



Preliminary Power Flow Results and Cost Estimates for Interconnection Feasibility Study Request # GI-2013-7

140 MW Wind Generation Facility South of Spring Canyon

PSCo Transmission Planning
October 30, 2013

Stand Alone Power Flow Results (Tables Only)

Affected Element	Contingency	Normal Rating (MVA)	Emergency Rating (MVA)	Pre-GI-2013-7 Percent Loading†	Post-GI-2013-7 Percent Loading	Delta (%)
Peetz (73150) - Sidney (73179) 115kV Line	N.Yuma (73143) - POI_GI2013-7 (73720) 230kV Line	109	109	83	105.1	22.1
Peetz (73150) - Sterling (73191) 115kV Line	N.Yuma (73143) - POI_GI2013-7 (73720) 230kV Line	109	109	84.4	106.6	22.2
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	N.Yuma (73143) - POI_GI2013-7 (73720) 230kV Line	203	203	114.4	141.7	27.3
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	Spring Canyon (73579) - POI_GI2013-7 (73720) 230kV line	203	203	114.4	111.9	-2.5
Didn't exceed thermal limit, but above 95%.						
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	Archer (73009) - Stegall (73190) 230kV Line	203	203	82.5	95.9	13.4
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	Ault (73012) - Lar.River (73108) 345kV Line	203	203	84.5	98.2	13.7
Archer (73009) - Stegall (73190) 230kV Line	Ault (73012) - Lar.River (73108) 345kV Line	459	459	92.1	95.9	3.8

†Pre-Project loading is based on Loss of the Spring Canyon - N.Yuma 230kV line.

Table 1: N-1 Contingency Analysis for GI-2013-7



Affected Element	Contingency	Normal Rating (MVA)	Emergency Rating (MVA)	Pre-GI-2013-7 Percent Loading†	Post-GI-2013-7 Percent Loading	Delta (%)
Archer (73009) - Stegall (73190) 230kV Line	13-Ault (73012) - Lar.River (73108) 345kV Line & Ault (73012) - Ault (73011) 345-230kV Tran	459	459	92.1	97	4.9
McKenzie (73132) - MaryslkSB (73436) 69kV Line	4-Craig (79014) - Ault (73012) 345kV line & Npark (73616) - Terry Ranch (73488) 230kV line	33	33	86.4	100.6	14.2
N.Yuma (73142) 115-N.Yuma (73143) 230kV transformer	22-N.Yuma (73143) - Story (73192) 230kV & N.Yuma (73143) - Wray (73224) 230kV line	167	167	79.4	107.5	28.1
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	10-N.Yuma (73143) - N.Yuma (73142) 230-115kV Tran & N.Yuma (73143) - SprCanyon (73579) 230kV line	203	203	115.1	142.3	27.2
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	11-N.Yuma (73143) - Wray (73224) 230kV Line & N.Yuma (73143) - SprCanyon (73579) 230kV line	203	203	115.1	142.3	27.2
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	13-Ault (73012) - Lar.River (73108) 345kV Line & Ault (73012) - Ault (73011) 345-230kV Tran	203	203	84.5	98.2	13.7
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	21-N.Yuma (73143) - Story (73192) 230kV & N.Yuma (73143) - N.Yuma (73142) 230-115kV Tran	203	203	82.4	102.4	20.0
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	22-N.Yuma (73143) - Story (73192) 230kV & N.Yuma (73143) - Wray (73224) 230kV line	203	203	82.1	101.6	19.5
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	24-Lar.River (73107) - Stegall (73190) 230kV & Stegall (73190) - Sidney (73180) 230kV line	203	203	75	96	21.0
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	30 - Bus Outage: Archer (73009) 230kV Bus	203	203	73.4	96.9	23.5
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	33 - Bus Outage: Stegall (73190) 230kV Bus	203	203	85.8	106.1	20.3
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	34 - Bus Outage: Stegall (73189) 115kV Bus	203	203	111.7	119.4	7.7
Marylksb (73232) 115 - Marylksb (73436) 69kV Transformer	4-Craig (79014) - Ault (73012) 345kV line & Npark (73616) - Terry Ranch (73488) 230kV line	25	25	117.4	136.7	19.3
Marylksb (73232) 115 - Marylksb (73436) 69kV Transformer	5-Craig (79014) - Ault (73012) 345kV line & Ault (73012) - Ault (73011) 345-230kV Tran	25	25	105.1	120.2	15.1
Marylksb (73232) 115 - Marylksb (73436) 69kV Transformer	15-Story (73192) - Pawnee (70311) 230kV line & Story (73193) - Story (73192) 345-230kV Tran	25	25	89	101.6	12.6
Marylksb (73232) 115 - Marylksb (73436) 69kV Transformer	28-Story (73192) - Pawnee (70311) 230kV line & Story (73192) - B.Ck Tri (73016) 230kV Line	25	25	89.1	101.6	12.5
Marylksb (73232) 115 - Marylksb (73436) 69kV Transformer	37 - Bus Outage: Sterling (73191) 115kV Bus	25	25	89.4	101.7	12.3
Peetz (73150) - Sidney (73179) 115kV Line	10-N.Yuma (73143) - N.Yuma (73142) 230-115kV Tran & N.Yuma (73143) - SprCanyon (73579) 230kV line	109	109	84.7	106.6	21.9
Peetz (73150) - Sterling (73191) 115kV Line	10-N.Yuma (73143) - N.Yuma (73142) 230-115kV Tran & N.Yuma (73143) - SprCanyon (73579) 230kV line	109	109	86.1	108.1	22.0
Peetz (73150) - Sidney (73179) 115kV Line	11-N.Yuma (73143) - Wray (73224) 230kV Line & N.Yuma (73143) - SprCanyon (73579) 230kV line	109	109	84.7	106.6	21.9
Peetz (73150) - Sterling (73191) 115kV Line	11-N.Yuma (73143) - Wray (73224) 230kV Line & N.Yuma (73143) - SprCanyon (73579) 230kV line	109	109	86.1	108.1	22.0

†Pre-Project loading is based on Loss of the Spring Canyon - N.Yuma 230kV line.

Table 2: N-2 Contingency Analysis for GI-2013-7

Costs Estimates and Assumptions

The estimated total cost for the required upgrades for GI-2013-7 is **\$19,500,000** and includes the labor materials and overhead associated with adjusting the existing metering to accommodate the Project. The estimated costs shown are a non binding, good faith estimate, estimated in 2013 dollars (no escalation applied) and are based upon typical construction costs for previously performed similar construction. These estimated costs include all applicable labor and overheads associated with the siting, engineering, design, procurement and construction of these new facilities. This estimate does not include the cost for any other Customer owned equipment and associated design and engineering. The following table lists the improvements required to accommodate the interconnection and the delivery of the Project.



The cost responsibilities associated with these facilities shall be handled as per current FERC guidelines. System improvements are subject to change upon more detailed analysis.

Overloaded Element	Upgrade	Cost
Peetz (73150) - Sidney (73179) 115kV Line	Reconductor	\$ 4,250,000
Peetz (73150) - Sterling (73191) 115kV Line	Reconductor	\$ 5,750,000
Sidney (73179) 115 - Sidney (73180) 230kV Transformer	New Transformer	\$ 3,000,000
Alternative 1: New 3 Breaker Substation at Structure 40.2	New Substation	\$ 5,000,000
Alternative 2: Interconnection at Spring Canyon	New 230 kV Termination and Equipment	\$ 1,500,000
Total		\$ 19,500,000

Table 3: Cost Estimates for GI-2013-7

Assumptions for Alternatives

- Scoping level cost estimates for Interconnection Facilities and Network/Infrastructure Upgrades for Delivery were developed by Xcel Energy/PSCo Engineering staff.
- Estimates are based on 2013 dollars (appropriate contingency and escalation applied)
- Estimates are non binding, good faith estimates only
- AFUDC has been excluded.
- Engineering will be performed in house.
- Lead times for materials were considered for the schedule.
- The Generation Facility is not in PSCo's retail service territory.
- PSCo (or it's Contractor) crews will perform all construction, wiring, testing and commissioning for PSCo owned and maintained facilities.
- Construction labor is estimated for straight time only – no overtime included.
- The estimated time to design, procure and construct the interconnection facilities is approximately 6 months after authorization to proceed has been obtained.
- Authorization to proceed is considered to be the execution of the LGIA.
- This project is completely independent of other queued projects and their respective ISD's.
- Line and substation bus outages will need to be authorized during the construction period to meet requested backfeed dates.