2018 STEP

2018 SPP Transmission Expansion Plan Report

January 5, 2018

Engineering

SPP Southwest Power Pool

Revision History

Date	Author	Change Description
01/05/2018	SPP	Initial Draft

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Section 1: Executive Summary

The 2018 SPP Transmission Expansion Plan (STEP) is a comprehensive listing of all transmission projects in SPP for the 20-year planning horizon. Projects included in the 2018 STEP are:

- Upgrades required to satisfy requests for Transmission Service;
- Upgrades required to satisfy requests for Generator Interconnection Service;
- Approved projects from the Integrated Transmission Planning (ITP) 20-Year,10-Year and Near-Term Assessments;
- Approved Balanced Portfolio Upgrades;
- Approved High Priority Upgrades;
- Endorsed Sponsored Upgrades; and
- Approved Interregional Projects.

The 2018 STEP consists of 445 upgrades with a total cost of $4.96 billion.

We invite stakeholders and all interested parties to submit any written comments on the projects included in the STEP via our Request Management System (RMS). SPP solicits feedback on proposed solutions to transmission needs through stakeholder working groups and planning summits as well as through meetings, teleconferences, web conferences, and via email or secure web-based workspace. These meetings provide an open forum where all stakeholders have an opportunity to provide advice and recommendations to SPP to aid in the development of the STEP. In addition to these opportunities, we also invite stakeholders to provide SPP with any transmission needs they deem to be beneficial to the transmission planning process through our website or RMS.

The chart below illustrates the cost distribution of the 2018 STEP based on project type. More detail on the total portfolio is listed in Section 10.

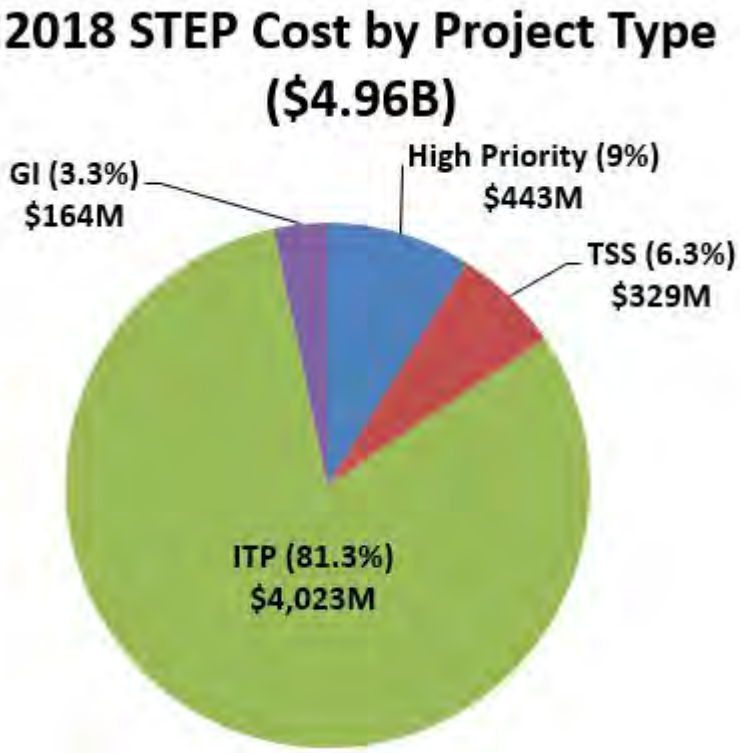

Figure 1-1: Cost by Project Type - 2018 STEP

After the SPP Board of Directors approves transmission expansion projects or once Service Agreements are executed, SPP issues Notifications to Construct (NTC) letters to appropriate Transmission Owners. A list of the NTCs issued in 2017 can be found in Section 11. A breakdown of the total list of NTCs issued in 2017 is shown below in Figure 1-2.

In 2017, SPP issued 30 NTC letters with estimated construction costs of $263.2 million for 71 projects to be constructed over the next five years through 2023. Of this $263.2 million, the upgrade cost breakdown is as follows:

- $110 thousand for Generator Interconnection (GI);
- $140.9 million for Transmission Service (TSS);
- $28.7 million for High Priority (HP); and
- $93.5 million for Integrated Transmission Planning (ITP) projects.

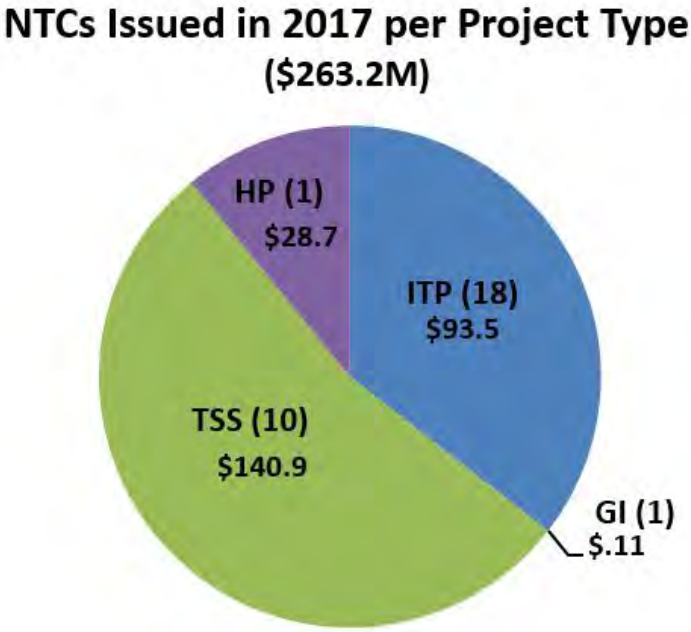

Figure 1-2: NTCs Issued in 2017 per Project Type

SPP actively monitors the progress of approved projects by soliciting feedback from project owners at least quarterly. As of December 20, 2017, 36 upgrades totaling approximately $245.6 million were completed during the year. The breakdown includes:

- 19 ITP - $163.9 million
- 3 TSS - $26.6 million
- 13 GI - $43.4 million
- 1 HP - $11.7 million

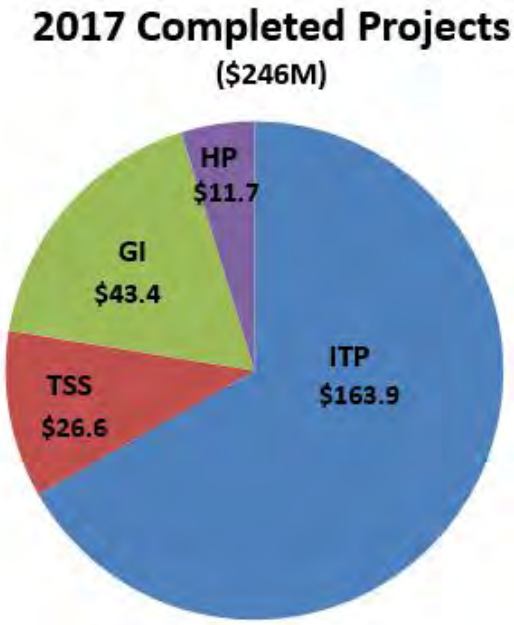

Figure 1-3: 2017 Completed Projects

Section 2:Transmission Services

2.1: Transmission Service 2017 Overview

SPP conducts the Aggregate Transmission Service Study (ATSS) process to determine if the SPP transmission system and neighboring Transmission Providers can accommodate requests for long-term firm Transmission Service. SPP combines all long-term point-to-point and long-term network integration transmission service requests received during a specified period of time into a single ATSS in order to develop a more efficient expansion of the transmission system that provides the necessary Available Transfer Capability (ATC) to accommodate all such requests at the minimum total cost.

During 2017, SPP completed two Aggregate Facilities Studies within the165-day study completion deadline in Attachment Z1 of the SPP Tariff. There were a combined 81 requests with a requested capacity of 5,076 MW. Below is a link to the Transmission Service Studies page where the studies can be further reviewed:

http://sppoasis.spp.org/documents/swpp/transmission/TRPAGE.cfm

Currently, the 2017-AG2 Aggregate Facility Study is underway and will be posted to the Transmission Service Studies page by May 14, 2018. There are 28 requests with a requested capacity of 1,561 MW in this study.

The graph below shows the total estimated cost of Transmission Service projects included in the 2018 STEP as compared to previous STEP Reports. Fluctuations in the annual STEP estimates may be influenced by the number of new projects identified in completed Transmission Service Studies either having been issued NTCs or approved and awaiting the issuance of an NTC, the completion of Transmission Service related projects, and the increase and decrease of Transmission Owner submitted project cost estimates within the applicable STEP timeframe.

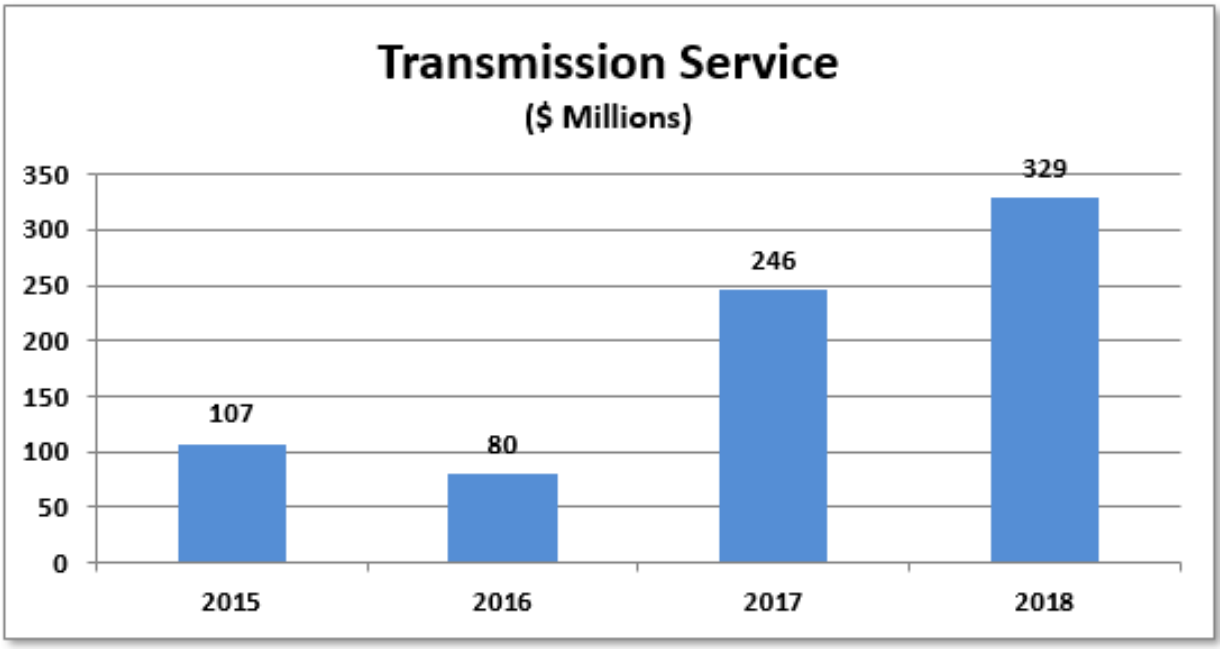

Figure 2-1: STEP Cost Estimate Comparison for Transmission Service Projects – 2015-2018

Transmission Service projects completed in 2017 can be found in the Completed Projects table in Section 12.

2.2: Tariff Attachments AQ and AR

Attachment AQ

SPP Tariff Attachment AQ defines a process through which delivery point additions, modifications, or abandonments can be studied without having to go through the Aggregate Study process. Delivery points submitted through the process are examined in an initial assessment to determine if a project is likely to have a significant effect on the transmission system. If necessary, a full study is then performed on the requested delivery points to determine any necessary upgrades. There were two NTCs issued in 2017 as a result of the Attachment AQ study process.

The number of requests and required studies are summarized in Table 2-1 below.

Study Year	Delivery Point Requests	Full Studies Required	Load Increase
2013	87	22	882 MW
2014	96	19	1,032 MW
2015	89	13	1,271 MW
2016	129	21	1,021 MW
2017	106	21	1,196 MW

Table 2-1: AQ Study Summary – 2013-2017

Attachment AR

Attachment AR defines a screening process used to evaluate potential Long-Term Service Request (LTSR) options or proposed Delivery Point Transfers (DPT). The LTSR option provides customers with a tool to assess possible availability of transmission service. The DPT screening study option enables customers to implement a DPT via issuance of a Service Agreement, more expediently pending the results of the screening. Both of these screening tools allow for a more streamlined ATSS process by reducing the number of requests in the ATSS process.

During 2017, seven DPT studies were posted and service was granted for six of the studies. There were no LTSR studies requested in 2017, but there were nine studies posted in 2017 resulting from 2016 requests.

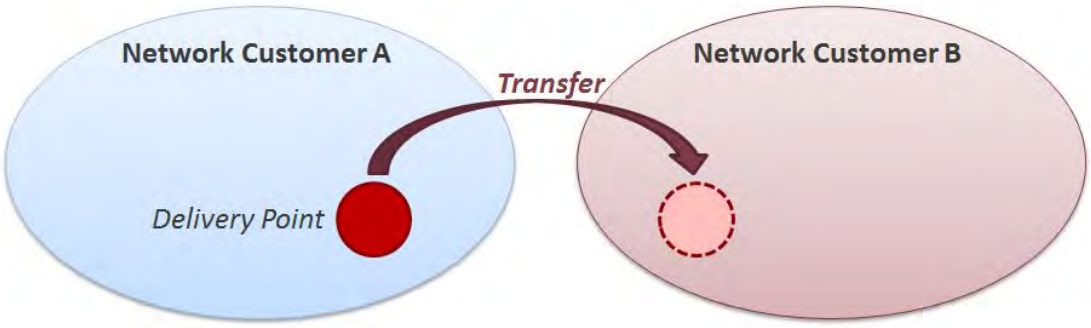

Figure 2-2 DPT Study Process

Section 3: Generator Interconnection

3.1: Generator Interconnection Overview

A GI study is conducted pursuant to Attachment V of the SPP Tariff whenever a request is made to connect new generation to the SPP transmission system. GI studies are conducted by SPP in collaboration with affected Transmission Owners and neighboring Transmission Providers to determine the required modifications to the transmission system, including cost and scheduled completion dates required to provide the service.

From January 1, 2017 to December 15, 2017 SPP received 239 GI requests and twenty-four (this includes both withdrawn and incomplete) affected system GI requests, compared to the 184 GI requests and nine affected system study requests received through the same period in 2016. As of December 15, 2017, there were 406 active[1] GI queue requests under study for 74,306 MW, and 9 requests had been removed from "study" status either from being withdrawn by the Customer or SPP or by the Customer executing a Generator Interconnection Agreement (GIA). The affected system study requests were made by neighboring Transmission Providers requesting SPP's evaluation of the impact of the requests on SPP's transmission system.

The graph below shows the total estimated cost of GI projects included in the 2018 STEP as compared to previous STEP Reports. Fluctuations in the annual STEP estimates may be influenced by the number of new projects identified in completed Generator Interconnection Studies that have either been issued NTCs or are approved and are awaiting the issuance of an NTC, the completion of Generator Interconnection related projects, and the increase and decrease of Transmission Owner submitted project cost estimates within the applicable STEP timeframe.

[1] Active GI requests includes those with an OASIS status of: FEASIBILITY STUDY STAGE, PISIS STAGE, DISIS STAGE, FACILITY STUDY STAGE, or IA PENDING, and those that have been submitted but not yet validated.

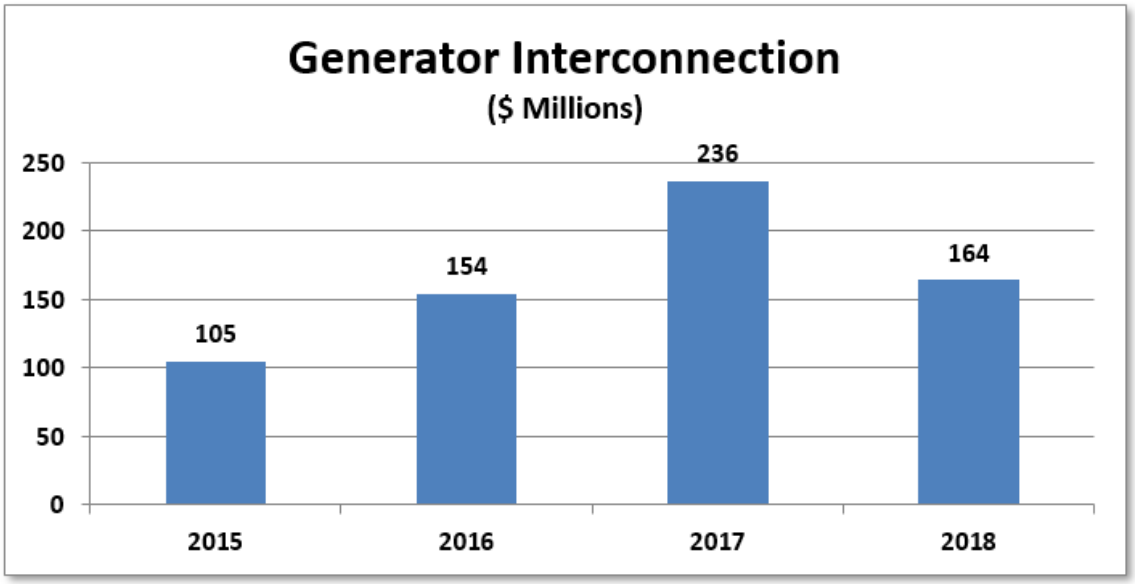

Figure 3-1: STEP Cost Estimate Comparison for Generator Interconnection Projects – 2015-2018

GI projects completed in 2017 can be found in the Completed Projects table in Section 12.

Section 4: Integrated Transmission Planning

4.1: 2017 ITP Near-Term (ITPNT)

During 2017, the 2017 ITPNT Assessment was completed and approved by the SPP Board of Directors in April. The 2017 ITPNT analyzed the SPP region's immediate transmission needs over the near-term planning horizon. The ITPNT assessed: a) regional upgrades required to maintain reliability in accordance with the North American Electric Reliability Corporation (NERC) Transmission Planning (TPL) Reliability Standards and SPP Criteria in the near-term horizon; b) zonal upgrades required to maintain reliability in accordance with more stringent individual Transmission Owner planning criteria in the near-term horizon; and c) coordinated projects with neighboring Transmission Providers. ITPNT projects are reviewed by SPP's Transmission Working Group (TWG) and Markets and Operations Policy Committee (MOPC) and approved by the SPP Board of Directors. Following Board of Directors' approval, SPP issued NTC letters for upgrades that required a financial commitment within the next four-year timeframe.

SPP performed analyses identifying potential bulk power system reliability needs. These findings were presented to Transmission Owners and the TWG to solicit transmission solutions to the potential issues identified. Also considered were transmission solutions from other SPP studies, such as the Aggregate Transmission Service Study and Generator Interconnection processes. From the resulting list of potential solutions, SPP identified the cost effective regional solutions for potential reliability needs. Through this process, SPP developed a draft list of 69 kV and above solutions necessary to provide reliable service in the SPP region in the near-term planning horizon.

For information on the 2017 ITPNT Assessment, see the full report (SPP.org > Engineering > Transmission Planning>2017 ITPNT Report).

The maps in Figures 4-1 and 4-2 show the draft ITPNT thermal and voltage solutions in correlation to the areas identified with reliability criteria violations.

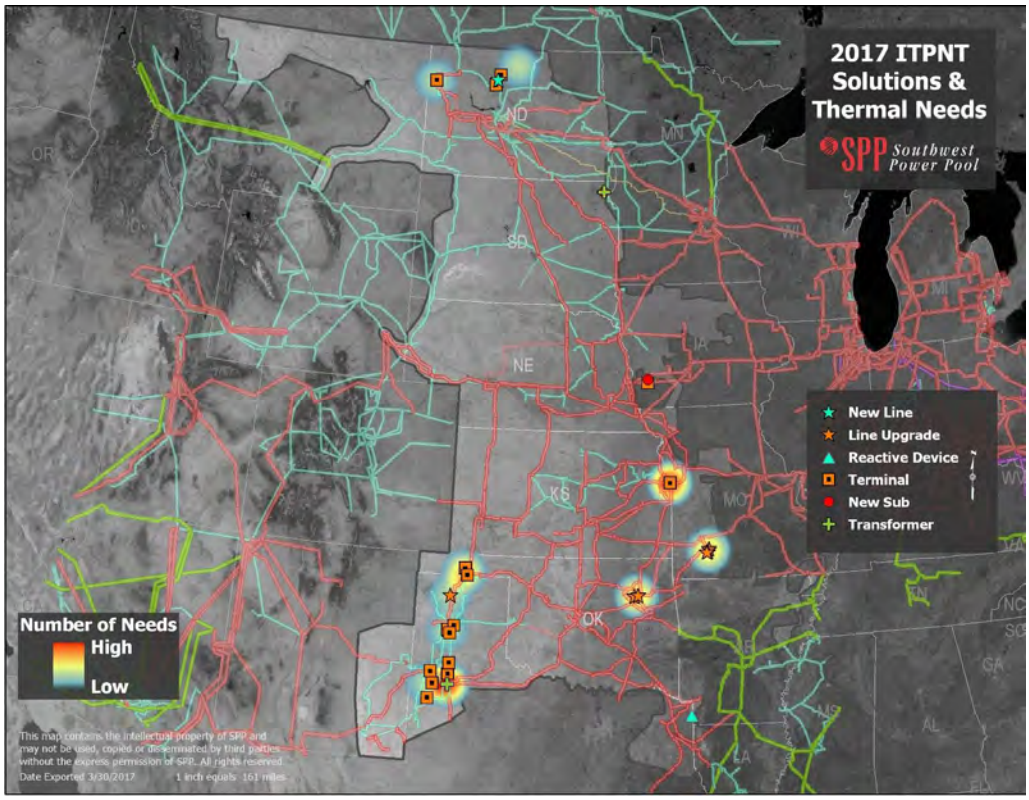

Figure 4-1: 2017 ITPNT Thermal Needs and Solutions

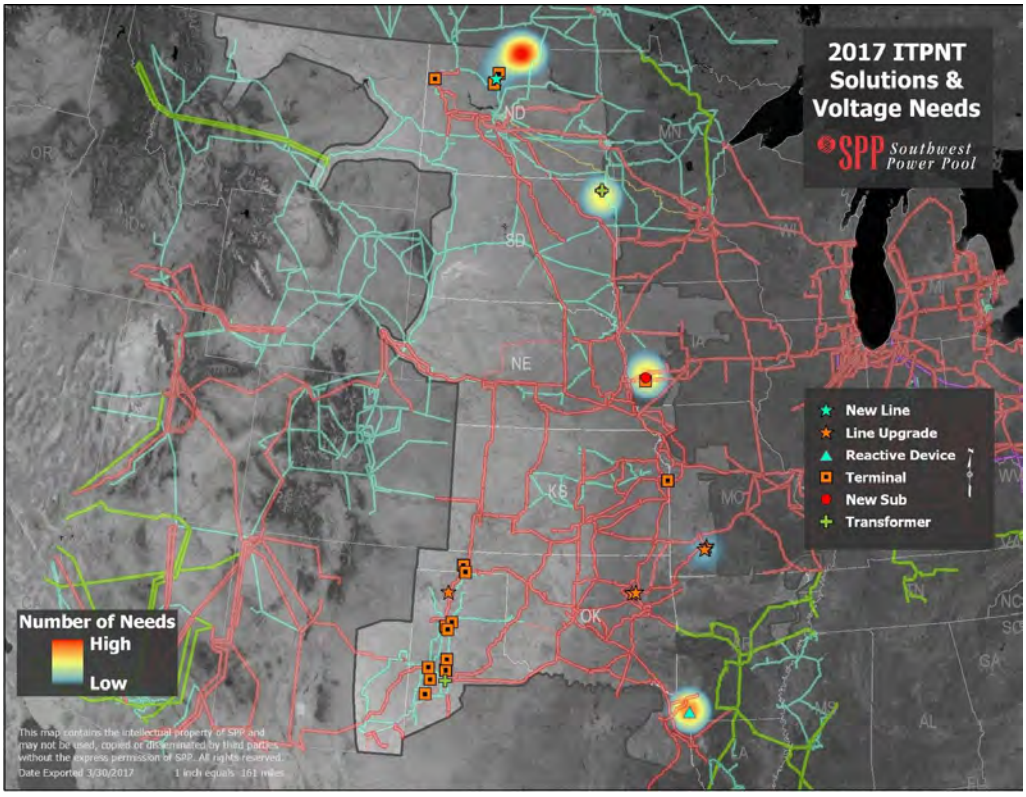

Figure 4-2: 2017 ITPNT Voltage Needs and Solutions

The net total study STEP impact of the 2017 ITPNT project plan is estimated to be $23.45M. There are 25 proposed upgrades making up 16 projects in the project plan. Of the 16 proposed projects, 15 will be recommended for issuance of new NTCs. One project had been identified as needing a Modified NTC (NTC modify). That net impact includes $60.34M for new projects, $184K in NTC Modify projects, and a reduction of $37M for withdrawn NTCs identified in the 2017 ITPNT Assessment. The 25 upgrades that received an NTC, NTC-C or NTC Modify solved 40 thermal and 68 voltage needs on the SPP transmission system. Project plan mileage consists of 26 miles of new transmission line and 35 miles of rebuild/reconductor line.

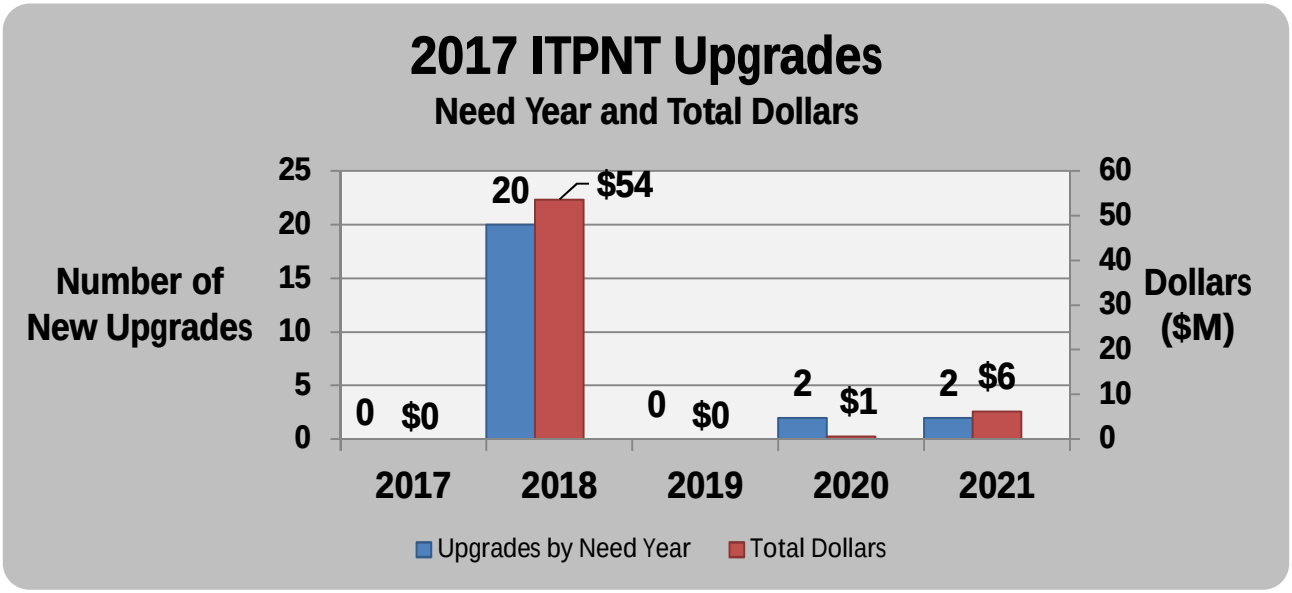

Figure 4-3: 2017 ITPNT Upgrades by Need Years and Dollars

Voltage Class	New Line (miles)	Rebuild/Reconductor (miles)
138 kV	0	9
115 kV	24	11
69 kV	2	15

Table 4-1: 2017 ITPNT Project Plan Mileages

The 2018 ITPNT assessment is currently in progress and SPP intends to finalize the Report and Portfolio in July 2018.

4.2: 2017 ITP10

The 2017 ITP10 was summarized in the 2017 STEP report which included a list of proposed projects. NTCs from the 2017 ITP10 were issued in 2017 and the table below summarizes the projects.

NTC ID	PID	Project Name	Facility Owner	Current Cost Amount
200428	31085	Northeast - Charlotte - Crosstown 161 kV Reactor	KCPL	$500,000
200429	31127	Knoll - Post Rock 230 kV New Line Ckt 2	MIDW	$409,012
	31127	Knoll Sub 230kV Terminal		$1,652,257
	31127	Post Rock Sub Addition		$1,245,091
200430	31082	Butler - Altoona 138 kV Terminal Upgrades	WR	$238,640
	31083	Neosho - Riverton 161 kV Terminal Upgrades	WR	$111,370
200431	31131	Siloam Springs - Siloam Springs City 161 kV Ckt 1 Rebuild (AEP)	AEP	$4,780,000
200432	31131	Siloam Springs - Siloam Springs City 161 kV Ckt 1 Rebuild (GRDA)	GRDA	$279,400
200433	31144	Tupelo 138 kV Terminal Upgrades	WFEC	$100,000
200434	31150	Lula- Tupelo Tap 138 kV Terminal Upgrades	OGE	$16,000
200444	31079	Tuco - Stanton 115 kV Terminal Upgrades	SPS	$356,757
	31080	Stanton - Indiana 115 kV Terminal Upgrades		$302,133
	31081	Indiana - SP-Erskine 115 kV Terminal Upgrades		$294,764
	41189	Martin - Pantex North 115 kV Terminal Upgrades		$335,157
	41189	Pantex South - Highland Tap 115 kV Terminal Upgrades		$335,697
200467	31082	Butler - Altoona 138 kV Terminal Upgrades	WR	$247,332

Table 4-2: 2017 ITP10 NTCs Issued

4.3: 2017 ITP10 Potter to Tolk 345 kV Additional Analysis

SPP staff proposed the construction of a 345 kV transmission line from the Potter 345 kV substation to the Tolk 345 kV substation as a part of their recommended 2017 ITP10 assessment portfolio. The MOPC approved the portfolio at its January 2017 meeting. During the 2017 SPP Board meeting, concerns were brought to the Board by stakeholders and Members Committee. With this feedback, the Board directed staff to further evaluate the project and report back to the Board at its April 2017 meeting.

With review and requested feedback from the TWG and ESWG, staff developed a study scope that contained the following elements:

- Perform a review of the third party study estimate used in the 2017 ITP10 assessment
- Perform economic model input sensitivities on the following:
    - Conventional resource assignment and siting
    - Renewable additions and siting
    - Load and gas price forecasts
- Substantiate future avoided reliability projects
- Calculate 40-year benefits

Staff presented their findings[2] to the Board during its April 2017 meeting with a recommendation for the removal of the Potter to Tolk 345 kV transmission line from the 2017 ITP10 portfolio. The TWG-, ESWG-, and MOPC-approved recommendation was approved by the Board and the project was removed from the portfolio.

[2] A presentation regarding the analysis can be found in the background materials of the April 25, 2017 Board meeting. Materials can be found at the following link: https://www.spp.org/documents/49913/bod_materials_20170425_pgd.pdf

Section 5: High Priority Studies

Figure 5-1 below is a comparison of the cost estimates for projects coming out of High Priority Studies. High Priority Studies projects completed in 2017 can be found in the Complete Project table in Section 12. Study details follow in sections 5-1 and 5-2.

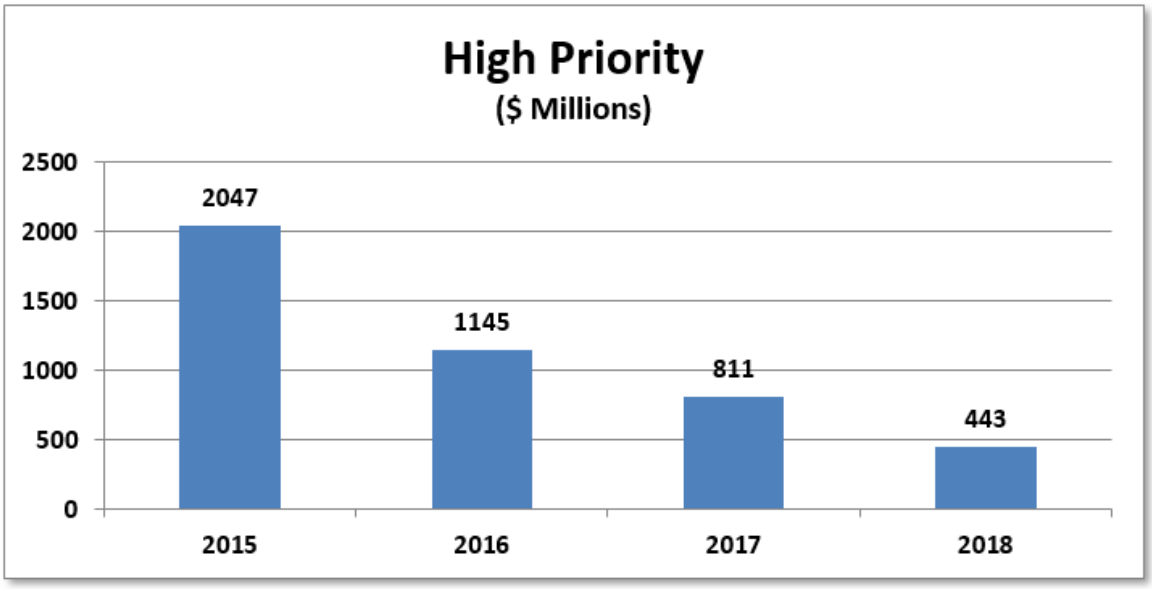

Figure 5-1: STEP Cost Estimate Comparison for High Priority Projects – 2015-2018

5.1: SPP Priority Projects

As referenced in the 2017 STEP Report, the final three projects associated with SPP's 2010 Priority Projects assessment were all place in-service in mid-December 2016. The projects are listed below in Table 5-1. For information on Priority Projects, see the full report (SPP.org > Engineering > Transmission Planning>Local Area Planning and High Priority Studies).

NTC ID	Project ID	Project Owner	Project Name
20096	936	AEP	Northwest Texarkana – Valliant 345 kV Ckt 1
20097	938	TSMO	Multi – Nebraska City – Mullin Creek – Sibley 345 kV (GMO)
20098	939	OPPD	Line – Nebraska City – Mullin Creek 345 kV (OPPD)

Table 5-1: Priority Projects

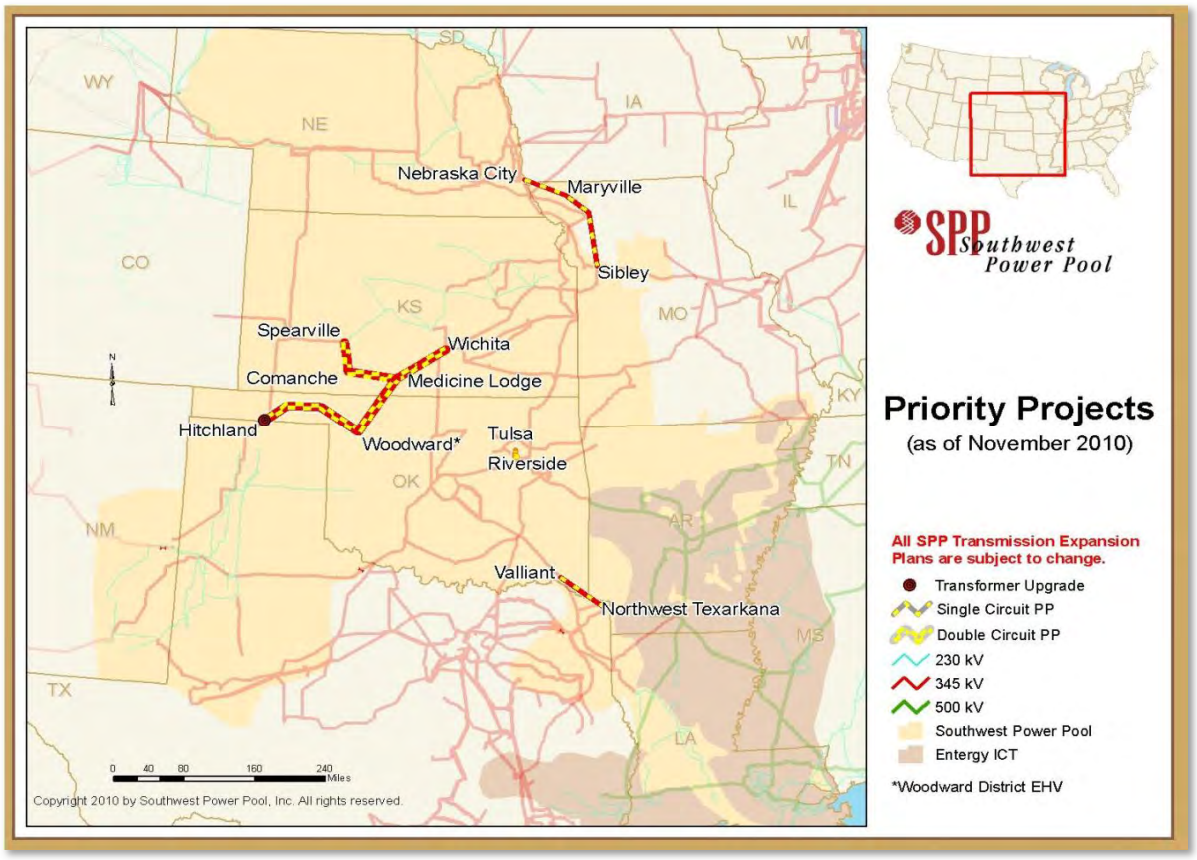

Figure 5-2: SPP Priority Projects

5.2: High Priority Incremental Load Study (HPILS)

HPILS projects included in the 2018 STEP List are listed in Table 5-2 below.

For information on the HPILS assessment, see the full report (SPP.org > Engineering > Transmission Planning>Local Area Planning and High Priority Studies).

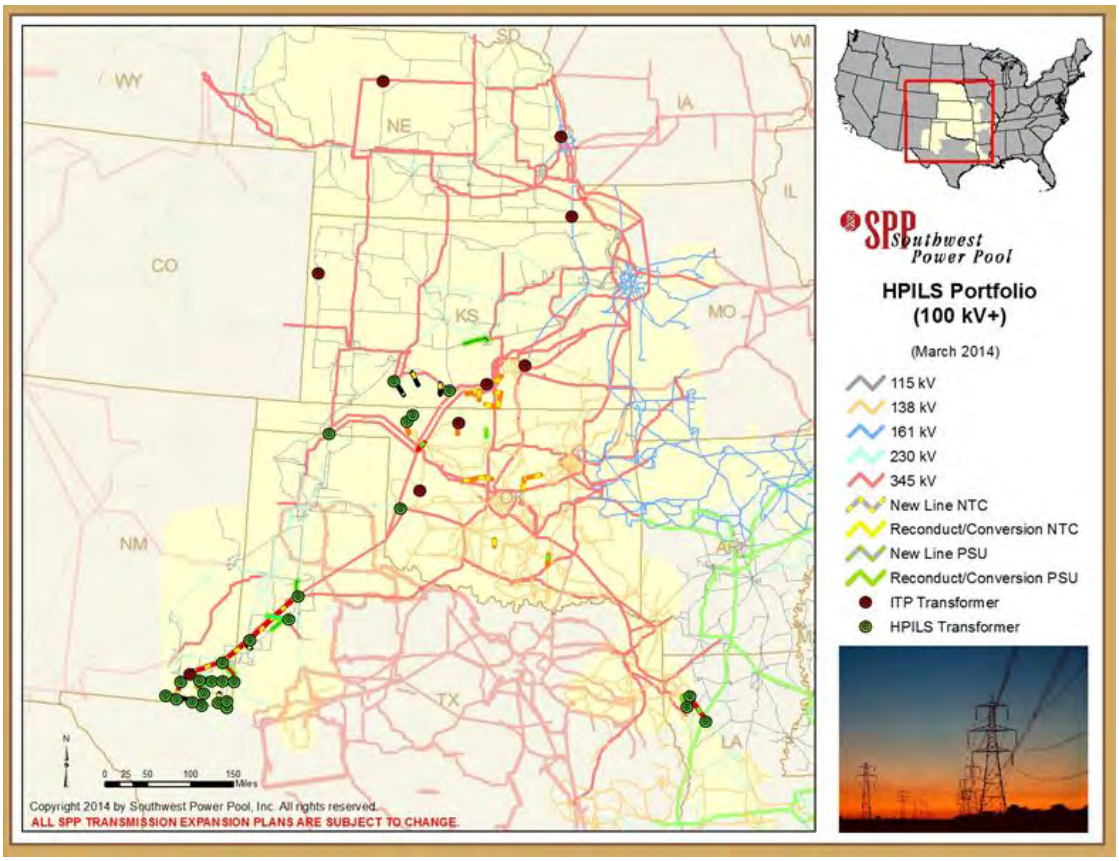

Figure 5-3: Finalized HPILS Portfolio (100 kV and above)

NTC ID	Project ID	Project Owner	Project Name	Current Cost Estimate
200276	30645	MKEC	Line - Harper - Rago 138 kV Ckt 1	$12,625,134
200277	30678	NPPD	XFR - Thedford 345/115 kV	$10,236,801
200282	30675	200282	Multi - China Draw - Yeso Hills 115 kV	$15,776,480
200282	30672	SPS	Multi - Dollarhide - Toboso Flats 115 kV	$5,062,341
200282	30694	SPS	Multi - Ponderosa - Ponderosa Tap 115 kV	$5,222,364
200309	30376	SPS	Multi - Hobbs - Yoakum 345/230 kV Ckt 1	$104,655,870
200309	30638	SPS	Multi - Kiowa - North Loving - China Draw 345/115 kV Ckt 1	$72,457,140
200309	30637	SPS	Multi - Hobbs - Kiowa 345 kV Ckt 1	$58,767,041
200309	30639	SPS	Multi - Potash Junction - Road Runner 345 kV Conv. and Transformers at Kiowa and Road Runner	$23,991,024
200309	30695	SPS	Multi - Livingston Ridge - Sage Brush - Lagarto - Cardinal 115 kV	$8,497,695
200436	30695	SPS	Multi - Livingston Ridge - Sage Brush - Lagarto - Cardinal 115 kV	$19,630,000
200311	30622	OGE	Multi - Knipe - SW Station - Linwood & Warwick Tap 138 kV Ckt 1	$30,844,580
200335	30644	MKEC	Line - Anthony - Harper 138 kV Ckt 1	$11,949,636

NTC ID	Project ID	Project Owner	Project Name	Current Cost Estimate
200362	30732	MKEC	Multi - Anthony - Bluff City - Caldwell - Mayfield - Milan - Viola 138 kV Ckt 1	$40,320,264
200363	30732	WR	Multi - Anthony - Bluff City - Caldwell - Mayfield - Milan - Viola 138 kV Ckt 1	$3,915,388
200411	30694	SPS	Multi - Ponderosa - Ponderosa Tap 115 kV	$5,000,000
200411	30825	SPS	Line - China Draw - Wood Draw 115 kV Ckt 1	$14,200,000

Table 5-2: HPILS Projects

Section 6: Sponsored Upgrades

No Sponsored Upgrades were completed and no new Sponsored Upgrades were approved in 2017.

Section 7: Regional Cost Allocation Review (RCAR)

SPP filed Docket No. ER17-2229 with the Federal Energy Regulatory Commission (FERC) on August 2, 2017 requesting revision to Attachment J, Section III.D.1 of its OATT. SPP, with review and/or approval of the RARTF, RTWG, CAWG, MOPC and the RSC, requested the timeline for performing the RCAR analysis be revised from the current three-year mandatory requirement to six years. An effective date of October 1, 2017 was also requested. The FERC issued an Order[3] on September 29, 2017 accepting the tariff revision.

The RARTF is currently exploring options for the RCAR III assessment. The next scheduled meeting is for January 15, 2018 at the AEP offices in Dallas, TX.

[3] https://www.ferc.gov/CalendarFiles/20170929091320-ER17-2229-000.pdf

Section 8: Interregional Coordination

8.1: Interregional Planning

Throughout 2017, SPP continued participation in joint planning and coordination processes with three different neighboring entities. SPP's respective Joint Operating Agreements (JOA) with Associated Electric Cooperative Inc. (AECI) and Midcontinent Independent System Operator (MISO) outline the requirements for joint and coordinated planning procedures, each of which result in the production of a Coordinated System Plan (CSP) which concluded in 2017. Addendum 4 to Attachment O of the Tariff outlines the requirements of the joint coordination procedures with the Southeastern Regional Planning Transmission group (SERTP).

2016 SPP-AECI JCSP

The SPP-AECI Joint Operating Agreement (JOA) requires a Joint Coordinated System Plan (JCSP) study be performed every other year to assure the reliable, efficient and effective operation of the transmission system along the SPP-AECI seam. SPP and AECI, along with SPP stakeholders, collaborated throughout 2016 on the performance of a JCSP to identify potential joint transmission projects that are mutually beneficial to both entities. The study concluded in January 2017 with the SPP-AECI Joint Planning Committee approving two projects.

Morgan Transformer Project

The project includes the addition of a new 345/161 kV transformer at AECI's existing Morgan substation in addition to an uprate of the 161 kV line between Morgan and Brookline. The analysis performed in the 2016 SPP-AECI JCSP showed significant benefit across multiple models used for the study. SPP and AECI utilized real-time Emergency Management System (EMS) modeling data to mimic the known and chronic operational issues in a planning model. These models allowed SPP to test potential transmission solutions to address the overloading issues at Brookline. An adjusted 2017 ITPNT model was also used to recreate the problem using a No Hydro Scenario. By turning off all of Southwestern Power Administration's (SPA) hydro generation and City Utilities of Springfield (CUS) JTEC units, SPP was able to recreate the overloading issues in a severe planning case. Table 8-1 illustrates the results of the Brookline overloading issues.

2016 SPP-AECI JCSP	Brookline Transformer %Overloaded (EMS Model)	Brookline Transformer %Overloaded (No Hydro Model)
Base case	102.8%	129.4%
Morgan Transformer	84.2%	99.5%

Table 8-1: Brookline Overloading Issues

In addition to the benefit shown in the joint study with AECI, this project also was recommended as an economic solution to address congestion in the 2017 SPP ITP10 study. The project's estimated engineering and construction costs is $13.75M. SPP and

AECI agreed to a cost share where SPP would be responsible for 89% of the project or $12.25M.

Brookline Reactor Project

The project includes the addition of a 50 MVAR reactor at SPP's existing Brookline 345 kV substation. The analysis performed in the 2016 SPP-AECI JCSP showed significant benefit for the project by reducing the voltage levels to be under SPP's criteria of 1.05 per unit (pu). The analysis also demonstrated that voltage levels would be lower on two AECI buses located at Huben and Morgan. SPP and AECI utilized real-time EMS modeling data to mimic the known and chronic operational high voltage issues in a planning model. These models allowed SPP to test potential transmission solutions to address the issue. Table 8-2 illustrates the results of the Brookline high voltage issues.

2016 SPP-AECI JCSP	Brookline High Voltages (pu)	Huben High Voltages (pu)	Morgan High Voltages (pu)
Base case	1.051	1.057	1.053
Brookline Reactor	1.039	1.054	1.046

Table 8-2: Brookline High Voltage Issues

In addition to the joint study with AECI, SPP also performed a regional review of this project in 2017. The project's estimated engineering and construction costs is $5M that would be allocated to SPP and AECI. SPP and AECI agreed to a cost share where SPP would be responsible for 97% of the project or $4.85M.

Regional Review of the 2016 SPP-AECI JCSP

SPP follows the stakeholder approved Regional Review Methodology to confirm the benefits to the SPP transmission system. The Morgan Transformer Project was not required to go through a regional review process because it was previously approved through an SPP regional planning process.

Regional Review of the Brookline Reactor Project

The TWG developed and approved the Brookline Reactor Regional Review Scope. The scope included evaluating the project in a planning model, reviewing the work done in the 2016 SPP-AECI JCSP, and confirming the project addressed a persistent operational need.

SPP utilized the 2017 ITP Near-Term supplemental model(s), which include the 2017 ITP10 approved projects, Generation Interconnection and Transmission Service approved projects and known model corrections, to evaluate the effectiveness of the project to provide voltage relief on the facilities in the area. As discussed in previous sections, no high voltage criteria violations in the area were identified in either the base or change case runs as this need is not typically identified in traditional planning studies.

SPP also presented an in-depth review of the analysis completed in the joint study with AECI to provide the benefits identified to SPP. The purpose of this was to provide

stakeholders who had not been involved in the joint portion of the study with the study results and the benefit identified to SPP.

Lastly, SPP utilized the Persistent Operations Issues Criteria document that was approved within SPP's regional stakeholder groups to provide details highlighting the presence of the chronic operational issues the project is addresses. High voltage issues in the document are described below:

- High/Low Voltage issues (Reliability)
    - Transmission Operating Guides that require reconfiguration, documenting mitigations for high and low voltage issues, will be reviewed from the last cycle and related voltage issues will be added to the ITP needs list. The mitigation to avoid the high/low voltage issue must be implemented 10% of the time of the year due to non-outage issues. Transmission Operating Guides that will be considered will only include transmission reconfiguration or potential load shed events. Switched shunts and generator Mvar adjustments will be optimized prior to needs being identified.

SPP provided the data to show the high voltage needs this project addresses are indeed a persistent operational issue. The mitigation to relieve the high voltage needs was active 22.47% of the time in 2016.

The SPP SSC, TWG, MOPC, and Board of Directors all approved the Brookline Reactor Project out of the regional review process.

FERC Filings

On August 7, 2017, SPP submitted filings to FERC for i) approval of the joint SPP and AECI projects; ii) the cost sharing approach negotiated between SPP and AECI; and iii) the regional cost allocation of the SPP responsible costs. This filing also included the negotiated agreement between SPP and AECI. SPP had requested an October 6, 2017 effective date.

On October 6, 2017, FERC issued an order rejecting the cost allocation for proposed Morgan Transformer and Brookline Reactor transmission projects identified pursuant to the joint planning process contained in the Commission-approved Joint Operating Agreement between SPP and AECI, and in so doing rejecting the proposed projects.

In the Order, FERC stated that "SPP has not shown that the proposed cost allocation for these specific non-Order No. 1000 projects, and the allocation of SPP's share of the costs of these projects on a region-wide, load-ratio share basis, is roughly commensurate with the projects' benefits…" and continued "Our rejection of SPP's proposal in these dockets does not preclude SPP from making a filing with the Commission demonstrating that the Morgan Transformer Project and Brookline Reactor Project provide regional benefits or proposing an alternative allocation of its share of the costs of these transmission projects that is roughly commensurate with the benefits"

SPP staff is evaluating the Commission's order and developing next steps for cost allocation of the two joint projects.

2016 SPP-MISO CSP

SPP continued interregional planning activities with MISO in 2017. SPP and MISO continued the 2016 CSP study pursuant to the joint planning procedures contained in Article 9 of the SPP-MISO JOA. The CSP was formally initiated on May 31, 2016, when the SPP-MISO Joint Planning Commission (JPC) voted in favor of performing a 2016 CSP Study. The purpose of the 2016 CSP study was to jointly evaluate seams transmission issues and identify transmission solutions that efficiently address the identified issues to the benefit of both SPP and MISO. The study consisted of an economic evaluation of seams transmission issues previously identified in SPP and MISO regional planning processes. This was accomplished by leveraging transmission needs identified in the SPP Integrated Transmission Planning (ITP) studies (2017 ITP10) and the MISO Transmission Expansion Planning (MTEP) process (2016 MTEP). The goal of the approach was to determine if interregional transmission solutions exist that were more efficient and cost effective than what each Regional Transmission Organization (RTO) could do regionally to address these needs. The interregional portion of the study concluded in April of 2017 with one project being recommended by the SPP-MISO JPC.

Loop One Split Rock to Lawrence 115 kV circuit into Sioux Falls

The proposed Interregional Project, Loop One Split Rock to Lawrence 115 kV Ckt into Sioux Falls, was a proposed new transmission project located near Sioux Falls, South Dakota. This project had an estimated in-service date of 2021. This project is also referred to as “I-18”.

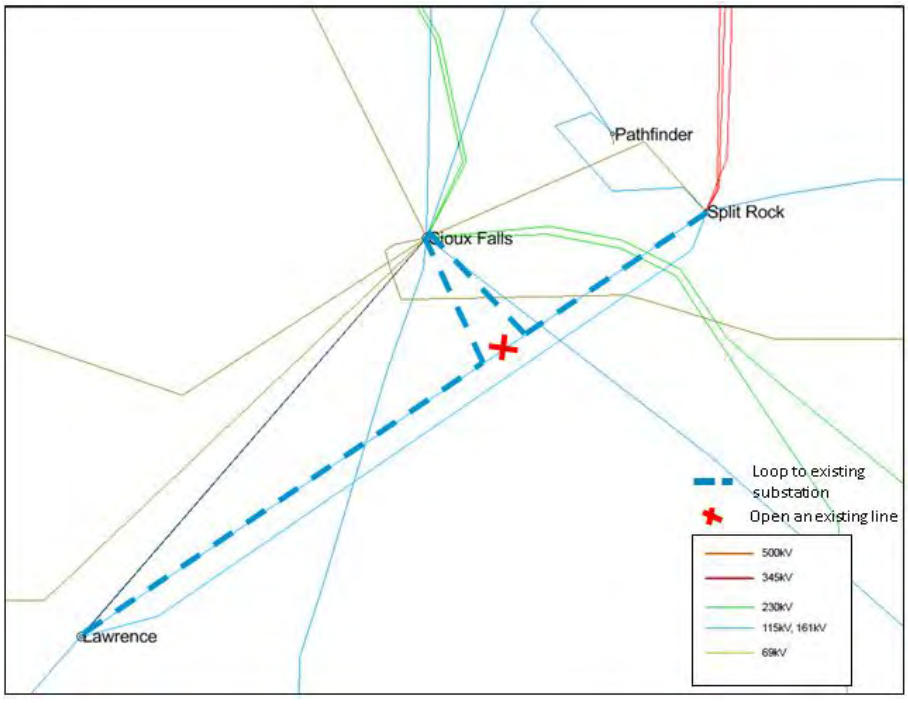

Figure 8-1: Loop One Split Rock to Lawrence 115 kV Ckt into Sioux Falls

The 2016 CSP study demonstrated this project provides APC benefits to both MISO and SPP that exceed the cost of the project over the initial 20 years of the project’s life. As a result the Loop One Split Rock to Lawrence 115kV circuit into Sioux Falls project was

recommended by MISO and SPP to the Interregional Planning Stakeholder Advisory Committee (IPSAC) for endorsement to move from the interregional portion of the study into the regional review process of each respective region. Both the MISO and SPP portion of the IPSAC endorsed this recommendation with no opposition. Based on that recommendation, the MISO-SPP Joint Planning Committee (JPC) voted in favor of approving this project for review in both the MISO and SPP regional review processes.

This project was proposed to relieve congestion on the Sioux Falls to Lawrence 115 kV FTLO Sioux Falls to Split Rock 230 kV flowgate. MISO and SPP's analyses showed the project completely relieves the congestion on this flowgate and provides benefit to both parties.

The estimated a scoping level cost estimate was approximately $6.15 million for this project. Assuming the in-service date of 2021, the $6.15 million cost resulted in a 20-year present value cost of $7.51 million. MISO and SPP's 20-year present value benefit analysis showed that MISO and SPP are estimated to collectively receive $27.83 million in APC benefit over the first 20 years of the project's life, resulting in a B/C ratio of 3.71. Of the $27.83 million of APC benefit, SPP is estimated to receive $5.15 million with MISO receiving $22.68 million. Since the proportion of cost paid by MISO and SPP is based on the proportion of benefits, the individual B/C ratio for both MISO and SPP is 3.71. Both MISO and SPP supported the recommendation of this project into the regional review process.

Regional Review of the Loop One Split Rock to Lawrence 115 kV Circuit into Sioux Falls

SPP's regional review analyses evaluated the Loop One Split Rock to Lawrence 115 kV circuit into Sioux Falls project's benefit to the SPP transmission system. Similar to the results seen in the interregional portion of the CSP, the project was shown to be beneficial to SPP. In accordance with SPP's Regional Review Methodology, the SSC and the Economic Studies Working Group (ESWG) are the SPP stakeholder groups responsible for oversight of the regional review. The ESWG is responsible for developing and approving the study scope. The regional review scope approved by the ESWG included calculating 1 year APC benefits using the 2017 ITP10 Sidebar Models. The analyses included evaluating both Future 1 and Future 3 scenarios.

- Future 1: Regional Clean Power Plan Solution - This Future assumes that the EPA CPP will be implemented at the regional level by meeting emission targets within the SPP footprint and each of its neighboring regions. Future 1 includes all assumptions from Future 3 with an increase in large-scale solar development and minimal distributed solar development.
- Future 3: Reference Case - This Future assumes no major changes to policies that are currently in place. Future 3 will include all statutory/regulatory renewable mandates and goals as well as other energy or capacity as identified in the Renewable Policy Survey, load growth projected by load serving entities through the MDWG model development process, and the impacts of existing regulations. Additional significant features of this Future include competitive wind and high availability of natural gas.

In addition to evaluating I-18, SPP's regional review also evaluated the SPP benefits of operating the Sioux Falls to Lawrence 115 kV line as open. The ESWG approved the additional analyses as an amendment to the regional review scope. The results from the analyses are shown in the table below.

Project	Future	SPP 1-yr Nominal NPCC Cost	2025 Sidebar Model w/ 2017 ITP10 Portfolio	
			SPP 1-yr Benefit	SPP 1-yr B/C
I18	F1	$212,009.74	$3.5M	$16.49
I18	F3	$212,009.74	$0.17M	$0.80
Open Line	F1	$0.00	$3.73M	N/A
Open Line	F3	$0.00	($-0.24M)	N/A

Table 8-3: Analysis Results of Sioux Falls-Lawrence 115 kV Line

SPP's analyses determined both solutions evaluated were potentially beneficial to the SPP transmission system, but only I-18 would provide long-term benefit to SPP. While operating the Sioux Falls to Lawrence line as open does provide SPP benefit in Future 1, it does not provide SPP with positive benefit across all the sensitivities evaluated in the regional review. Additional analysis also showed opening the line has the potential of shifting congestion to other constraints in the area demonstrating operating the line as open is not a long-term solution for SPP. Loop One Split Rock to Lawrence 115 kV circuit into Sioux Falls was determined to fully relieve congestion on the study need across all sensitivities and provides positive benefit to SPP across all sensitivities as well. Additional analysis of I-18 demonstrated potential congestion relief under multiple different contingencies in the area, demonstrating the potential to provide a more robust solution to opening the line, which SPP views as a better long-term solution to address congestion.

The project was endorsed by SPP's Seams Steering Committee (SSC) as a result of the interregional process and the SPP MOPC endorsed the report given to them at their October 2017 meeting. The SSC and MOPC endorsements were a result of the projects inability to be an approved Interregional Project due to MISO's prior determination not to recommend the project move forward. MISO and SPP will continue to explore process improvements to the RTOs' joint planning processes with the goal of performing more meaningful and beneficial joint studies.

Section 9: Project Tracking

9.1: NTC Letters Issued in 2017

After the SPP Board of Directors approves transmission expansion projects or once Service Agreements are executed, SPP issues Notifications to Construct (NTC) letters to appropriate Transmission Owners.

In 2017, SPP issued 30 NTC letters with estimated construction costs of $263.2 million for 71 projects to be constructed over the next five years through 2023. Of this $263.2 million, the upgrade cost breakdown is as follows:

- $110 thousand for Generator Interconnection (GI);
- $140.9 million for Transmission Service (TSS);
- $28.7 million for High Priority (HP); and
- $93.5 million for Integrated Transmission Planning (ITP) projects.

9.2: Projects Completed in 2017

After the SPP Board of Directors approves transmission expansion projects, SPP issues NTC letters to appropriate Transmission Owners. SPP actively monitors the progress of approved projects by soliciting feedback from project owners at least quarterly. As of December 20, 2017, 36 upgrades totaling approximately $245.6 million were completed during the year. The breakdown includes:

- 19 ITP - $163.9 million
- 3 TSS - $26.6 million
- 13 GI - $43.4 million
- 1 HP - $11.7 million

9.3: ITP20 Projects

ITP20 assessments were performed in 2010 and 2013. While the projects proposed by those studies are incorporated into the STEP Project List, they are not included in SPP's project tracking effort as part of the Quarterly Tracking Report. A list of active ITP20 projects will be maintained in the STEP Report and Project List. The current ITP20 projects are listed in the table below.

Name	Type	Size	Cost Estimate	Source Study
Post Rock 345/230 kV transformer Ckt 2	Transformer	345	$6,000,000	2010 ITP20
Mingo-Post Rock 345 kV	New Line	345	$121,500,000	2010 ITP20
Iatan-Jeffery Energy Center 345 kV	New Line	345	$79,875,000	2010 ITP20
Spearville - Mullergren 345 kV	New Line	345	$85,840,000	2010 ITP20
Mullergren - Circle 345 kV	New Line	345	$85,840,000	2010 ITP20

Name	Type	Size	Cost Estimate	Source Study
Circle - Reno 345 kV	New Line	345	$6,519,500	2010 ITP20
Keystone - Ogallala 345 kV	New Line	345	$5,625,000	2010 ITP20
Ogallala Transformer 345/230 kV	Transformer	345	$6,000,000	2010 ITP20
Mullergren 345/230 kV Transformer	Transformer	345	$6,000,000	2010 ITP20
Circle 345/230 kV transformer	Transformer	345	$6,000,000	2010 ITP20
Grand Island - Holt Co 345 kV	Rebuild/Re-Conductor	345	$64,125,000	2010 ITP20
Holt Co. - Shell Creek 345 kV	New Line	345	$69,750,000	2010 ITP20
Shell Creek 345/230 kV Transformer Ckt 2	Transformer	345	$6,000,000	2010 ITP20
Holt - Neligh 345 kV	New Line	345	$30,656,000	2010 ITP20
Columbus East 345/115 kV Transformer Ckt 2	Transformer	345	$6,000,000	2010 ITP20
Hoskins 345/230 kV Transformer Ckt 2	Transformer	345	$6,000,000	2010 ITP20
Hoskins 345/115 kV Transformer Ckt 2	Transformer	345	$6,000,000	2010 ITP20
Hoskins - Ft. Calhoun 345 kV	New Line	345	$193,380,000	2010 ITP20
Ft Calhoun - S3454 345 kV	New Line	345	$46,875,000	2010 ITP20
Cass Co. - S.W. Omaha (aka S3454) 345 kV Ckt1	New Line	345	$33,126,800	2010 ITP20
S3459 345/161 kV Transformer Ckt 2	Transformer	345	$12,600,000	2010 ITP20
Hitchland-Potter 345 kV Ckt 2	New Line	345	$133,875,000	2010 ITP20
Wichita-Viola 345 kV	New Line	345	$54,000,000	2010 ITP20
Viola-Rose Hill 345 kV Ckt 1	New Line	345	$54,000,000	2010 ITP20
South Fayetteville 345/161 kV Transformer Ckt1	Transformer	345	$12,600,000	2013 ITP20
Chamber Springs - South Fayetteville 345 kV Ckt1	New Line	345	$21,295,800	2013 ITP20
Maryville 345/161 kV Transformer Ckt1	Transformer	345	$12,600,000	2013 ITP20
Nashua 345/161 kV Transformer Upgrade Ckt11	Transformer	345	$12,600,000	2013 ITP20
Keystone - Red Willow 345 kV Ckt1	New Line	345	$130,141,000	2013 ITP20
Tolk - Tuco 345 kV Ckt1	New Line	345	$75,718,400	2013 ITP20
Holcomb 345/115 kV Transformer Ckt2	Transformer	345	$12,600,000	2013 ITP20
Neosho - Wolf Creek 345 kV Ckt1	New Line	345	$117,126,900	2013 ITP20
Clinton - Truman 161 kV Ckt1 Reconductor	Rebuild/Re-Conductor	161	$15,701,325	2013 ITP20
North Warsaw - Truman 161 kV Ckt1 Reconductor	Rebuild/Re-Conductor	161	$1,082,850	2013 ITP20
Auburn 345/115 kV Transformer Ckt2	Transformer	345	$12,600,000	2013 ITP20
Auburn - Swissvale 345 kV Ckt1 Voltage Conversion	Voltage Conversion	345	$20,112,700	2013 ITP20

Name	Type	Size	Cost Estimate	Source Study
Auburn - Jeffrey EC 345 kV Ckt1 Voltage Conversion	Voltage Conversion	345	$35,493,000	2013 ITP20
Muskogee/Pecan Creek 345 kV Terminal Upgrades	Substation	345	$34,605,675	2013 ITP20

Table 9-1: ITP20 Projects

Section 10: STEP Project List

The 2017 STEP Project List includes a comprehensive listing of transmission projects identified by the SPP RTO. All SPP BOD-approved projects are included in the 2016 STEP Project List. The list also includes SPP Tariff study projects, economic projects, and zonal projects.

Projects in the list are categorized in the column labeled "Project Type" by the following designations:

- Generator Interconnection – Projects associated with a FERC-filed Generator Interconnection Agreement
- High Priority – Projects identified in the high priority process
- ITP – Projects needed to meet regional reliability, economic, or policy needs in the ITP study processes
- Transmission Service – Projects associated with a FERC-filed Service Agreement
- Interregional – Projected identified in SPP's joint planning and coordination processes
- Sponsored – Entity requested and funded project reviewed and approved by SPP

The complete Network Upgrade list includes two dates.

1. In-service: Date Transmission Owner has identified as the date the upgrade is planned to be in-service.
2. SPP Need Date: Date upgrade was identified as needed by SPP.

A copy of the *2018 SPP Transmission Expansion Plan Report Project List* can be found at the following location: spp.org>engineering>transmission-planning>documents

10.1: Facility owner abbreviations used in the STEP List

Abbreviation and Identification	
AEP	American Electric Power
BEPC	Basin Electric Power Cooperative
ETEC	East Texas Electric Cooperative
GRDA	Grand River Dam Authority
ITCGP	ITC Great Plains
KCPL	Kansas City Power and Light Company
GMO	KCP&L Greater Missouri Operations Company
LEA	Lea County Cooperative
LES	Lincoln Electric System
MKEC	Mid-Kansas Electric Company
MIDW	Midwest Energy, Incorporated
NPPD	Nebraska Public Power District
OGE	Oklahoma Gas and Electric Company

Abbreviation and Identification	
OPPD	Omaha Public Power District
SWPA	Southwestern Power Administration
SPS	Southwestern Public Service Company
SEPC	Sunflower Electric Power Corporation
TSMO	Transource Energy
WFEC	Western Farmers Electric Cooperative
WR	Westar Energy

10.2: Upgrades: Information breakdown

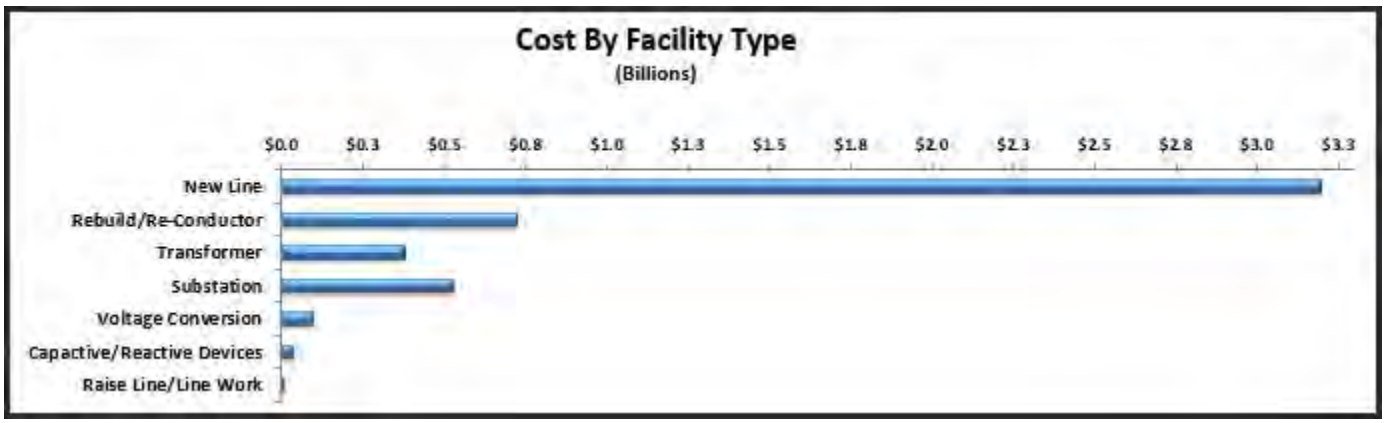

Figure 10-1: Total Cost by Facility Type

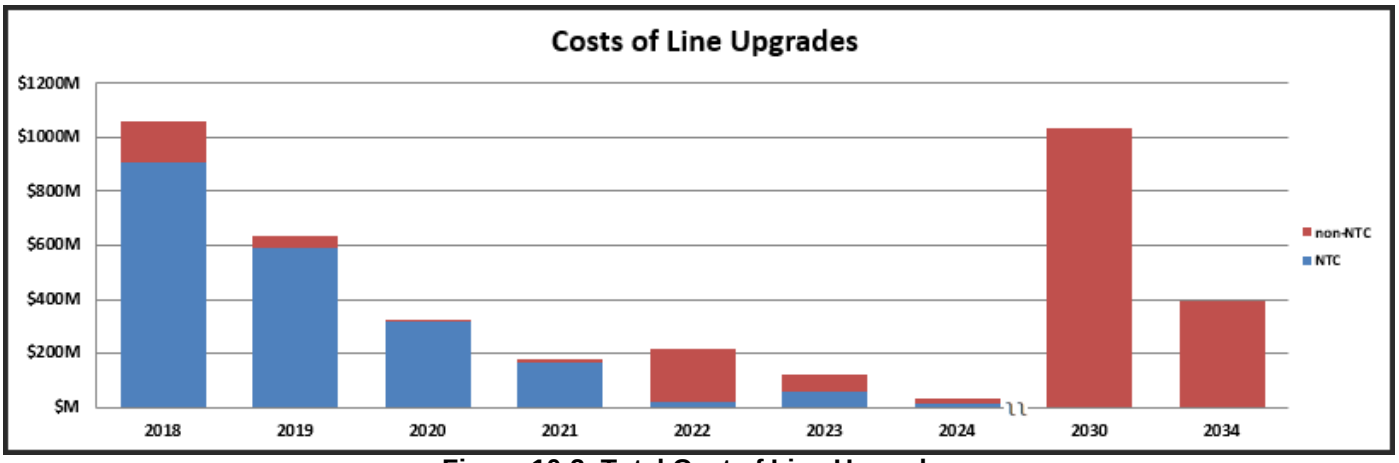

Figure 10-2: Total Cost of Line Upgrades

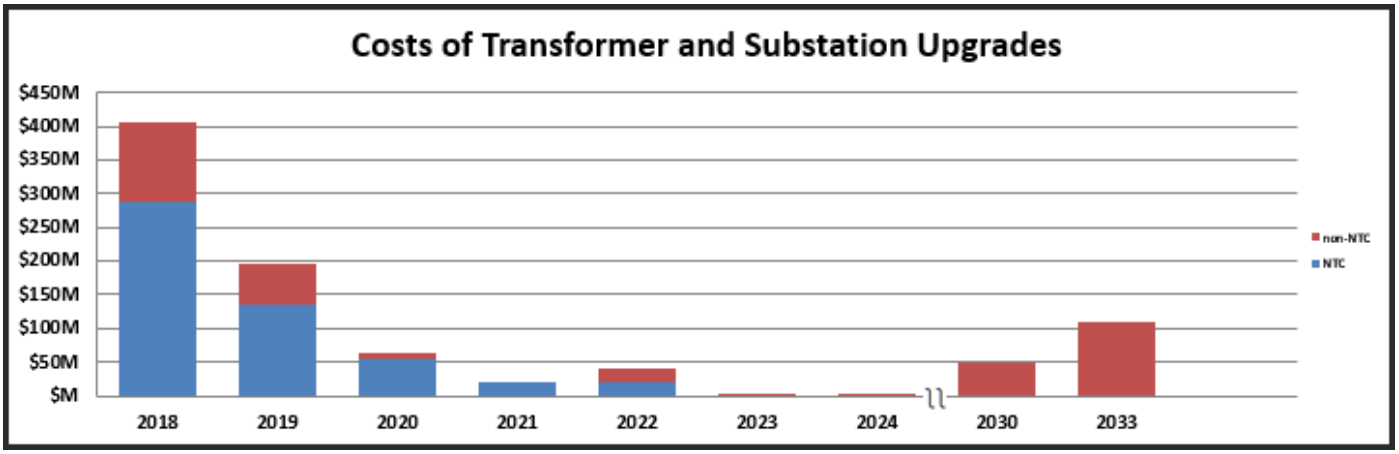

Figure 10-3: Total Cost of Transformer and Substation Upgrades

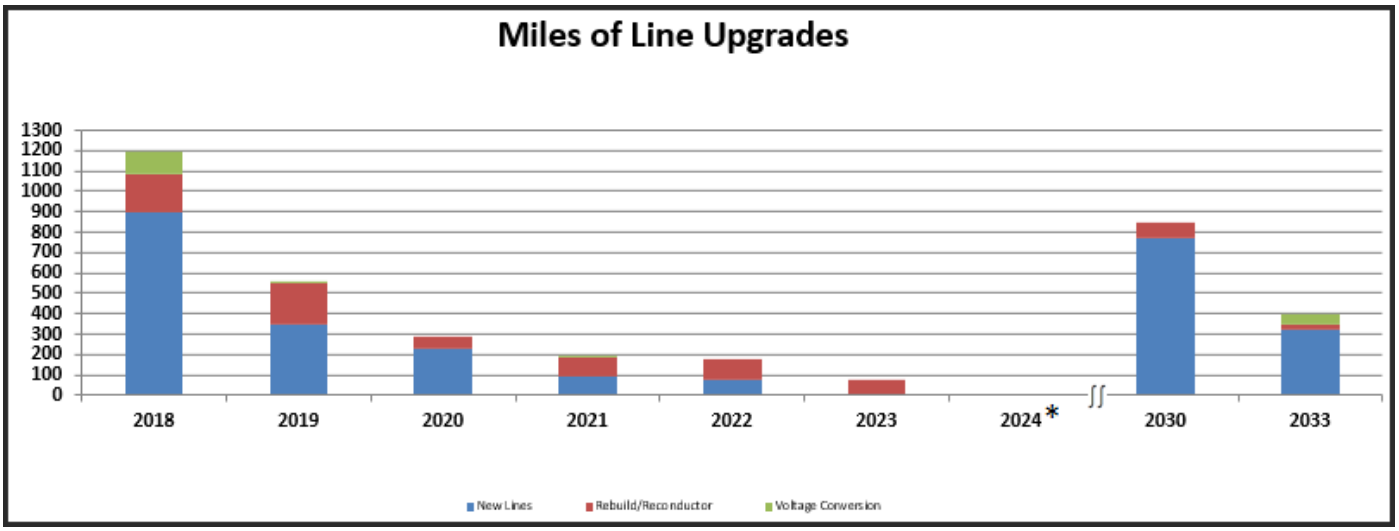

Figure 10-4: Total Miles of Line Upgrades by Project Type

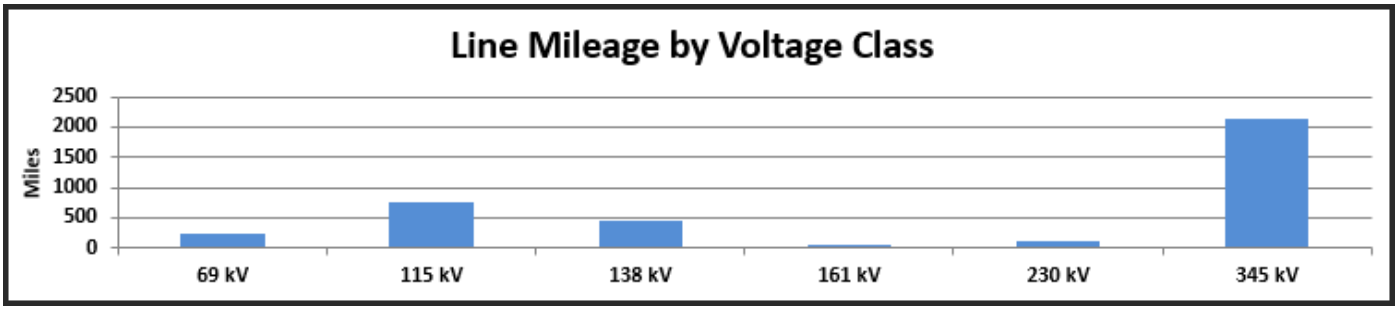

Figure 10-5: Total Line Mileage by Voltage Class

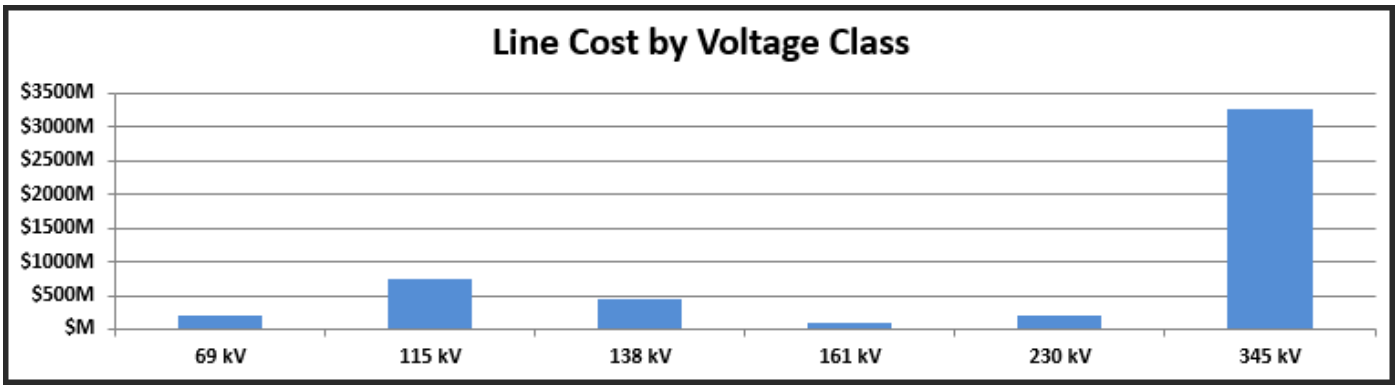

Figure 10-6: Total Line Cost by Voltage Class

Section 11: NTCs Issued in 2017

NTC ID	PID	Project Name	Facility Owner	Current Cost Amount
200420	30513	Potash Junction 230/115 kV Transformer Upgrade	SPS	$5,778,860
	30699	Northwest - Rolling Hills 115 kV Rebuild Ckt 1		$4,161,895
	31061	Livingston Ridge - Wipp 115 kV Ckt 1 Rebuild		$0
	31062	Pecos 230/115 kV Transformer Upgrade		$3,423,416
	31063	Carlsbad - Pecos 115 kV Terminal Upgrades		$767,347
200421	30693	Wolfforth 230/115 kV Ckt 1 Transformer	SPS	$3,790,207
200422	31184	Jeffrey Energy Center - Hoyt 345 kV Ckt 1	WR	$23,683,317
200423	31183	Hancock - Muskogee 161 kV Ckt 1 Terminal Upgrades	OGE	$37,638
200426	31109	Blaisdell 230/115 kV Transformer	BEPC	$5,778,860
	31174	Neset 230/115 kV Transformer Ckt 1		$5,778,860
200428	31085	Northeast - Charlotte - Crosstown 161 kV Reactor	KCPL	$500,000
200429	31127	Knoll - Post Rock 230 kV New Line Ckt 2	MIDW	$409,012
	31127	Knoll Sub 230kV Terminal		$1,652,257
	31127	Post Rock Sub Addition		$1,245,091
200430	31082	Butler - Altoona 138 kV Terminal Upgrades	WR	$238,640
	31083	Neosho - Riverton 161 kV Terminal Upgrades	WR	$111,370
200431	31131	Siloam Springs - Siloam Springs City 161 kV Ckt 1 Rebuild (AEP)	AEP	$4,780,000
200432	31131	Siloam Springs - Siloam Springs City 161 kV Ckt 1 Rebuild (GRDA)	GRDA	$279,400
200433	31144	Tupelo 138 kV Terminal Upgrades	WFEC	$100,000
200434	31150	Lula- Tupelo Tap 138 kV Terminal Upgrades	OGE	$16,000
200436	30672	Toboso Flats 115 kV Substation	SPS	$822,700
	30695	Livingston Ridge - Sage Brush 115 kV Ckt 1		$13,187,417
	30695	Lagarto 115 kV Substation		$1,200,057
	30695	Largarto - Sage Brush 115 kV Ckt 1		$6,186,323
	30695	Cardinal - Lagarto 115 kV Ckt 1		$7,315,580
200437	31073	Heizer 115/69 kV Ckt 4 Transformer	MIDW	$2,663,963
200444	31079	Tuco - Stanton 115 kV Terminal Upgrades	SPS	$356,757
	31080	Stanton - Indiana 115 kV Terminal Upgrades		$302,133
	31081	Indiana - SP-Erskine 115 kV Terminal Upgrades		$294,764
	41189	Martin - Pantex North 115 kV Terminal Upgrades		$335,157
	41189	Pantex South - Highland Tap 115 kV Terminal Upgrades		$335,697
200446	31186	IPC 138 kV Cap Bank	AEP	$1,298,049
	41202	T.S.E.-4 - E.61ST- 138 kV Rebuild		$6,014,381
	41233	Broken Arrow North - Lynn Lane East 138kV Ckt 1 Reconductor		$5,714,095
200448	41209	NIC170 2 - REP345 2 69 kV Reconductor	EDE	$4,050,000
	41209	REP345 2 - REP451 2 69 kV Reconductor		$1,450,000
	41209	REP451 2 - REP359 2 69 kV Reconductor		$800,000
200450	51236	Roberts County - Sisseton 69 kV New Line	EREC	$733,000
200451	51237	Redundancy Relaying at Stilwell	KCPL	$147,500
200452	41200	WILISTN7 115 kV Terminal Upgrades	WAPA	$350,000
	51236	ROBERTS CO7 115kV Substation	EREC	$3,957,000
	51236	XFR - Roberts County-ER8 115/69 Transformer	EREC	$1,300,000

NTC ID	PID	Project Name	Facility Owner	Current Cost Amount
200454	51253	L-10 Southern 69kV Terminal Upgrades	NIPCO	$573,452
	51253	J16 69kV Substation		$833,125
200455	30755	Tuco 230/115 kV Ckt 1 Transformer	SPS	$183,814
	41188	Hale County 115 kV Terminal Upgrades		$741,329
	41192	Coulter 115 kV Terminal Upgrades		$268,490
	41194	Plant X 230 kV Terminal Upgrades		$217,734
	41194	Sundown 230 kV Terminal Upgrades		$341,745
	41198	Upgrade ckt 1 terminal equipment TEXAS_CNTY 3 - Hitchland 115 kV at Texas County 115 kV bus		$98,639
	41198	Upgrade ckt 2 terminal equipment TEXAS_CNTY 3 - Hitchland 115 kV at Texas County 115 kV bus		$108,430
	51246	Nichols 230 kV Terminal Upgrades		$490,000
	41199	Etter to Moore 115kV line		$9,037,903
200456	41223	East Ruthville - SW Minot 115 kV New Line	CPEC	$20,745,000
	41223	East Ruthville - SW Minot 115 kV line Terminal Upgrades		$1,035,000
200457	30690	Plant X 230/115 kV Ckt 2 Transformer	SPS	$5,778,860
	31175	Cox Interchange - Hale Co Interchange 115 kV Ckt 1		$14,589,157
	31176	Hockley County Interchange 115 kV Terminal Upgrades		$324,585
200458	31086	DePaul - Girard Jct 69 kV	WR	$9,142,063
	31086	Franklin - Sugar Creek 69 kV		$6,666,094
200460	51254	Monolith 345 kV Substation	NPPD	$12,692,888
	51254	Monolith 345/115 kV Transformer #1		$5,179,657
	51254	Monolith 345/115 kV Transformer #2		$5,179,657
	51254	Monolith 115 kV Substation Upgrades		$11,271,233
	51254	Sheldon - Monolith 115 kV Ckt 1 New Line		$1,273,506
	51254	Sheldon 115 kV Terminal Upgrades		$3,703,266
200462	41223	East Ruthville - SW Minot 115 kV New Line	CPEC	$20,745,000
	41223	East Ruthville - SW Minot 115 kV line Terminal Upgrades		$1,035,000
200463	31075	Tap Centerville-Marmaton 161kV GEN-2015-016 Addition (WERE)	WR	$110,000
200466	51249	City of Winfield - Rainbow 69 kV Ckt 1	WR	$1,467,084
	51249	Oak - Rainbow 69 kV Ckt 1		$1,870,532
	51252	Creswell (CRSW TX-1) 138/69/13.2 kV Transformer Ckt 1		$2,961,462
	51252	Creswell (CRSW TX-2) 138/69/13.2 kV Transformer Ckt 1		$2,961,462
200467	31082	Butler - Altoona 138 kV Terminal Upgrades	WR	$247,332

Section 12: Upgrades Completed in 2017

UID	Facility Owner	Upgrade Name	SOURCE STUDY	Cost Estimate
10583	AEP	Chamber Springs - Farmington REC 161 kV Ckt 1	2013 ITPNT	$ 12,705,537
10600	WR	East Manhattan - Jeffrey Energy Center 230 kV Ckt 1 Rebuild	2014 ITPNT	$ 41,100,000
10604	WR	Arkansas City - Paris 69 kV Terminal Upgrades	Ag Studies	$ 228,364
10649	AEP	Brownlee - North Market 69 kV Ckt 1	2013 ITPNT	$ 16,401,035
50168	OGE	FT SMITH 500/161KV TRANSFORMER CKT 5	Ag Studies	$ 25,635,637
50520	SEPC	Mingo 345/115 kV Ckt 2 Transformer	2015 ITPNT	$ 8,597,207
50533	GRDA	Kerr - 412 Sub 161 kV Ckt 1 Terminal Upgrades	2014 ITPNT	$ 161,100
50600	WFEC	Hazelton 69 kV Capacitor	DPA Studies	$ 728,843
50608	NPPD	Bobcat Canyon 345/115 kV Transformer Ckt 1	2014 ITPNT	$ 5,928,480
50609	NPPD	Bobcat Canyon - Scottsbluff 115 kV Ckt 1	2014 ITPNT	$ 23,700,242
50616	NPPD	Bobcat Canyon 345 kV Terminal Upgrades	2014 ITPNT	$ 4,072,936
50718	AEP	Broadmoor - Fort Humbug 69 kV Ckt 1 Rebuild	2014 ITPNT	$ 6,695,986
50719	AEP	Daingerfield - Jenkins REC T 69 kV Ckt 1 Rebuild	2014 ITPNT	$ 2,819,806
50721	AEP	Hallsville - Marshall 69 kV Ckt 1 Rebuild	2014 ITPNT	$ 16,571,092
50738	OGE	Wildhorse 69 kV Cap Bank	2014 ITPNT	$ 740,254
50759	AEP	Letourneau 69 kV Cap Bank	2016 ITPNT	$ 1,409,347
50802	AEP	Darlington - Roman Nose 138 kV Ckt 1 (AEP)	HPILS	$ 11,652,107
51146	GRDA	Claremore 161 kV Terminal Upgrades	2015 ITPNT	$ 11,200
51180	SEPC	Mingo 345 kV Terminal Upgrades	2015 ITPNT	$ 4,332,021
51187	AEP	Southwestern Station - Carnegie 138 kV Ckt 1 Rebuild	2015 ITPNT	$ 9,397,311
51209	SEPC	Buckner - Spearville 345 kV Ckt 1 Terminal Upgrades	2015 ITPNT	$ 3,892,077
51300	ITCGP	Clark County 345kV Switching Station GEN-2012-024 Addition	GI Studies	$ 1,940,084
51331	NPPD	Antelope - County Line - 115kV Rebuild	GI Studies	$ 2,047,174
51340	NPPD	Battle Creek - County Line 115kV Rebuild	GI Studies	$ 1,952,826
51396	AEP	Leonard 138kV Switching Station (TOIF)	GI Studies	$ 668,626
51397	AEP	Leonard 138kV Switching Station (NU)	GI Studies	$ 6,996,176
51398	OGE	Leonard 138kV Switching Station (NU - OGE)	GI Studies	$ 20,000
51402	TSMO	Sub - Tap Nebraska City - Mullin Creek 345kV (Holt County) POI for GEN-2014-021 (TOIF)	GI Studies	$ 600,000
51403	TSMO	Sub - Tap Nebraska City - Mullin Creek 345kV (Holt County) POI for GEN-2014-021 (TSMO NU)	GI Studies	$ 1,840,000
51405	TSMO	Sub - Tap Nebraska City - Mullin Creek 345kV (Holt County) POI for GEN-2014-021 (SANU)	GI Studies	$ 16,570,000

51425	OGE	Woodward EHV 138kV Phase Shifting Transformer circuit #1	GI Studies	$	7,103,971
51474	OGE	Minco 345kV Substation GEN-2014-056 Addition (TOIF)	GI Studies	$	5,000
51509	BEPC	Berthold - Southwest Minot 115 kV Ckt 1 Reconductor	2016 ITPNT	$	2,876,720
51570	BEPC	Stegall 345 kV Terminal Upgrades	2014 ITPNT	$	2,499,727
51603	ITCGP	Clark County 345kV Switching Station GEN-2012-024 Addition (TOIF)	GI Studies	$	859,686
71925	OGE	Tap Coyote-Medford Tap 138kV - GEN-2015-015 Addition (NU)	GI Studies	$	2,840,000

Section 13: Glossary of Terms

Abbreviation and Identification	
AECI	Associated Electric Cooperative Inc.
ATC	Available Transfer Capability
ATSS	Aggregate Transmission Service Study
B/C	Benefit-to-Cost
BOD	Board of Directors
CBA	Consolidated Balancing Authority
CPP	Clean Power Plan
CUS	City Utilities of Springfield
DPT	Delivery Point Transfers
EHV	Extra High Voltage
EMS	Emergency Management System
EPA	Environmental Protection Agency
ESWG	Economic Studies Working Group
FERC	Federal Energy Regulatory Committee
GI	Generator Interconnection
GIA	Generator Interconnection Agreement
HP	High Priority
HPILS	High Priority Incremental Load Study
IPSAC	Interregional Planning Stakeholder Advisory Committee
ITP	Integrated Transmission Planning
ITP10	10-Year Integrated Transmission Planning Assessment
ITP20	20-Year Integrated Transmission Planning Assessment
ITPNT	Near-Term Integrated Transmission Planning Assessment
JCSP	Joint Coordinated System Plan
JOA	Joint Operating Agreement
LTSR	Long-Term Service Request
MDWG	Model Development Working Group
MISO	Midcontinent Independent System Operator
MOPC	Markets and Operations Policy Committee
MTEP	MISO Transmission Expansion Planning

Abbreviation and Identification	
NERC	North American Electric Reliability Corporation
NTC	Notifications to Construct
OATT	Open Access Transmission Tariff
RARTF	Regional Allocation Review Task Force
RCAR	Regional Cost Allocation Review
RMS	Request Management System
RSC	Regional State Committee
RTO	Regional Transmission Organization
RTWG	Regional Tariff Working Group
SERTP	Southeastern Regional Transmission Planning
SPA	Southwestern Power Administration
SPC	Strategic Planning Committee
STEP	SPP Transmission Expansion Plan
TPITF	Transmission Planning Improvement Task Force
TPL	Transmission Planning
TSS	Transmission Service
TWG	Transmission Working Group
WECC	Western Electricity Coordinating Council