APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0589

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: Kohler Power Systems

Manufacturer's Technical Representative: Brady Eifrid

Mailing Address: N 7650 Lakeshore Road, Sheboygan, WI 53083

Telephone: (920) 457-4441 Ext 33060 Email: brady.eifrid@kohler.com

Product Information

Product Name: Kohler Power Generators

Product Type: Diesel Electrical Power Generator

Product Model Number: 1250kW through 2000kW REOZMD
(List all unique product identification numbers and/or part numbers)

General Description: Diesel powered electrical generator above fuel tanks with or without enclosures and internal vibration isolators. Seismic enhancements made to test units and modifications required to address the anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Spring Vibration Isolated

Applicant Information

Applicant Company Name: The VMC Group

Contact Person: John P. Giuliano, PE

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: Date: 2/26/19

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

Company Name: Construction Engineering Research Laboratory

Contact Name: James Wilcoski

Mailing Address: 2902 Newmark Drive, Champaign, IL 61822

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

Company Name: Dynamic Certification Laboratories

Contact Name: Kelly Laplace

Mailing Address: 1315 Greg St. Suite 109 Sparks, NV 89431

Telephone: 775-385-5085 Email: Kelly@Shaketest.com

Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = 1.45

S_{DS} (Design spectral response acceleration at short period, g) = 1.93

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

R_p (Equipment or component response modification factor) = 2.0

Ω_0 (System overstrength factor) = 2

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 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

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 27, 2021

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to: S_{DS} (g) = 1.93 z/h = 0

Condition of Approval (if applicable):

Table 1 - Product Line Matrix

Model	Max. Rating [kW]	Configuration	Max. Package Dimensions [in]			Max. Weight [lbs]	Installation Method	UUT
			Max Length [in]	Max Width [in]	Max Height [in]			
1250REOZMD	1280	Open	250.0	88.0	98.0	26,500	Isolated	Extrapolated
		Enclosed on Tank	584.0	108.0	214.0	103,400	Isolated	UUT-01
1600REOZMD	1600	Open	267.0	88.0	102.0	31,600	Isolated	Interpolated
		Enclosed on Tank	589.0	114.0	207.0	103,400	Isolated	
1750REOZMD	1780	Open	269.0	109.0	122.0	36,000	Isolated	
		Enclosed on Tank	589.0	126.0	207.0	103,400	Isolated	
2000REOZMD	2000	Open	268.0	109.0	122.0	38,000	Isolated	UUT-02
		Enclosed on Tank	511.0	124.0	157.0	62,330	Isolated	UUT-03

Notes

1) Max. Dimensions and Max. Weight includes the largest and heaviest options of all the subcomponents.
2) Max. Weight for enclosed on tank gensets includes tank fully filled with fuel.
3.) On Tank units are rigidly mounted between tank and floor and internally isolated between unit and tank

Table 2 - Certified Subcomponents: Enclosure Matrix

Model	Enclosure			Max Weight[3] [lbs]	Manufacturer	UUT
	Material	Description	Part No.			
REOZMD	Aluminum	Weather enclosure, 40°C & 50°C Cooling Package	GM72613-TPG	2550	Global Power Components	Extrapolated
		Weather enclosure, 40°C & 50°C Cooling Package	GM72616-TPG	2800		
		Weather enclosure, 40°C Cooling Package	GM72617-TPG	2950		
		Weather enclosure, 40°C & 50°C Cooling Package	GM72637-TPG	3120		
		Weather enclosure, 50°C Cooling Package	GM72618-TPG	3275		
		Weather enclosure, 40°C & 50°C Cooling Package	GM72640-TPG	3495		
		Weather enclosure, 40°C Cooling Package	GM72641-TPG	3710		
		SL1 enclosure, 40°C & 50°C Cooling Package	GM72621-TPG	3850		
		Weather enclosure, 50°C Cooling Package	GM72642-TPG	4485		
		SL1 enclosure, 40°C & 50°C Cooling Package	GM72624-TPG	4700		
		SL1 enclosure, 40°C Cooling Package	GM72625-TPG	4825		
		SL2 enclosure, 40°C Cooling Package	GM72633-TPG	4825		
		SL1 enclosure, 40°C & 50°C Cooling Package	GM72648-TPG	5070		
		SL1 enclosure, 40°C & 50°C Cooling Package	GM72645-TPG	5345		
		SL2 enclosure, 40°C & 50°C Cooling Package	GM72632-TPG	5400		
		SL2 enclosure, 40°C & 50°C Cooling Package	GM72653-TPG	5490		
		SL1 enclosure, 50°C Cooling Package	GM72626-TPG	5575		
		SL2 enclosure, 40°C & 50°C Cooling Package	GM72656-TPG	5680		
		SL2 enclosure, 40°C & 50°C Cooling Package	GM72629-TPG	5850		UUT-01
		SL1 enclosure, 50°C Cooling Package	GM72650-TPG	5960		Interpolated
		SL2 enclosure, 40°C Cooling Package	GM72657-TPG	6250		
		SL2 enclosure, 50°C Cooling Package	GM72634-TPG	6375		
		SL1 enclosure, 40°C Cooling Package	GM72649-TPG	6510		
		SL2 enclosure, Internal Silencer, 50°C Cooling Package	GM72658-TPG	9375		UUT-03

Notes

1) SL1: Sound Level 1. SL2: Sound Level 2.
2) Enclosure kits exclude silencers except for UUT-03 enclosure (GM72658-TPG).
3) Only UUT-03 enclosure weight include internal silencer weight. All other enclosures weights exclude silencers weights.

Table 3 - Certified Subcomponents:Tank Matrix

Model	kW Range	Usable Capacity (gallons)	Material	Max Weight [lbs]	Manufacturer	UUT
REOZMD	1250 kW - 2000 kW	1350	Carbon Steel	8535	Global Power Components	UUT -03
		1600		8760		Interpolated
		2100		9340		
		2600		10340		
		3130		12045		
		4150		13600		
		5150		12800		
		6160		13950		
		7700		16810		UUT -01

Table 4 - Certified Subcomponents: Engine Matrix

Model	Part No.	Material	Max Weight [lbs]	Manufacturer	UUT
REOZMD	S12R-Y2PTAW-1	Carbon Steel	11620	Mitsubishi	UUT-01
	S16R-Y2PTAW-1		14399		Interpolated
	S16R-Y2PTAW2-1		14729		
	S16R-Y2PTAW2-1		14729		UUT-02, UUT-03

Table 5 - Certified Subcomponents: Alternator Matrix

Model	Part Number	Material	Max Weight [lbs]	Manufacturer	UUT
REOZMD	7M4046	Carbon Steel	5950	Marathon	Extrapolated
	7M4048		6300		
	7M4366-3300/4160v		6900		
	7M4050		7230		
	7M4368-3300/4160v		7500		
	7M4368-33/4160v		7500		
	7M4052		7800		UUT-01
	7M4370-3300/4160v		8200		Interpolated
	7M4054		8600		
	7M4374-3300-4160v		9300		
	7M4056		9740		
	7M4058		9740		UUT-02, UUT-03

Table 6 - Certified Subcomponents: Radiator Matrix

Model	Part Number	Max Weight [lbs]	Manufacturer	UUT
REOZMD	YT427819 (40°C Package)	2860	Young Touchstone	Extrapolated
	YT427820 (50°C Package)	2950		UUT-01
	YT427808 (40°C Package)	3050		Interpolated
	YT427809 (50°C Package)	3260		
	YT427810 (50°C Package)	3425		
	YT4277811 (50°C Package)	4000		UUT-02, UUT-03

Table 7 - Certified Subcomponents: Fuel Cooler Matrix

Model	Part Number	Max Weight [lbs]	Manufacturer	UUT
REOZMD	MOC8M	70	Young Touchstone	UUT-01, UUT-02, UUT-03

Table 8 - Certified Subcomponents: Skid Matrix

Model	Part Number	Material	Max Weight [lbs]	Manufacturer	UUT
REOZMD	GM80614	Carbon Steel	4822	KOHLER	Extrapolated
	GM80615		4822		
	GM80616		4973		UUT-01
	GM80620		5133		Interpolated
	GM80623		5180		
	GM79125		5289		UUT-02, UUT-03

Table 9 - Certified Subcomponents: Controller Matrix

Model	Model/Part Number	Max Weight	Manufacturer	UUT
REOZMD	DECISION MAKER 6000/ GM78092-2	<10lbs	KOHLER	UUT-01
	DECISION MAKER 550/ GM76122-2	<10lbs	KOHLER	UUT-02, UUT-03
	APM603/ GM99582-1	115lbs	KOHLER	UUT-04

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-01

30383-1701, UUT 17

Model Line	Model Number	Manufacturer
REOZM	1250REOZMD	Kohler

Product Construction Summary

Enclosed diesel powered electrical generator set 1250 kW on tank

Options / Subcomponent Summary

Enclosure: Global Power Components, Fuel Tank: Global Power Components, Engine: Mitsubishi, Alternator: Marathon, Radiator: Young Touchstone, Controller: Kohler, Skid: Kohler, Fuel Cooler: Young Touchstone

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
103,400	584	108	214	2.5	2.5	5.5

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	1.93	0.00	1.50	1.93	0.77	1.29	0.52

Test Mounting Details

Genset is internally isolated to tank using (10) M2SSH-1E Seismic Spring Mounts Provided by The VMC Group. The Mounts are Attached to the Tank Using (4) 3/4" Diameter ASTM A490 Bolts per Mount. Tank is attached to test Fixture with (22) 3/4" ASTM A490 Bolts.

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

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-02

PEER-STI/2011-15, UUT 1

Model Line	Model Number	Manufacturer
REOZM	2000REOZMD	Kohler

Product Construction Summary

Open diesel powered electrical generator set 2000 kW off tank

Options / Subcomponent Summary

Enclosure: N/A, Fuel Tank: N/A, Engine: Mitsubishi, Alternator: Marathon, Radiator: Young Touchstone, Controller: Kohler, Skid: Kohler, Fuel Cooler: Young Touchstone

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
38,000	268	109	122	3.0	3.4	4.4

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	1.93	0.00	1.50	1.93	0.77	1.29	0.52

Test Mounting Details

Skid is attached to (12) M2SSH-1E Seismic Spring Mounts Provided by The VMC Group. The Mounts are Attached to the Fixture Using (4) 3/4" ASTM A490 Bolts per Mount.

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

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-03

PEER-STI/2011-15, UUT 3

Model Line	Model Number	Manufacturer
REOZM	2000REOZMD	Kohler

Product Construction Summary

Enclosed diesel powered electrical generator set 2000 kW on tank

Options / Subcomponent Summary

Enclosure: Global Power Components, Fuel Tank: Global Power Components, Engine: Mitsubishi, Alternator: Marathon, Radiator: Young Touchstone, Controller: Kohler, Skid: Kohler, Fuel Cooler: Young Touchstone, Internal Silencer: Global Power Components

UUT Properties

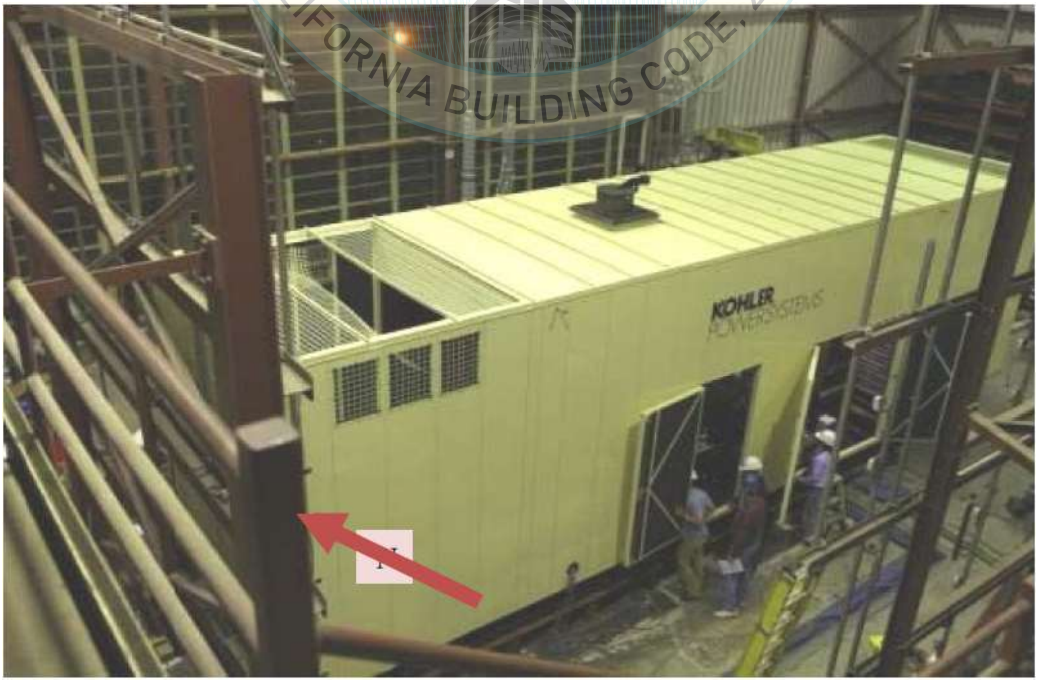
Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
62,330	511	124	157	2.7	2.2	2.4

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	1.93	0.00	1.50	1.93	0.77	1.29	0.52

Test Mounting Details

Genset is internally isolated to tank using (12) M2SSH-1E Seismic Spring Mounts Provided by The VMC Group. The Mounts are Attached to the Tank Using (4) 3/4" Diameter ASTM A490 Bolts per Mount. Tank is attached to test Fixture with (26) 3/4" ASTM A490 Bolts.



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

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-04

30827-1801, UUT 4

Model Line	Model Number	Manufacturer
REOZM	APM603	Kohler

Product Construction Summary

Kohler APM603: UL Gap Large

Options / Subcomponent Summary

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
115	14	21	44	N/A	N/A	N/A

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	2.00	1.00	1.50	3.20	2.40	1.68	0.68

Test Mounting Details

UUT mounted to wall frame 12 gage unistrut via 1/4" plate with (8) 5/16" diameter, grade 8 bolts and washers (16) washers with (8) spring nuts

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