APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0338 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: Eaton

Manufacturer's Technical Representative: Eddie Wilkie

Mailing Address: 175 Vista Blvd, Arden, NC 28704

Telephone: 828-651-0707 Email: eddiewilkie@eaton.com

Product Information

Product Name: Enclosed Circuit Breakers

Product Type: Enclosed Circuit Breakers

Product Model Number: See Product Range Summary
(List all unique product identification numbers and/or part numbers)

General Description: Enclosed molded case circuit breakers, 100-1200A, 600 Vac maximum. NEMA type 1, 3R, 4X and 12 enclosures. Seismic enhancements made to the test units and modifications required to address anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Rigid Wall Mounted

Applicant Information

Applicant Company Name: Eaton

Contact Person: Eddie Wilkie

Mailing Address: 175 Vista Blvd, Arden, NC 28704

Telephone: 828-651-0707 Email: eddiewilkie@eaton.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2013.

Signature of Applicant: Eddie Wilkie Date: 7/16/13

Title: Director of Engineering Company Name: Eaton

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

Company Name: ISAT

Name: William V. Joerger California License Number: SE 4545

Mailing Address: 1020 Crews Road, Quite Q, Matthews, NC 28105

Telephone: 510-714-0216 Email: wvjoerger@isatsb.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: Wyle Laboratories

Contact Name: Phil McNaught

Mailing Address: P.O. Box 77777, Huntsville, AL 35807

Telephone: 256-716-4130 Email: Phil.mcnaught@wyle.com

Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = 2.63

S_{DS} (Design spectral response acceleration at short period, g) = 3.51

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) = 2.5

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1

Equipment or Component Natural Frequencies (Hz) = See Resonance Summary

Overall dimensions and weight (or range thereof) = See Product Range Summary

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) =

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, 2010: ☐ Yes ☒ No

List of Attachments Supporting Special Seismic Certification

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

☒ Other(s) (Please Specify): Product Range Summary

OSHPD Approval (For Office Use Only) – **Approval Expires on December 31, 2019**

Signature: Date: September 23, 2013

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to : S_{DS} (g) = 3.51 z/h = 1.0

Condition of Approval (if applicable):

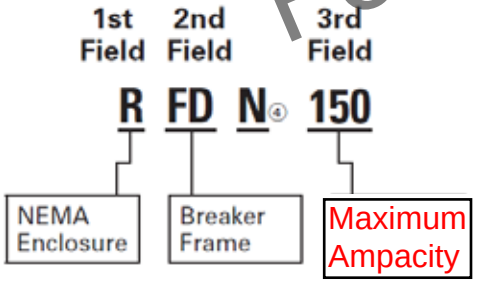
Certified Product Range Summary
Enclosed Circuit Breakers[a]

Model	NEMA Enclosure Type	Breaker Frame	Maximum Current (Amperes)	Enclosure Dimensions (in.)			Weight (lbs.)	S_{DS} (g)	Unit Tested
				Width	Depth	Height			
SFDN100	1[b]	F	100	9.13	5.2	19.13	13		Extrapolated
SGDN100	1[b]	G	100	8.56	6.28	17.5	12		Extrapolated
SFD100E	1[b]	F (ELCB)	100	8.56	6.28	23.25	15		Extrapolated
FFDN100	1[b]	F	100	9.72	6.28	18.81	12		Extrapolated
FFD100E	1[b]	F (ELCB)	100	9.72	6.28	24.56	15		Extrapolated
WGDN100	4X[c]	G	100	8.84	9.31	19.91	16		Extrapolated
WFDN100	4X[c]	F	100	8.84	9.31	19.91	16		Extrapolated
WFDN100E	4X[c]	F (ELCB)	100	8.84	9.31	19.91	20		Extrapolated
JGDN100	12[b]	G	100	9.16	9.31	19.91	16		Extrapolated
JFDN100	12[b]	F	100	9.16	9.31	19.91	16		Extrapolated
JFDN100E	12[b]	F (ELCB)	100	9.16	9.31	19.91	19		Extrapolated
RGDN100	3R[b]	G	100	9.16	9.31	19.91	16		Extrapolated
RFDN100	3R[b]	F	100	9.16	9.31	25.66	19		Extrapolated
RFDN100E	3R[b]	F (ELCB)	100	9.19	9.31	19.91	19		Extrapolated
SFDN225	1[b]	F	225	8.56	6.28	23.25	15		Extrapolated
FFDN225	1[b]	F	225	9.72	6.28	24.56	15		Extrapolated
WFDN225	4X[c]	F	225	8.84	9.31	25.66	20		Extrapolated
JFDN225	12[b]	F	225	9.16	9.31	25.66	19		Extrapolated
RFDN225	3R[b]	F	225	9.16	9.31	25.66	19		Extrapolated
SJDN250	1[b]	J	250	10.92	7.2	34.7	31		Extrapolated
FJDN250	1[b]	J	250	12.23	7.2	36.02	32		Extrapolated
WJDN250	4X[c]	J	250	11.56	10.22	37.5	39		Extrapolated
RJDN250	3R[b]	J	250	11.88	10.22	37.5	37		Extrapolated
JJDN250	12[b]	J	250	11.88	10.22	37.53	37		Extrapolated
SKDN400	1[b]	K	400	11.06	10.94	38.81	53		Extrapolated
FKDN400	1[b]	K	400	12.38	10.94	40.13	53		Extrapolated
WKDN400	4X[c]	K	400	12.38	14.06	41.69	74	3.51	UUT 1
JKDN400	12[b]	K	400	12.31	14.06	41.69	58		Interpolated
RKDN400	3R[b]	K	400	12.31	14.06	41.69	58		Interpolated
SLG630E	1[b]	LG (ELCB)	600	21.87	9.96	51.06	90		Interpolated
SLG630	1[b]	LG	600	21.88	10	53.75	108	3.51	UUT 3
SLDN600	1	L	600	14.31	12.38	45.88	81		Interpolated
JLG630	12[b]	LG	600	23.06	14.1	53.37	94		Interpolated
JLG630	12[b]	LG (ELCB)	600	23.06	14.1	53.37	94		Interpolated
RLG630	3R[b]	LG	600	23.06	14.1	53.37	94		Interpolated
RLG630	3R[b]	LG (ELCB)	600	23.06	14.1	53.37	94		Interpolated
WLG630	4X[c]	LG	600	23.06	14.11	53.38	96		Interpolated
WLDN600	4X[c]	L	600	14.91	15.5	48.31	88		Interpolated
JLDN600	12[b]	L	600	15.56	15.5	48.31	84		Interpolated
RLDN600	3R[b]	L	600	15.56	15.5	48.31	84		Interpolated
SNDN1200	1[b]	M,N	1200	21.44	15.41	61.22	178		Interpolated
JNDN1200	12[b]	M,N	1200	22.63	17.62	63.59	175		Interpolated
RNDN1200	3R[b]	M,N	1200	22.62	17.62	63.75	240	3.51	UUT 2

a. Manufactured by Eaton.
b. Enclosure made from carbon steel.
c. Enclosure made from stainless steel.

Enclosed Circuit Breakers – Model Numbering

1st Field Enclosure Type			2nd Field Breaker Family	3rd Field Maximum Ampacity
NEMA 1	Flush	F	G-Frame	50
	Surface	S	F-Frame	100
NEMA 3R		R	J-Frame	150
NEMA 12		J	K-Frame	225
NEMA 12K		D	L-Frame	250
NEMA 4/4X, 5	Stainless	W	M-Frame	400
~~NEMA 7/9~~	~~Cast Al.~~	~~X~~	N-Frame	600
				1200



NEMA Enclosure Type	Definitions NEMA Standard
1	Type 1 enclosures are intended for indoor use primarily to provide a degree of protection against contact with the enclosed equipment.
3R	Type 3R enclosures are intended for outdoor use primarily to provide a degree of protection against falling rain, sleet and external ice formation.
12	Type 12 enclosures are intended for indoor use primarily to provide a degree of protection against dust, falling dirt and dripping noncorrosive liquids.
12K	Type 12K enclosures with knockouts are intended for indoor use primarily to provide a degree of protection against dust, falling dirt and dripping noncorrosive liquids other than at knockouts.
4/4X	Type 4 enclosures are intended for indoor or outdoor use primarily to provide a degree of protection against windblown dust and rain, splashing water, and hose-directed water, and corrosion; and will be undamaged by the external formation of ice on the enclosure.
5	Type 5 enclosures are used for indoor use primarily to provide a degree of protection against dust and falling dirt.
7	Type 7 enclosures are for use indoors in locations classified as Class I, Groups B, C or D as defined in the National Electrical Code. ⑤
9	Type 9 enclosures are for use in indoor locations classified as Class II, Groups E, F or G as defined in the National Electrical Code.

④ "N" in this position indicates enclosure complies with NEC gutter space requirement.
⑤ XFDN050 is not Group B compliant.

Certified Component Summary
Molded Case Circuit Breakers (MCCB)

Molded Case Circuit Breakers (MCCB) 1 - 3 Poles (3 Pole Data Shown)										
Frame	Model	Trip Type (TM, E, NT)*	Size (Amperes)	Voltage	Dimensions / Weights				Manufacturer	Unit
					Width (in.)	Depth (in.)	Height (in.)	Weight (lbs.)		
G		TM	100	480	3	2.63	4	1.37	Eaton	Extrapolated
F		TM, E	225	600	4.13	3.38	6	4.5	Eaton	Extrapolated
F w/ EL Module		TM, E	225	600	4.13	3.96	12.06	8.5	Eaton	Extrapolated
J		TM, E	250	600	4.13	4.06	10	13.5	Eaton	Extrapolated
K		TM, E	400	600	5.49	4.31	10.13	11.5	Eaton	Extrapolated
K	HKD3400F	TM	400	600	5.49	4.31	10.13	11.5	Eaton	UUT 1
LG		TM, E, NT	600	600	7.22	4.09	10.13	20	Eaton	Interpolated
LG	LGE3630NN	NT	600	600	7.22	4.09	10.13	20	Eaton	UUT 3
LG W/ EL Module		TM, E, NT	600	600	7.22	5.43	15.38	27	Eaton	Interpolated
L		TM, E, NT	600	600	8..25	3.81	10.75	25	Eaton	Interpolated
M		TM, E, NT	800	600	8.25	4.06	16	30	Eaton	Interpolated
N		TM, E, NT	1200	600	8.25	5.5	16	45	Eaton	Interpolated
N	NG31000WX04Y02	E	1200	600	8.25	5.5	16	45	Eaton	UUT 2

* - "TM" = Thermal Magnetic, "E" = Electronic, "NT" = No Trip

Certified Enclosure Summary
Enclosed Circuit Breakers

NEMA Enclosure Type	Dimensions (in.)			Manufacturer	Tested in Unit	Notes
	Width	Depth	Height			
1 (Surface Type)	8.56	6.28	17.5	Eaton	Extrapolated	1
1 (Flush Type)	9.72	6.28	18.81	Eaton	Extrapolated	1
1 (Surface Type)	9.13	5.2	19.13	Eaton	Extrapolated	1
4X	8.84	9.31	19.91	Eaton	Extrapolated	2
3R/12	9.16	9.31	19.91	Eaton	Extrapolated	1,3
3R	9.19	9.31	19.91	Eaton	Extrapolated	1,3
1 (Surface Type)	8.56	6.28	23.25	Eaton	Extrapolated	1
1 (Flush Type)	9.72	6.28	24.56	Eaton	Extrapolated	1
4X	8.84	9.31	25.66	Eaton	Extrapolated	2
3R/12	9.16	9.31	25.66	Eaton	Extrapolated	1,3
1 (Surface Type)	10.92	7.2	34.7	Eaton	Extrapolated	1
1 (Flush Type)	12.23	7.2	36.02	Eaton	Extrapolated	1
4X	11.56	10.22	37.5	Eaton	Interpolated	2
3R/12	11.88	10.22	37.53	Eaton	Extrapolated	1,3
1 (Surface Type)	11.06	10.94	38.81	Eaton	Extrapolated	1
1 (Flush Type)	12.38	10.94	40.13	Eaton	Extrapolated	1
4X	11.75	14.06	41.69	Eaton	Extrapolated	2
4X	12.38	14.06	41.69	Eaton	UUT 1	2
1 (Surface Type)	14.31	12.38	45.88	Eaton	Interpolated	1
4X	14.91	15.5	48.31	Eaton	Interpolated	2
3R/12	15.56	15.5	48.31	Eaton	Interpolated	1,3
3R/12	23.06	14.1	53.37	Eaton	Interpolated	1,3
4X	23.06	14.11	53.38	Eaton	Interpolated	2
1 (Surface Type)	21.88	10	53.75	Eaton	UUT3	1
1 (Surface Type)	21.44	15.41	61.22	Eaton	Interpolated	1
3R/12	22.62	17.62	63.75	Eaton	UUT 2	1,3

Notes:

1. Enclosure made carbon steel.
2. Enclosure made from AISI 304 stainless steel.
3. NEMA 3R includes rain shield and gasket material for door. NEMA 12 includes gasket material for seams.

UUT 1 (Unit Under Test) Summary Sheet

Manufacturer: Eaton Corporation

Product Line: Enclosed Circuit Breaker

Model Number: WKDN400

Product Construction Summary: Cabinet is constructed of AISI 304 stainless steel, NEMA Type 4X enclosure rating.

Options/Component Summary: Molded Case Breaker K Frame 400A (HKD3400F)

UUT Properties (As Tested)

Weight (lbs.)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Width	Depth	Height	Front-Back	Side-Side	Vertical
74	12.38	14.06	41.69	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2013	2012 ICC-ES AC156	3.51	1	1.5	5.62	4.21	2.35	0.95

UUT maintained structural integrity and functionality as confirmed in post test inspection and operation checks.

UUT 1 was mounted to a rigid wall frame using (6) 5/16 bolts. The wall frame was welded to the shake table.

UUT 2 (Unit Under Test) Summary Sheet

Manufacturer: Eaton Corporation

Product Line: Enclosed Circuit Breaker

Model Number: RNDN1200

Product Construction Summary: Cabinet is constructed of powder-coated carbon steel, NEMA Type 3R enclosure rating.

Options/Component Summary: Molded Case Breaker N Frame 1200A (NG31000WX04Y02)

UUT Properties (As Tested)

Weight (lbs.)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Width	Depth	Height	Front-Back	Side-Side	Vertical
240	22.62	17.62	63.75	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2013	2012 ICC-ES AC156	3.51	1	1.5	5.62	4.21	2.35	0.95

UUT maintained structural integrity and functionality as confirmed in post test inspection and operation checks.

UUT 2 was mounted to a rigid wall frame using (6) 5/16 bolts. The wall frame was welded to the shake table.

UUT 3 (Unit Under Test) Summary Sheet

Manufacturer: Eaton Corporation

Product Line: Enclosed Circuit Breaker

Model Number: SLG630

Product Construction Summary: Cabinet is constructed of powder-coated carbon steel, NEMA Type 1 enclosure rating.

Options/Component Summary: Molded Case Breaker L Frame 600A (LGE3630NN)

UUT Properties (As Tested)

Weight (lbs.)	Dimensions (inches)			Lowest Natural Frequency (Hz)		
	Width	Depth	Height	Front-Back	Side-Side	Vertical
108	21.88	10	53.75	N/A	N/A	N/A

Seismic Test Parameters

Building Code	Test Criteria	Sds	z/h	Ip	Aflx-H	Arig-H	Aflx-V	Arig-V
CBC 2013	2012 ICC-ES AC156	3.51	1	1.5	5.62	4.21	2.35	0.95

UUT maintained structural integrity and functionality as confirmed in post test inspection and operation checks.

UUT 3 was mounted to a rigid wall frame using (6) 5/16 bolts. The wall frame was welded to the shake table.