OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP-0367-10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: Trane (Ingersoll Rand)

Manufacturer's Technical Representative: Shawn Jennings, Product Design Engineer

Mailing Address: 101 William White Blvd, Pueblo CO 81001

Telephone: 719-585-4392 Email: Shawn.Jennings@irco.com

Product Information

Product Name: RTAC

Product Type: Air Cooled Chiller

Product Model Number: RTAC 140-500 Ton
(List all unique product identification numbers and/or part numbers)

General Description: Hermetic rotary refrigeration machines which provide chilled water for water cooling systems. Seismic enhancements made to the test units and modifications required to address anomalies observed during the tests shall be incorporated into the production unit.

Mounting Description: Base mounted on seismic elastomeric isolators or base mounted on seismic spring isolators.

Applicant Information

Applicant Company Name: The VMC Group

Contact Person: John Wilson, Jr.

Mailing Address: 113 Main Street Bloomingdale NJ 07403

Telephone: 973-838-1780 Email: jwilson@thevmcgroup.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in accordance with the California Administrative Code, 2013.

Signature of Applicant: Date: 10/18/13

Title: CEO Company Name: The VMC Group

OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

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

Company Name: The VMC Group

Name: Mr. Ken 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): _____

Testing Laboratory

Company Name: PEER, University of California at Berkeley

Contact Name: Wesley Neighbour

Mailing Address: 1301 S. 46th street Richmond CA 94804

Telephone: 510-642-3437 Email: wdn@berkeley.edu

OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT
FACILITIES DEVELOPMENT DIVISION

Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = 1.37 for Neoprene, 1.88 for Spring Isolated

S_{DS} (Design spectral response acceleration at short period, g) = 2.28 (for Neoprene), 2.5 (for Spring Isolated)

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

R_p (Equipment or component response modification factor) = 2.5 (for Neoprene), 2.0 (for Spring Isolated)

Ω_0 (System overstrength factor) = 2.5

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 0

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, 2010: ☐ Yes ☒ No

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, 2019

Signature: _____ Date: 11/18/2013

Print Name: M. R. Karim Title: SHFR

Special Seismic Certification Valid Up to : S_{DS} (g) = See Above z/h = 0

Condition of Approval (if applicable): _____

Table 1 - Chiller Matrix

Nominal Capacity [Tons]	Type	Freq [Hz]	Operating Weight [lbs]	Dimensions [in]			S_{DS} Elastomeric Isolators	S_{DS} Spring Isolators	z/h	UUT
				Length	Width	Height				
140	Standard	60	11,077	196	89	98	2.28	2.50	0.0	Extrapolated
140	High	60	11,140	196	89	98	2.28	2.50	0.0	Extrapolated
155	Standard	60	11,116	196	89	98	2.28	2.50	0.0	UUT-01A / 01B
170	Standard	60	11,211	196	89	98	2.28	2.50	0.0	Interpolated
155	High	60	12,417	232	89	98	2.28	2.50	0.0	Interpolated
170	High	60	12,563	232	89	98	2.28	2.50	0.0	Interpolated
140	XE	60	12,557	232	89	98	2.28	2.50	0.0	Interpolated
185	Standard	60	12,884	232	89	98	2.28	2.50	0.0	Interpolated
200	Standard	60	13,186	232	89	98	2.28	2.50	0.0	Interpolated
185	High	60	14,298	268	89	98	2.28	2.50	0.0	Interpolated
155	XE	60	14,306	268	89	98	2.28	2.50	0.0	Interpolated
200	High	60	14,676	268	89	98	2.28	2.50	0.0	Interpolated
170	XE	60	14,698	268	89	98	2.28	2.50	0.0	Interpolated
225	Standard	60	14,671	268	89	98	2.28	2.50	0.0	Interpolated
250	Standard	60	14,937	268	89	98	2.28	2.50	0.0	Interpolated
275	Standard	60	19,613	360	89	98	2.28	2.50	0.0	Interpolated
225	High	60	16,392	362	89	98	2.28	2.50	0.0	Interpolated
185	XE	60	16,382	362	89	98	2.28	2.50	0.0	Interpolated
250	High	60	16,392	362	89	98	2.28	2.50	0.0	Interpolated
200	XE	60	16,351	362	89	98	2.28	2.50	0.0	Interpolated
275	High	60	21,023	432	89	98	2.28	2.50	0.0	Interpolated
250	XE	60	20,558	432	89	98	2.28	2.50	0.0	Interpolated
300	Standard	60	21,181	432	89	98	2.28	2.50	0.0	Interpolated
300	High	60	22,139	468	89	98	2.28	2.50	0.0	Interpolated
275	XE	60	21,702	468	89	98	2.28	2.50	0.0	Interpolated
350	High	60	24,679	468	89	98	2.28	2.50	0.0	Interpolated
300	XE	60	24,237	468	89	98	2.28	2.50	0.0	Interpolated
400	Standard	60	25,833	468	89	98	2.28	2.50	0.0	Interpolated
400	High	60	27,729	540	89	98	2.28	2.50	0.0	Interpolated
350	XE	60	27,342	540	89	98	2.28	2.50	0.0	Interpolated
450	Standard	60	26,453	540	89	98	2.28	2.50	0.0	Interpolated
Modified 350	Standard	60	25,984	432	89	98	2.45	2.50	0.0	UUT-02A / 02B
500	Standard	60	27,877	540	89	98	2.28	2.50	0.0	Extrapolated

Notes

1) UUT-02A & 02B Tested with 500 Ton Evaporator

Trane RTAC Air-Cooled Chillers
Certified Product Sub-Component Tables

Table 2a; Control Panel Construction

Model	W x H x D	Input Voltage	Enclosure Material	Manufacturer	UUT
Top Box (common to all models)	30" x 25" x 9"	230/380/460 VAC	0.072" steel enclosure; 0.0785" steel door; 0.108" steel backpanel	Trane	UUT 1 and 2
Bottom Box (common to all models)	88" x 34" x 10.5"	230/380/460 VAC	0.072" steel enclosure; 0.0785" steel door; 0.108" steel backpanel	Trane	UUT 1 and 2

Table 2b; Control Panel Components

Description	Manufacturer	Input Voltage VAC	Output Rating Range [Voltage/Current/Power]	UUT
Operator Interface	Dynaview	240	N/A	UUT 1 and 2
VFD	Danfoss TR1	200/230/380/460	200/230/380/460 VAC	UUT 1 and 2
Transformer	Trane	230/380/460	120/240 VAC	UUT 1 and 2
X-Line Starter	Trane	200/230/380/460	200/230/380/460 VAC	UUT 2
Y-delta Starter	Trane	230/380/460	200/230/380/460 VAC	UUT 1
Motor Starter	Trane	230/380/460	200/230/380/460 VAC	UUT 1 and 2
Disconnect	Schneider PowerPact	230/380/460	200/230/380/460 VAC	UUT 1 and 2
Terminal Block	Marathon	230/380/460	200/230/380/460 VAC	UUT 1 and 2
Circuit Breaker	Schneider PowerPact	230/380/460	200/230/380/460 VAC	UUT 1 and 2

Table 3; Compressors

Description	Type	Output Rating [RLA]	Input Voltage [VAC]	Manufacturer	UUT
M3	Rotary	270	200	Trane	UUT 1
M3	Rotary	118 - 235	230 - 460	Trane	Interpolated
M4	Rotary	320	200	Trane	UUT 1
M4	Rotary	139 - 278	230 - 460	Trane	Interpolated
N3	Rotary	203 - 386	200 - 380	Trane	Interpolated
N3	Rotary	168	460	Trane	UUT 2
N4	Rotary	200 - 399	230 - 460	Trane	Interpolated
N4	Rotary	459	200	Trane	UUT 2

Table 4; Condenser Coils

Length	Height x Depth	Fin Material	Tube Material & Dia	# Rows	Manufacturer	UUT
9' (shortest length)	42"X5"	0.0045" thick Aluminum	Copper, 3/8" OD	3	Trane	UUT 1
21' (longest length)	42"X5"	0.0045" thick Aluminum	Copper, 3/8" OD	3	Trane	UUT 2

Table 5; Evaporators

Description	Arrangement	Shell Material Shell Dia & Wall	Tons/Eff	Manufacturer	UUT
M1	2 or 3 pass	steel / 17.5" / 0.23"	120H/140S	Trane	Extrapolated
M2	2 or 3 pass	steel / 17.5" / 0.23"	130H/**155S**	Trane	UUT 1
N1	2 or 3 pass	steel / 17.5" / 0.23"	140H/170S	Trane	Interpolated
N2	2 or 3 pass	steel / 17.5" / 0.23"	155H	Trane	Interpolated
N3	2 or 3 pass	steel / 17.5" / 0.23"	170H/140X	Trane	Interpolated
N4	2 or 3 pass	steel / 17.5" / 0.23"	185S	Trane	Interpolated
N5	2 or 3 pass	steel / 17.5" / 0.23"	200S	Trane	Interpolated
N6	2 or 3 pass	steel / 17.5" / 0.23"	185H/155X	Trane	Interpolated
N7	2 or 3 pass	steel / 17.5" / 0.23"	225S	Trane	Interpolated
N8	2 or 3 pass	steel / 17.5" / 0.23"	200H/170X/185X/225H/250S/250H	Trane	Interpolated
N8	2 or 3 pass	steel / 17.5" / 0.23"	200H	Trane	Interpolated
R1	2 or 3 pass	steel / 23" / 0.23"	250S	Trane	Interpolated
R2	2 or 3 pass	steel / 23" / 0.23"	275S	Trane	Interpolated
R3	2 or 3 pass	steel / 23" / 0.23"	250H/200X	Trane	Interpolated
R4	2 or 3 pass	steel / 23" / 0.23"	300S	Trane	Interpolated
R5	2 or 3 pass	steel / 23" / 0.23"	275H/250X	Trane	Interpolated
R6	2 or 3 pass	steel / 23" / 0.23"	350S	Trane	Interpolated
R6	2 or 3 pass	steel / 23" / 0.23"	300H/275X	Trane	Interpolated
T1	2 or 3 pass	steel / 26.5" / 0.23"	350S	Trane	Interpolated
T2	2 or 3 pass	steel / 26.5" / 0.23"	375S	Trane	Interpolated
T3	2 or 3 pass	steel / 26.5" / 0.23"	350H/300X	Trane	Interpolated
T4	2 or 3 pass	steel / 26.5" / 0.23"	400S	Trane	Interpolated
T5	2 or 3 pass	steel / 26.5" / 0.23"	375H	Trane	Interpolated
T6	2 or 3 pass	steel / 26.5" / 0.23"	450S	Trane	Interpolated
T7	2 or 3 pass	steel / 26.5" / 0.23"	400H/350X	Trane	Interpolated
T7	2 or 3 pass	steel / 26.5" / 0.23"	400H/350X/450H/**500S**	Trane	UUT 2

All tubes are 1" Copper with 0.025" Wall

Table 6a; Fans

Description	# Blades	Blade Material	Manufacturer	UUT
Standard	3	Galv Steel	Revcor	UUT 1 and 2
Low Noise	9	Plastic	Kenco	UUT 1 and 2

Table 6b; Fan Motors

Model Number	Output Rating	Input Voltage	Type	Manufacturer	UUT
P56C75A05	1.5 HP	200-230 VAC	TEAO	Century	UUT 1
P56C76A05	1.5 HP	380 VAC	TEAO	Century	Interpolated
P56C77A05	1.5 HP	460 VAC	TEAO	Century	UUT 2
P56AD62A05	1.5 HP	200-230 VAC	TEAO Inverter Duty	Century	UUT 1
P56AD64A05	1.5 HP	380 VAC	TEAO Inverter Duty	Century	Interpolated
P56AD64A05	1.5 HP	460 VAC	TEAO Inverter Duty	Century	UUT 2

UUT	Model	UUT Configuration Description	Weight (lbs)	Height (in)	Width (in)	Length (in)	Connection List	Connection Details	S_{DS}	z/h	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}	Nat. Freq.		
															X	Y	Z
1A	RTAC 155 SE	Elastomer Isolation	11116	96	89	195	UUT Bolted to Beams Thru Seismic Neoprene Isolators Beams bolted to Fixture	(8) 5/8 UNC Grade 8 Bolts	2.28	0	2.28	0.91	1.52	0.61	6.4	5.8	11.2
1B	RTAC 155 SE	Spring Isolation	11116	106	89	195	UUT Bolted to MSSH-1E Spring Isolators MSSH-1E Spring Isolators bolted to Beams	(8) 5/8 Grade 2 Rod (Internal to Isolator) (16) 5/8 UNC Grade 8 Bolts (4 Per Isolator)	2.5	0	2.5	1	1.67	0.67	3.1	3.2	6.1
2A	RTAC 350 SE 500-T Evaporator	Elastomer Isolation	25984	98	89	435	UUT Bolted to Beams Thru Seismic Neoprene Isolators Beams bolted to Fixture	(12) 5/8 UNC Grade 8 Bolts	2.45	0	2.45	0.98	1.63	0.65	4.9	4.9	8.9
2B	RTAC 350 SE 500-T Evaporator	Spring Isolation	25984	108	89	435	UUT Bolted to MSSH-1E Spring Isolators MSSH-1E Spring Isolators bolted to Beams	(12) 5/8 Grade 2 Rod (Internal to Isolator) (24) 5/8 UNC Grade 8 Bolts (4 Per Isolator)	2.5	0	2.5	1	1.67	0.67	2.8	3	4.9

All units were full of contents listed on the certified product table, maintained structural integrity and functional compliance.

UUT1A: Mounted on VMC seismic neoprene isolators

UUT1B: Mounted on VMC MSSH seismic spring isolators

UUT2A: Mounted on VMC seismic neoprene isolators

UUT2B: Mounted on VMC MSSH seismic spring isolators