

SYSTEM IMPACT STUDY FOR [SPQ/CSQ][####][revision letter, if applicable]

Prepared by

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Registered Professional Engineer Stamp

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

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SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

INTERCONNECTION INFORMATION

Customer Information

Queue Position	SPQ####
System Impact Study Commitment Date	[date report is completed by Distribution Planning]
Size of Proposed Facility (MW)	
Coordinates or Facility Location	
Inverter Type(s)	
Engineer Performing SIS	[Engineer's name]
Field Work Order (FWO)	

Interconnection Summary

System Impact Study was performed for SPQXXXX on the ____ Substation, feeder _____. The system was simulated and analyzed for voltage, loading, and short circuit violations.

The distribution system improvements needed for this interconnection are:

Note: Provide description of how this interconnection will affect the distribution system if no upgrades are made. This section is to be filled out after studies are complete.

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INTERCONNECTION REQUESTS ASSOCIATED WITH THIS SUBSTATION

Queue Pos #	Feeder Name	Xfmr Pos #	GPS Coordinates	Size (MW _{AC})	Status	LL (MW _{AC})	HL (MW _{AC})

Note: The “LL” (Light Load) and “HL” (Heavy Load) columns represent the amount a Small Generator was generating at the time the Feeder Loading Information was measured.

Voltage-Reactive Power Control Settings for SPQXXXX

Voltage-Reactive Power Parameters	Inverter-based DER Default Settings
V_{Ref}	V_N
V_1	$0.92 V_{Ref}$
V_2	$0.98 V_{Ref}$
V_3	$1.02 V_{Ref}$
V_4	$1.08 V_{Ref}$
Q_1	44% of nameplate apparent power rating, injection
Q_2	0
Q_3	0
Q_4	44% of nameplate apparent power rating, absorption
Open Loop Response Time	5 s

NOTE: All DER shall utilize a fixed reference voltage V_{Ref} , V_N is assumed to be set at DER nominal AC operating voltage of 12.47 kV, and lastly that the DER reactive power capability may be reduced at lower voltage.

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BASE CASE INFORMATION FOR LIGHT LOADING CONDITIONS

Substation Name	
Interconnecting Feeder Name	
Substation Transformer Position # (e.g. WR1, BR1)	

Light Loading Information

Simulated Date	
Simulated Hour	

Feeder Loading Information

Feeder Name	Transformer Position	Loading (KW)	Loading (KVAR)
[Interconnected feeder]			
[Another feeder]			
[Another feeder]			

Feeder Voltage Profile for Light Loading Conditions

Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus			
Point of Interconnection			

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Upstream Device Backfeed

Device Type & ID	General Location	Does Backfeed Exist? (Y/N)	Capable of Backfeed? (Y/N/Unknown)
<Sub Reg/LTC>			
<Ex: Recloser>			
<Ex: Line Reg>			

Note: List all reclosers, voltage regulators, and/or substation transformer LTCs upstream of the proposed DG. If a voltage regulator or LTC is expected to experience backfeed and backfeed capability is unknown, flag it in the Summary section to be reviewed at the Facility Study stage. For voltage regulators, include an estimate for tentative replacement. For LTCs, the settings should be checked to ensure they are set to Ignore mode.

Fault Current Profile

Device Type or ID	Distance From Substation (ft.)	Bidirectional? (Y/N)	Continuous Rating (Amps)	Fault Ratings (Symmetrical, Asymmetrical, or Peak Interrupting/Withstand) in kA	Max Fault Current (Symmetrical/Asymmetrical/Peak) In kA
<Feeder breaker>					

<POI>					

Note: List devices between proposed point of interconnection and the feeder breaker. Include feeder regulator(s), feeder breaker, fuses, reclosers, switches, and sectionalizers.

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Pertinent Violations¹

Device Type	General Location	Violation Type	Comments

Note: Only list violations for the feeder with the proposed DG. Violations include Overloads, Under-Voltage, Over-Voltage, or Short Circuit Rating. Only list violations for cable, conductors, and equipment on the primary circuit or in the substation.

SMALL GENERATOR INTERCONNECTION – LIGHT LOADING (Proposed Small Generator is connected and in service)

Small Generator Location

Small Generator Location	
Latitude (DD)	Longitude (DD)

Feeder Voltage Profile for Light Loading Conditions (Small Generator is connected and in service)

Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus			
Point of Interconnection			

System Backfeed (Record loading at the source side of the proposed Small Generator's feeder breaker, and at the distribution power transformer).

Location	KW	KVAR
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¹ Base case violations are not the responsibility of the interconnection customer.

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Feeder Breaker		
Transformer (115 or 57kV terminals)		
Substation Source Location		

Note: Measured Daytime Minimum Load is utilized to determine System Backfeed values.

Also: Negative kW values indicate backfeed.

Transmission Planning Recommendations (If there is backfeed onto the transmission system)

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Note: Provide mitigation strategies and associated costs as proposed by transmission planning engineers. If there is no backfeed onto the transmission system, write "N/A" in the above field.

Contingency Analysis

Protective Device Contingency	Location	Load Loss (KW)	Load Loss (KVAR)	Violations
Contingency #1				
Contingency #2				
Contingency #3				

Note: Feeder single-contingency (N-1) analysis is performed to simulate the loss of a feeder line section due to a fault (where a protective device automatically isolates the faulted area). In the case of a group of fuses serving three-phases, a three-phase fault is assumed. This analysis is used to determine the limitations of distribution equipment (such as conductors and protective devices) since a fault could potentially lead to reduced load and increased reverse power flow on distribution equipment. The protective device contingency scenarios are chosen by the planning engineer based on the heaviest loaded laterals or mainline protective devices disconnected from the feeder while ensuring the proposed Small Generator is not disconnected from service.

Upstream Device Backfeed

Device Type & ID	General Location	Does Backfeed Exist? (Y/N)	Capable of Backfeed? (Y/N/Unknown)
<Sub Reg/LTC>			
<Ex: Recloser>			
<Ex: Line Reg>			

Note: List all reclosers, voltage regulators, and/or substation transformer LTCs upstream of the proposed DG. If a voltage regulator or LTC is expected to experience backfeed and backfeed capability is unknown, flag it in the Summary section to be reviewed at the Facility Study stage. For voltage regulators, include an estimate for tentative replacement. For LTCs, the settings should be checked to ensure they are set to Ignore mode.

Fault Current Profile (Proposed Small Generator is connected and in service)

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Device Type or ID	Distance From Substation (ft.)	Bidirectional? (Y/N)	Continuous Rating (Amps)	Fault Ratings (Symmetrical, Asymmetrical, or Peak Interrupting/ Withstand) in kA	Max Fault Current (Symmetrical/ Asymmetrical/ Peak) In kA
<Feeder breaker>					

<POI>					

Note: List devices between proposed point of interconnection and the feeder breaker. Include feeder regulator(s), feeder breaker, fuses, reclosers, switches, and sectionalizers.

Pertinent Violations

Device Type	General Location	Violation Type	Comments

Note: Only list new violations for the feeder with the proposed Small Generator. Violations include Overloads, Under-Voltage, Over-Voltage, or Short Circuit Rating. Only list violations for cable, conductors, and equipment on the primary circuit or in the substation.

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

BASE CASE INFORMATION FOR HEAVY LOADING CONDITIONS

Heavy Loading Information

Simulated Date	
Simulated Hour	

Feeder Loading Information (All feeders served from associated substation transformer)

Feeder Name	Transformer Position	Loading (KW)	Loading (KVAR)

Note: List feeders served from the associated transformer or bus of the interconnecting device

Feeder Voltage Profile for Heavy Loading Conditions

Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus			
Point of Interconnection			

Pertinent Violations²

Device Type	General Location	Violation Type	Comments

² Base case violations are not the responsibility of the interconnection customer.

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

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Note: Only list violations for the feeder with the proposed Small Generator. Violations include Overloads, Under-Voltage, Over-Voltage, or Short Circuit Rating. Only list violations for cable, conductors, and equipment on the primary circuit or in the substation.

SMALL GENERATOR INTERCONNECTION – HEAVY LOADING

Feeder Voltage Profile for Heavy Loading Conditions (Proposed Small Generator is connected and in service)

Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus			
Point of Interconnection			

System Backfeed (Record loading at the source side of the proposed Small Generator's feeder breaker, and at the distribution power transformer).

Location	KW	KVAR
Feeder Breaker		
Transformer (115 or 57kV terminals)		
Substation Source Location		

Note: Negative kW values indicate backfeed.

Pertinent Violations

Device Type	General Location	Violation Type	Comments

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Note: Only list new violations for the feeder with the Small Generator. Violations include Overloads, Under-Voltage, Over-Voltage, or Short Circuit Rating. Only list violations for cable, conductors, and equipment on the primary circuit or in the substation.

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

SYSTEM IMPROVEMENT SUMMARY

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Note: If no system improvements are needed, write "No additional upgrades are required on the distribution system pertaining to this interconnection request" in the above field.

SYSTEM IMPROVEMENTS – LIGHT LOADING

Feeder Voltage Profile for Light Loading Conditions (Proposed Small Generator is off)

Case No.	Case Name	Case Type	Case Status	Case Date	Case Location	Case Description	Case Details	Case Notes	Case Comments	Case Actions
1	John Doe	Case 1	Open	2023-01-01	New York	Case 1 Description	Case 1 Details	Case 1 Notes	Case 1 Comments	Case 1 Actions
2	Jane Smith	Case 2	Closed	2023-01-02	California	Case 2 Description	Case 2 Details	Case 2 Notes	Case 2 Comments	Case 2 Actions
3	Bob Johnson	Case 3	Pending	2023-01-03	Texas	Case 3 Description	Case 3 Details	Case 3 Notes	Case 3 Comments	Case 3 Actions
4	Alice Brown	Case 4	Open	2023-01-04	Florida	Case 4 Description	Case 4 Details	Case 4 Notes	Case 4 Comments	Case 4 Actions
5	Charlie Davis	Case 5	Closed	2023-01-05	Illinois	Case 5 Description	Case 5 Details	Case 5 Notes	Case 5 Comments	Case 5 Actions
6	Diana Prince	Case 6	Pending	2023-01-06	Washington	Case 6 Description	Case 6 Details	Case 6 Notes	Case 6 Comments	Case 6 Actions
7	Edward Norton	Case 7	Open	2023-01-07	Massachusetts	Case 7 Description	Case 7 Details	Case 7 Notes	Case 7 Comments	Case 7 Actions
8	Fiona Glenanne	Case 8	Closed	2023-01-08	Ontario	Case 8 Description	Case 8 Details	Case 8 Notes	Case 8 Comments	Case 8 Actions
9	George Clooney	Case 9	Pending	2023-01-09	Georgia	Case 9 Description	Case 9 Details	Case 9 Notes	Case 9 Comments	Case 9 Actions
10	Helen Mirren	Case 10	Open	2023-01-10	London	Case 10 Description	Case 10 Details	Case 10 Notes	Case 10 Comments	Case 10 Actions
11	Ian McKellen	Case 11	Closed	2023-01-11	Edinburgh	Case 11 Description	Case 11 Details	Case 11 Notes	Case 11 Comments	Case 11 Actions
12	Jennifer Lawrence	Case 12	Pending	2023-01-12	Indiana	Case 12 Description	Case 12 Details	Case 12 Notes	Case 12 Comments	Case 12 Actions
13	Keanu Reeves	Case 13	Open	2023-01-13	Manitoba	Case 13 Description	Case 13 Details	Case 13 Notes	Case 13 Comments	Case 13 Actions
14	Liam Neeson	Case 14	Closed	2023-01-14	Massachusetts	Case 14 Description	Case 14 Details	Case 14 Notes	Case 14 Comments	Case 14 Actions
15	Mel Gibson	Case 15	Pending	2023-01-15	Queensland	Case 15 Description	Case 15 Details	Case 15 Notes	Case 15 Comments	Case 15 Actions
16	Nicole Kidman	Case 16	Open	2023-01-16	Victoria	Case 16 Description	Case 16 Details	Case 16 Notes	Case 16 Comments	Case 16 Actions
17	Orlando Bloom	Case 17	Closed	2023-01-17	Queensland	Case 17 Description	Case 17 Details	Case 17 Notes	Case 17 Comments	Case 17 Actions
18	Peter Dinklage	Case 18	Pending	2023-01-18	Queensland	Case 18 Description	Case 18 Details	Case 18 Notes	Case 18 Comments	Case 18 Actions
19	Quentin Tarantino	Case 19	Open	2023-01-19	Queensland	Case 19 Description	Case 19 Details	Case 19 Notes	Case 19 Comments	Case 19 Actions
20	Rachel Watson	Case 20	Closed	2023-01-20	Queensland	Case 20 Description	Case 20 Details	Case 20 Notes	Case 20 Comments	Case 20 Actions
21	Samuel L. Jackson	Case 21	Pending	2023-01-21	Queensland	Case 21 Description	Case 21 Details	Case 21 Notes	Case 21 Comments	Case 21 Actions
22	Sean Penn	Case 22	Open	2023-01-22	Queensland	Case 22 Description	Case 22 Details	Case 22 Notes	Case 22 Comments	Case 22 Actions
23	Sharon Stone	Case 23	Closed	2023-01-23	Queensland	Case 23 Description	Case 23 Details	Case 23 Notes	Case 23 Comments	Case 23 Actions
24	Timothy Dalton	Case 24	Pending	2023-01-24	Queensland	Case 24 Description	Case 24 Details	Case 24 Notes	Case 24 Comments	Case 24 Actions
25	Uma Thurman	Case 25	Open	2023-01-25	Queensland	Case 25 Description	Case 25 Details	Case 25 Notes	Case 25 Comments	Case 25 Actions
26	Will Smith	Case 26	Closed	2023-01-26	Queensland	Case 26 Description	Case 26 Details	Case 26 Notes	Case 26 Comments	Case 26 Actions
27	Yasmine Bleeth	Case 27	Pending	2023-01-27	Queensland	Case 27 Description	Case 27 Details	Case 27 Notes	Case 27 Comments	Case 27 Actions
28	Zoe Lister-Jones	Case 28	Open	2023-01-28	Queensland	Case 28 Description	Case 28 Details	Case 28 Notes	Case 28 Comments	Case 28 Actions
29	Adam Sandler	Case 29	Closed	2023-01-29	Queensland	Case 29 Description	Case 29 Details	Case 29 Notes	Case 29 Comments	Case 29 Actions
30	Ben Stiller	Case 30	Pending	2023-01-30	Queensland	Case 30 Description	Case 30 Details	Case 30 Notes	Case 30 Comments	Case 30 Actions
31	Chris Rock	Case 31	Open	2023-01-31	Queensland	Case 31 Description	Case 31 Details	Case 31 Notes	Case 31 Comments	Case 31 Actions
32	Dave Matthews	Case 32	Closed	2023-02-01	Queensland	Case 32 Description	Case 32 Details	Case 32 Notes	Case 32 Comments	Case 32 Actions
33	Eddie Murphy	Case 33	Pending	2023-02-02	Queensland	Case 33 Description	Case 33 Details	Case 33 Notes	Case 33 Comments	Case 33 Actions
34	Faye Dunaway	Case 34	Open	2023-02-03	Queensland	Case 34 Description	Case 34 Details	Case 34 Notes	Case 34 Comments	Case 34 Actions
35	Gary Oldman	Case 35	Closed	2023-02-04	Queensland	Case 35 Description	Case 35 Details	Case 35 Notes	Case 35 Comments	Case 35 Actions
36	Hugh Grant	Case 36	Pending	2023-02-05	Queensland	Case 36 Description	Case 36 Details	Case 36 Notes	Case 36 Comments	Case 36 Actions
37	Isla Fisher	Case 37	Open	2023-02-06	Queensland	Case 37 Description	Case 37 Details	Case 37 Notes	Case 37 Comments	Case 37 Actions
38	Jack Black	Case 38	Closed	2023-02-07	Queensland	Case 38 Description	Case 38 Details	Case 38 Notes	Case 38 Comments	Case 38 Actions
39										

Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus			
Point of Interconnection			

Contingency Analysis

Protective Device Contingency	Location	Load Loss (KW)	Load Loss (KVAR)	Violations
Contingency #1				
Contingency #2				
Contingency #3				

Note: Feeder single-contingency (N-1) analysis is performed to simulate the loss of a feeder line section due to a fault (where a protective device automatically isolates the faulted area). In the case of a group of fuses serving three-phases, a three-phase fault is assumed. This analysis is used to determine the limitations of distribution equipment (such as conductors and protective devices) since a fault could potentially lead to reduced load and increased reverse power flow on distribution equipment. The

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

protective device contingency scenarios are chosen by the planning engineer based on the heaviest loaded laterals or mainline protective devices disconnected from the feeder while ensuring the proposed Small Generator is not disconnected from service.

Upstream Device Backfeed

Device Type & ID	General Location	Does Backfeed Exist? (Y/N)	Capable of Backfeed? (Y/N/Unknown)
<Sub Reg/LTC>			
<Ex: Recloser>			
<Ex: Line Reg>			

Note: List all reclosers, voltage regulators, and/or substation transformer LTCs upstream of the proposed DG. If a voltage regulator or LTC is expected to experience backfeed and backfeed capability is unknown, flag it in the Summary section to be reviewed at the Facility Study stage. For voltage regulators, include an estimate for tentative replacement. For LTCs, the settings should be checked to ensure they are set to Ignore mode.

Fault Current Profile

Device Type or ID	Distance From Substation (ft.)	Bidirectional? (Y/N)	Continuous Rating (Amps)	Fault Ratings (Symmetrical, Asymmetrical, or Peak Interrupting/ Withstand) in kA	Max Fault Current (Symmetrical/ Asymmetrical/ Peak) In kA
<Feeder breaker>					

<POI>					

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Note: List devices between proposed point of interconnection and the feeder breaker. Include feeder regulator(s), feeder breaker, fuses, reclosers, switches, and sectionalizers.

Pertinent Violations

Device Type	General Location	Violation Type	Comments

Note: None of these violations should supersede base case violations.

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Small Generator Interconnection – Light Loading (Proposed Small Generator is connected and in service)

Feeder Voltage Profile for Light Loading Conditions (Proposed Small Generator is connected and in service)

Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus			
Point of Interconnection			

System Backfeed (Record loading at the source side of the proposed Small Generator's feeder breaker, and at the distribution power transformer).

Location	KW	KVAR
Feeder Breaker		
Transformer (115 or 57kV terminals)		
Substation Source Location		

Note: Measured Daytime Minimum Load is utilized to determine System Backfeed values.

Also: Negative kW values indicate backfeed.

Contingency Analysis

Protective Device Contingency	Location	Load Loss (KW)	Load Loss (KVAR)	Violations
Contingency #1				
Contingency #2				
Contingency #3				

Note: Feeder single-contingency (N-1) analysis is performed to simulate the loss of a feeder line section due to a fault (where a protective device automatically isolates the faulted area). In the case of a group of fuses serving three-phases, a three-phase fault is assumed. This analysis is used to determine the limitations of distribution equipment (such as conductors and protective devices) since a fault could

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potentially lead to reduced load and increased reverse power flow on distribution equipment. The protective device contingency scenarios are chosen by the planning engineer based on the heaviest loaded laterals or mainline protective devices disconnected from the feeder while ensuring the proposed Small Generator is not disconnected from service.

Upstream Device Backfeed

Device Type & ID	General Location	Does Backfeed Exist? (Y/N)	Capable of Backfeed? (Y/N/Unknown)
<Sub Reg/LTC>			
<Ex: Recloser>			
<Ex: Line Reg>			

Note: List all reclosers, voltage regulators, and/or substation transformer LTCs upstream of the proposed DG. If a voltage regulator or LTC is expected to experience backfeed and backfeed capability is unknown, flag it in the Summary section to be reviewed at the Facility Study stage. For voltage regulators, include an estimate for tentative replacement. For LTCs, the settings should be checked to ensure they are set to Ignore mode.

Fault Current Profile (Proposed Small Generator is connected and in service)

Device Type or ID	Distance From Substation (ft.)	Bidirectional? (Y/N)	Continuous Rating (Amps)	Fault Ratings (Symmetrical, Asymmetrical, or Peak Interrupting/ Withstand) in kA	Max Fault Current (Symmetrical/ Asymmetrical/ Peak) In kA
<Feeder breaker>					

<POI>					

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

Note: List devices between proposed point of interconnection and the feeder breaker. Include feeder regulator(s), feeder breaker, fuses, reclosers, switches, and sectionalizers.

Pertinent Violations

Device Type	General Location	Violation Type	Comments

Note: None of these violations should supersede base case violations.

SYSTEM IMPACT STUDY (SIS) FOR DISTRIBUTION LINES AND EQUIPMENT

SYSTEM IMPROVEMENTS – HEAVY LOADING

Feeder Voltage Profile for Heavy Loading Conditions (Proposed Small Generator is off)

Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus			
Point of Interconnection			

Pertinent Violations

Device Type	General Location	Violation Type	Comments

Note: None of these violations should supersede base case violations.

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Small Generator Interconnection – Heavy Loading (Proposed Small Generator is connected and in service)

Feeder Voltage Profile for Heavy Loading Conditions (Proposed Small Generator is connected and in service)

Location	VA (120V base)	VB (120V base)	VC (120V base)
Feeder Bus			
Point of Interconnection			

System Backfeed (Record loading at the source side of the proposed Small Generator's feeder breaker, and at the distribution power transformer).

Location	KW	KVAR
Feeder Breaker		
Transformer (115 or 57kV terminals)		
Substation Source Location		

Note: Negative kW values indicate backfeed.

Pertinent Violations³

Device Type	General Location	Violation Type	Comments

Note: None of these violations should supersede base case violations.

³ Base case violations are not the responsibility of the interconnection customer.

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APPENDIX A: EQUIPMENT RATINGS AND STANDARDS

Cutouts

Polymeric Cutout Specifications					
Cutout Usage	PGE Part Number	Cutout Type	kV Rating	Amp Rating	
				Continuous	Asymmetrical Interrupting
General	40102	Open dropout	15	100	16,000
Special application	39478			200	12,000
	90006289	Solid blade		300	—

15-kV Solid Blade Cutout Ratings				
PGE Part Number	Voltage Rating (kV)		Current Rating (amps)	
	Nominal	Maximum	Continuous	Momentary (asymmetrical)
90006289	14.4	15.0	300	12,000

Table 10: 15-kV Solid Blade Cutout Ratings

Gang Operated Switches

15-kV Gang-Operated Switch Fault Ratings				
PGE Part Number	Manufacturer	Peak Withstand (amps, rms, 10 cycles)	Momentary, Symmetrical (amps, rms, three seconds)	Fault Closing (peak amps) ¹
03586	S&C Electric Company Omni-Rupter ²	65,000	20,000	42,000
	Inertia Engineering LineBOSS	51,000	32,000	30,000
03587	Unassembled S&C Electric Company Alduti-Rupter	40,000	25,000	20,000

Switches

15-kV Disconnect Switch Ratings				
PGE Part Number	Voltage Rating (kV)		Current Rating (amps)	
	Nominal	Maximum	Continuous	Momentary
03582	15	15.5	1200	61,000

Table 9: 15-kV Disconnect Switch Ratings

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Reclosers

Types of Reclosers and Corresponding PGE Part Numbers					
PGE Part Number	Phase	Setting	Continuous Rating	Type	Symmetrical Amps
03398	Single	1A3C	50	L ¹	3000
03399		2A2D			
03401			70		
03405			100		4000
03406			140		
39135			50	V4L	3000
03402		70	4200		
39130		1A3C	100		6000
03403		2A2D			
39131		1A3C	140		
03408		2A2D			
39132		1A3C	200		
03410		2A2D			
39133		1A3C	280		
03411		2A2D			
39134		1A3C			
—	Three	Electronic allows a variety of curves	560 and 800 maximum	WE	10,000
03414			800 maximum	VWE	12,000
39756				NOVA	12,500
40242					

1. The L-type recloser is no longer purchased by PGE; it is here for reference only.

PGE Part Number	Phase	Setting	Continuous Rating	Type	Symmetrical Amps (Interrupting)	Asymmetrical Amps (Withstand)
	Three	Electronically programmable	1000	VIPER-ST	16,000	25,600

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Switchgear

Switchgear Design Ratings	
Design	Rating
Maximum voltage	15.5 kV
Power frequency	60 Hz
Lightning impulse withstand voltage	95 kV
Power frequency withstand voltage	35 kV
Continuous current	1200 A
Momentary asymmetrical current	40 kA
Fault-closing asymmetrical current	40 kA

Table 1: Switchgear Design Ratings

600-A, Pad-Mounted Switchgear Configurations				
PGE Part Number	Number of Switch Ways	Number of Fused Ways	Switchgear Momentary Fault Rating (kA, asymmetrical)	Unit Momentary Fault Rating (kA, symmetrical)
39686	3	1	40	14
39687	2	2		

Table 5: 600-A, Pad-Mounted Switchgear Configurations

900-A, Pad-Mounted Switchgear Configurations					
PGE Part Number	Number of Switch Ways	Number of Fault Interrupter Ways	Switch Way Continuous Rating (amp)	Fault Interrupter Way Continuous Rating (amp)	Unit Fault Rating (kA, symmetrical)
90008072	2	2	900	600	25
90008073	3	1			
90008074	4	—		—	

Table 7: 900-A, Pad-Mounted Switchgear Configurations

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1200-A, Pad-Mounted Switchgear Configurations				
PGE Part Number	Number of Switch Ways	Number of Fused Ways	Switchgear Momentary Fault Rating (kA, asymmetrical)	Unit Momentary Fault Rating (kA, symmetrical)
01433	4	—	40	25
01434	2	2		14
01435	3	1		
40050 ¹	4	—	61	35
40051 ¹	3	1		

1. This style is currently only used for Intel sites that require a higher fault rating.

Table 3: 1200-A, Pad-Mounted Switchgear Configurations

600-A, Submersible Switchgear Ratings						
PGE Part Number	Number of Switch Ways	Number of Fault Interrupter Ways	Unit Continuous Rating (amp)	Switchgear Continuous Rating (amp)	Fault Interrupter Continuous Rating (amp)	Unit Fault Rating (kA, symmetrical)
01425	2	2	600	600	200	12.5
01427	3					
01428		3				

Table 10: 600-A, Submersible Switchgear Ratings

900-A, Submersible Switchgear Dimensions					
Unit Fault Rating (kA, symmetrical)	Total Number of Ways	Tank Width ¹ (inch)	Tank Depth ² (inch)	Bushing Height (inch)	Total Height (inch)
12.5	4	65.4375	40.0625	17.5	26.625
25			40.25	28.75	33
12.5	5	80.4375	40.0625	17.5	26.625
25			40.25	28.75	33
12.5	6	95.4375	40.0625	17.5	26.625
25			40.25	28.75	33

1. Termination side of tank.

2. Depth includes controller enclosure but not bushings.

Table 12: 900-A, Submersible Switchgear Dimensions

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IEEE Voltage Range/Clearing Times Table

Voltage range (% of base voltage ^a)	Clearing time(s) ^b
$V < 50$	0.16
$50 \leq V < 88$	2.00
$110 < V < 120$	1.00
$V \geq 120$	0.16

^aBase voltages are the nominal system voltages stated in ANSI C84.1-1995, Table 1.

^bDR $\leq$ 30 kW, maximum clearing times; DR $>$ 30kW, default clearing times.

The voltage deviation when the Small Generator is offline or in service must be within Voltage Guideline limits from 88% to 110% of the nominal voltage at the point of interconnection and the substation bus. The voltage guideline set by IEEE-1547 requires Small Generators to disconnect from the grid or clear at the set time shown.