# APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

**APPLICATION #: OSP-0321**

## HCAI Special Seismic Certification Preapproval (OSP)

**Type:** ☐ New ☒ Renewal

## Manufacturer Information

Manufacturer: Caterpillar Electric Power Division

Manufacturer's Technical Representative: Vasantha Kodukula

Mailing Address: 1720 West Kingsbury Street, Seguin, TX 78155

Telephone: (830) 386-2803 Email: Vasantha.kodukula@cat.com

## Product Information

Product Name: C4.4, C6.6, C7.1, C9, C13, C15, C18

Product Model Number(s): C4.4, C6.6, C7.1, C9, C13, C15, C18

Product Category: Emergency and Standby Power Systems

Product Sub-Category: Generators

General Description: Diesel powered internally isolated, rigid base mounted generators
Sizes D40, D50, D60, D80, D100, D125, D150, D175, D200, C9, C13, C15, and C18

Mounting Description: Internally isolated, rigid base mounted, - Location (Other) -> on or off fuel tanks, with or without

Tested Seismic Enhancements: Seismic enhancements made to the test units and/or modifications required to address anomalies during the tests shall be incorporated into the production units.

## Applicant Information

Applicant Company Name: The VMC Group

Contact Person: John Giuliano

Mailing Address: 113 Main Street, Bloomingdale, NJ 07403

Telephone: (973) 838-1780 Email: john.giuliano@thevmcgroup.com

Title: President

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

Company Name: THE VMC GROUP

Name: Kenneth Tarlow California License Number: S2851

Mailing Address: 980 9th Street, 16th Floor, Sacramento, CA 95814

Telephone: (832) 627-2214 Email: ken.tarlow@thevmcgroup.com

## Certification Method

☐ GR-63-Core ☒ ICC-ES AC156 ☐ IEEE 344 ☐ IEEE 693 ☐ NEBS 3

☐ Other (Please Specify):

## Testing Laboratory

Company Name: U.S. ARMY ENGINEER RESEARCH AND DEVELOPMENT CENTER, CONSTRUCTION ENGINEERING RESEARCH LABORATORY (CERL)

Contact Person: James Wilcoski

Mailing Address: 2902 Newmark Dr., Champaign IL 61822-1076

Telephone: (217) 373-6763 Email: James.wilcoski@usace.army.mil

Company Name: DYNAMIC CERTIFICATION LABORATORY (DCL)

Contact Person: Kelly Laplace

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

Telephone: (775) 358-5085 Email: Kelly@shaketest.com

Company Name: Pacific Earthquake Engineering Research Center (PEER)

Contact Person: Amarnath Kasalanati

Mailing Address: 1301 South 46th St., Bldg. 420, Richmond CA 94720-1729

Telephone: (510) 642-3437 Email: Amarnath1@berkeley.edu

## Seismic Parameters

Design Basis of Equipment or Components ($F_p/W_p$) = 1.7

$S_{DS}$ (Design spectral response acceleration at short period, g) = 2.26

$a_p$ (Amplification factor) = 2.5 (internally isolated)

$R_p$ (Response modification factor) = 2.0 (internally isolated)

$\Omega_0$ (System overstrength factor) = 2.0

$I_p$ (Importance factor) = 1.5

z/h (Height ratio factor) = 0

Natural frequencies (Hz) = See Attachment

Overall dimensions and weight = See Attachment



## HCAI Approval (For Office Use Only) - Approval Expires on 07/15/2030

Date: 7/15/2024

Name: Timothy Piland Title: Senior Structural Engineer

Special Seismic Certification Valid Up to: $S_{DS}$ (g) = 2.26 z/h = 0

Condition of Approval (if applicable):

# Table 1 - Certified Gensets On Tanks

| Product Family | Model | Rating [ kW ] | EPA Rating | Max Package Dimensions [ in ] | | | Weight[1] [ lbs ] | UUT |
|---|---|---|---|---|---|---|---|---|
| | | | | Length | Width | Height[2] | | |
| C4.4 Enclosed | D40 / D50 / D60 | 60 | Tier 3 | 108 | 44 | 84 | 6,310 | Interpolated |
| C4.4 Enclosed | D50 | 50 | Tier 3 | 108 | 41 | 80 | 6,310 | UUT-01A, UUT-01B |
| C4.4 Open | D40 / D50 / D60 | 60 | Tier 3 | 108 | 44 | 79 | 5,750 | Extrapolated |
| C4.4 Open | D80 / D100 | 100 | Tier 3 | 136 | 44 | 85 | 7,808 | Interpolated |
| C4.4 Enclosed | D80 / D100 | 100 | Tier 3 | 136 | 44 | 92 | 8,516 | Interpolated |
| C6.6 Open | D125 / D150 / D175 | 175 | Tier 3 | 198 | 44 | 95 | 11,856 | Interpolated |
| C6.6 Enclosed | D125 / D150 / D175 | 175 | Tier 3 | 198 | 44 | 96 | 12,830 | Interpolated |
| C6.6 Enclosed | D175 | 175 | Tier 3 | 199 | 44 | 96 | 12,830 | UUT-02A, UUT-02B |
| C7.1 Open | D125/D150/D175/D200 | 200 | Tier 3 | 198 | 44 | 96 | 12,114 | Interpolated |
| C7.1 Enclosed | D125/D150/D175/D200 | 200 | Tier 3 | 198 | 44 | 96 | 13,088 | Interpolated |
| C9 Open Wide Skid | C9 | 300 | Tier 3 | 219 | 81 | 108 | 17,450 | Interpolated |
| C9 Enclosed | C9 | 300 | Tier 3 | 219 | 81 | 114 | 19,850 | Interpolated |
| C13 Open Wide Skid | C13 | 400 | Tier 3 | 279 | 81 | 118 | 28,176 | Interpolated |
| C13 Enclosed | C13 | 400 | Tier 3 | 286 | 81 | 124 | 30,864 | Interpolated |
| C15 Open Wide Skid | C15 | 450 | Tier 3 | 244 | 81 | 119 | 25,773 | Interpolated |
| C15 Enclosed | C15 | 450 | Tier 3 | 251 | 81 | 127 | 28,504 | Interpolated |
| C15 Open Wide Skid | C15 | 500 | Tier 2 | 244 | 81 | 119 | 26,304 | Interpolated |
| C15 Enclosed | C15 | 500 | Tier 2 | 251 | 81 | 127 | 29,034 | Interpolated |
| C18 Open Wide Skid | C18 Tier 4F | 500 | Tier 4 Final | 230 | 90 | 99 | 19,042 | Interpolated |
| C18 Enclosed | C18 Tier 4F | 500 | Tier 4 Final | 247 | 90 | 111 | 16,900 | UUT-05 |
| C18 Open Wide Skid | 500-600kW | 600 | Tier 2 | 279 | 81 | 118 | 29,205 | Interpolated |
| C18 Enclosed | 500-600kW | 600 | Tier 2 | 286 | 81 | 124 | 32,031 | Interpolated |
| C18 Enclosed | 600kW | 600 | Tier 2 | 279 | 81 | 124 | 32,031 | UUT-03 |

[1]Weights include genset, enclosure (where applicable), and fuel tank with operating fluid

[2]Does not include the height of the tank

*Underlined and/or highlighted units shake tested in accordance with AC156

# Table 2 - Certified Gensets Off Tanks

| Product Family | Model | Rating [ kW ] | EPA Rating | Max Package Dimensions [ in ] | | | Weight[1] [ lbs ] | UUT |
|---|---|---|---|---|---|---|---|---|
| | | | | Length | Width | Height | | |
| C4.4 Enclosed | D40 / D50 / D60 | 60 | Tier 3 | 97 | 44 | 51 | 3,020 | Interpolated |
| C4.4 Enclosed | D50 | 50 | Tier 3 | 102 | 41 | 96 | 3,020 | UUT-01C |
| C4.4 Open | D40 / D50 / D60 | 60 | Tier 3 | 97 | 44 | 51 | 3,253 | Interpolated |
| C4.4 Open | D80 / D100 | 100 | Tier 3 | 97 | 44 | 51 | 3,253 | Interpolated |
| C4.4 Enclosed | D80 / D100 | 100 | Tier 3 | 114 | 44 | 59 | 3,961 | Interpolated |
| C6.6 Open | D125 / D150 / D175 | 175 | Tier 3 | 123 | 44 | 58 | 4,184 | Interpolated |
| C6.6 Enclosed | D125 / D150 / D175 | 175 | Tier 3 | 143 | 44 | 59 | 5,090 | Interpolated |
| C6.6 Enclosed | D175 | 175 | Tier 3 | 144 | 44 | 60 | 5,090 | UUT-02C |
| C7.1 Open | D125/D150/D175/D200 | 200 | Tier 3 | 123 | 44 | 58 | 4,442 | Interpolated |
| C7.1 Enclosed | D125/D150/D175/D200 | 200 | Tier 3 | 143 | 44 | 59 | 5,348 | Interpolated |
| C9 Open Narrow Skid | C9 | 300 | Tier 3 | 122 | 64 | 80 | 5,423 | Interpolated |
| C9 Open Wide Skid | C9 | 300 | Tier 3 | 150 | 80 | 80 | 5,961 | Interpolated |
| C9 Enclosed | C9 | 300 | Tier 3 | 178 | 80 | 87 | 8,364 | Interpolated |
| C13 Open Narrow Skid | C13 | 400 | Tier 3 | 138 | 64 | 82 | 7,584 | Interpolated |
| C13 Open Wide Skid | C13 | 400 | Tier 3 | 186 | 80 | 84 | 8,283 | Interpolated |
| C13 Enclosed | C13 | 400 | Tier 3 | 195 | 80 | 91 | 11,036 | Interpolated |
| C15 Open Narrow Skid | C15 | 450 | Tier 3 | 138 | 64 | 84 | 8,253 | Interpolated |
| C15 Open Wide Skid | C15 | 450 | Tier 3 | 150 | 80 | 84 | 8,662 | Interpolated |
| C15 Enclosed | C15 | 450 | Tier 3 | 195 | 80 | 91 | 11,393 | Interpolated |
| C15 Open Narrow Skid | C15 | 500 | Tier 2 | 138 | 64 | 84 | 8,784 | Interpolated |
| C15 Open Wide Skid | C15 | 500 | Tier 2 | 150 | 80 | 84 | 9,193 | Interpolated |
| C15 Enclosed | C15 | 500 | Tier 2 | 195 | 80 | 91 | 11,923 | Interpolated |
| C18 Open Narrow Skid | C18 | 600 | Tier 2 | 132 | 44 | 83 | 8,800 | UUT-04 |
| C18 Open Wide Skid | C18 | 600 | Tier 2 | 150 | 80 | 83 | 9,353 | Extrapolated |
| C18 Enclosed | C18 | 600 | Tier 2 | 204 | 80 | 89 | 12,637 | Interpolated[2] |
| C18 Open Wide Skid | C18 Tier 4F | 500 | Tier 4 Final | 209 | 90 | 84 | 11,294 | Interpolated |
| C18 Enclosed | C18 Tier 4F | 500 | Tier 4 Final | 227 | 90 | 96 | 13,720 | Interpolated[3] |

[1]Weights include genset and enclosure (where applicable)

[2]Similar to UUT-05, the only difference is lack of fuel tank

[3]Similar to UUT-03, the only difference is lack of fuel tank

*Underlined and/or highlighted units shake tested in accordance with AC156

## Table 2 - Certified Enclosures

| Product Family [ Caterpillar ] | Model | Type | Part Number | Max Dimensions [ in ] | | | Material | Weight [ lb ] | UUT |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Length | Width | Height | | | |
| C4.4 | D40, **D50,** D60 | WP with Window | 3943713 | 77 | 41 | 51 | Steel | 482 | Extrapolated |
| | | WP Standard | 3816168 | 77 | 41 | 51 | Steel | 483 | Extrapolated |
| | | SA1 with Window | 3943715 | 92 | 41 | 51 | Steel | 544 | Extrapolated |
| | | SA1 Standard | 3943714 | 92 | 41 | 51 | Steel | 545 | Extrapolated |
| | | SA2 with Window | 3943717 | 92 | 41 | 51 | Steel | 596 | UUT-01A, UUT-01B, UUT-01C |
| | | SA2 Standard | 3943716 | 92 | 41 | 51 | Steel | 598 | Interpolated |
| | D80, D100 | WP Standard | 3818667 | 93 | 41 | 59 | Steel | 611 | Interpolated |
| | | WP with Window | 3943721 | 93 | 41 | 59 | Steel | 616 | Interpolated |
| | | SA1 Standard | 3943722 | 114 | 41 | 59 | Steel | 690 | Interpolated |
| | | SA1 with Window | 3943723 | 114 | 41 | 59 | Steel | 696 | Interpolated |
| | | SA2 Standard | 3943724 | 114 | 41 | 59 | Steel | 711 | Interpolated |
| | | SA2 with Window | 3943725 | 114 | 41 | 59 | Steel | 717 | Interpolated |
| C6.6 / C7.1 | D125, D150, **D175,** D200 | WP Standard (D125-175) | 3943734 | 120 | 41 | 59 | Steel | 735 | Interpolated |
| | | WP with Window (D125-175) | 3943735 | 120 | 41 | 59 | Steel | 741 | Interpolated |
| | | WP Standard (D200) | 3784033 | 120 | 41 | 59 | Steel | 734 | Interpolated |
| | | WP with Window (D200) | 3943733 | 120 | 41 | 59 | Steel | 739 | Interpolated |
| | | SA1 Standard | 3943736 | 144 | 41 | 59 | Steel | 815 | Interpolated |
| | | SA1 with Window | 3943737 | 144 | 41 | 59 | Steel | 821 | Interpolated |
| | | SA2 Standard | 3943738 | 144 | 41 | 59 | Steel | 895 | UUT-02A, UUT-02B, UUT-02C |
| | | SA2 with Window | 3943739 | 144 | 41 | 59 | Steel | 901 | Interpolated |
| C9 | C9 | WP Standard | 449-0700 | 159 | 73 | 71 | Steel | 1,392 | Interpolated |
| | | | 606-9742[1] | 159 | 73 | 71 | Steel | 1,392 | Interpolated |
| | | | 606-9743[2] | 159 | 73 | 71 | Steel | 1,392 | Interpolated |
| | | SA1 Standard | 453-2197 | 177 | 73 | 71 | Steel | 1,863 | Interpolated |
| | | | 606-9755[1] | 177 | 73 | 71 | Steel | 1,863 | Interpolated |
| | | | 606-9761[2] | 177 | 73 | 71 | Steel | 1,863 | Interpolated |
| | | SA1 with Window | 453-2198 | 177 | 73 | 71 | Steel | 1,873 | Interpolated |
| | | | 606-9756[1] | 177 | 73 | 71 | Steel | 1,873 | Interpolated |
| | | | 606-9762[2] | 177 | 73 | 71 | Steel | 1,873 | Interpolated |
| | | SA2 Standard | 449-0534 | 177 | 73 | 71 | Steel | 2,365 | Interpolated |
| | | | 606-9757[1] | 177 | 73 | 71 | Steel | 2,365 | Interpolated |
| | | | 606-9763[2] | 177 | 73 | 71 | Steel | 2,365 | Interpolated |

**Notes:**

WP=Weatherproof, SA=Sound Attenuated, SA1=Sound Attenuated Level 1, SA2=Sound Attenuated Level 2, CW=Cold Weather

[1]Yellow color enclosure

[2]White color enclosure

## Table 2 - Certified Enclosures, Continued

| Product Family [ Caterpillar ] | Model | Type | Part Number | Max Dimensions [ in ] | | | Material | Weight [ lb ] | UUT |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Length | Width | Height | | | |
| C9 | C9 | SA2 With Window | 449-0724 | 178 | 88 | 74 | Steel | 2,373 | Interpolated |
| | | | 606-9758[1] | 178 | 88 | 74 | Steel | 2,373 | Interpolated |
| | | | 606-9764[2] | 178 | 88 | 74 | Steel | 2,373 | Interpolated |
| | | WP | 463-3012 | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | | 607-7000[1] | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | | 607-7012[2] | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | SA1 Standard | 463-3012 | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | | 607-7004[1] | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | | 607-7013[2] | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | SA1 with Window | 463-3012 | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | | 607-7005[1] | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | | 607-7014[2] | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | SA2 Standard | 463-3012 | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | | 607-7008[1] | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | | 607-7017[2] | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | SA2 with Window | 463-3012 | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | | 607-7009[1] | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| | | | 607-7018[2] | 195 | 75 | 71 | Steel | 1,375 | Interpolated |
| C15 | C15 | SA Standard | 393-2460 | 194 | 73 | 71 | Steel | 2,677 | Interpolated |
| | | | 607-4750[1] | 194 | 73 | 71 | Steel | 2,677 | Interpolated |
| | | | 607-4759[2] | 194 | 73 | 71 | Steel | 2,677 | Interpolated |
| | | SA with Window | 422-6087 | 194 | 73 | 71 | Steel | 2,688 | Interpolated |
| | | | 607-4751[1] | 194 | 73 | 71 | Steel | 2,688 | Interpolated |
| | | | 607-4760[2] | 194 | 73 | 71 | Steel | 2,688 | Interpolated |
| C18 | C18 | SA Standard | 393-2442 | 204 | 73 | 71 | Steel | 2,654 | Interpolated |
| | | | 607-4774[1] | 204 | 73 | 71 | Steel | 2,654 | Interpolated |
| | | | 607-4780[2] | 204 | 73 | 71 | Steel | 2,654 | Interpolated |
| | | SA with Window | 422-6089 | 204 | 73 | 71 | Steel | 2,665 | UUT-03 |
| | | | 607-4775[1] | 204 | 73 | 71 | Steel | 2,665 | Interpolated |
| | | | 607-4782[2] | 204 | 73 | 71 | Steel | 2,665 | Interpolated |
| | C18 Tier 4F | SA Standard | 606-7320[1] | 226 | 89 | 83 | Steel | 3,136 | Interpolated |
| | | | 606-7321[2] | 226 | 89 | 83 | Steel | 3,136 | Interpolated |
| | | | 461-6316 | 226 | 89 | 83 | Steel | 3,136 | UUT-05 |

**Notes:**

WP=Weatherproof, SA=Sound Attenuated, SA1=Sound Attenuated Level 1, SA2=Sound Attenuated Level 2, CW=Cold Weather

[1]Yellow color enclosure

[2]White color enclosure

# Table 3 - Certified Subcomponents

| Component [ MFR ] | Part Number | Notes | Weight [ lb ] | UUT |
|---|---|---|---|---|
| UL-142 Tanks [ Caterpillar ] | 387-7613 | 156 Gallons | 919 | Extrapolated |
| | 392-8555 | 228 Gallons | 1,184 | Extrapolated |
| | 387-7612 | 285 Gallons | 1,246 | UUT-01A, UUT-01B |
| | 382-3984 | 376 Gallons | 1,587 | Interpolated |
| | 466-9202 | 408 Gallons | 1,552 | Interpolated |
| | 392-8565 | 412 Gallons | 1,590 | Interpolated |
| | 449-0565 | 660 Gallons | 2,299 | Interpolated |
| | 599-7214 | 660 Gallons | 2,353 | Interpolated |
| | 461-6197 | 660 Gallons | 2,875 | UUT-05 |
| | 392-8524 | 725 Gallons | 2,524 | UUT-02A, UUT-02B |
| | 466-9205 | 784 Gallons | 2,370 | Interpolated |
| | 419-6632 | 1,000 Gallons | 3,278 | Interpolated |
| | 463-3100 | 1,100 Gallons | 3,408 | Interpolated |
| | 599-7141 | 1,100 Gallons | 3,501 | Interpolated |
| | 650-7436 | 1,800 Gallons | 4,500 | Interpolated |
| | 422-6066 | 1,855 Gallons | 4,541 | Interpolated |
| | 419-6634 | 2,160 Gallons | 4,991 | UUT-03 |
| Engine [ Perkins[1]/Caterpillar ] | 383-7265 | D40 | 1,190 | Extrapolated |
| | 383-7266 | D50 | 1,190 | UUT-01A, UUT-01B, UUT-01C |
| | 383-7267 | D60 | 1,190 | Interpolated |
| | 383-7268 | D80 | 1,190 | Interpolated |
| | 383-7269 | D100 | 1,190 | Interpolated |
| | 291-0361 | D125 | 1,543 | Interpolated |
| | 469-6214 | D125 | 1,543 | Interpolated |
| | 291-0362 | D150 | 1,543 | Interpolated |
| | 469-6211 | D150 | 1,543 | Interpolated |
| | 390-3314 | D175 | 1,709 | UUT-02A, UUT-02B, UUT-02C |
| | 469-4413 | D175 | 1,709 | Interpolated |
| | 456-7961 | D200 | 1,709 | Interpolated |
| | 452-9865 | C9 | 1,841 | Interpolated |
| | 434-3726 | C13 | 2,867 | Interpolated |
| | 506-6872 | C13 | 2,867 | Interpolated |
| | 423-0922 | C15 | 3,675 | Interpolated |
| | 420-6876 | C15 | 3,675 | Interpolated |
| | 420-6877 | C18 | 3,935 | UUT-03, UUT-04 |
| | 419-0904 | C18 Tier 4F | 3,935 | UUT-05 |
| Alternators [ Leroy Somer ] | 1500 Frame | C4.4 | 410 | Extrapolated |
| | 2000 Frame | C4.4 / C6.6 | 754 | UUT-01A, UUT-01B, UUT-01C |
| | 3000 Frame | C4.4 / C6.6 / C7.1 | 955 | Interpolated |
| | 3100 Frame | C4.4 / C6.6 / C7.1 | 1,213 | Interpolated |
| | 5000 Frame | C9 | 1,973 | UUT-02A, UUT-02B, UUT-02C |
| | 6100 Frame | C9/C13/C15/C18(500-600 kW) | 2,886 | UUT-05 |
| | 7000 Frame | C15/ C18(500-600 kW) | 3,671 | UUT-03, UUT-04 |
| Radiators [ Denso-Marston ] | 3174133 | D40/ **D50**/ D60 | 51 | UUT-01A, UUT-01B, UUT-01C |
| | 2994051 | D80/ D100 | 71 | Interpolated |
| | 2758174 | D125 / D150 | 148 | Interpolated |
| | 3304835 | **D175**/ D200 | 157 | UUT-02A, UUT-02B, UUT-02C |
| | 384-2246 | C9 / C13 | 269 | Interpolated |
| | 354-6434 | C13 / C15 | 309 | Interpolated |
| | 366-0080 | C18 (500-600 kW) | 584 | UUT-03, UUT-04 |
| Radiators [ Bearward ] | 336-8518 | C18 Tier 4F | 584 | UUT-05 |

[1] Perkins is a brand of Caterpillar

## Table 3 - Certified Subcomponents (Continued)

| Component [ MFR ] | Part/Model Number | Notes | Weight [ lb ] | UUT |
|---|---|---|---|---|
| **16 Gauge Steel Control Panel / Box [ Caterpillar ]** | N/A | **C4.4** / **C6.6** / C7.1 | 33 | UUT-01A, UUT-01B, UUT-01C UUT-02A, UUT-02B, UUT-02C |
| | 374-5749 | C9 / C15 / **C18 (500-600 kW)** | 177 | UUT-03, UUT-04 |
| | 461-6309 | C18 Tier 4F | 177 | UUT-05 |
| **Controller [ Caterpillar ]** | 4311966 | Controller - EMCP 4.2 (AVR Compatible) | 6 | UUT-01A, UUT-01B, UUT-01C UUT-02A, UUT-02B, UUT-02C |
| | 442-7222 | Controller - EMCP 4.2 (IVR Compatible) | 6 | UUT-03 |
| | 390-1195 | Controller - EMCP 4.3 | 6 | UUT-04 |
| | 356-0121 | Controller - EMCP 4.4 | 7 | Extrapolated |
| | DSE6310 | GCCP 1.2 | 2 (screen only) 120 (with cabinet) | UUT-10 |
| | DSE8610 | GCCP 1.5 | 3 (screen only) 69 (with cabinet) | UUT-11 |
| **Voltage Regulators [ Leroy-Somer ]** | R250 (AVR) | Control Panel-Mounted | 2.2 | UUT-01A, UUT-01B, UUT-01C |
| | R251 (AVR) | Control Panel-Mounted | 2.2 | Extrapolated |
| | R250 (AVR) | Alternator-Mounted | 2.2 | UUT-02A, UUT-02B, UUT-02C |
| | R450 (AVR) | Alternator-Mounted | 2.2 | UUT-04 |
| | EM10 (IVR) | Alternator-Mounted | 2.2 | UUT-03 |
| **Main Breaker Box [ Caterpillar ]** | 449-0638 | 14 Gauge Carbon Steel | 64 | UUT-03 |
| | 390-4858 | 14 Gauge Carbon Steel | 64 | UUT-04 |
| **Auxiliary Breaker Box [ Caterpillar ]** | 449-0619 | 16 Gauge Carbon Steel | 31 | UUT-03 |
| **Molded Case Breakers [ Square D ]** | R Frame | C9-C18 (350-750 kW) | 77 | UUT-03, UUT-04 |
| **Molded Case Breakers [ ABB ]** | T Series | C9-C18 (200-750 kW) | 55 | UUT-01A, UUT-01B, UUT-01C UUT-02A, UUT-02B, UUT-02C |
| | T8 | 1600A, 2000A, 2500A, **3000 A** | 175 (breaker) 350 (with cabinet) | UUT-12 |
| | XT5 | 400 A | 12 | UUT-07 |
| | XT6 | 600/800 A | 26 | Interpolated |
| | XT7 | 1200 A | 39 | Interpolated |
| | XT7M | 1200 A | 40 | UUT-08 |
| **Battery [ Caterpillar ]** | 9X-3404 | 12V | 68 | UUT-09A[2], UUT-09B[2] |

[2]Battery tested on wall mounted battery tray (PN: 423-7137) and secured to tray with strap (PN: 399-2026)

# UNIT UNDER TEST (UUT)
## Summary Sheet

**UUT-1A**

Test Report: PEER STI 2012-21

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | C4.4 D50 | Caterpillar |

**Product Construction Summary**

50kW Diesel Powered Electrical Generator Set, SA2 Carbon Steel Enclosure, and 285 gal Carbon Steel Fuel Tank

**Options / Subcomponent Summary**

Enclosure, Fuel Tank, Engine, Alternator, Radiator, 16 Gauge Steel Control Panel/Box, Controller, Voltage Regulator, Molded Case Breakers

**UUT Properties**

| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 4,260 | 108.0 | 41.0 | 80.0 | 5.3 | 6.8 | 11.8 |

**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 2022 | ICC-ES AC156 | 2.49 | 0.0 | 1.5 | 2.49 | 1.00 | 1.66 | 0.66 |
| | | - | - | - | - | - | - | - |

**Test Mounting Details**

UUT-1A was rigidly mounted to the fuel tank using (12) 5/8" diameter Grade 8 bolts. The tank was rigidly connected to the shake table using (12) 5/8" Grade 8 bolts.


Unit tested with empty tank and maintained structural integrity and functionality after AC-156 test.

# UNIT UNDER TEST (UUT)
## Summary Sheet

**UUT-1B**

Test Report: PEER STI 2012-21

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | C4.4 D50 | Caterpillar |

**Product Construction Summary**

50kW Diesel Powered Electrical Generator Set, SA2 Carbon Steel Enclosure, and 285 gal Carbon Steel Fuel Tank

**Options / Subcomponent Summary**

Enclosure, Fuel Tank, Engine, Alternator, Radiator, 16 Gauge Steel Control Panel/Box, Controller, Voltage Regulator, Molded Case Breakers

**UUT Properties**

| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 6,310 | 108.0 | 41.0 | 80.0 | 4.6 | 5.6 | 11.3 |

**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 2022 | ICC-ES AC156 | 2.49 | 0.0 | 1.5 | 2.49 | 1.00 | 1.66 | 0.66 |
| | | - | - | - | - | - | - | - |

**Test Mounting Details**

UUT-1B was rigidly mounted to the fuel tank using (12) 5/8" diameter Grade 8 bolts. The tank was rigidly connected to the shake table using (12) 5/8" 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-1C**

Test Report: PEER STI 2012-21

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | C4.4 D50 | Caterpillar |

**Product Construction Summary**

50kW Diesel Powered Electrical Generator Set and SA2 Carbon Steel Enclosure

**Options / Subcomponent Summary**

Enclosure, Engine, Alternator, Radiator, 16 Gauge Steel Control Panel/Box, Controller, Voltage Regulator, Molded Case Breakers

**UUT Properties**

| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 3,020 | 102.0 | 41.0 | 96.0 | 3.9 | 5.4 | 10.3 |

**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 2022 | ICC-ES AC156 | 2.49 | 0.0 | 1.5 | 2.49 | 1.00 | 1.66 | 0.66 |
| | | - | - | - | - | - | - | - |

**Test Mounting Details**

UUT-1C was rigidly mounted to the shake table using (12) 5/8" diameter 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-2A**

Test Report: PEER STI 2012-21

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | C6.6 D175 | Caterpillar |

**Product Construction Summary**

175kW Diesel Powered Electrical Generator Set, SA2 Carbon Steel Enclosure, and 725 gal Carbon Steel Fuel Tank

**Options / Subcomponent Summary**

Enclosure, Fuel Tank, Engine, Alternator, Radiator, 16 Gauge Steel Control Panel/Box, Controller, Voltage Regulator, Molded Case Breakers

**UUT Properties**

| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 7,610 | 199.0 | 44.0 | 96.0 | 4.3 | 7.0 | 9.4 |

**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 2022 | ICC-ES AC156 | 2.49 | 0.0 | 1.5 | 2.49 | 1.00 | 1.66 | 0.66 |
| | | - | - | - | - | - | - | - |

**Test Mounting Details**

UUT-2A was rigidly mounted to the fuel tank using (12) 5/8" diameter Grade 8 bolts. The tank was rigidly connected to the shake table using (16) 5/8" Grade 8 bolts.


Unit tested with empty tank and maintained structural integrity and functionality after AC-156 test.

# UNIT UNDER TEST (UUT)
## Summary Sheet

**UUT-2B**

Test Report: PEER STI 2012-21

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | C6.6 D175 | Caterpillar |

**Product Construction Summary**

175kW Diesel Powered Electrical Generator Set, SA2 Carbon Steel Enclosure, and 725 gal Carbon Steel Fuel Tank

**Options / Subcomponent Summary**

Enclosure, Fuel Tank, Engine, Alternator, Radiator, 16 Gauge Steel Control Panel/Box, Controller, Voltage Regulator, Molded Case Breakers

**UUT Properties**

| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 12,830 | 199.0 | 44.0 | 96.0 | 3.7 | 6.1 | 8.8 |

**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 2022 | ICC-ES AC156 | 2.49 | 0.0 | 1.5 | 2.49 | 1.00 | 1.66 | 0.66 |
| | | - | - | - | - | - | - | - |

**Test Mounting Details**

UUT-2B was rigidly mounted to the fuel tank using (12) 5/8" diameter Grade 8 bolts. The tank was rigidly connected to the shake table using (16) 5/8" 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-2C**

Test Report: PEER STI 2012-21

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | C6.6 D175 | Caterpillar |

**Product Construction Summary**

175kW Diesel Powered Electrical Generator Set and SA2 Carbon Steel Enclosure

**Options / Subcomponent Summary**

Enclosure, Engine, Alternator, Radiator, 16 Gauge Steel Control Panel/Box, Controller, Voltage Regulator, Molded Case Breakers

**UUT Properties**

| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 5,090 | 144.0 | 44.0 | 60.0 | 3.4 | 6.6 | 8.6 |

**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 2022 | ICC-ES AC156 | 2.49 | 0.0 | 1.5 | 2.49 | 1.00 | 1.66 | 0.66 |
| | | - | - | - | - | - | - | - |

**Test Mounting Details**

UUT-2C was rigidly mounted to the shake table using (12) 5/8" diameter 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-3**

Test Report: VMA-48473-01E

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | C18 | Caterpillar |

**Product Construction Summary**

600kW Diesel Powered Electrical Generator Set, SA Carbon Steel Enclosure, and 2160 gal Carbon Steel Fuel Tank

**Options / Subcomponent Summary**

Enclosure, Fuel Tank, Engine, Alternator, Radiator, 16 Gauge Steel Control Panel/Box, Controller, Voltage Regulator, 14 Gauge Carbon Steel Main Breaker Box, 16 Gauge Carbon Steel Auxiliary Breaker Box, Molded Case Breakers

**UUT Properties**

| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 32,031 | 279.0 | 81.0 | 124.0 | 6.2 | 4.8 | 10.5 |

**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 2022 | ICC-ES AC156 | 2.26 | 0.0 | 1.5 | 2.26 | 0.90 | 1.51 | 0.60 |
| | | - | - | - | - | - | - | - |

**Test Mounting Details**

UUT-3 was rigidly mounted to the shake table using (18) M16 ISO 10.9 Grade bolts with nuts.


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

# UNIT UNDER TEST (UUT)
## Summary Sheet

**UUT-4**

Test Report: PEER STI 2013-04; UUT-4A

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | C18 | Caterpillar |

**Product Construction Summary**

600kW Diesel Powered Electrical Generator Set

**Options / Subcomponent Summary**

Engine, Alternator, Radiator, 16 Gauge Steel Control Panel/Box, Controller, Voltage Regulator, 14 Gauge Carbon Steel Main Breaker Box, Molded Case Breakers

**UUT Properties**

| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 8,800 | 132.0 | 44.0 | 83.0 | 4.4 | 5.9 | 11.2 |

**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 2022 | ICC-ES AC156 | 2.30 | 0.0 | 1.5 | 2.30 | 0.92 | 1.53 | 0.61 |
| | | - | - | - | - | - | - | - |

**Test Mounting Details**

UUT-4 was rigidly mounted to the shake table using (6) 3/4" diameter 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-5**

Test Report: PEER STI 2015-12

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | C18 T4 Final | Caterpillar |

**Product Construction Summary**

500kW Diesel Powered Electrical Genset

**Options / Subcomponent Summary**

Enclosure, Fuel Tank, Engine, Alternator, Radiator, 16 Gauge Steel Control Panel/Box

**UUT Properties**

| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 16,900 | 247.0 | 90.0 | 111.0 | 3.9 | 4.9 | 7.2 |

**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 2022 | ICC-ES AC156 | 2.26 | 0.0 | 1.5 | 2.26 | 0.90 | 1.51 | 0.60 |
| | | - | - | - | - | - | - | - |

**Test Mounting Details**

UUT-5 was rigidly mounted to the fuel tank using (12) 5/8" diameter Grade 8 bolts. The tank was rigidly connected to the shake table using (12) 5/8" 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-7**

Test Report: DCL 19859-2201; UUT-1

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | XT 5 | ABB |

**Product Construction Summary**

Plastic Molded Case

**Options / Subcomponent Summary**

N/A

**UUT Properties**

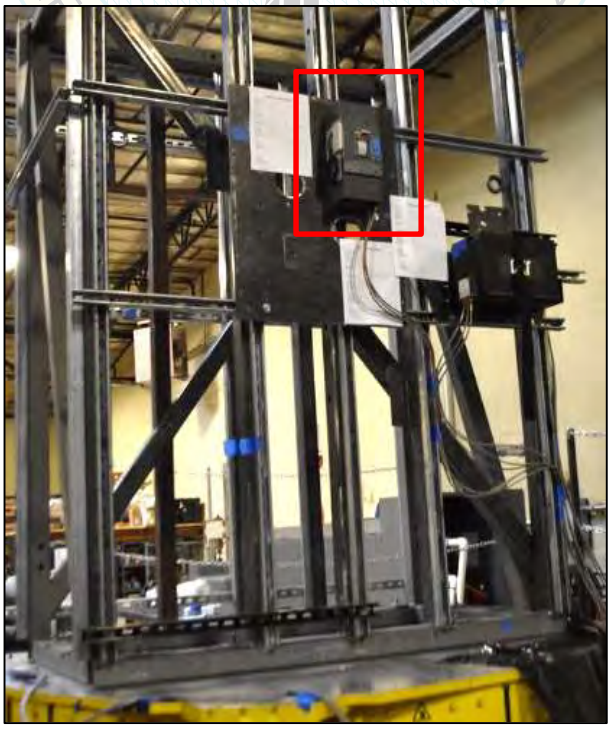
| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 12 | 6.0 | 5.8 | 8.5 | N/A | N/A | N/A |

**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 2022 | ICC-ES AC156 | 1.55 | 1.0 | 1.5 | - | 1.87 | - | - |
| | | 2.49 | 0.0 | 1.5 | 2.49 | - | 1.67 | 0.67 |

**Test Mounting Details**

UUT-7 was mounted directly to the wall fixture using (4) M5 105mm Grade 4.8 bolts, washers, nuts.



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

# UNIT UNDER TEST (UUT)
## Summary Sheet

**UUT-8**

Test Report: DCL 19859-2201; UUT-2

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | XT7M | ABB |

**Product Construction Summary**

Plastic Molded Case

**Options / Subcomponent Summary**

N/A

**UUT Properties**

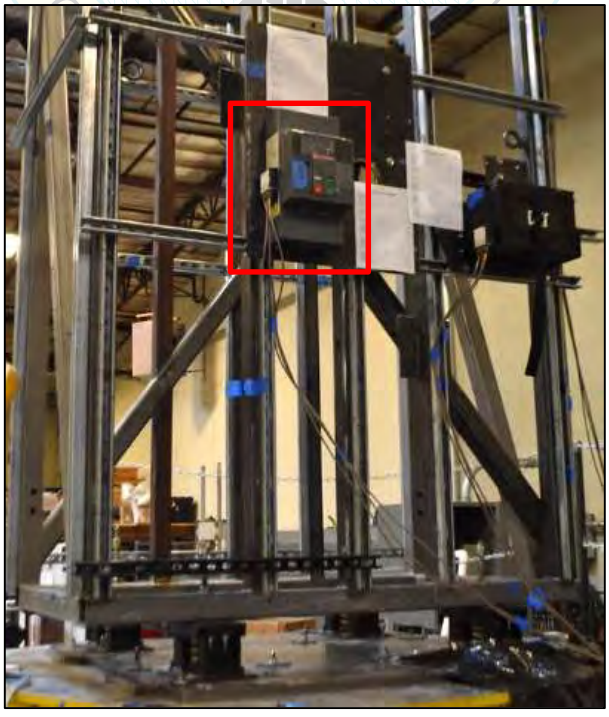
| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 40 | 8.5 | 7.0 | 15.0 | N/A | N/A | N/A |

**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 2022 | ICC-ES AC156 | 1.55 | 1.0 | 1.5 | - | 1.87 | - | - |
| | | 2.49 | 0.0 | 1.5 | 2.49 | - | 1.67 | 0.67 |

**Test Mounting Details**

UUT-8 was mounted directly to the wall fixture using (4) M5 105mm Grade 4.8 bolts, washers, nuts. The wall fixture was flexible mounted to the shake table with (4) VMC Group MSSH isolators.



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

# UNIT UNDER TEST (UUT)
## Summary Sheet

**UUT-9A**

Test Report: DCL 19859-2201; UUT-3A

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | 9X-3404 | Caterpillar |

**Product Construction Summary**

Wet Cell Battery, Battery Tray, Strap

**Options / Subcomponent Summary**

N/A

**UUT Properties**

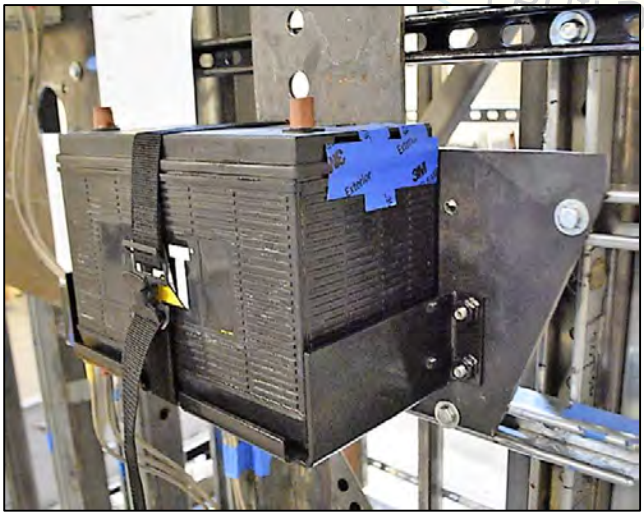
| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 68 | 16.3 | 7.0 | 9.5 | N/A | N/A | N/A |

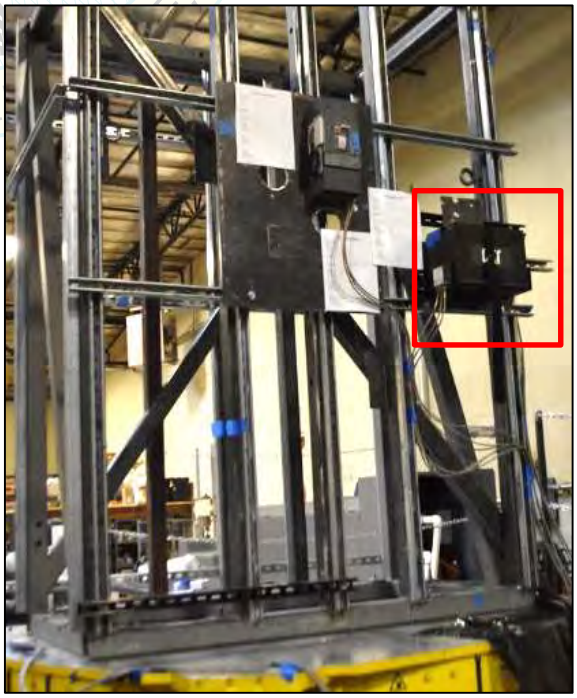
**UUT Highest Passed Seismic Run Information**

| Building Code | Test Criteria | $S_{DS}$ | z/h | $I_P$ | $A_{FLX-H}$ | $A_{RIG-H}$ | $A_{FLX-V}$ | $A_{RIG-V}$ |
|---|---|---|---|---|---|---|---|---|
| CBC 2022 | ICC-ES AC156 | 1.55 | 1.0 | 1.5 | - | 1.87 | - | - |
| | | 2.49 | 0.0 | 1.5 | 2.49 | - | 1.67 | 0.67 |

**Test Mounting Details**

The battery was supported by battery tray (PN: 423-7137) and secured to the tray with strap (PN: 399-2026). The battery tray was mounted directly to the wall fixture using (4) 3/8" diameter Grade 5 bolts.





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

# UNIT UNDER TEST (UUT)
## Summary Sheet

**UUT-9B**

Test Report: DCL 19859-2201; UUT-3B

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | 9X-3404 | Caterpillar |

**Product Construction Summary**

Wet Cell Battery, Battery Tray, Strap

**Options / Subcomponent Summary**

N/A

**UUT Properties**

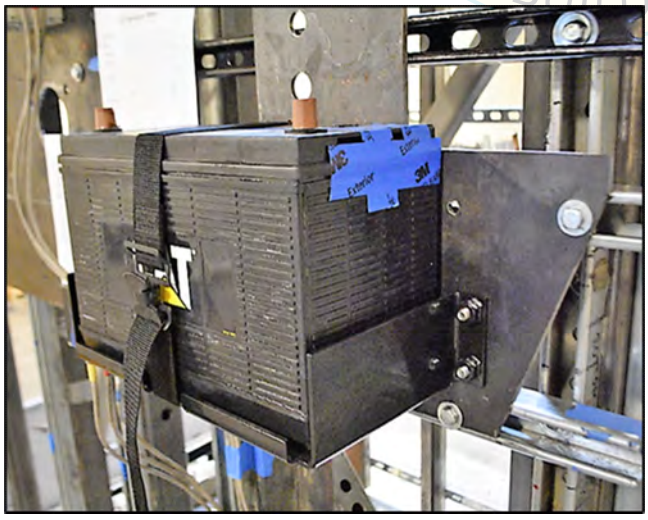
| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 68 | 16.3 | 7.0 | 9.5 | N/A | N/A | N/A |

**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 2022 | ICC-ES AC156 | 1.55 | 1.0 | 1.5 | - | 1.87 | - | - |
| | | 2.49 | 0.0 | 1.5 | 2.49 | - | 1.67 | 0.67 |

**Test Mounting Details**

The battery was supported by battery tray (PN: 423-7137) and secured to the tray with strap (PN: 399-2026). The battery tray was mounted directly to the wall fixture using (4) 3/8" diameter Grade 5 bolts. The wall fixture was flexible mounted to the shake table with (4) VMC Group MSSH isolators.



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

# UNIT UNDER TEST (UUT)
## Summary Sheet

**UUT-10**

Test Report: DCL 18449-2201; UUT-2

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Electrical Generator | D30 | Caterpillar |

**Product Construction Summary**

Carbon Steel Enclosure, Carbon Steel Fuel Tank

**Options / Subcomponent Summary**

Tank: Caterpillar; Enclosure: MGK Brazil; Engine/Radiator: Perkins; Alternator: LS; Controller: Caterpillar (DSE6310)

**UUT Properties**

| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 3,650 | 41.0 | 88.5 | 72.0 | 7.0 | 4.5 | 12.0 |

**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 2022 | ICC-ES AC156 | 1.56 | 1.0 | 1.5 | - | 1.87 | - | - |
| | | 2.50 | 0.0 | 1.5 | 2.50 | - | 1.68 | 0.68 |

**Test Mounting Details**

UUT-10 was rigidly mounted to the shake table using (8) 1/2" diameter Grade 5 bolts.


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

# UNIT UNDER TEST (UUT)
## Summary Sheet

**UUT-11**

Test Report: DCL 21017-2301; UUT-1

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Controller | DSE8610 (DeepSea GCCP 1.5) | Caterpillar |

**Product Construction Summary**

Carbon Steel and Plastic

**Options / Subcomponent Summary**

N/A

**UUT Properties**

| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 69 | 11.5 | 23.8 | 46.3 | N/A | N/A | N/A |

**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 2022 | ICC-ES AC156 | 1.56 | 1.0 | 1.5 | - | 1.87 | - | - |
| | | 2.50 | 0.0 | 1.5 | 2.50 | - | 1.68 | 0.68 |

**Test Mounting Details**

UUT-11 was attached to steel interface plate with (7) 3/8" Grade 5 bolts, round washers, and carbon steel plates washers. The steel interface plate was attached to the shake table using (4) VMC MSSH-1E spring isolators.

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

# UNIT UNDER TEST (UUT)
## Summary Sheet

**UUT-12**

Test Report: DCL 22453-2301; UUT-1

| Model Line | Model Number | Manufacturer |
|---|---|---|
| Molded Case Breaker Box | T8 | ABB |

**Product Construction Summary**

Carbon Steel

**Options / Subcomponent Summary**

N/A

**UUT Properties**

| Weight [ lbs ] | Dimensions [ in ] | | | Lowest Nat. Freq. [ Hz ] | | |
|---|---|---|---|---|---|---|
| | Length | Width | Height | F-B | S-S | V |
| 350 | 27.4 | 16.4 | 45.3 | 3.0 | 3.0 | 6.0 |

**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 2022 | ICC-ES AC156 | 1.55 | 1.0 | 1.5 | - | 1.86 | - | - |
| | | 2.49 | 0.0 | 1.5 | 2.49 | - | 1.67 | 0.67 |

**Test Mounting Details**

UUT-12 was attached to the steel interface plate using (9) 3/8" Grade 8 bolts, plate washers, and flat washers. The interface plate was isolated using (4) VMC Group MSSH-1E-650 spring isolators.

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