Louisville Gas and Electric Company and Kentucky Utilities Company

NERC Reliability Standards

Document Approval Sheet

Transmission Strategy and Planning

FAC-013-2 Transfer Capability Methodology

Effective: October 31, 2016

Louisville Gas and Electric Company and Kentucky Utilities Company

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Standard Information

FAC-013-2: All Requirements

Standard and Requirement Number
Assessment of Transfer Capability for the Near-term Transmission Planning Horizon

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Required Approval Signatures

Max Karavayev – Engineer III Transmission Planning

Print Name & Title (Prepared by)

10-5-2016

Signature & Date

Delyn Kilpack – Manager Transmission Strategy and Planning

Print Name & Title (Approved by)

Delyn Kilpack 10-5-2016

Signature & Date

Chris Balmer – Director Transmission Strategy and Planning

Print Name & Title (Approved by)

Ch Balm 10/5/16

Signature & Date

John Voyles, - Vice President of Transmission and Generation Services

Print Name & Title (Approved by)

10/10/16

Signature & Date

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Revision History

Effective Date	Version No.	2.0
10/31/2016	Summary of Changes: Annual review required by Compliance department; added clarification on forecast; .software tool changed from PSS MUST to TARA; removed reference to R3 since it was retired January 21, 2014. Add paragraph related to new TPL-001-4 standard for performing FAC-013 study. Add clarification that LG&E AND KU TP performs the functions of PC.	
Date	Version No.	1.0
04/01/2013	Summary of Changes: Document Creation	

PPL companies

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1 Introduction

The methodology described in the document was developed to ensure that the Planning Coordinator (PC) for Louisville Gas and Electric and Kentucky Utilities Company (LG&E and KU) perform an annual assessment of Transfer Capability for the Near-Term Planning Horizon. The purpose of the assessment is to identify potential future transmission system weaknesses and limiting Facilities that could impact the Bulk Electric System's (BES) ability to reliably transfer energy.

2 Definitions

Definitions can be found in the NERC Glossary for italicized terms.

Balancing Authority – The responsible entity that integrates resource plans ahead of time, maintains load-interchange-generation balance within a Balancing Authority Area, and supports Interconnection frequency in real time.

Balancing Authority Area – The collection of generation, transmission, and loads within the metered boundaries of the Balancing Authority. The Balancing Authority maintains load-resource balance within this area.

Bulk Electric System (BES) – As defined by the Regional Reliability Organization, the electrical generation resources, transmission lines, interconnections with neighboring systems, and associated equipment, generally operated at voltages of 100 kV or higher. Radial transmission facilities serving only load with one transmission source are generally not included in this definition.

Demand Side Management – The term for all activities or programs undertaken by Load-Serving Entity or its customers to influence the amount or timing of electricity they use.

Facility – A set of electrical equipment that operates as a single Bulk Electric System Element (e.g., a line, a generator, a shunt, compensator, transformer, etc.)

Generator Owner – Entity that owns and maintains generating units.

Load Serving Entity – Secures energy and transmission service (and related Interconnected Operations Services) to serve the electrical demand and energy requirements of its end-use customers.

Near Term Planning Horizon – The transmission planning period that covers Year One through five.

Planning Authority(PA) – The responsible entity that coordinates and integrates transmission facility and service plans, resource plans, and protection systems.

Planning Coordinator (PC) – See Planning Authority

Point-to-Point Transmission Service – The reservation and transmission of capacity and energy on either a firm or non-firm basis from the Point(s) of Receipt to the Point(s) of Delivery

Resource Planner - The entity that develops a long-term (generally one year and beyond) plan for the resource adequacy of specific loads (customer demand and energy requirements) within a Planning Authority Area.

System Operating Limit (SOL) - The value (such as MW, MVar, Amperes, Frequency or Volts) that satisfies the most limiting of the prescribed operating criteria for a specified system configuration to ensure operation within acceptable reliability criteria. System Operating Limits are based upon certain Operating Criteria. These include, but are not limited to:

Facility Ratings (Applicable pre- and post-Contingency equipment or facility ratings)

Transient Stability Ratings (Applicable pre- and post-Contingency stability limits)

Voltage Stability Ratings (Applicable pre- and post-Contingency voltage stability)

System Voltage Limits (Applicable pre- and post-Contingency voltage limits)

Transfer Capability – The measure of the ability of interconnected electric systems to move or transfer power in a reliable manner from one area to another over all transmission lines (or paths) between those areas under specified system conditions. The units of transfer capability are in terms of electric power, generally expressed in megawatts (MW). The transfer capability from "Area A" to "Area B" is not generally equal to the transfer capability from "Area B" to "Area A."

Transmission Planner (TP) – The entity that develops a long-term (generally one year and beyond) plan for the reliability (adequacy) of the interconnected bulk electric transmission systems within its portion of the Planning Authority Area.

3 Responsibilities & Procedures

R1. Each Planning Coordinator shall have a documented methodology it uses to perform an annual assessment of Transfer Capability in the Near-Term Transmission Planning Horizon (Transfer Capability methodology). The Transfer Capability methodology shall include, at a minimum, the following information:

The LG&E and KU Transmission Planner group also performs the functions for Planning Coordinator (PC) for LG&E/KU. The LG&E and KU PC performs an annual assessment of Transfer Capability in the Near-Term Planning Horizon. LG&E and KU uses near term summer and winter peak models developed for the Transmission Expansion Plan (TEP) to perform the annual assessment. (R.1.)

R1.1. Criteria for the selection of the transfers to be assessed.

Transfers up to 150% of the interconnect capability were analyzed. Transfers were also simulated between Midwest ISO, PJM and TVA (i.e. MISO to PJM, PJM to MISO, etc.) up to 10,000 MW. (R1.1.)

R1.2. A statement that the assessment shall respect known System Operating Limits (SOLs).

Transfers are assessed for each first-tier utility for which LG&E and KU has an interface. When identifying transfer limits, the SOLs for LG&E and KU as well as first-tier companies are respected. (R1.2.)

R1.3. A statement that the assumptions and criteria used to perform the assessment are consistent with the Planning Coordinator's planning practices.

The annual assessment is performed utilizing PowerGem TARA software tool. The model(s) for the assessment are developed by LG&E and KU Transmission Planning, performing the functions of Planning Coordinator, in accordance with the LG&E and KU Transmission System Planning Guidelines. Internal TEP model(s), as described in the Transmission System Planning Guidelines, are utilized for the assessment. The model(s) are developed using the most recent NERC Eastern Interconnection Reliability Assessment Group (ERAG) Base Case Series. (R1.3.)

R1.4. A description of how each of the following assumptions and criteria used in performing the assessment are addressed:

R1.4.1. Generation dispatch, including but not limited to long term planned outages, additions and retirements.

Generations units in the LG&E and KU model area are dispatched in merit order. The merit order is provided by the Generator Owners and/or resource planners. Generation outages scheduled for longer than six months, including retirements which are scheduled during the peak of the study period are modeled. Generation additions with approved firm transmission service are modeled. (R1.4.1.)

R1.4.2. Transmission system topology, including but not limited to long term planned Transmission outages, additions, and retirements.

The LG&E and KU transmission system is modeled with the expected normal configuration during the study period. Transmission outages scheduled for longer than six months, including retirements which are scheduled during the peak of the study period are modeled. Transmission additions with a scheduled in-service date prior to the peak of the study period will be modeled. (R1.4.2.)

R1.4.3. System demand.

Network customers provide forecasts of network load levels to include in the model(s). The load level is based on a load forecast for seasonal peak periods for both summer and winter peaks. These are submitted by Load Serving Entities in the LG&E and KU PC area. The system demand for other PC areas outside of LG&E and KU are retrieved from the multiregional modeling working group (MMWG) / Eastern Interconnection Reliability Assessment Group (ERAG) models. (R1.4.3.)

R1.4.4. Current approved and projected Transmission uses.

All approved long-term firm Point-To-Point Transmission Service with a contract period of five or more years will be included in the model(s). (R1.4.4.)

R1.4.5. Parallel path (loop flow) adjustments.

Other transactions that result in loop flows through the LG&E and KU transmission system are those confirmed, firm TSRs that were included in the multiregional modeling working group (MMWG) / Eastern Interconnection Reliability Assessment Group (ERAG) models. (R1.4.5.)

R1.4.6. Contingencies

The analysis will simulate each LG&E and KU single line contingency 100 kV and above. Also, each single line contingency 100 kV and above for first-tier utilities will be simulated. (R1.4.6.)

R1.4.7. Monitored Facilities.

All LG&E and KU and first-tier facilities 100 kV and above will be monitored as part of the simulations. (R1.4.7)

R1.5. A description of how simulations of transfers are performed through the adjustment of generation, Load or both.

Transfer simulations will be performed by utilizing the "export" and "import" functionality of TARA which scales available generation (including offline) up in the "from" area and scales available generation down in the "to" area. (R1.5.)

R2. Each Planning Coordinator shall issue its Transfer Capability methodology, and any revisions to the Transfer Capability methodology, to the following entities subject to the following:

R2.1. Distribute to the following prior to the effectiveness of such revisions:

R2.1.1. Each Planning Coordinator adjacent to the Planning Coordinator's Planning Coordinator area or overlapping the Planning Coordinator's area.

R2.1.2. Each Transmission Planner within the Planning Coordinator's Planning Coordinator area.

This methodology and any subsequent revisions will be distributed to PCs adjacent to or overlapping the LG&E and KU PC area prior to its effectiveness. The methodology and any subsequent revisions will also be distributed to each Transmission Planner (TP) within the LG&E and KU PC area prior to its effectiveness. A spreadsheet with names and contact information for the adjacent Planning Coordinators are maintained by the LG&E and KU PC. (R2.1.) (R2.1.1.) (R2.1.2.)

R2.2. Distribute to each functional entity that has a reliability-related need for the Transfer Capability methodology and submits a request for that methodology within 30 calendar days of receiving that written request.

If an entity, other than described above, has a reliability-related need for the Transfer Capability methodology and submits a request for the methodology, the methodology will be provided within 30 calendar days of receipt of the request. The methodology is posted on OASIS and can be downloaded for those entities that have a reliability related need for the methodology. (R2.2.)

R3. If a recipient of the Transfer Capability methodology provides documented concerns with the methodology, the Planning Coordinator shall provide a documented response to that recipient within 45 calendar days of receipt of those comments. The response shall indicate whether a change will be made to the Transfer Capability methodology and, if no change will be made to that Transfer Capability methodology, the reason why.

Requirement R3 has been retired (January 21, 2014) and is no longer applicable to FAC-013-2.

R4. During each calendar year, each Planning Coordinator shall conduct simulations and document an assessment based on those simulations in accordance with its Transfer Capability methodology for at least one year in the Near-Term Transmission Planning Horizon.

During each calendar year, the LG&E and KU PC will conduct simulations and document an assessment based on those simulations in accordance with its Transfer Capability methodology for at least one year in the Near-Term Transmission Planning Horizon. (R4.)

R5. Each Planning Coordinator shall make the documented Transfer Capability assessment results available within 45 calendar days of the completion of the assessment to the recipients of its Transfer Capability methodology pursuant to Requirement R2, Parts 2.1 and Part 2.2. However, if a functional entity that has a reliability related need for the results of the annual assessment of the Transfer Capabilities makes a written request for such an assessment after the completion of the assessment, the Planning Coordinator shall make the documented Transfer Capability assessment results available to that entity within 45 calendar days of receipt of the request

The assessment results will be distributed within 45 calendar days of the completion of the assessment to adjacent PCs and TPs within the LG&E and KU PC area. Additionally, if a functional entity with a reliability-related need submits a written request for the assessment results, the LG&E and KU PC will make the documented results available to that entity within 45 calendar days of receipt of the request. (R5.)

R6. If a recipient of a documented Transfer Capability assessment requests data to support the assessment results, the Planning Coordinator shall provide such data to that entity within 45 calendar days of receipt of the request. The provision of such data shall be subject to the legal and regulatory obligations of the Planning Coordinator's area regarding the disclosure of confidential and/or sensitive information.

If a recipient of the assessment request data to support the assessment results, the LG&E and KU PC will provide such data to that entity within 45 calendar days of receipt of the request. The provision of such data will be subject to the legal and regulatory obligations of the LG&E and KU PC area regarding the disclosure of confidential and/or sensitive information. (R6.)