APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0025 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: ABB Inc.

Manufacturer's Technical Representative: Brian Akers

Mailing Address: P.O. Box 38, 171 Industry Drive, Bland, VA 24315

Telephone: (276) 688-1673 Email: brian.akers@us.abb.com

Product Information

Product Name: Copper Wiring and Aluminum Wiring Coil Transformers

Product Type: 112-3,000 kVA Single & 3-Phase Dry Type Transformers

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

General Description: ABB copper wiring and aluminum wiring transformers are built with either copper or aluminum coils and are optionally braced within their enclosures with L-frames (Level 2) or A-frames (Level 3). Seismic enhancements made to the test units and modifications required to address the anomalies observed during the tests shall be incorporated into the production units

Mounting Description: Rigid floor mounted

Applicant Information

Applicant Company Name: ABB Inc.

Contact Person: Brian Akers

Mailing Address: P.O. Box 38, 171 Industry Drive, Bland, VA 24315

Telephone: (276) 688-1673 Email: brian.akers@us.abb.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: Brian Akers Date: 2/2/2017

Title: ABB Engineer Company Name: ABB Inc.

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: Wyle Laboratories

Contact Name: Rod Thornberry

Mailing Address: 7800 Hwy 20, Huntsville, AL 35806

Telephone: (256) 837-4411 Email: _____

Seismic Parameters

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

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

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

a_p (In-structure equipment or component amplification factor) = 1.0

R_p (Equipment or component response modification factor) = 2.5

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0

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

Overall dimensions and weight (or range thereof) = See attachment, 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: October 12, 2017

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): _____

ABB Dry Type Transformers
Product Range Summary

Type	Max. Service Wt.	Height	Width	Depth	Bracing Configuration (max. S_{DS} per type)				Bracing Configuration				Testing Status
					A	B	C	D	A	B	C	D	
					S_{DS}	S_{DS}	S_{DS}	S_{DS}	F_p/W_p	F_p/W_p	F_p/W_p	F_p/W_p	
Copper Windings													
112 kVA Dry Type Transformer	2,400 lbs	60"	38"	36"	0.29	N/A	0.98	1.11	0.21	N/A	0.71	0.80	Test Report PR055313-TR-16 - UUT1A, UUT1C, UUT1D
Dry Type Transformer	2,400 lbs - 21,000 lbs	60" - 120"	38" - 138"	36" - 72"									Interpolated
3000 kVA Dry Type Transformer	21,000 lbs	120"	138"	72"									Test Report T55796-1 - UUT2A, UUT2C, UUT2D
Aluminum Windings													
112 kVA Dry Type Transformer	1,956 lbs	60"	48"	36"	0.37	1.35	N/A	3.00	0.27	0.97	N/A	2.16	Test Report 57467R10-1 - UUT3A, UUT3B, UUT3D

Bracing Types

Configuration A - two feet with core clamps and cross channel brackets
Configuration B - two feet with core clamps and cross channel brackets, L-frame supports and gussets
Configuration C - three feet with core clamps and cross channel brackets, L-frame supports and gussets
Configuration D - three feet structural core clamps, core clamp and cross channel brackets, and diagonal A-frame braces.

Nameplate

ABB transformers are delivered to the project site with ABB, Eaton, Cutler Hammer, Square D, Siemens, or GE nameplates. In all cases the units are designated as 0-30 MVA 3-Phase Dry Type Transformers.

FORELL/ELSESSER ENGINEERS, INC.
Structural Engineers
160 Pine St., 6th Floor
San Francisco, CA 94111

Test Report PR055313-TR-16 – UUT1A, UUT1C, UUT1D
112kVA Dry Type Copper Wiring Transformer
60”H x 38”W x 36”D, 2,400 lbs
11 ga. Cold Formed Carbon Steel
Floor Mounted by welding

UUT1A - Configuration A: two feet with core clamps and cross channel brackets.
UUT1C - Configuration C: three feet with core clamps and cross channel brackets, L-frame supports and gussets
UUT1D - Configuration D: three feet structural core clamps, core clamp and cross channel brackets, and diagonal A-frame braces.

UUT1A - Configuration A:

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	0.44	1.0	1.5	0.70	0.53	0.29	0.12

Natural Frequencies (Hz)			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.
7.9	13	N/A	

UUT1C – Configuration C:

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	1.60	1.0	1.5	2.56	1.92	1.07	0.43

Natural Frequencies (Hz)			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	15	N/A	

UUT1D – Configuration D:

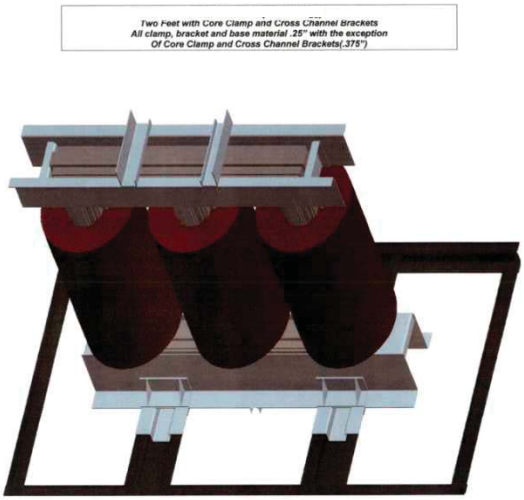
Building Code	Test Criteria	S_{DS} (g)	z/h	I_p	Horizontal		Vertical	
					A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC 156	3.16	1.0	1.5	5.06	3.79	2.12	0.84

Natural Frequencies (Hz)			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.
8.8	10.2	N/A	

Test Report T55796-1 – UUT2A, UUT2C, UUT2D
3000 kVa Copper Wiring Transformer & Enclosure (Largest)
120”H x 138”W x 72”D, 21,000 lbs
14 ga. Cold Formed Carbon Steel
Floor Mounted by welding

UUT2A - Configuration A: two feet with core clamps and cross channel brackets.
UUT2C - Configuration C: three feet with core clamps and cross channel brackets, L-frame supports and gussets
UUT2D - Configuration D: three feet structural core clamps, core clamp and cross channel brackets, and diagonal A-frame braces.

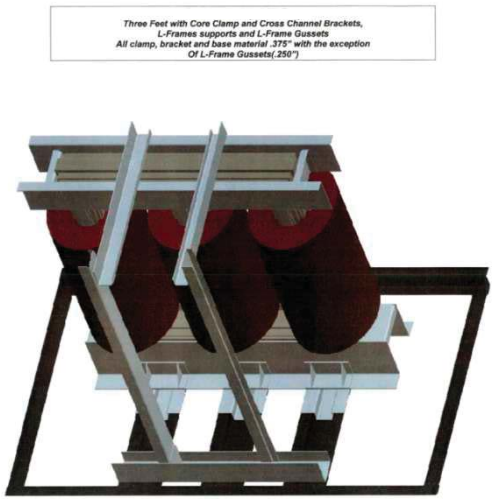
UUT2A – Configuration A:



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	0.29	1.0	1.5	0.46	0.35	0.19	0.08

Natural Frequencies (Hz)			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.
1.7	6.6	20.0	

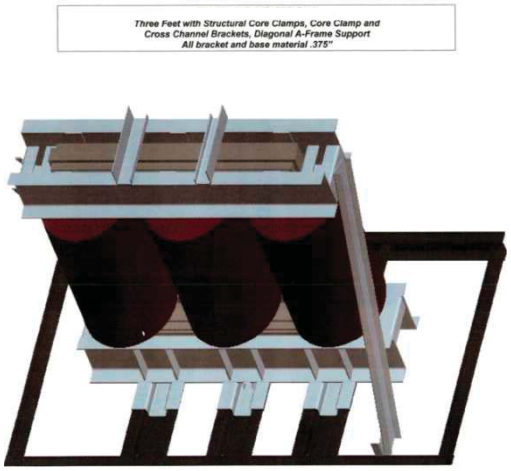
UUT2C – Configuration C:



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	0.98	1.0	1.5	1.57	1.18	0.66	0.26

Natural Frequencies (Hz)			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.
5.5	4.4	N/A	

UUT2D – Configuration D:



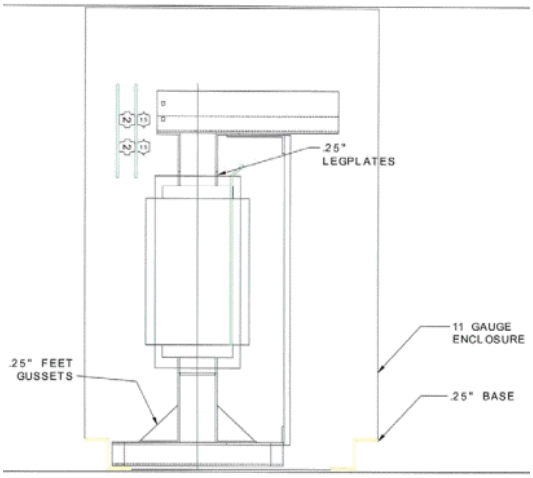
Building Code	Test Criteria	S_{DS} (g)	z/h	I_p	Horizontal		Vertical	
					A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC 156	1.11	1.0	1.5	1.78	1.33	0.74	0.30

Natural Frequencies (Hz)			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.
4.6	5.7	N/A	

Test Report 57467R10-1 – UUT3A, UUT3B, UUT3D
112 kVA Aluminum Wiring Transformer & Enclosure
60”H x 48”W x 36”D, 1,956 lbs
11 ga. Cold Formed Carbon Steel
Floor Mounted by welding

UUT3A - Configuration A: two feet with core clamps and cross channel brackets.
UUT3B - Configuration B: two feet with core clamps and cross channel brackets, L-frame supports and gussets
UUT3D - Configuration D: three feet structural core clamps, core clamp and cross channel brackets, and diagonal A-frame braces.

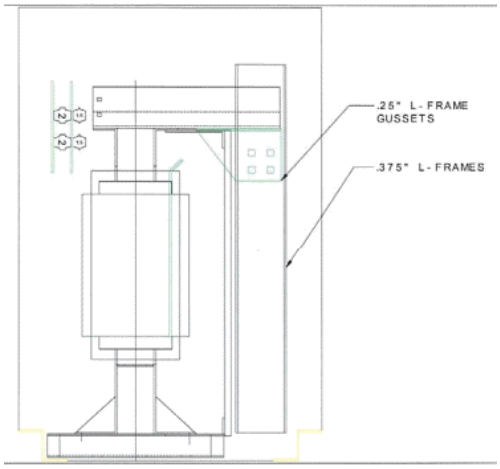
UUT3A – Configuration A:



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	0.37	1.0	1.5	0.59	0.44	0.25	0.10

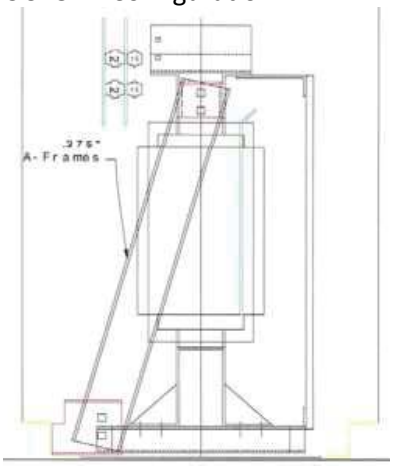
Natural Frequencies (Hz)			Test Results
F-B	S-S	V	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.
9.1	16.0	32.0	

UUT3B – Configuration B:



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	1.35	1.0	1.5	2.16	1.62	0.90	0.36
Natural Frequencies (Hz)			**Test Results**					
F-B	**S-S**	**V**	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.					
16.0	17.0	27.0						

UUT3D - Configuration D:



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	3.00	1.0	1.5	4.80	3.60	2.01	0.80
Natural Frequencies (Hz)			**Test Results**					
F-B	**S-S**	**V**	The UUT maintained structural integrity and functionality after the AC156 test. UUT full of contents during testing.					
8.6	27.0	32.0						