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Interconnection System Impact Study Report
REQUEST # GI-2004-3

275 MW Wind Facility

Xcel Energy Transmission Planning
May 2005

Executive Summary

This Interconnection System Impact Study Report summarizes the analyses performed by the Transmission Planning group of Public Service Company of Colorado (PSCo) to interconnect 275 MW of wind-powered generation one mile south of the Ault Substation and transfer the power to PSCo loads. The Customer proposed in-service date for commercial operation of the facility is December 1, 2006, with an assumed back-feed date of June 1, 2006. At the request of the Customer, the Project was evaluated as a Network Resource (NR) with the power going to PSCo customers. The request was studied primarily as a "stand-alone" project.

To be considered a firm Network Resource, it is estimated that the total cost for the transmission facilities required to accommodate this project is approximately $32.4 million and includes the following:

- $0.335 million for Customer Interconnection Facilities;
- $3.325 million for PSCo Network Upgrades for Interconnection;
- $28.706 million for PSCo Network Upgrades for Delivery.

The recommended Network Upgrades for Delivery include the following:

- Construct a new single-circuit 55-mile 230 kV transmission line from Ault Substation to the Ft.St. Vrain Substation
- Construct a new single-circuit 10-mile Fordham-Niwot 230 kV line

The time required to engineer, permit, and construct all the required PSCo facilities for Interconnection is estimated to be at least 20 months.

The estimated time required to engineer, permit, and construct the Network Upgrade facilities for Delivery is at least 42 months. Therefore, it is not feasible to implement the upgrades for interconnection or delivery by the proposed in-service date.

According to the interconnection request, the Customer will engineer, permit, construct, and finance the 30-mile 230 kV transmission line to the proposed tap station.

A simple diagram of the regional transmission system is shown in Figure 1, and a conceptual substation one-line is shown in Figure 2.

This System Impact Study verified conclusions from the Feasibility Study. In addition, this Study assessed any impacts to existing transfer paths and boundaries, and evaluated the transient stability of the regional system. The study found that transmission enhancements in addition to those listed above would be required to simultaneously accommodate a 275 MW output of the proposed Project, a near maximum MW output of the Ft.St.Vrain generation station (694 MW), and a maximum Tot7 flow of 890 MW (the transfer limit). These additions are listed in this report in the section called “Study Results – Power Flow Analysis”. Transient analysis indicated that the regional system is not at risk of instability, either under present conditions, or with the project implemented.

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Figure 1 - Regional Transmission Network

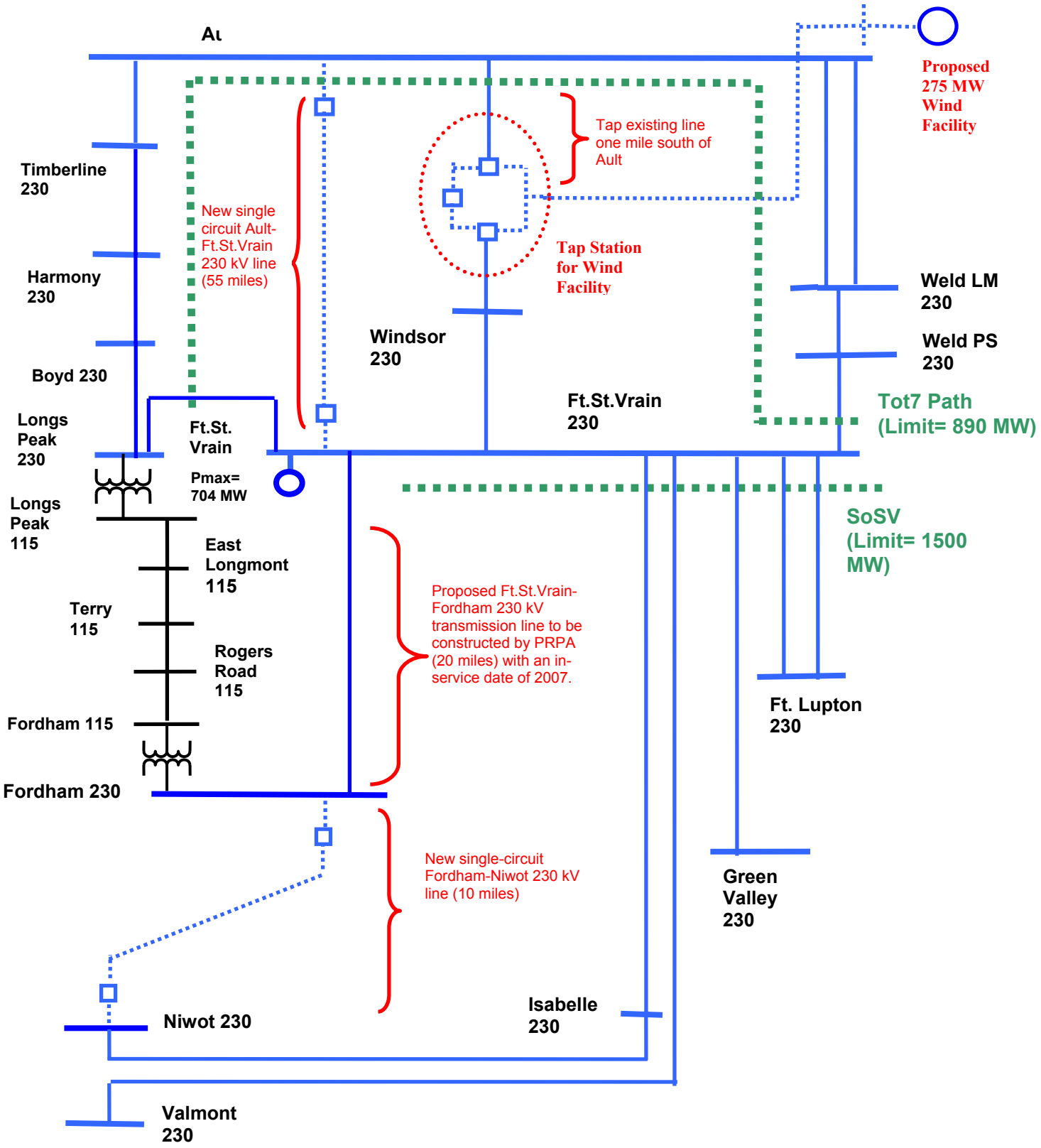
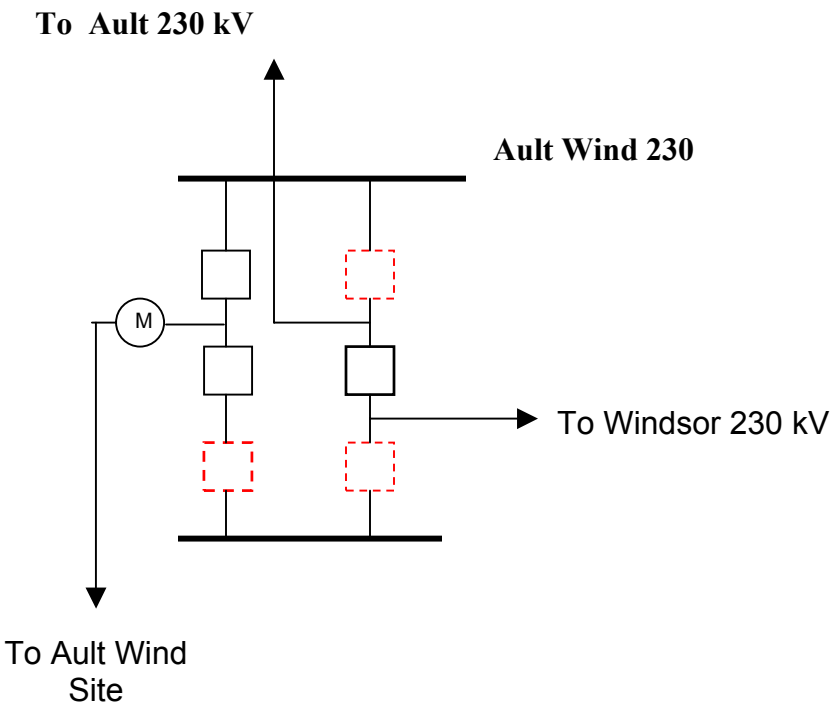


Figure 2 –Ault Wind Substation One-line with GI-2004-3



Study Scope and Analysis

The Interconnection System Impact Study evaluated the transmission requirements associated with the proposed interconnection to the PSCo Transmission System.

The Study consisted of power flow, short circuit, and dynamic stability analyses. The power flow analysis identified thermal or voltage limit violations resulting for the interconnection, and identified Network Upgrades required to deliver the proposed generation to PSCo loads. The short circuit analysis identified circuit breaker short circuit capability limits exceeded because of the Interconnection, and the delivery of the proposed generation to PSCo loads. The dynamic stability analysis identified any limitations due to angular instability of the system for regional disturbances.

PSCo adheres to NERC / WECC Reliability Criteria, as well as internal Company criteria for planning studies. During system intact conditions, criteria are to maintain transmission system bus voltages between 0.95 and 1.05 per-unit of system normal conditions, and steady state power flows within 1.0 per-unit of all elements thermal (continuous current or MVA) ratings. Operationally, PSCo tries to maintain a transmission system voltage profile ranging from 1.02 per-unit or higher at generation buses, to 1.0 per-unit or higher at transmission load buses. Following a single contingency element outage, transmission system steady state bus voltages must remain within 0.90 per-unit and 1.10 per-unit, and power flows within 1.0 per-unit of the elements continuous thermal ratings.

Impacts on the neighboring utilities were monitored, and were addressed in the scope of this study. If the Customer chooses to continue this request and move on to the Facility Study, that study will also include participation from the affected utility - Platte River Power Authority (PRPA).

Powerflow Study Models

For this analysis, the Western Electricity Coordinating Council (WECC) power flow case 07HS2A1P (approved January 20, 2005) was selected as the base model for the study. The case reflects peak 2007 summer loading conditions. Data representation in the area of study was reviewed and modified to accurately reflect the Rocky Mountain regional transmission system. Power transfers from north to south through Colorado were increased to study the regional transmission system. The 275 MW wind farm was modeled as a conventional generator with a 0.95 per unit (p.u.) lagging power factor (overexcited) and a 0.90 p.u. leading power factor (under-excited) capability to simulate the VAR requirements of the generators, assumed to be GE 1.5 MW DFIG turbines.

The study case was created from the base case by adjusting the Laramie River Station generation output to 1100 MW, the Sidney/Stegall DC east-to-west DC tie schedule to 300 MW, the Brush generation output to 243 MW, and the Pawnee/Manchief output to 790 MW. This generation dispatch is often modeled for studies that consider high flows

between southeast Wyoming and northeast Colorado. The proposed project was connected to a tap on the Ault-Windsor 230 kV line, via a single 30-mile 230 kV line, according to Customer provided data. The project generation was scheduled to PSCo peaking units located in and around the Denver-metro area.

Study Results

Power Flow Analysis

This study concludes that network upgrades would be required to interconnect and deliver the generation from the project on a firm basis. The upgrades are required due to impacts that the project would have to major transmission paths between Ault and the Denver-metro system. The following two transmission paths are located within the study area and are impacted by the project.

Tot7

"Tot7" is a Western Electricity Coordinating Council (WECC) defined power transfer path located in the vicinity of the study area. Tot7 is comprised of transmission lines that operate in conjunction to allow power to be transferred between northeast Colorado and the north Denver Metro Area. The path is shown in Figure No. 1 listed above. The path has a maximum north-to-south rating of 890 MW;however, the path rating is highly dependant on the level of load in the PRPA service territory and the on-line generation in the area called the Colorado-Big Thompson generation. The Tot7 path owners include PRPA and PSCo. The facilities that comprise Tot7 are as follows:

Transmission Line	Metered End
Ault-Windsor 230 kV	Ault
WeldPS-Ft.St.Vrain 230 kV	Weld
Longs Peak-Ft.St.Vrain 230 kV	Ft.St.Vrain

South of Ft. St. Vrain

"South of Ft. St. Vrain" (SoSV) is a PSCo internal power transfer path in the vicinity of the study area. SoSV is comprised of transmission lines lines that operate in conjunction to allow power to be transferred into the Denver Metro Area from Ft.St.Vrain. The SoSV path must accommodate the Tot7 flow along with generation at Ft. St. Vrain. The path is shown in Figure No. 1 listed above. The path has a maximum north-to-south rating of 1500 MW and is comprised of the following facilities:

Transmission Line	Metered End
Ft. St. Vrain-Ft. Lupton 230 kV #1	Ft. St. Vrain
Ft. St. Vrain-Ft. Lupton 230 kV #2	Ft. St. Vrain
Ft. St. Vrain-Green Valley 230 kV	Ft. St. Vrain
Ft. St. Vrain-Valmont 230 kV	Ft. St. Vrain
Ft. St. Vrain-Isabelle 230 kV	Ft. St. Vrain

Power flow studies were conducted to demonstrate the system limitations for power transfers from Ault to the Denver Metro Area. A table that summarizes study results is listed in Table No. 1 below. The table lists the various flow and generation dispatch scenarios and the impact on Tot7 and SoSV. The table has columns with various headings of path flows, generation levels and load levels. For example, one column is titled "SoSV" and represents the flow across the SoSV boundary. A second column is titled "Zone 754". The PRPA system and loads are a subset of Zone 754 loads and facilities. A third column is titled "CBT Gen" and represents the Colorado-Big Thompson generation that serves load in Zone 754.

Table No. 1 Results from 2007 Heavy Summer Power Flow Studies

Description	Limiting Element	Limiting Contingency	Tot7	SoSV	Zone754 Load	CBT Gen	FSV Gen
Maximum Zone 754 demand without Ault Wind Gen	WeldPS-WeldLM 230 kV (100.2% of its 637 MVA rating)	Ault-Windsor 230 kV	741	1397	861	163	694
Reduced Zone 754 demand at maximum Tot7 and reduced FSV generation (-150 MW) without Ault Wind Gen	WeldPS-WeldLM 230 kV (100.1% of its 637 MVA rating)	Ault-Windsor 230 kV	890	1396	520	163	544
Added 275 MW Wind Gen at reduced Zone 754 demand and reduced FSV generation	WeldPS-WeldLM 230 Kv (100.2% of its 637 MVA rating)	AultWndTap-Windsor 230 kV	610	1385	520	163	544
Added 275 MW Wind Gen at maximum Zone 754 demand and high FSV generation	WeldPS-WeldLM 230 kV (100.3% of its 637 MVA rating)	Windsor-FSV 230 kV	503	1428	861	163	694
Added 275 MW Wind Gen + Ault-FSV 230 kV + Fordham-Niwot 230 Kv (See Note 1)	Ft.St.Vrain-Ft.Lupton #2 (100.2% of its 435 MVA rating) Niwot-Leggett 230 (103.0% of its 435 MVA rating)	Ft.St.Vrain-Ft.Lupton #1 Ft.St.Vrain-Valmont 230	653	1576	861	163	694
Added 275 MW Wind Gen + Ault-FSV 230 kV + Fordham-Niwot 230 kV	Niwot-Leggett 230 (99.8% of its 435 MVA rating)	Ft.St.Vrain-Valmont 230	600	1524	861	163	694

Note 1: With the addition of the Fordham-Niwot 230 kV line, an extra line is added to the SoSV transfer boundary.

The following observations can be concluded from the power flow studies:

- Benchmark analysis determined the Tot 7 limit to be 741 MW under the conditions studied (Zone 754 demand at 861 MW, CBT generation at 163 MW, FSV generation at 694 MW)
- Reduction in Zone 754 demand to 520 MW allows the Tot7 transfer level to be increased to the maximum transfer limit of 890 MW. Criteria violations SoSV required a Ft.St.Vrain generation reduction of 150 MW to allow the 890 MW flow level on Tot7.
- Adding the proposed 275 MW wind project without infrastructure additions (with Zone 754 demand at 861 MW and Ft.St.Vrain generation at 694 MW) causes a reduction in the Tot7 limit from 741 MW to 503 MW (a reduction of 243 MW).
- The infrastructure additions (the Ault-Ft.St.Vrain 230 kV line and Fordham-Niwot 230 kV line remove the criteria violations on Tot7; however, limitations on SoSV occur. With transfers on Tot7 reduced to 653 MW (Zone 754 demand at 861 MW and FSV generation at 694 MW), an outage of the Ft.St.Vrain-Ft.Lupton 230 kV #1 line overloads the Ft.St.Vrain-Ft. 230 kV #2 line to 100.0%. The SoSV flow is 1576 MW (the new limit with the infrastructure additions). At this same flow level, the Niwot-Leggett 230 kV line overloads to 103% for an outage of the Ft.St.Vrain-Valmont 230 kV line.
- A reduction in transfers across Tot7 to 600 MW and SoSV to 1524 MW would be needed to remove the overload of the Niwot-Leggett 230 kV line.

The study determined that additional infrastructure (beyond the Ault-Ft.St.Vrain 230 kV line and the Fordham-Niwot 230 kV line) would be required to allow Tot7 flows at 890 MW, Ft.St.Vrain generation at near maximum levels and an Ault Wind Facility output of 275 MW: The infrastructure additions are as follows:

- Uprate PRPA's proposed 20-mile Ft.St.Vrain-Fordham 230 kV line.
- Rebuild the Valmont-Broomfield-Cherokee 115 kV double-circuit line to 230 kV double-circuit construction
- Loop the Ft.St.Vrain-Valmont 230 kV Line into the Niwot Substation creating a Ft.St.Vrain-Niwot 230 kV Line #2 and a Niwot-Valmont 230 kV Line #1. Uprate the Ft.St.Vrain-Niwot 230 kV Line #1(that will serve the Isabelle Substation)
- Construct a single-circuit 5-mile Niwot-Valmont 230 kV Line #2
- Uprate the 5-mile Niwot-Valmont 230 kV Line #1
- Construct a single-circuit 1-mile Niwot-Leggett 230 kV Line #1

The study demonstrated that Platte River's planned Ft.St.Vrain-Fordham 230 kV line is not adequate to accommodate the flows that result when theTot7 flow and Ft.St.Vrain generation are at maximum levels. The following is a list of upgrades needed to increase the rating of the Ft.St.Vrain-Fordham 230 kV line sufficiently to accommodate peak Tot7 flow and Ft.St.Vrain generation in the 2007 summer time frame:

- Restring eight miles of overhead transmission with composite conductor

- Replace eight miles of 1500 kcmil underground cable with 2500 kcmil cable
- Replace steel casings with non-conducting casings in a two-mile section of underground transmission

PRPA will need to order conductor and cable for this project by June 2006 to meet the May 2007 in-service date. Trying to modify the project specifications after June 2006 would be costly and could result in PRPA missing its May 2007 in-service date. Uprating the Ft.St.Vrain-Fordham 230 kV line after the in-service date would be even more expensive.

PRPA is constructing the Ft.St.Vrain-Fordham 230 kV line to help serve its long-term load growth in the Longmont and surrounding areas. This system impact study considered the impact of the proposed Ault Wind generation and associated infrastructure on the system in the Summer 2007 time frame and did not examine long-term impacts. If this alternative is pursued further, the long-term impacts of the Ault Wind generation and associated infrastructure on the future PRPA system, especially in the Longmont area, would need to be studied.

Short Circuit Analysis

The short circuit analysis was conducted at the affected switchyards in the study area including faulting the 230kV busses at the Ft. St. Vrain, Ault, and other busses with three-phase and single phase-to-ground faults. Table No. 2 shows how the fault currents change with the addition of the network upgrades. Of particular interest is the noticeable increase in fault current with the infrastructure upgrades in service. The addition of the associated infrastructure upgrades pushes the available fault current well beyond the interrupting capability of ten 230kV circuit breakers at Ft. St. Vrain. Therefore the estimate to replace the ten breakers is included as part of the estimated project cost.

Table No. 2 Short Circuit Study Results

	Wind Gen[2] (MW)	Fault Location[3]	Fault Type[4]	Fault Current[5] (A)
Existing	0	Ft. St. Vrain	3 phase	32,776
Existing	0	Ft. St. Vrain	SLG	33,992
Interconnect	0	Ault Wind Tap	3 phase	20,509
Interconnect	0	Ault Wind Tap	SLG	18,659
Interconnect	0	Ft. St. Vrain	3 phase	33,877
Interconnect	0	Ft. St. Vrain	SLG	34,771
Delivery	0	Ault Wind Tap	3 phase	22,210
Delivery	0	Ault Wind Tap	SLG	20,020
Delivery	0	Ft. St. Vrain	3 phase	36,067
Delivery	0	Ft. St. Vrain	SLG	36,965
Delivery	275	Ault Wind Tap	3 phase	24,648
Delivery	275	Ault Wind Tap	SLG	20,895
Delivery	275	Ft. St. Vrain	3 phase	37,092
Delivery	275	Ft. St. Vrain	SLG	37,464

Stability Analysis

Transient stability analyses of the Ault Wind Tap area were performed by modeling three-phase faults and single line-to-ground faults in the region of study. Dynamic models for the proposed project were prepared using General Electric 1.5 MW wind turbine generator data supplied by the manufacturer. The units were direct dispatched, with dynamic voltage control at the collector bus, under/over voltage protection monitored at the generator bus, the manufacturer suggested protection scheme with fault ride through capability, and over/under frequency protection monitored at the generator bus. The under/over voltage generator-tripping relay was set with a 0.3 p.u. lower voltage threshold. The system was analyzed with the proposed project with the system as it expected to exist in 2007. Additional studies modeled the infrastructure improvements required for firm delivery. Studies showed that the system was transiently stable in all cases. The unit terminal bus voltage and unit speed recover within expected limits and the units transfer power to the system without tripping off-line during disturbance conditions. System oscillations display positive damping. Plots of the stability analysis are available upon request. A summary of the study results modeling the addition of the wind generation without infrastructure improvements is shown in Table No. 3. The results with the wind generation added with infrastructure improvements are not listed but the transient performance results were similar.

Table 3 – Transient Stability Results (Fault Ride Through Capability Enabled) and No Infrastructure Additions

	Fault Location	Action	Result
1	Line end 3-ph fault at Ault Wind Tap 230 kV bus	Trip Ault-Ault Wind Tap 230 kV after 4 cycles to clear fault	System Stable. System oscillations display positive damping.
2	Line end 3-ph fault at Ault Wind Tap 230 kV bus	Trip Windsor-Ault Wind Tap 230 kV after 4 cycles to clear fault	System Stable. System oscillations display positive damping.
3	Line end 3-ph fault at Ault 345 kV bus	Trip LRS-Ault 345 kV after 4 cycles to clear fault	System Stable. System oscillations display positive damping.
4	Line end 3-ph fault at Windsor 230 kV bus	Trip Windsor-FSV 230 kV after 4 cycles to clear fault	System Stable. System oscillations display positive damping.

	Fault Location	Action	Result
5	Line end 3-ph fault at Ault 230 kV bus	Trip Ault-Archer 230 kV after 4 cycles to clear fault	System Stable. System oscillations display positive damping.
6	Line end 3-ph fault at Ault 230 kV bus	Trip Ault 230-345 kV Transformer after 4 cycles to clear fault	System Stable. System oscillations display positive damping.
7	Line end 3-ph fault at Ault 230 kV bus	Trip Ault-Rawhide 230 kV after 4 cycles to clear fault	System Stable. System oscillations display positive damping.
8	Line end 3-ph fault at Ault 230 kV bus	Trip Ault-Timberline 230 kV after 4 cycles to clear fault	System Stable. System oscillations display positive damping.
9	Line end 3-ph fault at Ault 230 kV bus	Trip Ault-WeldLM 230 kV after 4 cycles to clear fault	System Stable. System oscillations display positive damping.
10	SLG at Ault 230 kV bus.	Stuck breaker at Ault. Trip Ault-Rawhide 230 kV after 20 cycles to clear fault.	System Stable. System oscillations display positive damping.

Cost Estimates and Assumptions

To provide an interconnection and firm delivery for the Customer requested generation at the new tap station south of the Ault Substation network upgrades must be made on the PSCo transmission system. The estimated indicative total cost for the upgrades is **$32,366,000.**

The estimated cost shown is an “indicative” (+/-30%) preliminary budgetary cost in 2006 dollars and is based upon typical construction costs for previously performed similar construction. These estimated costs include all applicable labor and overheads associated with the engineering, design, and construction of these new PSCo facilities. This estimate does not include any costs for any Customer-owned, supplied, and installed equipment and associated design and engineering. This estimate also does not include any costs that may be required for other entities’ systems. The cost to

complete the section of the project from the point of interconnection to Ft. St. Vrain Substation is approximately $27.2 million and the cost to complete the section from Fordham to Niwot is approximately $4.8 million.

The following tables describe the network upgrades for interconnection that would be required for both ER and NR requests. The cost responsibilities associated with these facilities shall be handled as per current FERC guidelines.

Table 4 Customer Interconnection Facilities

Element	Description	Cost ($millions
New Ault Wind Farm Tap Switchyard	Interconnect Customer's 230kV line to a new 230kV switchyard. The new equipment required includes: • 230kV bi-directional revenue metering • required steel supporting structures • associated metering control and relaying	**$0.335**
Total Estimated Cost for Customer Interconnection Facilities		**$0.335**

Table 5 Network Upgrades for Interconnection (ER & NR)

Element	Description	Cost ($millions)
New Switching Station	Construct a three-breaker ring substation that will sectionalize the Ault – Windsor 230kV line one mile south of Ault, and interconnect the Customer's 230kV line to the Project. The equipment required includes: • Site development • Control building • Three 230kV 3000 amp 50kA circuit breakers • Eight 230kV disconnect switches • Dead-end structures, associated bus and connectors • High voltage metering with associated revenue metering equipment • Bus voltage transformers and line synchronizing transformers	**$2.896**
	Transmission line tap structure & tap	**$0.186**
	Siting & Land Rights	**$0.243**
TOTAL	**Total Cost**	**$3.325**
Time Frame		**20 months**

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Table 6 Network Upgrades required to deliver 275 MW

	Description	Cost
WAPA's Ault Substation	New 230kV line termination for new trans line to the Ft. St. Vrain Substation. The following equipment will be required: • two 230kV 3000 amp 50kA circuit breakers • four 230kV switches • misc. supporting steel • electrical bus work • associated metering control and relaying	$1,010k
Ft. St. Vrain Substation	New 230kV line termination for new trans line from WAPA's Ault Substation. The following equipment will be required: • one 230kV 3000 amp 50kA circuit breaker • one 230kV switch • misc. supporting steel • electrical bus work • associated control and relaying	**$658k**
Ft. St. Vrain Substation	Replace ten 230kV circuit breakers due to the fault duty rating being exceeded with infrastructure upgrades. Three CCVT's will also be added and the RTU will be expanded to accommodate additional breaker alarm points.	**$2,015k**
PRPA's Fordham Substation (future)	New 230kV line termination for new trans line to the Niwot Substation. The following equipment will be required: • one 230kV 3000 amp 50 kA circuit breaker • two 230kV switches • misc. supporting steel • electrical bus work • associated control and relaying	**$658k**
Niwot Substation	New 230kV line termination for new trans line from PRPA's Fordham Substation. The following equipment will be required: • one 230kV 3000 amp 50 kA circuit breaker • two 230kV switches • misc. supporting steel • electrical bus work • associated control and relaying	**$658k**
New Trans Line from WAPA's Ault Substation to Ft. St Vrain Substation	New single circuit 230kV transmission line from WAPA's Ault Substation to Ft. St Vrain Substation (approx. 55 miles). 1272 kcmil "Bittern" conductor with OPGW on tubular steel poles with foundations.	**$15,762k**
New Trans Line from PRPA's Fordham Substation to the Niwot Substation	New single circuit 230kV transmission line from PRPA's Fordham Substation to the Niwot Substation (approx. 10 miles). 1272 kcmil conductor with OPGW on tubular steel poles with foundations.	**$2,650k**
Siting, Permitting and Acquisition	Siting and Land Rights activities including siting study, acquisition & permitting.	**$5,295k**
	Total Estimated Cost for Network Upgrades for Delivery	**$28,706k**
	TOTAL NETWORK UPGRADES	**$32,031k**
	TOTAL COST OF PROJECT	**$32,366k**

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Assumptions:

- The estimated costs provided are "Scoping Estimates" with an accuracy of ± 30%.
- Estimates are based on 2006 dollars.
- PSCo (or its contractor) crews will perform all construction and wiring associated with PSCo-owned and maintained equipment.
- It is anticipated that to construct the Network Upgrades required for the interconnection (switchyard only) a Certificate of Public Convenience and Necessity (CPCN) will not be required from Colorado Public Utility Commission (CPUC). The estimated time for siting, permitting, acquisition, design and construction for the PSCo network upgrades required for the interconnection (switchyard only) is at least 20 months after the Interconnection Agreement has been signed.
- It is anticipated that a Certificate of Public Convenience and Necessity (CPCN) will be required from Colorado Public Utility Commission (CPUC) for the network upgrades required for delivery. The application for a CPCN will not be submitted until after the Customer has executed an Interconnection Agreement.
- A siting study and public involvement will be required for the network upgrades required for delivery. Permitting is expected to be difficult and potentially controversial. Land use permits will be required from multiple local jurisdictions.
- The estimated time for siting, permitting, acquisition, design and construction for the PSCo network upgrades required for delivery is at least 42 months after the Interconnection Agreement has been signed, and based upon other identified assumptions for Siting and Land Rights, Substation Engineering and Transmission Engineering (see below).
- New switchyard for the wind farm interconnection will be located adjacent to or under the existing Ault-Ft. St. Vrain 230kV transmission line.
- There is adequate space available at WAPA's Ault Substation for the new 230kV line termination, and WAPA will agree to allow this new installation.
- PRPA's Fordham Substation is a proposed new substation, and it is assumed that this new facility will be in service prior to PSCo's new network upgrades required for delivery. There will be adequate space available at PRPA's Fordham Substation for the new 230kV line termination, and PRPA will agree to allow this new installation.
- Fault duty ratings at PRPA's Forham Substation and the Niwot Substation are adequate.
- The last span into the new 230kV Ault Wind Farm Switchyard from the Customer owned 230kV line will be a slack span between the PSCo substation dead-end and the Customer's last structure, which is assumed to be a dead-end structure.
- Acquire a four-acre site in fee for the new Ault Wind Farm Switchyard.
- The new single circuit 230kV transmission line from PRPA's Fordham Substation to the Niwot Substation (approx. 10 miles) was estimated assuming overhead construction. If this new line is required to be constructed underground, the cost estimate will be significantly higher.