APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0483 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: Eaglerise Power Systems, Inc.

Manufacturer's Technical Representative: Joey Qiao

Mailing Address: 320 Constance Drive, Unit 1, Warminster, PA 18974

Telephone: 267.474.9855 Email: joey.qiao@useaglerise.com

Product Information

Product Name: High Efficiency (HE) Transformers

Product Type: Copper and Aluminum Transformers

Product Model Number: Per Attachment
(List all unique product identification numbers and/or part numbers)

General Description: Dry Type Transformers.

Mounting Description: Rigid Base Mounted

Applicant Information

Applicant Company Name: TRU Compliance, LLC

Contact Person: Derrick Watkins, PhD, S.E.

Mailing Address: 960 SW Disk Dr., Suite 104, Bend, OR 97702

Telephone: 844.878.0200 Email: dwatkins@trucompliance.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: Derrick Watkins Date: 10/03/2016

Title: Executive Vice President Company Name: TRU Compliance, LLC

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

Company Name: TRU Compliance, LLC

Name: Derrick Watkins, PhD S.E. California License Number: S5257

Mailing Address: 960 SW Disk Dr., Suite 104, Bend, OR 97702

Telephone: 844.878.0200 Email: dwatkins@trucompliance.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 Dynamic Testing Laboratory

Contact Name: Richard Siagel

Mailing Address: 1801 Route 51, Bldg. 8, Jefferson Hills, PA 15025

Telephone: 412.387.1015 Email: rsiagel@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) = 1.44 (S_{DS} = 2.0); 1.44 (S_{DS} = 3.2)

S_{DS} (Design spectral response acceleration at short period, g) = 2.0g (z/h = 1.0); 3.2g (z/h = 0.0)

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 (S_{DS} = 2.0g); 0.0 (S_{DS} = 3.2g)

Equipment or Component Natural Frequencies (Hz) = See Attachment

Overall dimensions and weight (or range thereof) = See Attachment

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): Attachment

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

Signature: Date: March 13, 2017

Print Name: Ali Sumer Title: DSE

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

Condition of Approval (if applicable):

SPECIAL SEISMIC CERTIFICATION
CERTIFIED COMPONENT MATRIX

TRU PROJECT NO. 15034

Manufacturer: Eaglerise Power Systems Inc.
Model Line: High Efficiency (HE) Transformers

TABLE 1

Certified Product Construction Summary:
Aluminum, 60Hz, Carbon steel NEMA Type 3R enclosure.
Construction type a: Single Phase (1Ø) 15 - 100kVA, Three Phase (3Ø) 15 - 150kVA : "Z" Bent Plate for Coil Base Frame, 4 total Threaded Rods, 2 total Clamp Bolts, "C" Bent Plate for Unit Base Frame, 4 total Base Frame bolts, Enclosure E1-E4, Wire windings
Construction type b: Three Phase (3Ø) 225 - 750kVA : "C" Channel for Coil Base Frame, 4 total Threaded Rods, 4 total Clamp Bolts, "C" Channel for Unit Base Frame, 8 total Base Frame bolts, Enclosure E5-E8, Foil windings

Certified Options Summary:
Single Phase (1Ø): 15 - 100kVA, Voltage 600V Class ,High Efficiency transformer
Three Phase (3Ø): 15 - 750kVA, Voltage 600V Class ,High Efficiency transformer

Mounting Configuration:
Rigid floor mounted.
Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

Building Code: CBC 2016 ***Seismic Certification Limits:*** S_{DS} = 2.0 g z/h = 1.0; S_{DS} = 3.2 g z/h = 0.0 I_P = 1.5

Model Line	Model	Dimension (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
High Efficiency Aluminum - 1∅	HE1015XX	20.2	19.4	21.5	200		Extrap
	HE1025XX	25.0	23.9	28.8	290		Extrap
	HE1037XX	25.0	23.9	28.8	370		Extrap
	HE1050XX	25.0	26.0	38.0	450		Extrap
	HE1075XX	25.0	26.0	38.0	590		Extrap
	HE1100XX	29.5	32.0	41.0	770		Extrap
High Efficiency Aluminum - 3Ø	HE3015XX	20.2	19.4	21.5	270		Extrap
	HE3030XX	25.0	23.9	28.8	420		Extrap
	HE3045XX	25.0	26.0	38.0	540		Extrap
	HE3075XX	29.5	32.0	41.0	750		Extrap
	HE3112XX	29.5	32.0	41.0	880		Extrap
	HE3150XX (HE3150AB Tested)	29.5	32.0	41.0	1236	UUT: 150kVA, Enclosure E4, Wire, Construction Type a	1
	HE3225XX	34.0	39.5	51.5	1600		Interp
	HE3300XX	38.4	48.5	59.0	2150		Interp
	HE3500XX	43.4	51.5	66.0	3500		Interp
	HE3750XX (HE3750AB Tested)	51.4	64.0	75.0	4241	UUT: 750kVA, Enclosure E8, Foil windings, Construction	2

SPECIAL SEISMIC CERTIFICATION
CERTIFIED COMPONENT MATRIX

TRU PROJECT NO. 15034

Manufacturer: Eaglerise Power Systems Inc.
Model Line: High Efficiency (HE) Transformers

TABLE 2

Certified Product Construction Summary:
Copper, 60Hz, Carbon steel NEMA Type 3R enclosure.
Construction type a: Single Phase (1Ø) 15 - 100kVA, Three Phase (3Ø) 15 - 150kVA : "Z" Bent Plate for Coil Base Frame, 4 total Threaded Rods, 2 total Clamp Bolts, "C" Bent Plate for Unit Base Frame, 4 total Base Frame bolts, Enclosure E1-E4, Wire windings
Construction type b: Three Phase (3Ø) 225 - 750kVA : "C" Channel for Coil Base Frame, 4 total Threaded Rods, 4 total Clamp Bolts, "C" Channel for Unit Base Frame, 8 total Base Frame bolts, Enclosure E5-E8, Foil windings

Certified Options Summary:
Single Phase (1Ø): 15 - 100kVA, Voltage 600V Class ,High Efficiency transformer
Three Phase (3Ø): 15 - 750kVA, Voltage 600V Class ,High Efficiency transformer

Mounting Configuration:
Rigid floor mounted.
Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

Building Code: CBC 2016 ***Seismic Certification Limits:*** S_{DS} = 2.0 g z/h = 1.0; S_{DS} = 3.2 g z/h = 0.0 I_P = 1.5

Model Line	Model	Dimension (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
High Efficiency Copper - 1∅	HE1015XXCU	20.2	19.4	21.5	220		Extrap
	HE1025XXCU	25.0	23.9	28.8	330		Extrap
	HE1037XXCU	25.0	23.9	28.8	400		Extrap
	HE1050XXCU	25.0	26.0	38.0	490		Extrap
	HE1075XXCU	25.0	26.0	38.0	670		Extrap
	HE1100XXCU	29.5	32.0	41.0	800		Extrap
High Efficiency Copper - 3Ø	HE3015XXCU	20.2	19.4	21.5	280		Extrap
	HE3030XXCU	25.0	23.9	28.8	400		Extrap
	HE3045XXCU	25.0	23.9	28.8	470		Extrap
	HE3075XXCU	25.0	26.0	38.0	700		Extrap
	HE3112XXCU	29.5	32.0	41.0	1080		Extrap
	HE3150XXCU (HE3150ABCU Tested)	29.5	32.0	41.0	1214	UUT: 150kVA, Enclosure E4, Wire, Construction Type a	3
	HE3225XXCU	34.0	39.5	51.5	1800		Interp
	HE3300XXCU	34.0	39.5	51.5	2100		Interp
	HE3500XXCU	43.4	51.5	66.0	3300		Interp
	HE3750XXCU (HE3750ABCU Tested)	43.4	51.5	66.0	4888	UUT: 750kVA, Enclosure E7, Foil, Construction Type b	4

SPECIAL SEISMIC CERTIFICATION
CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 15034

Manufacturer: Eaglerise Power Systems Inc. ***Table Description:*** Enclosures

Model Line: High Efficiency (HE) Transformers

TABLE 3

Building Code: CBC 2016 ***Seismic Certification Limits:*** S_{DS} = 2.0 g z/h = 1.0; S_{DS} = 3.2 g z/h = 0.0 I_P = 1.5

Model Line (Manufacturer)	Model	Dimension (in)			Weight (lb)	Material	Notes	UUT
		Depth	Width	Height				
Enclosures	E1	20.2	19.4	21.5		Carbon Steel NEMA Type 3R		
	E2	25.0	23.9	28.8		Carbon Steel NEMA Type 3R		
	E3	25.0	26.0	38.0		Carbon Steel NEMA Type 3R		
	E4	29.5	32.0	41.0		Carbon Steel NEMA Type 3R		1,3
	E5	34.0	39.5	51.5		Carbon Steel NEMA Type 3R		
	E6	38.4	48.5	59.0		Carbon Steel NEMA Type 3R		
	E7	43.4	51.5	66.0		Carbon Steel NEMA Type 3R		4
	E8	51.4	64.0	75.0		Carbon Steel NEMA Type 3R		2

SPECIAL SEISMIC CERTIFICATION
MODEL LINE NAMING CONVENTION

TRU PROJECT NO. 15034

Manufacturer: Eaglerise Power Systems Inc. ***Table Description:*** Model line numbering

Model Line: High Efficiency (HE) Transformers

Prefix	***Phase***	***Size (kVA Rating)***	***Primary Voltage***	***Secondary Voltage***	***Winding material***	***Temp Rise***	***Enclosure Type***	***Voltage Code***		
		1. 1-phase kVA rating from 15 to 100 kVA 2. 3-phase kVA rating from 15 to 750 kVA	See "Voltage Code"					x	1-phase	3-phase
HE (High Efficiency)	1	015	X	X	Al (default)	150 (default)	NEMA 3R (default)	A		480D
	3	025			Cu	115		B	208	208Y/120
		030				80		C		240D/120CT
		037						D		480Y/277
		045						E	240X480	
		050						F	120/240	
		075						G	600	600D
		100						H		240D
		112						J	416	416D
		150						K		208D
		167						L	277	
		225								
		300								
		500								
		750								

UNIT UNDER TEST (UUT)
TESTING SUMMARY SHEET

TRU PROJECT NO. 15034

Manufacturer: Eaglerise Power Systems Inc.

Model Line: High Efficiency (HE) Transformers

UUT	Unit Description	Report Number	Testing Laboratory	S_{DS}	z/h	I_p
1	Alluminum Wire, 3Ø, 150kVa	JID: 16-00495	Clark Testing	2	1	1.5
				3.2	0	
2	Alluminum Foils, 3Ø, 750kVa	JID: 16-00495	Clark Testing	2	1	1.5
				3.2	0	
3	Copper Wire, 3Ø, 150kVa	JID: 16-00495	Clark Testing	2	1	1.5
				3.2	0	
4	Copper Foil, 3Ø, 750kVa	JID: 16-00495	Clark Testing	2	1	1.5
				3.2	0	

Notes:

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 15034

UUT 1

Manufacturer: Eaglerise Power Systems Inc.
Model Line: High Efficiency (HE) Transformers
Model Number: HE3150AB ***Serial Number:*** N/A

Product Construction Summary:
Carbon steel NEMA Type 3R - Model E4 enclosure.
Construction Type a.

Options/Subcomponent Summary:
Aluminum Wire, 60Hz, Three Phase (3Ø): 150 kVA, Voltage 600V Class ,High Efficiency transformer

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1236	29.5	32	41	16.47	19.23	10.71

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS} (g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.33	0.53
		3.2	0.0	1.5	3.2	1.28	2.13	0.85

Test Mounting Details:

Unit is rigid base mounted to shake table using (4) 1/2" Grade 5 bolts.
Unit maintained structural integrity and remained functional per manufacturer requirement.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 15034

UUT 2

Manufacturer: Eaglerise Power Systems Inc.
Model Line: High Efficiency (HE) Transformers
Model Number: HE3750AB ***Serial Number:*** N/A

Product Construction Summary:
Carbon steel NEMA Type 3R - Model E8 Enclosure.
Construction Type b.

Options/Subcomponent Summary:
Aluminum Foil, 60Hz, Three Phase (3Ø): 750 kVA, Voltage 600V Class ,High Efficiency transformer

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
4241	51.4	64.0	75.0	16.47	12.15	33.06

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS} (g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.33	0.53
		3.2	0.0	1.5	3.2	1.28	2.13	0.85

Test Mounting Details:

Unit is rigid base mounted to shake table using (4) 5/8" Grade 5 bolts.
Unit maintained structural integrity and remained functional per manufacturer requirement.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 15034

UUT 3

Manufacturer: Eaglerise Power Systems Inc.
Model Line: High Efficiency (HE) Transformers
Model Number: HE3150ABCU ***Serial Number:*** N/A

Product Construction Summary:
Carbon steel NEMA Type 3R - Model E4 enclosure.
Construction Type a.

Options/Subcomponent Summary:
Copper Wire, 60Hz, Three Phase (3Ø): 150 kVA, Voltage 600V Class ,High Efficiency transformer

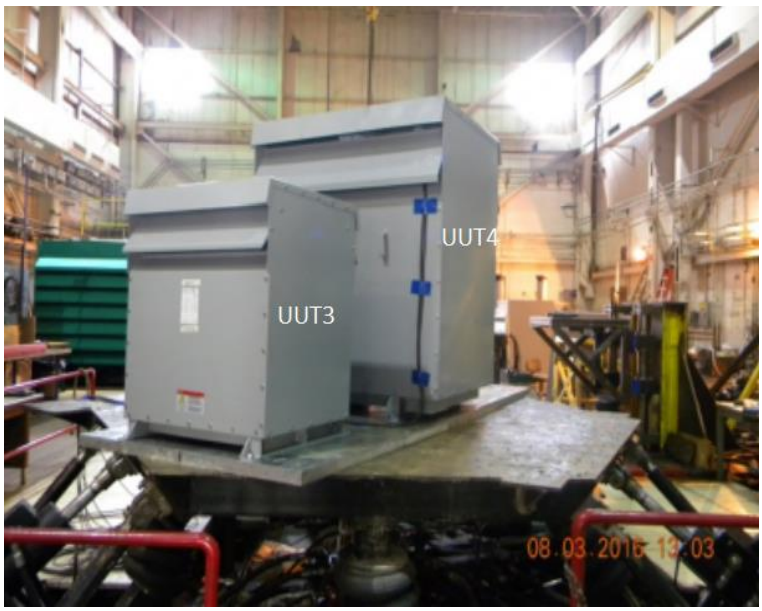
UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
1214	29.5	32	41	20.3	18.74	10

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS} (g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.33	0.53
		3.2	0.0	1.5	3.2	1.28	2.13	0.85

Test Mounting Details:



Unit is rigid base mounted to shake table using (4) 1/2" Grade 5 bolts.
Unit maintained structural integrity and remained functional per manufacturer requirement.
Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 15034

UUT 4

Manufacturer: Eaglerise Power Systems Inc.
Model Line: High Efficiency (HE) Transformers
Model Number: HE3750ABCU ***Serial Number:*** N/A

Product Construction Summary:
Carbon steel NEMA Type 3R - Model E7 Enclosure.
Construction Type b.

Options/Subcomponent Summary:
Copper Foil, 60Hz, Three Phase (3Ø): 750 kVA, Voltage 600V Class ,High Efficiency transformer

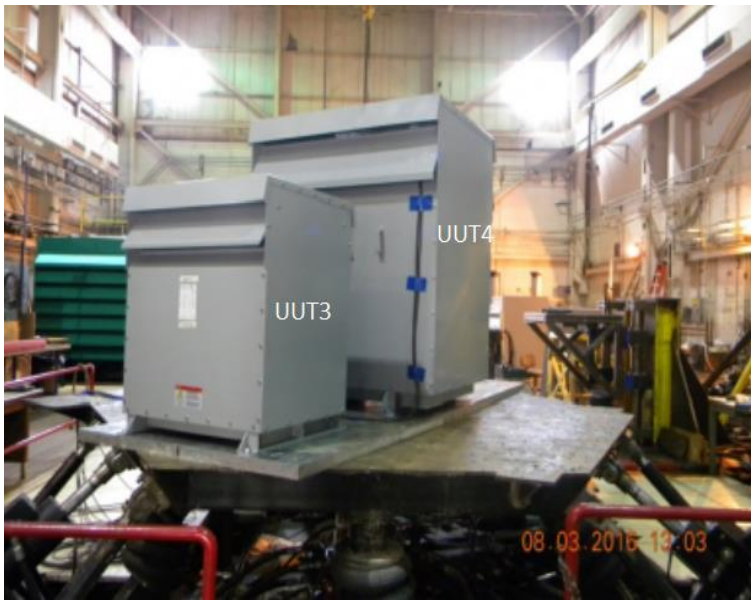
UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
4888	43.4	51.5	66.0	15.6	11.31	29.58

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS} (g)	z/h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2016	ICC-ES AC156	2.0	1.0	1.5	3.2	2.4	1.33	0.53
		3.2	0.0	1.5	3.2	1.28	2.13	0.85

Test Mounting Details:



Unit is rigid base mounted to shake table using (4) 5/8" Grade 5 bolts.
Unit maintained structural integrity and remained functional per manufacturer requirement.
Contents were included in testing per operating conditions.