APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0548

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Trane

Manufacturer's Technical Representative: Robert Boland

Mailing Address: 3600 Pammel Creek Road, La Crosse, WI 54601

Telephone: (608) 518-8643 Email: Robert.boland@irco.com

Product Information

Product Name: Series E CenTraVac (ECTV)

Product Type: Water Cooled Centrifugal Liquid Chiller

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

General Description: Catalogued shell and tube chillers with single compressor

Mounting Description: Base mounted upon elastomeric pads

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OSHPD
OSP-0548
By: Timothy J Piland
DATE: 03/12/2021
CALIFORNIA BUILDING CODE, 2019

Applicant Information

Applicant Company Name: The VMC Group

Contact Person: Mr. John Giuliano

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780 Email: John.giuliano@thevmcgroup.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: Joel P Giuliano Date: 9/11/19

Title: President Company Name: VMC Group

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

Company Name: The VMC Group

Name: Mr. Kenneth Tarlow California License Number: SE2851

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780 Email: Ken.tarlow@thevmcgroup.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):

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Testing Laboratory

Company Name: Construction Engineering Research Laboratory (CERL)

Contact Name: James Wilcoski

Mailing Address: 2902 Newmark Dr, Champaign, IL 61822

Telephone: (217) 352-6511 Email: James.wilcoski@usace.army.mil

Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = 2.61 (z/h = 1); 1.37 (z/h = 0)

S_{DS} (Design spectral response acceleration at short period, g) = 1.45g (z/h = 1); 2.28g (z/h = 0)

a_p (In-structure equipment or component amplification factor) = 2.5

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 and 0

Equipment or Component Natural Frequencies (Hz) = See Attachments

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

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

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List of Attachments Supporting Special Seismic Certification

☒ Test Report(s) ☐ Drawings ☐ Calculations ☐ Manufacturer's Catalog

☐ Other(s) (Please Specify):

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

Signature: Date: March 12, 2021

Print Name: Timothy J. Piland Title: SSE

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

Condition of Approval (if applicable):

Table 1 - Certified Product Table - Trane ECTV Centrifugal Water Cooled Liquid Chiller

Model	Stage	Hertz	Comp Size [ton]	Shell Sizes [Evap/Cond]	Shell Lengths [Evap/Cond]	Voltage Range [V]	Motor Range [kW]	Pressure Range [Psi]	Max Length [in]	Max Width [in]	Max Height [in]	Max Weight [lbs]	Grade		Roof		MFR	UUT
													S_{DS}	z/h	S_{DS}	z/h		
CVHH	2-Stage Single	60	900-1200	100	MM	380-4160	453-1228	150-300	160.00	109.10	124.90	55,930	2.28	0.0	1.45	1.0	Trane	Extrapolated
				100	LL	380-4160	453-1228	150-300	180.25	109.10	124.90	57,901	2.28	0.0	1.45	1.0	Trane	Extrapolated
				100	M-HM	380-4160	453-1228	150-300	160.00	123.20	124.90	63,476	2.28	0.0	1.45	1.0	Trane	Extrapolated
				130	MM	380-4160	453-1228	150-300	160.00	109.30	131.60	62,856	2.28	0.0	1.45	1.0	Trane	Extrapolated
				130	M-HM	380-4160	453-1228	150-300	160.00	123.30	131.60	71,476	2.28	0.0	1.45	1.0	Trane	Extrapolated
			1000	160/ 200	MM	460	745	300	160.00	113.50	139.10	60,590	2.28	0.0	1.45	1.0	Trane	1
			900-1200	160/ 200	MM	380-4160	453-1228	150-300	160.00	113.50	139.10	75,187	2.28	0.0	1.45	1.0	Trane	Interpolated
				160/ 200	M-HM	380-4160	453-1228	150-300	160.00	127.40	139.10	82,620	2.28	0.0	1.45	1.0	Trane	Interpolated
				200/220	LL	380-4160	453-1228	150-300	180.25	112.30	141.40	84,500	2.28	0.0	1.45	1.0	Trane	Interpolated
				220	LL	380-4160	453-1228	150	180.25	119.40	145.40	84,500	2.28	0.0	1.45	1.0	Trane	Interpolated
			1500-1700	200	LL	380-4160	653-1288	150-300	180.25	114.30	141.40	84,500	2.28	0.0	1.45	1.0	Trane	Interpolated
				200	L-HL	380-4160	653-1228	150	180.25	132.10	141.40	84,500	2.28	0.0	1.45	1.0	Trane	Interpolated
				220	LL	380-4160	653-1228	150-300	180.25	119.40	145.40	84,500	2.28	0.0	1.45	1.0	Trane	Interpolated
			1500	220	L-HL	4160	1228	150	180.25	142.50	145.40	84,500	2.28	0.0	1.45	1.0	Trane	2

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Table 2 - Certified Subcomponent Tables - Economizer Shells

Model	Size	Type	Dimensions		Materials	MFR	UUT
			OD [in]	L [in]			
ECTV	100 - 160	2 stage	29.9	99.3	Low Carbon Steel	Trane	1
	200 - 220	2-stage	32.0	99.3	Low Carbon Steel	Trane	2

Table 3 - Certified Subcomponent Tables - Evaporator Shells

Model	Size	Max Weight [lbs]	Dimensions		Materials	MFR	UUT
			OD [in]	L [in]			
ECTV	100M	12,982	42.9	160.0	Low Carbon Steel	Trane	Extrapolated
	100L	13,647	42.9	180.3	Low Carbon Steel	Trane	Extrapolated
	130M	15,312	48.0	160.0	Low Carbon Steel	Trane	Extrapolated
	160M	16,813	53.7	160.0	Low Carbon Steel	Trane	1
	160M	19,817	53.7	160.0	Low Carbon Steel	Trane	Interpolated
	200L	22,846	59.5	180.3	Low Carbon Steel	Trane	Interpolated
	220L	23,974	66.0	180.3	Low Carbon Steel	Trane	2

Table 4 - Certified Subcomponent Tables - Condenser Shells

Model	Size	Max Weight [lbs]	Dimensions		Materials	MFR	UUT
			OD [in]	L [in]			
ECTV	100M	11,261	36.0	160.0	Low Carbon Steel	Trane	Extrapolated
	100L	12,075	36.0	180.3	Low Carbon Steel	Trane	Extrapolated
	130M	13,808	40.3	160.0	Low Carbon Steel	Trane	Extrapolated
	200M	15,643	45.0	160.0	Low Carbon Steel	Trane	1
	200M	18,998	45.0	160.0	Low Carbon Steel	Trane	Interpolated
	200L	19,533	45.0	180.3	Low Carbon Steel	Trane	Interpolated
	220L	21,898	49.0	180.3	Low Carbon Steel	Trane	Interpolated
	10HM	15,774	50.1	160.0	Low Carbon Steel	Trane	Interpolated
	13HM	19,102	55.1	160.0	Low Carbon Steel	Trane	Interpolated
	20HM	22,388	60.1	160.0	Low Carbon Steel	Trane	Interpolated
	20HL	29,490	60.1	180.3	Low Carbon Steel	Trane	Interpolated
	22HL	31,353	66.7	180.3	Low Carbon Steel	Trane	Interpolated
	22HL	31,353	66.7	180.3	Low Carbon Steel	Trane	2

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Table 5 - Certified Subcomponent Tables - Compressor Drives and Starters

Model	Description	Max Input Voltage	Input Phase	Max Input Current [A]	Output HP	Max Dimensions [in]			Max Weight [lbs]	MFR	Materials	UUT
						Length	Width	Height				
AFDE	LV Drive	600V	3	1210	850	25"	98"	75"	3,300	Rockwell	Steel	1
CVKF	MV Starter	13800V	3	360	N/A	20"	38"	60"	560	Eaton	Steel	2
UATR	Auto Tranformer / Primary Reactor	13800V	3	360	N/A	40"	26"	27"	560	Eaton	Steel	2
CPTR	Control Power	600V	3	40	N/A	26"	14"	34"	230	Trane	Steel	2

Table 6 - Certified Subcomponent Tables - Control Panel

Model	Max Dimensions [in]			Max Weight [lbs]	MFR	Material	UUT
	Length	Width	Height				
AdaptiView™	6	33	36	130	Trane	Steel	1, 2

Table 7 - Certified Subcomponent Tables - Purge

Model	Max Dimensions [in]			Max Weight [lbs]	MFR	Material	UUT
	Length	Width	Height				
EarthWise™	27.5	21.75	25.75	140	Trane	Steel	1, 2

Table 8 - Certified Subcomponent Tables - Compressors

Model	Configuration	Frequency [Hz]	Size [ton]	MFR	Materials	Dimensions [in]			Max Weight [lbs]	UUT
						Length	Width	Height		
ECTV	2-Stage Single	60	1200	Trane	Cast Iron / Aluminum	95	76	67	14,865	1
			1700			94	76.5	63	15,089	2

Table 9 - Certified Subcomponent Tables - Cooling/Bypass Option

Model	MFR	Material	Description	Max Weight [lbs]	UUT
ECTV	Trane	Steel	Valve Actuators and Piping	82	1
				1,200	2

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Table 10 - Certified Subcomponent Tables - Valve Actuators for Cooling/Bypass Option

Model Number	Size [in]	Max Weight [lbs]	Materials	MFR	UUT
X13680933	3"	24	STL / SST	Bray	Extrapolated
X13680933	4"	32	STL / SST	Bray	1
X13680933	5"	39	STL / SST	Bray	Interpolated
X13680933	6"	49	STL / SST	Bray	Interpolated
X13680933	8"	104	STL / SST	Bray	Interpolated
X13680933	10"	120	STL / SST	Bray	Interpolated
X13680933	12"	184	STL / SST	Bray	Interpolated
X13680933	14"	309	STL / SST	Bray	Interpolated
X13680933	16"	472	STL / SST	Bray	2

Note: STL = Steel and SST = Stainless Steel

Table 11 - Certified Subcomponent Tables - Compressor Motors

Hertz	Motor Model [kW]	Compatible Motor Frame	Max Weight [lbs]	MFR	UUT
60	453	440E	3,468	Trane	Extrapolated
	512	440E	3,475	Trane	Extrapolated
	588	440E	3,540	Trane	Extrapolated
	588	5000	3,516	Trane	Extrapolated
	653	440E	3,663	Trane	Extrapolated
	653	5000	4,101	Trane	Extrapolated
	745	440E	3,696	Trane	1
	745	5000	4,101	Trane	Interpolated
	854	5000	4,028	Trane	Interpolated
	856	5000	4,028	Trane	Interpolated
	856	5800	4,544	Trane	Interpolated
	957	5000	4,166	Trane	Interpolated
	957	5800	4,698	Trane	Interpolated
	1060	5800	4,787	Trane	Interpolated
	1062	5800	4,787	Trane	Interpolated
	1228	5800	4,965	Trane	2

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UNIT UNDER TEST (UUT)
Summary Sheet

UUT-01

DCL 30246-1701

Model Line	Model Number	Manufacturer
ECTV	Size 160	Trane

Product Construction Summary

Carbon Steel Base Frame

Options / Subcomponent Summary

Evaporator: Trane; Condenser: Trane; Economizer: Trane; AFDE: Rockwell; Control Panel: Trane; Purge: Trane; Compressor: Trane; Cooling/Bypass Option: Trane; Valve Acutators: Trane; Compressor Motor: Trane

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
60,590	160.0	114.0	139.0	9.0	11.0	20.0

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	1.45	1.0	1.50	2.32	1.74	-	-
		2.28	0.0		-	-	1.52	0.61

Test Mounting Details

UUT-1 was mounted ot the fixture using twenty-four (24) 3/4" grade 8 bolts with VMC 119-A-100334-05 neoprene pads between the UUT base and the fixture.

UUT-1

All units were filled with contents and maintained structural integrity and functionality after AC-156 test

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UNIT UNDER TEST (UUT)
Summary Sheet

UUT-02

DCL 30246-1701

Model Line	Model Number	Manufacturer
ECTV	Size 220	Trane

Product Construction Summary

Carbon Steel Base Frame

Options / Subcomponent Summary

Evaporator: Trane; Condenser: Trane; Economizer: Trane; CVKF: Eaton; UATR: Eaton; CPTR: Trane; Control Panel: Trane; Purge: Trane; Compressor: Trane; Cooling/Bypass Option: Trane; Valve Acutators: Trane; Compressor Motor: Trane

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
89,550	180.3	143.0	146.0	11.0	11.0	20.0

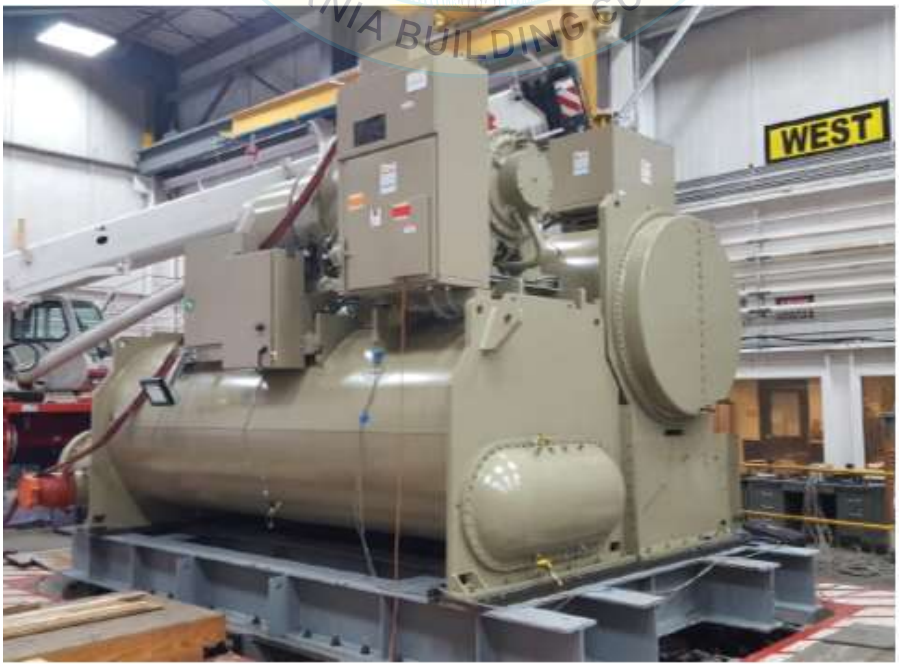
UUT Highest Passed Seismic Run Information

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	1.45	1.0	1.50	2.32	1.74	-	-
		2.28	0.0		-	-	1.52	0.61

Test Mounting Details

UUT-2 was mounted ot the fixture using twenty-four (24) 3/4" grade 8 bolts with VMC 119-A-100334-05 neoprene pads between the UUT base and the fixture.

UUT-2



All units were filled with contents and maintained structural integrity and functionality after AC-156 test

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