

**DISIS-2020-001**

**Cluster Interconnection Facilities**

**Study Phase 4 Report**

**3/31/2022**



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## 1.0 Introduction

PSCo has completed the Interconnection Facilities Studies for the Definitive Interconnection System Impact Study (DISIS) Cluster DISIS-2020-001. The results of the Interconnection Facilities Study for each interconnection will be provided through two reports, the Cluster Interconnection Facilities Study Report and the Individual Interconnection Facilities Study Report.

This Cluster Interconnection Facilities Study Report contains the results of the non-binding cost estimates, the electrical switching configuration of the connection equipment, and an estimate of the time required to complete the construction and installation to implement the conclusions of the final Phase 2 Report of all shared facilities in the DISIS-2020-001. The Individual Interconnection Facility Study Reports for each DISIS-2020-001 Generator Interconnection Request (GIR) provides the information specific to each GIR to physically and electrically connect the Interconnection Facilities to the Transmission System.

The DISIS-2020-001 Definitive Interconnection Study Cluster includes seven (7) GIRs: GI-2020-1, GI-2020-3, GI-2020-4, GI-2020-5, GI-2020-6, GI-2020-7, and GI-2020-10.

- GI-2020-1 is a 199 MW<sub>ac</sub> net rated Solar Photovoltaic (PV) Generating Facility requesting Energy Resource Interconnection Service (ERIS). The Point of Interconnection (POI) is Mirasol 230 kV Station.
- GI-2020-3 is a 199 MW<sub>ac</sub> net rated Solar PV Generating Facility requesting ERIS. The POI is a tap on the Boone - Comanche 230 kV line, at approximately 5 miles from the Boone Substation.
- GI-2020-4 is a 100 MW<sub>ac</sub> net rated Solar PV Generating Facility requesting ERIS. The POI is Mirasol 230 kV Station.
- GI-2020-5 is a 24 MW<sub>ac</sub> (18 MW<sub>ac</sub> in Summer) expansion of the Existing Fort Saint Vrain #4 generator requesting ERIS.
- GI-2020-6 is a 199 MW<sub>ac</sub> net rated Solar PV Generating Facility requesting Network Resource Interconnection Service (NRIS). The POI is a tap on the Pawnee - Missile 230 kV line, at approximately 9.93 miles from the Missile Site Substation.
- GI-2020-7 is a 1,000 MW<sub>ac</sub> net rated hybrid (700 MW Wind plus 300 MW Solar) Generating Facility requesting ERIS. The POI is Mirasol 345 kV Station.
- GI-2020-10 is a 230 MW<sub>ac</sub> net rated AC-coupled Solar PV and Battery Energy Storage (BES) Generating Facility requesting NRIS. The POI is a tap on the Comanche - Midway 230 kV line, at approximately 6 miles from the Comanche Substation. Since the tap position of the higher-queued request GI-2014-9 is at the same location, the study assumed GI-2020-10 interconnects at the same switching station as GI-2014-9 (GI-2014-9 230 kV Switching Station).



The Interconnection Facilities Studies are based on the [DISIS-2020-001 Phase 2 Report](#) dated 8/19/2021 and [DISIS-2020-001 Phase 2 Study Report Addendum](#) dated 9/15/2021.

There were no impacts to any Affected Systems under this DISIS-2020-001 Definitive Interconnection Study Cluster.

The scope of the Interconnection Facilities Studies, which is Phase 4 of the Definitive Interconnection Study process, includes non-binding cost estimates and construction schedules of the Interconnection Facilities and Network Upgrades.

This Cluster Interconnection Facilities Study Report provides the following information:

1. Cost estimates and assumptions applicable to all GIRs in DISIS-2020-001
2. Station Network Upgrades per Section 4.2.4.a of Attachment N Revised LGIP applicable to GIRs sharing common facilities and associated one-line diagrams
3. Network Upgrades per Section 4.2.4.b of Attachment N Revised Standard Large Generator Interconnection Procedures (LGIP) only applicable to GIRs sharing common facilities
4. Contingent Facilities applicable to all GIRs in DISIS-2020-001

## 2.0 Cost Estimates and Assumptions

The cost estimates provided in this Cluster Interconnection Facilities Study Report are based on the following assumptions:

- The cost estimates are in 2022 dollars with an escalation percentage and contingencies applied to the cost estimates.
- The cost estimates do not include an Allowance for Funds Used During Construction (AFUDC).
- The estimated costs include all applicable labor and overheads associated with the siting, engineering, design, and construction of the PSCo facilities to facilitate interconnection.
- The estimated costs do not include the cost for any Customer-owned equipment and associated design and engineering.
- Labor is estimated at straight time only; no overtime work is included.
- Lead times for materials were considered for the schedule.
- No costs for retail load metering are included in these estimates.
- PSCo (or its Contractor) will perform all construction, wiring, testing and commissioning for PSCo owned and maintained facilities.
- A Certificate of Public Convenience and Necessity (CPCN) may be required for the construction of the Interconnection Facilities and Station Network Upgrades. The expected time to obtain a CPCN approval is 18 months.
- The estimated time to permit, design, procure and construct the interconnection facilities is approximately 18 months after authorization to proceed (post CPCN) has been obtained.
- Customer will install two (2) redundant fiber optic circuits into the Transmission Provider's substation as part of its interconnection facilities construction scope.
- Power Quality Metering (PQM) will be required on the Customer's generation tie-line terminating into the POI.
- The Customer will be required to design, procure, install, own, operate and maintain a Load Frequency/Automated Generation Control (LF/AGC) RTU at their Customer substation. PSCo will be provided with indications, readings and data from the LF/AGC RTU.



### 3.0 Station Network Upgrade Costs

The Station Network Upgrade costs are allocated per-capita based on the number of Generation Facilities interconnecting at an individual station, in accordance with Section 4.2.4.a of Attachment N Revised LGIP. If no allocation table is provided, then the GIR is allocated all of the Station Network Upgrade costs associated with the POI.

**Table 3.1 – Total Cost of Station Network Upgrades by POI**

POI	Total Cost (million)	GIRs Sharing the POI
Mirasol 230 kV Station	\$29.013	GI-2020-1 and GI-2020-4
Mirasol 345 kV Station	\$27.810	GI-2020-7
GI-2020-3 230 kV Switching Station	\$20.225	GI-2020-3
GI-2020-6 230 kV Switching Station	\$18.864	GI-2020-6
Existing Fort Saint Vrain 4	\$0	GI-2020-5
Breaker addition at GI-2014-9 230 kV Switching Station	\$5.283	GI-2020-10

#### 3.1 Mirasol 230 kV Station

The estimated total cost and details of the Station Network Upgrades required for the Mirasol 230 kV Station POI are shown in Table 3.1.1. These Station Network Upgrade costs are shared by GI-2020-1 and GI-2020-4 on a per-capita basis, in accordance with Section 4.2.4.a. of Attachment N Revised LGIP, as shown in Table 3.1.2. Figure 3.1.1 provides the preliminary one-line diagram of the Mirasol 230 kV Station showing POIs of GI-2020-1 and GI-2020-4.

The following changes were made to the cost allocations from the DISIS-2020-001 Phase 2 Report:

- The costs to tap and route Lines 5411 and 5413 into the Mirasol 230 kV Station have been included as Station Network Upgrades for the Mirasol 230 kV Station and allocated between GI-2020-1 and GI-2020-4 in accordance with Section 4.2.4.a of Attachment N Revised LGIP. These costs were inadvertently included in the DISIS-2020-001 Phase 2 Report as System Network Upgrades and allocated between GI-2020-1, GI-2020-4, and GI-2020-7 in accordance with Section 4.2.4.b. of Attachment N Revised LGIP.
- The costs to raise Lines 7015 and 7017 to accommodate routing Lines 5411 and 5413 into the Mirasol 230 kV Station have been included as Station Network Upgrades for the Mirasol 230 kV Station and allocated between GI-2020-1 and GI-2020-4 in accordance with Section 4.2.4.a of Attachment N Revised LGIP. These costs were inadvertently included in the DISIS-2020-001 Phase 2 Report as



System Network Upgrades and allocated between GI-2020-1, GI-2020-4, and GI-2020-7 in accordance with Section 4.2.4.b. of Attachment N Revised LGIP.



**Table 3.1.1 – Station Network Upgrades - Mirasol 230kV Station**

Element	Description	Cost Est. (million)
PSCo's Mirasol 230 kV Station	Install a new 230 kV Station on the 230 kV Comanche - Midway lines 5411 and 5413. The new equipment includes: <ul style="list-style-type: none"> <li>• (9) 230 kV 3,000 A circuit breakers</li> <li>• (18) 230 kV 3,000 A disconnect switches</li> <li>• (12) 230 kV surge arresters</li> <li>• (14) 230 kV deadend structures</li> <li>• (2) Electrical Equipment Enclosures (EEE)</li> <li>• (2) Line traps</li> <li>• Station controls and wiring</li> <li>• Associated foundations and structures</li> </ul>	\$18.754
PSCo's Mirasol 230 kV Station	Install required communication in the EEEs at the Mirasol 230 kV Station	\$1.126
PSCo's Midway 230 kV Station	Remote end upgrades between Midway 230 kV Station and the new Mirasol 230 kV station	\$0.665
PSCo's Midway 230 kV Station	Communications upgrade associated with the remote end work between Midway 230 kV Station and the new Mirasol 230 kV Station	\$0.166
PSCo's Comanche 230 kV Substation	Remote end upgrades between Comanche 230 kV Substation and the new Mirasol 230 kV Station	\$0.847
PSCo's Mirasol 230 kV Station	Tap line 5411 and route into Mirasol 230 kV Station	\$2.378
PSCo's Mirasol 230 kV Station	Tap line 5413 and route into Mirasol 230 kV Station	\$1.783
PSCo's Mirasol 230 kV Station	Raise line 7015 to accommodate tapping the 5411 and 5413 lines and routing into the Mirasol 230 kV Station	\$2.552
PSCo's Mirasol 230 kV Station	Raise line 7017 to accommodate tapping the 5411 and 5413 lines and routing into the Mirasol 230 kV Station	\$0.358
PSCo's Mirasol 230 kV Station	Siting & Land Rights support for substation construction	\$0.384
<b>Total Cost Estimate for PSCo-Funded, PSCo-Owned Interconnection Facilities</b>		<b>\$29.013</b>
<b>Time Frame</b>	<b>Site, design, procure and construct</b>	<b>36 Months*</b>

\*Construction of the Mirasol 230 kV Station requires a CPCN from the Colorado Public Utilities Commission. The total time to obtain a CPCN, site, design, procure and construct the Mirasol 230 kV Station is expected to take up to 36 months.



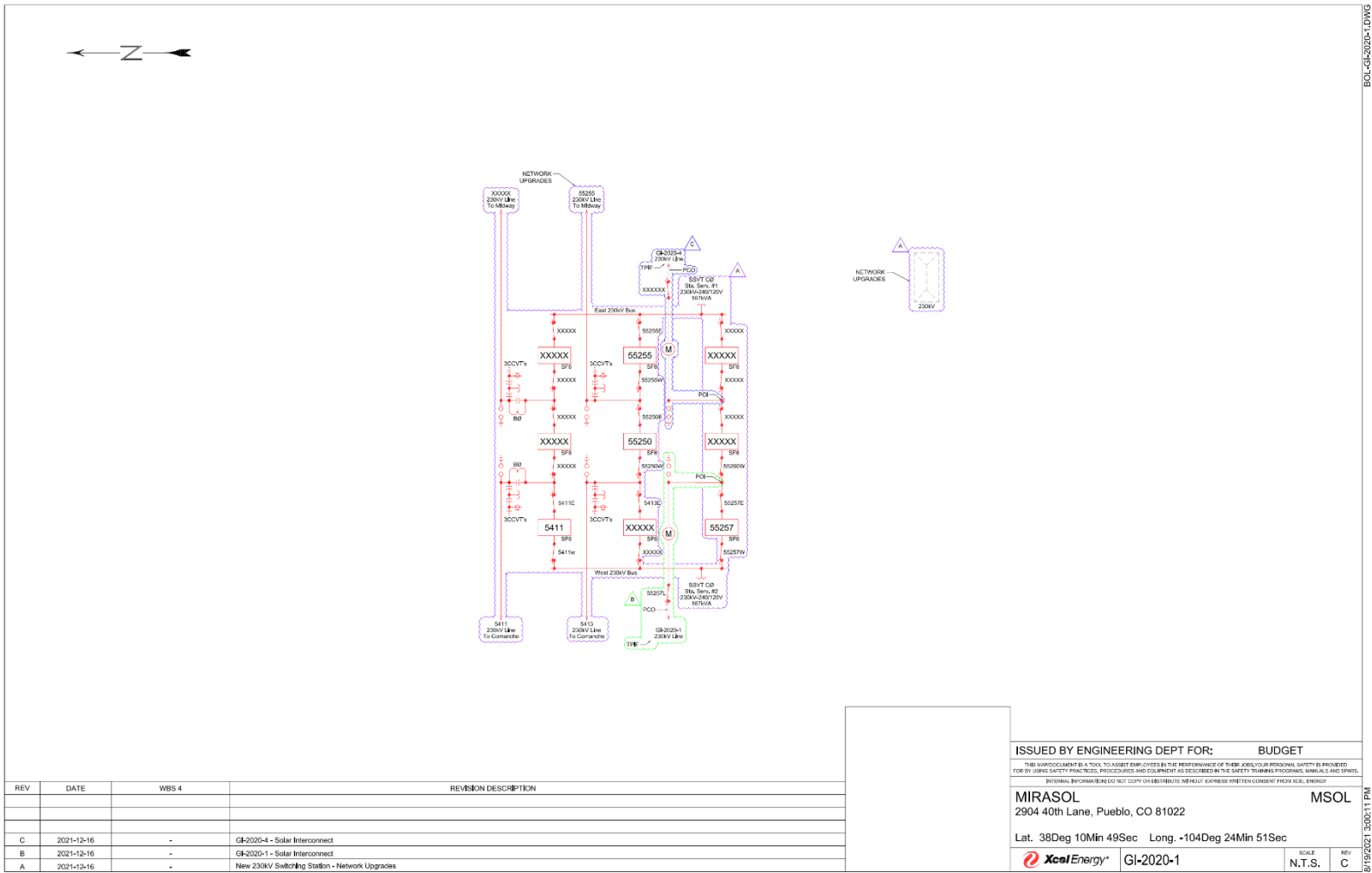


**Table 3.1.2 – Allocation of Mirasol 230 kV Station Costs by GIR (Section 4.2.4.a of Attachment N)**

<b>GIR</b>	<b>GIR MW</b>	<b>% Share</b>	<b>Costs allocated to GIR (million)</b>
GI-2020-1	199 MW	50%	\$14.507
GI-2020-4	100 MW	50%	\$14.507



Figure 3.1.1 – Preliminary One-line of the Mirasol 230 kV Station showing POIs of GI-2020-1 and GI-2020-4



REV	DATE	WBS 4	REVISION DESCRIPTION
C	2021-12-16	-	GI-2020-4 - Solar Interconnect
B	2021-12-16	-	GI-2020-1 - Solar Interconnect
A	2021-12-16	-	New 230kV Switching Station - Network Upgrades

ISSUED BY ENGINEERING DEPT FOR: BUDGET

THIS WORKDOCUMENT IS A TOOL TO ASSIST EMPLOYEES IN THE PERFORMANCE OF THEIR JOBS AND PERSONAL SAFETY IS PROVIDED FOR BY USING SAFETY PRACTICES, PROCEDURES AND EQUIPMENT AS DESCRIBED IN THE SAFETY TRAINING PROGRAMS, MANUALS AND SPALLS. INTERNAL INFORMATION SHOULD NOT COPY OR DISTRIBUTE WITHOUT EXPRESS WRITTEN CONSENT FROM XCEL ENERGY.

MIRASOL MSOL  
 2904 40th Lane, Pueblo, CO 81022  
 Lat. 38Deg 10Min 49Sec Long. -104Deg 24Min 51Sec

Xcel Energy GI-2020-1 SCALE: N.T.S. REV: C

9/19/2021 3:00:11 PM

## 3.2 Mirasol 345 kV Station

The estimated total cost and details of the Station Network Upgrades required for the Mirasol 345 kV Station POI are shown in Table 3.2.1. These Station Network Upgrade costs are 100% assigned to GI-2020-7 in accordance with Section 4.2.4.a. of Attachment N Revised LGIP. Figure 3.2.1 provides the preliminary one-line diagram of the Mirasol 345 kV Station showing POI of GI-2020-7.

The following changes were made to the cost allocations from the DISIS-2020-001 Phase 2 Report:

- The cost to tap and route Line 7015 into the Mirasol 345 kV Station have been included as Station Network Upgrades for the Mirasol 345 kV Station and allocated to GI-2020-7 in accordance with Section 4.2.4.a of Attachment N Revised LGIP. This cost was inadvertently included in the DISIS-2020-001 Phase 2 Report as a System Network Upgrade and allocated between GI-2020-1, GI-2020-4, and GI-2020-7 in accordance with Section 4.2.4.b. of Attachment N Revised LGIP.
- The cost to reroute Line 7017 to accommodate routing Line 7015 into the Mirasol 345 kV Station have been included as Station Network Upgrades for the Mirasol 345 kV Station and allocated to GI-2020-7 in accordance with Section 4.2.4.a of Attachment N Revised LGIP. This cost was inadvertently included in the DISIS-2020-001 Phase 2 Report as a System Network Upgrade and allocated between GI-2020-1, GI-2020-4, and GI-2020-7 in accordance with Section 4.2.4.b. of Attachment N Revised LGIP.

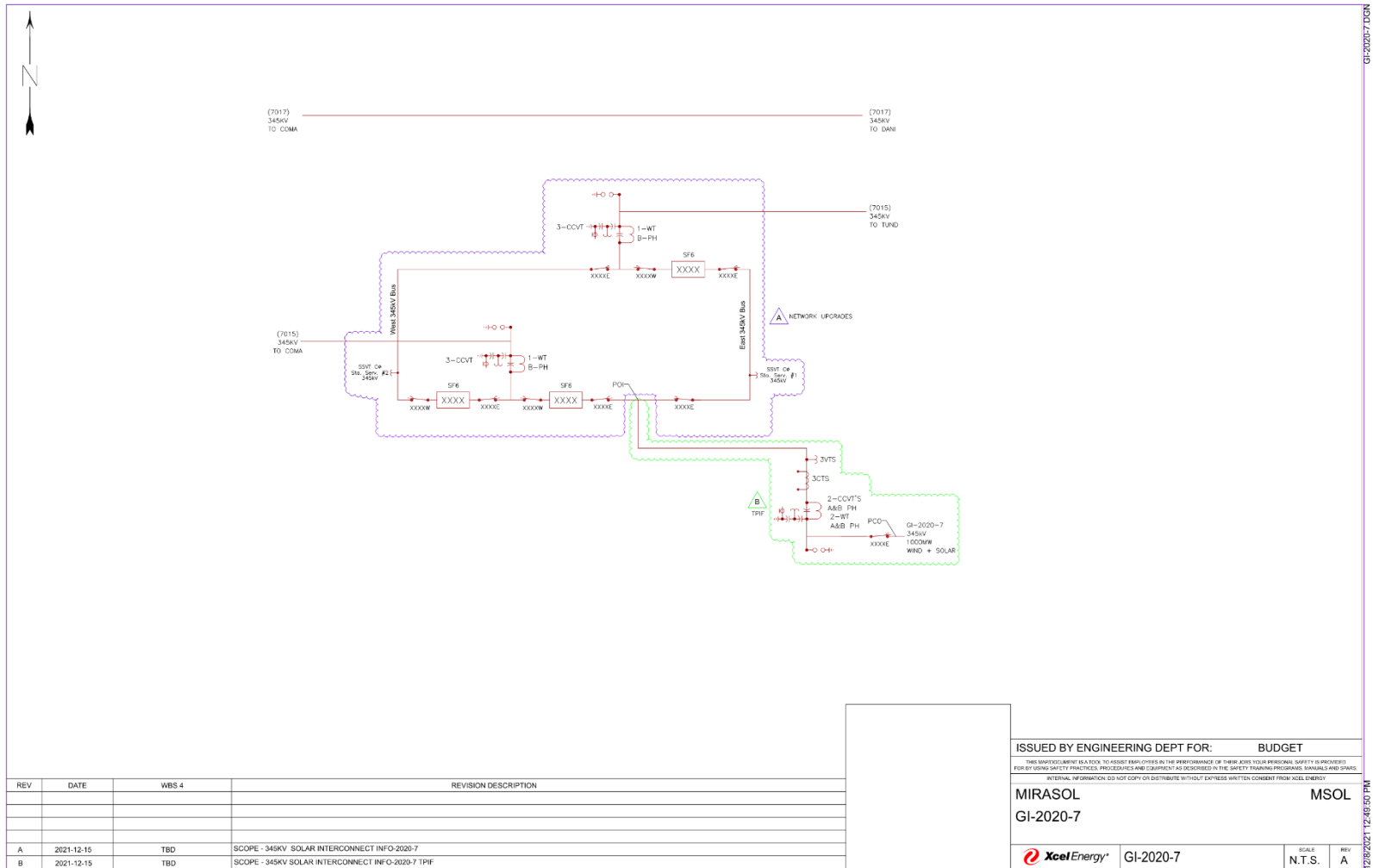


**Table 3.2.1 – Station Network Upgrades - Mirasol 345 kV Station**

<b>Element</b>	<b>Description</b>	<b>Cost Est. (million)</b>
PSCo's Mirasol 345 kV Station	Install a new 345 kV Station on the 345 kV Comanche – Tundra line. The new equipment includes: <ul style="list-style-type: none"> <li>• (3) 345 kV 3,000 A circuit breakers</li> <li>• (8) 345 kV 3,000 A disconnect switches</li> <li>• (6) 345 kV surge arresters</li> <li>• (5) 345 kV deadend structures</li> <li>• (1) Electrical Equipment Enclosure (EEE)</li> <li>• (2) Line traps</li> <li>• Station controls and wiring</li> <li>• Associated foundations and structures</li> </ul>	\$19.527
PSCo's Mirasol 345 kV Station	Install required communication in the EEE at the Mirasol 345 kV Station	\$0.628
PSCo's Comanche 345 kV Substation	Update primary and secondary line relaying and associated breaker fail on 345 kV lines at Comanche	\$0.568
PSCo's Tundra 345 kV Substation	Update primary and secondary line relaying and associated breaker fail on 345 kV lines at Tundra	\$0.837
PSCo's Mirasol 345 kV Station	Tap line 7015 and route into Mirasol 345 kV Station	\$3.658
PSCo's Mirasol 345 kV Station	Reroute line 7017 at Mirasol 345 kV Station to allow tap of line 7015 and route into Mirasol 345 kV Station	\$2.208
PSCo's Mirasol 345 kV Station	Siting & Land Rights support for substation construction	\$0.384
<b>Total Cost Estimate for PSCo-Funded, PSCo-Owned Interconnection Facilities</b>		<b>\$27.810</b>
<b>Time Frame</b>	<b>Site, design, procure and construct</b>	<b>36 Months*</b>

\*Construction of the Mirasol 345 kV Station requires a CPCN from the Colorado Public Utilities Commission. The total time to obtain a CPCN, site, design, procure and construct the Mirasol 345 kV Station is expected to take up to 36 months.

Figure 3.2.1 – Preliminary One-line of the Mirasol 345 kV Station showing GI-2020-7 POI



### 3.3 GI-2020-3 230 kV Switching Station

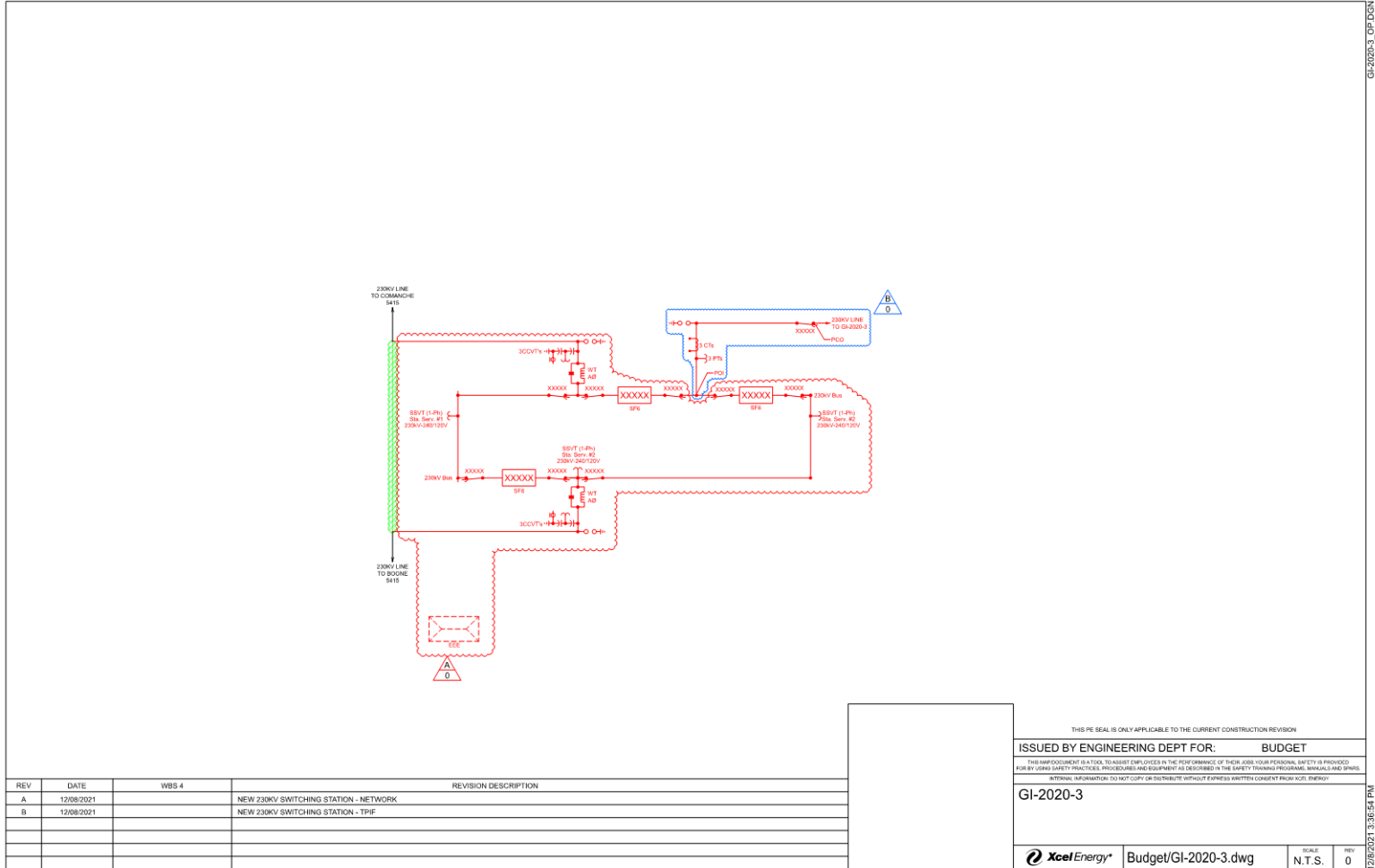
The estimated total cost and details of the Station Network Upgrades required at the GI-2020-3 230 kV Switching Station are shown in Table 3.3.1. These Station Network Upgrade costs are 100% assigned to GI-2020-3 in accordance with Section 4.2.4.a. of Attachment N Revised LGIP. Figure 3.3.1 provides the preliminary one-line diagram of the GI-2020-3 switching station showing POI of GI-2020-3.

**Table 3.3.1 –Station Network Upgrades – GI-2020-3 230 kV Switching Station**

Element	Description	Cost Est. (million)
PSCo's GI-2020-3 230 kV Switching Station	Install a new 230 kV substation on the Boone–Comanche line. The new equipment includes: <ul style="list-style-type: none"> <li>• (3) 230 kV 3,000 A circuit breakers</li> <li>• (8) 230 kV 3,000 A disconnect switches</li> <li>• (6) 230 kV CCVTs</li> <li>• (3) 230 kV SSVTs</li> <li>• (6) 230 kV surge arresters</li> <li>• (12) 230 kV deadend structures</li> <li>• (1) Electrical Equipment Enclosure (EEE)</li> <li>• (2) Line traps</li> <li>• Station controls and wiring</li> <li>• Associated foundations and structures</li> </ul>	\$15.795
PSCo's GI-2020-3 230 kV Switching Station	Install required communication in the EEE at the Switching Station	\$0.441
PSCo's GI-2020-3 230 kV Switching Station	Tap line 5415 and route into New GI-2020-3 230 kV Switching Station	\$1.114
PSCo's Boone Substation	Boone-230 kV 5415 Line Terminal Upgrade	\$0.954
PSCo's Comanche Substation	Comanche-230 kV 5415 Line Terminal Upgrade	\$1.003
PSCo's GI-2020-3 230 kV Switching Station	Land acquisition & permitting	\$0.918
<b>Total Cost Estimate for PSCo-Funded, PSCo-Owned Interconnection Facilities</b>		<b>\$20.225</b>
<b>Time Frame</b>	<b>Site, design, procure and construct</b>	<b>36 Months*</b>

\*Construction of the GI-2020-3 230 kV Switching Station requires a CPCN from the Colorado Public Utilities Commission. The total time to obtain a CPCN, site, design, procure and construct the GI-2020-3 230 kV Switching Station is expected to take up to 36 months.

Figure 3.3.1 – Preliminary One-line of the GI-2020-3 230 kV Switching Station showing GI-2020-3 POI



### 3.4 GI-2020-6 230 kV Switching Station

The estimated total cost and details of the Station Network Upgrades required at the GI-2020-6 230 kV Switching Station are shown in Table 3.4.1. These Station Network Upgrade costs 100% assigned to GI-2020-6 in accordance with Section 4.2.4.a. of Attachment N Revised LGIP. Figure 3.4.1 provides the preliminary one-line diagram of the GI-2020-6 230 kV switching station showing POI of GI-2020-6.

**Table 3.4.1 –Station Network Upgrades – GI-2020-6 230 kV Switching Station**

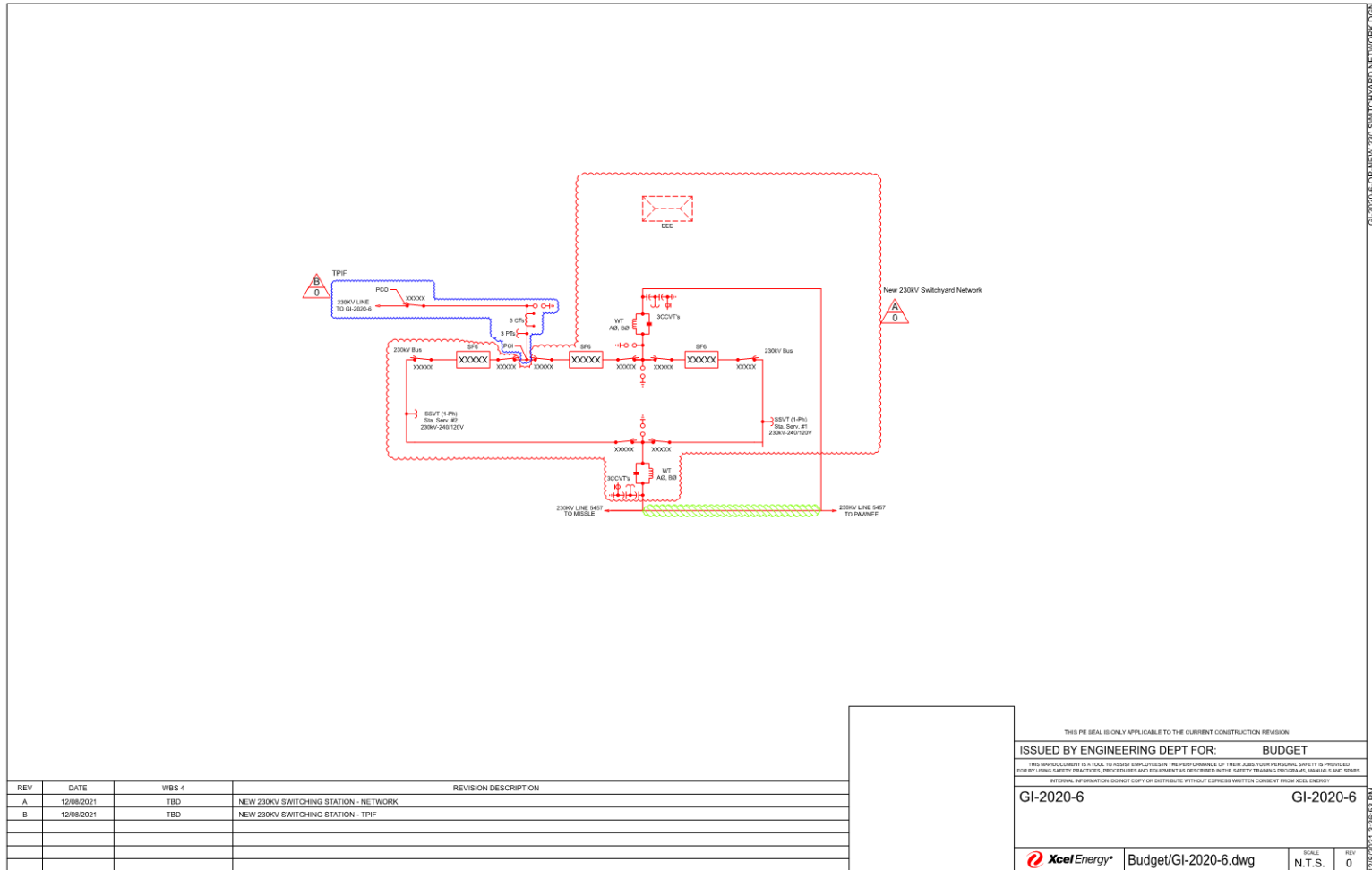
Element	Description	Cost Est. (million)
PSCo's GI-2020-6 230 kV Switching Station	Install a new 230 kV switching station on the Pawnee-Missile line. The new equipment includes: <ul style="list-style-type: none"> <li>• (3) 230 kV 3,000 A circuit breakers</li> <li>• (8) 230 kV 3,000 A disconnect switches</li> <li>• (6) 230 kV CCVTs</li> <li>• (2) 230 kV SSVTs</li> <li>• (6) 230 kV surge arresters</li> <li>• (12) 230 kV deadend structures</li> <li>• (1) Electrical Equipment Enclosure (EEE)</li> <li>• (4) Line Traps</li> <li>• Station controls and wiring</li> <li>• Associated foundations and structures</li> </ul>	\$15.749
PSCo's GI-2020-6 230 kV Switching Station	Install required communication in the EEE at the switching station	\$0.459
PSCo's GI-2020-6 230 kV Switching Station	Tap line 5457 and route into New GI-2020-6 230 kV Switching Station	\$1.065
PSCo's Pawnee Substation	Pawnee-230 kV 5457 Line Terminal Upgrade	\$0.341
PSCo's Missile Substation	Missile-230 kV 5457 Line Terminal Upgrade	\$0.332
PSCo's GI-2020-6 230 kV Switching Station	Land acquisition & permitting	\$0.918
<b>Total Cost Estimate for PSCo-Funded, PSCo-Owned Interconnection Facilities</b>		<b>\$18.864</b>
<b>Time Frame</b>	<b>Site, design, procure and construct</b>	<b>36 Months*</b>

\*Construction of the GI-2020-6 230 kV Switching Station requires a CPCN from the Colorado Public Utilities Commission. The total time to obtain a CPCN, site, design, procure and construct the GI-2020-6 230 kV Switching Station is expected to take up to 36 months.





Figure 3.4.1 – Preliminary One-line of the GI-2020-6 230 kV Switching Station showing GI-2020-6 POI



### 3.5 GI-2014-9 230 kV Switching Station Upgrade

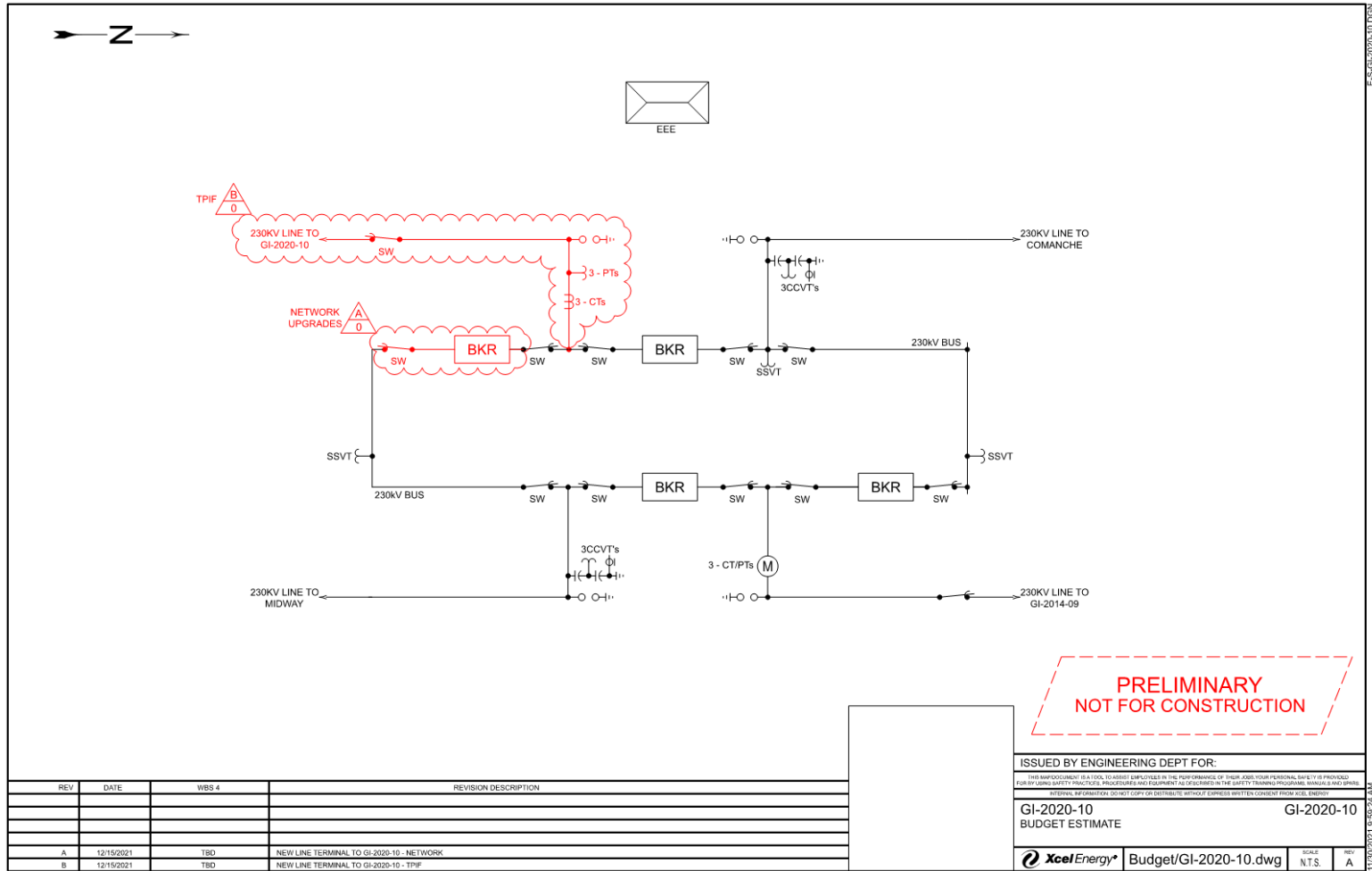
The estimated total cost and details of the Station Network Upgrades required at the GI-2014-9 230 kV Switching Station to accommodate interconnection of GI-2020-10 are shown in Table 3.5.1. These Station Network Upgrade costs are 100% assigned to GI-2020-10 in accordance with Section 4.2.4.a. of Attachment N Revised LGIP. Figure 3.5.1 provides the preliminary one-line diagram of the GI-2014-9 230 kV switching station showing POI of GI-2020-10.

**Table 3.5.1 – Station Network Upgrades – Expansion of GI-2014-9 Switching Station**

Element	Description	Cost Est. (million)
PSCo's GI-2014-9 230 kV Substation	Expand GI-2014-9 POI to interconnect GI-2020-10. The new equipment includes: <ul style="list-style-type: none"> <li>• (1) 230 kV 3,000 A circuit breaker</li> <li>• (1) 230 kV 3,000 A disconnect switches</li> <li>• (2) 230 kV deadend structures</li> <li>• Station controls and wiring</li> <li>• Associated foundations and structures</li> </ul>	\$1.107
PSCo's Transmission Line 5111	Upgrade/reconductor the 230 kV line 5111 between Daniels Park and Prairie substation.	\$2.088
PSCo's Transmission Line 5707	Upgrade/reconductor the 230 kV line 5707 between Daniels Park and Prairie substation.	\$2.088
<b>Total Cost Estimate for PSCo-Funded, PSCo-Owned Interconnection Facilities</b>		<b>\$5.283</b>
<b>Time Frame</b>	<b>Site, design, procure and construct</b>	<b>36 Months*</b>

\*GI-2020-10 is contingent on GI-2014-9 Switching Station construction. Construction of the GI-2014-9 230 kV Switching Station requires a CPCN from the Colorado Public Utilities Commission. The total time to obtain a CPCN, site, design, procure and construct the GI-2014-9 230 kV Switching Station is expected to take up to 36 months including the station upgrades required for GI-2020-10.

Figure 3.5.1 – Preliminary One-line of the GI-2014-9 230 kV Switching Station showing GI-2020-10 POI



## 4.0 System Network Upgrades

The estimated total cost and details of the System Network Upgrades and GIRs sharing the cost are shown in Tables 4.1 and 4.2. The System Network Upgrade costs are allocated based on the proportional impact of each individual GIR in the Cluster Study in accordance with Section 4.2.4.b of Attachment N Revised LGIP. The total time to site, design, procure and construct the upgrades is expected to take up to 36 months.

**Table 4.1 – Total Cost of System Network Upgrades (Section 4.2.4.b of Attachment N)**

System Network Upgrade	Description	Total Cost (million)	GIRs Sharing the Network Upgrade Cost
Total cost of Comanche Breaker Replacements	Replace fifteen (15) 230 kV Circuit Breakers identified as Overstressed due to the Cluster addition	\$13.200	GI-2020-1, GI-2020-3, GI-2020-4, GI-2020-6, GI-2020-7 and GI-2020-10
Total cost of Daniels Park Breaker Replacements	Replace eleven (11) 230 kV Circuit Breakers identified as Overstressed due to the Cluster addition	\$9.682	GI-2020-1, GI-2020-3, GI-2020-4, GI-2020-6, GI-2020-7 and GI-2020-10

**Table 4.2 – Allocation of Cost of System Network Upgrades (Section 4.2.4.b of Attachment N)**

System Network Upgrade	GIR	GIR MW	% Share	Costs Allocated to GIR (million)
Comanche 230 kV Breaker Replacements	GI-2020-1	199 MW	10%	\$1.320
	GI-2020-3	199 MW	11.5%	\$1.518
	GI-2020-4	100 MW	5.3%	\$0.700
	GI-2020-6	199 MW	0.2%	\$0.026
	GI-2020-7	1,000 MW	56.3%	\$7.432
	GI-2020-10	230 MW	16.7%	\$2.204
Daniels Park 230 kV Breaker Replacements	GI-2020-1	199 MW	7.0%	\$0.678
	GI-2020-3	199 MW	7.6%	\$0.736
	GI-2020-4	100 MW	3.9%	\$0.378
	GI-2020-6	199 MW	25.7%	\$2.488
	GI-2020-7	1,000 MW	52.9%	\$5.121
	GI-2020-10	230 MW	2.9%	\$0.281

## 5.0 Contingent Facilities

The following is the list of the unbuilt Interconnection Facilities and Network Upgrades upon which the costs, timing, and study findings of DISIS-2020-001 is dependent, and if delayed or not built, could cause a need for re-studies of the Interconnection Request or a reassessment of the Interconnection Facilities and/or Network Upgrades and/or costs and timing.

**GI-2020-5:** There are no unbuilt facilities modeled in the Northern Colorado Study Pocket. Also, there are no Interconnection Facilities, Station Upgrades or Network Upgrades identified for GI-2020-5. There are no Contingent Facilities identified for GI-2020-5.

**GI-2020-6:** There are no unbuilt facilities modeled in the Eastern Colorado Study Pocket. Interconnection Facilities, Station Upgrades and Network Upgrades are identified for GI-2020-6 in this report. There are no Contingent Facilities identified for GI-2020-6.

**GI-2020-1, GI-2020-3, GI-2020-4, GI-2020-7, and GI-2020-10:** The Contingent Facilities identified for these GIRs are:

1. The following unbuilt transmission projects modeled in the Base Case are identified as Contingent Facilities to GI-2020-1, GI-2020-3, GI-2020-4, GI-2020-7, and GI-2020-10:
  - Monument–Flying Horse 115 kV Series Reactor—ISD 2024
  - Upgrade Daniels Park–Priarie1 230 kV line to 756 MVA—ISD 2023
  - Upgrade Greenwood–Priarie1 230 kV line to 756 MVA—ISD 2023
  - Upgrade Daniels Park–Priarie3 230 kV line to 756 MVA—ISD 2023
  - Upgrade Greenwood–Priarie3 230 kV line to 576 MVA—ISD 2023
  - Upgrade Midway 230 kV bus tie to 576 MVA—ISD 2023
  - Upgrade Leetsdale–Monaco 230 kV line to 560 MVA—ISD 2021
  - Fuller 230/115 kV, 100 MVA #2 transformer—ISD 2023
  - The Cottonwood–Tesla 34.5 kV line is modeled open and Kettle Creek–Tesla 34.5 kV line is modeled closed on the CSU system—ISD 2023
  - Briargate S 115/230 kV transformer project tapping the Cottonwood–Fuller 230 kV line—ISD 2023
2. Station Network Upgrades identified for the respective GIRs in this report.
3. Other Network Upgrades identified for the respective GIRs in this report.