

TRANSMISSION SERVICES

MAR 30 2011



Wasatch Wind
INTERMOUNTAIN

Tom Fishback
PacifiCorp - Large Generation Interconnection Service Account Manager
1033 NE 6th Ave, 16th Floor
Portland, OR 97232
Office: 503.813.6102
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Thomas.Fishback@PacifiCorp.com

TRANSMISSION SERVICES

MAR 30 2011

March 25, 2011

**Subject: Large Generator Interconnection Request
59.2 MW Latigo Wind Park Project**

Dear Mr. Fishback

We hereby formally request interconnection with PacifiCorp for a Large Generator Interconnection of 59.2 MW involving the Latigo Wind Park (the "Project"). This project is located about 2.5 miles NW of Monticello, UT in San Juan County. This is a wind generation project that will utilize 37 - GE XLE Wind Turbines that are rated 1.6 MW each. The proposed COD date is December 31, 2012.

There will be one interconnect point studied into the Pinto Substation at the 138kV bus shown on the attached project location drawing.

Included with the enclosed Appendix 1 to LGIP - Interconnection Request for a Large Generating Facility Application are the following attachments:

Attachment A - This attachment include the Project maps.

- Point of Interconnect Map
- Project Location Map

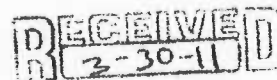
Attachment B - Project Electrical Oneline Diagram, Drawing E1-1.

Attachment C - Appendix 1 of the LGIP

Thank you for your attention to this matter. Please contact me at 435-503-8814 if you have any questions.

Sincerely,

Christine Mikell
Director of Development
Wasatch Wind Intermountain, LLC





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Latigo Wind Park
Large Generator Interconnection Request

Attachment A
Project Location Maps



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Latigo Wind Park
Large Generator Interconnection Request

Attachment B
Electrical Oneline Diagram

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Latigo Wind Park
Large Generator Interconnection Request

Attachment C

Appendix 1 to LGIP

Interconnection Request For a Large Generating Facility

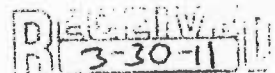
3-30-11

**APPENDIX 1 to LGIP
INTERCONNECTION REQUEST FOR A
LARGE GENERATING FACILITY**

1. The undersigned Interconnection Customer submits this request to interconnect its Large Generating Facility with Transmission Provider's Transmission System pursuant to a Tariff.
2. This Interconnection Request is for (check one):
 A proposed new Large Generating Facility.
 An increase in the generating capacity or a Material Modification of an existing Generating Facility.
3. The type of interconnection service requested (check one):
 Energy Resource Interconnection Service
 Network Resource Interconnection Service
4. Check here only if Interconnection Customer requesting Network Resource Interconnection Service also seeks to have its Generating Facility studied for Energy Resource Interconnection Service.
5. Interconnection Customer provides the following information:
 - a. Address or location of the proposed new Large Generating Facility site (to the extent known) or, in the case of an existing Generating Facility, the name and specific location of the existing Generating Facility;

Latitude: 37° 53' 32.73" N
Longitude: 109° 22' 53.35" W
See attached site location maps
 - b. Maximum summer at 40 degrees C and winter at -30 degrees C megawatt electrical output of the proposed new Large Generating Facility or the amount of megawatt increase in the generating capacity of an existing Generating Facility;

59.2MW Maximum Electrical Output
 - c. General description of the equipment configuration;



37, 1.6MW GE Wind Turbines

- d. Commercial Operation Date (Day, Month, and Year);

December 31, 2012

- e. Name, address, telephone number, and e-mail address of Interconnection Customer's contact person;

Mr. James O'Reilly
Project Manager
Wasatch Wind Intermountain, LLC
2700 Homestead Road, Suite 210
Park City, UT 84098
(435)503-7850
joreilly@wasatchwind.com

- f. Approximate location of the proposed Point of Interconnection (optional); and

Proposed Latigo Interconnection Point:
Pinto Substation - 138kV Bus
Latitude: 37° 52' 8" N
Longitude: 109° 19' 0.9" W

See attached location maps

- g. Interconnection Customer Data (set forth in Attachment A)

Loadflow and Dynamic Models for Wind Turbines
PSS®E Wind Program
GE 1.6MW Wind Turbine
See Attached Dynamic Model Data in Wind Generation
Section Below.

6. Applicable deposit amount as specified in the LGIP.

\$10,000

7. Evidence of Site Control as specified in the LGIP (check one)

X Is attached to this Interconnection Request
Will be provided at a later date in accordance with this
LGIP

8. This Interconnection Request shall be submitted to the representative indicated below:

[To be completed by Transmission Provider]

Transmission Provider:

(For all Overnight Deliveries)

PacifiCorp: 1033 NE 6th Ave
Portland, OR 97232
Attention: Director, Transmission Services
Telephone Number: (503) 813-6077

(For All other USPS Mail)

PacifiCorp: P.O. Box 2757
Portland, OR 97208-2757

9. Representative of Interconnection Customer to contact:

Mr. James O'Reilly
Project Manager
Wasatch Wind Intermountain, LLC
2700 Homestead Road, Suite 210
Park City, UT 84098
(435)503-7850
joreilly@wasatchwind.com

10. This Interconnection Request is submitted by:

Name of Interconnection Customer: Latigo Wind Park

By (signature): 

Name (type or print): Christine Mikell

Title: Director of Development

Date: 3/28/11

**Attachment A to Appendix 1
Interconnection Request**

LARGE GENERATING FACILITY DATA

NOT APPLICABLE - SEE WIND GENERATORS SECTION

UNIT RATINGS

kVA	<u>1828</u>	°F	_____	Voltage	<u>0.69kV</u>
Power Factor	<u>+/-0.90</u>				
Speed (RPM)	<u>1520 (rated), 1200 (synchronous)</u>				
Connection (e.g. Wye)	<u>Wye ungrounded (stator)</u>				
Short Circuit Ratio	<u>N/A</u>	Frequency, Hertz	<u>60</u>		
Stator Amperes at Rated kVA	<u>1300</u>	Field Volts	<u>N/A</u>		
Max Turbine MW	<u>1645</u>	°F	_____		

COMBINED TURBINE-GENERATOR-EXCITER INERTIA DATA

Inertia Constant, H =	<u>See below*</u>	kW sec/kVA
Moment-of-Inertia, WR ² =	<u>See below*</u>	lb. ft. ²

**GE 1.6 is a Doubly fed asynchronous machine - the rotor speed is decoupled from the grid frequency. Although the machine has physical inertia, inertia as seen by the grid is zero*

REACTANCE DATA (PER UNIT-RATED KVA)

GE 1.6 WTG is not a synchronous generator, hence the below fields not filled in

	DIRECT AXIS	QUADRATURE AXIS
Synchronous - saturated	X _{dv} <u>N/A</u>	X _{qv} <u>N/A</u>
Synchronous - unsaturated	X _{di} <u>N/A</u>	X _{qi} <u>N/A</u>
Transient - saturated	X' _{dv} <u>N/A</u>	X' _{qv} <u>N/A</u>
Transient - unsaturated	X' _{di} <u>N/A</u>	X' _{qi} <u>N/A</u>
Subtransient - saturated	X'' _{dv} <u>N/A</u>	X'' _{qv} <u>N/A</u>
Subtransient - unsaturated	X'' _{di} <u>N/A</u>	X'' _{qi} <u>N/A</u>
Negative Sequence - saturated	X _{2v} <u>N/A</u>	
Negative Sequence - unsaturated	X _{2i} <u>N/A</u>	
Zero Sequence - saturated	X _{0v} <u>N/A</u>	
Zero Sequence - unsaturated	X _{0i} <u>N/A</u>	
Leakage Reactance X _l	X _m <u>N/A</u>	

FIELD TIME CONSTANT DATA (SEC)

GE 1.6 WTG is not a synchronous generator, hence the below fields not filled in

Open Circuit	T'	do	N/A	T'	qo	N/A
Three-Phase Short Circuit Transient		T'd3	N/A	T'	q	N/A
Line to Line Short Circuit Transient		T'd2	N/A			
Line to Neutral Short Circuit Transient		T'd1	N/A			
Short Circuit Subtransient		T''d	N/A	T''	q	N/A
Open Circuit Subtransient	T''	do	N/A	T''	qo	N/A

ARMATURE TIME CONSTANT DATA (SEC)

GE 1.6 WTG is not a synchronous generator, hence the below fields not filled in

Three Phase Short Circuit	Ta3	N/A
Line to Line Short Circuit	Ta2	N/A
Line to Neutral Short Circuit	Ta1	N/A

NOTE: If requested information is not applicable, indicate by marking "N/A."

**MW CAPABILITY AND PLANT CONFIGURATION
LARGE GENERATING FACILITY DATA**

Note that GE 1.6 WTG has to be modeled as a complete system (Generator + Converter + Controls).

ARMATURE WINDING RESISTANCE DATA (PER UNIT)

Positive	R1	N/A
Negative	R2	N/A
Zero R	0	N/A

Rotor Short Time Thermal Capacity $I_2^2t = \underline{N/A}$
 Field Current at Rated kVA, Armature Voltage and PF = $\underline{590}$ amps
 Field Current at Rated kVA and Armature Voltage, 0 PF = $\underline{N/A}$ amps
 Three Phase Armature Winding Capacitance = $\underline{N/A}$ microfarad
 Field Winding Resistance = $\underline{N/A}$ ohms $\underline{\quad}$ °C
 Armature Winding Resistance (Per Phase) = $\underline{N/A}$ ohms $\underline{\quad}$ °C

CURVES

Provide Saturation, Vee, Reactive Capability, Capacity Temperature Correction curves. Designate normal and emergency Hydrogen Pressure operating range for multiple curves.

Note: See Reference: "Modeling of GE Wind-Turbine Generators for Grid Studies, Ver. 4.5.

GENERATOR STEP-UP TRANSFORMER DATA RATINGS (Collector Substation Transformer)

Capacity	Self-cooled/		
Maximum	Nameplate		
36,000 @ 55°C	/	60,000 @ 55°C	kVA
45,000 @ 65°C	/	75,000 @ 65°C	kVA
Voltage Ratio(Generator Side/System side/Tertiary)			
34.5	/138	/13.8	kV
Winding Connections (Low V/High V/Tertiary V (Delta or Wye))			
WYE	/WYE	/DELTA	(BURIED)
Fixed Taps Available			
138-kV ± 5% with 2.5% Steps			
Present Tap Setting			
138-kV			

IMPEDANCE (Collector Transformer)

Positive	Z ₁ (on self-cooled kVA rating)	8	%	30	X/R
Zero	Z ₀ (on self-cooled kVA rating)	7.6	%	30	X/R

EXCITATION SYSTEM DATA

Identify appropriate IEEE model block diagram of excitation system and power system stabilizer (PSS) for computer representation in power system stability simulations and the corresponding excitation system and PSS constants for use in the model.

GE 1.6 WTG has to be modeled as a complete system (Generator + Converter + Controls). Dynamic simulation models are available in PSS/E and PSLF. Reference: "Modeling of GE Wind-Turbine Generators for Grid Studies, Ver. 4.5"

GOVERNOR SYSTEM DATA

Identify appropriate IEEE model block diagram of governor system for computer representation in power system stability simulations and the corresponding governor system constants for use in the model.

GE 1.6 WTG has to be modeled as a complete system (Generator + Converter + Controls). Dynamic simulation models are available in PSS/E and PSLF. Reference: "Modeling of GE Wind-Turbine Generators for Grid Studies, Ver. 4.5"

WIND GENERATORS

Number of generators to be interconnected pursuant to this
Interconnection Request: 37

Elevation: 7500' Single Phase X Three Phase

Inverter manufacturer, model name, number, and version:
GE 1.6MW Wind Turbine with LVRT Capability and Enhanced PF Capability

List of adjustable set-points for the protective equipment or software:

See dynamic data sheet below

Note: A completed General Electric Company Power Systems Load Flow (PSLF) data sheet or other compatible formats, such as IEEE and PTI power flow models, must be supplied with the Interconnection Request. If other data sheets are more appropriate to the proposed device, then they shall be provided and discussed at Scoping Meeting.

The dynamic model data below details a lumped wind machine model at Bus 5 with a Generator ID of 1. This data should meet the requirements detailed in Appendix 7 to the Pacificorp LGIP (Interconnection Procedures for a Wind Generating Plant).

The data is from the PSS@E Wind Program (psse_gewt_w501.exe). The appropriate library file for simulation can be found on the PSS@E User Support Web Site.

```

REPORT FOR ALL MODELS AT ALL BUSES          BUS 5 [WT      0.690] MODELS
      Wind generator Bus #          5
      Wind Generator ID             1

5 'USRMDL' 1 'GEWTG1' 1 1 2 11 3 5
0 37
  1.6000      0.80000      0.50000      0.90000      1.2200
  1.2000      2.0000      0.40000      0.80000      10.0000      0.20000E-01/
5 'USRMDL' 1 'GEWTE1' 4 0 10 62 18 7
0 2
  0
  0.15000      18.000      0      5.0000      0.0000      0.0000      0.50000E-01
  3.0000
  0.60000      1.1200      0.40000E-01 0.43600      -0.43600      1.1000
  0.20000E-01
  0.45000      -0.45000      60.000      0.10000
  0.90000      1.1000      40.000
  0.50000      1.4500      0.50000E-01      0.50000E-01
  1.0000      0.15000      0.96000
  0.99600      1.0040      1.0400      1.0000
  0.95000      0.95000      0.40000
  1.0000      0.20000      1.0000      0.25000
  1.0000      14.000      25.000
  3.0000      -0.90000      8.0000      0.20000
  10.000      1.0000      1.7000
  1.2200      1.2500      5.0000      0.0000
  0.0000      0.000      0.25000E-02
  1.0000      5.5000      0.10000      -1.0000
  0.10000      0.0000

/
5 'USRMDL' 1 'GEWTT' 5 0 1 5 4 3 0
4.6300      0.0000      0.0000      1.8800      2.3000 /
0 'USRMDL' 0 'WGUSTC' 8 0 3 6 0 4
  5
  9999.0      5.0000      30.000      9999.0      9999.0
  30.000 /
0 'USRMDL' 0 'GEWTA' 5 8 0 3 9 1 4
  20.000      0.0000      27.000      -4.0000      0.0000      1.2250
  35.250      72.000      1200.0 /
0 'USRMDL' 0 'GEWTP' 5 8 0 3 10 3 3
  0.30000      150.00      25.000      3.0000      30.000
  -4.0000      27.000      -10.000      10.000      1.0000
0 'USRMDL' 0 'GEWTP' 8 0 2 0 0 17 5
  'USRMDL' 0 'VTGTPA' 0 2 6 4 0 1 5 5 '1' 0 0 0 0.15 5.0 0.20 0.08 / / 0
0 'USRMDL' 0 'VTGTPA' 0 2 6 4 0 1 5 5 '1' 0 0 0 0.30 5.0 0.70 0.08 /
0 'USRMDL' 0 'VTGTPA' 0 2 6 4 0 1 5 5 '1' 0 0 0 0.50 5.0 1.20 0.08 /
0 'USRMDL' 0 'VTGTPA' 0 2 6 4 0 1 5 5 '1' 0 0 0 0.75 5.0 1.90 0.08 /
0 'USRMDL' 0 'VTGTPA' 0 2 6 4 0 1 5 5 '1' 0 0 0 0.0 1.1 1.0 0.08 /

```

0	'USRMDL'	0	'VTGTPA'	0	2	6	4	0	1	5	5	'1'	0	0	0	0.0	1.15	0.1	0.08	/
0	'USRMDL'	0	'VTGTPA'	0	2	6	4	0	1	5	5	'1'	0	0	0	0.0	1.3	0.02	0.08	/
0	'USRMDL'	0	'FRQTPA'	0	2	6	4	0	1	5	5	'1'	0	0	0	56.5	66.0	0.02	0.08	/
0	'USRMDL'	0	'FRQTPA'	0	2	6	4	0	1	5	5	'1'	0	0	0	57.5	66.0	10.0	0.08	/
0	'USRMDL'	0	'FRQTPA'	0	2	6	4	0	1	5	5	'1'	0	0	0	54.0	61.5	30.0	0.08	/
0	'USRMDL'	0	'FRQTPA'	0	2	6	4	0	1	5	5	'1'	0	0	0	54.0	62.5	0.02	0.08	/

INDUCTION GENERATORS

Note: GE doubly fed asynchronous machine with back-to-back IGBT converters do not behave like an induction generator, hence below parameters are not relevant

- (*) Field Volts: _____
- (*) Field Amperes: _____
- (*) Motoring Power (kW): _____
- (*) Neutral Grounding Resistor (If Applicable): _____
- (*) I_2^2t or K (Heating Time Constant): _____
- (*) Rotor Resistance: _____
- (*) Stator Resistance: _____
- (*) Stator Reactance: _____
- (*) Rotor Reactance: _____
- (*) Magnetizing Reactance: _____
- (*) Short Circuit Reactance: _____
- (*) Exciting Current: _____
- (*) Temperature Rise: _____
- (*) Frame Size: _____
- (*) Design Letter: _____
- (*) Reactive Power Required In Vars (No Load): _____
- (*) Reactive Power Required In Vars (Full Load): _____
- (*) Total Rotating Inertia, H: _____ Per Unit on KVA Base

Note: Please consult Transmission Provider prior to submitting the Interconnection Request to determine if the information designated by (*) is required