Interconnection Facilities Study
Final Report
Request # GI-2014-5

50 MW Solar Photovoltaic Generating Facility
Missile Site 230 kV Substation, Colorado

Xcel Energy – Public Service Company of Colorado
Transmission Planning West
February 14, 2018

I. Executive Summary

Public Service Company of Colorado (PSCo) received an Interconnection Request (IR) on May 13, 2014 which was assigned GI-2014-5 queue position. GI-2014-5 is a solar photovoltaic generating facility rated at 50 MW gross electrical output that will be located in Arapahoe County in Colorado. The point of interconnection (POI) requested for GI-2014-5 is the 230 kV bus within the PSCo Missile Site Substation.

The Commercial Operation Date (COD) originally requested for the generating facility in the IR was October 31, 2018. PSCo completed a Facilities Study Report for GI-2014-5 on June 30, 2015 and a Large Generator Interconnection Agreement (LGIA) was executed on March 6, 2016. The LGIA was subsequently placed into suspension by the customer. In April of 2017 the customer sent PSCo a request to take the LGIA out of suspension and concurrently requested a new COD of December 1, 2018 for the generating facility and a corresponding new back-feed date (for site energization) of June 1, 2018.

This Interconnection Facilities Study Report summarizes the construction schedule and cost of siting, engineering, equipment procurement and construction needed to interconnect the proposed GI-2014-5 solar generating facility at Missile Site 230 kV substation.

The one-line drawing of Missile Site 230 kV substation provided in Appendix A shows the Point of Interconnection of GI-2014-5, the Interconnection Facilities required for GI-2014-5, as well as the Point of Change of Ownership between the Transmission Provider's and Interconnection Customer's Interconnection Facilities.

The estimated total cost for the Transmission Provider Interconnection Facilities is **$1.797 Million**, as follows:

- $0.962 million for Customer-Funded, PSCo-Owned Interconnection Facilities
- $0.835 million for PSCo-Funded, PSCo-Owned Interconnection Facilities

There are no PSCo Network Upgrades for Delivery required for this Interconnection.

The estimated time required to design, engineer, procure and construct the Interconnection Facilities is 14 months from when the authorization to proceed was obtained. An Engineering & Procurement Agreement can be executed to facilitate completion of the Interconnection Facilities.

II. Introduction

Public Service Company of Colorado (PSCo) received an Interconnection Request (IR) on May 13, 2014 which was assigned GI-2014-5 queue position. GI-2014-5 is a solar photovoltaic generating facility rated at 50 MW gross electrical output that will be located in Arapahoe County in Colorado. The point of interconnection (POI) requested for GI-2014-5 is the 230 kV bus within the PSCo Missile Site Substation.

The Commercial Operation Date (COD) originally requested for the generating facility in the IR was October 31, 2018. PSCo completed a Facilities Study Report for GI-2014-5 on June 30, 2015 and a Large Generator Interconnection Agreement (LGIA) was executed on March 6, 2016. The LGIA was subsequently placed into suspension by the customer. In April of 2017 the customer sent PSCo a request to take the LGIA out of suspension and concurrently requested a new COD of December 1, 2018 for the generating facility and a corresponding new back-feed date (for site energization) of June 1, 2018.

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III. General Interconnection Facilities Description

A. Project Purpose & Scope

Summary

This Project is to connect a 50 MW solar photovoltaic generating facility into the 230 kV yard at Missile Site substation. The interconnection will consist of a single breaker, 3 gang switches, 3 metering units and 1 bus Capacitor Coupled Voltage Transformer (CCVT). The project is split into two estimates to account for the customer funded equipment of the interconnection and the Xcel funded station improvements.

The project cost will be split between Xcel Energy and the Interconnection Customer. Each estimate prepared has a cost responsibility owner in the assumptions. The point of interconnection will be the metering units. The generation customer will pay for all equipment up to and including the metering units, Xcel will own all equipment inside of the substation, and Xcel Energy will fund the remaining portion of equipment required for the interconnection.

Attachments:

- System One Line

Notable Items

- Design/Construction timeline is significantly shorter than traditional, and will leave little room for error.
- Ring bus expansion
- One line breaker
- Communication will be dual fiber into the substation
- A bus CCVT will be added on the north 230 kV bus to provide sync close potential for ring configuration
- Two outages will need to be taken to complete construction

Future Considerations

The existing design of the 230 kV yard terminates 3 transmission lines and 1 autotransformer. The ultimate design of the 230 kV yard considers the possible termination of 3 generation ties, 2 autotransformers, and 6 transmission lines

Distribution vs. Transmission Asset Ownership and Cost Responsibility

The substation primary function is presently defined as Transmission. This project will not change the primary function of the substation when complete assuming no other changes.

The project cost will be borne solely by Transmission Asset Management (TAM). Project costs that affect the whole of the substation are assigned based on the substation's defined primary function (such as grading, fencing, and electrical equipment enclosure) and will be the responsibility of TAM since the substation primary function is TAM.

B. FERC and/or NERC Compliance Requirements

Critical Infrastructure Protection (CIP) Asset

The CIP status of this substation was verified on 6/4/2015. This design was reviewed and authorized by CIP Compliance personnel.

Power System Restoration Plan Impact

Power system restoration plan impact was verified on 2/13/2018.

Facility Ratings and Smart One-Lines

This substation has BES facilities.

A smart one-line already exists for this substation. The existing smart one-line will be updated to include the changes made by this project. Facility ratings changes will be managed via the SubTran Portal, and will be reviewed and approved per the Procedure for Review and Approval of Facility Ratings.

C. Right of Way/Permitting

No land purchases or right of way/permitting are required for the substation portion of this project.

D. Electrical Features

Transmission Lines: Current Carrying Capacity of Affected/Tapped/New

No transmission line capacity will be impacted by this project.

Fault Current

Type of Fault / Location	Three Phase (A)	Single-Line-to-Ground (A)
Before 50MW PV Interconnection	14,143 A	12,005 A
After 50MW PV Interconnection	14,393 A	13,791 A

Electrical Removals & Relocations

A section of the 230 kV bus will be removed to accommodate the two new gang switches and circuit breaker.

Electrical Installations (Major Equipment)

As a part of this project, an existing dead end structure will have a mounted gang disconnect switch for metering maintenance, 3 metering units, and 3 arresters on structures below the dead end. The 230 kV bay will contain a new circuit breaker and 2 new gang switches. The associated low bus will be installed to accommodate the new equipment. In addition 1 CCVT will be installed on the 230 kV bus to allow the northern ring positions to close in the event the autotransformer is out of service.

Conductor ampacity and wind speed information is provided in the table below. A wind speed of 2fps was applied unless otherwise noted in the write-up.

Conductor/Bus	#/Phase	Ampacity
1272 AAC	1	3850A
5 inch Bus	2	2418A per pair

Ampacity based on XEL-STD-Criteria for Eng & Design of Transmission Substations - Physical for the specific Operating Company.

Line 55045 will be installed by the generation customer and will be approximately 0.5 miles. The Line will be brought into the substation and terminated at the existing dead end. One Optical Ground Wire (OPGW) will be installed and one underground fiber will also be strung. The underground should not pose too much of an issue as the generator owns the land adjacent to Missile Site substation. Wildlife protection will be used on all equipment in accordance with Xcel Energy standards.

Electrical Equipment Enclosure (EEE)

The existing EEE has sufficient space to hold the new equipment for this project.

AC System

The existing AC system is adequate for the new breaker and relaying.

DC System

The existing DC system is adequate for the new breaker and relaying.

Grounding

The existing grounding is adequate.

Lightning Protection

The existing lightning protection is adequate. A new OPGW wire will be installed as a part of the transmission portion of this project.

Trenching & Cable

New conduit will be installed into the duct on the east side of the 230 kV bay. Conduit will run north to the new breaker and west to the new metering units.

Wave/Line Traps

No new wave/line traps are required.

E. Civil Features

Grading & Fencing

Grading, fencing, or drainage work is not required as part of the scope of this project. The existing substation pad already exists for the area where this equipment will be installed.

Storm Water Permit

There is currently an open Storm Water Permit. All of this work will be performed under said permit.

SPCC (Oil Containment)

Oil containment is not required. The breaker being installed is SF6 gas and does not have oil.

The SPCC plan will not need to be updated as equipment containing oil is neither being added nor removed.

Xcel Energy

Civil Removals & Relocations

There will not be any civil structure or foundation removals or relocations for this project. The bus bars on two existing switch structures will have to be removed to allow for the installation of new switches and the bus will have to be modified.

Foundations & Structures

Foundations to be designed using the Soil Boring Report prepared in 2009 by A.G. Wassenaar. The recommended soil bearing pressure per this report is not to exceed 1,500 pounds per square foot. The soil boring report does not discuss special frost design requirements. Oil containment and firewall installations/modifications are not part of the scope of this project.

There is an existing dead-end in the substation which is planned to be used for the 230 kV line connection. It has been designed to allow for a switch to be mounted on the dead-end girders present on the dead-end structure per the design criteria and manufacturer drawings.

There are two existing switch structures with foundations already installed in the field that will be utilized to install two new 230 kV switches. In addition, an existing CCVT structure and foundation already installed in the field will be utilized to install a single CCVT.

The following concrete slab foundations will be installed:

Quantity	Description	Approx. Size
1	New circuit breaker slab	Approx. 10 ft x 12 ft x 1.5 ft

The following galvanized rolled steel structures with drilled pier foundations will be installed:

Structure Quantity	Rolled Steel Description	Steel Wt./ Structure	Drilled Piers		
			Pier Qty/ Structure	Approx. Size	
				Dia.	Depth
3	10x10x1/4 –(8'-6" tall) 230 kV Metering Stand	450 lb	1	30"	9'
3	8x8x1/4 –(13 ft tall) - 230 kV Arrestor Stand	500 lb	1	30"	9'
	Total Rolled Steel Weight (for 6 structures)	2850 lb			

Structures are based on previously designed metering and arrestor stand structures in the Missile 230 kV yard and analyzed for tube strength, weld, and plate sizing based on project loads.

The following galvanized tapered tubular steel structures with drilled pier foundations will be installed:

Structure Quantity	Tapered Tubular Steel Description	Steel Wt./ Structure	Drilled Piers		
			Pier Qty/ Structure	Approx. Size	
				Dia.	Depth
	N/A – Dead-end is existing				
	Total Taper Tubular Steel Weight	0			

Switchgear Building

Neither a new switchgear building or a EEE building will be installed for this project. Structural modifications to an existing switchgear or EEE are not required.

Fire protection (Fire protection wall, and fire protection layer around EEE)

Firewalls are not required in the scope of this project.

F. Protection Features

Transmission Line Protection (230kV)

- 230kV Missile – GI-2014-5 Line 55045
- Radial Feed
- The primary protection for the new 230kV TL55045 Missile Site to GI-2014-5 is a line current differential (87L) scheme utilizing a SEL-411L relay (87P). The 87P relay also implements backup step distance and ground overcurrent protection. The 3-phase current input (IW) on the 87P relay is wired to the summation of the bushing CTs (BCTs) on BKR 55045 and 55042. The current polarizing circuit from the tertiary CTs on the 345/230/13.8kV Bank 1 is wired to the A-phase input (IAX) on the 87P relay. The 3-phase potential input (VY) of the 87P relay is wired to the 67V secondary of the new 3-phase TL55045 line-side metering PTs. The wiring of inputs and outputs on the 87P relay should follow the Xcel Energy standard harmonized design.
- The secondary protection for TL55045 is a permissive overreaching transfer trip (POTT) scheme utilizing a SEL-311C relay (21S). The 21S relay also implements backup step distance and ground overcurrent protection. The 3-phase current input on the 21S relay is wired to the summation of the BCTs on BKR 55045 and 55042. The current polarizing

circuit from the tertiary CTs on the 345/230/13.8kV Bank 1 is wired to the neutral current input (IN) on the 21S relay. The 3-phase potential input on the 21S is wired to the 67V secondary of the new 3-phase TL55045 line-side metering PTs. The wiring of inputs and outputs on the 21S relay should follow the Xcel Energy standard harmonized design.

- The primary direct transfer trip protection in case of a breaker failure condition is provided by SEL-2506 module (85PF-TT). DTT is initiated by contacts from the lockout relays for BKR 55045 and 55042. The wiring of inputs and outputs on the 85PF-TT module should follow the Xcel Energy standard harmonized design.
- The secondary direct transfer trip protection in case of a breaker failure condition is provided by SEL-2506 module (85SF-TT). DTT is initiated by contacts from the lockout relays for BKR 55045 and 55042. The wiring of inputs and outputs on the 85SF-TT module should follow the Xcel Energy standard harmonized design.

Transmission Breaker Protection (230kV)

- BKR 55045, 55042, 5457, 1391, 7100, and 7101
- The breaker failure protection, reclosing and sync check for BKR 55045 are implemented utilizing a SEL-351S relay (BKR 55045 50BF). The 3-phase current input on the 50BF relay is wired to BCTs on BKR 55045 prior to the summation point for TL55045 21S relay. The A-phase input of the 3-phase potential input on the 50BF relay is wired to the 67V X1 secondary of the new 230kV North Bus CCVT. The single phase potential input (VS) on the 50BF relay is wired to the 67V secondary of the A-phase TL55045 line-side metering PT. The wiring of inputs and outputs on the 50BF relay should follow the Xcel Energy standard harmonized design.
- The breaker failure protection and sync check for BKR55042 are implemented utilizing a SEL-351 relay (BKR55042 PKG-BF). BKR55042 PKG-BF does not perform automatic reclosing of BKR55042. The trip output of BKR55042 PKG-BF trips the BKR 55042 breaker failure lockout relay (BKR55042 86BF). The wiring of BKR55042 86BF will be changed to trip and block closing of BKR55045. The single phase potential input (VS) on the BKR55042 PKG-BF relay will be re-wired to the 67V secondary of the B-phase TL55045 metering PT.
- The breaker failure protection, reclosing, and sync check for BKR5457 are implemented using a SEL-351 relay (BKR5457 PKG-BF). The A-phase of the 3-phase potential input on the BKR5457 PKG-BF relay shall be re-wired to the 67V X1 secondary of the new A-phase 230kV North Bus CCVT. The single phase potential input (VS) on the BKR5457 PKG-BF relay shall be re-wired to the 67V X1 secondary of the A-phase TL5457 line-side CCVT.
- The breaker failure protection for BKR1391 is implemented utilizing a SEL-501 (BKR1391 PKG-BF). The trip output of BKR1391 PKG-BF trips the tertiary lockout relay (1391 86BF). The wiring of 1391 86BF will be changed to trip and block closing of BKR55045.

- The breaker failure protection and sync check for BKR7100 are implemented utilizing a SEL-351 relay (BKR7100 PKG-BF). The trip output of BKR7100 PKG-BF trips the BKR7100 breaker failure lockout relay (BKR7100 86BF). The wiring of BKR7100 86BF will be changed to trip and block closing of BKR55045.
- The breaker failure protection and sync check for BKR7101 are implemented utilizing a SEL-351 relay (BKR7101 PKG-BF). The trip output of BKR7101 PKG-BF trips the BKR7101 breaker failure lockout relay (BKR7101 86BF). The wiring of BKR7101 86BF will be changed to trip and block closing of BKR55045.

Transmission Bus Protection (345kV)

- 345kV Bank 1 Bus
- The primary bus protection for 345kV Bank1 Bus is a bus differential (87B) scheme utilizing a Basler BE1-87B (PKG-T1BP). The trip output of PKG-T1BP trips the primary 345kV Bank1 Bus lockout relay (86T1BP) as well as initiates breaker failure via an auxiliary relay (PKG-T1BP AR1). The wiring of 86T1BP will be changed to trip and block closing of BKR55045. The wiring of PKG-T1BP AR1 will be changed to initiate breaker failure on BKR55045 50BF.
- The secondary bus protection for 345kV Bank1 Bus is a bus differential (87B) scheme utilizing a GE B90 (PKG-T1BS). The trip output of PKG-T1BS trips the secondary 345kV Bank1 Bus lockout relay (86T1BS). The wiring of 86T1BP will be changed to trip and block closing of BKR55045. The PKG-T1BS breaker failure initiate (BFI) output (OUT5) will be re-wired to initiate breaker failure on BKR55045 50BF.

Transformer Protection (13.8/230/345kV)

- Bank 1
- The primary protection for 345/230/13.8kV Bank1 is a transformer differential (87T) scheme utilizing a SEL-387 (PKG-TP). The three phase current input (W3) will be moved from the BKR55042 BCTs to the BKR55045 BCTs. The PKG-TP breaker failure initiate (BFI) output (OUT105) will be re-wired to initiate breaker failure on BKR55045 50BF. The PKG-TP breaker status input (IN104) will be re-wired to include the 52a contact of BKR55045. The trip output of PKG-TP trips the primary transformer lockout relay (86T1P). The wiring of 86T1P will be changed to trip and block closing of BKR55045.
- The secondary protection for 345/230/13.8kV Bank1 is a transformer differential (87T) scheme utilizing a GE T60 (PKG-TS). The PKG-TS relay also implements step-distance and ground overcurrent. The three phase current input (I3) will be moved from the BKR55042 BCTs to the BKR55045 BCTs. The PKG-TS breaker failure initiate (BFI) output (OUT5) will be re-wired to initiate breaker failure on BKR55045 50BF. The PKG-TS breaker status input (IN1) will be re-wired to include the 52a contact of BKR55045. The trip output of PKG-TS trips the secondary transformer

lockout relay (86T1S). The wiring of 86T1S will be changed to trip and block closing of BKR55045.

- The tertiary protection for 345/230/13.8kV Bank1 is a phase and negative sequence time overcurrent (51P/Q) scheme utilizing a SEL-501 (PKG-T1T). PKG-T1T initiates breaker failure via an auxiliary relay (AR1). The output of AR1 shall be changed to initiate breaker failure on BKR55045 50BF.
- The tertiary overvoltage protection for 345/230/13.8kV Bank1 is a neutral overvoltage (59N) scheme utilizing a Basler BE1-59N (PKG-T1TN). PKG-T1N initiates breaker failure via an auxiliary relay (AR2). The output of AR2 shall be changed to initiate breaker failure on BKR55045 50BF.

G. Communication Features

Summary

The Communications Plan is in support of the Scoping Estimate (SE) for work at Missile Site Substation customer interconnection to the customer's 50 MW generating facility. The Communications Plan addresses WAN, network access control, remote relay access, EMS (SCADA), pilot protection, and phone system.

Wide Area Network (WAN)

Presently, Missile substation does have Xcel owned fiber and transport capabilities so the recommended WAN connection will be via the operations carrier ethernet transport network using the existing aggregation switch and channel bank.

RTU

SCADA requires a local terminal to poll and forward data to the SCADA master, and to provide control and monitoring at the substation.

An existing GE D20 will provide SCADA. The MSST230kV RTU has approximately 86 spare status points, 60 spare analog points, and 58 spare control points which should be more than sufficient to accommodate this project.

Local Annunciation

A Cooper/Eaton/Cybectec SMP 16 HMI is currently installed for local control and is sufficient to accommodate this project.

Telephone Protection

Existing telephone service is provided via Xcel's corporate network with no modifications.

Relay Remote Access

The Substation LAN featuring a Checkpoint CIP1200R firewall and Ruggedcom RX1501 L2 switch is existing and will be used for all relays added as part of this project. The existing SEL-2030 communication processor should be replaced with a newer RTAC SEL-3530 because the SEL-2030 is obsolete and no new devices should be connected to this equipment and will function as a data concentrator as well as port server to the existing non-IP relays. This is because the D20 RTU processors are memory limited.

PLC (programmable logic controller)/Feeder Load Monitoring/Information-flow/ Others

Not Applicable for this facility.

Fiber Optic Cable

- A primary channel will be provided over private fiber (OPGW) installed by the interconnection customer on the new transmission line and will use a dedicated fiber pair of single-mode fiber.
- An SEL-2506 remote I/O module will be installed as the primary DTT on a separate dedicated pair of single-mode fiber on the new T-line OPGW.
- A secondary channel will be provided over private fiber (OPGW) installed by the interconnection customer on the new transmission line and will use a dedicated fiber pair of single-mode fiber and require a short distance transceiver (SEL-2829).

Interconnections

This project will require a foreign utility interconnection. The interconnection will/will not require AGC (Automatic Generation Control) control and information.

H. Control Features

General

Control Panel Locations

Panel #	Panel Description	Size
1	55045 Relay Protection Panel	28”
2	Breaker Control Panel	28”

Removals

No panels will be removed as a part of this project

I. Project Operating Concerns and Outages

Outages/Temporary Configurations

An outage on the 230 kV north bus and Bank #1 will be required to remove a section of the 230 kV low bus and install the new 230 kV breaker, gang switches, and associated bus work. In addition to this outage, one more will be required to terminate the new transmission line on the dead end.

IV. Cost Estimates and Assumptions

The one-line drawing of Missile Site 230 kV substation provided in Appendix A shows the Point of Interconnection of GI-2014-5, the Interconnection Facilities required for GI-2014-5, as well as the Point of Change of Ownership between the Transmission Provider’s and Interconnection Customer’s Interconnection Facilities.

Scoping level cost estimates for Transmission Provider Interconnection Facilities (+/- 20% accuracy) were developed by PSCo Engineering. Estimates are developed based on typical construction costs for previous completed projects. The cost estimates are in 2017 dollars with escalation and contingency factors included. AFUDC is not included. Estimates are developed assuming typical construction costs for previous completed projects. These estimates include all applicable labor and overheads associated with the siting support, engineering, design, material/equipment procurement, construction, testing and commissioning of these new substation and transmission line facilities. This estimate does not include the cost for any other Customer owned equipment and associated design and engineering.

The following tables list the transmission improvements required for the interconnection and the delivery of generation output. The estimated total cost for the Transmission Provider Interconnection Facilities is **$1.797 Million**. The cost

responsibilities associated with these facilities shall be handled as per current FERC guidelines. System improvements are subject to revision as a more detailed and refined design is produced.

Table 1: Transmission Provider Interconnection Facilities – PSCo Owned, Interconnection Customer Funded

Element	Description	Cost Estimate (Millions)
PSCo's Missile Site 230 kV Transmission Substation	Interconnect Customer to the Missile Site 230kV Transmission Substation (into the 230kV bus). The new equipment includes: • One 230kV gang switch • Three 230kV arresters • One set (of three) 230kV CT/PT metering units • AR15 communications equipment • Associated bus, wiring and equipment • Associated site development, grounding, foundations and structures • Associated transmission line communications, station controls, relaying and testing	**$0.782**
	Transmission line relocation and tap into substation. Structures, conductor, insulators, hardware and labor.	**$0.160**
	Siting and Land Rights support for siting studies, land and ROW acquisition and construction.	**$0.020**
	Total Cost Estimate for PSCo-Owned, Customer-Funded Interconnection Facilities	**$0.962**
Time Frame	**Site, design, procure and construct**	**14 Months**

Table 2: Network Upgrades for Interconnection – PSCo Owned and Funded

Element	Description	Cost Estimate (Millions)
PSCo's Missile Site 230 kV Transmission Substation	Interconnect Customer to tap at Missile Site 230kV Transmission Substation (into the 230kV bus). The new equipment includes: • One 230kV circuit breaker • Two 230kV gang switches • Associated communications, supervisory and SCADA equipment • Associated line relaying, station controls and testing • Associated bus, miscellaneous electrical equipment, cabling and wiring • Associated foundations and structures • Associated road and site development, fencing and grounding	**$0.815**

	Siting and Land Rights support for substation land acquisition and construction.	**$0.020**
	Total Cost Estimate for PSCo-Owned, PSCo-Funded Interconnection Facilities	**$0.835**
Time Frame	**Site, design, procure and construct**	**14 months**

Table 3: PSCo Network Upgrades for Delivery

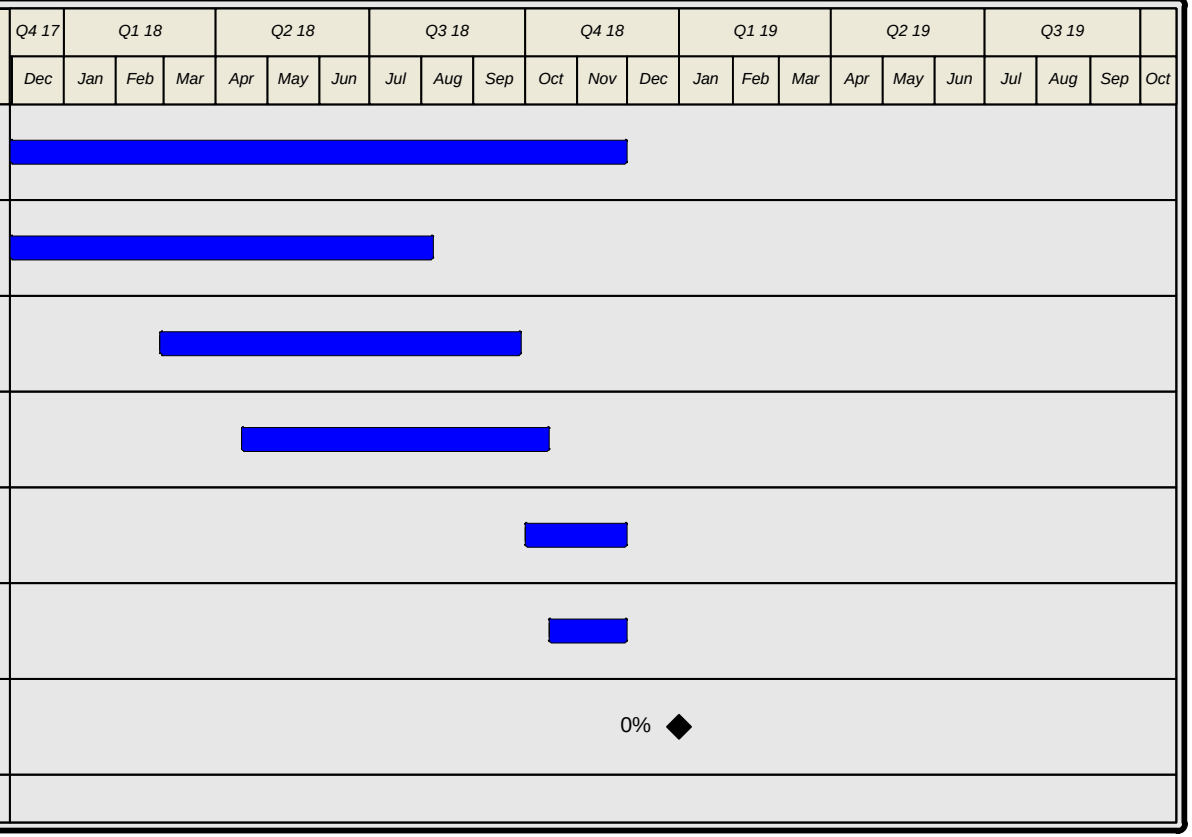
Element	Description	Cost Estimate (Millions)
	No upgrades have been identified.	

Cost Estimate Assumptions

- Appropriation level project cost estimates for Interconnection Facilities and Network Upgrades for Interconnection and Delivery (+/- 20% accuracy) were developed by PSCo / Xcel Engineering.
- Estimates are based on 2017 dollars (appropriate contingency and escalation factors included).
- AFUDC has been excluded.
- Labor is estimated for straight time only – no overtime included.
- Lead times for materials were considered for the schedule.
- The Solar Generation Facility is not in PSCo's retail service territory. Therefore, no costs for retail load (distribution) facilities and metering required for station service are included in these estimates.
- PSCo / Xcel (or our Contractor) crews will perform all construction, wiring, testing and commissioning for PSCo owned and maintained facilities.
- The estimated time to site, design, procure and construct the interconnection and network delivery facilities is approximately 14 months after authorization to proceed has been obtained.
- A CPCN will not be required for the interconnection and network delivery facilities construction.
- The Customer shall design, procure and install a Load Frequency/Automated Generation Control (LF/AGC) RTU at their Customer Substation. PSCo / Xcel will need indications, readings and data from the LFAGC RTU.
- Customer will string OPGW fiber into substation as part of the transmission line construction scope.
- No new substation land will need to be acquired.
- Breaker duty study determined that no breaker replacements are needed in neighboring substations.

V. Engineering, Procurement & Construction Schedule

ID	Task Name	Duration
1	GI-2014-9: 70MW PV Solar Generation Interconnection	56.6w
2	Substation Design & Engineering	40w
3	Substation Materials Procurement	30.8w
4	Substation Construction	26.2w
5	Relay, Protection & Control Equipment Testing	9w
6	Final Commissioning	7w
7	Project Completion	0w
8		



Appendix A – GI-2014-5 Interconnection to 230 kV Bus in Missile Site Substation