | 3.20g              | 2.40g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.



**UUT<sub>v</sub>-2a**

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts in both sections.



|                                                                                                                                                                                                                                                                           |                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                                                                                                                                                            | <b>Test Location:</b> Clark Test Laboratory |
| <b>Product Line:</b> Class 2, ISB Switchboard                                                                                                                                                                                                                             | <b>Report Number:</b> 10155                 |
| <b>Model Number:</b> Switchboard NPI 2, 2000A                                                                                                                                                                                                                             | <b>UUT No. in Test Report:</b> UUT2         |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                                                                                                                                                               |                                             |
| <b>UUT Description:</b> The unit is comprised of a two mated, floor mounted NEMA type 1 enclosure with 2000A busway with Entelliguard circuit breaker.                                                                                                                    |                                             |
| <b>UUT Components:</b> NEMA 1 12ga carbon steel enclosure with 2000 copper bus, 1 Entelliguard circuit breaker (GA20M2X), heater (CRX# OT-1225), fuse (A4J6, AJT1-1/2, TR3R), relay (SPVRB 480), 0.3kVA Control Power Transformer (9T58K2808), and 123" top feeder stack. |                                             |

## UUT PROPERTIES

| Weight (lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |      |      |
|-------------|---------------------|-----------------|------------------|------------------------|------|------|
|             | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS   | V    |
| 1,435       | 35.0"               | 35.0"           | 90.0"            | 8.2                    | 16.8 | 31.0 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 2.00                | 1.00  | 1.50           | 3.20g              | 2.40g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

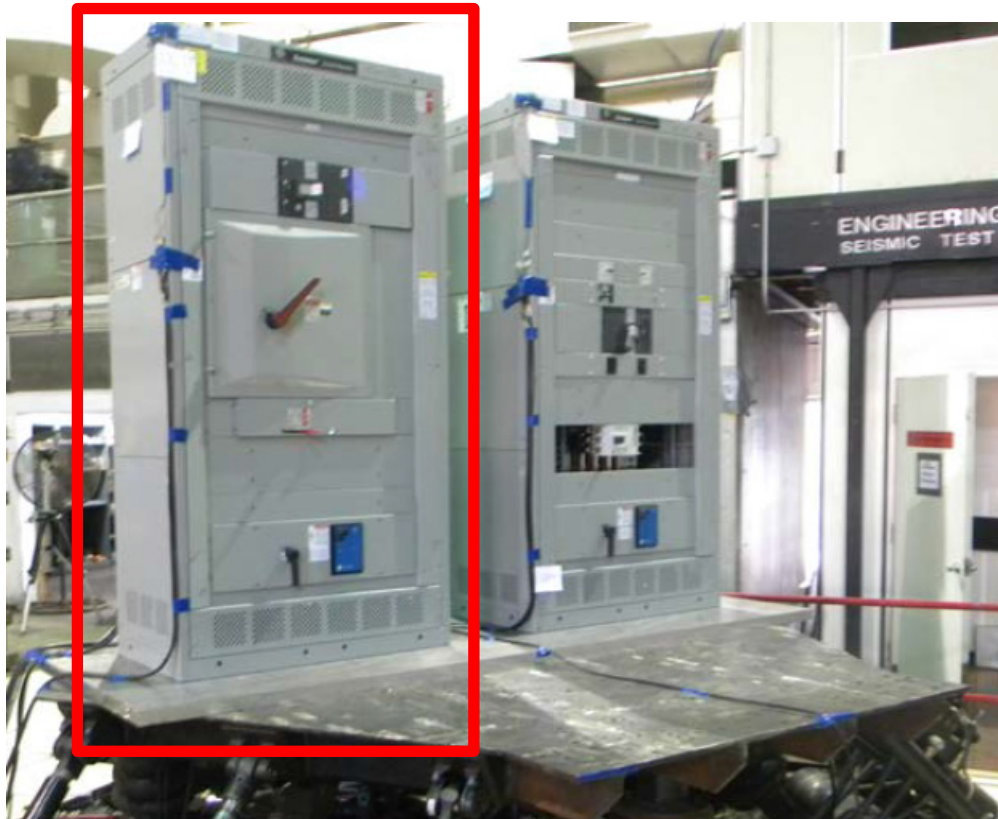
UUT<sub>v</sub>-3

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.

**Required Modifications:** (6) 1/4"-20 bolts added to front frame.



**Manufacturer:** ABB, Inc.

**Test Location:** Clark Test Laboratory

**Product Line:** Class1, Class 2, ISB Switchboard

**Report Number:** 10155

**Model Number:** Switchboard NPI-2, 4000A

**UUT No. in Test Report:** UUT3

**UUT Function:** Synchronization of multiple power sources to main bus for distribution of electricity.

**UUT Description:** The unit comprised of a standalon floor mounted NEMA 1 enclosure with 4000A busway and multiple circuit breakers.

**UUT Components:** NEMA 1 12ga carbon steel enclosure with 4000A copper bus, 2000 spectra series panelboard (APNB3820), TVSS Surge Protection device (TPHE480D12PP), record plus circuit breakers (FBL36TE030R, FBH36TE035R2, FGP36AA066R1), spectra circuit breakers (SEHA36AT0030, SKHA36AT1200), thermal mag molded case breakers (TEYF1015, TEYF2015, TEYF3015).

## UUT PROPERTIES

| Weight<br>(lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |    |     |
|----------------|---------------------|-----------------|------------------|------------------------|----|-----|
|                | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS | V   |
| 1,026          | 45.0"               | 25.0"           | 90.0"            | 8.95                   | 10 | >33 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 2.00                | 1.00  | 1.50           | 3.20g              | 2.40g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT<sub>v</sub>-6

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.

**Required Modifications:** (6) 1/4"-20 bolts added to front frame



|                                                                                                                                                                                                                |                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                                                                                                 | <b>Test Location:</b> Clark Test Laboratory |
| <b>Product Line:</b> Class1, Class 2, ISB Switchboard                                                                                                                                                          | <b>Report Number:</b> 10155                 |
| <b>Model Number:</b> Switchboard NPI-2, 4000A                                                                                                                                                                  | <b>UUT No. in Test Report:</b> UUT6         |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                                                                                                    |                                             |
| <b>UUT Description:</b> The unit is comprised of a standalone floor mounted NEMA type 1 enclosure with 4000A busway and multiple circuit breakers.                                                             |                                             |
| <b>UUT Components:</b> NEMA 1 12ga carbon steel enclosure with 4000A aluminum bus, 1200A (TKM3F), fusible switches (ADS36030HS, ADS36120LB), surge protection device (TPHE480D30PP), and 1200A fuse (AFBY1200) |                                             |

## UUT PROPERTIES

| Weight (lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |      |      |
|-------------|---------------------|-----------------|------------------|------------------------|------|------|
|             | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS   | V    |
| 870         | 45.0                | 25.0            | 91.0             | 9.48                   | 11.4 | 13.0 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 2.00                | 1.00  | 1.50           | 3.20g              | 2.40g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT<sub>w</sub>-4

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.

**Required Modifications:** (6) 1/4-20 screws to the front door.



|                                                                                                                                                                                                               |                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                                                                                                | <b>Test Location:</b> Clark Test Laboratory |
| <b>Product Line:</b> Class1, Class 2, ISB Switchboard                                                                                                                                                         | <b>Report Number:</b> 10154                 |
| <b>Model Number:</b> Switchboard NPI-2, 4000A                                                                                                                                                                 | <b>UUT No. in Test Report:</b> UUT4         |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                                                                                                   |                                             |
| <b>UUT Description:</b> The unit is comprised of a standalone floor mounted NEMA type 1 enclosure with a 4000A busway and high pressure contact switch (HPC).                                                 |                                             |
| <b>UUT Components:</b> NEMA 1 12ga carbon steel enclosure with 4000A aluminum bus, 4000A HPC (THPC3640G3T), 4000A fuse (A4BY4000), ground fault transformer (BGFL254-1200), EPM power meter (PL74501AB0A000). |                                             |

## UUT PROPERTIES

| Weight (lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |      |     |
|-------------|---------------------|-----------------|------------------|------------------------|------|-----|
|             | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS   | V   |
| 1,176       | 40.0"               | 35.0"           | 90.0"            | 8.77                   | 7.43 | >33 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 2.00                | 1.00  | 1.50           | 3.20g              | 2.40g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.



UUT<sub>w</sub>-5

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.

**Required Modifications:** (4) 1/4-20 screws to the front door.



|                                                                                                                                                                                                                                                  |                                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                                                                                                                                   | <b>Test Location:</b> Clark Test Laboratory |
| <b>Product Line:</b> Class1, Class 2, ISB Switchboard                                                                                                                                                                                            | <b>Report Number:</b> 10154                 |
| <b>Model Number:</b> Switchboard NPI-2, 800A                                                                                                                                                                                                     | <b>UUT No. in Test Report:</b> UUT5         |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                                                                                                                                      |                                             |
| <b>UUT Description:</b> The unit is comprised of a standalone floor mounted NEMA type 1 enclosure with 800A busway and 800A high pressure contract (HPC) switch.                                                                                 |                                             |
| <b>UUT Components:</b> NEMA 1 12ga carbon steel enclosure with 800A aluminum bus, 800A HPC switch (THPR3608GA3), 800A fuses (A4BY800), ampmeter (250440LSVE7JBNU), voltmeter (250444SJS7JGSU) and 2 selector switches (A11A00721E, A11A048-723E) |                                             |

## UUT PROPERTIES

| Weight (lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |      |      |
|-------------|---------------------|-----------------|------------------|------------------------|------|------|
|             | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS   | V    |
| 510         | 30.0"               | 25.0"           | 90.0"            | 12.3                   | 10.9 | 12.7 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 2.00                | 1.00  | 1.50           | 3.20g              | 2.40g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT<sub>u</sub>-1

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.

**Required Modification:** (24) 1/4-20 screws added to front panels.



**Manufacturer:** ABB, Inc.

**Test Location:** Clark Test Laboratory

**Product Line:** Class 2, ISB Switchboard

**Report Number:** 10164

**Model Number:** Switchboard NPI-2

**UUT No. in Test Report:** UUT1

**UUT Function:** Synchronization of multiple power sources to main bus for distribution of electricity.

**UUT Description:** The unit is comprised of a floor mounted NEMA type 1 enclosures consisting of a 6000A copper busway and a 6000A Enteliguard Breaker.

**UUT Components:** NEMA1 12ga Carbon Steel Enclosure; 6000A Enteliguard G Circuit Breaker (GA60M2X), 6000A Copper silver-plated bus, PQM Meter (PQM II), Fuse (AJT2), Fuse Block (15149-3), Voltage Conditioner Plate (SVCA480Y), Power Supply Plate (SPSA480).

## UUT PROPERTIES

| Weight<br>(lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |     |      |
|----------------|---------------------|-----------------|------------------|------------------------|-----|------|
|                | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS  | V    |
| 4,463          | 60.0"               | 60.0"           | 90.0"            | 3.5                    | 2.4 | 10.6 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 1.56                | 1.00  | 1.50           | 2.50g              | 1.87g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

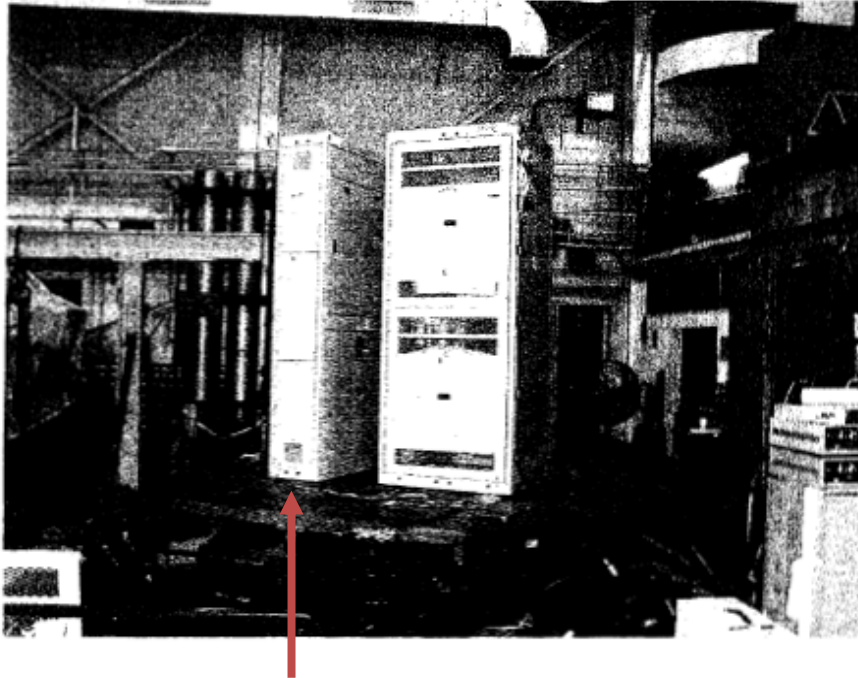
Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT<sub>x</sub>-1

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.



UUT-1

|                                                                                                                                                                 |                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                                                  | <b>Test Location:</b> Clark Test Laboratory  |
| <b>Product Line:</b> Class 2, ISB Switchboard                                                                                                                   | <b>Report Number:</b> 8101                   |
| <b>Model Number:</b> Integrated Switchboard Distribution                                                                                                        | <b>UUT No. in Test Report:</b> Switchboard#1 |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                                                     |                                              |
| <b>UUT Description:</b> The unit is comprised of a standalone floor mounted NEMA type 1 enclosure with a 250A Circuit Breaker and (2) A Series Panelboards.     |                                              |
| <b>UUT Components:</b> NEMA1 12ga Carbon Steel Enclosure with a 250A Spectra F Circuit Breaker (SFLA36AT0250), (2) A Series Panel Board (AQM3424MTX, ALM342MTX) |                                              |

## UUT PROPERTIES

| Weight<br>(lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |      |     |
|----------------|---------------------|-----------------|------------------|------------------------|------|-----|
|                | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS   | V   |
| 435            | 40.0"               | 15.0"           | 90.0"            | 19.50                  | 12.5 | >33 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 1.56                | 1.00  | 1.50           | 2.50g              | 1.87g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

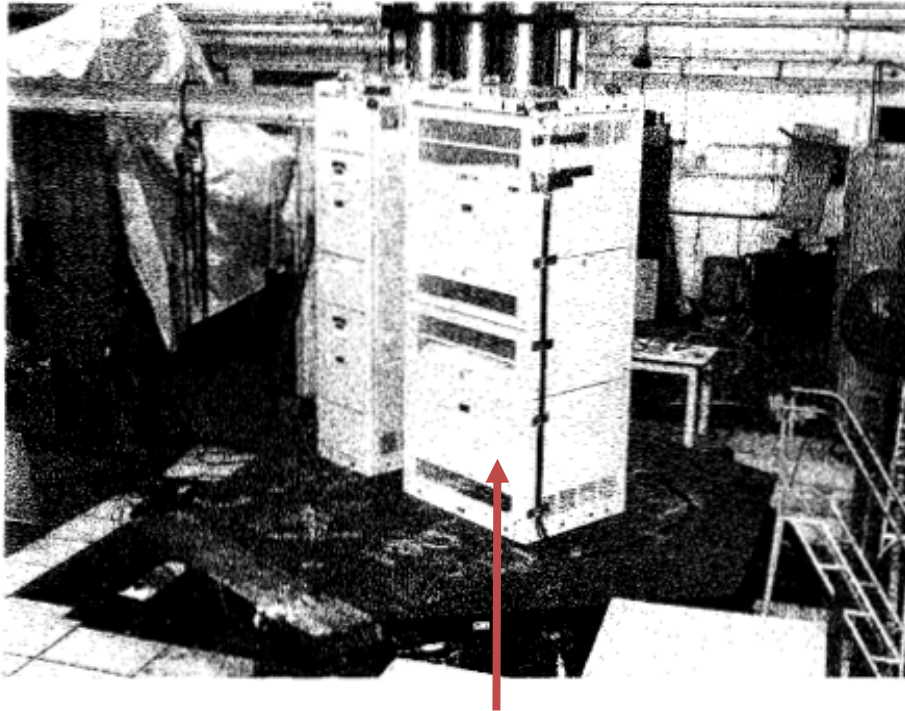
Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT<sub>x</sub>-3

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.



UUT-3

|                                                                                                                              |                                               |
|------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                               | <b>Test Location:</b> Clark Test Laboratory   |
| <b>Product Line:</b> Class 2, ISB Switchboard                                                                                | <b>Report Number:</b> 8101                    |
| <b>Model Number:</b> Integrated Switchboard w/ ATS                                                                           | <b>UUT No. in Test Report:</b> Switchboard #3 |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                  |                                               |
| <b>UUT Description:</b> The unit is comprised of a standalone floor mounted NEMA type 1 enclosure with ATS Switches.         |                                               |
| <b>UUT Components:</b> NEMA1 12ga Carbon Steel Enclosure; (2) 200A Automatic Transfer Switches (ZTG000A00020E, ZTG00A0U020E) |                                               |

## UUT PROPERTIES

| Weight (lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |      |     |
|-------------|---------------------|-----------------|------------------|------------------------|------|-----|
|             | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS   | V   |
| 405         | 20.0"               | 30.0"           | 90.0"            | 18.70                  | 14.8 | >33 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 1.67                | 1.00  | 1.50           | 2.67g              | 2.0g               | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

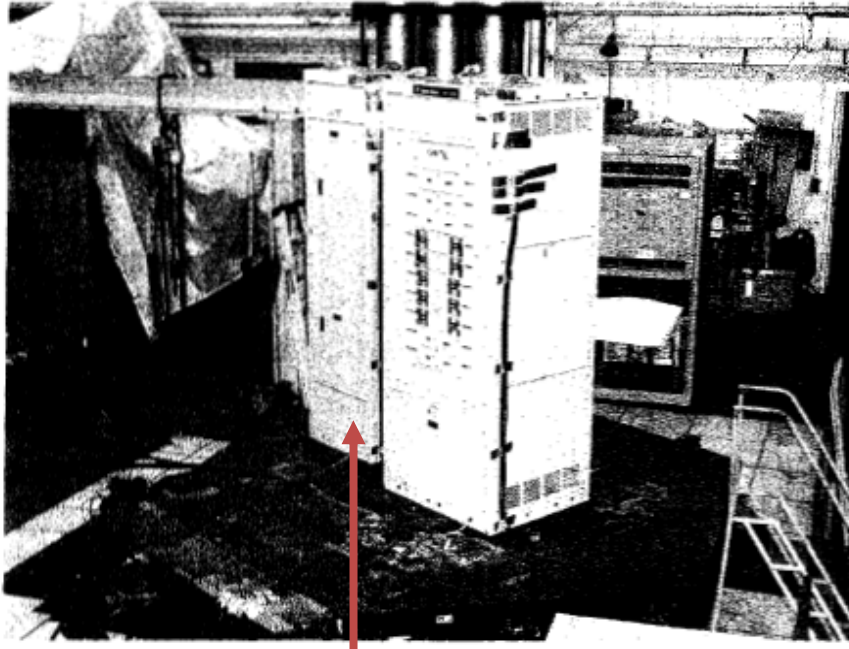


UUT<sub>x</sub>-5

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.



UUT-5

|                                                                                                                                  |                                               |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                   | <b>Test Location:</b> Clark Test Laboratory   |
| <b>Product Line:</b> Class 2, ISB Switchboard                                                                                    | <b>Report Number:</b> 8101                    |
| <b>Model Number:</b> Integrated Switchboard                                                                                      | <b>UUT No. in Test Report:</b> Switchboard #5 |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                      |                                               |
| <b>UUT Description:</b> The unit is comprised of a standalone floor mounted NEMA type 1 enclosure with A Series Panel Board 600A |                                               |
| <b>UUT Components:</b> NEMA1 12ga Carbon Steel Enclosure; A Series Panel Board 600A (ADM3366MTX), and TVSS (TPHE480D30PP).       |                                               |

## UUT PROPERTIES

| Weight<br>(lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |      |     |
|----------------|---------------------|-----------------|------------------|------------------------|------|-----|
|                | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS   | V   |
| 380            | 25.0"               | 15.0"           | 90.0"            | 5.5                    | 12.5 | >33 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 1.67                | 1.00  | 1.50           | 2.67g              | 2.00g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT<sub>y</sub>-1a

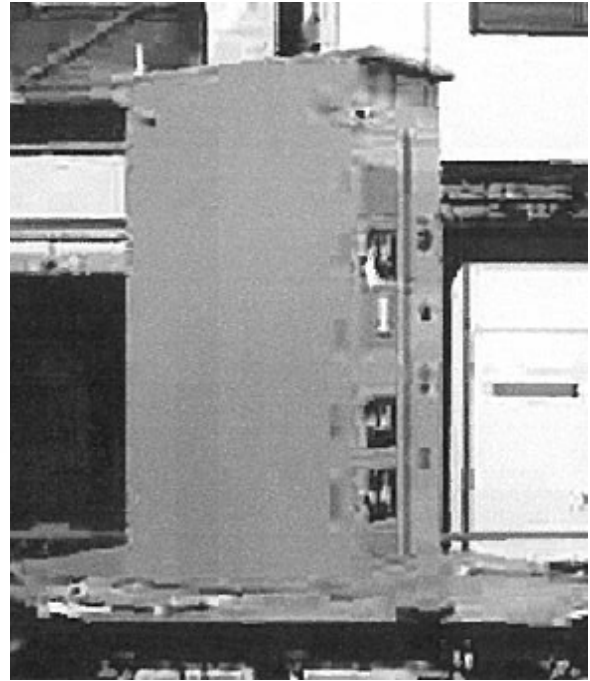
# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.



UUT-1A



|                                                                                                                                                                        |                                             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                                                         | <b>Test Location:</b> Clark Test Laboratory |
| <b>Product Line:</b> Class 2, ISB Switchboard                                                                                                                          | <b>Report Number:</b> 8055                  |
| <b>Model Number:</b> AV3 Stack                                                                                                                                         | <b>UUT No. in Test Report:</b> UUT1A        |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                                                            |                                             |
| <b>UUT Description:</b> The unit is comprised of a floor mounted NEMA type 3R enclosure consisting of a drip roof, circuit breakers and a relay.                       |                                             |
| <b>UUT Components:</b> NEMA3R 12ga Carbon Steel Enclosure with Relay (BE3-27-1A1N2), Spectra Circuit Breaker (SKPA36AT1200, SGLA36AT0600, SFLA36AT0250, SELA36AT0150). |                                             |

## UUT PROPERTIES

| Weight<br>(lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |     |     |
|----------------|---------------------|-----------------|------------------|------------------------|-----|-----|
|                | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS  | V   |
| 1,050          | 15.0"               | 50.0"           | 104.0"           | 12.4                   | 7.8 | >33 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 1.67                | 1.00  | 1.50           | 2.67g              | 2.00g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.



**UUT<sub>y</sub>-1b**

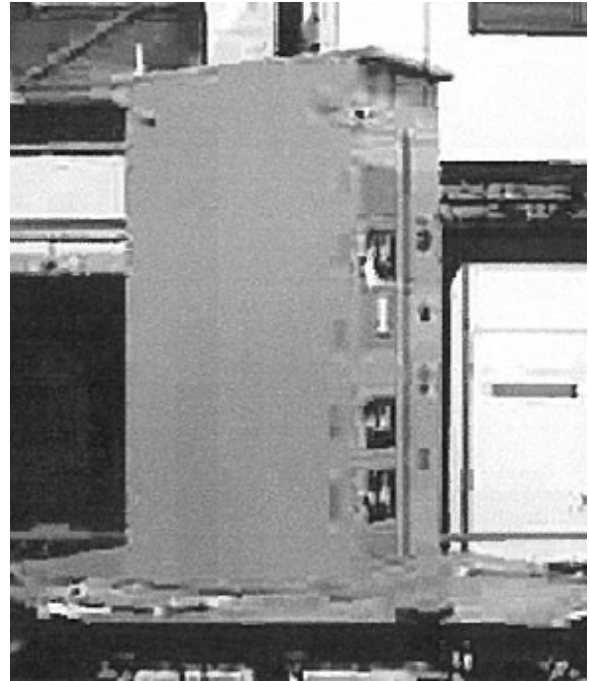
# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.



UUT-1B



|                                                                                                                                      |                                             |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                       | <b>Test Location:</b> Clark Test Laboratory |
| <b>Product Line:</b> Class 2, ISB Switchboard                                                                                        | <b>Report Number:</b> 8055                  |
| <b>Model Number:</b> Power Break II                                                                                                  | <b>UUT No. in Test Report:</b> UUT1B        |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                          |                                             |
| <b>UUT Description:</b> The unit is comprised of a floor mounted NEMA type 3R enclosure consisting of a drip roof, circuit breakers. |                                             |
| <b>UUT Components:</b> NEMA3R 12ga Carbon Steel Enclosure with Powerbreak II Circuit Breaker (SSD30D30H, SSD20B20H, SSD08B08H).      |                                             |

## UUT PROPERTIES

| Weight<br>(lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |     |     |
|----------------|---------------------|-----------------|------------------|------------------------|-----|-----|
|                | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS  | V   |
| 2,129          | 22.0"               | 50.0"           | 104.0"           | 12.4                   | 7.8 | >33 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 1.67                | 1.00  | 1.50           | 2.67g              | 2.00g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 2.50                | 0.00  | 1.50           | -                  | -                  | 1.68g              | 0.68g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT<sub>z</sub>-1

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.



|                                                                                                                                      |                                             |
|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                       | <b>Test Location:</b> Clark Test Laboratory |
| <b>Product Line:</b> ISB Switchboard                                                                                                 | <b>Report Number:</b> 8480                  |
| <b>Model Number:</b> Integrated                                                                                                      | <b>UUT No. in Test Report:</b> UUT1         |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                          |                                             |
| <b>UUT Description:</b> The unit is comprised of a standalone floor mounted NEMA type 1 enclosure with (2) dry type transformers.    |                                             |
| <b>UUT Components:</b> NEMA1 12ga Carbon Steel Enclosure with 75kVA Transformer (9T84C9474G03), 112.5kVA Transformer (9T84C9475G03). |                                             |

## UUT PROPERTIES

| Weight (lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |      |     |
|-------------|---------------------|-----------------|------------------|------------------------|------|-----|
|             | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS   | V   |
| 2,125       | 40.0"               | 35.0"           | 90.0"            | 7.8                    | 32.0 | >33 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 1.10                | 1.00  | 1.50           | 1.52g              | 1.14g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 1.76                | 0.00  | 1.50           | -                  | -                  | 1.02g              | 0.41g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT<sub>z-2</sub>

# UNIT UNDER TEST (UUT) SUMMARY SHEET



**Mounting Details:** Floor mounted with (4) 1/2" diameter grade 5 bolts.



|                                                                                                                                                    |                                             |
|----------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|
| <b>Manufacturer:</b> ABB, Inc.                                                                                                                     | <b>Test Location:</b> Clark Test Laboratory |
| <b>Product Line:</b> ISB Switchboard                                                                                                               | <b>Report Number:</b> 8480                  |
| <b>Model Number:</b> Integrated                                                                                                                    | <b>UUT No. in Test Report:</b> UUT2         |
| <b>UUT Function:</b> Synchronization of multiple power sources to main bus for distribution of electricity.                                        |                                             |
| <b>UUT Description:</b> The unit is comprised of a standalone floor mounted NEMA type 1 enclosure with a 150kVA Transformer and 225kVA Transformer |                                             |
| <b>UUT Components:</b> NEMA1 12ga Carbon Steel Enclosure; 150kVA Transformer (copper windings), 225kVA Transformer (copper windings)               |                                             |

## UUT PROPERTIES

| Weight (lb) | Dimensions (inches) |                 |                  | Natural Frequency (Hz) |      |     |
|-------------|---------------------|-----------------|------------------|------------------------|------|-----|
|             | Enclosure Width     | Enclosure Depth | Enclosure Height | FB                     | SS   | V   |
| 2,410       | 40.0"               | 35.0"           | 90.0"            | 15.6                   | 15.5 | >33 |

## SEISMIC TEST PARAMETERS

| Test Criteria           | S <sub>DS</sub> (g) | z / h | I <sub>p</sub> | A <sub>FLX-H</sub> | A <sub>RIG-H</sub> | A <sub>FLX-V</sub> | A <sub>RIG-V</sub> |
|-------------------------|---------------------|-------|----------------|--------------------|--------------------|--------------------|--------------------|
| CBC 2019 / ICC-ES-AC156 | 1.10                | 1.00  | 1.50           | 1.52g              | 1.14g              | -                  | -                  |
| CBC 2019 / ICC-ES-AC156 | 1.76                | 0.00  | 1.50           | -                  | -                  | 1.02g              | 0.41g              |

Note: The unit was full of contents during testing and remained functional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.