



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

**APPLICATION FOR OSHPD SPECIAL SEISMIC
CERTIFICATION PREAPPROVAL (OSP)**

OFFICE USE ONLY

APPLICATION #: OSP – 0638

OSHPD Special Seismic Certification Preapproval (OSP)

Type: New Renewal

Manufacturer Information

Manufacturer: Vertiv

Manufacturer's Technical Representative: Keith Goshia

Mailing Address: 975 Pittsburgh Drive, Delaware, OH 43015

Telephone: (740) 833-8557

Email: keith.goshia@vertiv.com

Product Information

Product Name: Liebert EXL UPS

Product Type: Uninterruptible Power Supply (UPS)

Product Model Number: Varies (See attachment)

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

General Description: UPS Cabinet

Mounting Description: Base mounted-rigid

Applicant Information

Applicant Company Name: TRU Compliance, by Structural Integrity Associates, Inc.


Contact Person: Galen Reid

Mailing Address: 5215 Hellyer Ave., Suite 210, San Jose, CA 95138

Telephone: 844-878-0200

Email: greid@structint.com

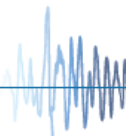
I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2016.

Signature of Applicant: 

Date: 12/30/2019

Title: Program Manager

Company Name: TRU Compliance, by Structural Integrity Associates, Inc.





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

Company Name: TRU Compliance, by Structural Integrity Associates, Inc.

Name: Andrew M. Coughlin California License Number: S6082

Mailing Address: 5215 Hellyer Ave., Suite 210, San Jose, CA 95138

Telephone: 844-878-0200 Email: acoughlin@structint.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): _____

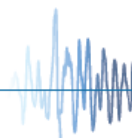
Testing Laboratory

Company Name: Environmental Testing Laboratory

Contact Name: Jeremy Lange

Mailing Address: 11034 Indian Trail, Dallas, TX 75229

Telephone: (972) 247-9657 Email: jeremy@etldallas.com





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Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = 1.11 ($S_{DS} = 1.54, z/h = 1$); 0.72 ($S_{DS} = 1.61, z/h = 0$)

S_{DS} (Design spectral response acceleration at short period, g) = 1.54 ($z/h = 1$), 1.61 ($z/h = 0$)

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

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1 ($S_{DS} = 1.54$), 0 ($S_{DS} = 1.61$)

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): Product Matrices

OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2025

Signature: William Staehlin

Date: May 13, 2021

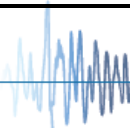
Print Name: William Staehlin

Title: Senior Structural Engineer

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

1900511-CR-001 R0



Manufacturer: Vertiv Corporation Model Line: EXL-S1	TABLE 1
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Certified Product Construction Summary:
Carbon steel frame and skins

Certified Options Summary:
600 kVA UPS with backfeed disconnect and sharing inductor

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 2019	Seismic Certification Limits:	$S_{DS} = 1.54 g$ z/h=1.0	$I_P = 1.5$
		$S_{DS} = 1.61 g$ z/h=0.0	

Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height			
EXL-S1 UPS	52SN600	38.9	74.75	79	2788		1

**SPECIAL SEISMIC CERTIFICATION
CERTIFIED SUBCOMPONENT MATRIX**

1900511-CR-001 R0



Manufacturer:	Vertiv Corporation	Table Description: Modules	TABLE 2
Model Line:	EXL-S1		

Building Code:	CBC 2019	Seismic Certification Limits:	$S_{DS} = 1.54 g \quad z/h = 1.0$	$I_p = 1.5$
			$S_{DS} = 1.61 g \quad z/h = 0.0$	

Component Type	Manufacturer	Model	Description	Notes	UUT
Power Module	Vertiv Corporation	559310G1	Carbon steel		1
Boost Module	Vertiv Corporation	559310G1	Carbon steel		1
Static Switch	Vertiv Corporation	563980G1	Carbon steel		1

UNIT UNDER TEST (UUT) SUMMARY SHEET

1900511-CR-001 R0



Manufacturer: Vertiv Corporation
Model Line: EXL-S1

UUT	Unit Description	Report Number	Testing Laboratory	S _{DS}	z/h	I _p
1	EXL-S1 UPS	15392A Rev. 2 Seismic Certification Test Report and Report 15392A Rev. 2_Addendum 1	ETL - Dallas	1.54 1.61	1 0	1.5

Notes:

UNIT UNDER TEST (UUT) SUMMARY SHEET

1900511-CR-001 R0



Manufacturer: Vertiv Corporation	UUT 1
Model Line: EXL-S1	
Model Number: 52SN600	
Serial Number: FEMAN62	

Product Construction Summary:
Carbon steel frame and skins

Options/Subcomponent Summary:
Power Module x 3 (PN: 559318G1), Boost Module x 1 (PN: 559310G1), Static Switch x1 (PN:563980G1)

UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height	Front-Back	Side-Side	Vertical
2788	38.9	74.75	79	7.88	8.29	17.48

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 2019	ICC-ES AC156 (2015)	1.54	1.0	1.5	2.46	1.85	1.07	0.43
		1.61	0.0					

Test Mounting Details:



UUT base mounted-rigid to shake table with eight (8) L-brackets provided by the manufacturer (PN: 567256G1). Each L- bracket is attached to the front of the unit with four (4) M12X50 bolts. Each bracket was attached to the shake table with a 1/2" Grade 8 bolt with flat washer.

Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

Contents were included in testing per operating conditions.