

**Southwest Power Pool**  
**JOINT TRANSMISSION WORKING GROUP & ECONOMIC STUDIES WORKING GROUP MEETING**  
**November 15<sup>th</sup>, 2017**  
**Conference Call**

**• Summary of Action Items •**

1. Approve the meeting agenda.
2. Approved performing a voltage stability assessment after the final portfolio is finalized.

**Southwest Power Pool**

**JOINT TRANSMISSION WORKING GROUP & ECONOMIC STUDIES WORKING GROUP MEETING**

**November 15<sup>th</sup>, 2017**

**Conference Call**

**• M I N U T E S •**

**Agenda Item 1 – Administrative Items**

TWG Chair Travis Hyde and ESWG Chair Alan Myers called the meeting to order at 1:03pm. The following members were in attendance (Attachment 1a – Attendance):

TWG

Travis Hyde (Chair), Oklahoma Gas & Electric  
Scott Benson, Lincoln Electric System  
John Boshears, City Utilities of Springfield  
John Fulton, Southwestern Public Service Company  
Joe Fultz, Grand River Dam Authority  
James Ging, Kansas Power Pool  
Kalun Kelley, Western Farmers Electric Cooperative  
John Knofczynski, East River Electric Power Cooperative  
Jim McAvoy, Oklahoma Municipal Power Authority  
Matt McGee, American Electric Power  
Nathan McNeil, Midwest Energy, Inc.  
Michael Mueller, Arkansas Electric Cooperative Corporation  
Alan Myers, ITC Great Plains  
Gayle Nansel, Western Area Power Administration  
Matthew Stoltz, Basin Electric Power Cooperative  
Jason Shook, GDS Associates representing ETEC  
Harold Wyble, Kansas City Power & Light

ESWG

Alan Myers (Chair), ITC Great Plains  
Al Tamimi, Sunflower  
Bennie Weeks, Xcel Energy  
Bethany King, Empire District  
Eric Burkey, South Central MCN  
Randy Collier, City Utilities of Springfield  
Don Frerking, Kansas City Power & Light  
Natasha Henderson, Golden Spread Electric Cooperative  
Leon Howell, Oklahoma Gas & Electric  
Jon Iverson, Omaha Public Power District  
Gayle Nansel, Western Area Power Authority  
Tim Owens, Nebraska Public Power District  
Anita Sharma, American Electric Power  
Jeremy Severson, Basin Electric Power Cooperative  
Kurt Stradley, Lincoln Electric System  
Michael Watt, Oklahoma Municipal Power Authority  
John Olsen, Westar Energy

Kirk Hall and Amber Greb, SPP staff, informed their respective chair that the groups had achieved a quorum.

### **1b Receipt of Proxies**

The following proxies were announced (Attachment 1b – Proxies):

#### **TWG**

- Cody Sickler (TSG&T) proxy for Chris Pink (TSG&T)
- Dustin Betz (NPPD) proxy for Randy Lindstrom (NPPD)
- Steve Hohman (OPPD) proxy for Dan Lenihan (OPPD)

#### **ESWG**

- Ben Elsey (Xcel Energy) proxy for Bennie Weeks (Xcel Energy) beginning at 2:30 pm.

### **Agenda Item 1c – Review of Agenda**

Chair Alan Myers (ITC) presented the agenda for review and asked for any additions or corrections. (Attachment 1c – 20171115 ESWG Agenda).

**ESWG Motion: Kurt Stradley (LES) made a motion to approve the agenda, seconded by Leon Howell (OGE). The motion was approved unanimously.**

**TWG Motion: Alan Myers (ITCGP) made a motion to approve the agenda, seconded by Jason Shook (GDS). The motion was approved unanimously.**

### **Agenda Item 2 –2019 ITP Scope Items**

#### **Agenda Item 2a –2019 ITP Consolidation**

Amber Greb (SPP) opened discussion on Consolidation, providing background information on the project selection and grouping processes that lead to the Final portfolio. Staff explained three possible scenarios for project consolidation and a high level overview of the process for each scenario. Staff reviewed the consolidation consideration list survey results with the group. The groups agreed with the direction staff was heading and directed that they continue working on how the consolidation considerations would be applied to each project. (Attachment 2a – Portfolio Consolidation)

#### **Agenda Item 2b - Stability Assessment**

Chris Jamieson (SPP) opened stability analysis discussion. Chris informed the group that stability should be finalized in November as part of the scope. Staff discussed three options for handling voltage stability and discussed the feasibility of each option. (Attachment 2b – 2019 ITP Voltage Stability Assessment)

**TWG Motion: Kalun Kelley (WFEC) made a motion to approve the option 1 for the voltage stability assessment, seconded by John Fulton (SPS). The motion was approved unanimously.**

Respectfully Submitted,

Amber Greb  
ESWG Secretary

Kirk Hall  
TWG Secretary

**Bennie Weeks**

**Xcel Energy | Responsible By Nature**

Mgr., Resource Planning

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**From:** Weeks, Bennie F

**Sent:** Wednesday, November 15, 2017 1:05 PM

**To:** 'Metzker, Amber L'; Myers, Alan K.

**Cc:** Elsey, Ben R

**Subject:** today's joint ESWG/TWG meeting

Alan and Amber - I'll be on the call up to 2:30 CT. Beginning 2:30 Ben Elsey will be my proxy.

**Bennie Weeks**

**Xcel Energy | Responsible By Nature**

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Kirk,

I'm unable to attend this joint TWG/ESWG meeting on 11/15, therefore, I'm having Steve Hohman (OPPD Sr. Transmission Planning Engineer) sit in for me and will be my proxy for this meeting.

Thanks,

**Dan Lenihan, P.E.**

Director – Planning & Strategy

Energy Delivery

Omaha Public Power District

Energy Control Center, ECC-5

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Email: [djlenihan@oppd.com](mailto:djlenihan@oppd.com)

From: Audrey White [<mailto:awhite@spp.org>]  
Sent: Monday, November 13, 2017 8:27 AM  
To: SPP TWG (EXPLODER) <[twg@spplist.spp.org](mailto:twg@spplist.spp.org)>; SPP ESWG (Exploder) <[eswg@spplist.spp.org](mailto:eswg@spplist.spp.org)>; SPP ESWG (Members Only) <[SPPESWGMembersOnly@spp.org](mailto:SPPESWGMembersOnly@spp.org)>; SPP TWG (Members Only) <[SPPTWG@spp.org](mailto:SPPTWG@spp.org)>  
Subject: TWG/ESWG Joint 11/15/17 Agenda & Updated Background Materials posted

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TWG/ESWG Joint 11/15/17 Agenda & Background Materials have been updated with the following file:

\*2b. Supplemental\_2017ITP10\_Event1\_Pre-contingency>Loading

The documents are available at the SPP link below:

[TWG Meeting Materials](#)

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Kirk and Travis - I give my TWG voting proxy to Dustin Betz for the Joint ESWG/TWG Conference Call on 11/15/2017.

**Randy R. Lindstrom**

Transmission Planning Supervisor  
Transmission Compliance & Planning  
Nebraska Public Power District Operations  
Office: 402-563-5240

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Kirk,

Cody Sickler will be my proxy for this meeting.

Thanks,

Chris Pink

**From:** Audrey White [<mailto:awhite@spp.org>]

**Sent:** Wednesday, November 08, 2017 3:15 PM

**To:** SPP TWG (EXPLODER); SPP TWG (Members Only); SPP ESWG (Exploder); SPP ESWG (Members Only)

**Subject:** [EXTERNAL] TWG/ESWG Joint 11/15/17 Agenda & Background Materials posted

TWG/ESWG Joint 11/15/17 Agenda & Background Materials have been posted at the SPP website for you review at the link shown below:

[TWG Meeting Materials](#)

[TWG/ESWG 11/15/17 Online Registration](#)

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All sessions in Central Standard Time (Chicago, GMT-06:00)

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## ECONOMIC STUDIES WORKING GROUP/TRANSMISSION WORKING GROUP

November 15<sup>th</sup>, 2017

### Net Conference

#### • A G E N D A •

1. Administrative Items
  - a. Call to Order, Introductions..... Alan Myers (5 minutes)
  - b. Receipt of Proxies ..... Amber Greb (1 minute)
  - c. Review of Agenda<sup>1</sup> ..... Alan Myers (1 minute)
2. 2019 ITP Scope Items<sup>1</sup>..... SPP Staff (120 minutes)
  - a. Consolidation<sup>1</sup> (Juliano Freitas)..... (150 Minutes)
  - b. Stability Assesment<sup>1</sup> (Approval Item) (Chris Jamieson)..... (90 minutes)
3. Closing Items ..... All (5 minutes)
  - a. Summary of Action Items (Amber Greb)
  - b. Future Meetings
    - i. November 30<sup>th</sup>, 2017: Potential Conference Call
    - ii. Summit: December 6, 2017 (now a Net Conference)
    - iii. December 14<sup>th</sup>, 2017: 8<sup>th</sup> Floor AEP Offices, Dallas, TX
    - iv. January 11<sup>th</sup>, 2018: 8<sup>th</sup> or 41<sup>st</sup> Floor AEP Office, Dallas, TX

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<sup>1</sup> Background Material Included



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# 2019 ITP Portfolio Consolidation

SPP Staff

November 9, 2017

# Objective

## Goal of the Final Portfolio:

- Develop a regional plan that provides reliable and economic delivery of energy and facilitates achievement of public policy objectives, while maximizing benefits to the end-use customer

## Goal for today:

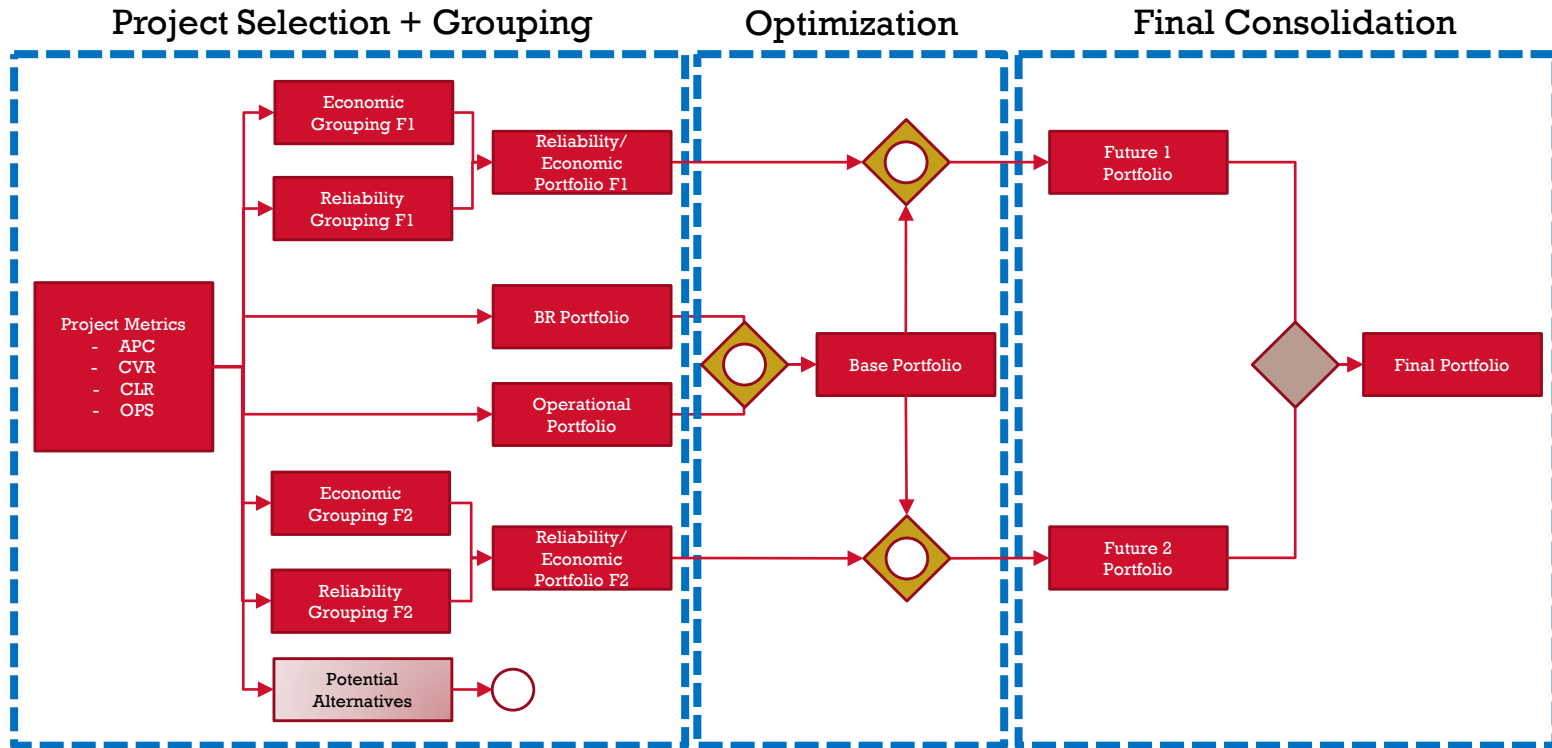
- Vetting the path to the final portfolio



# ITP Manual Language

## Section 6.2 Portfolio Consolidation

To determine a recommended plan, the portfolios of potential projects must be consolidated. SPP and stakeholders will discuss, determine and document details of the study-specific consolidation criteria during each study scope development.

# Portfolio Development Summary



-  Optimization with consideration of potential alternatives
-  Individual project review including assessment of unmet needs, while ensuring must-fix needs are addressed

# Portfolio Consolidation

## Scenarios

Scenarios	F1	F2
Same project in each future	Project A	Project A
Competing Projects	Project B	Project C
Projects in one Future	Project D	N/A

# Consolidation Considerations Survey Results

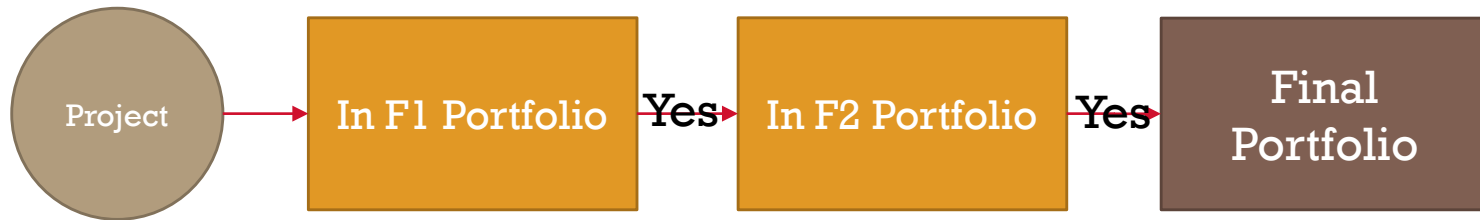
<b>Consideration</b>	<b>Rank</b>
40-year NPV project benefit or B/C	<b>1</b>
Larger-scale solutions that provide more robustness and additional qualitative benefits	<b>2</b>
The potential for a project to mitigate operational issues	<b>3</b>
Long-term viability	<b>4</b>
One-year project benefit or B/C	<b>5</b>
ARR Feasibility Issues	<b>6</b>
The potential for a project to address non-thermal issues	<b>7</b>
Congestion relief/Project overlap	<b>8</b>
Minimum design standards	<b>9</b>
Facility age	<b>9</b>

Note: SPP Staff has not yet determined the time and cost associated with each of these considerations



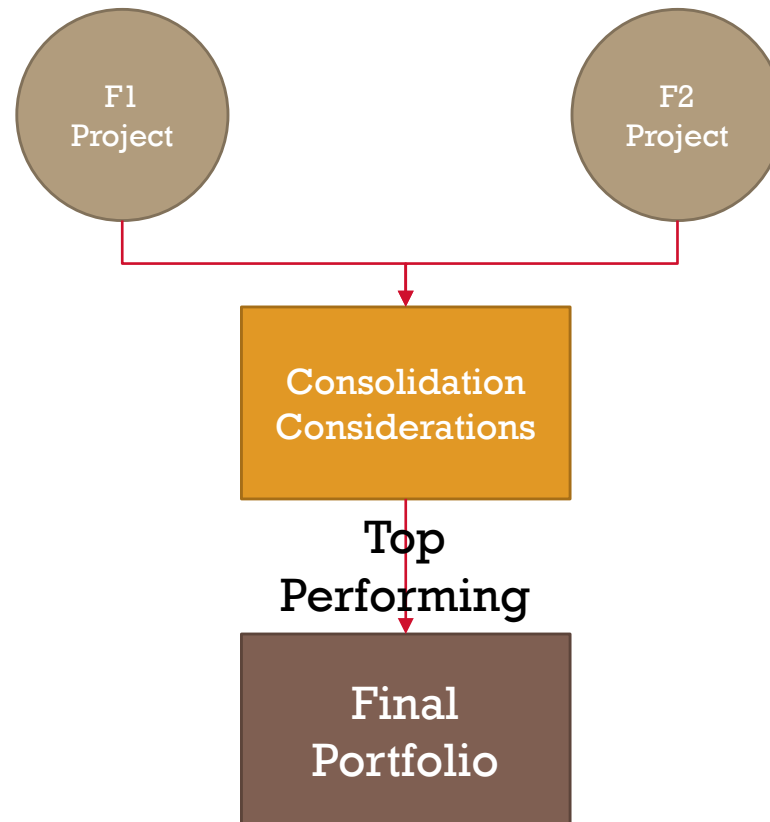
# Portfolio Consolidation

## Same project in both portfolios



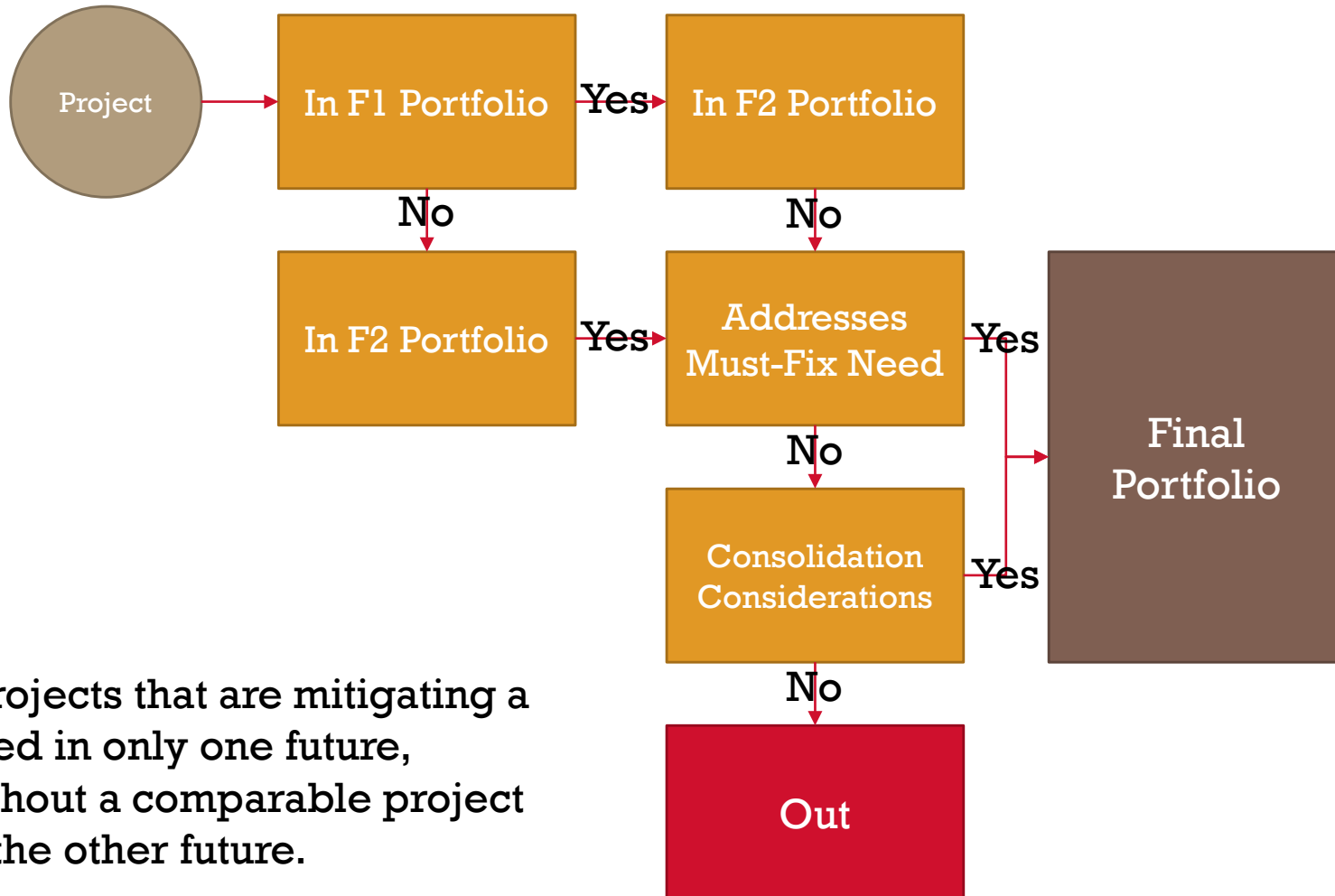
# Portfolio Consolidation

## Competing Projects



# Portfolio Consolidation

## Projects in one future's portfolio



\*Projects that are mitigating a need in only one future, without a comparable project in the other future.

# Consolidation Considerations Survey Results

	Average Confidence Level (Scale of 0 to 5, with 5 being the most confident)
Future 1	3.06
Future 2	2.56

# Next Steps

- November 30<sup>th</sup> – Finalize Consolidation Methodology



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# 2019 ITP Voltage Stability Analysis Scope

SPP Staff

November 15th, 2017

# ITP Stability Analysis

- 2019 ITP Scope (First Objective)
  - Final approval (November)
- ITP Manual Language (Second Objective)
  - Develop and approve methodology (Standard/Non-Standard)
  - Develop and approve manual language (Standard/Non-Standard)



# Stakeholder Direction

- TPITF white paper:
  - “The remaining TPL Steady State events will be handled along with the stability process outside of the ITP process.”
  - “SPP Staff will conduct transfer analysis as needed to identify any voltage stability limitations that may precede the system’s thermal limitations and also include these voltage stability limitations in the system constraints list.”
- 2017 Variable Generation Integration Study Recommendations:
  - “The Transmission Working Group (TWG) shall assess and define requirements for SPP to perform voltage stability analysis during low load scenarios as part of SPP Planning process.”

# Incorporating Stakeholder Direction

- SPP approach to incorporating stakeholder direction
  - SPP studies to date have demonstrated system thermal limitations typically precede the voltage stability limitations, but only marginally so
- SPP has identified three options
  - Background
  - Observations
  - Comparison
- Option 2 and 3 schedule feasibility is currently being evaluated

# Option 1

- After the portfolio is finalized, perform a voltage stability analysis to assess the voltage performance of the planned system
  - 2015 ITP10 Wind transfers W->E
  - 2017 ITP10 Generation transfers N->S, S->N, W->E
- Observations
  - Status Quo
  - Quantitative economic project performance is based on resolving congestion due to thermal limitations of the system
  - Analysis done after portfolio development and may introduce uncertainty into the portfolio recommendation process

# Option 2

- Use the 2017 ITP10 Voltage Stability Assessment results to define interfaces that proxy voltage stability limitations and include in the system constraints list
- During portfolio development, use 2017 ITP10 voltage stability assessment models and results to evaluate how congested interface limits change as result of significant reactive device solutions
- For other transmission topology modifications and additions, evaluate those based on how they divert power away from congested interfaces or aggravate congested interfaces

# Option 2 Background

- 2017 ITP10 examples where voltage stability limitations may precede the system's thermal limitations
- See pages 31-35 in the 2017 ITP10 voltage stability report approved by TWG provided as background material that provide thermal limit loading at the point of voltage collapse for most limiting 345 kV outages
- Other top 345 kV outages from the 2017 ITP10 stability assessment are also provided as background material
  - SPP has identified a list of potential interface candidates to proxy voltage stability limitations

# Option 3

- Perform a voltage stability assessment prior to finalizing the constraint assessment to identify interfaces that proxy voltage stability limitations and include in the system constraints list
- During portfolio development, use applicable voltage stability assessment models and results on a limited basis to evaluate how congested interface limits change as result of significant reactive device solutions
- For other transmission topology modifications and additions, evaluate those based on how they divert power away from congested interfaces or aggravate congested interfaces

# Option 2 and 3 Observations

- Quantitative economic project performance would be based on resolving congestion due to thermal limitations and system voltage stability limits
- Proxy interfaces may allow study to better focus on most beneficial projects
  - Proxy interfaces can capture and curb project benefits
- Including proxy interfaces may introduce complexities into the process
- Including proxy interfaces may be more in line with system operation initiatives

# Option 2 and 3 Comparison

<b>Task</b>	<b>Option 2*</b> <b>Time/Complexity/Risk</b>	<b>Option 3*</b> <b>Time/Complexity/Risk</b>
Additional scope	N/A	More
Model vetting	N/A	More
Transfer Analysis Methodology Debate	N/A	More
Software Settings (Pre and Post-Contingency)	N/A	More
Additional Transfer Analysis	N/A	More
Results vetting	Less	More
Interface Rating Methodology	Same	Same
TWG Review/Approval	Less	More
Portfolio Development	Same	Same
Accuracy/Precision	Same	Same

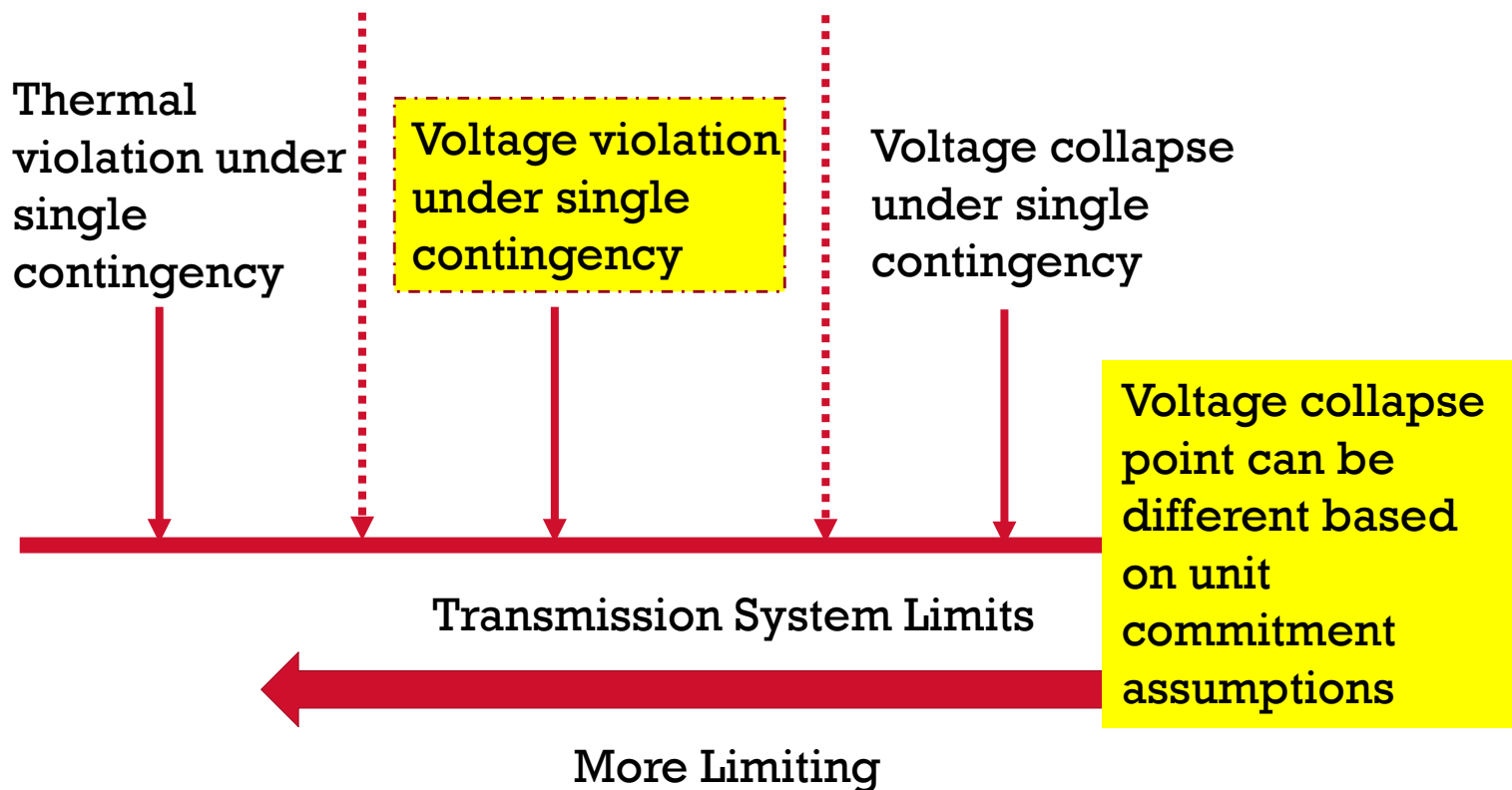
\*Leading up to and concurrent with Constraint Assessment and Economic Model Finalization



# Interface Rating Illustration

To account for uncertainties interface rating for voltage collapse can be determined by combining critical generator and transmission contingency

WECC maintains 105% transfer path voltage stability margin under single contingency and 102.5% for multiple contingencies



# Interface Rating Decisions

- Which model and transfer scenario should define the interface rating?
- Should the interface have both a summer and winter rating?
- Should the interface rating be based on voltage collapse or low voltage violations?