APPLICATION FOR OSHPD SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY	
APPLICATION #:	OSP – 0074 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Siemens

Manufacturer's Technical Representative: Reid Barkley

Mailing Address: 1500 Harvester Road, West Chicago, IL 60185

Telephone: (630) 562-5633 Email: Reid.barkley@siemens.com

Product Information

Product Name: Tiastar Motor Control Center

Product Type: Low Voltage Motor Control Center - MCC

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

General Description: MCC's are used to control various types of electrical motors for industrial applications. The units are constructed of carbon steel enclosures (NEMA 1, 1A, and 2) and contain a wide variety of electrical components. 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 floor mounted.

Applicant Information

Applicant Company Name: W.E. Gundy & Associates, Inc.

Contact Person: Travis Soppe, SE

Mailing Address: 250 Bobwhite Ct. Suite 100, Boise, Idaho 83706

Telephone: (208) 342-5989 Ext. 115 Email: tsoppe@wegai.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: Travis Soppe Date: 09 / 25 / 2015

Title: Vice President Company Name: W.E. Gundy & Associates, Inc.

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

Company Name: W.E. Gundy & Associates, Inc.

Name: Travis Soppe California License Number: S6115

Mailing Address: 250 Bobwhite Ct, Suite 100, Boise, Idaho 83703

Telephone: (208) 342-5989 Ext. 115 Email: tsoppe@wegai.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: Clark Dynamic Testing Laboratory

Contact Name: Brandon Ross

Mailing Address: 1801 Rout 51 Jefferson Hills, Pennsylvania 15025

Telephone: (412) 387-1025 Email: bross@clarktesting.com

Seismic Parameters

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

Design Basis of Equipment or Components (F_p/W_p) = 1.50 for z/h = 1.0 and 1.12 for z/h = 0.0

S_{DS} (Design spectral response acceleration at short period, g) = 2.0 for z/h = 1.0 and 2.5 for z/h = 0.0

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

R_p (Equipment or component response modification factor) = 6.0

Ω_0 (System overstrength factor) = 2.0

I_p (Importance factor) = 1.5

z/h (Height factor ratio) = 1.0 and 0.0

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, 2010: ☐ Yes ☒ No

List of Attachments Supporting Special Seismic Certification

☒ Test Report(s) ☐ Drawings ☐ Calculations ☒ Manufacturer's Catalog

☒ Other(s) (Please Specify): Certified Product Line and Subcomponent Matrices, Subcomponent Certification Letter

OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2022

Signature: Date: December 9, 2015

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):

SIEMENS TIASTAR MOTOR CONTROL CENTER - SEISMIC DESIGN
CERTIFIED PRODUCT LINE MATRIX

WEGAI
W.E. GUNDY & ASSOCIATES, INC.
STRUCTURAL & EARTHQUAKE ENGINEERING

ID Number	Main Bus Ampere	Enclosure Width (in.)	Enclosure Depth (in.)	Enclosure Height (in.)	Section Weight (lbs) Min-Max	Tested Section		Representative UUT
						Enclosure Type	MAX COG (in)	
NEMA 1, 1A, 2, Eclosures								
TSTR-MCC-600-F	600	20	15	90	310 - 710		42.8	extrapolated
TSTR-MCC-600-F	600	20	20	90	370 - 770		42.8	extrapolated
TSTR-MCC-600-BB	600	20	21	90	390 - 790		42.8	extrapolated
TSTR-MCC-600-F	600	24	15	90	340 - 740		42.8	extrapolated
TSTR-MCC-600-F	600	24	20	90	400 - 800		42.8	extrapolated
TSTR-MCC-600-F	600	30	15	90	310 - 710		42.8	extrapolated
TSTR-MCC-600-F	600	30	20	90	370 - 770		42.8	extrapolated
TSTR-MCC-600-BB	600	30	21	90	390 - 790		42.8	extrapolated
TSTR-MCC-800-F	800	20	15	90	310 - 710	NEMA 1	42.8	UUT-1-A/B
TSTR-MCC-800-F	800	20	20	90	370 - 770		42.8	interpolated
TSTR-MCC-800-BB	800	20	21	90	390 - 790	NEMA 1A	42.8	UUT-2-A/B
TSTR-MCC-800-F	800	24	15	90	350 - 750		42.8	interpolated
TSTR-MCC-800-F	800	24	20	90	400 - 800		42.8	interpolated
TSTR-MCC-800-F	800	30	15	90	320 - 720		42.8	interpolated
TSTR-MCC-800-F	800	30	20	90	370 - 770		42.8	interpolated
TSTR-MCC-800-BB	800	30	21	90	390 - 790		42.8	interpolated

General Notes:

[1)] All NEMA 1, 1A, and 2 Enclosures are constructed of carbon steel.

[2)] Enclosures listed are plug in units that house the various subcomponents listed in the subcomponent matrices. Additionally all enclusures contain both vertical and horizontal bus with the corresponding rated amprage.

[3)] Listed Center of Gravities are estimated by the manufacturer using modeling of the different units under test.

[4)] Certified units cannot exceed maximum tested COG per Main Bus Ampere group.

SIEMENS TIASTAR MOTOR CONTROL CENTER - SEISMIC DESIGN
CERTIFIED PRODUCT LINE MATRIX

WEGAI
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STRUCTURAL & EARTHQUAKE ENGINEERING

ID Number	Main Bus Ampere	Enclosure Width (in.)	Enclosure Depth (in.)	Enclosure Height (in.)	Section Weight (lbs) Min-Max	Tested Section		Representative UUT
						Enclosure Type	MAX COG (in)	
NEMA 1, 1A, 2, Eclosures								
TSTR-MCC-1200-F	1200	20	15	90	320 - 720		43.9	interpolated
TSTR-MCC-1200-F	1200	20	20	90	370 - 800	NEMA 2	43.9	UUT-3-A/B/C/D
TSTR-MCC-1200-F	1200	20	20	90	370 - 800	NEMA 1	43.9	UUT-10B-A/B/C/D
TSTR-MCC-1200-BB	1200	20	21	90	390 - 790		43.9	interpolated
TSTR-MCC-1200-F	1200	24	15	90	350 - 750		43.9	interpolated
TSTR-MCC-1200-F	1200	24	20	90	400 - 800		43.9	interpolated
TSTR-MCC-1200-F	1200	30	15	90	320 - 720		43.9	interpolated
TSTR-MCC-1200-F	1200	30	20	90	400 - 800	NEMA 1	43.9	UUT-14-A/B
TSTR-MCC-1200-BB	1200	30	21	90	400 - 800		43.9	interpolated
TSTR-MCC-1600-F	1600	20	15	90	320 - 720		44.4	interpolated
TSTR-MCC-1600-F	1600	20	20	90	380 - 780	NEMA 1	44.4	UUT-6-A/B
TSTR-MCC-1600-F	1600	20	20	90	380 - 780	NEMA 1	44.4	UUT-10A-A/B/C/D
TSTR-MCC-1600-F	1600	20	20	90	380 - 780	NEMA 1	44.4	UUT-13-A/B
TSTR-MCC-1600-BB	1600	20	21	90	400 - 800		44.4	interpolated
TSTR-MCC-1600-F	1600	24	15	90	360 - 760		44.4	interpolated
TSTR-MCC-1600-F	1600	24	20	90	410 - 810		44.4	interpolated

General Notes:

[1)] All NEMA 1, 1A, and 2 Enclosures are constructed of carbon steel.

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CERTIFIED PRODUCT LINE MATRIX

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STRUCTURAL & EARTHQUAKE ENGINEERING

ID Number	Main Bus Ampere	Enclosure Width (in.)	Enclosure Depth (in.)	Enclosure Height (in.)	Section Weight (lbs) Min-Max	Tested Section		Representative UUT
						Enclosure Type	MAX COG (in)	
NEMA 1, 1A, 2, Eclosures								
TSTR-MCC-1600-F	1600	30	15	90	330 - 730		44.4	interpolated
TSTR-MCC-1600-F	1600	30	20	90	390 - 790		44.4	interpolated
TSTR-MCC-1600-BB	1600	30	21	90	410 - 810		44.4	interpolated
TSTR-MCC-2000-F	2000	20	15	90	340-740	NEMA 1	49.0	UUT-S1
TSTR-MCC-2000-F	2000	20	20	90	448-848		49.0	interpolated
TSTR-MCC-2000-BB	2000	20	21	90	508-868		49.0	interpolated
TSTR-MCC-2000-F	2000	24	15	90	425-825		49.0	interpolated
TSTR-MCC-2000-F	2000	24	20	90	478-878		49.0	interpolated
TSTR-MCC-2000-F	2000	30	15	90	413-813		49.0	interpolated
TSTR-MCC-2000-F	2000	30	20	90	470-870		49.0	interpolated
TSTR-MCC-2000-BB	2000	30	21	90	531-890		49.0	interpolated
TSTR-MCC-2000-F	2000	20	15	90	340-740		49.0	interpolated
TSTR-MCC-2500-F	2500	20	20	90	454-854	NEMA 1	57.5	UUT-15-A/B/C
TSTR-MCC-2500-BB	2500	20	21	90	516-874		57.5	interpolated
TSTR-MCC-2500-F	2500	24	20	90	484-884		57.5	interpolated
TSTR-MCC-2500-F	2500	30	20	90	476-876	NEMA 1	57.5	UUT-16-A/B/C
TSTR-MCC-2500-BB	2500	30	21	90	539-896		57.5	extrapolated

General Notes:

[1)] All NEMA 1, 1A, and 2 Enclosures are constructed of carbon steel.

[2)] Enclosures listed are plug in units that house the various subcomponents listed in the subcomponent matrices. Additionally all enclusures contain both vertical and horizontal bus with the corresponding rated amprage.

[3)] Listed Center of Gravities are estimated by the manufacturer using modeling of the different units under test.

[4)] Certified units cannot exceed maximum tested COG per Main Bus Ampere group.

SIEMENS TIASTAR MOTOR CONTROL CENTER - SEISMIC DESIGN CERTIFIED PRODUCT LINE MATRIX

ID Number	Main Bus Ampere	Enclosure Width (in.)	Enclosure Depth (in.)	Enclosure Height (in.)	Section Weight (lbs) Max	Tested Section		Representative UUT
						Enclosure Type	MAX COG (in)	
NEMA 3R Enclosures [5] "F" Sections listed in the matrix above can be housed within the listed enclosures below								
TSTR-MCC-XXX-F-3R	600-2500	48	40	100	730	NEMA 3R	37.9	extrapolated
TSTR-MCC-XXX-F-3R	600-2500	58	40	100	730	NEMA 3R	37.9	extrapolated
TSTR-MCC-XXX-F-3R	600-2500	68	40	100	700	NEMA 3R	37.9	UUT-12-A/B/C

General Notes:

[4] Certified units cannot exceed maximum tested COG per Main Bus Ampere group.

[5] NEMA 3R Enclosures are constructed to house the NEMA1, 1A, and 12 Front Only units with predefined shipping split segments. The NEMA 3R shipping split listed above and can house any combination of the Front Only NEMA1, 1A, 2, and 12 units listed above up to the total combined section width defined.

SIEMENS TIASTAR MOTOR CONTROL CENTER
CERTIFIED SUBCOMPONENT MATRIX

WEGAI
W.E. GUNDY & ASSOCIATES, INC.
STRUCTURAL & EARTHQUAKE ENGINEERING

Subcomponent ID	Manufacturer	Description	Width (in) actual or min-max	Depth (in) actual or min-max	Height (in) actual or min-max	Max Weight (lbs)	Representative
Main Lugs							
MLO-600A	Siemens	600A	20	8	12 - 30	30	extrapolated
MLO-800A	Siemens	800A	20	8	24 - 30	45	UUT-1-A
MLO-1200A	Siemens	1200A	20	8	24 - 30	65	UUT-10B-A / UUT-12
MLO-1600A	Siemens	1600A, Top only	20	8	30	35	UUT-10A-A
MLO-2000A	Siemens	2000A	30	15	48 - 72	125	interpolated
MLO-2500A	Siemens	2500A	30	15	48 - 72	130	UUT-15-B
Main Breakers							
MCB-125A	Siemens	125A	20	8	24	18	extrapolated
MCB-250A	Siemens	250A	20	8	30 - 36	30	UUT-1-B
MCB-400A	Siemens	400A	20	8	30 - 42	40	interpolated
MCB-600A	Siemens	600A	20	8	30 - 42	40	interpolated
MCB-800A	Siemens	800A	20	8	48 - 54	120	interpolated
MCB-1200	Siemens	1200A	20	8	48 - 54	135	UUT-10B-D
MCB-1600	Siemens	1600A	20 - 30	15 - 20	72	425	UUT-10A-D
MCB-2000	Siemens	2000A	30	20	72	440	interpolated
MCB-2500	Siemens	2500A	30	20	72	450	UUT-16-B
Main Disconnect Switches							
MDS-60A	Siemens	30A or 60A	20	8	24	18	extrapolated
MDS-100A	Siemens	100A	20	8	30	25	UUT-2-A
MDS-200A	Siemens	200A	20	8	42 - 48	40	interpolated
MDS-400A	Siemens	400A	20	8	48 - 60	60	interpolated
MDS-600A	Siemens	600A	20	8	48 - 60	60	interpolated
MDS-800A	Siemens	800A	20	8	72	125	interpolated
MDS-1200A	Siemens	1200A	20	8	72	135	UUT-3-A

SIEMENS TIASTAR MOTOR CONTROL CENTER
CERTIFIED SUBCOMPONENT MATRIX

WEGAI
W.E. GUNDY & ASSOCIATES, INC.
STRUCTURAL & EARTHQUAKE ENGINEERING

Subcomponent ID	Manufacturer	Description	Width (in) actual or min-max	Depth (in) actual or min-max	Height (in) actual or min-max	Max Weight (lbs)	Representative
Starters							
MS-1	Siemens	SIZE 1	15	8	6 - 24	30	UUT-1-A / UUT-S1 UUT-10A-B / UUT-10B-B UUT-12-A / UUT-15-A
MS-2	Siemens	SIZE 2	15	8	6 - 24	35	interpolated
MS-3	Siemens	SIZE 3	15	8	12 - 48	60	UUT-15-A/C
MS-4	Siemens	SIZE 4	15	8	18 - 60	75	UUT-16-C
MS-5	Siemens	SIZE 5	15 - 20	8	36 - 72	110	UUT-S1
MS-6	Siemens	SIZE 6	20 - 30	11	48 - 72	175	UUT-3-C
Softstarters							
3RW402	Siemens	9A - 28A	15	8	18 - 30	35	extrapolated
3RW403	Siemens	34A - 46A	15	8	18 - 30	35	UUT-1-A
3RW404	Siemens	58A - 70A	15	8	24 - 48	60	interpolated
3RW405	Siemens	117A - 145A	15	8	36 - 48	70	interpolated
3RW407	Siemens	205A - 385A	20 - 30	15	48 - 72	140	interpolated
3RW442	Siemens	26A - 82A	15	8	36 - 54	75	interpolated
3RW443	Siemens	100A - 145A	15	8	36 - 60	80	interpolated
3RW444	Siemens	180A - 385A	20 - 30	15	48 - 72	145	UUT-10A-A / UUT-10B-A
Feeders - Circuit Breaker							
FCB-125	Siemens	125A	15	8	6 - 12	18	UUT-1-A / UUT-12-A/C
FCB-250	Siemens	250A	15	8	12 - 18	30	interpolated
FCB-400	Siemens	400A	15	8	24	30	interpolated
FCB-600	Siemens	600A	15	8	24	30	interpolated
FCB-800	Siemens	800A	20	8	36 - 48	120	interpolated
FCB-1200	Siemens	1200A	20	8	36 - 48	135	UUT-3-D

SIEMENS TIASTAR MOTOR CONTROL CENTER
CERTIFIED SUBCOMPONENT MATRIX

WEGAI
W.E. GUNDY & ASSOCIATES, INC.
STRUCTURAL & EARTHQUAKE ENGINEERING

Subcomponent ID	Manufacturer	Description	Width (in) actual or min-max	Depth (in) actual or min-max	Height (in) actual or min-max	Max Weight (lbs)	Representative
Feeders - Disconnect Switch							
FDS-60A	Siemens	30A or 60A	15	8	12	18	UUT-2-A
FDS-100A	Siemens	100A	15	8	18	25	interpolated
FDS-200A	Siemens	200A	15	8	30	30	interpolated
FDS-400A	Siemens	400A	20	8	42	35	interpolated
FDS-600A	Siemens	600A	20	8	42	35	UUT-2-A
Single Phase Distribution Transformers							
XFMR-1-3	Hammond Power Systems	3 KVA	20	15	12	75	extrapolated
XFMR-1-5	Hammond Power Systems	5 KVA	20	15	12	80	extrapolated
XFMR-1-7.5	Hammond Power Systems	7.5 KVA	20	15	18	80	UUT-1-B
XFMR-1-10	Hammond Power Systems	10 KVA	20	15	18	112	interpolated
XFMR-1-15	Hammond Power Systems	15 KVA	20	15	18	165	interpolated
XFMR-1-25	Hammond Power Systems	25 KVA	20	20	24	230	UUT-12-C
XFMR-1-30	Hammond Power Systems	30 KVA	20	20	24	250	interpolated
XFMR-1-37.5	Hammond Power Systems	37.5 KVA	20	20	36	285	interpolated
XFMR-1-45	Hammond Power Systems	45 KVA	20	20	36	405	UUT-3-D
Three Phase Distribution Transformers							
XFMR-3-9	Hammond Power Systems	9 KVA	20	15	18	165	extrapolated
XFMR-3-15	Hammond Power Systems	15 KVA	20	20	18	165	UUT-2-A
XFMR-3-25	Hammond Power Systems	25 KVA	20	20	18	240	interpolated
XFMR-3-30	Hammond Power Systems	30 KVA	20	20	18	255	interpolated
XFMR-3-37.5	Hammond Power Systems	37.5 KVA	20	20	24	260	interpolated
XFMR-3-45	Hammond Power Systems	45 KVA	20	20	24	345	UUT-3-B

General Notes:
All transformers are "dry type" with aluminum coils.

SIEMENS TIASTAR MOTOR CONTROL CENTER
CERTIFIED SUBCOMPONENT MATRIX

WEGAI
W.E. GUNDY & ASSOCIATES, INC.
STRUCTURAL & EARTHQUAKE ENGINEERING

Subcomponent ID	Manufacturer	Description	Width (in) actual or min-max	Depth (in) actual or min-max	Height (in) actual or min-max	Max Weight (lbs)	Representative
Lighting Panelboards							
PNLBD-18	Siemens	18 Circuit	15	8	30	40	UUT-2-A
PNLBD-30	Siemens	30 Circuit	15	8	36	50	interpolated
PNLBD-42	Siemens	42 Circuit	15	8	42	65	UUT-3-B
HMI Panel							
SmartStart	Siemens	12" Touchscreen	20	8	18	26	UUT-1-B
Drives							
MM440 "A" Frame	Siemens	0.6A - 3.9A	15	8	18	25	UUT-1-B
MM440 "B" Frame	Siemens	4A - 8.5A	15	8	24	35	interpolated
MM440 "C" Frame	Siemens	10.5A - 30.5A	15	8	24 - 36	50	interpolated
MM440 "D" Frame	Siemens	38A - 59A	20	12	48	80	interpolated
MM440 "E" Frame	Siemens	71A - 96A	20	12	60	100	interpolated
MM440 "F" Frame	Siemens	103A - 169A	20	15	72	200	interpolated
MM440 "FX" Frame	Siemens	200A - 245A	20 - 30	15	72	400	UUT-2-B
G120 "FSA" Frame	Siemens	1.3A - 4.1A	15	8	18 - 42	60	UUT-1-A
G120 "FSB" Frame	Siemens	5.9A - 10.2A	15	8	24 - 54	80	interpolated
G120 "FSC" Frame	Siemens	13.2A - 32A	15	8	36 - 54	90	interpolated
G120 "FSD" Frame	Siemens	32A - 60A	20	15	48 - 72	130	UUT-12-B
G120 "FSE" Frame	Siemens	60A - 90A	20 - 30	15	60 - 72	160	interpolated
G120 "FSF" Frame	Siemens	90A - 250A	20 - 40	15	72	300	UUT-10A-C / UUT-10B-C
G120 "FSGX" Frame	Siemens	300A - 475A	40 - 60	20	72	800	UUT-13-A/B
18 Pulse "E" Frame	Siemens	60A - 90A	40	20	72	300	UUT-6-A/B
18 Pulse "F" Frame	Siemens	90A - 250A	50	20	72	600	UUT-14-A/B

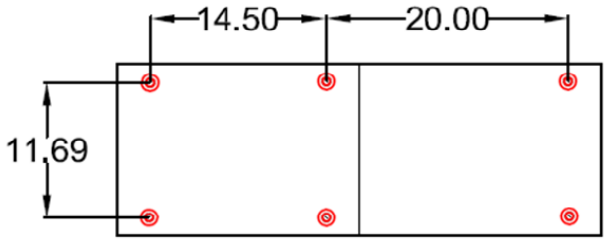
SIEMENS TIASTAR MOTOR CONTROL CENTER
CERTIFIED SUBCOMPONENT MATRIX

WEGAI
W.E. GUNDY & ASSOCIATES, INC.
STRUCTURAL & EARTHQUAKE ENGINEERING

Subcomponent ID	Manufacturer	Description	Width (in) actual or min-max	Depth (in) actual or min-max	Height (in) actual or min-max	Max Weight (lbs)	Representative
Input / Output Reactor							
RLW Reactor	MTE	1.1A	4.5	1.5	3.7	1.6	UUT-12-A
RLW Reactor	MTE	1.1A - 160A	4.5 - 9.25	1.5 - 8.25	3.7 - 7.5	53	interpolated
RL Reactor	MTE	2A	4.4	2.8	4.1	4	UUT-10A-B / UUT-10B-B
RL Reactor	MTE	1A - 55A	3.8 - 9	1.2 - 5.3	3.5 - 7	27	interpolated
RL Reactor	MTE	55A	9	5.3	7	27	UUT-12-B
RLW Reactor	MTE	160A	9	8.25	7.5	53	UUT-10A-C / UUT-10B-C
RL Reactor	MTE	55A - 320A	9.10.8	5.3 - 8.3	7 - 9	110	interpolated
RL Reactor	MTE	320A	10.8	8.3	9	110	UUT-13-A/B
RLW Reactor	MTE	322A	9	8.75	7.5 - 11	108	extrapolated
Harmonic Filter							
MAPP0006D	MTE	6A	8.0	5.5	8.7	16	UUT-12-A
MAPP0008-240D	MTE	8A - 240A	8.0 - 15.3	5.5 - 12.8	8.7 - 20.0	165	interpolated
MAPP0320D	MTE	320A	15.3	14.8	20.0	390	UUT-10A-B / UUT-10B-B
Metering Units							
PAC3100	Siemens	Sentron	3.8	2.0	3.8	< 10	extrapolated
PAC3200	Siemens	Sentron	3.8	2.8	3.8	< 10	UUT-10A-D / UUT-10B-D
PAC4200	Siemens	Sentron	3.8	3.0	3.8	< 10	interpolated
013-75AA	Crompton	Ammeter	3.5	2.0	3.5	< 10	UUT-16-B
013-01VA	Crompton	Voltmeter	3.5	2.0	3.5	< 10	UUT-16-B

UUT-1-A/B	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Floor mounted with six (6) 5/8"- Grade 8 Bolts



Manufacturer: Siemens	**Test Location:** Clark Labs, PA	**Test Date:** August 2014

Product Line: Tiastar Motor Control Center - Seismic Design

Identification Number: TSTR-MCC-800-F	**Serial Number:** 89ES15881020

UUT Function: Electrical operation and control of various types of motors for industrial applications.

UUT Description: Unit consists of 2 - 20" wide by 15" deep segements bolted together. Unit is constructed with NEMA 1 carbon steel enclosures, has a main bus ampre rating of 800 amps, and allows for front only sub-component installation.

UUT Subcomponent Description: UUT-1A (left section) contains a MLO-800A main lug, MS-1 starter, FCB-125 feeder circuit breaker, 3RW403 softstarter, and a G120 "FSA" Frame drive. UUT-1B (right section) contains a MCB-250A main breaker, XFMR-1-7.5 single phase distribution transformer, SmartStart HMI panel, and a MM440 "A" Frame drive.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)				Natural Fequency (Hz)		
	Est. COG	Width	Depth	Height	FB	SS	V
790	42.8"	40"	15"	90"	9.47	11.29	>33

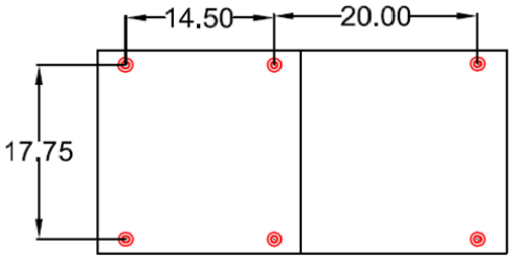
SEISMIC TEST PARAMETERS

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 2013 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53
	2.50	0.0	1.5	2.50	1.00	1.67	0.67

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT-2-A/B	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Floor mounted with six (6) 5/8"- Grade 8 Bolts



Manufacturer: Siemens	**Test Location:** Clark Labs, PA	**Test Date:** August 2014

Product Line: Tiastar Motor Control Center - Seismic Design

Identification Number: TSTR-MCC-800-BB	**Serial Number:** 89EB15881021

UUT Function: Electrical operation and control of various types of motors for industrial applications.

UUT Description: Unit consists of 2 - 20" wide by 21" deep segements bolted together. Unit is constructed with NEMA 1A carbon steel enclosures, has a main bus ampre rating of 800 amps, and allows for front and back (referenced as BB) sub-component installation.

UUT Subcomponent Description: UUT-2A (left section) contains a MDS-100A Main Disconnect Switch, FDS-60A feeder disconnect switch, FDS-600A feeder disconnect switch, XFMR-3-15 three phase distribution transformer, and a PNLBD-18 lighting panelboard. UUT-2B (right section) contains a MM440 "FX" Frame drive.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)				Natural Fequency (Hz)		
	Est. COG	Width	Depth	Height	FB	SS	V
1,204	41.5"	40"	21"	90"	11.35	5.74	>33

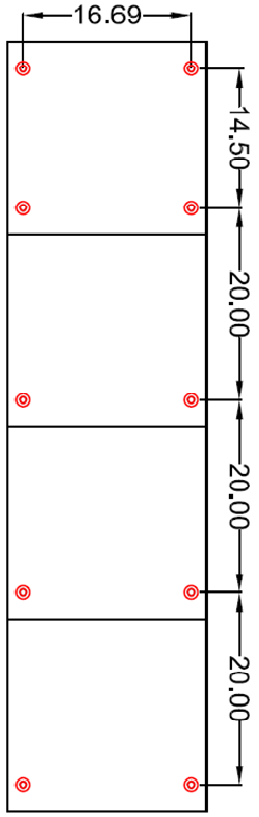
SEISMIC TEST PARAMETERS

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 2013 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53
	2.50	0.0	1.5	2.50	1.00	1.67	0.67

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT-3-A/B/C/D	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Floor mounted with ten (10) 5/8"- Grade 8 Bolts



Manufacturer: Siemens	**Test Location:** Clark Labs, PA	**Test Date:** August 2014

Product Line: Tiastar Motor Control Center - Seismic Design

Identification Number: TSTR-MCC-1200-F	**Serial Number:** 89EF15881022

UUT Function: Electrical operation and control of various types of motors for industrial applications.

UUT Description: Unit consists of 4 - 20" wide by 20" deep segements bolted together. Unit is constructed with NEMA 2 carbon steel enclosures, has a main bus ampre rating of 1200 amps, and allows for front only sub-component installation.

UUT Subcomponent Description: UUT-3A (left section) contains a MDS-1200A main disconnect switch. UUT-3B (left-mid section) contains a PNLBD-42 lighting panelboard and a XFMR-3-45 three phase distribution transformer. UUT-3C (right-mid section) contains a MS-6 starter. UUT-3D (right section) contains a FCB-1200 feeder circuit breaker and a XFMR-1-45 single phase distribution transformer.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)				Natural Fequency (Hz)		
	Est. COG	Width	Depth	Height	FB	SS	V
2,288	37.3"	80"	20"	90"	10.27	10.04	>33

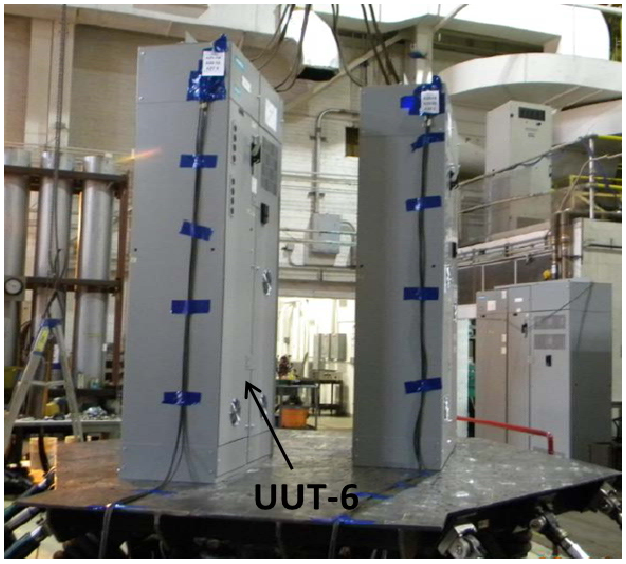
SEISMIC TEST PARAMETERS

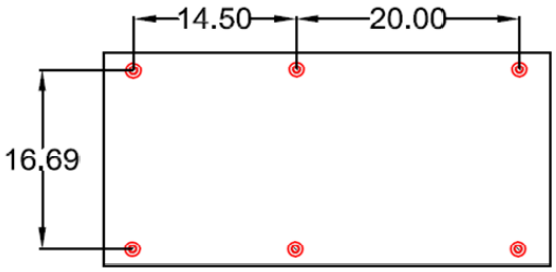
Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2013 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53
	2.50	0.0	1.5	2.50	1.00	1.67	0.67

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT-6-A/B	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Floor mounted with six (6) 5/8"- Grade 8 Bolts





Manufacturer: Siemens	**Test Location:** Clark Labs, PA	**Test Date:** August 2014

Product Line: Tiastar Motor Control Center - Seismic Design

Identification Number: TSTR-MCC-1600-F	**Serial Number:** 89EF15881025

UUT Function: Electrical operation and control of various types of motors for industrial applications.

UUT Description: Unit consists of 2 - 20" wide by 20" deep segements bolted together. Unit is constructed with NEMA 1 carbon steel enclosures, has a main bus ampre rating of 1600 amps, and allows for front only sub-component installation.

UUT Subcomponent Description: UUT-6A (left section) and UUT-6B (right section) are combined to support the 18 Pulse "E" Frame Drive.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)				Natural Fequency (Hz)		
	Est. COG	Width	Depth	Height	FB	SS	V
1,000	37.8"	40"	20"	90"	10.61	9.18	>33

SEISMIC TEST PARAMETERS

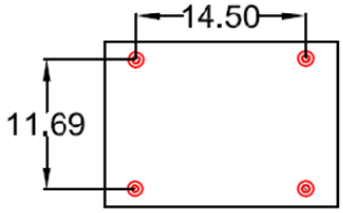
Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2013 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53
	2.50	0.0	1.5	2.50	1.00	1.67	0.67

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT-S1	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Floor mounted with four (4) 1/2"- Grade 5 Bolts

UUT-S1



Manufacturer: Siemens	**Test Location:** Clark Labs, PA	**Test Date:** November 2008

Product Line: Tiastar Motor Control Center - Seismic Design

Identification Number: TSTR-MCC-2000-F	**Serial Number:** 3001829302

UUT Function: Electrical operation and control of various types of motors for industrial applications.

UUT Description: Unit consists of a single 20" wide by 15" deep NEMA 1 carbon steel enclosures, has a main bus ampre rating of 2000 amps, and allows for front only sub-component installation.

UUT Subcomponent Description: The unit contains 3 - MS-1 Starters and a MS-5 starter

UUT PROPERTIES

Weight (lb)	Dimensions (inches)				Natural Fequency (Hz)		
	Est. COG	Width	Depth	Height	FB	SS	V
482	49.0"	20"	15"	90"	6.3	8.6	>33

SEISMIC TEST PARAMETERS

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 2013 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53
	2.50	0.0	1.5	2.50	1.00	1.67	0.67

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT-12-A/B/C	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Floor mounted with six (6) 5/8"- Grade 8 Bolts and 2"x1.5"x.5" Seismic Washers

Manufacturer: Siemens	**Test Location:** Clark Labs, PA	**Test Date:** June 2015

Product Line: Tiastar Motor Control Center - Seismic Design

Identification Number: TSTR-MCC-1200-F	**Serial Number:** 89EF17341024

UUT Function: Electrical operation and control of various types of motors for industrial applications.

UUT Description: Unit consists of 3 - 20" wide by 20" deep segements bolted together and housed in 87" wide by 37" deap NEMA 3R carbon steel enclosure. The unit has a main bus ampre rating of 1200 amps, and allows for front only sub-component installation.

UUT Subcomponent Description: UUT-12-A (left section) contains a MS-1 starter, MAPP0006D harmonic filter, RLW-1.1A reactor, and MLO-1200 main lug. UUT-12-B (mid section) contains a G120 FSD drive, RL-55A reactor, and two MS-1 starters. UUT-12-C (right section) contains a FCB-125 feeder and a XFMR-1-25 single phase transformer.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)				Natural Fequency (Hz)		
	Est. COG	Width	Depth	Height	FB	SS	V
2,348	37.9"	68"	40"	100"	17.24	19.42	>33

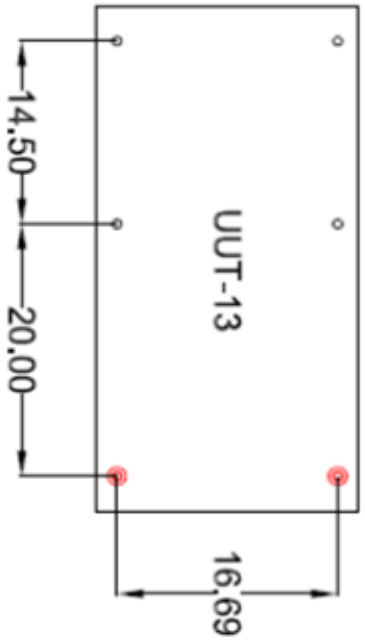
SEISMIC TEST PARAMETERS

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 2013 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53
	2.50	0.0	1.5	2.50	1.00	1.67	0.67

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT-13-A/B	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. Gundy & Associates, Inc. Structural & Earthquake Engineering

Mounting Details: Floor mounted with six (6) 5/8"- Grade 8 Bolts



Manufacturer: Siemens	**Test Location:** Clark Labs, PA	**Test Date:** June 2015

Product Line: Tiastar Motor Control Center - Seismic Design

Identification Number: TSTR-MCC-1600-F	**Serial Number:** 89EF17341025

UUT Function: Electrical operation and control of various types of motors for industrial applications.

UUT Description: Unit consists of 2 - 20" wide by 20" deep segements bolted together, is constructed with NEMA 1 carbon steel enclosure with reinforced side sheets, has a main bus ampre rating of 1600 amps, and allows for front only sub-component installation.

UUT Subcomponent Description: UUT-13-A (left section) and UUT-13-B (right section) are combined to support the G120 FSGX drive.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)				Natural Fequency (Hz)		
	Est. COG	Width	Depth	Height	FB	SS	V
1,054	44.4"	40"	20"	91"	11.64	12.71	>33

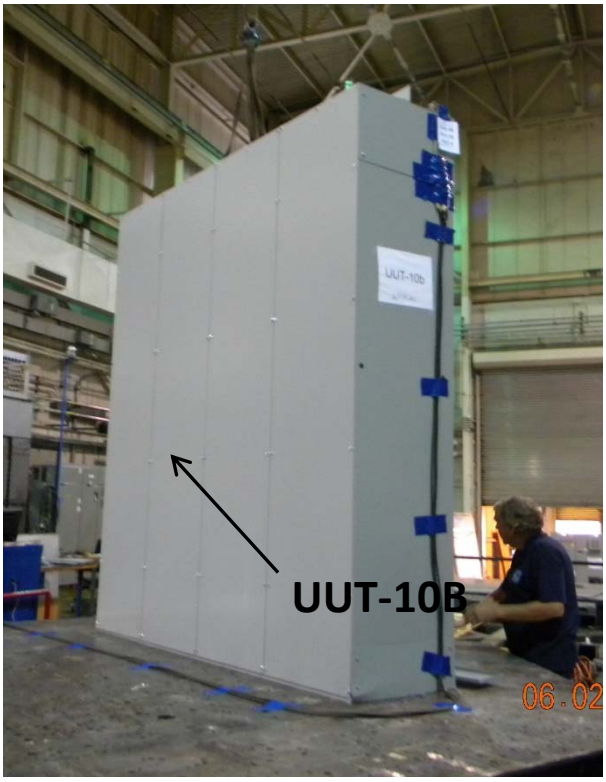
SEISMIC TEST PARAMETERS

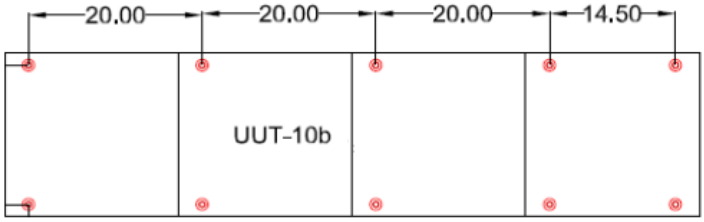
Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2013 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53
	2.50	0.0	1.5	2.50	1.00	1.67	0.67

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT-10B-A/B/C/D	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Floor mounted with ten (10) 5/8"- Grade 8 Bolts





Manufacturer: Siemens	**Test Location:** Clark Labs, PA	**Test Date:** June 2015

Product Line: Tiastar Motor Control Center - Seismic Design

Identification Number: TSTR-MCC-1200-F	**Serial Number:** 89EF17341022

UUT Function: Electrical operation and control of various types of motors for industrial applications.

UUT Description: Unit consists of 4 - 20" wide by 20" deep segements bolted together, is constructed with NEMA 1 carbon steel enclosure, has a main bus ampre rating of 1200 amps, and allows for front only sub-component installation.

UUT Subcomponent Description: UUT-10B-A (left section) contains a MLO-1200 main lug and a 3RW444 softstarter. UUT-10B-B (left-mid section) contains a MAPP0320D harmonic filter, two MS-1 starters, and a RL-2A reactor. UUT-10B-C (right-mid section) contains a G120 FSF drive and a RLW-160A reactor. UUT-10B-D (right section) contains a MCB-1200 main breaker and a PAC3200 metering unit.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)				Natural Fequency (Hz)		
	Est. COG	Width	Depth	Height	FB	SS	V
2,012	43.9"	80"	20"	91"	9.67	17.17	>33

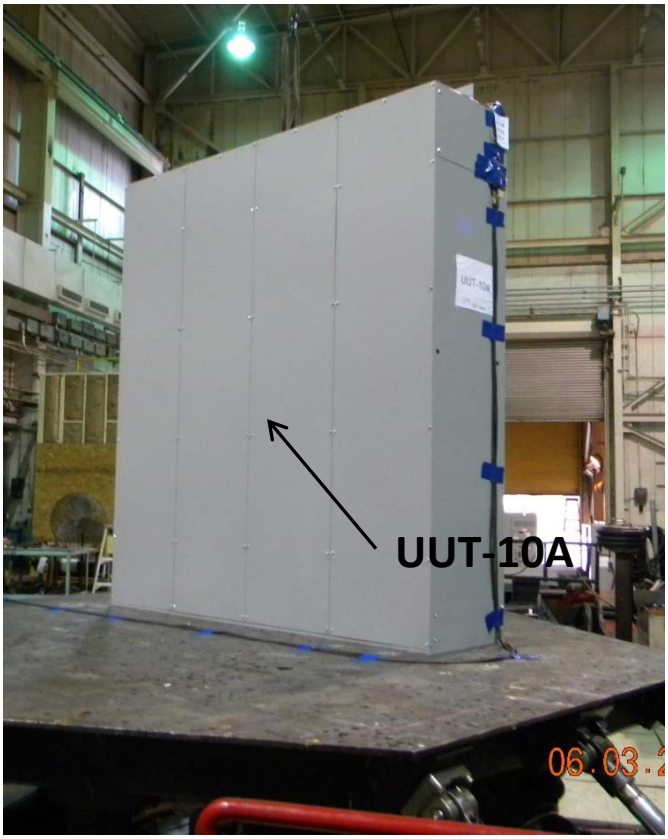
SEISMIC TEST PARAMETERS

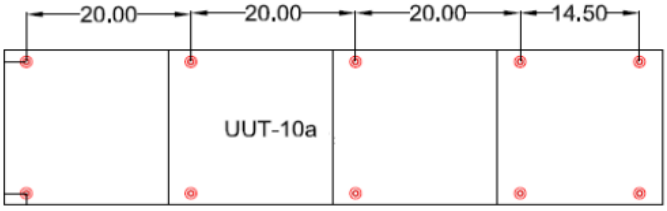
Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2013 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53
	2.50	0.0	1.5	2.50	1.00	1.67	0.67

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT-10A-A/B/C/D	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. Gundy & Associates, Inc. Structural & Earthquake Engineering

Mounting Details: Floor mounted with ten (10) 5/8"- Grade 8 Bolts





Manufacturer: Siemens	**Test Location:** Clark Labs, PA	**Test Date:** June 2015

Product Line: Tiastar Motor Control Center - Seismic Design

Identification Number: TSTR-MCC-1600-F	**Serial Number:** 89EF17341021

UUT Function: Electrical operation and control of various types of motors for industrial applications.

UUT Description: Unit consists of 4 - 20" wide by 20" deep segements bolted together, is constructed with NEMA 1 carbon steel enclosure with reinforced side sheets, has a main bus ampre rating of 1600 amps, and allows for front only sub-component installation.

UUT Subcomponent Description: UUT-10A-A (left section) contains a MLO-1600 main lug and a 3RW444 softstarter. UUT-10A-B (left-mid section) contains a MAPP0320D harmonic filter, two MS-1 starters, and a RL-2A reactor. UUT-10A-C (right-mid section) contains a G120 FSF drive and a RLW-160A reactor. UUT-10A-D (right section) contains a MCB-1600 main breaker and a PAC3200 metering unit.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)				Natural Fequency (Hz)		
	Est. COG	Width	Depth	Height	FB	SS	V
2,140	44.1"	80"	20"	91"	17.57	11.47	>33

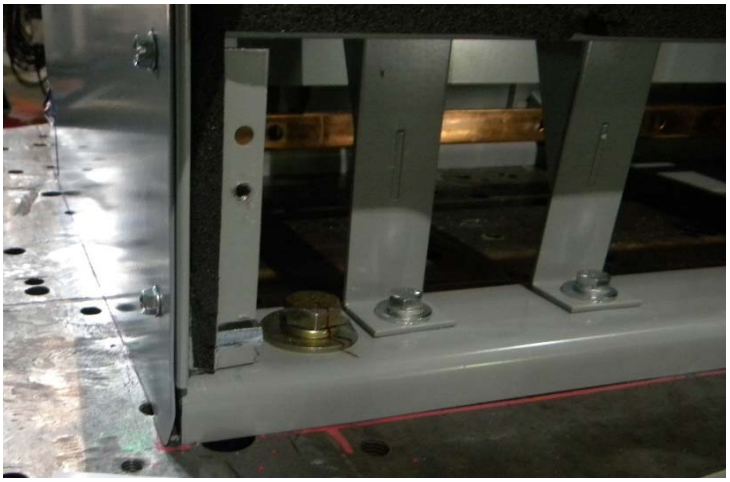
SEISMIC TEST PARAMETERS

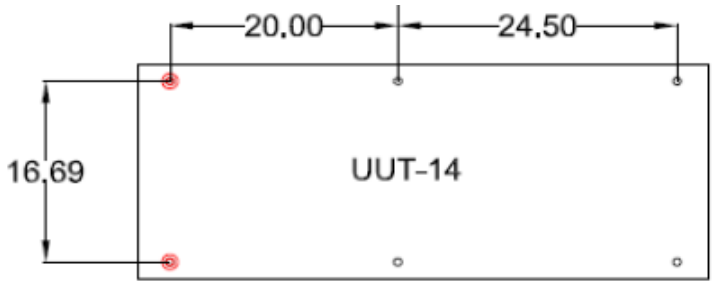
Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2013 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53
	2.50	0.0	1.5	2.50	1.00	1.67	0.67

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT-14-A/B	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. Gundy & Associates, Inc. Structural & Earthquake Engineering

Mounting Details: Floor mounted with six (6) 5/8"- Grade 8 Bolts





Manufacturer: Siemens	**Test Location:** Clark Labs, PA	**Test Date:** June 2015

Product Line: Tiastar Motor Control Center - Seismic Design

Identification Number: TSTR-MCC-1200-F	**Serial Number:** 89EF17341026

UUT Function: Electrical operation and control of various types of motors for industrial applications.

UUT Description: Unit consists of 1 - 20" wide and 1 - 30" wide by 20" deep segements bolted together, is constructed with NEMA 1 carbon steel enclosure, has a main bus ampre rating of 1200 amps, and allows for front only sub-component installation.

UUT Subcomponent Description: UUT-14-A (left section) and UUT-14-B (right section) are combined to support the 18 Pulse F Frame drive.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)				Natural Fequency (Hz)		
	Est. COG	Width	Depth	Height	FB	SS	V
1,794	32.2"	50"	20"	91"	15.43	18.27	>33

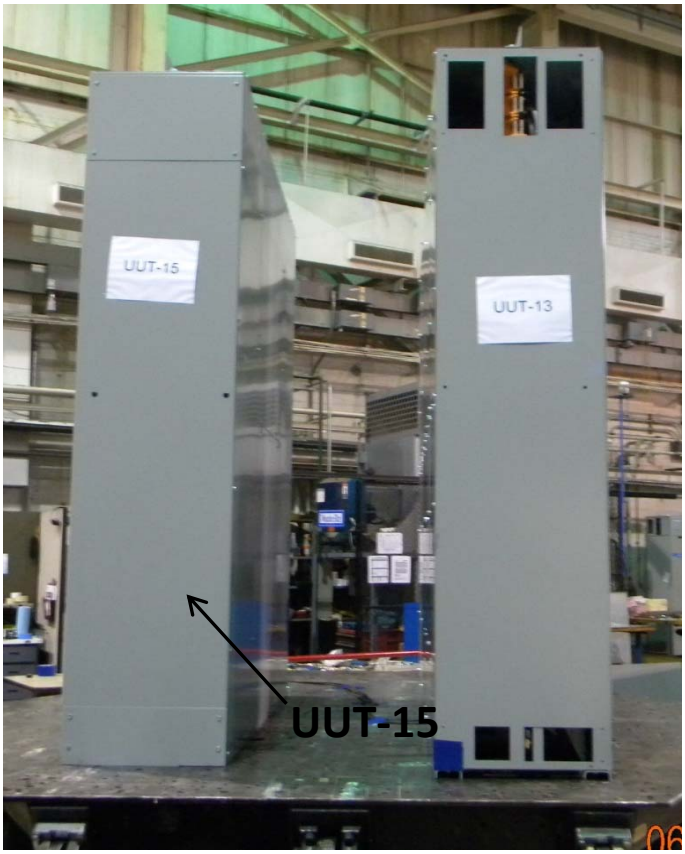
SEISMIC TEST PARAMETERS

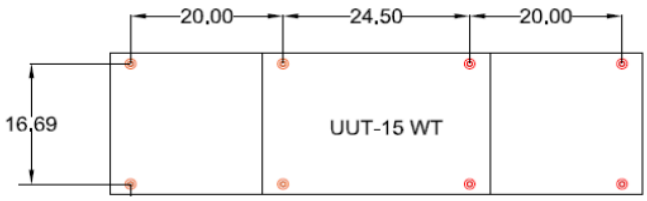
Building Code / Test Criteria	S_{DS} (g)	z / h	I_P	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
CBC 2013 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53
	2.50	0.0	1.5	2.50	1.00	1.67	0.67

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT-15-A/B/C	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Floor mounted with eight (8) 5/8"- Grade 8 Bolts





Manufacturer: Siemens	**Test Location:** Clark Labs, PA	**Test Date:** June 2015

Product Line: Tiastar Motor Control Center - Seismic Design

Identification Number: TSTR-MCC-2500-F	**Serial Number:** 89EF17341027

UUT Function: Electrical operation and control of various types of motors for industrial applications.

UUT Description: Unit consists of 2 - 20" wide and 1 - 30" wide by 20" deep segements bolted together, is constructed with NEMA 1 carbon steel enclosure with reinforced side sheets, has a main bus ampre rating of 2500 amps, and allows for front only sub-component installation.

UUT Subcomponent Description: UUT-15-A (left section) contains 3 - MS-1 starters and 2 - MS-3 starters. UUT-15-B (mid section) contains a MLO-2500A main lug. UUT-15-C (right section) contains a MS-1 starter, 2 - MS-3 starters, and a MS-4 starter.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)				Natural Fequency (Hz)		
	Est. COG	Width	Depth	Height	FB	SS	V
1,498	57.5"	70"	20"	91"	9.12	24.05	>33

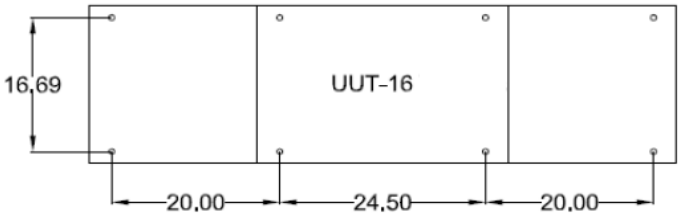
SEISMIC TEST PARAMETERS

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 2013 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53
	2.50	0.0	1.5	2.50	1.00	1.67	0.67

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.

UUT-16-A/B/C	UNIT UNDER TEST (UUT) SUMMARY SHEET	WEGAI W.E. GUNDY & ASSOCIATES, INC. STRUCTURAL & EARTHQUAKE ENGINEERING

Mounting Details: Floor mounted with eight (8) 5/8"- Grade 8 Bolts



Manufacturer: Siemens	**Test Location:** Clark Labs, PA	**Test Date:** June 2015

Product Line: Tiastar Motor Control Center - Seismic Design

Identification Number: TSTR-MCC-2500-F	**Serial Number:** 89EF17341028

UUT Function: Electrical operation and control of various types of motors for industrial applications.

UUT Description: Unit consists of 2 - 20" wide and 1 - 30" wide by 20" deep segements bolted together, is constructed with NEMA 1 carbon steel enclosure with reinforced side sheets, has a main bus ampre rating of 2500 amps, and allows for front only sub-component installation.

UUT Subcomponent Description: UUT-16-A (left section) contains 3 - MS-1 starters and 2 - MS-3 starters. UUT-16-B (mid section) contains a MCB-2500A main breaker, a 013-75AA ammeter, and a 013-01VA voltmeter. UUT-16-C (right section) contains a MS-1 starter, 2 - MS-3 starters, and a MS-4 starter.

UUT PROPERTIES

Weight (lb)	Dimensions (inches)				Natural Fequency (Hz)		
	Est. COG	Width	Depth	Height	FB	SS	V
1,830	51.7"	70"	20"	91"	9.04	32.06	>33

SEISMIC TEST PARAMETERS

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 2013 / ICC-ES AC156	2.00	1.0	1.5	3.20	2.40	1.33	0.53
	2.50	0.0	1.5	2.50	1.00	1.67	0.67

Note: The unit was full of contents during testing and remained fuctional before and after the ICC-ES AC156 test. The unit maintained structural integrity during and after the ICC-ES AC156 Test.