

# FAC-001-0 Facility Connection Requirements Matrix Spreadsheet

Revised: 06-09-2011

FAC-001-0 End User	Location of Documentation (Page)
R2.1.1   Joint Studies	<ul style="list-style-type: none"> <li>• PPL EU Document "Procedure For The Connection of Transmission or End-user Facilities To The PPL EU Transmission System", dated June 10, 2009. (Attachment D.0c, D.0d, D.0e &amp; D.0f)</li> <li>• PPL EU document "Point of Contact Requirements for High Voltage Customer-Owned Facilities – Revision 1, April 2007," p. 5, section 1.1 "Initiating a Request to Add or Modify Customer Connections." (Attachment D.3a)</li> <li>• Also included is the typical information Form customers must complete to initiate the interconnection review. This Form is included in Attachment D.3a.</li> </ul>
R2.1.2   Notification	<ul style="list-style-type: none"> <li>• Procedures for notification of new or modified facilities are identified in PJM Manual 3A – Energy Management System Model Updates and Quality Assurance, Revision 6, Section 3, pp. 18-22. (Attachment E.1a)</li> <li>• In addition, the PJM Relay Subcommittee has an internal three step procedure for interconnection of facilities between Transmission Owners. The procedure is documented in "Process for Performing Relay Work (settings/design) for Interconnection Lines in the PJM System", document # 627601, 8/19/10. The process is briefly described here -- The first step of this process is to have the necessary TO's agree on the scope of work involved in this project. The second step is to ensure that the TO's mutually agree on the protective relay settings at the remote terminals. Finally, the third step is to perform commissioning of the protective systems and declare the transmission facility in service. (Attachment E.2a)</li> <li>• Beyond this, PJM tracks the status of new or modified RTEP projects within the transmission system monthly. An example of that status report is included. (Attachment E.3a)</li> </ul>
R2.1.3  Volts, MW, MVAR	<ul style="list-style-type: none"> <li>• PPL EU Document "Point of Contact Requirements for High Voltage Customer-Owned Facilities – Revision 1, April 2007" pp. 10-11, section 1.7. (Attachment F.3a)</li> <li>• It should be noted that PPL EU Tariff does not have a power factor clause. PPL EU is responsible for ensuring adequate reactive support exists at each voltage level. (Attachments F.2a and F.2b)</li> </ul>
R2.1.4  Breaker Duty & Surge Protection	<ul style="list-style-type: none"> <li>• PPL EU Document "Point of Contact Requirements for High Voltage Customer-Owned Facilities – Revision 1, April 2007," pp. 24-25 indicate that breaker duty and surge protection must be considered at the interconnection substation. (Attachment G.1a)</li> <li>• For 200 kV and above, the PJM document V.N (PJM Insulation Coordination and Surge Protection) is also used as a guiding document. (Attachment G.1b)</li> </ul>
R2.1.5   System Protection	<ul style="list-style-type: none"> <li>• PPL EU Document "Reliability Principles and Practices – January 2004 Revision" Section H, p. 1, items 1 through 4, and Section H, pp. 6-17 and pp. 29-34, describes the protection criteria adhered in all situations. (Attachment H.1a)</li> <li>• In addition, the Point of Contact Requirements document (see pp. 5, 12-13, 90), sections 1.2, 2, and 8, supports the philosophy identified in the PPL EU Reliability Principles &amp; Practices. (Attachment H.1b)</li> <li>• Another guiding document is the PJM Relay Subcommittee Protective Relaying Philosophy and Design Standards, Revision 3, dated 6/1/2003. (Attachment H.1c)</li> <li>• Also Reference PJM OATT, Appendix 2, Section 4.9.1, p. 1795. (Attachment H.1d)</li> </ul>

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R2.1.6  Metering & Telecom	<ul style="list-style-type: none"> <li>• For End-User installations, refer to PPL EU Document “Point of Contact Requirements for High Voltage Customer-Owned Facilities – Revision 1, April 2007,” p. 6, section 1.3. (Attachment I.2a)</li> <li>• In addition, for FERC jurisdictional customers (&gt;100 kV), reference PJM Manual 1 – Control Center and Data Exchange Requirements, Revision 19, Section 5, pp. 33-40. (Attachment I.2b)</li> </ul>
R2.1.7  Grounding & Safety	<ul style="list-style-type: none"> <li>• PPL EU Document “Point of Contact Requirements for High Voltage Customer-Owned Facilities – Revision 1, April 2007,” pp. 18-19, sections 4.3 and 4.4, and pp. 16-17, 90, sections 3.2, 3.6, and 8, identify PPL EU grounding requirements and ground grid testing requirements. (Attachment J.1a)</li> <li>• Another PPL EU document providing practices on grounding is “Procedure 2-108 Ground Grid Design” – dated 12/29/06. (Attachment J.1b)</li> <li>• The PJM OATT also discusses safety in Appendix 2, Section 7, pp. 1814-1816. (Attachment J.1c)</li> </ul>
R2.1.8  Insulation & Coordination	<ul style="list-style-type: none"> <li>• PPL EU Document “Point of Contact Requirements for High Voltage Customer-Owned Facilities – Revision 1, April 2007,” p. 10, section 1.6, and pp. 12-13, section 2.1, identify the PPL EU insulation requirements. (Attachment K.1a)</li> <li>• For 200 kV and above, the PJM document V.N (PJM Insulation Coordination and Surge Protection) is used as a guiding document. (Attachment K.1b)</li> </ul>
R2.1.9  Volts, Reactive Power & Power Factor	<ul style="list-style-type: none"> <li>• Because the PPL EU tariff does not have a power factor clause, end-user customers are not responsible for control of voltage, reactive power or power factor. PPL EU is responsible for ensuring these attributes remain within acceptable limits.</li> <li>• Refer to PPL EU Document “Point of Contact Requirements for High Voltage Customer-Owned Facilities – Revision 1, April 2007” p. 10, section 1.7. (Attachment L.3a)</li> <li>• PPL EU Document “Reliability Principles and Practices – January 2004 Revision” section C, pp. 28-30, Paragraph VIII., addresses Reactive Power issues. (Attachment L.3b)</li> </ul>
R2.1.10  Power Quality	<ul style="list-style-type: none"> <li>• PPL EU Document “Reliability Principles and Practices – January 2004 Revision” section C, p. 3, item 19 indicates that such installation must adhere to PPL EU power quality standards. (Attachment M.1a)</li> <li>• Item 19 is addressed by PPL EU internal documents SPR-249, Harmonics Guidelines – Table 1, p. 1 (Attachment M.1b) and SPR-640, Flicker Guideline – Table V, p. 21 (Attachment M.1c) that describe, in detail, our power quality standards and analysis methods.</li> </ul>
R2.1.11  Equip. Ratings	<ul style="list-style-type: none"> <li>• In a similar manner, End-User customers are responsible for ensuring their equipment has proper ratings. As with generator developers, PPL EU requires the end-user to provide information on equipment ratings for PPL EU review as noted in PPL EU Document “Point of Contact Requirements for High Voltage Customer-Owned Facilities – Revision 1, April 2007.” Samples are provided for reference; p. 24, section 4.6.3; p. 85, section 7.2.1. (Attachment N.3a)</li> </ul>
R2.1.12	<ul style="list-style-type: none"> <li>• For End-User facilities, synchronizing of facilities generally does not apply. If an end-user facility had to be modified to accommodate new generation, to avoid an “out of synchronism” condition, PPL EU Document “Reliability Principles and Practices – January 2004 Revision” section H, p. 36, Paragraph III-B., addresses synchronization issues. (Attachment O.3a)</li> </ul>

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Synchronization	
R2.1.13  Maintenance	<ul style="list-style-type: none"> <li>• End-User customer facilities, coordination of maintenance outages is described in DPI-204, Part 2 (Enhanced Work Methods), “Examples of Enhanced Work Method Applications,” paragraph 1, dated September 22, 2006. (Attachment P.3a)</li> <li>• See also PPL EU Document "Guideline for Application of Regional Sectionalizing to Connect a Transmission Customer", dated June 10, 2009, p. 1, paragraphs 4 and 5. (Attachment P.3b)</li> </ul>
R2.1.14  Operation Issues	<ul style="list-style-type: none"> <li>• PPL EU Document “Reliability Principles and Practices – January 2004 Revision” section F, pp. 1-2 (see Attachment Q.3a) and section B, p. 51, part IX - Distribution Voltage Control. (Attachment Q.3b)</li> <li>• In addition, the PPL EU Tariff, Rule 4, Paragraph G, discusses emergency load control, which is an operational issue. (see Attachment Q.3c)</li> </ul>
R2.1.15  Inspection Requirements	<ul style="list-style-type: none"> <li>• PPL EU Document “Point of Contact Requirements for High Voltage Customer-Owned Facilities – Revision 1, April 2007,” pp. 13, 89, sections 2 and 7.4. (Attachment S.3a)</li> </ul>
R2.1.16  Normal & Emergency Operating	<ul style="list-style-type: none"> <li>• “Clarifying Procedure – Development of Operating Instructions For Facilities Connected to the PPL EU Transmission System,” dated June 10, 2009, describes the PPL EU internal procedure for creating a document that describes communications during normal and emergency operating conditions. By applying the procedure, a T&amp;D Operations “Operating Instructions (OI)” for each specific facility is created. The resulting OI document describes normal and emergency procedures, responsibility for equipment, contact information, switching &amp; blocking methods, and other information on the status of equipment. (Attachment T.0a)</li> <li>• PJM Manual 13 – Emergency Operations, Revision 44, Section 1, pp. 7-9. (Attachment T.2a)</li> <li>• PJM Manual 1 – Control Center and Data Exchange Requirements, Revision 19, Section 4, pp. 28-32. (Attachment T.2b)</li> </ul>