



INDEPENDENT, INNOVATIVE, RELIABLE TRANSMISSION MANAGEMENT SERVICES

TSR LGE-2015-016
(TSR #81748926)
System Impact Study Report
Executive Summary

PROPRIETARY

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1. Executive Summary

TranServ has evaluated the Long-Term Firm Point to Point (PTP) Transmission Service Request (TSR) listed in Table 1-1. A System Impact Study (SIS) was performed to determine the impact of this TSR on the transmission network, to determine if any transmission constraints prohibit granting the requested service and to identify any limiting constraints. This report documents that SIS.

Table 1-1 Request Details

Assign Ref	POR	POD	MW	TS Increment	TS Type	Request Type	Start Time	Stop Time	Q-Time
81748926	KMPA	PJM	120	Yearly	PTP	Original	06/01/2017	06/01/2022	10/06/2015

As shown in Table 1-1, TSR #81748926 (TSR LGE-2015-016) is for a 120 MW transaction.

An Ad Hoc Study Group was formed. Participation in the Ad Hoc Study Group was by invitation to all first-tier Transmission Providers (TP) and/or Transmission Owners (TO) of LG&E and KU.

As given in the Louisville Gas and Electric/Kentucky Utilities (LG&E and KU) TSR Study Criteria Document, posted on the LG&E and KU Open Access Same-Time Information System (OASIS), TSR SISs include both Near-Term Transmission Planning Horizon and Long-Term Transmission Planning Horizon models. The subject TSR was evaluated using 2017 Winter peak, 2017 Summer Peak, 2017 Off Peak, 2025 Summer Peak, and 2025 Winter Peak power flow models based on the 2017W, 2017S, 2017H, 2025S, and 2025W 2016 Base Case Study (BCS) R20150227 models (2016 BCS models). The TSR LGE-2015-016 models incorporate the 2015 Transmission Expansion Plan (TEP) LG&E and KU system improvements schedule. It should be noted that initially the TSR LGE-2015-016 models did not include planned system upgrades associated with the retirement of a transmission substation near the point of receipt (POR) of this request. However in response to an Ad Hoc Study Group request to model these upgrades, an additional analysis was performed and the study results were updated accordingly.

All appropriate prior queued transactions were modeled prior to modeling of the subject request. This study included the effect of all earlier queued requests. Representation of these earlier queued requests may also have necessitated the representation of associated planned transmission improvements. Thus, it is important to realize that, if the planned improvements do not come to fruition, the subject request's impact on the transmission system as identified by this study may become invalid and a revised study may become necessary before transmission service can be granted.

The subject request does not start within the posted Available Transfer Capability (ATC)/Available Flowgate Capability (AFC)/Available Share of Total Flowgate Capacity (ASTFC) horizons, so no OASIS ATC/AFC/ASTFC check was performed.

1.1 Summary of Power flow Analysis Results

1.1.1 Thermal Constraints

No system intact thermal constraints due to the subject request were found.

No other system intact thermal constraints due to the subject request were found.

Table 1-2 summarizes the LG&E and KU contingency thermal constraints to providing the requested service.

**Table 1-2
 LG&E and KU Thermal Constraints Summary**

Year/ Season	Facility	Rating	Pre TSR		Post TSR		DF%
			MVA	%	MVA	%	
2017S	TRIMBLCO 345.00 TO 06CLIFTY 345.00 1	1370	1397.93	102.04	1412.34	103.09	12.01%
2025S	HARDST A 69.000 TO WALKER 69.000 1	28	26.38	94.21	30.08	107.43	3.08%
2025S	HARDST A 69.000 TO PRINCETN 69.000 1	28	27.58	98.50	31.71	113.25	3.44%
2025S	EARLNG N 69.000 TO MADS S J 69.000 1	83	82.27	99.12	85.89	103.48	3.02%

It is important to note that only the highest loading results for each contingency of interest for each model/scenario are included in Table 1-2. A more detailed listing of these results can be found in Appendix B of the full report.

No other third party thermal constraints due to the subject request were found.

1.1.2 Voltage Constraints

No voltage constraints due to the subject request were found.

1.1.3 Flowgate Constraints

No LG&E and KU flowgate analysis was performed as part of this study. However, an analysis of third party flowgates was performed and no third party flowgate constraints due to the subject request were found.

1.1.4 ATC/AFC/ASTFC Constraints

The subject request does not start within the posted ATC/AFC/ASTFC horizons, thus no OASIS ATC/AFC/ASTFC check was performed.

1.2 Conclusion

LG&E and KU thermal constraints have been identified, as listed in Table 1-2. These constraints must be addressed by the “Mitigation Needed By” dates shown in Table 1-3 in order to provide the requested service to the TSR-2015-016 request. No Third Party constraints have been identified.

LG&E and KU Constraints

**Table 1-3
 LG&E and KU Mitigation Needed by and Estimated Mitigation Dates**

Facility to Mitigate	Mitigation Needed By	Estimate Mitigation Date	Mitigation
TRIMBLCO TO 06CLIFTY 345	2017S	2017S	Existing Operating Guide
HARDST A TO PRINCETN 69	2024S	2024S	MOT increase of 15.2 mile Hardesty A to Princeton 69 kV line
HARDST A TO WALKER 69	2023S	2023S	MOT increase of 7.94 mile Hardesty A to Walker 69 kV line
EARLNG N TO MADS S J 69	2023S	2023S	MOT increase of 4.03 mile Madisonville Tap to Earlington North 69 kV line

As can be seen in Table 1-2, the loadings on the Trimble – Clifty Creek 345 kV, Princeton – Hardesty, Hardesty – Walker and Earlington North – Madisonville South Junction 69 kV lines load beyond acceptable levels and will require mitigation. As can also be seen from Table 1-2, the Trimble – Clifty Creek 345 kV line was not found to load beyond acceptable levels in the 2025 models. Thus this is only a near-term constraint which, as per LG&E and KU planning guidelines, can be mitigated with an operating guide. As can also be seen from Table 1-2, the Princeton – Hardesty, Hardesty – Walker and Earlington North – Madisonville South Junction 69 kV lines load beyond acceptable levels in the 2025 models and thus must be mitigated with system upgrades. As can be seen in Table 1-3, the estimated mitigation dates shown are coincident with or prior to the mitigation needed dates.

LG&E and KU’s non-binding planning level cost estimate to mitigate the thermal constraints is **\$15, 700,000 USD**. LG&E and KU has determined that direct assignment facilities are not required for this request. A detailed non-binding planning level cost estimate is given in Section 6 of the full report. It is important to note that the cost for this request could actually be \$0 USD if Projects #43, #894 and #895 are retained in the Final LG&E and KU 2016 TEP as they are currently listed

in the Draft LG&E and KU 2016 TEP. The Draft LG&E and KU 2016 TEP was presented by LG&E and KU at the 2015 Fall Stakeholder Meeting and is posted on OASIS within the “2015 Fall LGE-KU ITO Stakeholder Meeting Presentations 11192015” document. Approval of the LG&E and KU 2016 TEP is expected early next year. The cost for this request will be updated in the Facility Study.

Full SIS Report

The full report is available on LG&E and KU CEII FTP site. See study report title posting on OASIS for instructions for accessing LG&E and KU CEII FTP site. LG&E and KU secure CEII FTP site URL is: <https://eft.lge-ku.com/EFTClient/Account/Login.htm>