APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0279 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: **HASKRIS**

Manufacturer's Technical Representative: Allen Dreyer

Mailing Address: 100 Kelly Street, Elk Grove, IL. 60007

Telephone: On File Email: On File

Product Information

Product Name: **R1200; OPC-SERIES & WW-SERIES**

Product Type: OUTRDOOR CHILLERS & HEAT EXCHANGERS

Product Model Number: SEE ATTACHMENT 1
(List all unique product identification numbers and/or part numbers)

General Description: Self-contained air-cooled process fluid chiller systems, and fluid-to-fluid heat exchangers. All enclosures are powder-coated carbon steel. Seismic enhancements incorporated into the test units and modifications required to address anomalies observed during tests shall be incorporated into the certified units.

Mounting Description: Rigid base mounted.

Applicant Information

Applicant Company Name: **EASE LLC.**

Contact Person: JONATHAN ROBERSON, S.E.

Mailing Address: 5877 Pine Ave, Suite 210, Chino Hills, CA. 91709

Telephone: (909) 606-7622 Email: (909) 606-7622

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: 11/17/16

Title: PRINCIPAL ENGINEER Company Name: **EASE LLC.**

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

Company Name: **EASE LLC.**

Name: Jonathan Roberson, S.E. California License Number: S4197

Mailing Address: 5877 Pine Ave, Suite 210, Chino Hills, CA. 91709

Telephone: 909-606-7622 Email: jon@easeco.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, Inc.**

Contact Name: Brady Richard

Mailing Address: 11034 Indian Trail, Dallas, TX 75229-3513

Telephone: 972-247-9657 Email: brady@etldallas.com

Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = **1.872**

S_{DS} (Design spectral response acceleration at short period, g) = **2.6**

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 2**

Overall dimensions and weight (or range thereof) = **SEE ATTACHMENT 1**

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) = 1.0

Ω_0 (System overstrength factor) = 2.0

C_d (Deflection amplification factor) = 1.0

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): Attachments 1 & 2

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

Signature: Date: 12/21/16

Print Name: M. R. Karim Title: SHFR

Special Seismic Certification Valid Up to : S_{DS} (g) = 2.6 z/h = 1.0

Condition of Approval (if applicable):

ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS

TABLE 1: SEISMIC CERTIFIED SYSTEMS & COMPONENTS

Manufacturer	**HASKRIS**
Product Line	**OUTDOOR CHILLERS AND RECIRCULATING WATER SYSTEMS**

COMPONENT	PART NO.	DIMENSIONS (IN.) W	D	H	MAX. WT. (LB.)	MOUNTING	BASIS [1]
Chiller							
R1200 Outdoor Chiller	R1200-Seismic -006	49	36	75	1460	Rigid Base	UUT1
OPC10 Outdoor Process	OPC 10-460 V-3-Seismic	49	36	75	1460	Rigid Base	INT
OPC8 Outdoor Process Chiller	OPC 8-460 V-3-Seismic	49	36	75	1430	Rigid Base	UUT2
WW3 Platform Non-Refrigerated Water Recirculating Systems (Water-to-Water)	WW3-Seismic -001	30	25	34	300	Rigid Base	UUT3
WW4 Platform Non-Refrigerated Water Recirculating Systems (Water-to-Water)	WW4-Seismic -001	30	25	34	315	Rigid Base	UUT4

Mount	Rigid Base: a free-standing, base mounted condition with the component rigidly attached to a supporting structure and no lateral support above the base (i.e. Floor Mounted).
Notes	1. BASIS: • UUT#: Indicates that a test specimen matching these characteristics was tested. • INT (Interpolate): indicates a model that was not specifically tested, and by which seismic qualification was established through evaluation of testing of other, similar models in the product line. 2. Seismic Certification is limited to units which include the major subassemblies identified in Table 2: Seismic Qualified Internal Subassemblies. 1. Tabulated Weights are dry weights

TABLE 2: SEISMIC QUALIFIED INTERNAL SUBASSEMBLIES

MANUFACTURER	PRODUCT SERIES	MODEL	NOTES
COMPRESSORS			
Copeland	Scroll™ ZR compressors	ZR108KCE-TFD-265	UUT 1
Copeland	Scroll™ ZR compressors	ZR125KCE-TFD-265	
Copeland	Scroll™ ZR compressors	ZR144KCE-TFD-265	UUT 2
PUMP			
MTH	Regenerative Turbine	T41M-AB, 2HP	UUT 1
MTH	Regenerative Turbine	T51M-AB, 5HP	UUT 2
MTH	Regenerative Turbine	T41P-AB, 2HP	UUT 3
MTH	Regenerative Turbine	T51P-AB, 5HP	UUT 4
FAN MOTOR/BLADE			
Continental Fan Manufacturing	Direct Drive	AFK180	UUT 1, UUT 2
EVAPORATOR			
GEA PHE SYSTEMS North America, Inc.	Brazed Plate Heat Exchanger	WP5-30	UUT 1, UUT 2
VARIABLE FREQUENCY DRIVE (VFD)			
Yaskawa	AC Drive	CIMR-VU4A0005GAAA	UUT 1, UUT 2
HEAT EXCHANGER			
GEA PHE SYSTEMS North America, Inc.	Brazed Plate Heat Exchanger	WP4-40	UUT 3
GEA PHE SYSTEMS North America, Inc.	Brazed Plate Heat Exchanger	(2) WP4-40	UUT 4
EXPANSION VALVE			
Sporlan	Balanced Port TXV	EBSVE-11-CP100	UUT 1, UUT 2
CONDENSER			
LUVATA	Copper tube aluminum fin	T071025B	UUT 1, UUT 2
FLOW SWITCH			
JOHNSON CONTROLS	Paddle Flow Switch	F61LB-1C	UUT 1, UUT 2
LIQUID FILTER DRIER			
Emerson Climate Technologies	EK Liquid Line Filter Drier	EK-415S	UUT 1, UUT 2
LOW FLUID TANK LEVEL INDICATOR			
Gems Sensors	LS-7	605147	UUT1
Madison Company	Side-Mounted Switches with Slosh Shield	M8705	UUT2
Gems Sensors	LS-7	602969	UUT3, UUT4

Table continues next page

ATTACHMENT 1: SEISMIC CERTIFIED COMPONENTS

MANUFACTURER	PRODUCT SERIES	MODEL	NOTES
PRESSURE RELIEF BYPASS VALVE			
Fulflo Speciality Valves	SVB	SFVB-5105R-SS-WS	UUT 1, UUT 2, UUT 3, UUT 4
CONTROLLER			
Future Design Controls	4300	51301100	UUT 1, UUT 2
Future Design Controls	9300	513810	UUT 1, UUT 2
Future Design Controls	4300	5150000	UUT 3, UUT 4
RESERVOIR (CLOSED SYSTEM)			
Haskris	30 gal non-sealed stainless steel tank	4589	UUT 1
Haskris	25 gal sealed stainless steel tank	5110	UUT 2
Haskris	14 gal. non-sealed stainless steel tank	4924	UUT 3; UUT 4

UUT- 1 R1200 Outdoor Chiller

Manufacturer:	Haskris Company
Identification:	Model No.: R1200
	Serial No. HB22170
Description:	Powder-coated carbon steel enclosure with the major internal subassemblies identified in Attachment 1/Table 2 and other elements necessary to form a complete chiller system. UUT was tested with reservoir full of fluid. Test specimen included structural enhancements corresponding to Model No. R1200-SEISMIC-006.
Mounting:	Rigid Base

Properties:

DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	FRONT-AXIS	SIDE-AXIS	VERTICAL-AXIS
48.875	36	75.75	1452	12.39	13.29	11.61

Shake Table Test Parameters

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 AC156-15	2.6	1	1.5	4.16	3.12	1.74	0.70

Unit maintained structural integrity and functionality after the ICC-ES AC 156 test in accordance with manufacturer requirements.

UUT- 2 OPC8 Outdoor Process Chiller

Manufacturer:	Haskris Company
Identification:	Model No.: OPC 8
	Serial No. HB22635
Description:	Powder-coated carbon steel enclosure with the major internal subassemblies identified in Attachment 1/Table 2 and other elements necessary to form a complete chiller system. UUT was tested with reservoir full of fluid. Test specimen included structural enhancements corresponding to Model No. OPC 8-460V-3-SEISMIC.
Mounting:	Rigid Base

Properties:

DIMENSIONS (in.)				LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height	Weight (lb.)	FRONT-AXIS	SIDE-AXIS	VERTICAL-AXIS
48.875	36	75.75	1424	12.71	13.77	12.03

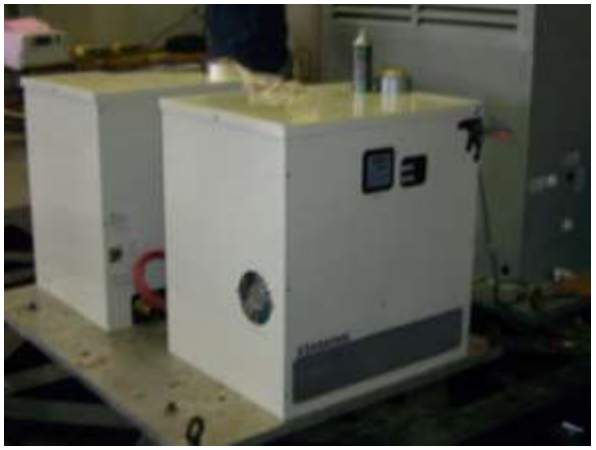
Shake Table Test Parameters

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 AC156-15	2.6	1	1.5	4.16	3.12	1.74	0.70

Unit maintained structural integrity and functionality after the ICC-ES AC 156 test in accordance with manufacturer requirements.

UUT- 3 WW3 Platform Non-Refrigerated Water Recirculating Systems (Water-to-Water)

Manufacturer:	Haskris Company
Identification:	Model No.: WW3
	Serial No. HB24458
Description:	Powder-coated carbon steel enclosure with the major internal subassemblies identified in Attachment 1/Table 2 and other elements necessary to form a complete fluid-fluid heat exchange system. UUT was tested with reservoir full of fluid. Test specimen included structural enhancements corresponding to Model No. WW3-SEISMIC-001.
Mounting:	Rigid Base



Properties:

DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height		FRONT-AXIS	SIDE-AXIS	VERTICAL-AXIS
29.5	24.5	32	292	25.86	27.91	25.75

Shake Table Test Parameters

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 AC156-15	2.6	1	1.5	4.16	3.12	1.74	0.70

Unit maintained structural integrity and functionality after the ICC-ES AC 156 test in accordance with manufacturer requirements.

UUT- 4 WW4 Platform Non-Refrigerated Water Recirculating Systems (Water-to-Water)

Manufacturer:	Haskris Company
Identification:	Model No.: WW4
	Serial No. HB24430
Description:	Powder-coated carbon steel enclosure with the major internal subassemblies identified in Attachment 1/Table 2 and other elements necessary to form a complete fluid-fluid heat exchange system. UUT was tested with reservoir full of fluid. Test specimen included structural enhancements corresponding to Model No. WW4-SEISMIC-001.
Mounting:	Rigid Base

Properties:

DIMENSIONS (in.)			Weight (lb.)	LOWEST RESONANT FREQUENCY (Hz.)		
Width	Depth	Height		FRONT-AXIS	SIDE-AXIS	VERTICAL-AXIS
29.5	24.5	32	315	19.09	27.47	>50

Shake Table Test Parameters

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 AC156-15	2.6	1	1.5	4.16	3.12	1.74	0.70

Unit maintained structural integrity and functionality after the ICC-ES AC 156 test in accordance with manufacturer requirements.