OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0042-10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: General Electric

Manufacturer's Technical Representative: Senthil Kumar Natarajan

Mailing Address: 41 Woodford Avenue, Plainville, CT 06062-2372

Telephone: (860) 747-7349 Email: senthil.n@ge.com

Product Information

Product Name: Breakmaster Load Interrupter Switch

Product Type: Load Interrupter Switchgear

Product Model Number: See I. Certified Product Table attached
(List all unique product identification numbers and/or part numbers)

General Description: Load interrupter switchgear in light gauge sheet metal over metal framed enclosures. Seismic enhancements made to the UUTs & modifications required to address anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Rigid floor mounted.

Applicant Information

Applicant Company Name: General Electric

Contact Person: Senthil Kumar Natarajan

Mailing Address: 41 Woodford Avenue, Plainville, CT 06062-2372

Telephone: (860) 747-7349 Email: senthil.n@ge.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant: Senthil Kumar Date: May 10, 2016

Title: Senior Program Leader - NPI Company Name: General Electric

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: Forell/Elsesser Engineers, Inc.

Name: Marco Scanu, SE California License Number: S4454

Mailing Address: 160 Pine St., 6th Flr., San Francisco, CA 94111

Telephone: (415) 837-0700 Email: m.scanu@forell.com

Supports and Attachments Preapproval

☐ Supports and attachments are preapproved under OPM- _____
(Separate application for OSHPD Preapproval of Manufacturer's Certification (OPM) of Supports and attachments is required)

☒ Supports and attachments are not preapproved

Certification Method

☒ Testing in accordance with: ☒ ICC-ES AC156

☐ Other (Please Specify): _____

Testing Laboratory

Company Name: Clark Testing Laboratory (formerly Astro Nuclear/Dynamics, Inc.)

Contact Name: Russell Matich

Mailing Address: 1801 Route 51, Jefferson Hills, PA 15025

Telephone: (412) 387-1025 Email: rmatich@clarktesting.com

Seismic Parameters

Design in accordance with ASCE 7-10 Chapter 13: ☒ Yes ☐ No

Design Basis of Equipment or Components (F_p/W_p) = See attachment, I. Certified Products Table

S_{DS} (Design spectral response acceleration at short period, g) = See attachment, I. Certified Products Table

a_p (In-structure equipment or component amplification factor) = 2.5

R_p (Equipment or component response modification factor) = 6.0

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1

Equipment or Component Natural Frequencies (Hz) = See attachment, III.UUT Summary Sheets

Overall dimensions and weight (or range thereof) = See attachment, I. Certified Products Table

Equipment or Components @ grade designed in accordance with ASCE 7-10 Chapter 15: ☐ Yes ☒ No

Design Basis of Equipment or Components (V/W) = _____

S_{DS} (Design spectral response acceleration at short period, g) = _____

S_{D1} (Design spectral response acceleration at 1 second period, g) = _____

R (Response modification coefficient) = _____

Ω_0 (System overstrength factor) = _____

C_d (Deflection amplification factor) = _____

I_p (Importance factor) = 1.5

Height to Center of Gravity above base = _____

Equipment or Component Natural Frequencies (Hz) = _____

Overall dimensions and weight (or range thereof) = _____

Tank(s) designed in accordance with ASME BPVC, 2015: ☐ Yes ☒ No

List of Attachments Supporting Special Seismic Certification

☒ Test Report(s) ☐ Drawings ☒ Calculations ☒ Manufacturer's Catalog

☒ Other(s) (Please Specify): Certified Products Table, Certified Subcomponents Table, UUT Summary Sheets

OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2022

Signature: _____ Date: May 27, 2016

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to : S_{DS} (g) = See Above z/h = 1

Condition of Approval (if applicable): Power Con 1200 Amp Selector Switch (5989 – UUT-1; Part # 110C9870P1) is only certified up to an S_{DS} = 1.42g & z/h = 1 or their equivalent.

General Electric - Load Interrupter Switchgear
I. Certified Products Table

BreakMaster Load Interrupter Switchgear (BreakMaster V)

	Ampacity	Width	Depth	Height	Max. Weight	NEMA rating	Notes	Test Status	S_{DS}[3](g)	F_P/W_p
BreakMaster Load Interrupter Switchgear	1200A	20"	60''	127''	918 lbs	3R	4	3380-UUT6A	2.41	1.81
	600A	40"	60''	90''	1,400 lbs	1		3380-UUT6B	2.41	1.81
	1200A	35"	60''	127''	1,604 lbs	3R	4	3380-UUT5B	2.43	1.82
	600A-1200A	15"-40"	50"-60"	90"-127"	1,610 lbs	1, 3R	4	Interpolated	2.41	1.81
	600A	35"	60''	90''	1,608 lbs	1		3380-UUT5A	2.43	1.82
	600A	35"	50"	80''	1,740 lbs	1		15-01425 UUT1	2.09	1.57
	600A-1200A	15"-44"	50"-60"	80"-99"	2,800 lbs	1, 3R		Interpolated	2.06	1.55
	1200A	44''	60"	99''	2,796 lbs	3R		15-01425-UUT2	2.06	1.55

Notes

1. Enclosures are indoor (NEMA-1) or outdoor (NEMA-3R), using carbon steel.
2. Dimensions are for individual sections. Sections may be installed alone or bayed together. Typical sections also referred to as Simplex, Main, Feeder, Duplex, Selector, ATS, and Lineup based on electrical wiring diagrams.
3. S_{DS} rating is limited to the lower S_{DS} rating of the either the Section or the Interior Subcomponents - see Certified Subcomponents Table.
4. The height includes the top hat box 32" high, NEMA 3R units are 99", NEMA 1 Units are 90".

General Electric - Load Interrupter Switchgear
II. Certified Subcomponents Table

Subcomponent	Manufacturer	Part #	Testing Status	S_{DS}
Top Entry Pull Section				
Top Pull Box, 33" High	GE	N/A	3380 UUT 5	2.43 g
Top Pull Box, 33" High		N/A	3380 UUT 6	2.41 g
Pull Boxes 14-33"		N/A	Interpolated Extrapolated	2.41 g
Note: All Top Entry Pull Sections are constructed of cold formed carbon steel				
Bus				
Copper	GE	N/A	3380 UUT 5	2.43 g
Fuses RBA Expulsion (up to 15.5kV)				
RBA Fuse 20A	GE	15RBA2-20E	Extrapolated	2.43 g
RBA Fuse 400A		15RBA4-NH	3380 UUT 5	2.43 g
RBA Fuse 20A-720A		15RBA*, 8RBA*	Interpolated/Extrapolated	2.43 g
RBA Fuse 800A		15RBA8-INH	3380 UUT 5	2.43 g
Fuses EJO and CPT (up to 15.5kV)				
Fuse 0.25A	Mersen	9F60CED003	3380 UUT 6	2.41 g
Fuse 5A		9F60CED005	3380 UUT 6	2.41 g
Fuse 25A		9F60BHH002	3380 UUT 5	2.43 g
Fuse 0.25A-900A		9F6*	Interpolated	2.41 g
Fuse 900A		9F62KCB900	3380 UUT 6	2.41 g
Fuses Mersen A-Series (up to 15.5kV)				
A-Series 25E	Mersen	A155F1C0R0-25E	3380 UUT 6	2.41 g
A-Series 25E-300E		A155*, A055*	Interpolated	2.41 g
A-Series 300E		A155B3D0R0-300E	3380 UUT 6	2.41 g
Fuses S & C Expulsion				
3E	S&C Electric	SCE122005R4	3380 UUT5	2.43 g
3E - 400E		SCE*	Interpolated	2.43 g
400E		SCE132600R4	3380 UUT5	2.43 g
Bussman Fuses				
Fuse 5.5 kV	Bussman	15-5CAVHO-53	3380 UUT 6	2.41 g
Fuses 5.5kV - 15.5 kV Rated		15-5CAVHO*	Interpolated/Extrapolated	2.41 g
Fuse 15.5 kV		15-5CAVHO-53	3380 UUT 5	2.43 g

General Electric - Load Interrupter Switchgear
II. Certified Subcomponents Table

Subcomponent	Manufacturer	Part #	Testing Status	S_{DS}
Selector Break Switches				
600 Amp Switch	Power Con	110C9939P2	3380 UUT 5	2.43 g
600 - 1200A Switches		110C9939P*	Interpolated	2.43 g
1200 Amp Switch		110C9939P5	3380 UUT 5	2.43 g
Current Transformer				
Current Transformer - 100:5	ITI - GE	ITI#780101	3380 UUT 6	2.41 g
Current Transformer: [100:5 - 2000:5]		ITI#780*	Interpolate	2.41 g
Current Transformer - 2000:5		ITI#780202	3380 UUT 5	2.43 g
Voltage Transformer				
VT: 2400/120 VAC	ITI - GE	PTG3260242FF	3380 UUT 6	2.41 g
VT: (2400/120 VAC - 14400/120 VAC)		PTG*	Interpolated	2.41 g
VT: 14400/120 VAC		PTG521101442FF	3380 UUT 5	2.43 g
Control Power Transformers (CPTs)				
CPT: 2400/120 V	ITI- GE	CPTS3605242A	3380 UUT 6	2.41 g
CPT: (2400/120 V - 14400/120 V)		CPTS*	Interpolated	2.41 g
CPT: 14400/120 V		CPTS59551442	3380 UUT 5	2.43 g
Surge Arrestors				
Arrestor Distribution- 3kV	GE	9L20FXX003XHS	3380 UUT 5	2.43 g
Arrestor Intermediate - 10kV		9L12PPM010S	3380 UUT 5	2.43 g
Arrestor Station - 21kV		9L11XPM021S	3380 UUT 5	2.43 g
Distribution/Intermediate/Station Class 36kV Max		9L*	Interpolated/Extrapolated	2.43 g
Power Management & Metering				
Electronic Power Meter (EPM)	GE	PL74501A0B0A000	10154-UUT 4	2.5 g
		PL*	Interpolated	2.41 g
Power Quality Meter (PQM)		PQMT20CA	3380 UUT 6	2.41 g
		PQM*	Interpolated	2.41 g
Note: EPM and PQM are physically and functionally similar.				
Ammeter				
Ammeter: 0-1A	Crompton	077-05FA-LALA-C6	3380 UUT 6	2.41 g
Ammeter: 0-2 A to 0-1500A		077-05FA*	Interpolated	2.41 g
Ammeter: 0-2000A		077-05FA-LSTM-C7	3380 UUT 6	2.41 g

General Electric - Load Interrupter Switchgear
II. Certified Subcomponents Table

Subcomponent	Manufacturer	Part #	Testing Status	S_{DS}
Switches				
Ammeter Selector Switch	American Solenoid (AMS)	A11A048723E	3380 UUT 6	2.41 g
Voltmeter Selector Switch		A11A004721E	3380 UUT 5	2.43 g
Voltmeter				
Voltmeter 0-2.4 kV	Crompton	077-05GA-PZUA-C6	3380 UUT 5	2.43 g
Voltmeter: (0-2.4 kV - 0-13.2 kV)		077-05GA*	Interpolated	2.43 g
Voltmeter 0-14.4 kV		077-05GA-PZWD-C7	3380 UUT 5	2.43 g
Insulator				
Glass-Polyester	GE	190B9905	3380 UUT 5	2.43 g
Porcelain		190B9913	3380 UUT 6	2.41 g
Relays				
APVR Relay	APVR	APVR - 120V	3380 UUT 6	2.41 g
		APVR*	Interpolated	2.41 g
		APVR - 480V	3380 UUT 6	2.41 g
Motor Management Relays	GE	SR735-5-5-HI-485	15-01425 UUT 1	2.09 g
		SF73*, SF350*,MIF*, FE35*	Interpolated	2.06 g
		MIFIIPI15E10HI00	15-01425 UUT2	2.06 g
		F35N03VKHF8FH6EMXXPXX	15-01425 UUT2	2.06 g
Other Accessories				
Thermostat	Pfannenberg Electro-Industries	270A9960	3380 UUT 5	2.43 g
Space Heater ASM	GE	110C9991G1	3380 UUT 5	2.43 g
		110C9991G*	Interpolated	2.06 g
		110C9991G3	15-01425 UUT2	2.06 g
1200 Amp Selector Switch	Power Con	110C9870P1	5989 UUT1	1.42 g
Duplex Receptacle	GE	110C9661G3	3380 UUT 5	2.43 g
		110C9661G*	Interpolated	2.06 g
		110C9661G4	15-01425 UUT2	2.06 g
Glow Tube	Glow Tube Inc.	RS05010002	3380 UUT 5	2.43 g
Convenience Light	GE	TCA115-PH-SW	3380 UUT 5	2.43 g

General Electric - Load Interrupter Switchgear
II. Certified Subcomponents Table

Subcomponent	Manufacturer	Part #	Testing Status	S_{DS}
Other Accessories				
Low Voltage Box	GE	110C9514G3	15-01425 UUT 1	2.09 g
		110C9*	Interpolated	2.09 g
		110C9814PV1	3380 UUT 5	2.43 g
VB2+ SECO VCB Breaker	GE	SVEFFB1AAAZA000003	15-01425 UUT 1	2.09 g
		SVEF*	Interpolated	2.06 g
		SVEFGB2AAAZA000003	15-01425 UUT2	2.06 g

5989 – UUT 1
1200A BreakMaster Load Interrupter Switchgear
Cold Formed Carbon Steel, NEMA 1
35”W x 50”D x 90”H, 1300 lbs
Floor mounted using: (4) – 1/2”-13 bolts

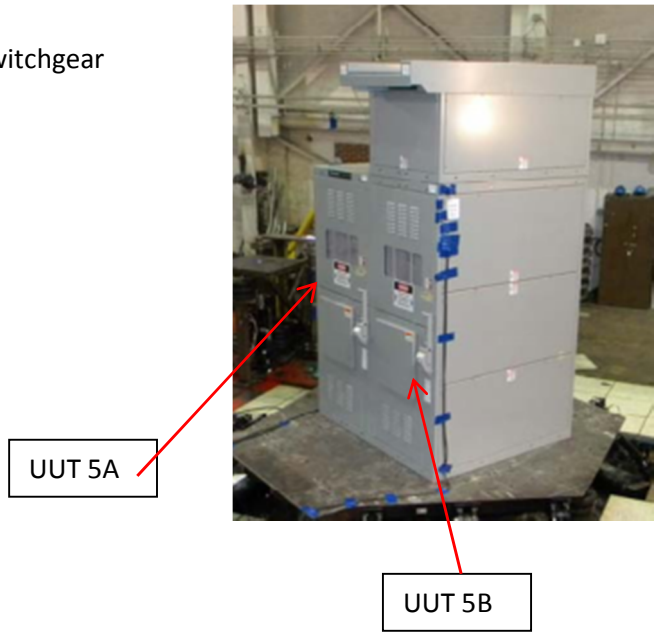
5989 -UUT 1- Internal Components

Building Code	Test Criteria	S_{DS} (g)	z/h	I_p	Horizontal		Vertical	
					A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC 156	1.42	1.0	1.5	2.27	1.70	0.95	0.38

Natural Frequencies			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.
6.0 Hz	6.0 Hz	4.5 Hz	

Internal Components	Manufacturer	Part #
1200A Selector Switch	PowerCon	110C9870P1
EJO Fuse 200A	Mersen	9F62F0D200
Arrestor Intermediate - 10kV	GE	9L12PPM010S

3380 – UUT 5: UUT 5A & UUT 5B
600A/1200A BreakMaster Load Interrupter Switchgear
Cold Formed Carbon Steel, NEMA 1 & 3R
Section A: 35”W x 60”D x 90”H, 1608 lbs
Section B: 35”W x 60”D x 123”H, 1604 lbs
Floor mounted using: (8) – 1/2”-13 bolts



Building Code	Test Criteria	S_{DS} (g)	z/h	I_p	Horizontal		Vertical	
					A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC 156	2.43	1.0	1.5	3.88	2.91	1.63	0.66
Natural Frequencies			**Test Results**					
F-B	**S-S**	**V**	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.					
11.2 Hz	7.78 Hz	11.56 Hz						

3380 -UUT 5- Internal Components

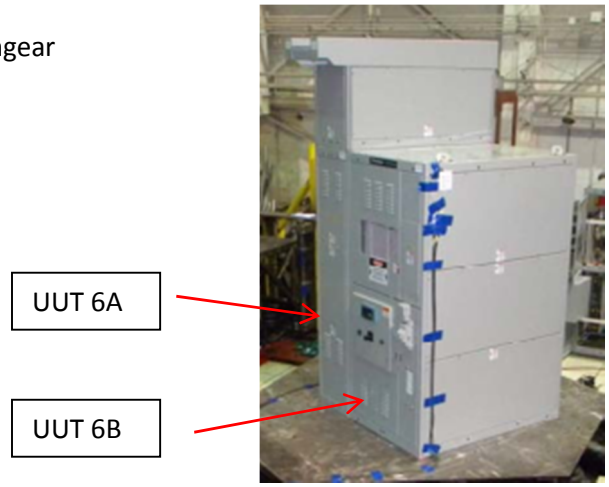
Internal Components	Manufacturer	Part #
Copper Bus	GE	N/A
RBA Fuse: 400 A	GE	15RBA4-NH
RBA Fuse 800A	GE	15RBA8-INH
EJO Fuse 25A	Mersen	9F60BHH002
3E	S&C Electric	SCE122005R4
400E	S&C Electric	SCE132600R4
Fuse 15.5kV	Bussman	15-5CAVHO-53
600 Amp Switch	Power Con	110C9939P2
1200 Amp Switch	Power Con	110C9939P5
Current Transformer - 2000:5	ITI - GE	ITI#780202
VT: 14400/120 VAC	ITI - GE	PTG521101442FF
CPT: 14400/120 V	ITI - GE	CPTS59551442
Arrestor Distribution - 3kV	GE	9L20FXX003XHS
Arrestor Intermediate - 10 kV	GE	9L12PPM010S
Arrestor Station - 21kV	GE	9L11XPM021S

3380 – UUT 5: UUT 5A & UUT 5B
600A/1200A BreakMaster Load Interrupter Switchgear

3380 -UUT 5- Internal Components Cont'd

Internal Components	Manufacturer	Part #
Voltmeter Selector Switch	American Solenoid (AMS)	A11A004721E
Voltmeter 0-2.4 kV	Crompton	077-05GA-PZUA-C6
Voltmeter 0-14.4 kV	Crompton	077-05GA-PZWD-C7
Glass-Polyester Insulator	GE	190B9905
Thermostat	Pfannenberg Electro-Industries	270A9960
Space Heater ASM	GE	110C9991G1
Duplex Recepticale (Option with Thermostat)	GE	110C9661G3
Glow Tube	Glow Tube Inc.	RS05010002
Convenience Light	GE	TCA115-PH-SW
Low Voltage Box	GE	110C9814PV1
28 Inch Height (Top Entry Pull Section)	GE	N/A

3380 – UUT 6: UUT 6A & UUT 6B
600A/1200A BreakMaster Load Interrupter Switchgear
Cold Formed Carbon Steel, NEMA 3R & 1
Section A: 20”W x 60”D x 123”H, 918 lbs
Section B: 40”W x 60”D x 90”H, 1400 lbs
Floor mounted using: (8) – 1/2”-13 bolts



Building Code	Test Criteria	S_{DS} (g)	z/h	I_p	Horizontal		Vertical	
					A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC 156	2.41	1.0	1.5	3.85	2.89	1.61	0.65

Natural Frequencies			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.
15.31 Hz	7.7 Hz	12.4 Hz	

3380 -UUT 6- Internal Components

Internal Components	Manufacturer	Part #
Copper Bus	GE	N/A
EJO Fuse 0.25A	Mersen	9F60CED003
EJO Fuse 5A	Mersen	9F60CED005
EJO Fuse 900A	Mersen	9F62KCB900
A-Series 25E	GE	A155F1C0R0-25E
A-Series 300E	GE	A155B3D0R0-300E
Fuse 5.5kV	Bussman	15-5CAVHO-53
Current Transformer - 100:5	ITI - GE	ITI#780101
VT: 2400/120 VAC	ITI - GE	PTG3260242FF
CPT: 2400/120 V	ITI - GE	CPTS3605242A
Power Quality Meter (PQM)	GE	PQMT20CA
Ammeter: 0-1A	Crompton	077-05FA-LALA-C6
Ammeter: 0-2000A	Crompton	077-05FA-LSTM-C7
Ammeter Selector Switch	American Solenoid (AMS)	A11A048723E
Voltmeter Selector Switch	American Solenoid (AMS)	A11A004721E
Porcelain Insulator	GE	190B9913
APVR Relay	APVR	APVR-120V
APVR Relay	APVR	APVR-480V
Low Voltage Box	GE	110C9814PV1
33 Inch Height (Top Entry Pull Section)	GE	N/A

10154 - UUT 4
4000A Evolution Switchboard
w/ High Pressure Contact Switch (HPC)
0.105” Cold-Formed Carbon Steel
40”W x 35”D x 90”H
Weight: 1176 lbs

Floor mounted with (4) ½”-13 Grade 5 bolts

UUT-4 on the right

Building Code	Test Criteria	S_{DS} (g)	z/h	I_p	Horizontal		Vertical	
					A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC 156	2.50	1.0	1.5	4.00	3.00	1.68	0.68
Natural Frequencies			**Test Results**					
F-B	**S-S**	**V**	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.					
8.77 Hz	7.43 Hz	33.3 Hz						

4000A High Pressure Contact Switch (HPC) – 10154-UUT4 – Internal Components

Internal Components	Manufacturer	Part #
4000A Aluminum tin-plated bus	GE	
4000A HPC Switch	GE	THPC3640G3T
Fuses 4000A	Ferraz Shawmut	A4BY4000
Fuses 1/2 A	Ferraz Shawmut	ATDR1/2
Fuse holder Ultra safe class CC	Ferraz Shawmut	USCC2 P216489
Ground Fault	ITI (Instrument Transformers, Inc.)	BGFL254-1200
Terminal Block	GE	CR151B46
EPM 7430D Power Meter	GE	PL74501A0B0A000

15-01425 – UUT 1
600A Load Interrupter Switch with SECO Breaker
Cold Formed Carbon Steel, NEMA 1
35”W x 50”D x 80”H, 1740 lbs
Floor mounted using: (4) – 1/2”-13 Grade 5 bolts

Building Code	Test Criteria	S_{DS} (g)	z/h	I_p	Horizontal		Vertical	
					A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC 156	2.09	1.0	1.5	3.34	2.51	1.40	0.56

Natural Frequencies			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.
9.81 Hz	13.16 Hz	16.81 Hz	

15-01425 -UUT 1- Internal Components

Internal Components	Manufacturer	Part #
Copper Bus	GE	N/A
Current Transformer - 100:5	ITI - GE	ITI#780101
VT: 2400/120 VAC	ITI - GE	PTG3260242FF
Glass-Polyester Insulator	GE	190B9905
Motor Management Relay	GE	SR735-5-5-HI-485
Low Voltage Box	GE	110C9514G3
VB2+ SECO VCB Breaker	GE	SVEFFB1AAAZA000003

15-01425 – UUT 2

1200A Load Interrupter Switch with SECO Breaker
Cold Formed Carbon Steel, NEMA 3R
44”W x 60”D x 99”H, 2796 lbs
Floor mounted using: (4) – 5/8”-13 Grade 5 bolts

Building Code	Test Criteria	S_{DS} (g)	z/h	I_p	Horizontal		Vertical	
					A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC 156	2.06	1.0	1.5	3.30	2.47	1.38	0.56
Natural Frequencies			**Test Results**					
F-B	**S-S**	**V**	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.					
8.71 Hz	5.56Hz	11.68 Hz						

15-01425 -UUT 2- Internal Components

Internal Components	Manufacturer	Part #
Copper Bus	GE	N/A
Current Transformer - 100:5	ITI - GE	ITI#780101
VT: 14400/120 VAC	ITI - GE	PTG521101442FF
CPT: 14400/120 V	ITI - GE	CPTS59551442
Arrestor Station - 21kV	GE	9L11XPM021S
Porcelain Insulator	GE	190B9913
Motor Management Relay	GE	F35N03VKHF8FH6EMXXPXX
Motor Management Relay	GE	MIFIIPI15E10HI00
Thermostat	Pfannenberg Electro-Industries	270A9960
Space Heater	GE	110C9991G3
Duplex Receptacle (Option with Thermostat)	GE	110C9661G4
VB2+ SECO VCB Breaker	GE	SVEFGB2AAAZA000003