



OFFICE OF STATEWIDE HEALTH PLANNING AND DEVELOPMENT  
FACILITIES DEVELOPMENT DIVISION

APPLICATION FOR OSHPD SPECIAL SEISMIC  
CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP – 0400 – 10

OSHPD Special Seismic Certification Preapproval (OSP)

Type:  New  Renewal

Manufacturer Information

Manufacturer: Industrial Electric Mfg.

Manufacturer's Technical Representative: Ashok Kulkarni

Mailing Address: 48205 Warm Springs Blvd., Fremont, CA 94539

Telephone: 510-360-1247 Email: ashokk@iemfg.com

Product Information

Product Name: 38kV Switchgear

Product Type: MV Switchgear

Product Model Number: See I. Certified Product Table attached  
(List all unique product identification numbers and/or part numbers)

General Description: 38kV Switchgear NEMA 1 Indoor & NEMA 3R Outdoor Sections. Seismic enhancements made to the  
UUTs & modifications required to address anomalies observed during the tests shall be incorporated into the production units.

Mounting Description: Rigidly floor mounted

Applicant Information

Applicant Company Name: Industrial Electric Mfg.

Contact Person: Ashok Kulkarni

Mailing Address: 48205 Warm Springs Blvd., Fremont, CA 94539

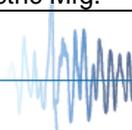
Telephone: 510-360-1247 Email: ashokk@iemfg.com

I hereby agree to reimburse the Office of Statewide Health Planning and Development review fees in  
accordance with the California Administrative Code, 2013.

Signature of Applicant:  Date: 11/26/2014

Title: Vice President of Engineering Company Name: Industrial Electric Mfg.

"Access to Safe, Quality Healthcare Environments that Meet California's Diverse and Dynamic Needs"





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

Company Name: Forell/Elsesser Engineers, Inc.

Name: Marco Scanu, SE California License Number: S4454

Mailing Address: 160 Pine St., 6<sup>th</sup> Flr., San Francisco, CA 94111

Telephone: (415) 837-0700 Email: m.scanu@forell.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: UC Berkeley – PEER

Contact Name: Wesley Neighbour

Mailing Address: 1301 S. 46<sup>th</sup> Street, Building 420, Richmond, CA 94804

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

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**Seismic Parameters**

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

Design Basis of Equipment or Components ( $F_p/W_p$ ) = 1.54

$S_{DS}$  (Design spectral response acceleration at short period, g) = 2.05

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

$R_p$  (Equipment or component response modification factor) = 6.0

$\Omega_0$  (System overstrength factor) = 2.5

$I_p$  (Importance factor) = 1.5

$z/h$  (Height factor ratio) = 1.0

Equipment or Component Natural Frequencies (Hz) = See attachment, "III. UUT Summary Sheets"

Overall dimensions and weight (or range thereof) = See attachment, "I. Certified Product Table"

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) = \_\_\_\_\_

$\Omega_0$  (System overstrength factor) = \_\_\_\_\_

$C_d$  (Deflection amplification factor) = \_\_\_\_\_

$I_p$  (Importance factor) = 1.5

Height to Center of Gravity above base = \_\_\_\_\_

Equipment or Component Natural Frequencies (Hz) = \_\_\_\_\_

Overall dimensions and weight (or range thereof) = \_\_\_\_\_

Tank(s) designed in accordance with ASME BPVC, 2010:  Yes  No

**List of Attachments Supporting Special Seismic Certification**

Test Report(s)  Drawings  Calculations  Manufacturer's Catalog

Other(s) (Please Specify): \_\_\_\_\_

**OSHPD Approval (For Office Use Only) – Approval Expires on December 31, 2019**

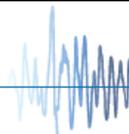
Signature:  Date: December 24, 2014

Print Name: Timothy J. Piland Title: SSE

Special Seismic Certification Valid Up to :  $S_{DS}$  (g) = 2.05  $z/h$  = 1

Condition of Approval (if applicable): \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_



**IEM - 38kV Switchgear**  
**I. Certified Products Table**

<b>Voltage Rating</b>	<b>Height (in)</b>	<b>Width (in)</b>	<b>Depth (in)</b>	<b>Weight (lbs)</b>	<b>NEMA Rating</b>	<b>Test Status</b>
<b>Individual Sections</b>						
38 kV	95	42	123	2,000 - 4,200 lbs	1, 3R	Extrapolated
38 kV	95	42	123	4,200	Type 1	UUT-2
38 kV	95	42	123	4,200 - 6,000 lbs	1, 3R	Interpolated
38 kV	95	42	123	4,500 lbs, 6,000 lbs	Type 3R	UUT-1 <sup>1</sup>

**Notes**

1. UUT1 consisted of two sections of the same dimensions with differing weights.
2. NEMA-3R non-walk-in enclosure: 107"H x 54"W x 132"D per section (+12"H x +12"W x +11"H per section).

**IEM - 38kV Switchgear**  
**II. Certified Subcomponents Table**

Internal Components	Manufacturer	Part #	Testing Status
<b>Digital Relay</b>			
SEL-311 Differential and Distance Protection Relay	Schweitzer	0311LXXB4	Extrapolated
SEL-351A Protection Relay	Schweitzer	0351AXXB4	Extrapolated
SEL-387 Current Differ. And Overcurrent Relay	Schweitzer	0387XXB4	Extrapolated
SEL-451 Protection Relay	Schweitzer	045144151XXB4	UUT-1
SEL-487B Bus Differential Protection Relay	Schweitzer	0487BXXB4	Interpolated
SEL-501 Overcurrent Relay	Schweitzer	0501XXB4	Interpolated
SEL-751A Feeder Protection Relay	Schweitzer	0751AXXB4	Interpolated
SEL-787 Transformer Differential Relay	Schweitzer	0787EX1A1A0X	UUT-1
BE1 Voltage Protective Relay	Basler	BE1-27-A3E-E1J	UUT-2
BE1 Current Differential Protective Relay	Basler	BE1-CDS240-0N5F	Interpolated
BE1 Overcurrent Protection System	Basler	BE1-951-B3ED0N1F	Interpolated
BE1 Bus Differential Relay	Basler	BE1-87B-ED0N1F	Interpolated
BE1 Under/Over Frequency Protective Relay	Basler	BE1-81O/U-XXX	Interpolated
BE1 Directional Power Relay	Basler	BE1-32R-B3ED1PA	UUT-2
<b>Power Monitors/Meters</b>			
Power Monitor 3000	Allen Bradley	1404-M405A-ENT	UUT-1
GE Electronic Power Monitor (EPM) 5300P	GE	PL53002A0A00	Extrapolated
GE Electronic Power Monitor (EPM) 783	GE	783X9011001	UUT-2
GE Electronic Meter	GE	783X901001	UUT-2
SEL-734 Advanced Metering System	Schweitzer	0734009V1D11	UUT-1
Powerlogic ION 7330 Power Meter	Square D	S7330A0B0B0A	UUT-2
<b>Switches</b>			
FT1 Test Switch 6 Pole	ABB	FT129A516G01	UUT-1
Series 24 Control Switch	Electroswitch	24202D	UUT-1, UUT-2
<b>Indicating Light</b>			
Heavy Duty Indicating Light Red	GE	CR104PLT93R	UUT-1, UUT-2
Heavy Duty Indicating Light Green	GE	CR104PLT93G	UUT-1, UUT-2
<b>Power Components</b>			
Potential Transformer	ABB	1VLT5212003507	UUT-1
15kVA Transformer	IEM	89067-AFP-CT	UUT-1
Current Transformer	ITI	785-202	UUT-1
	ITI	785-122MR	UUT-2
38kV 1200A Vacuum Breaker	Innovative Power Technologies	VVAG-38140MABB	UUT-2
38kV 2000A Vacuum Breaker		VVAG-38240M-ABBBBBBA	UUT-1

**Test Report 2014-08 – UUT 1**  
 NEMA 3R Outdoor Unit

Cold Formed Carbon Steel  
 108”W x 132”D x 107”H, 10,500 lbs  
 Floor mounted w/: (10) – 1/2” Gr. 5 bolts



Building Code	Test Criteria	S <sub>DS</sub> (g)	z/h	Horizontal		Vertical	
				A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	A <sub>FLX-V</sub>	A <sub>RIG-V</sub>
CBC 2013	ICC-ES AC 156	2.17	1	3.47g	2.60g	1.45g	0.58g
<b>Natural Frequencies</b>			<b>Test Results</b>				
<b>F-B</b>	<b>S-S</b>	<b>V</b>	The UUT maintained structural integrity and functionality after the AC156 test.				
13.4 Hz	4.7 Hz	>33 Hz					
			The unit was full of content during testing.				

Internal Components	Manufacturer	Part #
SEL-451 Protection Relay	Schweitzer	045144151XXB4
SEL-787 Transformer Differential Protection Relay	Schweitzer	0787EX1A1A0X75850200
Power Monitor 3000	Allen Bradley	1404-M405A-ENT
SEL-734 Advanced Metering System	Schweitzer	0734009V1D11
FT1 Test Switch 6 Pole	ABB	FT129A516G01
Heavy Duty Indicating Light Red	GE	CR104PLT93R
Heavy Duty Indicating Light Green	GE	CR104PLT93G
38kV 2000A Vacuum Breaker	Innovative Power Technologies	VVAG-38240M-ABBBBBBA
Potential Transformer	ABB	1VLT5212003507
15kVA Transformer	IEM	89067-AFP-CT
Current Transformer	ITI	785-202
Control Switch	Electroswitch	24202D

**Test Report 2014-08 – UUT 2**

NEMA 1 Indoor Unit  
 Cold Formed Carbon Steel  
 42"W x 123"D x 95"H, 4,200 lbs  
 Floor mounted w/: (19) – 1/2" Gr. 5 bolts

Tested twice:

Setup B – bottom plates in place  
 Setup C – bottom plates removed



Building Code	Test Criteria	S <sub>Ds</sub> (g)	z/h	Horizontal		Vertical	
				A <sub>FLX-H</sub>	A <sub>RIG-H</sub>	A <sub>FLX-V</sub>	A <sub>RIG-V</sub>
CBC 2013	ICC-ES AC 156	2.05	1	3.28g	2.46g	1.37g	0.55g
<b>Natural Frequencies*</b>			<b>Test Results</b>				
<b>F-B</b>	<b>S-S</b>	<b>V</b>	The UUT maintained structural integrity and functionality after the AC156 test.				
7.5 Hz	14.1 Hz	>33 Hz					
*as measured in Setup B			The unit was full of content during testing.				

Internal Components	Manufacturer	Part #
BE-127 Voltage Relay	Basler	BE1-27-A3E-E1J
BE1-32R Directional Power Relay	Basler	BE1-32R-B3ED1PA
Powerlogic ION 7330 Power Meter	Square D	S7330A0B0B0A
KVV2C Electronic Switchboard Meter	GE	783X901001
Heavy Duty Indicating Light Red	GE	CR104PLT93R
Heavy Duty Indicating Light Green	GE	CR104PLT93G
38kV 1200A Vacuum Breaker	Innovative Power Technologies	VVAG-38140MABB
Current Transformer	ITI	785-122MR
Control Switch	Electroswitch	24202D