PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

Large Generator Interconnection
System Impact Study Report

Completed for

Proposed Interconnection to PacifiCorp's existing
138 kV line
Running through the
Interconnection Customer
Facility connecting near Cove Fort substation,
In Beaver County, Utah

June 2, 2008

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1 DESCRIPTION OF THE GENERATING FACILITY

("Interconnection Customer") has proposed interconnecting 80 MW of new generation consisting of GE 1.5 MW wind turbines to PacifiCorp's ("Transmission Provider") system on the 138 kV radial transmission line being built by a higher queued interconnection customer approximately 12 miles West of Cove Fort substation. The Cove Fort 138 kV substation is being up graded to 138 kV for the higher queued interconnection customer. The 138 kV radial transmission line runs through the Interconnection Customer's property. The requested commercial operation date for the Project is, November 1, 2009.

The Transmission Provider has assigned the Interconnection Customer "Q0128" for this Project.

2 SCOPE OF THE STUDY

The interconnection system impact study shall evaluate the impact of the proposed interconnection on the reliability of the transmission system. The interconnection system impact study will consider Base Case as well as all-generating facilities (and with respect to (iii) below, an identified network upgrades associated with such higher queued interconnection) that, on the date the interconnection system impact study is commenced:

(i) are directly interconnected to the Transmission System;
(ii) are interconnected to Affected Systems and may have an impact on the Interconnection Request;
(iii) have a pending higher queued Interconnection Request to interconnect to the Transmission System; and
(iv) have no Queue Position but have executed an LGIA or requested that an unexecuted LGIA be filed with FERC.

The interconnection system impact study will consist of: a short circuit analysis, including identification of any circuit breaker short circuit capability limits exceeded as a result of this interconnection; a stability analysis, including a dynamic study; and a power flow analysis, to identify any thermal overload or voltage limit violations resulting from the interconnection

The interconnection system impact study will state the assumptions upon which it is based. It will state the results of the analyses; and provide the requirements or potential impediments to providing the requested interconnection service; including preliminary indication of the cost and length of time that would be necessary to correct any problems identified in those analyses and implement the interconnection. The interconnection system impact study will provide a list of facilities that are required as a result of the interconnection request and a non-binding good faith estimate of the cost responsibility and a non-binding good faith estimated time to construct.

3 TYPE OF INTERCONNECTION SERVICE

The Interconnection Customer has selected *Network Resource (NR)* Interconnection Service, but has also elected to have the interconnection studied as an *Energy Resource (ER).* The customer will select NR or ER prior to the Facilities Study.

4 DESCRIPTION OF PROPOSED INTERCONNECTION

The interconnection customer has modified the request for the point of interconnection to the Transmission Provider's system. The request for interconnection as understood by the Transmission Provider now, is at a point on the Interconnection Customer's property 12 miles from the original interconnection point in Cove Fort. This modification from the original request to connect at the substation being constructed for a higher queue position in the Cove Fort area will require a second substation with a three breaker ring bus to be built adjacent to the Interconnection Customer's collector station as shown in section 5.1.3.2.

5 STUDY ASSUMPTIONS

The following assumptions were made for this study:

- The proposed Project will meet all wind generation interconnection requirements for voltage control (including control of the interconnection bus voltage and WTG voltage ride-through), power factor range and frequency control as defined in Section G3 of the PacifiCorp Operating Requirements for Generation Entities document.
- All study results will meet the voltage and facility overload criteria defined in the PacifiCorp Engineering Handbook – Operating and Reliability Guidelines (PacifiCorp Planning Standards).
- The Point of Interconnection is being moved to accommodate the Interconnection Customer's request based on the understanding that a new 138 kV transmission line will be built as well as Cove Forth substation up graded to 138 kV will be paid by a higher queued customer. If the higher queued party should choose not to come on line. The responsibility of the new 138 kV transmission line will be built as well as Cove Forth substation up grades to 138 kV will be paid by the Interconnect Customer.
- It is assumed the Interconnection Customer agrees to a tapped line from the main as shown in the figure in section 5.1.3.2. as the present configuration is radial from Cove Fort where an in and out configuration is not needed at this time as it provides no additional benefit.
- Project facilities include new three breaker ring bus substation for point of interconnection. The Interconnection Customer will build all the facilities required to connect the Project.
- The main 138 kV line from Sigurd to West Cedar is constructed of 397.5 ACSR conductor with a rating of 136 MVA. It is assumed the Interconnection Customer

understands in all N-1 condition where any section of the main line between Sigurd and Parowan is impacted generation at the Interconnection Customer facility will need to be curtailed in such a manner as to prevent overload of the remaining section of line. This requirement will be waived should the Interconnection Customer, at their expense, choose to replace the existing conductor in the main line with a conductor having a thermal rating capable of the entire load regardless of direction of flow.

- It is assumed the Interconnection Customer understands for N-1 conditions involving the section of line between the Interconnection Customer's point of interconnection back to Cove Fort will require a total shut down.
- The collector station is 12 miles from point of interconnection and should have protection on both sides of the 138-34.5 kV transformer(s). There should be adequate protection at Cameron, Sevier, Parowan and Sigurd to drop the Interconnection Customer's facility in the event of certain outages.
- The collector station transformer will be rated at 138-34.5 kV 100 MVA.
- To the extent practical, this study will be based on the results of prior studies and engineering judgment.
- Generation tripping will be required for certain transmission line outage conditions. Specific requirements will be determined during this system impact study.
- The Interconnection Customer's request for energy resource or network resource interconnection service in and of itself does not convey transmission service. Only a Network Customer can make a request to designate a generating resource as a network resource. Since the queue of higher priority Transmission Service Requests may be different when and if a Network Customer's requests network resource designation for this generation facility, the transmission modifications, if any, necessary to provide Network Resource interconnection service may be significantly different. Therefore, the Interconnection Customer should regard the results of this study as informational rather than final.
- It is assumed there is little to no change in the dynamics study performed previously.
- A number of planned facility additions/improvements are assumed to be in-service by 11/1/2009. Which includes the addition of a Static VAr compensator at Camp Williams, and a 200 MVAr shunt capacitor at Mona, a second 138 kV breaker at Cameron, relaying for two breakers at Cameron, 138 kV bus with three breakers, two 15 Mvar shunt capacitors at Parowan Valley and lastly, Three Peaks 345-138 kV substation installed at Cedar City.

Combined Generation and Long Term Firm Request Queue (Active Requests)

QUEUE	OASIS AREF	Company	Completed Request Received	Control Area	Type of Request	POR	POD for TSR requests Commercial Operation for GI	Request Start Date	MW
44			06/03/04	East	ER	Timp - Tri-City Line, 138kV		05/15/07	535-S/567-W
	245540		10/18/04	East	NT	Desert Power	PACE	01/01/06	95
51			02/22/05	East	GEN	Rowley Substation, 138kV		06/01/07	25-S/31-W
168	271480		03/17/05	East	NT	PACE	PACE	07/01/07	37
52			03/28/05	East	GEN	Terminal Sub Distribution Circuit, 12.47kV			3.2
192	285679		06/09/05	East	NT	PACE	PACE	07/01/07	12
226	301356		09/14/05	East	NT	MDWP	PACE	06/01/12	340
227	301357		09/14/05	East	NT	MDWP	PACE	06/01/12	500
237	305955		10/11/05	East	NT	Moroni Sub	PACEN	11/30/05	1
66			12/05/05	East	NR	Blundell Geothermal Sub		10/19/07	11-S/15-W
273	316762		12/12/05	East	NT	PACE	PACE	01/01/07	15
274	316764		12/12/05	East	NT	PACE	PACE	01/01/05	55
67			12/14/05	East	ER	Blundell Geothermal Sub		11/01/09	41-S/50-W
288	320610		01/06/06	East	NT	PACE	PACE (Load)	06/01/06	10
293	323874		01/27/06	East	NT	PACE	PACE (Load)	04/01/07	6
297	326467		02/10/06	East	NT	PACE	PACE	06/01/09	255
73			03/27/06	East	GEN	Spanish Fork - Santaquin, 46Kv		10/15/07	18.9
307	337682		04/12/06	East	NT	PACE	PACE	04/06/06	68
310	339268		04/12/06	East	NT	PACE	PACE	04/15/06	141
78			04/25/06	East	NR	Mona Substation, 345Kv			59
353	342397		04/26/06	East	NT	PACE	PACE	05/01/06	90
360	343700		05/01/06	East	NT	PACE	PACE	05/02/06	215
377	344018		05/02/06	East	NT	PACE	PACE	05/03/06	39
411	346043		05/11/06	East	NT	PACE	PACE (Load)	07/01/06	16
439	348700		05/21/06	East	NT	PACE	PACE	05/22/06	1
442	349036		05/22/06	East	NT	PACE	PACE (Load)	11/01/06	5
444	354411		06/16/06	East	NT	PACE	INT (Load)	09/01/06	6
445	354952		06/19/06	East	NT	PACE	PACE	01/01/08	19
446	355015		06/20/06	East	NT	PACE	PACE (Load)	02/01/07	5
447	355085		06/20/06	East	NT	PACE	PACE	03/01/08	60
463	363667		08/01/06	East	PTP	MPAC	PACEN	08/15/06	250
465	365082		08/08/06	East	NT	MDGT	PACE		-250
467	365983		08/14/06	East	NT	PACE	PACE (Load)	04/09/08	30
473	370068		09/07/06	East	NT	PACE	PACE (Load)	04/01/07	11
474	370071		09/07/06	East	NT	PACE	PACE (Load)	12/01/06	5/8
475	370076		09/07/06	East	NT	PACE	PACE (Load)	09/07/06	8
476	370084		09/07/06	East	NT	PACE	PACE (Load)	03/01/07	1/2
95			10/06/06	East	NR w/ER	Tooele-Dugway line, 46kV		12/31/08	71.4
494	378464		10/24/06	East	NT	PACE	INT	03/01/07	614
107			11/14/06	East	NR	Timp-Tri-City line, 138kV		05/15/07	79/49
523	384156		11/28/06	East	NT	PACE	PACE (Load)	01/01/08	13
529	385998		12/8/06	East	NT	PACE	INT	01/01/07	2
111			12/8/06	East	NA	Salt Lake - TBD		12/31/07	0.511
553	395507		2/2/07	East	PTP	PACE	MDGT	03/01/07	4
565	396235		2/6/07	East	NT	PACE	PACE (Load)	11/01/07	5
568	397734		2/15/07	East	NT	PACE	PACE (Load)	01/01/08	11
569	398656		2/19/07	East	NT	PACE	PACE (Load)	06/01/07	4/13/14/17/18/20
589	400067		2/26/07	East	NT	PACE	PACE (Load)	09/01/08	2/3/10/15/20
600	400817		3/2/07	East	NT	PACE	PACE (Load)	06/01/08	9
602	402411		3/12/07	East	NT	PACE	PACE (Load)	07/01/08	82

- A number of higher priority transmission service and/or generator interconnection requests will be considered in this study including but not limited to the following. If any of these requests are withdrawn, PacifiCorp reserves the right to restudied this interconnection request, and the results and conclusions may significantly change.

5.1 Energy Resource (ER) Interconnection Service

Energy Resource Interconnection Service allows the Interconnection Customer to connect its generating facility to the Transmission Provider's transmission system and to be eligible to deliver electric output using firm or non-firm transmission capacity on an as available basis. Consistent with Section 38.2.2.2 of PacifiCorp's Open Access Transmission Tariff, the facility will be studied such that deliverability will be determined to the Transmission Provider's aggregate network loads assuming some portion of existing network resources are displaced by

the output of the Interconnection Customer's large generating facility. Energy resource interconnection service in and of itself does not convey transmission service.

5.1.1 Study Results

The results of the studies indicate the Project can be interconnected as proposed; however, under any N-1 condition involving the main line between Sigurd and Parowan Valley, the Project generation output will require curtailment tripping to mitigate overloads on the existing 138 kV transmission system. The following are the major N-1 line outage scenarios that will cause curtailment of generation:

1) Loss of the Parowan Valley to Cameron Line
2) Loss of the Cameron to Cove Fort line
3) Loss of the Cove Fort to Sigurd line
4) Loss of the Cove Fort to Interconnection Customer

In the first three outages some generation (20 MW) output is possible. However, in the last scenario complete shut down of the generation will be required.

5.1.2 Requirements

5.1.2.1 Generating Facility Modifications

The Transmission Provider will require the facility to operate in voltage control mode with the ability to deliver power to the point of interconnection at a +/- 0.95 power factor. During normal voltage conditions, the voltage control scheme should operate to minimize the reactive exchange between the Interconnection Customer's Project and the Transmission Provider system. The power factor requirement will be reviewed during the system impact study. With GE wind-turbine generators, Transmission Provider normally requires use of GE's Wind Park Management system, which allows control of a single point voltage.

All wind turbines must meet the Transmission Provider's low voltage ride-through requirements as specified in the interconnection agreement.

5.1.2.2 Transmission Modifications

In the event the higher queued party elects not to proceed, the new 12-mile radial 138 kV transmission line will be owned by the Transmission Provider, and be treated as a direct assigned facility, until the Transmission Provider uses it to serve its own load. Until this occurs, Interconnection Customer will be required to pay an annual facilities payment to the Transmission Provider, and will be responsible for line losses back to Cove Fort substation. Once the transmission line is built to the higher queued party, an in and out tap to the point of

interconnection substation for Q0128 will be constructed. This will require a new self-supporting single pole tap structure on concrete foundation. In addition, there will be a dead end span from the last dead end structure in the Interconnection Customer's radial line to the Transmission Provider's new substation. Transmission Provider will require that there is a full deadend structure at least 20 feet outside the point of interconnection substation fence separating the Interconnection Customer ownership from the Transmission Provider ownership and that the last span is sagged at the proper tension to the substation tower. The Interconnection Customer will construct the last span into point of interconnection substation. The final dead end structure shall be a three-pole deadend.

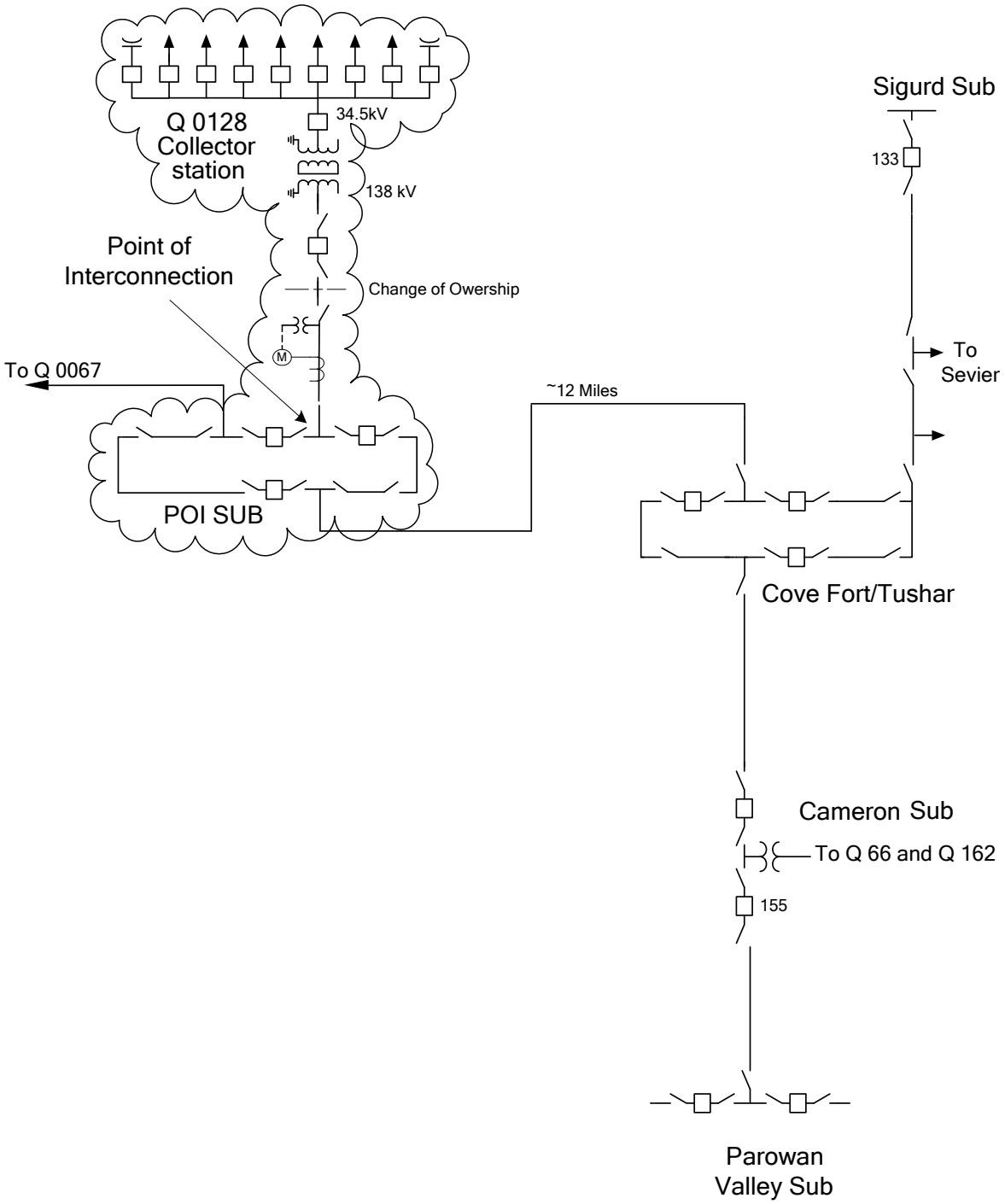

Figure 1 System One Line Diagram

5.1.2.3 Existing Circuit Breaker Upgrades Short Circuit

The increase in fault duty on the system as a result of the addition of the generation facility with the 53 – 1.5 MVA wind turbine generators fed through 1 – 60/80/100 MVA step up transformer with 10.0% impedance will not push the fault duty above the interrupting rate of the existing equipment.

5.1.2.4 Protection Requirements

The installation of protective relays for line fault detection will be required at the Transmission Providers new point of interconnection substation for the protection of the line to the Interconnection Customer's substation, and the lines to Q0067 and Cove Fort substations. Pilot line protection will be used on both of the lines. OPGW will be installed on the new 138 kV line from Q0067 substation to the new switching station at Cove Fort. Fibers from the OPGW will need to be routed in and out of the new point of interconnection substation. This optical cable will be used for the line protection system and to communicate status and loading information back to the Transmission Providers' Energy Control Center. With this plan, a minimal amount of work will need to be done either at Q0067 substation or at Cove Fork substation for the line protection. This system is shown in figure 1: System One Line Diagram.

The protection for the tie line between the point of interconnection substation and the Interconnection Customer's collector station can be a bus differential relay if the ground mats of the two stations are connected.

The Interconnection Customer will provide the outputs from a set of current transformers associated with the 138 kV tiebreaker that will be fed into the bus differential relay in the Transmission Provider's substation. The operation of the bus differential relay will trip the Interconnection Customer's breakers as well as the Transmission Provider's breaker.

To prevent overload of the 138 kV transmission system between Sigurd and Parowan Valley a portion of the generation facility will need to be tripped off line for the loss of a line section in one of the two transmission paths from Cove Fork substation. A remedial action scheme (RAS) will need to be installed. The logic unit of the RAS will be located at Cove Fort substation and will take information of line loss being communicated in from Parowan Valley, Cameron and Sigurd substations as will as the status of the line breakers at Cove Fork substation. The action of the RAS for a line loss will be to send a trip signal to the Interconnection Customer's substation to initiate the tripping of a number of the 34.5 kV turbine line breakers. Line loss circuitry will need to be installed at Parowan Valley, Cameron and Sigurd substations as well as communication transfer trip equipment to get the status of the lines back to Cove Fork substation. The condition to trip the 34.5 kV breakers will be communicated using the relay to relay communication protocol that will exist in the line relays on the line between Cove Fork and the point of interconnection substation.

In addition to the line protective relaying a relay used for under/over voltage and over/under frequency protection of the system will be installed at the point of interconnection substation. If

the voltage, magnitude or frequency, is outside of the normal operation range this relay will trip open all of the Interconnection Customer's 34.5 kV line breakers at the collector station.

5.1.2.5 Data (RTU) Requirements

The installation of a RTU is required at the Transmission Provider's point of interconnection substation. With the Project collector station adjacent to the point of interconnection substation, the same RTU will receive data from the Interconnection Customers data concentrator via a digital communication circuit. This digital communication link between a data concentrator at the collector station and the RTU at the point of interconnection substation will use DNP-3.0 or Modbus protocol. In addition to the control and indication of the 138kV breakers in the point of interconnection substation the following data from the wind farm, collector station, and switch yard will be feed into the RTU. The data will be transmitted to the PacifiCorp system over communications circuits as described in Section 5.1.3.7.

From the POI Substation:

Analogs:

- Net Generation MW
- Net Generator MVAR

Accumulator Pulses:

- Interchange metering kWH

From the Collector Station:

Analogs:

- Real power flow through each of the 34.5 kV line feeder breakers
- Reactive power flow through each of the 34.5 kV line feeder breakers
- Reactive power flow from each of the shunt capacitor banks
- Wind speed

Status:

- All 34.5 and 138kV breakers

The interchange real power MW will need to be telemetered to the Transmission Provider's Alternate Energy Control Center at Sigurd substation independent of the analog supplied to the RTU

5.1.2.6 Substation Requirements

Construct a new 138 kV Switching station that is to connect Q0128 on to PacifiCorp's Cove Fort – Q0063 138 kV interconnection radial line. The new switching substation is to contain a 3 breaker, 138 kV ring bus for looping in the Cove Fort – Q0063 138 kV interconnection radial line and to connect Project Q0128 which is proposed to be located adjacent to the new substation. The substation is to be designed and laid out with space provided for the ultimate substation expansion to a 4 breaker ring bus. Assume the entire yard will be fenced in and will

have two 24' double wide gates and one personnel access gate. The new substation will be owned and operated by PacifiCorp. The Interconnection Customer will also be responsible for the acquisition of the property, all permitting and rights of way required for all interconnection facilities.

The major equipment is as follows:

3 – 138 kV, 2000 A, circuit breaker

6 – 138 kV, 2000 A, TPST, manually operated, vertical break switch

3 – 138 V, 2000 A, TPST, manually operated, vertical break switch equipped w/ grounding blades.

6 – 138 kV voltage transformers

6 – 98 kV MCOV surge arresters (add 3 more if collector station is not adjacent to sub)

1 – 125 Volt, 100AH battery system with seismic zone 4 battery rack

1 - 12 Amp, 125VDC/120VAC battery charger

1 – 12' x 16' control house

3 – 138 kV metering units

5.1.2.7 Communication Requirements

A splice point will be provided for the OPGW on the Q0067 project on the new Blundell - Cove Fort substation line, at the point of interconnection for the new "Point of Interconnection substation." A 48-fiber, single mode, cable is to be installed between the splice point and the point of interconnection substation. All 48 fibers are to be terminated in the point of interconnection substation. A 48-fiber, single mode cable is to be installed between the point of interconnection and the Interconnect Customer collector station buildings. Twenty-four (24) of these fibers are to be terminated in each building. A fiber node, digital multiplex channel bank with RS-232 cards, 4WE&M cards, FXS cards, and an analog telemetry transmitter will be installed in the point of interconnection substation. The relay protection will be connected over multimode fiber optic transceivers. Single mode fiber optic transceivers will be installed between the point of interconnection substation and the Interconnection Customer's collector station to provide for the interconnection of the DNP 3.0 or Modbus communications to the point of interconnection substation RTU. Power for the communications equipment will be from the 125 VDC battery system with the use of redundant 125 V to 48 V DC-DC converters.

Additional communications work will be required at the following substations; Parowan, Cameron, Cove Fort, Sigurd, as wellas Blundell Communication site, Milford service center, Scipio Communication, and SCC to provide for the remedial action scheme (RAS)

communications, and the communications to the point of interconnection substation RTU for voice, data, and telemetry communications.

5.1.2.8 Metering Requirements

Rocky Mountain Power will provide standard 138 kV metering for this type of facility. It will include remote access capability. Metering will be done at the 138 kV point of interconnect, having a bypass switch for maintenance of the metering. Primary and backup metering is required to meter the net generation. The physical revenue metering point will be located inside the switching station. Except as otherwise noted, the Transmission Provider will design and procure all interconnection revenue metering equipment, including disconnect switches to be used for metering maintenance. The Transmission Provider shall own, install and maintain the high side revenue metering and instrument transformers. The metering instrument transformers shall be manufactured by Areva-Ritz and be a wye connected design. Expect 35 weeks delivery time once purchase order is completed. The primary metering transformers shall be 650 BIL extended range for high accuracy metering with ratio's of 700/1 voltage and 200/1 current rated with RF of 2.

The primary meter will provide data to SCADA and the backup meter will provide the telemetering data. A dial-up phone line required for retail sales and generation accounting via the MV-90 translation system. All meters will include both analog and digital output boards following the most current standard specifications. The metering design package will include two revenue quality meters, a test switch, and all data inputs and outputs terminated at a metering interposition block. One meter will be designated a primary meter and be used for EMS data that includes bidirectional kWH quantities, and instantaneous MW, MVAR and per phase voltage data. The second or backup meter will be used for telemetry MW data sent to the alternate control center.

5.1.3 Cost Estimate

SIS Interconnection: Detail Estimate Page	Quantity	Unit	CY 2008 Total Cost	CY 2008 Grand Total
Energy Resourse (ER) Interconnection Service				
ER - Direct Assigned				
Collector Station (customer owned) Termination of customer fiberoptics at the Collector Station & Communications	1	Lot	71,200	
Point of interconnection substation Metering and Termination of customer fiberoptics	1	Lot	206,000	
Point of interconnection substation Last structure before point of interconnection	1	Lot	304,800	
Total ER - Direct Assigned			**582,000**	
ER - Network Upgrades				
POI Substation New three breaker ring bus substation	1	Lot	6,484,800	
Cove Fort Substation Communication and Protection and Control upgrades	1	Lot	72,500	
Cameron Substation Substation, Communication and Protection and Control upgrades	1	Lot	39,800	
Parowan Valley Substation Substation, Communication and Protection and Control upgrades	1	Lot	39,800	
Sigurd Substation Substation, Communication and Protection and Control upgrades	1	Lot	54,700	
Scipio Pass Communication Site Communication upgrade	1	Lot	30,800	
Salt Lake Control Center Communication upgrade	1	Lot	26,600	
Millford Service center Communication upgrade	1	Lot	31,000	
Total ER - Network Upgrades			**6,780,000**	
Total Energy Resource				**7,362,000**

5.1.4 Schedule

It is estimated that it will take approximately 18 months from the date of an executed large generation interconnection agreement or an engineering and procurements agreement, to design, procure and construct the facilities requested to accommodate this interconnection request. The schedule will be further developed and optimized during the facility study.

5.1.5 Maximum Amount of Power that can be delivered into Network Load, with no Transmission Modifications (for informational purposes only).

The generating facility can deliver up to 60 MW without upgrades to the Transmission Provider's local transmission system during N-0 conditions in 2009. In 2011 this number drops to 20 MW based on a higher queue priority. This is based on the system as it is today without future improvements included.

5.1.6 Additional Transmission Modifications Required to Deliver 100% of the Power into Network Load, and related results (for informational purposes only).

The Sigurd to Cameron 138 kV line is currently 397.5 ACSR and has a continuous rating of 136 MVA. The position of Interconnection Customer allows the flows to be almost evenly split between Sigurd and Cameron with about a 55/45 percent split. If the 138 kV line between Sigurd and West Cedar is closed through and the flows of the backbone 345 kV are from North to South during an N-0 situation flows to the South are slightly greater than to the North. During light loading the flow is generally in the direction from Cameron to Sigurd. During light loading under certain conditions a phase shifter will be required on the Cameron side of the point of interconnection substation in order to capture the full output of Interconnection Customer generation facility.

During normal loading conditions (no line outages), and with the breakers at Cameron closed (A project has been approved to add an additional breaker and relaying at Cameron which should be completed prior to the in-service date of the Interconnection Customer Project.), the full output can be generated. However, with the loss of any section of the Sigurd to Parowan 138 kV line the result is the same; causing an overloaded condition. In addition to unplanned outages, this condition will exist in the event maintenance on the above mentioned lines is required. During these periods, curtailment of Project generation will be required, unless the Interconnection Customer elects to rebuild the line between Sigurd and Parowan. During some light loading situations, there is a potential for high voltage.

The discussion thus far assumes there is no rebuild of the 138 kV existing line from Sigurd to Parowan and that system status is normal (i.e., no line segment is out of service). The only way to ensure 100% deliverability (avoid curtailment during outages) would be to rebuild the line in its entirety from Sigurd to Parowan (98 miles). This would allow for the deliverability during N-1 scenarios. With no line rebuild during any N-1 situation the Interconnection Customer collector station would need to be tripped offline or, in the alternative, an automatic mechanism could be installed to run-back Project generation as necessary, in order to limit flows on the remaining line in-service to its continuous rating.

In order to deliver power to the Transmission Provider's aggregate network loads, additional dynamic reactive will be required in the Salt Lake City area in order to increase the capacity of the Wasatch Front South constrained transmission path. Based on the results of prior studies, this

will require the Interconnection Customer to participate in a proposed new Static VAr compensator capacity in the Wasatch Front on the basis of 0.5 MVAR per MW of increased transfer capability. The Interconnection Customer's cost responsibility share would then be 99 x 0.5 = 49.5 MVAR. For additional information, please see the system impact study performed for Q060-062 which can be found on PacifiCorp's OASIS at the following internet location: http://www.oasis.pacificorp.com/OASIS/PPW/lgia/pacificorplgiaq.htm

5.1.8 Cost Estimate

Total Cost – ER Interconnection Service – Interconnection only	**$7,362,000**
Net Work upgrades	
Reconductor line	$ 77,000,000
Static VAr compensation	$7,000,000
Phase Shifting Transformer	$6,000,000
Total Cost – NR Interconnection Service – Interconnection Only	**$ 97,362,000**

5.1.9 Schedule

It could take as much as five years to rebuild the Sigurd to Parowan 138 kV line.

5.2 Network Resource (NR) Interconnection Service

Network resource interconnection service allows the Interconnection Customer to integrate its large generating facility to the Transmission Provider's transmission system in a manner comparable to that in which the Transmission Provider integrates its generating facilities to serve native load customers. The transmission system is studied at peak load under a variety of severely stressed conditions in order to determine the transmission modifications. If any, which are necessary in order to deliver the aggregate generation in the area of the point of interconnection to the Transmission Provider's aggregate load, and assumes that some portion of existing network resources are displaced by the output of the Interconnection Customer's large generating facility. Network resource interconnection service in and of itself does not convey transmission service.

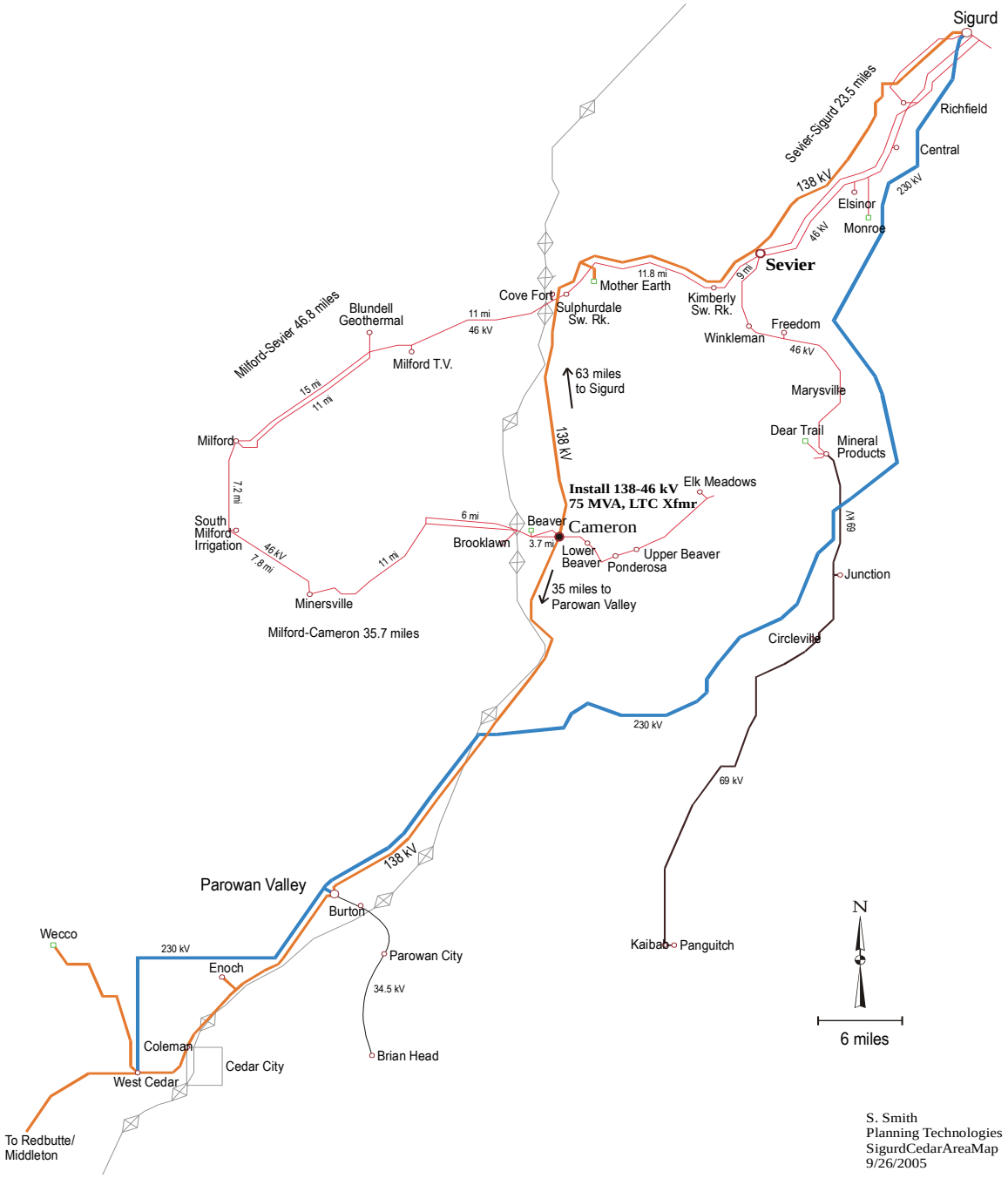

Figure 2 Major Area Transmission for Q0128 Project

5.2.1 Requirements

Requirements are the same as those outlined for ER and ER-100% deliverability.

6 PARTICIPATION BY AFFECTED SYSTEMS

No affected systems were identified with this interconnection request.