



**DEPARTMENT OF HEALTH CARE ACCESS AND INFORMATION  
FACILITIES DEVELOPMENT DIVISION**

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

OFFICE USE ONLY

**APPLICATION #: OSP-0674**

**HCAI Special Seismic Certification Preapproval (OSP)**

Type:  New  Renewal

**Manufacturer Information**

Manufacturer: Vertiv Corporation

Manufacturer's Technical Representative: Keith Goshia

Mailing Address: 975 Pittsburgh Drive, Delaware, OH 43015

Telephone: (740) 833-8557

Email: keith.goshia@vetiv.com

**Product Information**

Product Name: UPS and Batteries

Product Type: UPS

Product Model Number: Varies, see tables

General Description: UPS (lithium-ion battery cabinet) base mounted rigid standalone or base mounted rigid ganged.

Mounting Description: Rigid, Floor Mounted

Tested Seismic Enhancements: None

DATE: 03/08/2022

**Applicant Information**

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

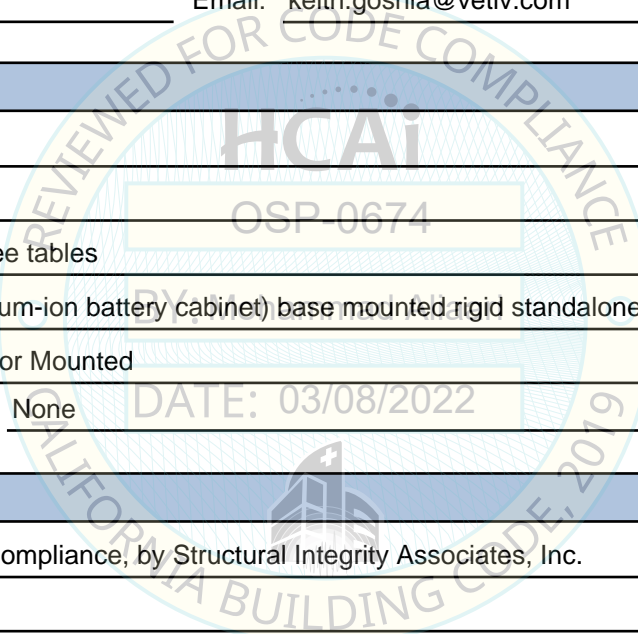
Contact Person: Katie Braman

Mailing Address: 5215 Hellyer Ave, Suite 101, San Jose, CA 95138-1025

Telephone: (541) 526-1947

Email: kbraman@structint.com

Title: Program Manager





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

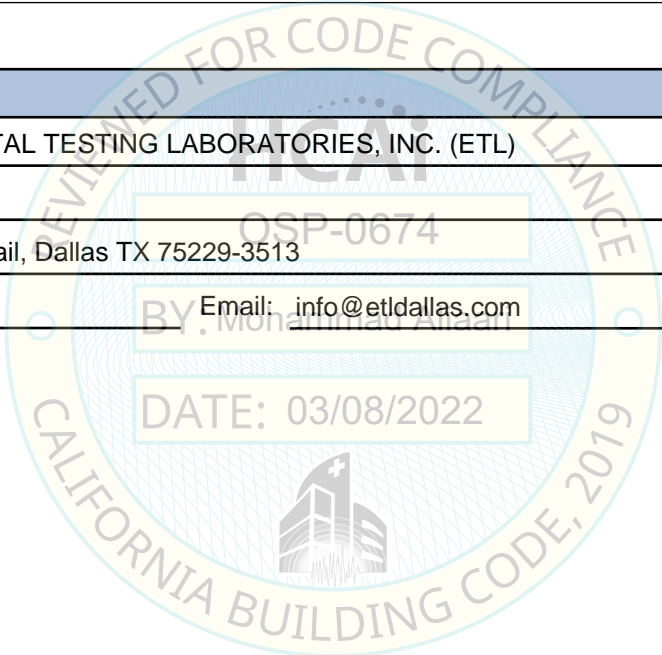
Company Name: STRUCTURAL INTEGRITY ASSOCIATES, INC.  
Name: Andrew Coughlin California License Number: S6082  
Mailing Address: 5215 Hellyer Ave, Suite 101, San Jose, CA 95138-1025  
Telephone: (415) 635-8461 Email: acoughlin@structint.com

**Certification Method**

GR-63-Core       ICC-ES AC156       IEEE 344       IEEE 693       NEBS 3  
 Other (Please Specify): \_\_\_\_\_

**Testing Laboratory**

Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)  
Contact Person: Jeremy Lange  
Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513  
Telephone: (972) 247-9657 Email: info@etldallas.com





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**Seismic Parameters**

Design Basis of Equipment or Components ( $F_p/W_p$ ) = 1.224 @ 1.7g, z/h =1; 0.967@2.15g, z/h=0

SDS (Design spectral response acceleration at short period, g) = 1.7g @ z/h=1; 2.15g @ z/h=0

$a_p$  (Amplification factor) = 1.0

$R_p$  (Response modification factor) = 2.5

$\Omega_0$  (System overstrength factor) = 2.0

$I_p$  (Importance factor) = 1.5

z/h (Height ratio factor) = 1 and 0

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment

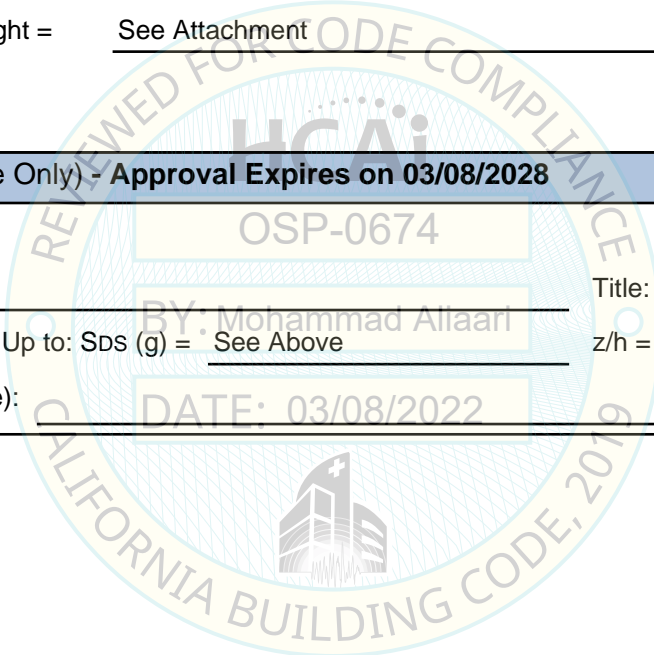
**HCAI Approval (For Office Use Only) - Approval Expires on 03/08/2028**

Date: 3/8/2022

Name: Mohammad Aliaari Title: Senior Structural Engineer

Special Seismic Certification Valid Up to: SDS (g) = See Above z/h = See Above

Condition of Approval (if applicable): DATE: 03/08/2022



# SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

2000359-CR-001-R0



<b>Manufacturer:</b> Vertiv Corporation	<b>TABLE 1</b>
<b>Model Line:</b> Li-Ion Battery Cabinet	

**Certified Product Construction Summary:**  
14 ga. Carbon Steel Cabinet

**Certified Options Summary:**  
11-17 Lithium Battery Modules. Quantity is uniquely identified by model number.  
All other subcomponents are identical between models.

**Mounting Configuration:**  
Base mounted - Rigid (Standalone)  
Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

**Building Code: CBC 2019**      **Seismic Certification Limits:**       $S_{DS} = 1.70\text{ g}$     $z/h = 1.0$        $I_p = 1.5$   
 $S_{DS} = 2.15\text{ g}$     $z/h = 0.0$

Model Line	Model	Dimensions (in)			Weight (lb)	Notes	UUT
		Depth	Width	Height <sup>1</sup>			
Lithium-Ion Battery Cabinet	PHR2042-001A	21	26	81	763	11 Battery Modules	2
	PHR2652-001A	21	26	91	866	13 Battery Modules	Interp.
	PHR2852-001A	21	26	91	902	14 Battery Modules	Interp.
	PHR3262-001A	21	26	91	974	16 Battery Modules	Interp.
	PHR3462-001A	21	26	91	1010	17 Battery Modules	1

Note:  
<sup>1</sup>The 91.0" height includes the height of the top hat junction box.

# SPECIAL SEISMIC CERTIFICATION CERTIFIED COMPONENT MATRIX

2000359-CR-001-R0



<b>Manufacturer:</b> Vertiv Corporation	<b>TABLE 2</b>
<b>Model Line:</b> Li-Ion Battery Cabinet	

**Certified Product Construction Summary:**  
14 ga. Carbon Steel Cabinet

**Certified Options Summary:**  
22-34 Lithium Battery Modules. Quantity is uniquely identified by model number.  
All other subcomponents are identical between models.

**Mounting Configuration:**  
Base mounted - Rigid (Ganged)  
Note: Installed mounting configuration must be of similar configuration and equivalent strength and stiffness to those tested.

**Building Code: CBC 2019**      **Seismic Certification Limits:**       $S_{DS} = 1.70 g$   $z/h = 1.0$        $I_p = 1.5$   
 $S_{DS} = 2.15 g$   $z/h = 0.0$

Model Line	Model <sup>4</sup>	Dimensions (in) <sup>4</sup>			Weight <sup>2</sup> (lb)	Notes	UUT
		Depth	Width	Height <sup>3</sup>			
Lithium-Ion Battery Cabinet	PHR2042-001A	21	52	91	1724	22 Battery Modules	Interp.
	PHR2652-001A	21	52	91	1773	26 Battery Modules	Interp.
	PHR2852-001A	21	52	91	1845	28 Battery Modules	Interp.
	PHR3262-001A	21	52	91	1917	32 Battery Modules	Interp.
	PHR3462-001A	21	52	91	1989	34 Battery Modules <sup>1</sup>	3

Notes:  
<sup>1</sup> UUT1 and UUT2 were ganged to together and populated with 17 battery modules each to create UUT3.  
<sup>2</sup> The ganged unit weighs less than identical standalone units due to the interior panels being removed to join the two battery cabinets.  
<sup>3</sup> The 91.0" height includes the height of the top hat junction box.  
<sup>4</sup> The model numbers do not change for the ganged configuration.

# SPECIAL SEISMIC CERTIFICATION CERTIFIED SUBCOMPONENT MATRIX

2000359-CR-001-R0



<b>Manufacturer:</b> Vertiv Corporation <b>Model Line:</b> Li-Ion Battery Cabinet			<b>Table Description:</b> Various Subcomponents		<b>TABLE 3</b>
<b>Building Code:</b> CBC 2019			<b>Seismic Certification Limits:</b> $S_{DS} = 1.70g \ z/h = 1.0$ $S_{DS} = 2.15g \ z/h = 0.0$		
Component Type	Manufacturer	Model	Description	Notes	UUT
Battery Modules	Samsung	EM2031AE00XA	Type A, 36.0 lbs, Plastic Case		1,2,3
		EM2031AE00YA	Type B, 36.0 lbs, Plastic Case		1,2,3
SMU	Samsung	V049-0011XA	Carbon Steel, Plastic		1,2,3
SMPS Assembly	Samsung	V044-0006XA	3-Phase Type A, Carbon Steel, Plastic		1,2,3
		SJ94-00238B	3-Phase Type B, Carbon Steel, Plastic		1,2,3
		V044-0004XA	1-Phase Type A, Carbon Steel, Plastic		1,2,3
		V044-0005AA	1-Phase Type B, Carbon Steel, Plastic		1,2,3
Rack Frame	Samsung	V808-00066A	White, Carbon Steel, 298 lbs		Interp.
		V808-00068A	Black, Carbon Steel, 298 lbs		1,2,3
Junction Box	Samsung	571563P1	Carbon Steel, 30.5 lbs, 10.0" High		1,3





# UNIT UNDER TEST (UUT) SUMMARY SHEET

2000359-CR-001-R0



<b>Manufacturer:</b> Vertiv Corporation	<b>UUT 1</b>
<b>Model Line:</b> Li-Ion Battery Cabinet	
<b>Model Number:</b> PHR3462-001A	
<b>Serial Number:</b> N/A	

**Product Construction Summary:**  
14 ga. Carbon Steel Cabinet

**Options/Subcomponent Summary:**  
**Battery Modules:** (9) EM2031AE00XA, (8) EM2031AE00YA, **SMU:** V049-0011XA, **SMPS Assembly:** V044-0006XA, SJ94-00238B, V044-0004XA, V044-0005AA, **Rack Frame:** V808-00068A, **Junction Box:** 571563P1

### UUT Properties

Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height <sup>1</sup>	Front-Back	Side-Side	Vertical
1010	21.0	26.0	91.0	6.2	5.7	16.0

<sup>1</sup>Total height includes the height of the junction box on top of the cabinet.

### UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>P</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)
CBC 2019	ICC-ESAC156	1.70	1.0	1.5	2.77	2.08	1.43	0.57
		2.15	0.0					

**Test Mounting Details:**



Base Mounted - Rigid: Four (4) 5/8" Grade 5 bolts with four (4) plate washers.  
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

2000359-CR-001-R0



<b>Manufacturer:</b> Vertiv Corporation	<b>UUT 3</b>
<b>Model Line:</b> Li-Ion Battery Cabinet	
<b>Model Number:</b> PHR3462-001A (2) <b>Serial Number:</b> N/A	

**Product Construction Summary:**  
14 ga. Carbon Steel Cabinet

**Options/Subcomponent Summary:**  
**Battery Modules:** (18) EM2031AE00XA, (16) EM2031AE00YA, **SMU:** V049-0011XA, **SMPS Assembly:** V044-0006XA, SJ94-00238B, V044-0004XA, V044-0005AA, **Rack Frame:** V808-00068A, **Junction Box:** 571563P1

<i>UUT Properties</i>						
Weight (lb)	Dimension (in)			Lowest Natural Frequency (Hz)		
	Depth	Width	Height <sup>1</sup>	Front-Back	Side-Side	Vertical
1989	21.0	52.0	91.0	2.6	6.0	8.4

<sup>1</sup>The total height includes the height of the junction box on top of the cabinet.

<i>UUT Highest Passed Seismic Run Information</i>									
Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	I <sub>p</sub>	A <sub>FLX-H</sub> (g)	A <sub>RIG-H</sub> (g)	A <sub>FLX-V</sub> (g)	A <sub>RIG-V</sub> (g)	
CBC 2019	ICC-ES AC156	1.70	1.0	1.5	2.77	2.08	1.43	0.57	
		2.15	0.0						

**Test Mounting Details:**



Base Mounted - Rigid: Eight (8) 5/8" Grade 5 bolts with eight (8) 5/8" plate washers. The two (2) PHR3462-001A units are ganged together using twelve (12) M10 Grade 8.8 bolts, washers and nuts through the holes on the sides of the units. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test. Contents were included in testing per operating conditions.