APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0609

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☒ New ☐ Renewal

Manufacturer Information

Manufacturer: Cummins Power Generation

Manufacturer's Technical Representative: Prasant Panigrahy

Mailing Address: 1400 73rd Ave NE, Fridley, MN – 55432 USA

Telephone: 612-270-9214 Email: prasant.k.panigrahy@cummins.com

Product Information

Product Name: Power Generator Systems

Product Type: Power Generator Sets

Product Model Number: DQDAA, B, C & DQCA, B, C & DQFAA, B, C, D, H
(List all unique product identification numbers and/or part numbers)

General Description: 250-1000 kW Cummins Diesel Powered Generators with or without enclosure; on and off tank; with or without internal isolators.

Mounting Description: Rigid base mounted with or without internal vibration isolators.

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: 6/12/19

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 St., 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: University of California Berkeley, PEER

Contact Name: Amarnath Kasalanati

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

Telephone: 510-642-6475 Email: Amarnath1@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) = DQDA Models: Rigid (1.44); Internally Isolated (4.50)
DQFA & DQC Models: Rigid (0.47); Internally Isolated (1.46)

S_{DS} (Design spectral response acceleration at short period, g) = DQDA Models (2.00)
DQFA & DQC Models (0.65)

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

R_p (Equipment or component response modification factor) = 2.0 (Internally Isolated); 2.5 (Rigid)

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1

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, 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 24, 2021

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to: S_{DS} (g) = See Above z/h = 1

Condition of Approval (if applicable):

Table 1 - Product Line Matrix

Model	Max. Rating [kW]	Max. Package Dimensions [in]			Max. Operating Weight W/ Fuel (if applicable) [lbs]	S_{DS} [g]		Configuration	Installation Method	Internal Isolation	UUT
		Length	Width	Height		z/h = 0.0	z/h = 1.0				
DQDAA, B, C	250, 275, 300	119	50	66	5,113	2.48	2.00	Open Off Tank	Rigid	Yes	UUT-01
DQDAA, B, C	250, 275, 300	233	90	100	13,039	2.48	2.00	Enclosed Off Tank	Isolated	Yes	UUT-02
DQDAA, B, C	250, 275, 300	222	86	104	14,250	2.48	2.00	Enclosed On Tank	Rigid	Yes	UUT-03
DQDAA, B, C	250, 275, 300	222	90	116	20,790	2.48	2.00	Open On Tank	Isolated	Yes	UUT-04
DQDAA, B, C	250, 275, 300	232	90	128	29,504	2.48	2.00	Enclosed On Tank	Isolated	Yes	UUT-05
DQCA, B, C	600, 750, 800	315	102	119	29,291	1.94	0.65	Enclosed Off Tank	Isolated	Yes	Interpolated
DQCA, B, C	600, 750, 800	315	102	131	43,156	1.94	0.65	Open On Tank	Isolated	No	Interpolated
DQCA, B, C	600, 750, 800	338	102	142	52,082	1.94	0.65	Enclosed On Tank	Isolated	Yes	Interpolated
DQFAA, B, C, D, H	750, 800, 900, 1000, 1000	338	97	115	18,642	1.94	0.65	Open Off Tank	Isolated	No	UUT-06
DQFAA, B, C, D, H	750, 800, 900, 1000, 1000	338	102	138	45,202	1.94	0.65	Open On Tank	Isolated	No	Interpolated
DQFAA, B, C, D	750, 800, 900, 1000	315	102	119	29,794	1.94	0.65	Enclosed Off Tank	Isolated	No	UUT-07
DQFAA, B, C, D	750, 800, 900, 1000	338	97	137	53,425	1.94	0.65	Enclosed On Tank	Isolated	No	UUT-08

Table 1 - Certified Subcomponents: Engine Matrix

Manufacturer	Model	Models Where Used	Material	Max. Wet Weight [lbs]	S_{DS} @ z/h=0.0	S_{DS} @ z/h=1.0	UUT
Cummins	QSL9-G7	DQDA, B, C	Cast Iron	1,627	2.48	2.00	UUT-01, 02, 03, 04, 05
	QSK23	DQCA, B, C	Cast Iron	6,170	1.94	0.65	Interpolated
	QST30	DQFAA, B, C, D, H	Cast Iron	6,860	1.94	0.65	UUT-06, 07, 08

Note: Listed engine models are not interchangeable.

Table 2 - Certified Subcomponents: Alternator Matrix

Manufacturer	Model	Models Where Used	Material	Max. Wet Weight [lbs]	S_{DS} @ z/h=0.0	S_{DS} @ z/h=1.0	UUT
Cummins	HC4	DQDA, B, C	Steel Laminations & Copper Windings	2,582	2.48	2.00	UUT-01, 02, 03, 04, 05
	S6	DQCA, B, C, DQFAA, B, C, D	Steel Laminations & Copper Windings	5,128	1.94	0.65	Interpolated
	HC6	DQCA, B, C, DQFAA, B, C, D, H	Steel Laminations & Copper Windings	5,602	1.94	0.65	UUT-06, 08
	P7	DQFAA, B, C, D, H	Steel Laminations & Copper Windings	6,654	1.94	0.65	UUT-07

Note: S6, HC6 and P7 alternator models cannot be replaced with HC4.

Table 3 - Certified Subcomponents: Radiator Matrix

Manufacturer	Core Size [ft^2]	Models Where Used	Material		S_{DS} @ z/h=0.0	S_{DS} @ z/h=1.0	Max. Wet Weight [lbs]	UUT
			Core (fin + tube)	Supporting Structure				
AKG	10	DQDA, B, C	Auminum + Aluminum	Carbon Steel	2.48	2.00	464	UUT-03
	26	DQCA, B, C	Auminum + Aluminum	Carbon Steel	1.94	0.65	1,303	Interpolated
	34	DQFAA, B, C, D, H	Auminum + Aluminum	Carbon Steel	1.94	0.65	1,614	UUT-06, 08

Note: Listed radiator sizes are not interchangeable.

Table 4 - Certified Subcomponents: Controller Matrix

Manufacturer	Model	Models Where Used	Material	Max. Wet Weight [lbs]	S_{DS} @ z/h=0.0	S_{DS} @ z/h=1.0	UUT
Cummins	PCC2100	DQDA, B, C	Carbon Steel and Plastic	10	2.48	2.00	UUT-01, 02, 03, 04, 05
	PC 2.3	DQCA, B, C	Carbon Steel and Plastic	90	1.94	0.65	Interpolated
	PC 3.3	DQCA, B, C, DQFAA, B, C, D, H	Carbon Steel and Plastic	90	1.94	0.65	UUT-06, 08

Note: PC 2.3 and PC 3.3 models cannot be replaced with PCC2100.

Table 5 - Certified Subcomponents: Enclosure Matrix

Manufacturer	Model Name	Models Where Used	Material	S_{DS} @ z/h=0.0	S_{DS} @ z/h=1.0	UUT
Cummins	Thor-I	DQDA, B, C	Carbon Steel	2.48	2.00	UUT-02, 03, 05
	Thor-II	DQCA, B, C, DQFAA, B, C, D	Carbon Steel	1.94	0.65	UUT-06, 07, 08

Note: Thor-I and Thor-II enclosures are not interchangeable.

Table 6 - Certified Subcomponents: Fuel Tank

Manufacturer	Capacity [gals]	Models Where Used	Material	Max. Wet Weight [lbs]	S_{DS} @ z/h=0.0	S_{DS} @ z/h=1.0	UUT
Tramont	270 - 1,470	DQDA, B, C	Carbon Steel	14,697	2.48	2.00	UUT-04, 05
Hennig	270	DQDA, B, C	Carbon Steel	3,988	2.48	2.00	UUT-03
United Alloy Inc.	200 - 2,400	DQCA, B, C, DQFAA, B, C, D	Carbon Steel	24,072	1.94	0.65	UUT-08

Note: Listed tanks are not interchangeable.

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-01

PEI-PEER-CUM-130; UUT-30

Model Line	Model Number	Manufacturer
DQDA	DQDAC	Cummins

Product Construction Summary

Structural Carbon Steel Skid

Options / Subcomponent Summary

Cummins Engine; Cummins Alternator; Cummins Controller; Bearward Radiator

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
5,113	119	50	66	3.49	6.22	11.09

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 2019	ICC-ES AC156	2.48	0	1.5	2.48	0.99	1.66	0.67
		2.00	1	1.5	3.20	2.40	1.34	0.54

Test Mounting Details

Genset secured to the fixture using (4) 3/4" dia ASTM 325 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

PEI-PEER-CUM-130; UUT-32

Model Line	Model Number	Manufacturer
DQDA	DQDAC	Cummins

Product Construction Summary

Structural Carbon Steel Skid

Options / Subcomponent Summary

Cummins Engine; Cummins Alternator; Cummins Controller; Bearward Radiator; Cummins Enclosure

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
13,039	233	90	100	5.54	4.40	6.98

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 2016	ICC-ES AC156	2.48	0	1.5	2.48	0.99	1.66	0.67
		2.00	1	1.5	3.20	2.40	1.34	0.54

Test Mounting Details

Genset secured to enclosure base via (4) EBCO 4990-60 duro elastomer isolators. Enclosure base secured to the fixture using (4) 3/4" dia ASTM 325 bolts.

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

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-03

VMA-45782-01E; UUT-1

Model Line	Model Number	Manufacturer
DQDA	DQDAC-QSL9-G7	Cummins

Product Construction Summary

Structural Carbon Steel Skid and Carbon Steel Sheet Metal Enclosure

Options / Subcomponent Summary

Cummins Engine; Cummins Alternator; Cummins Controller; AKG Radiator; Cummins Enclosure; Hennig Fuel Tank

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
14,250	222	86	104	5.5	4.3	9.3

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 2016	ICC-ES AC156	2.50	0	1.5	2.50	1.00	1.67	0.67
		2.00	1	1.5	3.20	2.40	1.34	0.54

Test Mounting Details

Genset secured to fuel tank using (4) 3/4" dia. SAE Grade 5 bolts. Fuel tank secured to the fixture using (12) 1" dia. SAE Grade 8 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

PEI-PEER-CUM-130; UUT-31

Model Line	Model Number	Manufacturer
DQDA	DQDAC	Cummins

Product Construction Summary

Structural Carbon Steel Skid

Options / Subcomponent Summary

Cummins Engine; Cummins Alternator; Cummins Controller; Bearward Radiator; Tramont Fuel Tank

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
20,790	222	90	116	3.11	4.40	7.84

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 2016	ICC-ES AC156	2.48	0	1.5	2.48	0.99	1.66	0.67
		2.00	1	1.5	3.20	2.40	1.34	0.54

Test Mounting Details

Genset secured to a sub-base tank via (4) EBCO 4990-60 duro elastomer isolators. Sub-base tank secured to fixture using (10) 5/8" dia. ASTM 325 bolts.

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

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-05

PEI-PEER-CUM-130; UUT-33

Model Line	Model Number	Manufacturer
DQDA	DQDAC	Cummins

Product Construction Summary

Structural Carbon Steel Skid

Options / Subcomponent Summary

Cummins Engine; Cummins Alternator; Cummins Controller; Bearward Radiator; Cummins Enclosure; Tramont Fuel Tank

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
29,504	232	90	128	3.11	4.40	6.98

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 2016	ICC-ES AC156	2.48	0	1.5	2.48	0.99	1.66	0.67
		2.00	1	1.5	3.20	2.40	1.34	0.54

Test Mounting Details

Genset secured to a sub-base tank via (4) EBCO 4990-60 duro elastomer isolators. Sub-base tank secured to fixture using (10) 5/8" dia. ASTM 325 bolts.

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

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-06

VMA-49943; UUT-34B

Model Line	Model Number	Manufacturer
DQFA	DQFAD	Cummins

Product Construction Summary

Structural Carbon Steel Skid.

Options / Subcomponent Summary

Cummins Engine; Cummins Alternator; Cummins Controller; AKG Radiator.

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
18,642	338	97	115	1.6	2.9	4.5

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 2016	ICC-ES AC156	1.94	0	1.5	1.94	0.78	1.3	0.52

Test Mounting Details

Genset secured to skid via (10) VMC M2SSH-1E-3400N spring isolators. Genset skid secured to fixture using (18) 3/4" dia. SAE Grade 8 bolts.

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

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-07

PEI-PEER-CUM-123; UUT-13

Model Line	Model Number	Manufacturer
DQFA	DQFAD	Cummins

Product Construction Summary

Structural Carbon Steel Skid and Carbon Steel Sheet Metal Enclosure

Options / Subcomponent Summary

Cummins Engine; Cummins Alternator; Cummins Controller; Bearward Radiator; Cummins Thor-II Enclosure.

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
29,794	315	102	119	5.54	8.8	13.97

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 2016	ICC-ES AC156	1.94	0	1.5	1.94	0.78	1.3	0.52

Test Mounting Details

Genset attached to enclosure base via (10) VMC M2SSH-1E-3400N spring isolators. Enclosure base secured to fixture using (12) 3/4" dia SAE Grade 8 bolts.

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

UNIT UNDER TEST (UUT)
Summary Sheet

UUT-08

VMA-49943; UUT-34A

Model Line	Model Number	Manufacturer
DQFA	DQFAD	Cummins

Product Construction Summary

Structural Carbon Steel Skid.

Options / Subcomponent Summary

Cummins Engine; Cummins Alternator; Cummins Controller; AKG Radiator; Cummins Enclosure; UAI Fuel Tank.

UUT Properties

Weight [lbs]	Dimensions [in]			Lowest Nat. Freq. [Hz]		
	Length	Width	Height	F-B	S-S	V
53,425	338	97	137	1.8	3.1	4.7

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 2016	ICC-ES AC156	1.94	0	1.5	1.94	0.78	1.3	0.52

Test Mounting Details

Genset secured to enclosure base via (10) VMC M2SSH-1E-3400N spring isolators. Sub-base tank secured to fixture using (18) 3/4" dia SAE Grade 8 bolts.

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