



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP – 0500-10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: OnLine Power

Manufacturer's Technical Representative: Sherri Shahsavari

Mailing Address: 14000 S Broadway, Los Angeles, CA 90061

Telephone: 323.721.5017 x412 Email: sherris@onlinepower.com

Product Information

Product Name: Power Wave 1 / Power Wave 3

Product Type: Emergency Lighting Inverter

Product Model Number: See Attachment

(List all unique product identification numbers and/or part numbers)

General Description: Single phase or three phase emergency lighting inverter with battery backup inside of a carbon steel electrical cabinet enclosure. Seismic enhancements made to the test units required to address the anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Base mounted – rigid.

Applicant Information

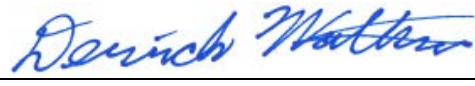
Applicant Company Name: TRU Compliance, LLC

Contact Person: Derrick Watkins, Ph.D., S.E.

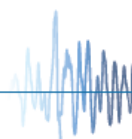
Mailing Address: 960 SW Disk Drive, Suite 104, Bend, OR 97702

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:  Date: 1/13/2017

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





**OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION**

OSH-FD-759 (REV 12/16/15)

Page 2 of 3

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

Company Name: TRU Compliance, LLC

Name: Derrick Watkins, Ph.D., 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): _____

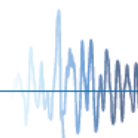
Testing Laboratory

Company Name: Pacific Earthquake Engineering Research Center (PEER)

Contact Name: Nathaniel Knight

Mailing Address: 1301 South 46th Street, Bldg. 420, Richmond, CA 94804

Telephone: (510) 642-3437 Email: peer_center@berkeley.edu





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OSH-FD-759 (REV 12/16/15)

Page 2 of 3

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 for $S_{DS} = 2.0g$ @ $z/h = 1.0$; 1.35 for $S_{DS} = 3.0g$ @ $z/h = 0.0$

S_{DS} (Design spectral response acceleration at short period, g) = 2.0 for $z/h = 1.0$; 3.0 for $z/h = 0.0$

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 for $S_{DS} = 2.0g$; 0.0 for $S_{DS} = 3.0g$

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 (VW) = _____

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

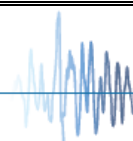
OSHDP Approval (For Office Use Only) – Approval Expires on December 31, 2022

Signature: [Signature] Date: 1/23/17

Print Name: M. R. Karim Title: SHFR

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. 15052



Manufacturer: Online Power Products						TABLE 1	
Model Line: Power Wave 1							
Certified Product Construction Summary: Base & Top: 12 GA. carbon steel, Back & Sides: 14 GA. carbon steel, Doors: 16 GA. carbon steel.							
Certified Options Summary: Input/Output voltage: 120-480VAC.							
Mounting Configuration: Base mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2016		Seismic Certification Limits:			$S_{DS} = 2.0 \quad z/h=1.0$ $S_{DS} = 3.0 \quad z/h=0.0$		$I_P = 1.5$
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
Power Wave 1 Cabinet Type A	SV-PW3.0A0100N1	18	39	68	1,284		extrap.
	SV-PW3.0A5800T1	18	39	68	1,284		extrap.
	SV-PW3.0B1300N1	18	39	68	1,284		extrap.
	SV-PW3.0B5800T1	18	39	68	1,284		extrap.
	SV-PW3.0D0400N1	18	39	68	1,284		extrap.
	SV-PW3.0D5800T1	18	39	68	1,284		extrap.
	SV-PW3.0R2500N1	18	39	68	1,284		extrap.
	SV-PW3.0R5800T1	18	39	68	1,284		extrap.
	SV-PW3.0H1100T1	18	39	68	1,284		extrap.
	SV-PW3.0H2500T1	18	39	68	1,284		extrap.
	SV-PW3.0H5800T1	18	39	68	1,284		extrap.
	SV-PW3.0R1100T1	18	39	68	1,284		extrap.
	SV-PW5.0A0100N1	18	39	68	1,284		extrap.
	SV-PW5.0A5800T1	18	39	68	1,284		extrap.
	SV-PW5.0B1300N1	18	39	68	1,284		extrap.
	SV-PW5.0B5800T1	18	39	68	1,284		extrap.
	SV-PW5.0D0400N1	18	39	68	1,284		extrap.
	SV-PW5.0D5800T1	18	39	68	1,284		extrap.
	SV-PW5.0R2500N1	18	39	68	1,284		extrap.
	SV-PW5.0R5800T1	18	39	68	1,284		extrap.
	SV-PW5.0H1100T1	18	39	68	1,284		extrap.
	SV-PW5.0H2500T1	18	39	68	1,284		extrap.
	SV-PW5.0H5800T1	18	39	68	1,284		extrap.
	SV-PW5.0R1100T1	18	39	68	1,284		extrap.

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SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

TRU PROJECT NO. 15052



Manufacturer: Online Power Products						TABLE 1	
Model Line: Power Wave 1							
Certified Product Construction Summary: Base & Top: 12 GA. carbon steel, Back & Sides: 14 GA. carbon steel, Doors: 16 GA. carbon steel.							
Certified Options Summary: Input/Output voltage: 120-480VAC.							
Mounting Configuration: Base mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2016		Seismic Certification Limits:			$S_{DS} = 2.0 \quad z/h=1.0$ $S_{DS} = 3.0 \quad z/h=0.0$		$I_P = 1.5$
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
Power Wave 1 Cabinet Type A	SV-PW6.0A0100N1	18	39	68	1,340		extrap.
	SV-PW6.0A5800T1	18	39	68	1,340		extrap.
	SV-PW6.0B1300N1	18	39	68	1,340		extrap.
	SV-PW6.0B5800T1	18	39	68	1,340		extrap.
	SV-PW6.0D0400N1	18	39	68	1,340		extrap.
	SV-PW6.0D5800T1	18	39	68	1,340		extrap.
	SV-PW6.0R2500N1	18	39	68	1,340		extrap.
	SV-PW6.0R5800T1	18	39	68	1,340		extrap.
	SV-PW6.0H1100T1	18	39	68	1,340		extrap.
	SV-PW6.0H2500T1	18	39	68	1,340		extrap.
	SV-PW6.0H5800T1	18	39	68	1,340		extrap.
	SV-PW6.0R1100T1	18	39	68	1,340		extrap.
	SV-PW7.5A0100T1	18	39	68	1,340		extrap.
	SV-PW7.5A5800T1	18	39	68	1,340		extrap.
	SV-PW7.5B1300N1	18	39	68	1,340		extrap.
	SV-PW7.5B5800T1	18	39	68	1,340		extrap.
	SV-PW7.5D0400N1	18	39	68	1,340		extrap.
	SV-PW7.5D5800T1	18	39	68	1,340		extrap.
	SV-PW7.5R2500N1	18	39	68	1,340		extrap.
	SV-PW7.5R5800T1	18	39	68	1,340		extrap.
	SV-PW7.5H1100T1	18	39	68	1,340		extrap.
	SV-PW7.5H2500T1	18	39	68	1,340		extrap.
	SV-PW7.5H5800T1	18	39	68	1,340		extrap.
	SV-PW7.5R1100T1	18	39	68	1,340		extrap.

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SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

TRU PROJECT NO. 15052



Manufacturer: Online Power Products						TABLE 1	
Model Line: Power Wave 1							
Certified Product Construction Summary: Base & Top: 12 GA. carbon steel, Back & Sides: 14 GA. carbon steel, Doors: 16 GA. carbon steel.							
Certified Options Summary: Input/Output voltage: 120-480VAC.							
Mounting Configuration: Base mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2016		Seismic Certification Limits:			$S_{DS} = 2.0 \quad z/h=1.0$ $S_{DS} = 3.0 \quad z/h=0.0$		$I_P = 1.5$
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
Power Wave 1 Cabinet Type A	SV-PW8.0A0100T1	18	39	68	1,795	UUT: 120V in, 120V out	1
	SV-PW8.0A5800T1	18	39	68	1,795		interp.
	SV-PW8.0B1300N1	18	39	68	1,795		interp.
	SV-PW8.0B5800T1	18	39	68	1,795		interp.
	SV-PW8.0D0400N1	18	39	68	1,795		interp.
	SV-PW8.0D5800T1	18	39	68	1,795		interp.
	SV-PW8.0R2500N1	18	39	68	1,795		interp.
	SV-PW8.0R5800T1	18	39	68	1,795		interp.
	SV-PW8.0H1100T1	18	39	68	1,795		interp.
	SV-PW8.0H2500T1	18	39	68	1,795		interp.
	SV-PW8.0H5800T1	18	39	68	1,795		interp.
	SV-PW8.0R1100T1	18	39	68	1,795		interp.
Power Wave 1 Cabinet Type B	SV-PW010A0100T1	30.5	51	70	2,438		interp.
	SV-PW010A5800T1	30.5	51	70	2,438		interp.
	SV-PW010B1300N1	30.5	51	70	2,438		interp.
	SV-PW010B5800T1	30.5	51	70	2,438		interp.
	SV-PW010D0400N1	30.5	51	70	2,438		interp.
	SV-PW010D5800T1	30.5	51	70	2,438		interp.
	SV-PW010R2500N1	30.5	51	70	2,438		interp.
	SV-PW010R5800T1	30.5	51	70	2,438		interp.
	SV-PW010H1100T1	30.5	51	70	2,438		interp.
	SV-PW010H2500T1	30.5	51	70	2,438		interp.
	SV-PW010H5800T1	30.5	51	70	2,438		interp.
	SV-PW010R1100T1	30.5	51	70	2,438		interp.

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SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

TRU PROJECT NO. 15052



Manufacturer: Online Power Products						TABLE 1	
Model Line: Power Wave 1							
Certified Product Construction Summary: Base & Top: 12 GA. carbon steel, Back & Sides: 14 GA. carbon steel, Doors: 16 GA. carbon steel.							
Certified Options Summary: Input/Output voltage: 120-480VAC.							
Mounting Configuration: Base mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2016		Seismic Certification Limits:		$S_{DS} = 2.0 \quad z/h=1.0$ $S_{DS} = 3.0 \quad z/h=0.0$		$I_P = 1.5$	
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
Power Wave 1 Cabinet Type B	SV-PW012A0100T1	30.5	51	70	3,681		interp.
	SV-PW012A5800T1	30.5	51	70	3,681		interp.
	SV-PW012B1300N1	30.5	51	70	3,681		interp.
	SV-PW012B5800T1	30.5	51	70	3,681		interp.
	SV-PW012D0400N1	30.5	51	70	3,681		interp.
	SV-PW012D5800T1	30.5	51	70	3,681		interp.
	SV-PW012R2500N1	30.5	51	70	3,681		interp.
	SV-PW012R5800T1	30.5	51	70	3,681		interp.
	SV-PW012H1100T1	30.5	51	70	3,681		interp.
	SV-PW012H2500T1	30.5	51	70	3,681		interp.
	SV-PW012H5800T1	30.5	51	70	3,681		interp.
	SV-PW012R1100T1	30.5	51	70	3,681		interp.
	SV-PW015A0100T1	30.5	51	70	3,852		interp.
	SV-PW015A5800T1	30.5	51	70	3,852		interp.
	SV-PW015B1300N1	30.5	51	70	3,852		interp.
	SV-PW015B5800T1	30.5	51	70	3,852		interp.
	SV-PW015D0400N1	30.5	51	70	3,852		interp.
	SV-PW015D5800T1	30.5	51	70	3,852		interp.
	SV-PW015R2500N1	30.5	51	70	3,852		interp.
	SV-PW015R5800T1	30.5	51	70	3,852		interp.
	SV-PW015H1100T1	30.5	51	70	3,852		interp.
	SV-PW015H2500T1	30.5	51	70	3,852		interp.
	SV-PW015H5800T1	30.5	51	70	3,852		interp.
	SV-PW015R1100T1	30.5	51	70	3,852		interp.

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SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

TRU PROJECT NO. 15052



Manufacturer: Online Power Products						TABLE 1	
Model Line: Power Wave 1							
Certified Product Construction Summary: Base & Top: 12 GA. carbon steel, Back & Sides: 14 GA. carbon steel, Doors: 16 GA. carbon steel.							
Certified Options Summary: Input/Output voltage: 120-480VAC.							
Mounting Configuration: Base mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2016		Seismic Certification Limits:		$S_{DS} = 2.0 \quad z/h=1.0$ $S_{DS} = 3.0 \quad z/h=0.0$		$I_P = 1.5$	
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
Power Wave 1 Cabinet Type B	SV-PW017A0100T1	30.5	51	70	4,512		interp.
	SV-PW017A5800T1	30.5	51	70	4,512		interp.
	SV-PW017B1300N1	30.5	51	70	4,512		interp.
	SV-PW017B5800T1	30.5	51	70	4,512		interp.
	SV-PW017D0400N1	30.5	51	70	4,512		interp.
	SV-PW017D5800T1	30.5	51	70	4,512		interp.
	SV-PW017R2500N1	30.5	51	70	4,512		interp.
	SV-PW017R5800T1	30.5	51	70	4,512		interp.
	SV-PW017H1100T1	30.5	51	70	4,512		interp.
	SV-PW017H2500T1	30.5	51	70	4,512		interp.
	SV-PW017H5800T1	30.5	51	70	4,512		interp.
	SV-PW017R1100T1	30.5	51	70	4,512	UUT: 277V in, 480V out	2

SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

TRU PROJECT NO. 15052



Manufacturer: Online Power Products						TABLE 2	
Model Line: Power Wave 3							
Certified Product Construction Summary: Base & Top: 12 GA. carbon steel, Back & Sides: 14 GA. carbon steel, Doors: 16 GA. carbon steel.							
Certified Options Summary: Input: 208Y/120V ~ 480Y/277 Output: 208Y/120V ~ 480Y/277							
Mounting Configuration: Base mounted - rigid Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.							
Building Code: CBC 2016		Seismic Certification Limits:		$S_{DS} = 2.0 \quad z/h=1.0$ $S_{DS} = 3.0 \quad z/h=0.0$		$I_P = 1.5$	
Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
Power Wave 3	SV-PW010B05LHT3-VA	18	39	68	1,083	208Y/120V in, 208Y/120V out	3
	SV-PW010B09LHT3-VA	18	39	68	1,083		interp.
	SV-PW010H09LHT3-VA	18	39	68	1,083		interp.
	SV-PW010H05LHT3-VA	18	39	68	1,083		interp.
	SV-PW015B05LHT3-VA	18	39	68	1,446		interp.
	SV-PW015B09LHT3-VA	18	39	68	1,446		interp.
	SV-PW015H09LHT3-VA	18	39	68	1,446		interp.
	SV-PW015H05LHT3-VA	18	39	68	1,446		interp.
	SV-PW020B05LHT3-VA	18	39	68	1,679		interp.
	SV-PW020B09LHT3-VA	18	39	68	1,679		interp.
	SV-PW020H09LHT3-VA	18	39	68	1,679		interp.
	SV-PW020H05LHT3-VA	18	39	68	1,679		interp.
	SV-PW025B05LHT3-VA	18	39	68	1,679		interp.
	SV-PW025B09LHT3-VA	18	39	68	1,679		interp.
	SV-PW025H09LHT3-VA	18	39	68	1,679		interp.
	SV-PW025H05LHT3-VA	18	39	68	1,679		interp.
	SV-PW030B05LHT3-VA	18	39	68	1,719		interp.
	SV-PW030B09LHT3-VA	18	39	68	1,719		interp.
	SV-PW030H09LHT3-VA	18	39	68	1,719		interp.
	SV-PW030H05LHT3-VA	18	39	68	1,719		interp.
	SV-PW040B05LHT3-VA	18	39	68	2,066		interp.
	SV-PW040B09LHT3-VA	18	39	68	2,066		interp.
	SV-PW040H09LHT3-VA	18	39	68	2,066		interp.
	SV-PW040H05LHT3-VA	18	39	68	2,066		interp.

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 15052



Manufacturer: Online Power Products		Table Description: Batteries			TABLE 3	
Model Line: Power Wave 1 & 3						
Building Code: CBC 2016		Seismic Certification Limits:		$S_{DS} = 2.0 \quad z/h = 1.0$ $S_{DS} = 3.0 \quad z/h = 0.0$		$I_P = 1.5$
Component Type	Manufacturer	Model	Description	Notes	UUT	
Battery	Exide Technologies	S12V285F	12V, 285-270WPC, lead acid		2	
		S12V300F	12V, 306-290WPC, lead acid		interp.	
		S12V370NGF	12V, 373-353WPC, lead acid		interp.	
		S12V550NGF	12V, 550-521WPC, lead acid		5	
		M12V105FT	12V, 100Ah, lead acid		5	
		M12V155FT	12V, 150Ah, lead acid		interp.	
		M12V180FT	12V, 175Ah, lead acid		5	
	Vision Group	UNA12-370	12V, 95 Ah, lead acid		1	
		UNA12-420	12V, 106 Ah, lead acid		2	
	Power-Sonic Co.	PHR-12350	12V, 95 Ah, lead acid		1	
	MK (Unigy)	HR7500ET	12V, 750 WPC, lead acid		5	
	CSB Battery/Hitachi Chemical Company	HRL12330WFR	12V, 330W, lead acid		1	
		HRL12540WFR	12V, 540W, lead acid		5	

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 15052



Manufacturer: Online Power Products		Table Description: Transformers			TABLE 4
Model Line: Power Wave 1 & 3					
Building Code: CBC 2016		Seismic Certification Limits:		$S_{DS} = 2.0$ $z/h = 1.0$ $S_{DS} = 3.0$ $z/h = 0.0$	$I_P = 1.5$
Component Type	Manufacturer	Model	Description	Notes	UUT
Transformer	OnLine Power Inc.	1400-105	50VA, Cu windings, 120-277V in, 120V out		extrap.
		1400-110	130VA, Cu windings, 208-277V in, 120V out		extrap.
		1400-111	60VA, Cu windings, 208-480V in, 120V out		extrap.
		1400-113	200VA, Cu windings, 120-277V in, 120V out		2
		1400-114	130VA, Cu windings, 208-480V in, 120V out		3
		1450-1473-02	5kVA, Cu windings, 120-277V in, 120-277V out		interp.
		1450-1613-01	7.5kVA, Cu windings, 208-277V in, 208-277V out		interp.
		1450-1661-01	7.5kVA, Cu windings, 480V in, 240/277V out		interp.
		1450-1473-04	10kVA, Cu windings, 120-277V in, 120-277V out		interp.
		1450-1473-06	15kVA, Cu windings, 120-277V in, 120-277V out		interp.
		1450-1629-02	15kVA, Cu windings, 120V in, 240V out		interp.
		1450-1507-02	15kVA, Cu windings, 158V in, 120V out		3
		1450-1508-02	15kVA, Cu windings, 158V in, 277V out		interp.
		1450-1613-02	15kVA, Cu windings, 208-277V in, 208-277V out		interp.
		1450-1661-02	15kVA, Cu windings, 480V in, 240/277V out		interp.
		1450-1613-03	18kVA, Cu windings, 208-277V in, 208-277V out		interp.
		1450-1473-07	20kVA, Cu windings, 120-277V in, 120-277V out		interp.
		1450-1629-03	20kVA, Cu windings, 120V in, 240V out		interp.
		1450-1507-03	20kVA, Cu windings, 158V in, 120V out		interp.
		1450-1508-03	20kVA, Cu windings, 158V in, 277V out		interp.
		1450-1613-04	20kVA, Cu windings, 208-277V in, 208-277V out		2
		1450-1661-03	20kVA, Cu windings, 480V in, 240/277V out		2
		1450-1506-06	23kVA, Cu windings, 120V in, 127-220V out		3

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

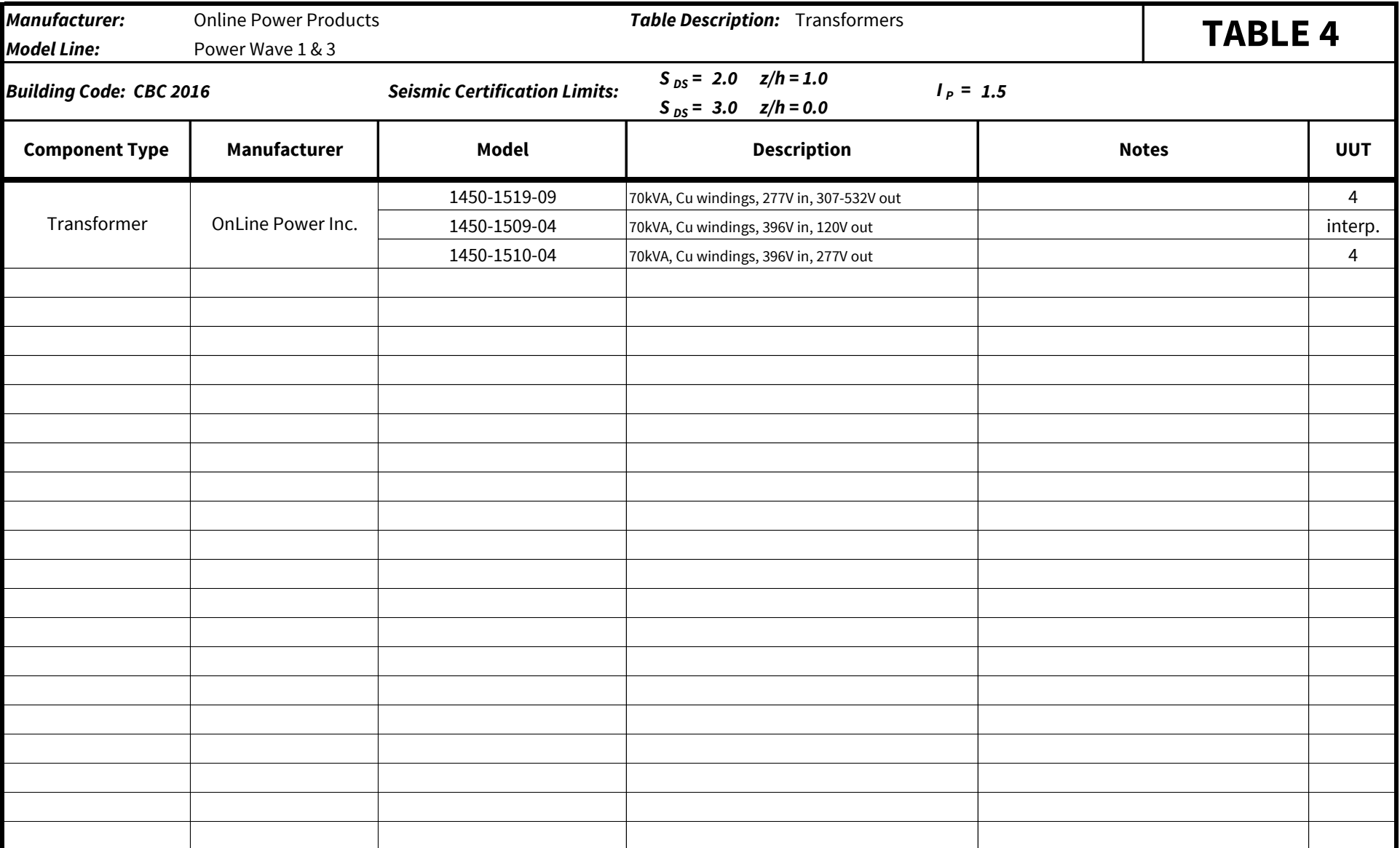
TRU PROJECT NO. 15052



Manufacturer: Online Power Products		Table Description: Transformers			TABLE 4
Model Line: Power Wave 1 & 3					
Building Code: CBC 2016		Seismic Certification Limits:		$S_{DS} = 2.0$ $z/h = 1.0$ $S_{DS} = 3.0$ $z/h = 0.0$	$I_P = 1.5$
Component Type	Manufacturer	Model	Description	Notes	UUT
Transformer	OnLine Power Inc.	1450-1620-06	23kVA, Cu windings, 120V in, 277-220V out		interp.
		1450-1525-06	23kVA, Cu windings, 277V in, 120-220V out		interp.
		1450-1619-06	23kVA, Cu windings, 277V in, 120-220V out		interp.
		1450-1519-06	23kVA, Cu windings, 277V in, 127-220V out		interp.
		1450-1509-01	30kVA, Cu windings, 213V in, 120V out		interp.
		1450-1510-01	30kVA, Cu windings, 213V in, 277V out		interp.
		1450-1509-02	40kVA, Cu windings, 213V in, 120V out		interp.
		1450-1510-02	40kVA, Cu windings, 213V in, 277V out		interp.
		1450-1506-07	45kVA, Cu windings, 120V in, 173-300V out		interp.
		1450-1620-07	45kVA, Cu windings, 120V in, 277-300V out		interp.
		1450-1525-07	45kVA, Cu windings, 277V in, 120-300V out		interp.
		1450-1619-07	45kVA, Cu windings, 277V in, 120-300V out		interp.
		1450-1519-07	45kVA, Cu windings, 277V in, 173-300V out		interp.
		1450-1509-03	50kVA, Cu windings, 396V in, 120V out		interp.
		1450-1510-03	50kVA, Cu windings, 396V in, 277V out		interp.
		1450-1620-08	58kVA, Cu windings, 120V in, 277-532V out		interp.
		1450-1506-08	58kVA, Cu windings, 120V in, 307-532V out		interp.
		1450-1525-08	58kVA, Cu windings, 277V in, 120-532V out		interp.
		1450-1619-08	58kVA, Cu windings, 277V in, 120-532V out		interp.
		1450-1519-08	58kVA, Cu windings, 277V in, 307-532V out		interp.
		1450-1506-09	70kVA, Cu windings, 120V in, 307-532V out		interp.
		1450-1525-09	70kVA, Cu windings, 277V in, 120-532V out		interp.
		1450-1619-09	70kVA, Cu windings, 277V in, 120-532V out		interp.

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TRU PROJECT NO. 15052



SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 15052



Manufacturer: Online Power Products		Table Description: Circuit Breakers			TABLE 5
Model Line: Power Wave 1 & 3					
Building Code: CBC 2016		Seismic Certification Limits:		$S_{DS} = 2.0$ $z/h = 1.0$ $S_{DS} = 3.0$ $z/h = 0.0$	$I_P = 1.5$
Component Type	Manufacturer	Model	Description	Notes	UUT
Circuit Breaker	Cutler Hammer (ED)	ED2125L	2P, 125A		1
		ED2150L	2P, 150A		interp.
		ED2175L	2P, 175A		interp.
		ED2200L	2P, 200A		1
		ED3125L	3P, 125A		interp.
		ED3150L	3P, 150A		interp.
		ED3175L	3P, 175A		4
	Cutler Hammer (QC)	QC1030	1P, 30A		1
		QC1050	1P, 50A		interp.
		QC1100	1P, 100A		interp.
		QC2015H	2P, 15A		interp.
		QC2020H	2P, 20A		1
		QC2025H	2P, 25A		interp.
		QC2030H	2P, 30A		interp.
		QC2040H	2P, 40A		interp.
		QC2050H	2P, 50A		1
		QC2060H	2P, 60A		interp.
		QC2070	2P, 70A		interp.
		QC2080	2P, 80A		interp.
		QC2090	2P, 90A		interp.
		QC2100H	2P, 100A		interp.
		QC3035H	3P, 35A		3
		QC3050H	3P, 50A		interp.

SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 15052



Manufacturer: Online Power Products		Table Description: Circuit Breakers			TABLE 5	
Model Line: Power Wave 1 & 3						
Building Code: CBC 2016		Seismic Certification Limits:		$S_{DS} = 2.0$ $z/h = 1.0$ $S_{DS} = 3.0$ $z/h = 0.0$	$I_p = 1.5$	
Component Type	Manufacturer	Model	Description	Notes	UUT	
Circuit Breaker	Cutler Hammer (QC)	QC3070H	3P, 70A		interp.	
		QC3080H	3P, 80A		interp.	
		QC3090H	3P, 90A		interp.	
		QC3100H	3P, 100A		3	
	Cutler Hammer (GHC)	GHC1015	1P, 15A		1	
		GHC1025	1P, 25A		1	
		GHC1035	1P, 35A		interp.	
		GHC1040	1P, 40A		interp.	
		GHC1050	1P, 50A		interp.	
		GHC1060	1P, 60A		interp.	
		GHC1080	1P, 80A		interp.	
		GHC1100	1P, 100A		2	
		GHC3020	3P, 20A		interp.	
		GHC3030	3P, 30A		interp.	
		GHC3040	3P, 40A		3	
		GHC3060	3P, 60A		interp.	
		GHC3080	3P, 80A		4	
		GHC3100	3P, 100A		3	
		Cutler Hammer (EGE)	EGE3020FFG	3P, 20A		4
			EGE3030FFG	3P, 30A		interp.
	EGE3040FFG		3P, 40A		interp.	
	EGE3050FFG		3P, 50A		interp.	
	EGE3070FFG		3P, 70A		interp.	

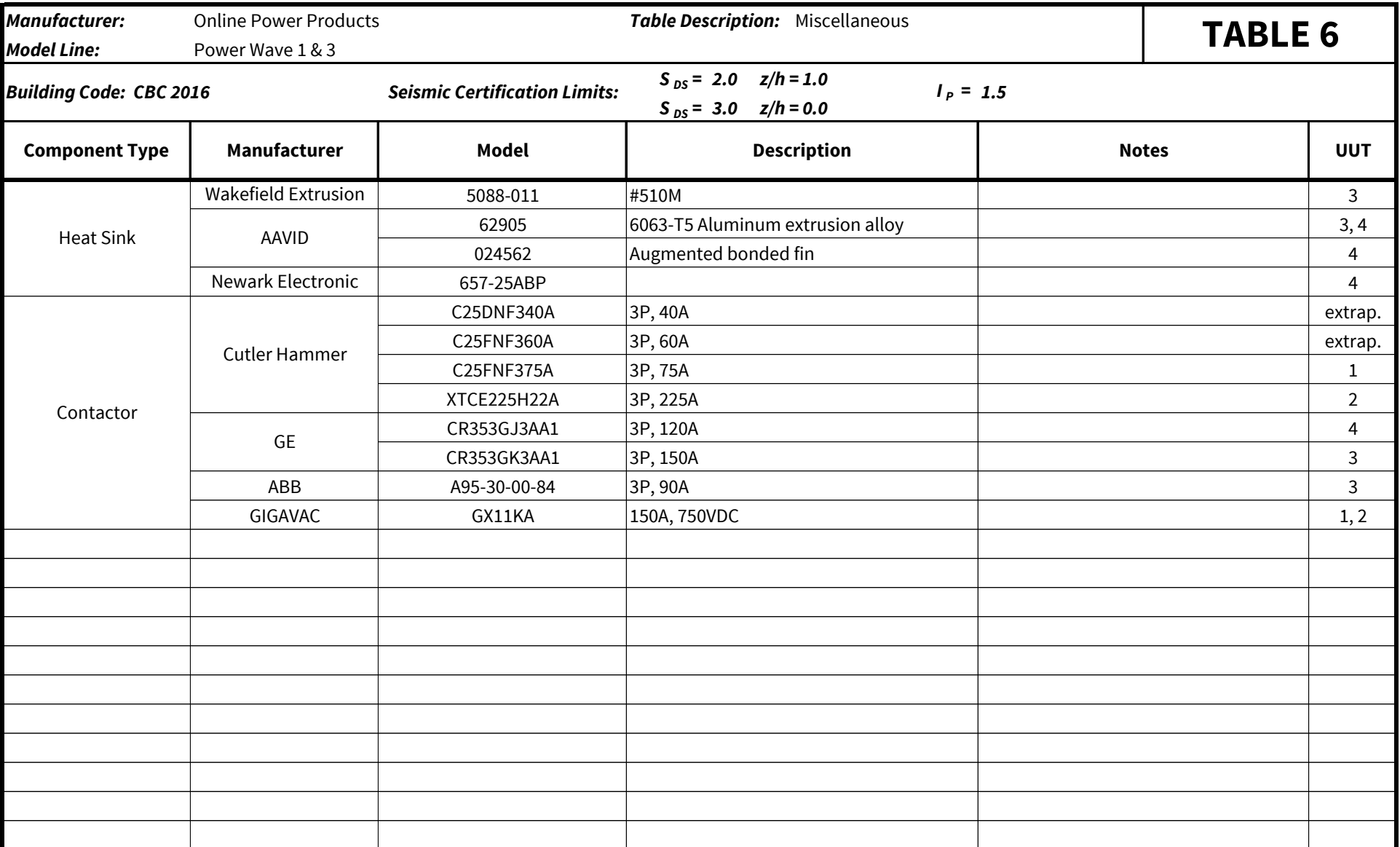
SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 15052



Manufacturer: Online Power Products		Table Description: Circuit Breakers			TABLE 5	
Model Line: Power Wave 1 & 3						
Building Code: CBC 2016		Seismic Certification Limits:		$S_{DS} = 2.0 \quad z/h = 1.0$ $S_{DS} = 3.0 \quad z/h = 0.0$		$I_P = 1.5$
Component Type	Manufacturer	Model	Description	Notes	UUT	
Circuit Breaker	Cutler Hammer (EGE)	EGE3080FFG	3P, 80A		interp.	
		EGE3100FFG	3P, 100A		4	
	ABB	TS3N060TW-2	2P, 60A		1	
		TS3N090TW-2	2P, 90A		3	
		TS3N100TW-2	2P, 100A		5	
		TS3N125TW-2	2P, 125A		interp.	
		TS3N150TW-2	2P, 150A		2	
		T3N200TW	2P, 200A		4	
		S201-C20	1P, 20A		2	
		S203-D20	3P, 20A		interp.	
		S203-B20	3P, 20A		interp.	
		T2S015TW	3P, 15A		interp.	
		T2S025TW	3P, 25A		interp.	
		T2S030TW	3P, 30A		interp.	
		T2S040TW	3P, 40A		interp.	
		T2S050TW	3P, 50A		interp.	
		T2S060TW	3P, 60A		interp.	
		T2S070TW	3P, 70A		interp.	
		T2S080TW	3P, 80A		interp.	
		T2S090TW	3P, 90A		4	

TRU PROJECT NO. 15052



SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 15052



Manufacturer: Online Power Products		Table Description: Miscellaneous			TABLE 6
Model Line: Power Wave 1 & 3					
Building Code: CBC 2016		Seismic Certification Limits:		$S_{DS} = 2.0 \quad z/h = 1.0$ $S_{DS} = 3.0 \quad z/h = 0.0$	$I_p = 1.5$
Component Type	Manufacturer	Model	Description	Notes	UUT
PCBD	OnLine Power Inc.	1625-287-01	1PH, 3-5kW, 10kW & 3PH, 10kW-15kW (24 Ω Resistor)		1
		1625-287-02	1PH, 7.5, 12.5, 15, 17kW & 3PH, 20 kVA-25kVA (14 Ω Resistor)		2
		1625-287-03	3PH, 40kVA (6.8 Ω, 1/2w Resistor), 150A CT		3
		1625-287-05	3PH, 20kVA	Identical to '-287-03 (software)	interp.
		1625-287-XX	Base Board (1, 3 Phase Power Board)		1, 2, 3
		1625-288-05	1PH, 3-10kW	Identical to '-288-07 (software)	interp.
		1625-288-07	1PH, 12.5kW, 17kW		2
		1625-288-XX	Base Board (Standard Control Board)		1, 2
		1625-291-01	1PH & 3PH, SCR Driver PDBD		4
		1625-291-XX	Base Board (SCR Drive Board)		1
		1625-296-05	3PH, Control PCBD, 10-15kVA with LCD		3
		1625-296-06	3PH, Control PCBD, 20-30kVA with LCD	Identical to '-296-05 (software)	interp.
		1625-296-07	3PH, Control PCBD, 50kVA/50kW with LCD	Identical to '-296-05 (software)	interp.
		1625-296-08	3PH, Control PCBD, 40kVA with LCD	Identical to '-296-05 (software)	interp.
		1625-296-XX	Base Board (3 Phase Control Board)		3
		1625-298-01	3PH, 50kVA & 50 kW, 150A CT		4
		1625-298-XX	Base Board (3 Phase Power Board)		4
		1625-305-XX	3PH, DC to DC converter, 50kVA/50kW		4
		1625-343-XX	1PH & 3PH, Alarm, Dirstribution PCBD		1
		1625-344-XX	1PH Control PCBD (Event Logging)		1
		1625-355-XX	3PH, Control PCBD (Event Logging)		4

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SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 15052



Manufacturer: Online Power Products		Table Description: Miscellaneous			TABLE 6
Model Line: Power Wave 1 & 3					
Building Code: CBC 2016		Seismic Certification Limits:	$S_{DS} = 2.0$ $S_{DS} = 3.0$	$z/h = 1.0$ $z/h = 0.0$	$I_P = 1.5$
Component Type	Manufacturer	Model	Description	Notes	UUT
PCBD	OnLine Power Inc.	1625-362-XX	3PH, Netagent Interface (Network Mgmt)		4
		1625-367-XX	3PH, Metering Interface PCBD		4
		1625-405-XX	1PH & 3PH, Slow Transfer PCBD		1
		1625-406-XX	3PH, Output Overload Sensing PCBD		1
		1625-407-XX	1PH & 3PH, Fast Transfer Processor PCBD		1
		1625-461-XX	1PH & 3PH, Alarm Relay PCBD		2
		1625-352-XX	1 PH, Audio Alarm PCBD		1
Current Sensor	LEM	LA100-P	100A		3, 4
Switch	Control Switches International Inc.	N63-US10726-05	3P, 55A, 600V		3
		3N125US10726-03	3P, 125A, 600V		
		A200US10726-02	3P, 175A, 600V		4
Rectifier Diode	Int. Rectifier	IRKD91/14	91A		3, 4
	Semikron	SKKD 100/16 G6	91A		3, 4
	Powerex	CD411699B	91A, 1800V		3, 4
		CD411699C			3, 4
Diode Bridge	Multicom	MCCM3508-RH	35A, 800VDC		3, 4
	Collmer Semiconductor	KBPC35-04	35AMP, 400VDC		1, 2
	General Semiconductor	GBPC35-04	35AMP, 400VDC		1, 2
SCR	Semikron	SKKT 92/12E	95A		3
		SKKT 132/12E	132A		4
LCD Display	OPTREX	C-51847NFJ-SLW-AEN	4.5-5.5V, 98.5mm x 61mm x 15.6mm		3

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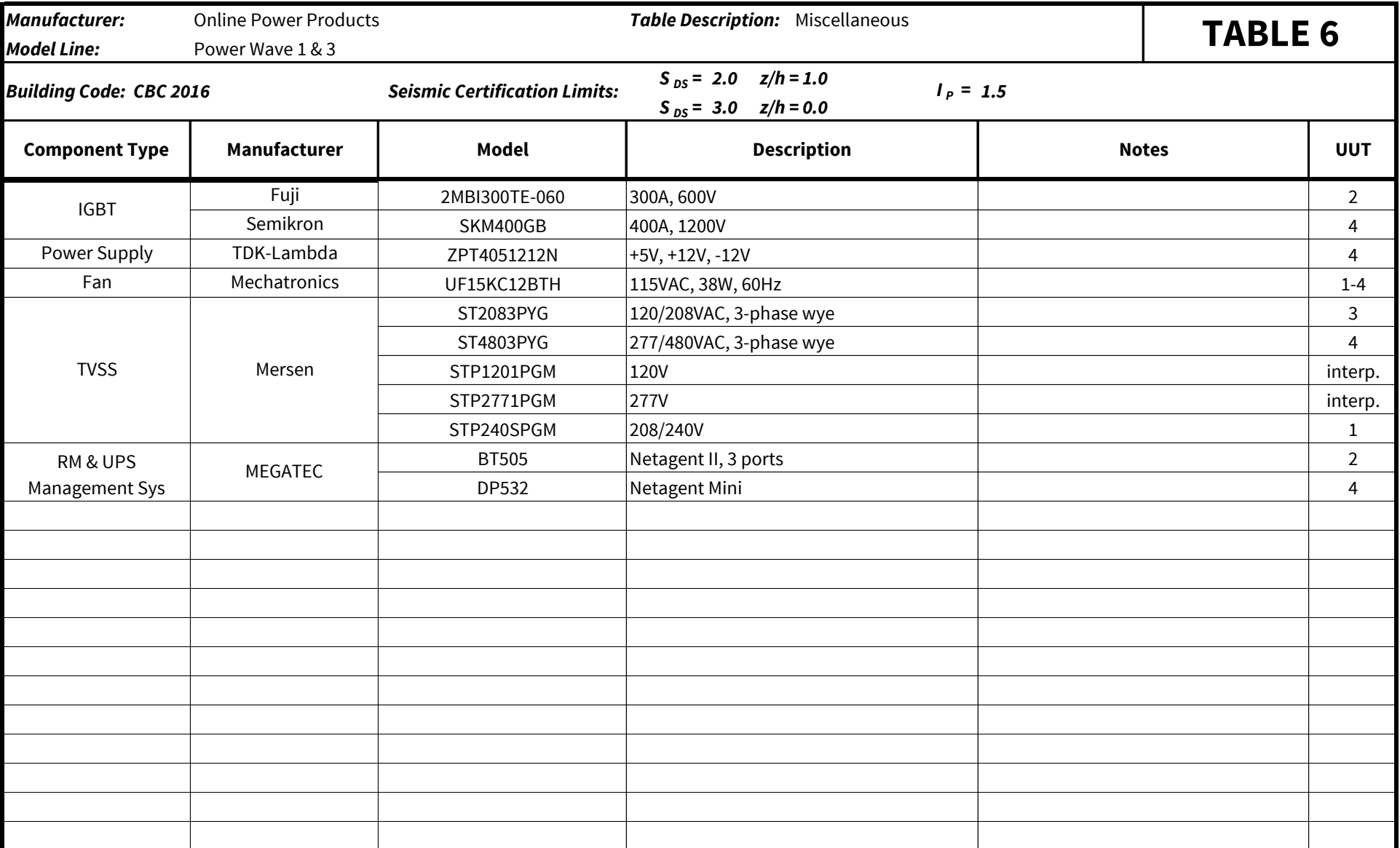
SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

TRU PROJECT NO. 15052



Manufacturer: Online Power Products		Table Description: Miscellaneous			TABLE 6
Model Line: Power Wave 1 & 3					
Building Code: CBC 2016		Seismic Certification Limits:	$S_{DS} = 2.0$ $z/h = 1.0$ $S_{DS} = 3.0$ $z/h = 0.0$	$I_p = 1.5$	
Component Type	Manufacturer	Model	Description	Notes	UUT
LCD Display	Panasonic	AIG05GQ02D	24VDC, 3.6W, 73mm x 38.4mm		4
Inductor	OnLine Power Inc.	1450-1470-01	55A, 200uH, 120-277VAC		3
		1450-1470-02	75A, 200uH, 120-277VAC		interp.
		1450-1470-03	90A, 200uH, 120-277VAC		2
		1450-1470-04	125A, 200uH, 120-277VAC		interp.
		1450-1472-01	55A, 500uH, 80-240VDC		interp.
		1450-1472-02	75A, 350uH, 80-240VDC		3
		1450-1472-03	90A, 350uH, 80-240VDC		2
		1450-1522	125A, 500uH, 12-15Hz, 125A		4
Capacitor	FJ Enterprise	606R330A4T	60mFD, 330VAC, 60Hz		3
		406R660A4T	40mFD, 600VAC, 60Hz		4
		156R370A4T	15mFD, 370VAC, 60Hz		3, 4
Terminal Block	Mersen	MPDB63153	600V, 175A		3
		MPDB63193	600V, 135A		interp.
		MPDB63150	600V, 135A		interp.
		MPDB67003	600V, 310A		interp.
		MPDB67000	600V, 310A		interp.
		MPDB67023	600V, 350A		3
		MPDB67423	600V, 310A		4
	Weidmuller	WDU35	690V, 109A		1
		WPE35	Ground, 12-2 AWG		1
IGBT	Fuji	2MBI150TA-060	150A, 600V		1
		2MBI200TE-060	200A, 600V		3

TRU PROJECT NO. 15052



UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 15052



Manufacturer:	Online Power Products	UUT 1
Model Line:	Power Wave 1 & 3	
Model Number:	SV-PW8.0A0100T1	
Serial Number:		N/A

Product Construction Summary:
Base & Top: 12 GA. carbon steel, **Back & Sides:** 14 GA. carbon steel, **Doors:** 16 GA. carbon steel.
 Cabinet type A

Options/Subcomponent Summary:
Lead Acid batteries: 12V 95 Ah; 12V 330W **Breakers:** Cutler Hammer: (ED) 125 & 200A; (QC) 30, 50, & 100A; (GHC) 15 & 25A| ABB: TS 60A

UUT Properties										
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)						
	Depth	Width	Height	Front-Back	Side-Side	Vertical				
1795	18	39	68	17.3	12.7	19.1				
UUT Highest Passed Seismic Run Information										
Building Code		Test Criteria		S _{DS}	z/h	I _P	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016		ICC-ES AC156		2.0	1.0	1.5	3.20	2.40	2.0	0.8
				3.0	0.0	1.5				

Test Mounting Details:



The UUT was rigid base mounted to the table using (6) 5/8" Grade 8 bolts.
 Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
 Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 15052



Manufacturer:	Online Power Products	UUT 2
Model Line:	Power Wave 1 & 3	
Model Number:	SV-PW017R1100T1	
Serial Number:		N/A

Product Construction Summary:
Base & Top: 12 GA. carbon steel, **Back & Sides:** 14 GA. carbon steel, **Doors:** 16 GA. carbon steel.
 Cabinet type B

Options/Subcomponent Summary:
Lead Acid batteries: 12V, 285-270WPC; 12V, 106 Ah **Transformers:** 200VA, Cu windings, 120-277V in, 120V out; 20kVA, Cu windings, 208-277V in, 208-277V out; 20kVA, Cu windings, 480V in, 240/277V out **Breakers:** Cutler Hammer: (GHC) 100A| ABB: 125 & 200A

UUT Properties									
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)					
	Depth	Width	Height	Front-Back	Side-Side	Vertical			
4512	30.5	51	70	9.5	12	22			
UUT Highest Passed Seismic Run Information									
Building Code		Test Criteria	S _{DS}	z/h	I _P	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016		ICC-ES AC156	2.0	1.0	1.5	3.20	2.40	2.0	0.8
			3.0	0.0	1.5				

Test Mounting Details:



The UUT was rigid base mounted to the table using (12) 5/8" Grade 8 bolts.
 Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
 Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 15052



Manufacturer:	Online Power Products	UUT 3
Model Line:	Power Wave 1 & 3	
Model Number:	SV-PW010B05LHT3-VA	
Serial Number:		N/A

Product Construction Summary:
Base & Top: 12 GA. carbon steel, **Back & Sides:** 14 GA. carbon steel, **Doors:** 16 GA. carbon steel.

Options/Subcomponent Summary:
Transformers: 130VA, Cu windings, 208-480V in, 120V out; 15kVA, Cu windings, 158V in, 120V out; 23kVA, Cu windings, 120V in, 127-220V out **Breakers:** Cutler Hammer: (QC) 35 & 100A; (GHC) 40 & 100A| ABB: 90A

UUT Properties										
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)						
	Depth	Width	Height	Front-Back	Side-Side	Vertical				
1083	18	39	68	23.1	12.4	20				
UUT Highest Passed Seismic Run Information										
Building Code		Test Criteria		S _{DS}	z/h	I _P	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016		ICC-ES AC156		2.0	1.0	1.5	3.20	2.40	2.0	0.8
				3.0	0.0	1.5				

Test Mounting Details:



The UUT was rigid base mounted to the table using (6) 5/8" Grade 8 bolts.
 Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
 Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 15052



Manufacturer:	Online Power Products	UUT 4
Model Line:	Power Wave 1 & 3	
Model Number:	SV-PW050H09LHT3-KW	
Serial Number:		N/A

Product Construction Summary:
Base & Top: 12 GA. carbon steel, **Back & Sides:** 14 GA. carbon steel, **Doors:** 16 GA. carbon steel.

Options/Subcomponent Summary:
Transformers: 70kVA, Cu windings, 277V in, 307-532V out; 70kVA, Cu windings, 396V in, 277V out; **Breakers:** Cutler Hammer: (ED) 175A; (GHC) 80A; (EGE) 20 & 100A| ABB: 90 & 200A

UUT Properties										
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)						
	Depth	Width	Height	Front-Back	Side-Side	Vertical				
2565	18	39	68	20.3	11.2	21.5				
UUT Highest Passed Seismic Run Information										
Building Code		Test Criteria		S _{DS}	z/h	I _P	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016		ICC-ES AC156		2.0	1.0	1.5	3.20	2.40	2.0	0.8
				3.0	0.0	1.5				

Test Mounting Details:

The UUT was rigid base mounted to the table using (6) 5/8" Grade 8 bolts.
 Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
 Contents were included in testing per operating conditions.

UNIT UNDER TEST (UUT) SUMMARY SHEET

TRU PROJECT NO. 15052



Manufacturer:	Online Power Products	UUT 5
Model Line:	Power Wave 1 & 3	
Model Number:	51 Inch Battery Cabinet	
Serial Number:		N/A

Product Construction Summary:
Base & Top: 12 GA. carbon steel, **Back & Sides:** 14 GA. carbon steel, **Doors:** 16 GA. carbon steel.

Options/Subcomponent Summary:
Lead Acid batteries: 12V, 550-521WPC; 12V, 100Ah; 12V, 175Ah; 12V, 750 WPC; 12V, 540W **Breakers:** ABB: 100A

UUT Properties										
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)						
	Depth	Width	Height	Front-Back	Side-Side	Vertical				
4320	30.5	51	70	9.4	8.5	8.9				
UUT Highest Passed Seismic Run Information										
Building Code		Test Criteria		S _{DS}	z/h	I _p	A _{FLX-H}	A _{RIG-H}	A _{FLX-V}	A _{RIG-V}
CBC 2016		ICC-ES AC156		2.0	1.0	1.5	3.20	2.40	2.0	0.8
				3.0	0.0	1.5				

Test Mounting Details:



The UUT was rigid base mounted to the table using (12) 5/8" Grade 8 bolts.
 Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.
 Contents were included in testing per operating conditions.