APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0449 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: MTU America, Inc.

Manufacturer's Technical Representative: Ben Stratton

Mailing Address: 100 Power Drive, Mankato, MN 56001

Telephone: 507-625-7973 Email: ben.stratton@ps.rolls-royce.com

Product Information

Product Name: Gas Generator Set

Product Type: Electrical Power Generator

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

General Description: Gas Powered Electrical Generators Sizes 30-125kW, seismic enhancements made to the test units and modifications required to address the anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Rigid Base Mounted Enclosure/Genset or Externally Spring Isolated Enclosure/Genset

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, 2013.

Signature of Applicant: Date: 11/4/2015

Title: President Company Name: The VMC Group

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 1

Company Name: Dynamic Certification Laboratories

Contact Name: Kelly Laplace

Mailing Address: 1315 Greg Street, Suite 109, Sparks, Nevada 89431

Telephone: 775-358-5085 Email: kelly@shaketest.com

Testing Laboratory 2

Company Name: Pacific Earthquake Engineering Research Center UC Berkeley (PEER)

Contact Name: Clément Barthès

Mailing Address: 1301 S. 46th Street, Building 420, Richmond, CA 94804

Telephone: 510-665-3409 Email: clementbarthes@berkeley.edu

Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = Isolated [4.50 (z/h = 1) & 1.88 (z/h = 0)] Rigid [1.44 (z/h = 1) & 1.13 (z/h = 0)]

S_{DS} (Design spectral response acceleration at short period, g) = 2.00 (z/h = 1) & 2.50 (z/h = 0)

a_p (In-structure equipment or component amplification factor) = 2.5 (Isolated) and 1.0 (Rigid)

R_p (Equipment or component response modification factor) 2.0 (Isolated) and 2.5 (Rigid)

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0 (S_{DS} = 2.00) & 0.0 (S_{DS} = 2.50)

Equipment or Component Natural Frequencies (Hz) See attached

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

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, 2022

Signature: Date: May 6, 2016

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 Gensets[6, 7]

Model	Max Rating (kW)	Dimensional Data				z/h = 0.0 S_{DS}	z/h = 1.0 S_{DS}	Tested / Interpolated / Extrapolated
		Max Length (in)	Max Width (in)	Max Height (in)	Open Genset[5] Weight (lbs)			
MTU 4R0075 GS30[1]	30	74.0	34.0	54.5	1,300	2.50	2.00	UUT-01
MTU 6V0072 GS40	40	74.0	34.0	48.5	1,800	2.50	2.00	Interpolated
MTU 8V0063 GS50	50	80.0	36.0	52.0	1,900	2.50	2.00	Interpolated
MTU 8V0071 GS60[2]	60	80.0	36.0	51.9	2,000	2.50	2.00	UUT-02
MTU10V0068GS75[3]	75	100.0	48.0	83.0	2,460 (Tested) 3,700 (Max)	2.50	2.00	UUT-03
MTU10V0068GS100	100	100.0	48.0	83.0	3,700	2.50	2.00	Interpolated
MTU10V0068GS125[4]	125	100.0	48.0	83.0	3,700	2.50	2.00	UUT-04

Notes

1) Tested with Carbon Steel Enclosure
2) Tested with Aluminum Enclosure
3) Tested with Carbon Steel Enclosure
4) Tested with Aluminum Enclosure
5) Genset Weight without Enclosure see Table 2 for Enclosure Weight
6) Gensets are Certified as follows:
   a) Rigid base mounted w/ or w/o enclosures.
   b) External spring isolated w/ or w/o enclosures.
7) Dimensional Data is Nominal and actual data may vary.

Table 2 - Certified Enclosures

Component (MFR)	MTU Part Number	Notes	Weight (lbs.)	Tested / Interpolated / Extrapolated
Enclosures (MTU)	SUA103868	30 kW Carbon Steel Enclosure	600	UUT-01
	SUA59296 / SUA59297	30 kW Carbon Steel Intake & Outlet Scoops	210	UUT-01
	SUA103872	30 kW Aluminum Enclosure	306	Interpolated
	SUA71025 / SUA71026	30 kW Aluminum Intake & Outlet Scoops	95	Interpolated
	XG2530100017	30 & 50 kW Carbon Steel Enclosure	792	Interpolated
	SUA103870	40-60 kW Carbon Steel Enclosure	600	Interpolated
	SUA77581	30-60 kW Carbon Steel Enclosure CQE	695	Interpolated
	SUA103874	40-60 kW Aluminum Enclosure	306	Interpolated
	SUA78329	30-60 kW Aluminum Enclosure CQE	290	UUT-02
	SUAPH104828	75-125 kW Carbon Steel Enclosure	766	UUT-03
	SUAPH104829	75-125 kW Carbon Steel Scoop	244	UUT-03
	SUAPH104874	75-125 kW Aluminum Enclosure	355	UUT-04
	SUAPH104869	75-125 kW Aluminum Scoop	94	UUT-04
	XS526300.00034 / XSG25300.00066	Lighting Kit (AC/DC)	42	UUT-01 / 02
	SUAPH104508, SUAPH104509	Lighting Kit (AC/DC)	42	UUT-03 / 04

Table 3 - Certified Subcomponents

Component (MFR)	MTU Part Number	Notes	Tested / Interpolated / Extrapolated
Carbon Steel Silencer (Phillips & Temro)	SUA94155	2 1/2" Space Saver 8" Dia.	UUT-01
	SUA93265	3" Space Saver 8" Dia.	UUT-02
	SUA101740	3" Space Saver 14" Dia.	UUT-03 / 04
Engine[6] (GM)	SUA88560 / SUA88561	30 kW	UUT-01
	SUA88562 / SUA88563	40 kW	Interpolated
	SUA88564 / SUA88565	50 kW	Interpolated
	SUA88566 / SUA88567	60 kW	UUT-02
Engine (MTU)	SUA102375	75 kW	UUT-03
	SUA102376	100 kW	Interpolated
	SUA102377	125 kW	UUT-04
Alternators (Marathon)	280 Frame	30-60 kW	UUT-01
	360 Frame	30-125 kW	UUT-02 / 03
	430 Frame	75-600 kW	UUT-04
Radiators (JB Radiator)	SUA101938 (Core) SUA101947 (Fan)	75 kW	UUT-03
	SUA101939 (Core) SUA101948 (Fan)	100 kW	Interpolated
	SUA101940 (Core) SUA101949 (Fan)	125 kW	UUT-04
Air Filter (Baldwin)	SUA77166	30-60 kW	UUT-01 / 02
	SUA77168	75-125 kW	UUT-03 / 04
Controller (MTU)	MGC-1500 Series	Each controller is a depopulated version of the controller with a higher number. The boxes of the 2000 and 3000 series are the same. The 1500 series box is smaller. All boxes are carbon steel.	UUT-01 / 03
	MGC-2000 Series		Interpolated
	MGC-3000 Series		UUT-02 / 04

Notes
6) The cooling package for the 30-60kW gensets is part of the GM-supplied engine

Table 3 - Certified Subcomponents (Continued)

Component (MFR)	MTU Part Number	Notes	Tested / Interpolated / Extrapolated
Jacket Water Heaters (Kim Hotstart)	SUA52746	1000 kW	UUT-01
	SUA52748	1500 kW	Interpolated
	SUA52748	1500 kW	UUT-03
	SUA52750	1800 kW	UUT-02
	SUA52750	1800 kW	UUT-04
Breakers (Square-D)	H Frame	150 Amp Max Rating	Extrapolated
	J Frame	250 Amp Max Rating	UUT-03
	LA Frame	400 Amp Max Rating	Interpolated
	LD Frame	600 Amp Max Rating	UUT-03
	M Frame	800 Amp Max Rating	Interpolated
	P Frame	1200 Amp Max Rating	UUT-04
Battery (Exide)	SUA120299	12V	UUT-01 / 02 / 03 / 04
Battery Charger (SENS)	SUA85250	3.5 A	UUT-01
	SUA85257	6 A	Interpolated
	SUA87358	6 A	Interpolated
	SUA89983	10 A	UUT-04
	SUA85204	10 A	Interpolated
	SUA86468	10 A	Interpolated
	SUA83187	10 A	Interpolated
Battery Charger (Guest)	SUA79100	6 A	UUT-02
	SUA79100	6 A	UUT-04
Battery Charger (Marinco)	XG3130100003	6 A	UUT-03

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-01

VMA-49667-01

Model Line	Model Number	Manufacturer
30-125kW Gas Gensets	MTU 4R0075 GS30	MTU

Product Construction Summary

Standard Enclosure

Options / Subcomponent Summary

Silencer: Phillips & Temro ; Engine: GM ; Alternator: Marathon ; Air Filter: Baldwin ; Controller: MTU ; Jacket Water Heater: Kim Hotstart ; Battery: Exide ; Battery Charger: SENS

UUT Properties

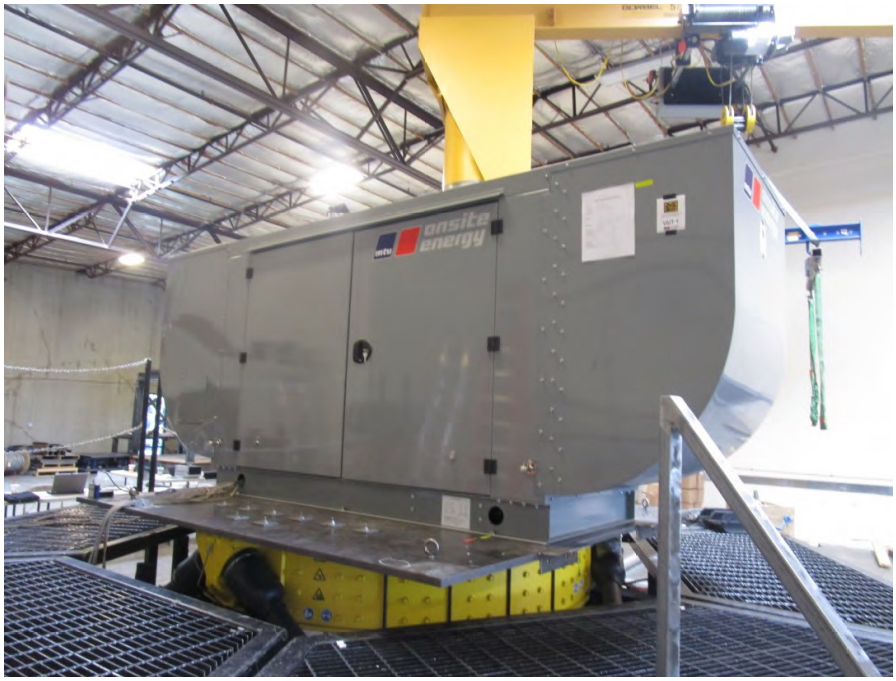
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
2,240	74	34	50.6	5.0	7.8	8.0

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2013	ICC-ES AC156	2.00 g's	1.0	1.5	3.20 g's	2.40 g's	1.34 g's	0.54 g's
		2.50 g's	0.0	1.5	2.50 g's	1.00 g's	1.68 g's	0.68 g's

Test Mounting Details

UUT Rigidly attached to shake table interface fixture with (6) 5/8" Grade 8 Bolts



All units were filled with contents and maintained structural integrity and functionality

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-02

VMA-49667-01

Model Line	Model Number	Manufacturer
30-125kW Gas Gensets	MTU 8V0071 GS60	MTU

Product Construction Summary

Crystal Quiet Enclosure

Options / Subcomponent Summary

Silencer: Phillips & Temro ; Engine: GM ; Alternator: Marathon ; Air Filter: Baldwin ; Controller: MTU ; Jacket Water Heater: Kim Hotstart ; Battery: Exide ; Battery Charger: Guest

UUT Properties

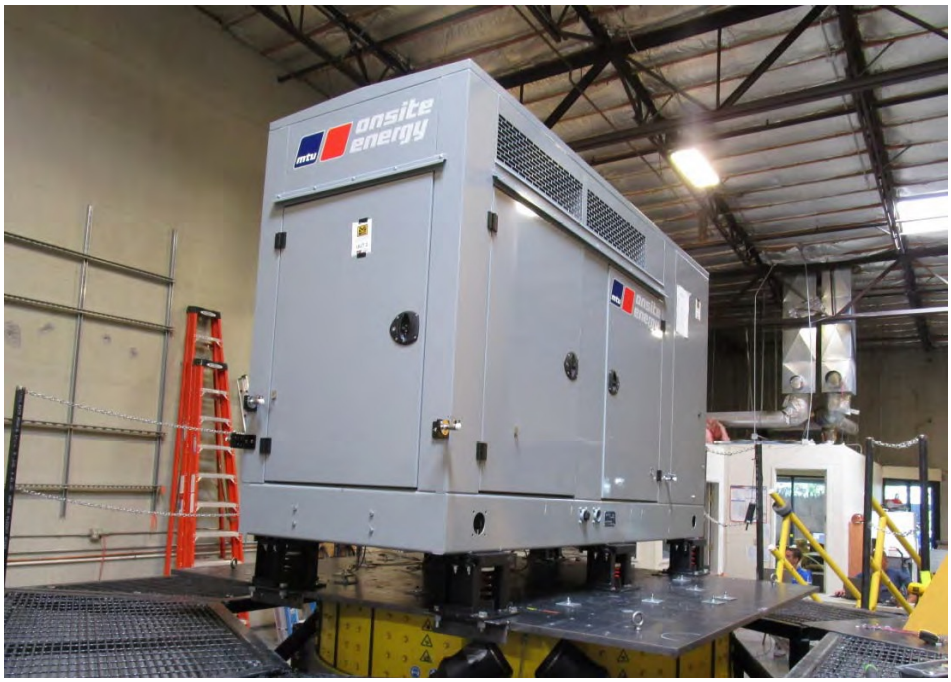
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
2,590	112	40	68	2.5	4.0	5.0

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2013	ICC-ES AC156	2.00 g's	1.0	1.5	3.20 g's	2.40 g's	1.34 g's	0.54 g's
		2.50 g's	0.0	1.5	2.50 g's	1.00 g's	1.68 g's	0.68 g's

Test Mounting Details

UUT externally isolated with (6) VMC MSSH-3C isolators each attached with (1) 3/4" Grade 8 Bolt;
Isolators attached to shake table interface fixture each with (4) 3/4" Grade 8 Bolts



All units were filled with contents and maintained structural integrity and functionality

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-03

VMA-49667-01

Model Line	Model Number	Manufacturer
30-125kW Gas Gensets	MTU10V0068GS75	MTU

Product Construction Summary

Steel Enclosure

Options / Subcomponent Summary

Silencer: Phillips & Temro ; Engine: Ford ; Alternator: Marathon ; Air Filter: Baldwin ; Controller: MTU ; Jacket Water Heater: Kim Hotstart ; Battery: Exide ; Battery Charger: SENS ; Radiator: JB Radiator ; Breakers: Square-D

UUT Properties

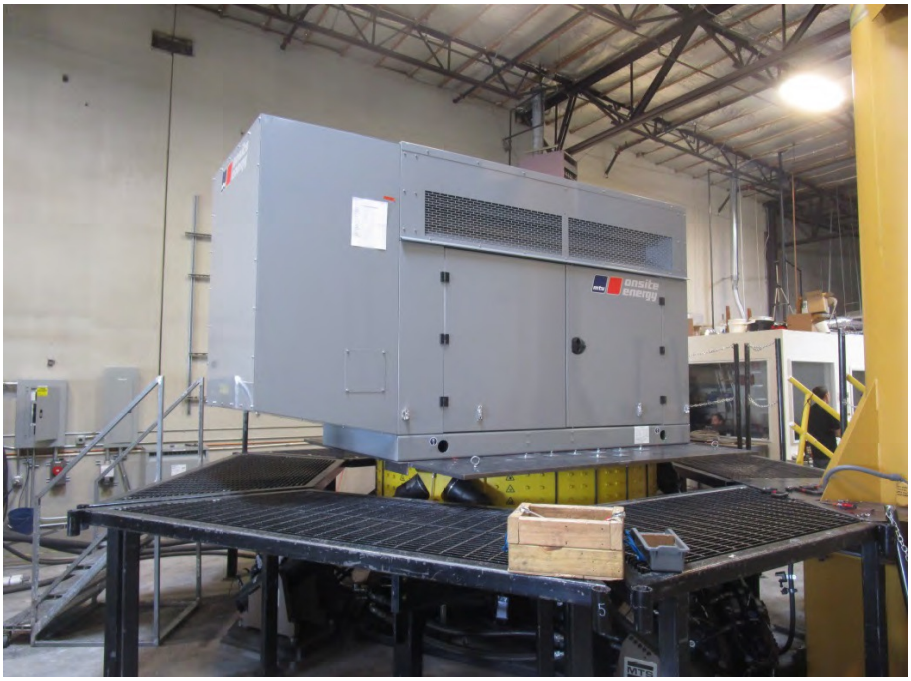
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
3,420	133	48	83	4.3	6.8	14.5

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2013	ICC-ES AC156	2.00 g's	1.0	1.5	3.20 g's	2.40 g's	1.34 g's	0.54 g's
		2.50 g's	0.0	1.5	2.50 g's	1.00 g's	1.68 g's	0.68 g's

Test Mounting Details

UUT Rigidly attached to shake table interface fixture with (6) 5/8" Grade 8 Bolts



All units were filled with contents and maintained structural integrity and functionality

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-04

VMA-49667-01

Model Line	Model Number	Manufacturer
30-125kW Gas Gensets	MTU10V0068GS125	MTU

Product Construction Summary

Aluminum Enclosure

Options / Subcomponent Summary

Silencer: Phillips & Temro ; Engine: Ford ; Alternator: Marathon ; Air Filter: Baldwin ; Controller: MTU ; Jacket Water Heater: Kim Hotstart ; Battery: Exide ; Battery Charger: Guest ; Radiator: JB Radiator ; Breakers: Square-D

UUT Properties

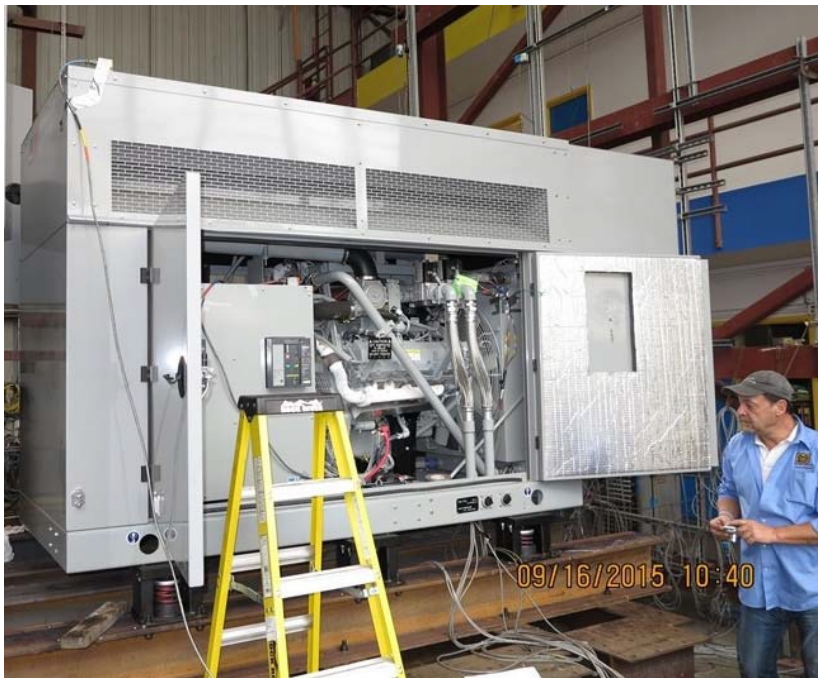
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
4,300	133	48	83	2.9	4.1	6.7

UUT Highest Passed Seismic Run Information

Building Code	Test Criteria	S_{DS}	z/h	I_P	A_{FLX-H}	A_{RIG-H}	A_{FLX-V}	A_{RIG-V}
CBC 2013	ICC-ES AC156	2.00 g's	1.0	1.5	3.20 g's	2.40 g's	1.34 g's	0.54 g's
		2.50 g's	0.0	1.5	2.50 g's	1.00 g's	1.68 g's	0.68 g's

Test Mounting Details

UUT externally isolated with (6) VMC MSSH-3C isolators each attached with (1) 3/4" Grade 8 Bolt;
Isolators attached to shake table interface fixture each with (4) 3/4" Grade 8 Bolts



All units were filled with contents and maintained structural integrity and functionality