DISIS 2017-002

Incremental Long-Term Congestion Rights Study Report

GEN-2017-108

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By SPP Generation Interconnections Dept.

REVISION HISTORY

DATE OR VERSION NUMBER	AUTHOR	CHANGE DESCRIPTION
08/21/2024	SPP	Initial Report
09/23/2024	SPP	Updated Sponsored Upgrades to Network Upgrades, Updated Sponsor to Customer
10/31/2024	SPP	Updated results with invalid contingency events removed, Updated Candidate ILTCR(s)

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INTRODUCTION

Incremental Long-Term Congestion Rights (ILTCRs) were made available by FERC 685 Guideline 3 as a reimbursement mechanism for sponsors of transmission upgrades. The guideline specifies that long-term firm transmission rights made feasible by transmission upgrades or expansions must be available upon request to any party that pays for such upgrades or expansions in accordance with the transmission organization's prevailing cost allocation methods for upgrades or expansions. Effective July 1, 2020, ILTCR is the default cost recovery mechanism for eligible Network Upgrades (NU) with Directly Assigned Upgrade Cost (DAUC) as a result of a Generation Interconnection Study (GIS), Aggregate Transmission Service Study (ATSS), or a Sponsored Upgrade Study in SPP.

The objective of the ILTCR analysis is to determine the incremental Available Transfer Capability (ATC) created on each of the Upgrade Sponsor submitted source-to-sink paths over a ten-year period resulting from the construction of the Network Upgrade. The Upgrade Sponsor may then have the option to use the results of this study to obtain candidate ILTCRs on the path selected.

The ILTCR study process was completed for GEN-2017-108 (the Customer) that has Directly Assigned Upgrade Costs (DAUC) for the following network upgrades from DISIS 2017-002 Studies.

- Archie 161 kV Terminal Equipment Upgrade (DISIS-2017-002)
- Archie to G17-108-TAP 161 kV Rebuild (DISIS-2017-002)

STUDY INPUTS

MODEL BASIS

The 2023 ITP Transmission Services (TS) cases were the starting point for the analysis. The following details specify the particular models utilized for this evaluation.

- Model years 2026, 2027, 2028, 2033
    - Summer Peak (2026SP, 2027SP, 2028SP, 2033SP)
    - Winter Peak (2026WP, 2027WP, 2028WP, 2033WP)
    - Light Load (2027LP, 2028LP, 2033LP)

MONITORED FACILITIES

The monitored elements include all SPP control area branches, ties, and buses 69 kV and above, and all first tier Non-SPP control area branches and ties 100 kV and above. NERC Power Transfer Distribution Flowgates for SPP and first tier Non-SPP control areas are monitored. Additional NERC Flowgates are monitored in second tier or greater Non-SPP control areas.

- All branches and ties within the following areas:
    - SPP Internal Areas for 60kV – 999kV facilities:
        - 506– 546, 640 – 659, 998, 999
    - SPP External Areas for 100kV – 999kV facilities:
        - 327, 330, 351, 356, 502, 600, 615, 620, 627, 635, 661, 680
- NERC, SPP, and Tier 1 Permanent Monitor Flowgates (thermal)

CONTINGENCY EVENTS

The contingency set includes all SPP control area branches and ties 69kV and above, first tier Non-SPP control area branches and ties 115 kV and above, any defined contingencies for these control areas, and generation unit outages for the SPP control areas with SPP reserve share program redispatch.

- All branches, ties, shunts, and generators within the following areas:
    - SPP Internal Areas for 60kV – 999kV facilities: o
        - 515 – 546, 640, 641, 642, 645, 650, 652, 659, 998, 999
    - SPP External Areas for 100kV – 999kV facilities:
        - 327, 330, 351, 356, 502, 600, 615, 620, 627, 635, 661, 680
- NERC, SPP, and Tier 1 Permanent Contingent Flowgates
- SPP T.O. Specific P1, P2, P4, and P5 TPL-004-1 Contingencies
- SPP T.O. Specific Op Guide Implementation

NETWORK UPGRADES

The Network Upgrades were sorted based on construction lead-time in order to reflect the sequence of in-service dates for the upgrades. Each Network Upgrade was evaluated sequentially and as a standalone addition. Sequentially, the first Network Upgrade was evaluated in comparison to the TS Case. The second Network Upgrade was evaluated on top of the previously added Network Upgrade. The process was repeated until all Network Upgrades were evaluated. Network

Upgrades that share the same construction lead-time were evaluated as incremental upgrades to the final set of Network Upgrades with the same lead-times. The studied Network Upgrades and associated lead time for the Customer is listed in Table 0-1.

Table 0-1: Network Upgrades

Upgrade ID	Upgrade Name	Estimated Lead-Time (months)
156516	Archie 161 kV Terminal Equipment Upgrade (DISIS-2017-002)	48
156851	Archie to G17-108-TAP 161 kV Rebuild (DISIS-2017-002)	48

CONTINGENT UPGRADES

Contingent upgrades are not yet in-service. These facilities have been assigned to higher queued interconnection customers. These facilities were included in the models respective of their estimated lead-time for this study prior to determining the incremental transfer amount that each Network Upgrade provided. The list of contingent upgrades and their associated lead-time for the participating Customers is listed in Table 0-2.

Table 0-2: Contingent Upgrade Sequence

Upgrade ID	Upgrade Name	Estimated Lead-Time (months)
NTC 210592/210626	Line - Wolf Creek - Blackberry 345 kV	6
NTC 210616	Multi - Minco - Pleasant Valley - Draper 345 kV	6
NTC 210627	Multi - Border - Woodward 345 kV Tap	12
NTC 210483	Multi - Park Community - Sunshine 138 kV	24
NTC 220738/TBD	Matthewson - Redbud 345 kV New Line	48
NTC 210618/200220	Multi - Gentleman - Cherry Co. - Holt Co. 345 kV	48

CUSTOMER TRANSFER PATHS

The Customer is eligible to select up to three (3) source-to-sink transfer paths per Network Upgrade. The list of valid source-to-sink paths is posted on the SPP OASIS site under Source/Sink Summary and were available to Customers with a valid OASIS certificate.

Customers may select paths for ILTCR studies using their new generator that was studied as a source. The generator must be registered in the Marketplace before it is able to participate in the Congestion Hedging process.

Each source-to-sink transfer path was collected by SPP for the Customer and those submissions are captured in the Results section.

STUDY METHODOLOGY

TRANSFER ANALYSIS

A DC transfer analysis was conducted using PowerGEM TARA to determine the limiting flowgates in each applicable case for the respective transfer paths provided by the Customer. Constraints were defined as any overloaded facility in which the transfer had three (3) percent or more TDF or OTDF impact for system intact or contingency conditions respectively. AC Contingency Analysis was performed on each case to identify existing overloaded flowgates that were not caused by the Customer, Network Upgrade, or the source-to-sink transfer path. These flowgates were filtered out of the transfer analysis results for the respective case in which they were reported in the AC Contingency Analysis.

Once the initial DC limiting flowgates were filtered to valid results, the top five (5) limiting flowgates in each applicable case for the respective transfer paths provided by the Customer were AC verified. If the AC verified results reported a non-converged condition and all other AC verified transfers were not zero, then the AC non-converged condition was reviewed for appropriate adjustments until an AC transfer limit was established. If no adjustments were found to resolve the AC non-converged condition, then the AC transfer limit was reported as 0 MW to reflect the condition in which no transfer could be achieved.

With the transfer limits AC verified, the deltas between the minimum AC transfer amounts across all analyzed cases for each path with and without the associated Network Upgrade were determined as follows:

- If ATC pre-NU < 0 and ATC post-NU < 0, then individual increment = 0
- If ATC pre-NU < 0 and ATC post-NU > 0, then individual increment = ATC post-NU
- If ATC pre-NU > 0 and ATC post-NU > 0, then individual increment = ATC post-NU – ATC pre-NU

If the Network Upgrade costs were shared between multiple Customers, then the minimum delta was allocated to each participating Customer in the same proportion as the pro-rata share of the total cost of the upgrade allocated. The lowest amount of candidate MWs that can be awarded is 0.1 MW. Therefore, any candidate MWs below 0.1 MWs is reported as 0.0 MWs.

ILTCR STUDY RESULTS

Table 0-1 summarizes the minimum incremental ATC created across all seasons for each of the source-to-sink paths provided by the Customer for the Network Upgrades.

Appendix A includes the detailed results of the top five (5) most limiting flowgates for each transfer path as submitted by the Customer.

Table 0-1: GEN-2017-108 Candidate ILTCRs

NU #	NU	Source	Sink	Min Delta (MW)	Cost Allocation (%)	cILTCR (MW)
156516	Archie 161 kV Terminal Equipment Upgrade (DISIS-2017-002)	EDEP_SWMPEPHUB	EDE	0	100%	0
156516	Archie 161 kV Terminal Equipment Upgrade (DISIS-2017-002)	MPSIATANUN2	EDE	1.1	100%	1.1
156516	Archie 161 kV Terminal Equipment Upgrade (DISIS-2017-002)	OPPD.NC2	MOPEP_MPS	2	100%	2
156851	Archie to G17-108-TAP 161 kV Rebuild (DISIS-2017-002)	MPSGRNWD1UN4	MPSNEVADAUN1	0.1	100%	0.1
156851	Archie to G17-108-TAP 161 kV Rebuild (DISIS-2017-002)	MPSIATANUN1	EDE	1.1	100%	1.1
156851	Archie to G17-108-TAP 161 kV Rebuild (DISIS-2017-002)	WR.WOLF	KCPL_MPS	4	100%	4

CONCLUSION

The ILTCR analysis determined the incremental ATC created on the Customer submitted source-to-sink paths as provided by the associated Network Upgrade. The Customer may choose the one source-to-sink path in which to receive candidate ILTCRs based on the ATC results presented. If a source-to-sink path that reported no incremental ATC (0 MW) is chosen, then the Customer will not receive any candidate ILTCRs for the Network Upgrade. This data will be included in applicable agreement(s) and executed before filing with FERC.

The Customer must notify SPP 45 days in advance of energization of the associated Network Upgrade via RMS ticket. Tracking of the Network Upgrade progress can be achieved by utilizing the SPP Quarterly Project Tracking workbooks posted on the SPP website. Once the Network Upgrade is energized, SPP will make available TCR MWs for the candidate ILTCR until the end of that TCR year in the next feasible monthly TCR auction.

APPENDIX A

IC	NU	Network Upgrade Name	Source	Sink	Limit	Case	Monitored Facility	Contingency Name	Base FCITC	Upgrade FCITC	ATC Increase
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	EDEP_SWMPEPHUB	EDE	1	33LP0	543094 SWAVRLY2 69.0 543063 SWAVRLY5 161 1	229614	214.5	214.4	0
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	EDEP_SWMPEPHUB	EDE	2	28LP0	543094 SWAVRLY2 69.0 543063 SWAVRLY5 161 1	229614	220.2	220.2	0
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	EDEP_SWMPEPHUB	EDE	3	33WP0	543094 SWAVRLY2 69.0 543063 SWAVRLY5 161 1	229614	249.3	242.5	0
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	EDEP_SWMPEPHUB	EDE	4	28WP0	543094 SWAVRLY2 69.0 543063 SWAVRLY5 161 1	229614	250.2	248.9	0
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	EDEP_SWMPEPHUB	EDE	5	33WP0	547464 BOL 73 5 161 996851 BOL-BURN 69.0 1	259339	261.9	259.8	0
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	MPSIATANUN2	EDE	1	28SP0	542982 IATAN 7 345 996869 IATAN11 161 11	229734	77.5	78.6	1.1
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	MPSIATANUN2	EDE	2	33SP0	542982 IATAN 7 345 996869 IATAN11 161 11	229734	86.5	87.9	1.4
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	MPSIATANUN2	EDE	3	28SP0	996869 IATAN11 161 541350 IATAN5 161 11	229734	144.4	145.6	1.2
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	MPSIATANUN2	EDE	4	33SP0	996869 IATAN11 161 541350 IATAN5 161 11	229734	152.3	153.8	1.5
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	MPSIATANUN2	EDE	5	33WP0	547464 BOL 73 5 161 996851 BOL-BURN 69.0 1	259339	260.9	258.5	0
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	OPPD.NC2	MOPEP_MPS	1	33SP0	645458 S3458 3 345 645456 S3456 3 345 1	234014	31.6	33.6	2
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	OPPD.NC2	MOPEP_MPS	2	33SP0	541232 LEX161 5 161 541264 LEX69 2 69.0 1	229576	59.2	59.2	0
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	OPPD.NC2	MOPEP_MPS	3	28WP0	543062 SALSBRY5 161 543064 NORTON 5 161 1	259350	130.3	137.5	7.2
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	OPPD.NC2	MOPEP_MPS	4	33SP0	543096 MAYVWTP2 69.0 543100 AMOCOPL2 69.0 1	229576	250.6	247.4	0
GEN-2017-108	156516	Terminal Upgrades at Archie 161kV	OPPD.NC2	MOPEP_MPS	5	28SP0	543096 MAYVWTP2 69.0 543100 AMOCOPL2 69.0 1	229576	262.1	248.5	0

IC	NU	Network Upgrade Name	Source	Sink	Limit	Case	Monitored Facility	Contingency Name	Base FCITC	Upgrade FCITC	ATC Increase
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	MPSGRNWD1UN4	MPSNEVADAUN1	1	28SP0	541208 NEVADA 5 161 541308 NEVADA 2 69.0 2	228203	34	34.1	0.1
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	MPSGRNWD1UN4	MPSNEVADAUN1	2	33WP0	541208 NEVADA 5 161 541308 NEVADA 2 69.0 2	228203	42	42.2	0.2
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	MPSGRNWD1UN4	MPSNEVADAUN1	3	28WP0	541208 NEVADA 5 161 541308 NEVADA 2 69.0 2	228203	42.7	42.9	0.2
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	MPSGRNWD1UN4	MPSNEVADAUN1	4	28SP0	541208 NEVADA 5 161 541308 NEVADA 2 69.0 2	Base Case	45.2	45.9	0.7
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	MPSGRNWD1UN4	MPSNEVADAUN1	5	33SP0	541208 NEVADA 5 161 541308 NEVADA 2 69.0 2	228203	57	56.5	0
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	MPSIATANUN1	EDE	1	28SP0	542982 IATAN 7 345 996869 IATAN11 161 11	229734	77.6	78.7	1.1
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	MPSIATANUN1	EDE	2	33SP0	542982 IATAN 7 345 996869 IATAN11 161 11	229734	86.7	88.1	1.4
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	MPSIATANUN1	EDE	3	28SP0	996869 IATAN11 161 541350 IATAN5 161 11	229734	144.7	145.8	1.1
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	MPSIATANUN1	EDE	4	33SP0	996869 IATAN11 161 541350 IATAN5 161 11	229734	152.6	154.1	1.5
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	MPSIATANUN1	EDE	5	33WP0	547464 BOL 73 5 161 996851 BOL-BURN 69.0 1	259339	260.9	258.5	0
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	WR.WOLF	KCPL_MPS	1	28SP0	542982 IATAN 7 345 996869 IATAN11 161 11	229734	293.1	297.1	4
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	WR.WOLF	KCPL_MPS	2	33SP0	542982 IATAN 7 345 996869 IATAN11 161 11	229734	344.1	349.5	5.4
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	WR.WOLF	KCPL_MPS	3	33SP0	996869 IATAN11 161 541350 IATAN5 161 11	229734	617	622.4	5.4
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	WR.WOLF	KCPL_MPS	4	33LP0	532797 WOLFCRK7 345 532799 WAVERLY7 345 1	259303	755.8	752.3	0
GEN-2017-108	156851	Rebuild the decommissioned Archie to G17-108-TAP 161 kV line	WR.WOLF	KCPL_MPS	5	33LP0	532799 WAVERLY7 345 542981 LACYGNE7 345 1	259303	1080.6	1077.8	0