PROJECT REGISTER OF EMBEDDED GENERATION ABOVE 5MW

evoenergy

Project Register

There is only one large scale greater than 5MW embedded generator connected to Evoenergy as at present. Please see below for more information.

<table>
<tr><th colspan="5">Evoenergy (ABN) - Network Connection Services Register of
Plant - Completed Embedded Generation Projects
- as per Clause 5.3A.3 of the National Electricity Rules</th></tr>
<tr><td>Project</td><td colspan="4">FRV Royalla Solar Farm</td></tr>
<tr><td></td><td>Location</td><td>Theodore Zone Substation - Williamsdale</td><td>Connected</td><td>18 August 2014</td></tr>
<tr><td>(1) technology of generating unit (e.g. synchronous generating unit, induction generator, photovoltaic array, etc) and its make and model;</td><td colspan="4">• Technology: Photovoltaic array and inverters
• Make: Jinko modules, Ingeteam inverters
• Model: JKM295P modules, 1000 M400 PowerMax 400Vac inverters</td></tr>
<tr><td>(2) maximum power generation capacity of all embedded generating units comprised in the relevant generating system;</td><td colspan="4">• Name plate rating: 20MW
• Nominal rating: 20MW</td></tr>
<tr><td>(3) contribution to fault levels;</td><td colspan="4">The generating system limits its contribution to the fault current at the connection point to:
a) three phase fault current 1.1 kA;
b) single phase to ground fault current 1.1 kA;
c) phase to phase to ground fault current 1.1 kA, calculated at 1.1 per unit voltage.s</td></tr>
<tr><td>(4) the size and rating of the relevant transformer;</td><td colspan="4">• Rated capacity 10 x 2 MVA ONAN
• Voltage ratio 0.4/11 kV/kV
• Impedance 6.25% on 2 MVA base</td></tr>
<tr><td>(5) a single line diagram of the connection arrangement;</td><td colspan="4">Refer ROY-DWG-ELE-1642 and ROY-DWG-ELE-1643</td></tr>
<tr><td>(6) protection systems and communication systems;</td><td colspan="4">Proposed Access Standards:

S 5.2.5.8 - Protection of generating units from power system disturbances: Minimum
S 5.2.5.9 - Protection systems that impact on power system security: Automatic
S 5.2.5.10 - Protection to trip plant for unstable operations: Automatic

The Generating system has the following protection system arrangement:

Protection Relay 1X [Micom P141]:
• Over-frequency: 52.1Hz for 0.00s, 51.1Hz for 120s and 50.6Hz for 600s
• Under-frequency: 46.9Hz for 0.00s, 48.9Hz for 120s and 49.4Hz for 600s</td></tr>
</table>

	• Over-voltage: 1.11 pu for 1.3s and 1.30 pu for 0.4s • Under-voltage: 0.89 pu for 10s and 0.79 pu for 2s • Rate of Change of Frequency: 4.1 Hz/s, 0.25s time delay. Protection Relay 1Y [SEL 351S]: • Over-frequency: 52.1Hz for 0.00s, 51.1Hz for 120s and 50.6Hz for 600s • Under-frequency: 46.9Hz for 0.00s, 48.9Hz for 120s and 49.4Hz for 600s • Over-voltage: 1.11 pu for 1.3s and 1.30 pu for 0.4s • Under-voltage: 0.89 pu for 10s and 0.79 pu for 2s • Rate of Change of Frequency: 4 Hz/s, 0.25s time delay. Protection Relay 2X [Micom P141]: • Over-frequency: 52.1Hz for 0.00s, 51.1Hz for 120s and 50.6Hz for 600s • Under-frequency: 46.9Hz for 0.00s, 48.9Hz for 120s and 49.4Hz for 600s • Over-voltage: 1.11 pu for 1.3s and 1.30 pu for 0.4s • Under-voltage: 0.89 pu for 10s and 0.79 pu for 2s • Rate of Change of Frequency: 4.1 Hz/s, 0.25s time delay. Protection Relay 2Y [SEL 351S]: • Over-frequency: 52.1Hz for 0.00s, 51.1Hz for 120s and 50.6Hz for 600s • Under-frequency: 46.9Hz for 0.00s, 48.9Hz for 120s and 49.4Hz for 600s • Over-voltage: 1.11 pu for 1.3s and 1.30 pu for 0.4s • Under-voltage: 0.89 pu for 10s and 0.79 pu for 2s • Rate of Change of Frequency: 4 Hz/s, 0.25s time delay. In relation to the General Requirements for this clause, generating system will be automatically disconnected from the power system for the following conditions: (a) faults within the generating system by primary protection elements as detailed in NER clause 5.2.5.9 Proposed Access Standards: S 5.2.6.1 Remote monitoring: Negotiated S 5.2.6.2 Communication equipment: Minimum Description: Communication Systems The following quantities will be transmitted to AEMO's control centre in real time in accordance with clause 4.11 of the Rules. (i) the active power output of the generating unit or generating system (as applicable); (ii) if connected to a transmission system, the reactive power output of the generating unit or generating system (as applicable)

	(2) any other quantity that AEMO reasonably requires to discharge its market and power system security functions as set out in Chapters 3 and 4 of the Rules This Generator will: (1) provide and maintain a telephone facility for the purposes of operational communications between the Generator's responsible operator under clause 4.11.3(a) and AEMO's control centre; and (2) provide electricity supplies for remote monitoring equipment and remote control equipment installed in relation to its generating system capable of keeping such equipment available for at least 1 hour following total loss of supply at the connection point for the relevant generating unit.
(7) voltage control and reactive power capability;	Proposed Access Standards: S 5.2.5.13 Voltage and reactive power control: Negotiated S 5.2.5.1 Reactive power capability: Negotiated Voltage Control This generating system has plant capabilities and control systems sufficient to ensure: (i) power system oscillations, for the frequencies of oscillation of the generating unit against any other generating unit, are adequately damped; (ii) operation of the generating unit does not degrade: (A) any mode of oscillation that is within 0.3 nepers per second of being unstable, by more than 0.01 nepers per second; & (B) any other mode of oscillation to within 0.29 nepers per second of being unstable; and (iii) operation of the generating unit does not cause instability (including hunting of tap-changing transformer control systems) that would adversely impact other Registered Participants; (2) the generating system will have facilities for testing its control systems sufficient to establish their dynamic operational characteristics; (3) the generating unit or generating system has facilities: to regulate voltage or reactive power or power factor in a manner that does not prevent the Network Service Provider from achieving the requirements of clauses S5.1a.3 and S5.1a.4, and sufficient to achieve the performance agreed in respect of clauses S5.2.5.1, S5.2.5.2, S5.2.5.3, S5.2.5.4, S5.2.5.5, S5.2.5.6 and S5.2.5.12; The Generator is capable of: • Supplying at its connection point an amount of reactive power of at least the product of its active power level and 0.0873 (if the active power level equals or exceeds 20%) or 0.0675 (if the active power level is less than 20%); • Absorbing at its connection point an amount of reactive power

	of at least the product of its active power level and 0.2619 (if the active power level equals or exceeds 20%) or 0.2025 (if the active power level is less than 20%);
(8) details specific to the location of a facility connected to the network that are relevant to any of the details in subparagraphs (1)-(7).	Nil applicable