

To view complete list of Interconnection requirements click link below.
<http://www.pplelectric.com/NR/rdonlyres/F3F8BF4A-FCB9-43D2-BBDD-A452352B33CC/0/MatrixReferenceMaterial.pdf>

Revised 6-10-2009

FAC-001-0 Transmission	Location of Documentation (Page)
R2.1.1 Joint Studies	<ul style="list-style-type: none"> • 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 & D.0f)
	<ul style="list-style-type: none"> • PJM Open Access Transmission Tariff – Section IV, subpart A “Interconnection Procedures”, section 36.1.03. (Attachment D.2a)
	<ul style="list-style-type: none"> • In addition, this is further described in PJM Manual 14A – Introduction to the Generation and Transmission Interconnection Process, Revision 7, Section 2, pp. 9-15. (Attachment D.2b)
R2.1.2 Notification	<ul style="list-style-type: none"> • Procedures for notification of new or modified facilities are identified in PJM Manual 3A – Energy Management System Model Updates and Quality Assurance, Revision 4, Section 3, pp. 18-22. (Attachment E.1a)
	<ul style="list-style-type: none"> • In addition, the PJM Relay Subcommittee has a 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" and in the PJM RS meeting minutes. 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)
	<ul style="list-style-type: none"> • 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)
R2.1.3 Volts, MW, MVAR	<ul style="list-style-type: none"> • PPL EU Document “Reliability Principles and Practices – January 2004 Revision at Section C, pp. 28-29, Part VIII, applies to voltage levels from 100kV to 200kV. (Attachment F.2a)
	<ul style="list-style-type: none"> • For the Bulk Power system (200 kV and above), voltage/ var control is documented in Section D, pp. 20-23, Part VI and Part VII. (Attachment F.2b)
	<ul style="list-style-type: none"> • Also reference PJM Manual 3 – Transmission Operations, Revision 33, Section 3, p. 26. (Attachment F.2c)
	<ul style="list-style-type: none"> • PJM Manual 14C – Generation and Transmission Interconnection Facility Construction, Revision 5, Section 3, pp. 36-39, which also references the OATT, Part IV, subpart E, section 50.6. (Attachment F.2d)
R2.1.4 Breaker Duty & Surge Protection	<ul style="list-style-type: none"> • 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)
	<ul style="list-style-type: none"> • 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)

<p>R2.1.5</p> <p>System Protection</p>	<ul style="list-style-type: none"> • PPL EU Document “Reliability Principles and Practices – January 2004 Revision” Section H, p. 1, items 1 through 4 describes the protection criteria adhered in all situations; also Section H, pp. 6-17 and pp. 29-34. (Attachment H.1a) • 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 & Practices. (Attachment H.1b) • Another guiding document is the PJM Relay Subcommittee Protective Relaying Philosophy and Design Standards, Revision 3, dated 6/1/2003. (Attachment H.1c) • Also Reference PJM OATT, Appendix 2, Section 4.9.1, Sheet 516.01B.10. (Attachment H.1d)
<p>R2.1.6</p> <p>Metering & Telecom</p>	<ul style="list-style-type: none"> • PJM OATT, Appendix 2, Section 8, Sheet 516.01B.15 to Sheet 516.01B.17 (Attachment I.1b) and in Section 24, sheet 77. (Attachment I.1c) • PJM Manual 1 – Control Center and Data Exchange Requirements, Revision 15, Section 5, pp. 31-37 (Attachment I.1d)
<p>R2.1.7</p> <p>Grounding & Safety</p>	<ul style="list-style-type: none"> • 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) • Another PPL EU document providing practices on grounding is “Procedure 2-108 Ground Grid Design” – dated 12/29/06. (Attachment J.1b) • The PJM OATT also discusses safety in Appendix 2, Section 7, Sheet 516.01B.15. (Attachment J.1c)
<p>R2.1.8</p> <p>Insulation & Coordination</p>	<ul style="list-style-type: none"> • 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) • 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)
<p>R2.1.9</p> <p>Volts, Reactive Power & Power Factor</p>	<ul style="list-style-type: none"> • PJM OATT, Section II, Item 24.3, p. 77 discusses Power Factor. (Attachment L.2a) • In addition, PJM Manual 3 – Transmission Operations, Revision 33, Section 3, pp. 26-28 discusses these issues. (Attachment L.2b)
<p>R2.1.10</p> <p>Power Quality</p>	<ul style="list-style-type: none"> • 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) • 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. • Power Quality with respect to transmission facilities is also referenced in PJM Manual 14E – Merchant Transmission Specific Requirements, Revision 2, Section 2, pp. 20-23. (Attachment M.1e)

R2.1.11	<ul style="list-style-type: none"> For Transmission facilities, the PPL EU Document “Reliability Principles and Practices – January 2004 Revision” section C, p. 2, items 2 and 7 and section D, pp. 1-2 (items highlighted) indicates that all equipment must be operated within normal limits with system normal and within emergency limits under abnormal conditions. (Attachment N.2a)
Equip. Ratings	
R2.1.12	<ul style="list-style-type: none"> For Transmission facilities, the PPL EU Document “Reliability Principles and Practices – January 2004 Revision” section H, pp. 8, 14-15 illustrate that all reclosing is through synchrocheck facilities. (Attachment O.2a)
Synchronization	
R2.1.13	<ul style="list-style-type: none"> PPL EU Document “Reliability Principles and Practices – January 2004 Revision” section D, p. 6 (Attachment P.2a), section E, p. 1 (Attachment P.2b) that maintenance outages must be coordinated with external entities. This is also identified in section F, pp. 5-7. (Attachment P.2c)
Maintenance	<ul style="list-style-type: none"> PJM Manual 3 – Transmission Operations, Revision 33, Section 1, p. 6. (Attachment P.2d)
R2.1.14	<ul style="list-style-type: none"> PPL EU Document “Reliability Principles and Practices – January 2004 Revision” section F, p. 1 deals directly with operating principles and the steps that must be taken to ensure proper voltage. (Attachment Q.2a)
Operation Issues	<ul style="list-style-type: none"> In addition, refer to PJM Manual 3 – Transmission Operations, Revision 33, Section 3, pp. 23-28 provides additional guidance. (Attachment Q.2b)
	<ul style="list-style-type: none"> Also, refer to PJM Manual 14E – Merchant Transmission Specific Requirements, Revision 2, pp. 24-25. (Attachment Q.2c)
R2.1.15	<ul style="list-style-type: none"> PJM OATT, Attachment O, Appendix 2, Article 5.4, Sheet 516.01B.13 discusses the need for facility inspections. (Attachment S.2a)
Inspection Requirements	
R2.1.16	<ul style="list-style-type: none"> “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&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 & blocking methods, and other information on the status of equipment. (Attachment T.0a)
Normal & Emergency Operating	<ul style="list-style-type: none"> PJM Manual 13 – Emergency Operations, Revision 36, Section 1, pp. 7-9. (Attachment T.2a)
	<ul style="list-style-type: none"> PJM Manual 1 – Control Center and Data Exchange Requirements, Revision 15, Section 4, pp. 27-30. (Attachment T.2b)