



**Southwest Power Pool**  
**TRANSMISSION WORKING GROUP MEETING**  
**June 13, 2014**  
**Net Conference**

**• Summary of Action Items •**

1. The TWG approved the additional TRM values for the flowgates requested by AEP
2. [Click here and type action item]

**Southwest Power Pool  
TRANSMISSION WORKING GROUP MEETING**

**June 13, 2014  
Net Conference**

**• M I N U T E S •**

**Agenda Item 1 – Administrative Items**

TWG Chair Noman Williams called the meeting to order at 8:32 a.m. The following members were in attendance (Attachment 1a, 1b – Attendance, Proxies) or represented by proxy:

Mo Awad, Westar Energy, Inc.  
John Boshears, City Utilities of Springfield  
Alan Burbach, Lincoln Electric System, proxy for Scott Benson  
John Fulton, Southwestern Public Service Co.  
Joe Fultz, Grand River Dam Authority  
William Hawkins, Western Farmers Electric Cooperative, proxy for Tim Smith  
Dan Lenihan, Omaha Public Power District  
Randy Lindstrom, Nebraska Public Power District  
Jim McAvoy, Oklahoma Municipal Power Authority  
Matt McGee, American Electric Power  
Nate McNeil, Midwest Energy, Inc.  
Nate Morris, Empire District Electric  
Alan Myers, ITC Great Plains  
John Payne, Kansas Electric Power Cooperative, Inc.  
Jason Shook, GDS Associates representing ETEC  
Jeff Stebbins, Tri-County electric Cooperative  
Noman Williams, Sunflower Electric Power Cooperative, on phone  
Harold Wyble, Kansas City Power & Light

Kirk Hall, SPP staff, informed the group that there was a quorum.

**Agenda Item 2 – BP Revision 7060**

Carry Frizzell, SPP staff, presented the revised Business Practice 7060 (Attachment 2 – BP 7060) to the group. The group had a brief discussion concerning the escalation rate. Carry confirmed that the cost provided by the Transmission Owner would still be used, but it will be escalated at the rate assumed in the source study. Carry also clarified for the group that the escalation rates are determined by 40 year analysis and hasn't changed in several years.

**Alan Myers made the motion to endorse the Business Practice revision. Joe Fultz seconded the motion. The vote passed unopposed.**

**Agenda Item 3 – Reliability Benefit Metric Update**

Juliano Freitas, SPP staff, and Hannes Pfeifenberger, Brattle Group, presented to the TWG (Attachment 3 – Reliability Metric Review and Recommendation). Juliano let the group know that the ESWG did not have a recommendation at this time but would like to get approval before the July MOPC. There was discussion on the accuracy of generation to load representation of the grid usage. Hannes pointed out the primary difference is that it would be simulated as all generation and one zone verse all generation and all zones in reality. After continued discussion on the various options Juliano provided a SPP Staff recommendation for Load Ratio Share for 300 kV and greater, system reconfiguration for 100 kV and

less, and to use both for 100 kV to 300 kV. The discussion moved to how this could affect cost allocation. The group noted that this was about who benefits from transmission being built. Upon request Juliano and Hannes reviewed Dr. Proctor's approach, which would use 2/3 and 1/3 Load Ratio Share for low voltage projects and 50/50 Distribution Factor and System Reconfiguration hybrid calculation for high voltage projects. After continued discussion Noman was not comfortable with a straw poll since the group hadn't had time to review the material. The conversation then shifted to discuss a timeline for approval. Noman notified Juliano that the TWG would need material to review as soon as possible to approve before the 4<sup>th</sup> of July.

#### **Agenda Item 4 – CIP-002-5**

Michael Odom, SPP staff, presented an update (Attachment 4 – CIP-002-5 Draft Methodology 13JUN14 TWG) to the group, and informed the group that SPP staff would like to present the methodology to MOPCY in October for approval. The group then had a brief discussion on which year would be the most appropriate. Noman noted that it needed to be in the planning horizon not in the operating horizon.

#### **Agenda Item 5 – TRM Approvals**

Ryan Harrigill, SPP staff, requested the TWG approve the additional TRM values for the flowgates that were requested by AEP. A discussion was also brought up as to whether or not the current flowgate process was adequate under the Integrated Market.

**Action Item: Include flowgate process discussion as agenda topic in future TWG meeting.**

**Matt McGee made a motion to approve the TRM values. Mo Awad seconded the motion. The motion passed unopposed.**

#### **Agenda Item 6 – TPLTF Update**

Michael Odom provided the group with an update (Attachment 5a, 5b, 5c – TPL Task Force Update, TPLTF Action Items, TPL-001-4 R3 Discussion) from the TPLTF.

#### **Agenda Item 7 – EPA Rules Update**

This item was skipped.

#### **Agenda Item 8 – MDWG Update**

Joe Fultz, GRDA, gave an update (Attachment 6 – MDWG Report) to the group from the last MDWG meeting. The December 31 date for the model build was discussed, and the MDWG will continue to shoot for it as a goal. A finalization in January was also discussed to include approved ITP projects.

**Action Item: SPP Staff to confirm if anyone has reached out to WAPA/Heartland/Basin for the new model build.**

Kirk Hall asked if the group would like to discuss wind accreditation change during the July conference call. It was decided to add it to the July agenda.

Respectfully Submitted,

Jody Holland  
Secretary



**Southwest Power Pool, Inc.**  
**TWG NET CONFERENCE**  
**June 13, 2014**  
**Net Conference – Little Rock, Arkansas**

**• A G E N D A •**

8:30 a.m. – 12:00 p.m.

1. BP Revision 7060 .....Cary Frizzell (15 min.)
2. Reliability Benefit Metric Update.....Juliano Freitas (1 hr.)
3. CIP-002-5 .....Michael Odom (30 min.)
4. TRM Approvals (Action Item) ..... Champy Gahagan (15 min.)
5. TPLTF Update .....Michael Odom (30 min.)
6. EPA Rules Update..... Lanny Nickell (15 min.)
7. MDWG Update ..... Joe Fultz (15 min.)

*Relationship-Based • Member-Driven • Independence Through Diversity*  
*Evolutionary vs. Revolutionary • Reliability & Economics Inseparable*

All sessions in Central Daylight Time (Chicago, GMT-05:00)

Session detail for 'TWG Net Conference - 6/13/14':

Participant Name	Email	IP Address	Browser	Date	Invited	Registered	Start time
1 Shaun Scot	smscott@s	198.22.157	WINDOWS	#####	No	N/A	8:22 AM
2 Martin Gre	mgreen@g	69.27.128.	WINDOWS	#####	No	N/A	8:26 AM
3 John Boshe	john.boshe	66.119.2.2	WINDOWS	#####	No	N/A	8:26 AM
4 Nathan Mc	nmcneil@r	50.93.237.	WINDOWS	#####	No	N/A	8:27 AM
5 Tony Gott	(tgott@aeci	69.27.134.	WINDOWS	#####	No	N/A	8:28 AM
6 John Fultor	john.fulton	192.234.13	WINDOWS	#####	No	N/A	8:28 AM
7 Harold Wyl	harold.wyb	144.73.9.6	WINDOWS	#####	No	N/A	8:28 AM
8 Alan Burba	aburbach@	204.145.8.	WINDOWS	#####	No	N/A	8:29 AM
9 Nicole King	n.king@oc	204.61.12.	WINDOWS	#####	No	N/A	8:29 AM
10 Bob Burner	g.burner@	192.234.12	WINDOWS	#####	No	N/A	8:30 AM
11 Mo Awad	mo.awad@	138.230.25	WINDOWS	#####	No	N/A	8:30 AM
12 Richard Da	richard.daf	208.53.220	WINDOWS	#####	No	N/A	8:31 AM
13 Gimod Ola	jgolapurayil	12.106.168	WINDOWS	#####	No	N/A	8:31 AM
14 Nate Morri	nmorris@e	69.55.155.	WINDOWS	#####	No	N/A	8:31 AM
15 Randy Lind	rrlinds@np	192.132.20	WINDOWS	#####	No	N/A	8:31 AM
16 Robert Jan	rob.jansser	72.83.68.9	WINDOWS	#####	No	N/A	8:31 AM
17 Cary Frizze	lfrizzell@sj	198.22.156	WINDOWS	#####	No	N/A	8:32 AM
18 Matt McGe	mcmcgee@	161.235.22	WINDOWS	#####	No	N/A	8:32 AM
19 Ryan H	rharrigill@	198.22.156	WINDOWS	#####	No	N/A	8:32 AM
20 Dan Leniha	djenihan@	141.246.2.	WINDOWS	#####	No	N/A	8:32 AM
21 Jason Shoo	jason.shoo	67.213.163	WINDOWS	#####	No	N/A	8:32 AM
22 Geoffrey M	g.rush@oc	204.61.12.	WINDOWS	#####	No	N/A	8:32 AM
23 Pat Wilkins	pwilkins@t	68.203.22.	WINDOWS	#####	No	N/A	8:33 AM
24 William Ha	w_hawkins	69.151.48.	WINDOWS	#####	No	N/A	8:35 AM
25 Jason Chap	j.chaplin@	204.61.12.	WINDOWS	#####	No	N/A	8:36 AM
26 Joe Lang	jlang@les.c	204.145.8.	WINDOWS	#####	No	N/A	8:37 AM
27 J Fultz - GR	jfultz@grd	69.27.128.	WINDOWS	#####	No	N/A	8:38 AM
28 Noumvi Gh	noumvi.gh	168.166.67	WINDOWS	#####	No	N/A	8:38 AM
29 Juliana Brir	juliana.brin	198.45.18.	WINDOWS	#####	No	N/A	8:41 AM
30 Alan Myers	amyers@it	12.106.168	WINDOWS	#####	No	N/A	8:44 AM
31 David Sarg	dave.sarge	209.12.179	WINDOWS	#####	No	N/A	8:46 AM
32 Jeff Stebbir	jstebbins@	12.147.235	WINDOWS	#####	No	N/A	8:53 AM
33 Chenal We	awhite@sp	198.22.156	WINDOWS	#####	Yes	N/A	8:59 AM
34 John Payne	jpayne@ke	67.63.236.	WINDOWS	#####	No	N/A	9:00 AM
35 Josie Dagg	edaggett@v	205.254.14	WINDOWS	#####	No	N/A	9:11 AM
36 H. Pfeifenb	hpfeifen@l	38.97.122.	WINDOWS	#####	No	N/A	9:13 AM
37 Chris Jamie	cjamieson@	198.22.156	WINDOWS	#####	No	N/A	9:21 AM
38 Steve Gaw	rsgaw1@gr	184.5.192.	WINDOWS	#####	No	N/A	9:22 AM
39 Pat Hayes	(phayes@ar	199.38.133	WINDOWS	#####	No	N/A	9:32 AM
40 Heather St	hstarnes19	76.125.83.	MAC,Safari	#####	No	N/A	9:36 AM
41 Al Tamimi	atamimi@	50.93.236.	WINDOWS	#####	No	N/A	9:37 AM
42 Jim McAvoy	jmcavoy@	66.210.186	WINDOWS	#####	No	N/A	9:40 AM
43 Kyle Watso	kwatso2@	198.8.5.11	WINDOWS	#####	No	N/A	9:58 AM
44 Michael Wi	mwegner@	12.106.168	WINDOWS	#####	No	N/A	10:01 AM

45	Justin	justin.w.rac	192.234.13	WINDOWS	#####	No	N/A	10:02 AM
46	Jeff Knotte	jeff.knottel	66.119.2.2:	WINDOWS	#####	No	N/A	10:14 AM
47	Randy Colli	randy.collic	66.119.2.2:	WINDOWS	#####	No	N/A	10:23 AM
48	Jeremy Sev	jseverson@	216.235.16	WINDOWS	#####	No	N/A	10:26 AM

## Kirk Hall

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**From:** Scott Benson <[sbenson@les.com](mailto:sbenson@les.com)>  
**Sent:** Wednesday, June 11, 2014 12:57 PM  
**To:** Kirk Hall  
**Cc:** Burbach, Alan  
**Subject:** 6/13/14 TWG Proxy

Kirk,

Alan Burbach will be acting as my proxy for the 6/13/14 TWG meeting.

Thanks,

Scott J. Benson, P.E. | Manager, Resource & Transmission Planning

Lincoln Electric System

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## Kirk Hall

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**From:** Smith, Tim <t\_smith@wfec.com>  
**Sent:** Wednesday, June 11, 2014 9:54 AM  
**To:** Kirk Hall  
**Cc:** Hawkins, William  
**Subject:** RE: TWG Meeting 6/13/2014

Kirk,  
I will be unable to sit on the TWG call Friday but William Hawkins (WFEC) has my proxy.

*Tim C. Smith, P.E.*

WFEC Supervisor, Transmission Engineering  
P.O. Box 429  
Anadarko, OK. 73005-0429  
Office 405 247-4568  
Cell 405 615-9517



<b>BPR Number</b>	053	<b>BPR Title</b>	Reformat of BP7060
<b>Business Practice Section(s) Requiring Revision</b> (include Section No., Title, and Protocol Version)	7060 Notification to Construct and Project Cost Estimating Processes Effective January 1, 2012		
<b>Impact Analysis Required</b> (Yes or No)	No		
<b>MMU Report Required</b> (Yes or No)	No		
<b>Requested Resolution</b> (Normal or Urgent)	Normal		
<b>Revision Description</b>	Business Practice was reorganized and reformatted for improved clarity. Non-substantive edits were made for consistency. Baseline cost escalation procedure description was added to Section 8.		
<b>Reason for Revision</b>	To improve clarity and consistency of Business Practice.		
<b>Tariff Implications or Changes (Yes or No; If yes include a summary of impact and/or specific changes)</b>	No		
<b>Criteria Implications or Changes (Yes or No; If yes include a summary of impact and/or specific changes)</b>	No		
<b>Credit Implications (Yes or No, and summary of impact)</b>	No		
<b>Working Group/Committee Review and Results</b>	PCWG – <a href="#">Approved 4-8-2014</a> BPWG – <a href="#">Approved 5-19-2014</a> ORWG – RTWG – TWG – MOPC –		

<b>Sponsor</b>	
<b>Name</b>	Terri Gallup
<b>E-mail Address</b>	<a href="mailto:tagallup@aep.com">tagallup@aep.com</a>
<b>Company</b>	AEP
<b>Company Address</b>	
<b>Phone Number</b>	
<b>Fax Number</b>	

**Proposed Business Practice Language Revision**

## Business Practice

### Contents

- [1. Notification to Construct](#)
- [2. Notification to Construct with Conditions](#)
- [3. Issuance of an NTC or NTC-C](#)
- [4. Format of NTC/NTC-C Letters and Identifiers](#)
- [5. Acceptance of an NTC-C or NTC](#)
- [6. NTC/NTC-C Modification](#)
- [7. NTC/NTC-C Withdrawal](#)
- [8. Project Specification and Cost Estimation Process](#)
- [9. Standardized Cost Estimate Reporting Template \(SCERT\)](#)
- [10. PCWG Review Process for Applicable Projects](#)
- [11. Projects Reviewed by PCWG](#)
- [12. Reporting](#)
- [13. Dispute Resolution](#)

### 1. Notification to Construct

An SPP Notification to Construct (NTC) letter is a formal document directing the Designated Transmission Owner (DTO) for the commencement of construction of Network Upgrades that have been approved or endorsed by the SPP Board of Directors (BOD) intended to meet the construction needs of the SPP Transmission Expansion Plan (STEP), SPP Open Access Transmission Tariff (OATT), or Regional Transmission Organization (RTO).

### 2. Notification to Construct with Conditions

An SPP Notification to Construct with Conditions (NTC-C) letter is a formal document directing a DTO to further refine its Study Estimate, as defined in Section 8, for an Applicable Project. An NTC-C does not authorize the DTO to start construction or to order materials for the project.

The NTC-C will direct a DTO to perform detailed engineering and cost studies within a stated timeframe in the NTC-C letter to refine its Study Estimate for further SPP analysis to determine if the project should proceed with an NTC for actual construction. The DTO shall provide SPP an estimate of the engineering and other costs (i.e., such as the costs for engineering to develop the design, perform siting/routing reviews, perform environmental studies, or to take other actions required to refine the Study Estimate) required to develop the NTC-C Project Estimate (CPE).

#### 2.1. Legacy Project

A Legacy Project is a construction project for which SPP has issued an NTC prior to January 1, 2012.

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## **2.2. Applicable Projects**

Applicable Projects are construction projects, including Legacy Projects, that SPP has the authority to direct construction of, has a nominal operating voltage of 100 kV or above, and has a Study Estimate in excess of \$20 million. A single Applicable Project may consist of multiple upgrades or multiple projects assigned to multiple DTOs. A non-Applicable Project with a nominal operating voltage of 100 kV or above that has been issued an NTC will become an Applicable Project if either its NTC Project Estimate (NPE) or any subsequent cost estimate exceeds \$20 million. Applicable Projects will continue to be Applicable Projects even if their subsequent cost estimates fall below \$20 million.

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## **3. Issuance of an NTC or NTC-C**

The authority for SPP to issue an NTC is derived from approval by the BOD, a FERC filed Service Agreement under the SPP OATT, an endorsed Economic or Sponsored Upgrade upon the execution of a contract that financially commits a Project Sponsor to fund such upgrade, or when such upgrade is otherwise required pursuant to the tariff. An NTC or NTC-C may be issued for projects originating from processes described in Section VI of Attachment O of the OATT.

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The issuance of an NTC or NTC-C represents that the Network Upgrade is eligible for cost recovery under the SPP OATT, including if SPP withdraws the NTC or NTC-C as described in Section 7 below.

SPP will issue an NTC-C when SPP staff has determined that a project in the Study Estimate stage requires a CPE. SPP staff will provide the timeframe that the DTO has to provide its CPE to SPP in the NTC-C letter.

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SPP will issue an NTC or NTC-C under the following conditions and time constraints defined in Sections 3.1 through 3.5:

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### **3.1. Approved Network Upgrades from ITP/High Priority Studies**

Unless previously issued, SPP staff will issue NTC(s) or NTC-C(s) for all Network Upgrades approved by the BOD for which financial commitment is required prior to the approval of the next update of the STEP. Additionally if authorized by the BOD, SPP staff will issue an NTC/NTC-C for each Network Upgrade for which a financial commitment is needed within the next four years or other time period as designated by the BOD. Such an NTC/NTC-C will be issued within 15 business days from the time the SPP BOD approves the project.

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### **3.2. Sponsored Upgrades**

An NTC will be issued for an endorsed Sponsored Upgrade once a project sponsor has financially committed to pay for the Sponsored Upgrade.

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### **3.3. Network Upgrades related to Transmission Service requests**

Unless previously issued, SPP staff will issue NTCs or NTC-Cs for all identified projects associated with Transmission Service Agreements (TSA) within 15 business days from the time at which SPP receives from all customers in an Aggregate Study executed TSA(s) or written request(s) from customer(s) requesting a TSA be filed unexecuted.

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### **3.4. Network Upgrades related to Generation Interconnection requests**

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➤ Unless previously issued, SPP staff may issue NTCs for identified project(s) associated with Generation Interconnection Agreements (GIA) to an affected Transmission Owner (TO) who is not a party to the GIA within 15 business days from the Effective Date of the GIA.

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### •3.5. **Network Upgrades related to Attachment AQ requests**

➤ Unless previously issued, SPP staff will issue NTCs or NTC-Cs for all identified projects associated with the request within 15 business days from the time at which SPP receives the updated and executed Network Integrated Transmission Service Agreement.

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## **4. Format of NTC/NTC-C Letters and Identification Numbers**

To ensure proper and consistent documentation of approved Network Upgrades, SPP NTC and NTC-C letters shall include, at a minimum, the following information in Sections 4.1 through 4.5:

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[A Sample NTC for a Network Upgrade is provided as Appendix A in this document.](#) [A Sample NTC-C for a Network Upgrade is provided as Appendix B in this document.](#)

### •4.1. **NTC/NTC-C Information**

- The NTC is assigned a unique NTC Identification Number.
  - NTC ID# convention, SPP-NTC-#
  - *Example:* SPP-NTC-1
- The NTC-C is assigned an NTC Identification Number just as an NTC.

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### •4.2. **Project Information**

- Projects are assigned a unique Project Identification Number (PID).
  - Project ID# convention, SPP-PID-#
  - *Example:* SPP-PID-1
- Projects consist of one or more Network Upgrades.
- The Project name will generally describe the Network Upgrades associated with the Project.
- Project Information will include an Estimated Cost and a Project Schedule, which will include, at a minimum, the Need Date.

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### •4.3. **Network Upgrade Information**

- Network Upgrades are assigned a unique Upgrade Identification Number (UID)
  - Network Upgrade ID# convention, SPP-UID-#
  - *Example:* SPP-UID-1
- The Network Upgrade Description will provide a brief scope of the Network Upgrade
- Documentation of Network Upgrade Owner
  - SPP Member/facility owner(s) and Contact Information
  - Markets and Operations Policy Committee (MOPC) Representative
  - TWG Representative, if applicable
- Categorization
  - Economic as a part of a Balanced Portfolio
  - Integrated Transmission Planning Process

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- Sponsored Upgrade
  - Service Upgrade
  - Zonal Reliability Upgrade
  - Other
- Upgrade Specifications
    - Upgrade Type: Reconductor, Rebuild, New Construction, etc.
    - Voltage levels
    - Estimated Line Length and minimum required summer and winter rating
    - Transformer, minimum required summer and winter rating
    - Associated terminal equipment, minimum required summer and winter rating
    - Any other static equipment
  - Network Upgrade Justification
    - NERC Reliability Compliance
    - Regional Study reliability
    - Zonal criteria
    - Transmission service request – List Aggregate study number with reference to posted facility log
    - Economic
    - Other
  - Need Date
  - Network Upgrade cost estimate in present day dollars, date of cost estimate, and origination of cost estimate.
  - Cost recovery for Network Upgrade
    - Base Plan Allocated
    - Direct Assignment
    - Project Sponsor
    - Zonal
    - Regional
    - Other

**4.4. Documentation of Approvals**

- BOD approval or endorsement date or reference to approved motion
- Service Agreement number
- Commitment details of Sponsored Upgrades

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**4.5. Documentation of Project History**

- The NTC/NTC-C will list any previously issued NTC ID or NTC-C ID numbers associated with the approved Network Upgrade or Network Upgrade change
- The NTC/NTC-C will include any related past NTC/NTC-C identification numbers to ensure proper documentation of the approval
- When the situation warrants issuing a new NTC/NTC-C, the new NTC/NTC-C will include past NTC/NTC-C numbers and information documenting the Network Upgrade change and party requesting the formally approved Network Upgrade change, rationale for the change and approvals for the scope adjustments

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~~Modifications of the approval are outlined in Section 6.~~

~~A Sample NTC for a Network Upgrade is provided as Appendix A in this document. A Sample NTC-C for a Network Upgrade is provided as Appendix B in this document.~~

## 5. Acceptance of an NTC-C or NTC

### 5.1. For all Applicable Projects that have been issued an NTC-C

The DTO shall provide to SPP, within 90 days of the date of the NTC letter, a written commitment that it has accepted to construct the Network Upgrade(s) and that it shall provide SPP with an NTC-C Project Estimate (CPE), as described in Section 8.4, on or before the due date requested by SPP in the NTC-C letter. The DTO shall advise SPP of any inability to provide the CPE by the SPP requested date as soon as the inability becomes apparent to the DTO.

If the CPE variance bandwidth of -20% to +20% does not exceed the Study Estimate variance bandwidth of -30% to +30%, as discussed in Section 8, the Applicable Project's cost variance will be deemed acceptable and SPP staff will remove the conditions in the NTC and SPP staff will notify the DTO in writing within 5 business days that the conditions have been removed and issue a new NTC to the DTO. This will be the authorization for the DTO to proceed with the construction of the Applicable Project. In other words, if the CPE is not greater than 1.0833 times the Study Estimate and is not less than 0.875 times the Study Estimate, an NTC will be issued with no further review.

If the CPE variance bandwidth exceeds the variance bandwidth of -30% to +30% of the Study Estimate, SPP staff will re-evaluate this Applicable Project using the new cost estimate data provided by the DTO, and will make a recommendation to the BOD at its next regularly scheduled meeting. In other words, if the CPE is greater than 1.0833 times the Study Estimate or is less than 0.875 times the Study Estimate SPP staff will re-evaluate the project.

The CPE received from the DTO will be used as the final-established baseline cost estimate for reporting all future cost estimate changes during the Project Tracking process for the project and will be the basis for determining project cost variances.

### 5.2. For all projects that have been issued an NTC

If the DTO accepts the NTC, it shall respond as prescribed in the NTC letter and provide SPP with a refined Study Estimate. This estimate is referred to as the NTC Project Estimate (NPE), as described in Section 8.5.

The NPE received from the DTO for these projects will be used as the final-established baseline cost estimate for reporting all future cost estimate changes during the Project Tracking process and will be the basis for determining project cost variances.

The baseline cost estimate for a Legacy Project shall be established as the value submitted in Project Tracking as of January 31, 2014, listed on the 2014 Quarter 2 SPP Project Tracking Report and approved by the BOD.

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## 6. NTC/NTC-C Modification

It is recognized that from time to time modifications may be necessary to NTCs/NTC-Cs. The following sections outline the process to be used and the conditions under which an NTC/NTC-C may be modified.

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### 6.1. Changes That Could Require a Modification

In the event that changes occur that could cause an NTC/NTC-C for a Project to be modified, SPP may re-study the need for the Project. Changes that could cause an NTC/NTC-C for a Project to be modified include but are not limited to:

#### NTC/NTC-C

- Change in scope
- Change in the In-Service Date or Need Date
- Changes in load
- Changes in generation
- Annulment of Transmission Service Requests (TSR)
- Change in local planning criteria
- Modeling error
- Change in DTO

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#### NTC

- Change in cost estimates

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### 6.2. Restrictions to Modifications to an NTC/NTC-C

Modifications must not:

- Cause adverse impact to Service Agreements or other contractually committed service under the SPP OATT.
- Render firm transmission service under the OATT undeliverable.

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### 6.3. Stakeholder Request for Project Re-Study

A stakeholder wishing to have an NTC/NTC-C Project restudied must provide SPP with the necessary model changes needed to study the modification of the Project in the appropriate models. If SPP determines that a change has occurred that could cause an NTC/NTC-C for a Project to be modified, SPP will perform the necessary analysis to determine if the Project modification meets the Network Upgrade Justification of the original Project as described in Section 4.3. For a Project modification to be deemed reasonable, it must meet or exceed the Network Upgrade Justification of the original Project.

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### 6.4. Notifications if NTC/NTC-C is Modified

If SPP determines that an NTC/NTC-C Project modification is reasonable, it will inform the TWG, MOPC, and BOD of this fact at their next regularly scheduled quarterly meeting and request the BOD approval or endorsement, as necessary, to issue an NTC/NTC-C modification.

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After the BOD approves or endorses the NTC/NTC-C modification, SPP will issue a modified NTC/NTC-C, as needed.

## 6.5. Modifications to NTCs for Applicable Projects

After an NTC has been issued for an Applicable Project, and a modification is required, an NTC-C shall not be issued.

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## 6.6. Change in Scope

A modification to an NTC/NTC-C shall be required if a change to the scope of the Project requires a modification in the designated Project. A change to the scope shall mean those new objectives that have a material impact on the required operating characteristics of the Transmission System pursuant to all applicable requirements of the SPP Tariff, SPP Criteria, NERC Reliability Standards, and the Transmission Provider's and TO's Transmission Planning Reliability Criteria in effect to maintain the reliable operation of the Transmission System in accordance with Good Utility Practice. Such changes may include but are not limited to:

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- Topology
  - Routing changes
  - Interconnection point changes
- Operating Characteristics
- Changes in load
- Changes in generation
- Changes in local planning criteria
- Modeling errors
- Unavoidable need for modifications in distribution

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And must:

- Provide comparable or improved level of electrical performance
- Not cause adverse impact to Service Agreements or other contractually committed service sold under the SPP OATT
- Not render sold firm transmission service undeliverable

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In the event that the scope of an NTC/NTC-C needs to be modified, a new NTC/NTC-C letter shall be issued to clarify the change and to reflect any modifications to Project scope. SPP staff will complete the appropriate review for a modification.

If a stakeholder wishes to propose a change in the scope of an NTC/NTC-C or wishes to propose an alternative transmission solution to an already approved Network Upgrade, the requestor shall coordinate the proposed change with SPP staff.

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## 6.7. Change in the In-Service Date or Need Date

It is recognized that a change in an NTC/NTC-C may be necessary due to required changes to the Project schedule.

Through the processes identified in Section 3, SPP could change the Need Date, which would result in an NTC/NTC-C modification.

The following items are not expected to cause a change in an NTC/NTC-C due to the fact that time delays associated with these causes are handled through a mitigation plan or a re-dispatch option, as appropriate:

- Not enough time to complete Project based on SPP's Need Date
- Unforeseen delays, such as:

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- Regulatory
- Siting
- Construction
- Equipment delivery

### **6.8. Change in Designated Transmission Owner**

A modified NTC/NTC-C shall be required if there is a change in the DTO of a Project. Once the change in DTO is approved, SPP shall issue a modified NTC/NTC-C reflecting the change in DTO. SPP shall inform the TWG and the PCWG of an approved change in DTO at their respective next regularly scheduled meeting.

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## 7. NTC/NTC-C Withdrawal

In the event that changes occur which could render an NTC/NTC-C for an approved Project unnecessary, SPP may re-study the need for the Project. Changes that could render an NTC/NTC-C for an approved Project unnecessary include but are not limited to:

- Changes in load
- Changes in generation
- Annulment of TSR's
- Change in local planning criteria
- Modeling error

But must not:

- Cause adverse impact to Service Agreements or other contractually committed service under the SPP OATT
- Render firm transmission service undeliverable-

### 7.1. Stakeholder Request for Project Re-studied for Withdrawal

A stakeholder wishing to have an NTC/NTC-C Project re-studied for withdrawal must provide SPP with the necessary information needed to study the removal of the Project from the appropriate models. If SPP determines that changes have occurred that could render an NTC/NTC-C for an approved Project unnecessary, SPP will perform any necessary analysis and will, in consultation with stakeholders, determine if the Project is still required. Consideration of NTC/NTC-C withdrawal will take into account the stage of development of the Project and discussion with the DTO.

If SPP confirms that an NTC/NTC-C Project is unnecessary, it will inform the TWG, PCWG, MOPC, and BOD of this fact at their next regularly scheduled meeting and request approval by the BOD, as necessary, to withdraw the NTC/NTC-C.

After the BOD approves the withdrawal of an NTC/NTC-C, SPP will notify the DTO that the NTC/NTC-C has been withdrawn. If the NTC/NTC-C was due to a Service Agreement, then the NTC/NTC-C withdrawal shall not need TWG, MOPC, or BOD approval but shall be addressed by SPP staff.

### 7.2. Notify SPP of Costs Related to an NTC Withdrawal

Within six months after receiving an NTC/NTC-C withdrawal, the DTO shall notify SPP of any costs that it incurred prior to receiving the withdrawal of the NTC/NTC-C for reimbursement pursuant to Section VIII of Attachment J to SPP's OATT.

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# COST ESTIMATE PROCESS

## 8. Project Specification and Cost Estimation Process

A tiered approach for project cost estimates is based upon the level of project definition that is known while also considering an appropriate level of risk valuation. Each Stage of the Cost Estimation process is described in more detail below.

### 8.1. Baseline Cost Escalation

The established baseline is the version of a cost estimate that can only be changed through formal change control procedures and is used as a basis for comparison.

All cost estimates established as baselines will be escalated annually. SPP will escalate any cost estimate for an Upgrade that is considered a baseline estimate at the rate assumed in the source study that originated the need for the Upgrade. The new escalated baseline cost estimate will be used for comparison with any updated cost estimate submitted in the same calendar year to measure cost estimate variance.

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### 8.2. Conceptual Estimate Stage

The **Conceptual Estimate** is the estimate prepared by SPP staff based on historical cost information in an SPP database and updated information provided by the TO(s). It is to be used as a screening tool to determine if a project is cost-effective and whether it should be pursued in meeting a determined system need. This estimate would not attempt to address detailed environmental, geography, terrain or other issues.

In this first stage, SPP staff will develop the initial project scope and Conceptual Estimate using a cost estimate tool (database platform) that will be developed in conjunction with the TO(s). The cost estimating tool will include historical SPP cost data such as construction costs per mile for specific voltage levels, substation construction cost estimates, and construction cost modifiers for other relevant factors such as differences in region, terrain, urban/rural, etc. This will allow cost estimates to be developed to more readily accommodate the screening of large numbers of potential projects and selecting suitable candidates for further study.

The output of the cost estimate tool will be a table providing the total cost estimate for each project under consideration, as well as all of the supporting information for each cost estimate. This will provide an easy-to-use reference for the Conceptual Estimates and the ability to determine variations between them. SPP staff, in conjunction with the Transmission Owners, will update the cost data used in the cost estimate tool on an annual basis. To support these updates, SPP staff will provide an aggregate summary of final cost data collected in the Project Tracking process. This will ensure the cost estimate tool is kept up-to-date for Conceptual Estimates and will help refine the tool to reflect a better estimate of actual costs.

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### 8.3. Study Estimate Stage

The **Study Estimate** is the estimate prepared by the DTO(s) for projects that pass the Conceptual Estimate screening process and require a more refined cost estimate for project approval.

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The Study Estimate Stage begins after the initial project screening is completed and the list of potential projects has been narrowed to those most likely to be selected. SPP and the incumbent DTO for each project must review and refine the project scope as necessary to provide study-level cost estimates for each alternative project.

The Study Estimate is the first detailed, cost estimate that the DTOs will be required to submit. For this estimate, DTOs will develop cost estimates based on the Study Estimate Design Guide. Due to the large number of unknown design and construction parameters at this point in the planning process and the project scope, the DTO should identify those unknowns and the risks associated with them.

The final project cost is expected to be within a -30% to + 30% variance from the Study Estimate.

#### **8.4. NTC-C Project Estimate Stage**

The **NTC-C Project Estimate (CPE)** is the estimate prepared by a DTO for an Applicable Project after the receipt of an NTC-C. This estimate will include any cost estimate analysis, as described in Section 2. The CPE will be used as a the final established baseline for reporting all cost estimate changes during the Project Tracking process and will be the basis for determining project variance. The NTC-C Project Cost Estimate (CPE) provided is expected to be within a +/- 20% precision bandwidth of the final project cost.

The CPE shall be submitted to SPP by the DTO on or before the date stated in the NTC-C letter.

For Applicable Projects originating from an ITP process, the CPE shall be due four months prior to the start of the next applicable ITP process (note: ITP processes are described in Attachment O of the SPP OATT).

For example, NTC-Cs issued for the 2015 ITP10 will have a CPE return deadline of four months prior to the start of the next ITP10 process. The 2015 ITP10 review was started July 1, 2013 and will complete its 18 month cycle December 31, 2014. The CPE response will be due no later than February 28, 2016.

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Applicable Process	Start Date of Next Process	CPE Due
ITP10 (e.g. 2015 ITP10)	Every 3 <sup>rd</sup> July 1 <sup>st</sup> (e.g. July 1, 2016)	Every 3 <sup>rd</sup> Feb 28 <sup>th</sup> (e.g. Feb 28, 2016)
ITP Near-Term (e.g. 201 <del>25</del> ITPNT)	Every January 1 <sup>st</sup> (e.g. Jan. 1, 201 <del>36</del> )	Every August 31 <sup>st</sup> (e.g. Aug. 31, 201 <del>25</del> )

For Applicable Projects originating from a non-ITP process, the CPE shall be due 6 months after the date in which the NTC-C is issued.

If the CPE variance bandwidth of -20% to +20% does not exceed the Study Estimate variance bandwidth of -30% to +30%, as described in Section 5.1, the project's cost variance will be deemed acceptable and the conditions, as described in Section 2, on the NTC will be removed by SPP staff. SPP staff will issue a revised NTC letter to the DTO removing the conditions from the NTC. This will be the authorization for the DTO to proceed with the project.

If the CPE variance bandwidth exceeds the variance bandwidth of -30% to +30%, as described in Section 5.1, of the Study Estimate, SPP staff will re-evaluate this project using the new cost estimate data, and will make a recommendation to the BOD at its next scheduled quarterly meeting.

SPP staff's recommendation could be, but is not limited to, one of the following actions:

- a. Accept the cost estimate variance and approve the Applicable Project as described in the NTC-C letter and remove the NTC's conditions;
- b. Modify the existing Applicable Project with input from TWG;
- c. Replace the Applicable Project with an alternative solution with input from TWG; or
- d. Cancel the Applicable Project.

If the cost estimate variation of the CPE is accepted by the BOD, the CPE will be used as a final baseline cost estimate for reporting all future cost estimate changes during the Project Tracking process and will be the basis for determining project cost variances.

**8.5. NTC Project Estimate Stage**

The **NTC Project Estimate (NPE)** is provided by the DTO after receipt of an NTC for a non-Applicable Project. It includes any additional cost or project information that is known at the time that the DTO is required to provide its response to the SPP. The NPE will be used as the final-established baseline for reporting all cost estimate changes during the Project Tracking process and will be the basis for determining project variance. The final project cost is expected to be within a -20% to + 20% variance from the NPE.

This stage begins after a non-Applicable Project has been issued an NTC. The DTO has 90 days to respond to the NTC by committing to a project as required by the NTC or proposing a different project schedule or project specifications to be considered by SPP. If the DTO accepts the NTC, it shall respond as prescribed in the SPP NTC letter with a written commitment to construct letter and a NPE both submitted to SPP within the 90-day response period.

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**•8.6. Design and Construction Estimate Stage**

**Design and Construction Estimates** are provided by the DTO to SPP while the DTO engineering and construction are being completed, including any environmental, routing or siting requirements, and that has a known route. This would include but not be limited to any known material and labor costs and condemnation costs. The final project cost is expected to be within a -20% to + 20% variance from the applicable CPE or NPE.

This stage covers the period between the start of design engineering to the final project closeout and the subsequent submittal of actual project costs to SPP through the Project Tracking process. All line-item cost differences between the cost estimate being used as an established baseline and these updated cost estimates must be accompanied by a detailed explanation from the DTO.

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**Table 1: Cost Estimate Stage Definition Overview**

Estimate Name*	Stage		End Usage	Precision Bandwidth
	Projects > 100 kV & > \$20 Million	All other BOD Approved Projects		
<b>Conceptual</b>	1	1	Concept screening for ITP20/ITP10	-50% to + 100%
<b>Study</b>	2	2	Study of feasibility and plan development for ITP10/ITPNT	-30% to +30%
	<b><i>NTC-C Issued</i></b>	<b><i>NTC Issued</i></b>		
<b>NTC-C Project (CPE)</b>	3	N/A	<del>Final-Established</del> baseline (NTC-C)**	-20% to +20%
	<b><i>New NTC Issued</i></b>			
<b>NTC Project (NPE)</b>	N/A	3	<del>Final-Established</del> baseline (NTC)**	-20% to +20%
<b>Design &amp; Construction</b>	4	4	Design after NTC issued and build the project	-20% to +20%***

\* The Conceptual Estimate will be prepared by SPP. All subsequent estimates will be prepared by the DTO(s).

\*\*BOD approval required to reset the baseline.

\*\*\*Actual cost is expected to be within +/-20% of ~~final-established~~ baseline estimate.

# PROJECT REPORTING and TRACKING

## 9. Standardized Cost Estimate Reporting Template (SCERT)

SPP will request the completion of a Standardized Cost Estimate Reporting Template (SCERT) for all project cost estimates and applicable monthly/quarterly updates. The SCERT template is located on the SPP website on the Project Cost Working Group webpage. The SCERT will:

- a. Provide a consistent format among all estimates
- b. Facilitate the Project Tracking process
- c. Ensure the required level of detail is provided
- d. Facilitate the transition of a completed project into the proper Annual Transmission Revenue Requirement (ATRR) recovery process through SPP's OATT

For each Legacy Project, the TO authorized to construct the Legacy Project will populate a SCERT if the cost estimate of the project increases 10% or greater than the established baseline cost estimate.

All information requested to be sent to SPP in this section shall be submitted to [SPPprojecttracking@spp.org](mailto:SPPprojecttracking@spp.org).

### 9.1. Study Estimate Design Guide

DTOs will develop consistent cost estimates through the completion of a SCERT and using that information for the cost estimate along with a list of the assumptions used by the DTO to develop the Study Estimate. For the Study Estimate, all DTOs shall develop estimates based on the Study Estimate Design Guide.

The SCERT information from the DTO provides a transparent process on what they have provided in their cost estimate, including the assumptions made on unknowns at the time the cost estimate was prepared.

## 10. Reporting

### Status of upgrades identified in the STEP

On a quarterly basis the SPP shall post:

- the status of the upgrades on the SPP website
- any NTC/NTC-C(e) issued during the quarter
- any NTC/NTC-C withdrawal(e) issued during the quarter
- any NTC(e) modifications issued during the quarter

At least quarterly, SPP will submit a Project Tracking report to the PCWG detailing all project cost estimate changes that are outside the established project variance bandwidth.

### 11. For all Projects with an approved NPE or CPE

DTOs building a Project(s) with an approved NPE or CPE shall submit Project Tracking updates to SPP staff on a quarterly basis, unless the bandwidth is exceeded as denoted in (a) or (b) below, in which case the DTO will notify SPP within 45 calendar days with the information as follows:

- a. If an Applicable Project cost estimate deviates or is expected to deviate +/- 10% from its established baseline cost estimate, the DTO will notify SPP staff detailing the cost estimate variances with an updated SCERT along with comments and explanations regarding the variances. SPP staff will provide notification to the PCWG with no corrective action expected. SPP staff will monitor these projects and take appropriate action if necessary.

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~~b. If an Applicable Project cost estimate deviates or is expected to deviate +/-20% from its established baseline cost estimate, the DTO will notify SPP staff detailing the cost estimate variances with an updated SCERT along with comments and explanations regarding the variances. SPP staff will provide the updated information to the PCWG. The PCWG will review and provide recommendations to the MOPC and BOD. The PCWG will also provide an update to the RSC. The DTO will be required to provide monthly updates regarding project cost estimates and other relevant information to SPP staff until BOD action is taken.~~

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~~At least quarterly, SPP will submit a Project Tracking report to the PCWG detailing all project cost estimate changes that are outside the established project variance bandwidth.~~

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## ~~12. Dispute Resolution~~

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~~Dispute resolutions should be handled as specified in Section 12 of the SPP OATT. If a dispute is filed the Customer that has service contingent upon the upgrade being completed shall be notified by SPP staff.~~

# PCWG PROJECT REVIEW

## 13.10. PCWG Review Process for Applicable Projects

The Project Cost Working Group (PCWG) process ~~will initially apply only applies~~ to approved Applicable Projects ~~that are 300 kV and above and greater than \$20 Million in total Project cost. Once the PCWG determines that the process is refined and working well, it will be expanded to include all approved Applicable Projects that are 100 kV and above and greater than \$20 Million. This process will only apply~~ once a DTO has received an NTC from SPP ~~and construction has commenced~~ and the project exceeds the stated bandwidths as described in Section 5.1.

All information requested to be sent to SPP in this section shall be submitted to [SPPprojecttracking@spp.org](mailto:SPPprojecttracking@spp.org).

If an Applicable Project deviates or is expected to deviate +/- 10% from its established baseline cost estimate, the DTO shall provide all relevant data and information to SPP with an updated SCERT within 45 calendar days when the DTO became aware of the deviation. SPP staff will then notify the PCWG. The PCWG may require the DTO to provide monthly Project Tracking data after this notice from the DTO.

If an Applicable Project deviates or is expected to deviate +/-20% from its established baseline cost estimate the DTO, within 45 calendar days when the DTO became aware of the deviation, notify SPP staff detailing the cost estimate variances with an updated SCERT along with comments and explanations regarding the variances.

The PCWG will receive the updated scope and SCERT provided to SPP by the DTO including any Project Tracking data updates, any comments from the DTO related to cost estimate variances, and any applicable input from SPP staff. The DTO's comments should include relevant information regarding any sunk costs, an explanation for the cost estimate variances, and comments regarding whether construction of the project should continue. The PCWG will oversee all reports to be submitted to the MOPC, RSC, and BOD prior to their regularly scheduled meetings.

## 11. Projects Reviewed by PCWG

### 14.

The PCWG will provide recommendations to the MOPC and BOD regarding any Applicable Project whose cost estimate exceeded the +/-20% bandwidth of the established baseline cost estimate. Recommended action(s) may include any of the following:

- i. Accept the cost estimate deviation as reasonable and acceptable and ~~reset-reestablish~~ the baseline used to evaluate future cost estimate deviations.
- ii. Identify all or a portion of the costs related to the variances and recommend any changes to the NTC that would reduce the cost or avoid the issues that may be causing the increase.
- iii. Suspend all future expenditures on the project while SPP restudies the project to determine appropriate changes to the NTC, possible withdrawal of the NTC or whether an alternative project should replace the project.

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The BOD will make the final determination on whether to accept the PCWG recommendation(s) or to choose an alternative action.

If the BOD determines to **reset-reestablish** the baseline cost estimate, the previous baseline cost estimate will be retained in the monitoring tool.

The PCWG will notify MOPC if a trend appears to be developing whereby the information provided in the SCERTs is deviating from the Study Estimate Design Guide. The MOPC will then determine if a review of the SCERT indicates changes in the Study Estimate Design Guide are required.

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## 12. Project Reporting

### 12.1. SPP Staff

On a quarterly basis the SPP staff shall post:

- the status of the upgrades identified in the STEP on the SPP website
- any NTC/NTC-C(s) issued during the quarter
- any NTC/NTC-C withdrawal(s) issued during the quarter
- any NTC(s) modifications issued during the quarter

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At least quarterly, SPP staff will submit a Project Tracking report to the PCWG detailing all project cost estimate changes that are outside the established project variance bandwidth.

### 12.2. DTOs with Projects with an Approved NPE or CPE

DTOs building a Project(s) with an approved NPE or CPE shall submit Project Tracking updates to SPP staff on a quarterly basis, unless the bandwidth is exceeded as denoted in (a) or (b) below, in which case the DTO will notify SPP within 45 calendar days with the information as follows:

- a. If an Applicable Project cost estimate deviates or is expected to deviate +/-10% from its established baseline cost estimate, the DTO will notify SPP staff detailing the cost estimate variances with an updated SCERT along with comments and explanations regarding the variances. SPP staff will provide notification to the PCWG with no corrective action expected. SPP staff will monitor these projects and take appropriate action if necessary.
- b. If an Applicable Project cost estimate deviates or is expected to deviate +/-20% from its established baseline cost estimate, the DTO will notify SPP staff detailing the cost estimate variances with an updated SCERT along with comments and explanations regarding the variances. SPP staff will provide the updated information to the PCWG. The PCWG will review and provide recommendations to the MOPC and BOD. The PCWG will also provide an update to the RSC. The DTO will be required to provide monthly updates regarding project cost estimates and other relevant information to SPP staff until BOD action is taken.

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**15.13. Dispute Resolution**

Dispute resolutions should be handled as specified in Section 12 of the SPP OATT. If a dispute is filed the Customer that has service contingent upon the upgrade being completed shall be notified by SPP staff.

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## APPENDIX A: Sample NTC

### SPP Notification To Construct

415 N. McKinley, 140 Plaza West  
Little Rock, AR 72205-3020  
501-614-3220 • Fax: (501) 666-0376  
[\[SPP CONTACT\]](#)  
[\[SPP CONTACT TITLE\]](#)

**SPP-NTC-#**

[\[DATE\]](#)

[\[DESIGNATED TRANSMISSION OWNER\]](#)  
[\[ADDRESS\]](#)

RE: Notification to Construct [\[Approved Reliability Network Upgrades/Network Upgrades Pursuant to Transmission Service Request\]](#)

Dear [\[DESIGNATED TRANSMISSION OWNER\]](#),

Pursuant to Section 3.3 of the Southwest Power Pool, Inc. ("SPP") Membership Agreement and Attachment O, Section VIII, of the SPP Open Access Transmission Tariff ("OATT"), SPP provides this Notification to Construct ("NTC") directing [\[DESIGNATED TRANSMISSION OWNER\]](#), as the Designated Transmission Owner, to construct the Network Upgrade[s].

On [\[DATE\]](#), the Southwest Power Pool ("SPP") [\[Board of Directors approved the Network Upgrade\(s\) listed below to be constructed\] OR \[concluded that the Project is required on the \[DESIGNATED TRANSMISSION OWNER\] system to fulfill Transmission Service Requests as detailed in Aggregate Facility Study SPP-200#-AG#-AFS-##\] OR \[Insert the appropriate reason to construct the Project if different than listed above\].](#)

Project ID: [PID #](#)

Project Name: [Project Name](#)

Need Date for Project: [DATE](#)

Estimated In-Service Date for Project: [IN-SERVICE DATE PROVIDED BY NETWORK UPGRADE OWNER DURING AGGREGATE STUDY](#)

Estimated Cost for Project: [\\$###,###](#)

Network Upgrade ID: [UID #](#)

Network Upgrade Description: [Network Upgrade Description](#)

Network Upgrade Owner: [Owner Information](#)

MOPC Representative: [Representative Information](#)

TWG Representative: [Representative Information](#)

Categorization: [Regional Reliability / Zonal Reliability / Economic / Service](#)

Network Upgrade Specifications: [Network Upgrade Specifications](#)

Network Upgrade Justification: [Network Upgrade Justifications](#)

Need Date for Network Upgrade: [Network Upgrade Need Date](#)

Estimated In-Service Date for Network Upgrade: [IN-SERVICE DATE PROVIDED BY NETWORK UPGRADE OWNER DURING AGGREGATE STUDY](#)

Estimated Cost for Network Upgrade (current day dollars): ####,###  
Cost Allocation of the Network Upgrade: Base Plan Funded / Direct Assigned to Customer / Sponsored Network Upgrade / Other  
Estimated Cost Source: Network Upgrade Owner / Network Upgrade Sponsor/ SPP  
Date of Cost Estimate: MM/DD/YYYY

[In the event the NTC is a modification to or withdrawal of an existing NTC, the following will be listed in addition to or instead of the above: Previous NTC number, Previous NTC Issue Date, and Reason for Change.]

**Commitment to Construct**

The DTO must provide to SPP a written commitment to construct the Network Upgrade(s) within 90 days of the date of this Notification to Construct, pursuant to Attachment O, Section VIII.6 of the SPP OATT, in addition to providing a construction schedule for the Network Upgrade(s). Failure to provide a written commitment to construct as required by Attachment O could result in the Network Upgrade(s) being assigned to another entity.

**Mitigation Plan**

The Need Date OR Estimated In-Service Date represents the timing required for the Network Upgrade(s) to address the identified need. Your prompt attention is required for formulation and approval of any necessary mitigation plans for the Network Upgrade(s) if the Need Date OR Estimated In-Service Date is not feasible. Additionally, if it is anticipated that the completion of any Network Upgrade will be delayed past the Need Date OR Estimated In-Service Date, SPP requires a mitigation plan be filed within 60 calendar days of the determination of expected delays.

**Notification of Commercial Operation**

A notification of commercial operation for each listed Network Upgrade must be provided to SPP within 60 calendar days after the Network Upgrade is complete and in-service. The DTO must provide SPP with the actual costs of these Network Upgrades as soon as possible after completion of construction. Timely cost notification will facilitate the timely billing by SPP based on actual costs.

**Notification of Progress**

On an ongoing basis, please keep SPP advised of any inability on [\[DESIGNATED TRANSMISSION OWNER\]](#)'s part to complete the approved Network Upgrade(s). For project tracking purposes, SPP requires [\[DESIGNATED TRANSMISSION OWNER\]](#) to submit updates on the status of the Network Upgrade(s) on a quarterly basis in conjunction with the SPP Board of Directors meetings. However, consistent with Sections 20.1 and 32.10 of the SPP OATT, [\[DESIGNATED TRANSMISSION OWNER\]](#) shall also advise SPP of any inability to comply with the Project Schedule as soon as the inability becomes apparent.

All terms and conditions of the SPP OATT and the SPP Membership Agreement shall apply to this Project, and nothing in this NTC shall vary such terms and conditions.

Don't hesitate to contact me if you have questions or comments regarding these instructions. Thank you for the important role that you play in maintaining the reliability of our electric grid.

Sincerely,

[\[SPP CONTACT SIGNATURE\]](#)

[\[SPP CONTACT TITLE\]](#)

cc: SPP COO, SPP Sr. VP Engineering & Regulatory Policy, SPP Director Transmission Policy, SPP Vice President of Engineering, SPP Director of Transmission Development, [\[MOPC REPRESENTATIVE\(S\)\]](#), [SPPprojecttracking@spp.org](mailto:SPPprojecttracking@spp.org), [\[TWG REPRESENTATIVE\(S\)\]](#).

## APPENDIX B: Sample NTC-C

### SPP Notification To Construct with Conditions

415 N. McKinley, 140 Plaza West  
Little Rock, AR 72205-3020  
501-614-3220 • Fax: (501) 666-0376  
[\[SPP CONTACT\]](#)  
[\[SPP CONTACT TITLE\]](#)

**SPP-NTC-#**

[\[DATE\]](#)

[\[DESIGNATED TRANSMISSION OWNER\]](#)  
[\[ADDRESS\]](#)

RE: Notification to Construct [\[Approved Reliability Network Upgrades/Network Upgrades Pursuant to Transmission Service Request\]](#)

Dear [\[DESIGNATED TRANSMISSION OWNER\]](#),

Pursuant to Section 3.3 of the Southwest Power Pool, Inc. ("SPP") Membership Agreement and Attachment O, Section VIII, of the SPP Open Access Transmission Tariff ("OATT"), SPP provides this Notification to Construct ("NTC") directing [\[DESIGNATED TRANSMISSION OWNER\]](#), as the Designated Transmission Owner, to construct the Network Upgrade[s]. This NTC is Conditioned upon the [\[DESIGNATED TRANSMISSION OWNER\]](#) not ordering materials or beginning construction until:

- (1) the DTO submits a refined project cost estimate (CPE) to SPP staff that has a variance bandwidth of -20% to +20% that does not exceed the Study Estimate variance bandwidth of -30% to +30% as provided for in SPP's Business Practices; **or**
- (2) the SPP Board of Directors considers SPP Staff's re-evaluation of a project that has a refined project cost estimate (CPE) from the DTO that exceeds the Study Estimate variance bandwidth of -30% to +30% as provided for in SPP's Business Practices.

On [\[DATE\]](#), the Southwest Power Pool ("SPP") [\[Board of Directors approved the Network Upgrade\(s\) listed below to be constructed\] OR \[concluded that the Project is required on the \[DESIGNATED TRANSMISSION OWNER\] system to fulfill Transmission Service Requests as detailed in Aggregate Facility Study SPP-200#-AG#-AFS-##\] OR \[Insert the appropriate reason to construct the Project if different than listed above\].](#)

Project ID: [PID #](#)

Project Name: [Project Name](#)

Need Date for Project: [DATE](#)

Estimated In-Service Date for Project: [IN-SERVICE DATE PROVIDED BY NETWORK UPGRADE OWNER DURING AGGREGATE STUDY](#)

Estimated Cost for Project: [\\$###,###](#)

Network Upgrade ID: [UID #](#)

Network Upgrade Description: [Network Upgrade Description](#)

Network Upgrade Owner: [Owner Information](#)



MOPC Representative: [Representative Information](#)  
TWG Representative: [Representative Information](#)  
Categorization: [Regional Reliability / Zonal Reliability / Economic / Service](#)  
Network Upgrade Specifications: [Network Upgrade Specifications](#)  
Network Upgrade Justification: [Network Upgrade Justifications](#)  
Need Date for Network Upgrade: [Network Upgrade Need Date](#)  
Estimated In-Service Date for Network Upgrade: [IN-SERVICE DATE PROVIDED BY NETWORK UPGRADE OWNER DURING AGGREGATE STUDY](#)  
Estimated Cost for Network Upgrade (current day dollars): [####.###](#)  
Cost Allocation of the Network Upgrade: [Base Plan Funded / Direct Assigned to Customer / Sponsored Network Upgrade / Other](#)  
Estimated Cost Source: [Network Upgrade Owner / Network Upgrade Sponsor/ SPP](#)  
Date of Cost Estimate: [MM/DD/YYYY](#)

[\[In the event the NTC-C is a modification to or withdrawal of an existing NTC-C, the following will be listed in addition to or instead of the above: Previous NTC-C number, Previous NTC-C Issue Date, and Reason for Change.\]](#)

**Commitment to Construct**

The DTO must provide to SPP a written commitment to construct the Network Upgrade(s) within 90 days of the date of this Notification to Construct. Failure to provide a written commitment to construct could result in the Network Upgrade(s) being assigned to another entity.

**NTC-C Project Estimate (CPE)**

Also, the DTO must provide SPP an NTC-C Project Estimate by [\[DATE\]](#) as described in SPP's Business Practices regarding Notification to Construct with Conditions. [\[DESIGNATED TRANSMISSION OWNER\]](#) shall advise SPP of any inability to provide the NTC-C Project Estimate by [\[DATE\]](#) as soon as the inability becomes apparent.

**Removal of Conditions**

Upon notice by SPP staff of removal of the conditions contained in this NTC, SPP staff will issue the DTO a new NTC and the following will be applicable:

**Mitigation Plan**

The Need Date OR Estimated In-Service Date represents the timing required for the Network Upgrade(s) to address the identified need. Your prompt attention is required for formulation and approval of any necessary mitigation plans for the Network Upgrade(s) if the Need Date OR Estimated In-Service Date is not feasible. Additionally, if it is anticipated that the completion of any Network Upgrade will be delayed past the Need Date OR Estimated In-Service Date, SPP requires a mitigation plan be filed within 60 days of the determination of expected delays.

**Notification of Commercial Operation**

Please submit a notification of commercial operation for each listed Network Upgrade to SPP as soon as the Network Upgrade is complete and in-service. Please provide SPP with the actual costs of these Network Upgrades as soon as possible after completion of construction. This will facilitate the timely billing by SPP based on actual costs.

**Notification of Progress**

On an ongoing basis, please keep SPP advised of any inability on [\[DESIGNATED TRANSMISSION OWNER\]](#)'s part to complete the approved Network Upgrade(s). For project tracking purposes, SPP requires [\[DESIGNATED TRANSMISSION OWNER\]](#) to submit updates on the status of the Network Upgrade(s) on a quarterly basis in conjunction with the SPP Board of Directors meetings. However, consistent with Sections 20.1 and 32.10 of the SPP OATT, [\[DESIGNATED TRANSMISSION OWNER\]](#) shall also advise SPP of any inability to comply with the Project Schedule as soon as the inability becomes apparent.

All terms and conditions of the SPP OATT and the SPP Membership Agreement shall apply to this Project, and nothing in this NTC shall vary such terms and conditions.

Don't hesitate to contact me if you have questions or comments regarding these instructions. Thank you for the important role that you play in maintaining the reliability of our electric grid.

Sincerely,

[\[SPP CONTACT SIGNATURE\]](#)  
[\[SPP CONTACT TITLE\]](#)

cc: SPP COO, SPP Sr. VP Engineering & Regulatory Policy, SPP Director Transmission Policy, SPP Vice President of Engineering, SPP Director of Transmission Development, [\[MOPC REPRESENTATIVE\(S\)\]](#), [SPPprojecttracking@spp.org](mailto:SPPprojecttracking@spp.org), [\[TWG REPRESENTATIVE\(S\)\]](#).

Dept	Doc ID	Document Title	Current Version	Current Rev Date
Tariff Administration	0810pcsBP7060	Notification to Construct and Project Cost Estimating Processes Effective January 1, 2012	1.0	4/4/2012

**Revision History**

Ver No:	Rev. Date:	Eff. Date:	By	Summary of Changes
1.0	4/4/2012	1/1/2012	kq/ cs	New Business Practice governing NTC's issued after 1/1/2012

**Approval**  
Primary Owner: Jimmy Womack



Digitally signed by Jimmy Womack  
DN: cn=Jimmy Womack, o=SPP, Inc., ou=RTO-TA, email=jwomack@spp.org, c=US  
Date: 2012.04.04 10:13:05 -0500

*Signature date supercedes prior approval dates*



# Metrics Review & Recommendations

TWG

June 13<sup>th</sup>, 2014



Helping our members  
work together to  
keep the lights on...  
today and in the future



# Agenda

- **Introduction**
- **Assessment of benefit metrics and alternative allocation methodologies**
  - A. Benefits of Mandated Reliability Projects
- **Timeline & next steps**

# Overview

- **ESWG has been tasked with reviewing the calculation and allocation of benefit metrics for:**
  - 2015 ITP10
  - RCAR II
- **MOPC directed ESGW to provide recommendations by July 2010**
- **Brattle is engaged for an independent assessment of alternative methodologies on “tentative metrics”**
- **Today – will discuss pros/cons of alternatives and show preliminary findings on the impact of RCAR I results**

<b>Benefit Metrics</b>	<b>Calculated in RCAR I?</b>	<b>Considered for 2015 ITP10 and RCAR II?</b>	<b>Included in This Assessment?</b>
Adjusted Production Cost (APC)	✓	Yes	
Emission Rates and Values	✓	Yes	
Ancillary Service Needs and Production Costs	✓	Yes	
Avoided or Delayed Reliability Projects	✓	Yes	
Capacity Cost Savings due to Reduced On-Peak Transmission Losses	✓	Yes	
<b>A. Benefits of Mandated Reliability Projects</b>	✓	Yes	<b>Allocation method</b>
<b>B. Benefits from Meeting Public Policy Goals</b>	✓	Yes	<b>Overall approach</b>
<b>C. Mitigation of Transmission Outage Costs</b>	✓	Yes	<b>Allocation method</b>
<b>D. Increased Wheeling Through and Out Revenues</b>		Yes	<b>How to include</b>
<b>E. Marginal Energy Losses Benefits</b>		Yes	<b>How to include</b>
Reducing the Cost of Extreme Events		No	
Capital Savings due to Reduction of Members' Minimum Required Margin		No	
Reduced Loss of Load Probability		No	

# **A. ASSUMED BENEFIT OF MANDATED RELIABILITY PROJECTS**



# Reliability Benefit Allocation Methodologies

- **Highway/Byway (current methodology)**
  - Allocates assumed benefits of mandated reliability projects in the same manner costs are allocated
- **Distribution Factor (DFAX)**
  - Measures relative usage of Reliability Upgrades by the load of each transmission zone assuming no transmission outages and that each zone is served by all generation in SPP (excluding renewable generation)
- **Line Outage Distribution Factor (LODF)**
  - Measures incremental usage of reliability upgrades under first contingency conditions (i.e., when existing facilities are on outage)
- **System Reconfiguration (SR)**
  - Measures relief on usage of existing facilities after reliability upgrades are added (assuming all else equal to case with upgrades)

**Note:**

These allocation methodologies do not impact the total reliability benefit of projects. They only impact the allocation of benefit to zones.

# Highway/Byway Methodology

- **Basic assumptions for allocating reliability benefits:**
  - Reliability upgrades  $\geq 300$  kV provide regional reliability benefits allocated to all zones based on load ratio share (LRS)
  - Reliability upgrades at 100-300 kV provide mostly (2/3) local and some (1/3) regional benefits (based on LRS)
  - Reliability upgrades  $< 100$  kV provide local benefits allocated to only the individual zones projects are located in
- **Attractive because it is intuitive, simple to calculate, transparent, and reasonable long-term proxy (next slide)**
- **However:**
  - Incorporates neither actual usage, nor the need for specific upgrade, nor specific reliability benefit of individual projects
  - Does not necessarily capture potentially higher local reliability benefits of highway projects or the potentially higher regional reliability benefits of byway projects

# DFAX Methodology

## Attempts to calculate incremental flows on reliability upgrades to serve load in each zone

- Uses incremental power flows from all generation in the SPP footprint (excluding renewables, scaled based on their nameplate capacity) to each load zone
- Positive and negative DFAX are first weighted based on share of annual hours with positive and negative flows from PROMOD simulations
- Then normalized to size of each load zone using load ratio shares

## Intends to measure the usage of upgrades under normal (N-0) system conditions but:

- Does not consider the reliability needs that triggered these upgrades in the first place (zones using upgrades may not be the ones that initially needed them)
- Many moving parts in implementing the DFAX approach (e.g., generation assumptions) can significantly impact the allocation of estimated benefits
- Incremental flows from all SPP generation to individual load zones (and excluding renewable generation) does not reflect actual usage of upgrade (next slide)

# DFAX Methodology (cont'd)

## **All-generation-to-load zone approach does not accurately capture system use**

- Disadvantages zones far from main SPP resources; makes it appear the zone is importing most of its generation from distant resources, thereby relying much more on regional facilities

## **Excluding renewables from generation-to-load power flow analysis does not capture some of the reliability need**

- Analysis to identify reliability needs include at least some renewable generation (e.g., in power flow cases for both for system peak and shoulder period)

## **Results sensitive to sequence of calculations**

- SPP applies Promod shares to DFAX, then normalizes for size of load zone; PJM first normalizes DFAX then applies Promod shares

## **Applying power flow usage to all hours of the year based on positive and negative flows does not focus on reliability (but same for LODF and SR)**

- Reliability need or benefit is not driven by 8,760 hours of both positive and negative flows (as simulated in Promod)
- Hourly usage reflects neither the need for nor the benefit of the upgrade

# LODF Methodology

**Measures incremental flows shifted onto a reliability upgrade during (first contingency) outages of existing transmission facilities. However:**

- Does not reflect need for the reliability upgrades
- Only measures additional “usage” of upgrade during N-1 outages of the existing transmission facilities (i.e., does not consider usage during N-0 conditions)
- Applying usage during N-1 conditions to 8,760 hours of the year is unrealistic and not related to reliability need
- Tends to result in disproportionate allocation of benefits to nearby zones, particularly for high voltage upgrades driven by regional flows
- Substantial effort to calculate (requires power flow evaluation of outage of every existing transmission element), particularly for AC power flow

# System Reconfiguration Methodology

**Measures incremental flows shifted onto existing system during outage of the reliability upgrade**

- Proxy for how much the upgrade reduces flows on the existing system
- Captures benefits of lower-voltage upgrades on immediately neighboring systems
- Computationally much simpler than LODF

## **However:**

- Subject to same limitations as LODF
- Does not reflect need for high-voltage reliability upgrades driven by broad changes in regional power flows (i.e., beyond the load serving needs of the local zone)
- Would disproportionately allocate reliability benefits of high-voltage upgrades to nearby zones
  - High voltage upgrades attract a lot of flows from the nearby existing system even if that system did not need to be upgraded for the purpose of serving zonal load
  - Would burden local zones with integration of new generation that is exported to rest of SPP footprint

## Load Ratio Shares

**H/B allocates a major portion of reliability benefits based on load ratio share. Even though this does not provide a “technical gauge” on usage, need, or beneficiaries, there are some good reasons to use LRS:**

- Load ratio shares (mostly 12-CP or 4-CP, occasionally 1-CP) are routinely used by utilities to allocate company-wide costs to different subsidiaries and different customer classes
- Transmission-related disturbances can be wide-spread; if reliability events result in load shedding, that will often be distributed on a load ratio share
- Most reliability projects ultimately are built to serve load or interconnect generation needed to serve load; larger utilities will require more of that, so load ratio share will be a good long-term proxy
- Even if public policy requirements indirectly trigger reliability upgrades, larger utilities will likely cause more of that
- Part of the transmission system is necessary to support reserve sharing. Zones with higher peak loads will likely get a greater share of reserve sharing benefits
- NERC reliability-related penalties are allocated based on LRS

# SPP Recommendations

## Use hybrid approach to reflect the different characteristics of higher and lower voltage reliability upgrades

- Load ratio shares (LRS) to allocate reliability benefits of high-voltage transmission upgrades (>300kV)
  - Recognizes broad regional reliability needs, system usage, and broad impact and reliability benefits of highest-voltage (highway) portion of the grid
- System reconfiguration (SR) results to allocate reliability benefits of low-voltage transmission upgrades (<100kV)
  - Recognizes relief to local system provided by low-voltage upgrades without artificially limiting it to single local zones
- Use average of LRS and SR to allocate reliability benefits of medium-voltage upgrades (100-300kV)
  - Recognizes mix of local and regional needs and benefits associated with these facilities



# Preliminary Results

## Allocation of RCAR I Mandated Reliability Benefits by Project Type

All Projects					ITP10				Other				Proctor Comprise			
SPP-wide Benefits																
Total		\$2.50 billion			\$0.73 billion				\$1.77 billion				\$0.67 B		\$1.30 B	\$1.98 B
Analyzed*		\$1.98 billion			\$0.67 billion				\$1.30 billion							
Zone	H/B	DFAX	LODF	SR	H/B	DFAX	LODF	SR	H/B	DFAX	LODF	SR	ITP10 DFAX	Other SR	TOTAL	
AEP	22.9%	20.0%	22.6%	19.2%	22.2%	17.4%	22.0%	15.5%	23.2%	21.2%	23.0%	21.0%	17.4%	21.0%	19.8%	
CUS	0.8%	0.6%	0.0%	0.0%	1.4%	0.8%	0.0%	0.0%	0.4%	0.4%	0.0%	0.0%	0.8%	0.0%	0.3%	
EDE	1.2%	1.0%	0.3%	0.5%	2.3%	1.3%	0.0%	0.2%	0.7%	0.8%	0.4%	0.6%	1.3%	0.6%	0.8%	
GMO	2.1%	0.9%	0.2%	0.3%	3.8%	1.2%	0.0%	0.1%	1.2%	0.8%	0.3%	0.3%	1.2%	0.3%	0.6%	
GRDA	1.4%	1.5%	0.4%	0.4%	1.8%	1.7%	0.2%	0.2%	1.3%	1.4%	0.5%	0.6%	1.7%	0.6%	0.9%	
KCPL	3.9%	2.1%	1.8%	1.4%	7.2%	2.2%	0.6%	0.3%	2.2%	2.1%	2.3%	2.0%	2.2%	2.0%	2.0%	
LES	1.2%	0.8%	0.2%	0.3%	1.8%	0.9%	0.2%	0.3%	0.9%	0.7%	0.3%	0.3%	0.9%	0.3%	0.5%	
MIDW	1.5%	1.4%	1.6%	1.7%	0.8%	0.2%	0.7%	0.7%	1.9%	2.0%	2.0%	2.1%	0.2%	2.1%	1.5%	
MKEC	1.6%	1.9%	0.1%	0.0%	2.1%	0.5%	0.1%	0.0%	1.4%	2.5%	0.1%	0.0%	0.5%	0.0%	0.2%	
NPPD	4.7%	4.3%	7.2%	6.8%	6.1%	5.3%	14.2%	13.6%	4.0%	3.8%	3.9%	3.5%	5.3%	3.5%	4.1%	
OGE	9.5%	12.0%	11.4%	16.1%	13.2%	16.7%	12.2%	24.5%	7.7%	9.7%	11.1%	11.9%	16.7%	11.9%	13.5%	
OPPD	2.5%	2.4%	0.1%	0.2%	4.7%	4.1%	0.0%	0.3%	1.5%	1.6%	0.1%	0.1%	4.1%	0.1%	1.4%	
SEPC	1.4%	1.3%	3.6%	4.0%	1.0%	0.8%	3.4%	4.1%	1.6%	1.5%	3.7%	4.0%	0.8%	4.0%	2.9%	
SPS	19.6%	30.6%	26.2%	23.8%	18.2%	40.5%	32.4%	24.5%	20.3%	25.6%	23.3%	23.4%	40.5%	23.4%	29.1%	
WFEC	6.0%	3.3%	5.3%	4.4%	3.0%	3.6%	6.7%	6.1%	7.5%	3.1%	4.6%	3.6%	3.6%	3.6%	3.6%	
WR	19.6%	16.0%	18.9%	20.9%	10.4%	2.8%	7.3%	9.4%	24.2%	22.5%	24.5%	26.6%	2.8%	26.6%	18.7%	
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	

### Notes:

These results are based on preliminary analysis including approximately 80% of the upgrades.

The allocation factors under DFAX are very sensitive to specific assumptions and implementation of the approach.

# Preliminary Results (cont'd)

## Allocation of RCAR I Mandated Reliability Benefits by Voltage Level

All Projects					< 100 kV				100–300 kV				> 300 kV			
<b>SPP-wide Benefits</b>																
Total		\$2.50 billion			\$0.36 billion				\$1.41 billion				\$0.72 billion			
Analyzed*		\$1.98 billion			\$0.26 billion				\$1.09 billion				\$0.60 billion			
Zone	H/B	DFAX	LODF	SR	H/B	DFAX	LODF	SR	H/B	DFAX	LODF	SR	H/B	DFAX	LODF	SR
AEP	22.9%	20.0%	22.6%	19.2%	46.5%	40.0%	47.6%	45.3%	17.4%	16.3%	16.1%	14.6%	22.4%	17.7%	23.8%	16.0%
CUS	0.8%	0.6%	0.0%	0.0%	0.0%	0.5%	0.0%	0.0%	0.5%	0.4%	0.0%	0.0%	1.6%	0.8%	0.0%	0.0%
EDE	1.2%	1.0%	0.3%	0.5%	0.0%	1.2%	2.1%	2.9%	0.8%	0.7%	0.0%	0.0%	2.5%	1.4%	0.0%	0.2%
GMO	2.1%	0.9%	0.2%	0.3%	0.0%	0.8%	0.0%	0.1%	1.4%	0.9%	0.3%	0.2%	4.2%	1.1%	0.0%	0.4%
GRDA	1.4%	1.5%	0.4%	0.4%	3.4%	3.7%	1.7%	2.1%	0.7%	0.9%	0.2%	0.2%	2.0%	1.7%	0.3%	0.2%
KCPL	3.9%	2.1%	1.8%	1.4%	0.0%	2.1%	1.4%	0.8%	2.6%	1.6%	1.9%	1.4%	7.9%	2.9%	1.8%	1.7%
LES	1.2%	0.8%	0.2%	0.3%	0.0%	0.4%	0.0%	0.0%	1.1%	0.8%	0.3%	0.4%	2.0%	0.9%	0.2%	0.3%
MIDW	1.5%	1.4%	1.6%	1.7%	0.0%	0.3%	0.0%	0.0%	2.3%	2.4%	2.4%	2.6%	0.8%	0.2%	0.8%	0.7%
MKEC	1.6%	1.9%	0.1%	0.0%	0.0%	0.5%	0.0%	0.0%	2.1%	2.9%	0.1%	0.0%	1.4%	0.5%	0.1%	0.0%
NPPD	4.7%	4.3%	7.2%	6.8%	0.0%	1.6%	0.3%	0.0%	4.8%	4.4%	4.6%	4.2%	6.7%	5.4%	15.3%	14.6%
OGE	9.5%	12.0%	11.4%	16.1%	2.7%	12.4%	14.0%	17.9%	8.4%	8.6%	9.0%	8.6%	14.5%	18.1%	14.9%	29.0%
OPPD	2.5%	2.4%	0.1%	0.2%	0.1%	1.4%	0.1%	0.1%	1.7%	1.8%	0.1%	0.1%	5.1%	4.1%	0.0%	0.3%
SEPC	1.4%	1.3%	3.6%	4.0%	0.0%	0.4%	0.4%	0.2%	1.9%	1.8%	4.6%	4.9%	1.1%	0.8%	3.2%	4.1%
SPS	19.6%	30.6%	26.2%	23.8%	3.1%	9.9%	4.2%	2.9%	27.2%	31.4%	32.6%	33.3%	13.1%	38.2%	24.0%	15.7%
WFEC	6.0%	3.3%	5.3%	4.4%	20.8%	6.3%	11.5%	8.9%	4.0%	2.2%	3.1%	2.3%	3.3%	3.9%	6.5%	6.2%
WR	19.6%	16.0%	18.9%	20.9%	23.5%	18.4%	16.7%	18.8%	23.2%	23.0%	24.7%	27.2%	11.5%	2.2%	9.0%	10.3%
<b>TOTAL</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>	<b>100%</b>

### Notes:

These results are based on preliminary analysis including approximately 80% of the upgrades.

The allocation factors under DFAX are very sensitive to specific assumptions and implementation of the approach.

# Preliminary Results (cont'd)

## Allocation of RCAR I Mandated Reliability Benefits Under Recommended Hybrid Approach

All Projects		< 100 kV	100–300 kV			> 300 kV
<b>SPP-wide Benefits</b>						
Total	\$2.50 billion	\$0.36 billion	\$1.41 billion			\$0.72 billion
Analyzed*	\$1.98 billion	\$0.26 billion	\$1.11 billion			\$0.60 billion
Zone	Hybrid Approach	System Reconfig.	SR	LRS	Average of LRS and System Reconfig.	LRS
AEP	23.3%	45.3%	14.6%	22.4%	18.5%	22.4%
CUS	0.9%	0.0%	0.0%	1.6%	0.8%	1.6%
EDE	1.9%	2.9%	0.0%	2.5%	1.3%	2.5%
GMO	2.5%	0.1%	0.2%	4.2%	2.2%	4.2%
GRDA	1.5%	2.1%	0.2%	2.0%	1.1%	2.0%
KCPL	5.1%	0.8%	1.4%	7.9%	4.6%	7.9%
LES	1.3%	0.0%	0.4%	2.0%	1.2%	2.0%
MIDW	1.2%	0.0%	2.6%	0.8%	1.7%	0.8%
MKEC	0.8%	0.0%	0.0%	1.4%	0.7%	1.4%
NPPD	5.1%	0.0%	4.2%	6.7%	5.4%	6.7%
OGE	13.3%	17.9%	8.6%	14.5%	11.5%	14.5%
OPPD	3.0%	0.1%	0.1%	5.1%	2.6%	5.1%
SEPC	2.0%	0.2%	4.9%	1.1%	3.0%	1.1%
SPS	17.3%	2.9%	33.3%	13.1%	23.2%	13.1%
WFEC	3.8%	8.9%	2.3%	3.3%	2.8%	3.3%
WR	16.9%	18.8%	27.2%	11.5%	19.3%	11.5%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

**Note:** These results are based on preliminary analysis including approximately 80% of the upgrades.

# Preliminary Results (cont'd)

## Allocation of RCAR I Mandated Reliability Benefits Under Modified Hybrid Approach

All Projects		< 100 kV	100–300 kV			> 300 kV		
<b>SPP-wide Benefits</b>								
Total	\$2.50 billion	\$0.36 billion			\$1.41			\$0.72
Analyzed*	\$1.98 billion	\$0.26 billion			\$1.11			\$0.60
Zone	Modified Hybrid Approach	100%	66.7%	33.3%	Weighted Average	33.3%	66.7%	Weighted Average
		SR	SR	LRS		SR	LRS	
AEP	<b>21.9%</b>	45.3%	14.6%	22.4%	17.2%	16.0%	22.4%	20.3%
CUS	<b>0.6%</b>	0.0%	0.0%	1.6%	0.5%	0.0%	1.6%	1.1%
EDE	<b>1.4%</b>	2.9%	0.0%	2.5%	0.9%	0.2%	2.5%	1.8%
GMO	<b>1.8%</b>	0.1%	0.2%	4.2%	1.6%	0.4%	4.2%	2.9%
GRDA	<b>1.2%</b>	2.1%	0.2%	2.0%	0.8%	0.2%	2.0%	1.4%
KCPL	<b>3.9%</b>	0.8%	1.4%	7.9%	3.6%	1.7%	7.9%	5.8%
LES	<b>1.0%</b>	0.0%	0.4%	2.0%	0.9%	0.3%	2.0%	1.5%
MIDW	<b>1.4%</b>	0.0%	2.6%	0.8%	2.0%	0.7%	0.8%	0.8%
MKEC	<b>0.6%</b>	0.0%	0.0%	1.4%	0.5%	0.0%	1.4%	1.0%
NPPD	<b>5.7%</b>	0.0%	4.2%	6.7%	5.0%	14.6%	6.7%	9.3%
OGE	<b>14.2%</b>	17.9%	8.6%	14.5%	10.5%	29.0%	14.5%	19.3%
OPPD	<b>2.1%</b>	0.1%	0.1%	5.1%	1.8%	0.3%	5.1%	3.5%
SEPC	<b>2.7%</b>	0.2%	4.9%	1.1%	3.6%	4.1%	1.1%	2.1%
SPS	<b>19.5%</b>	2.9%	33.3%	13.1%	26.6%	15.7%	13.1%	13.9%
WFEC	<b>4.0%</b>	8.9%	2.3%	3.3%	2.6%	6.2%	3.3%	4.3%
WR	<b>18.2%</b>	18.8%	27.2%	11.5%	22.0%	10.3%	11.5%	11.1%
<b>TOTAL</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>

**Note:** These results are based on preliminary analysis including approximately 80% of the upgrades.

# TIMELINE & NEXT STEPS

# CIP-002-5 Draft methodology

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Steady State Planning



Helping our members  
work together to  
keep the lights on...  
today and in the future

# Overview

- **MOPC Action Item 211:**
  - Procedures for identification of generating resources that are required to avoid Adverse Reliability Impacts
  - Bring to July 2014 MOPC meeting for approval
- **CIP-002-5 effective: April 1, 2016 for High/Medium impact systems**
- **Two Planning Coordinator related criterion**
  - **Criterion 2.3 & Criterion 2.6**

# Draft methodology for Criteria 2.3 & 2.6

- **Criterion 2.3**
  - *“Each generation Facility that its Planning Coordinator or Transmission Planner designates, and informs the Generator Owner or Generator Operator, as necessary to avoid an Adverse Reliability Impact in the planning horizon of more than one year.”*
- **Criterion 2.6**
  - *“Generation at a single plant location or Transmission Facilities at a single station or substation location that are identified by its Reliability Coordinator, Planning Coordinator, or Transmission Planner as critical to the derivation of Interconnection Reliability Operating Limits (IROLs) and their associated contingencies.”*



# Draft methodology for Criterion 2.3

- **BES Cyber Systems (a.k.a. Reliability Must Run units)**
  - When a contingency analysis (G-1, N-1) identifies an under-voltage condition characterized by bus voltages of less than 90% across 20 or more BES facilities. Trial run identified 2 units.
- **BES Cyber Systems list of Generation Facilities posted on secure site for review annually**
- **GO will be notified of units on their list**

# Draft methodology for Criterion 2.6

- **SPP Criteria 12.3.2**
  - Potential IROLs will be investigated when a contingency analysis highlights a thermal overload in excess of 120% of the SOL of the monitored facility.
  - Potential IROLs will also be investigated when a contingency analysis highlights an under-voltage condition characterized by bus voltages of less than 90% across three or more BES facilities.
- **TPL Steady State assessment allows system adjustments per SPP Criteria 12.3.2**
- **BES Cyber Systems list of Generation or Transmission Facilities posted on secure site for review annually**
- **GO/TO will be notified of facilities on their list**

# Draft methodology for CIP-002-5

- **Planning Coordinator analysis**
  - **Potential Reliability Must Run (RMR) identification**
  - **Potential Interconnection Reliability Operating Limits (IROL) identification**
  - **Analysis to be performed once CIP-002-5 methodology is approved by MOPC**
  - **Results communicated as soon as possible**

# TPL Task Force Update

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Steady State Planning



Helping our members  
work together to  
keep the lights on...  
today and in the future

# Important Dates

- **Effective dates**
  - **BES procedure update – July 1, 2014**
  - **Models – January 1, 2015**
  - **Studies – January 1, 2016**

# Update

- **Power flow models**

Requirement	Description	Base case	Sensitivity case (R2.1.4)
R2.1.1	Year 1 or 2 peak	MDWG 2016S	MDWG 2016SH transfer*
R2.1.1	Year 5 peak	MDWG 2020S	MDWG 2020SH transfer*
R2.1.2	Year 1 - 5 off-peak	MDWG 2016G	MDWG 2016L
R2.2.1	Long-Term horizon peak	MDWG 2025S	N/A

- **Dynamic models**

Requirement	Description	Base case	Sensitivity case (R2.4.3)
R2.4.1	Year 1 through 5 peak	MDWG 2016S	MDWG 2016SH
R2.4.2	Year 1 through 5 off-peak	MDWG 2016L	MDWG 2016G*
R2.5	Long-Term horizon peak	MDWG 2025S	N/A

\* Model is not being built during current processes.

- **Added 7 sheets to MDWG Submittal workbook to capture outages related to R1.1.2**

# Update

- **Standard review**
  - **Requirements 1- 8**
    - **Currently through requirement 3**
- **Load survey sent out to MDWG and TPLTF Members to address a gap for TPL-001-4 regarding R2.4.1 (dynamic load modeling)**
- **Common Contingency Naming Convention effort by MRO TAS (Midwest Reliability Organization Transmission Assessment Subcommittee)**
- **BES Definition**
  - **BESNET Tool is now available**

Item	Date Originated	Action Item	Updates	Status (Not Started, In Progress, Closure Pending, On Hold, Closed)	Owner	Notes/Comments	Need By Date	
1	03/11/14	Reene Miranda gave the following example: A line is built in your area by another TO (owner), but it benefits you, who will be the Transmission Planner? Ask TWG to address this issue of who is the TP in this situation.		Pending	Staff responsible	1) Jason Shook: For the RFP submittal, have to state the Transmission Planner. 2) Harold Wyble: mentioned that he would know who is building in his geographical footprint. 3) Joe Fultz: mentioned that MDWG would be working on who is responsible for what when considering the UFLS standard. This might help identify.		
2	03/11/14	Get clarification of study submittal timing with audit concern for effective date of 1/1/2016.		Closed	Jonathan Hayes	R1 and R7 are effective 1/1/2015 AND R2 through R6 as well as R8 are effective 1/1/2016. Entities need to be ready to show evidence of R1 and R7 before 1/1/2015 and R2 through R6 and R8 before 1/1/2016.		
3	03/11/14	Post SPP gap analysis on the website, with disclaimer (others have found other gaps)		Closed	Jason Terhune			
4	03/11/14	Add column to Gap Analysis to include TOs		Closed	Jason Terhune			
5	03/11/14	Forward example of cross reference table to SPP (Michael Odom)		Closed	Brian Brownlow			
6	03/11/14	Include BES guidance document in background materials on the TPLTF website		Closed	Jason Terhune			
7	03/11/14	Research other regions to see how they are documenting TPL and BES process.		In Progress	Michael Odom			
8	03/11/14	Send out doodle poll for next two meetings in one poll		Closed	Jason Terhune			
9	03/21/14	Provide feedback on SPP's GAP analysis		On Hold	TPLTF reps		4/14/2014	
10	03/25/14	Review current RSAWs in preparation for the April TPLTF meeting		On Hold	TPLTF reps			
11	03/25/14	Work with MDWG about R1, R1.1.1.2		Closed	Nathan McNeil / Reene Miranda			
12	03/25/14	Year 5 and Year 10 are needed		Closed	Nathan McNeil / Reene Miranda			
13	03/25/14	Check with Anthony to see what the most current MDWG manual is and send link out to the TPLTF exploder		Closed	Jason Terhune			
14	03/25/14	Send out May Meeting notice (May 12th, 1:30 – 3:30)		Closed	Jason Terhune			
15	03/25/14	Add column to Gap analysis to cross reference the previous standard, include RSAW responses		On Hold	Michael Odom / Jason Terhune / Brian Brownlow			
16	04/21/14	Set up bi-weekly meetings and send out meeting notices		Closed	Jason Terhune			
17	04/21/14	Edit March 25th Meeting Minutes and post for May 5th Meeting approval		Closed	Jason Terhune			
18	04/21/14	Post TPL Comprehensive report (for RSAW reference) in the TPLTF Background materials		Closed	Dee Edmondson			





## A. Introduction

1. **Title:** Transmission System Planning Performance Requirements
2. **Number:** TPL-001-4
3. **Purpose:** Establish Transmission system planning performance requirements within the planning horizon to develop a Bulk Electric System (BES) that will operate reliably over a broad spectrum of System conditions and following a wide range of probable Contingencies.
4. **Applicability:**
  - 4.1. **Functional Entity**
    - 4.1.1. Planning Coordinator.
    - 4.1.2. Transmission Planner.
5. **Effective Date:** Requirements R1 and R7 as well as the definitions shall become effective on the first day of the first calendar quarter, 12 months after applicable regulatory approval. In those jurisdictions where regulatory approval is not required, Requirements R1 and R7 become effective on the first day of the first calendar quarter, 12 months after Board of Trustees adoption or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

Except as indicated below, Requirements R2 through R6 and Requirement R8 shall become effective on the first day of the first calendar quarter, 24 months after applicable regulatory approval. In those jurisdictions where regulatory approval is not required, all requirements, except as noted below, go into effect on the first day of the first calendar quarter, 24 months after Board of Trustees adoption or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities.

For 84 calendar months beginning the first day of the first calendar quarter following applicable regulatory approval, or in those jurisdictions where regulatory approval is not required on the first day of the first calendar quarter 84 months after Board of Trustees adoption or as otherwise made effective pursuant to the laws applicable to such ERO governmental authorities, Corrective Action Plans applying to the following categories of Contingencies and events identified in TPL-001-4, Table 1 are allowed to include Non-Consequential Load Loss and curtailment of Firm Transmission Service (in accordance with Requirement R2, Part 2.7.3.) that would not otherwise be permitted by the requirements of TPL-001-4:

- P1-2 (for controlled interruption of electric supply to local network customers connected to or supplied by the Faulted element)
- P1-3 (for controlled interruption of electric supply to local network customers connected to or supplied by the Faulted element)
- P2-1
- P2-2 (above 300 kV)
- P2-3 (above 300 kV)
- P3-1 through P3-5
- P4-1 through P4-5 (above 300 kV)
- P5 (above 300 kV)

## B. Requirements

**R1.** Each Transmission Planner and Planning Coordinator shall maintain System models within its respective area for performing the studies needed to complete its Planning Assessment. The models shall use data consistent with that provided in accordance with the MOD-010 and MOD-012 standards, supplemented by other sources as needed, including items represented in the Corrective Action Plan, and shall represent projected System conditions. This establishes Category P0 as the normal System condition in Table 1. *[Violation Risk Factor: Medium]*  
*[Time Horizon: Long-term Planning]*

**TPLTF feels that R1 is currently being met through current MDWG processes with the exception of 1.1.2**

**1.1.** System models shall represent:

MDWG manual defines the responsibilities of PC and TP

PC: Combined effort (TP & PC) using Models on Demand (MOD), compiles the TP submitted data

TP: Combined effort (TP & PC) using Models on Demand (MOD), provides the data below in accordance with model building process

**Should apply to all of R1**

1.1.1. Existing Facilities

1.1.2. Known outage(s) of generation or Transmission Facility(ies) with a duration of at least six months. TF will recommend to the MDWG to include a new tab in the Data submission spreadsheet that captures outages 6 months or longer.

1.1.3. New planned Facilities and changes to existing Facilities

1.1.4. Real and reactive Load forecasts

1.1.5. Known commitments for Firm Transmission Service and Interchange

1.1.6. Resources (supply or demand side) required for Load

**R2.** Each Transmission Planner and Planning Coordinator shall prepare an annual Planning Assessment of its portion of the BES. This Planning Assessment shall use current or qualified past studies (as indicated in Requirement R2, Part 2.6), document assumptions, and document summarized results of the steady state analyses, short circuit analyses, and Stability analyses. *[Violation Risk Factor: High]* *[Time Horizon: Long-term Planning]*

**2.1.** For the Planning Assessment, the Near-Term Transmission Planning Horizon portion of the steady state analysis shall be assessed annually and be supported by current annual studies or qualified past studies as indicated in Requirement R2, Part 2.6. Qualifying studies need to include the following conditions:

2.1.1. System peak Load for either Year One or year two, and for year five.

2.1.2. System Off-Peak Load for one of the five years.

2.1.3. P1 events in Table 1, with known outages modeled as in Requirement R1, Part 1.1.2, under those System peak or Off-Peak conditions when known outages are scheduled.

2.1.4. For each of the studies described in Requirement R2, Parts 2.1.1 and 2.1.2, sensitivity case(s) shall be utilized to demonstrate the impact of changes to the basic assumptions used in the model. To accomplish this, the sensitivity analysis in the Planning Assessment must vary one or more of the following conditions by a sufficient amount to stress the System within a range of credible conditions that demonstrate a measurable change in System response :

- Real and reactive forecasted Load.

**Comment [MO1]:** Look at RSAW responses for the current standard. Check Trueshare.

**Comment [MO2]:** Get feedback from Nathan about the 6 month duration after the May MDWG meeting. He will work with Reene on a response to MDWG.

**Comment [MO3]:** AI: SPP to check with Anthony Cook, provide the MDWG manual – post on TPLTF site

**Comment [MO4]:** May be an addition to the MDWG manual, Nathan can discuss at the MDWG meeting.

**Comment [MO5]:** How do we measure this? Individual TPs can determine the stress.

- Expected transfers.
- Expected in service dates of new or modified Transmission Facilities.
- Reactive resource capability.
- Generation additions, retirements, or other dispatch scenarios.

- Controllable Loads and Demand Side Management.
- Duration or timing of known Transmission outages.

PC:  
TP:

2.1.5. When an entity's spare equipment strategy could result in the unavailability of major Transmission equipment that has a lead time of one year or more (such as a transformer), the impact of this possible unavailability on System performance shall be studied. The studies shall be performed for the P0, P1, and P2 categories identified in Table 1 with the conditions that the System is expected to experience during the possible unavailability of the long lead time equipment.

Comment [MO6]:

PC: 2.1.5 is covered under P6.2.1-.P6.2.4 meets the performance requirements without Load shedding. Need to draft some document to state Member's spare equipment strategy.

AI: SPP to request list of spare equipment with lead time over a year from Members  
TP:

**2.2.** For the Planning Assessment, the Long-Term Transmission Planning Horizon portion of the steady state analysis shall be assessed annually and be supported by the following annual current study, supplemented with qualified past studies as indicated in Requirement R2, Part 2.6:

2.2.1. A current study assessing expected System peak Load conditions for one of the years in the Long-Term Transmission Planning Horizon and the rationale for why that year was selected.

**2.3.** The short circuit analysis portion of the Planning Assessment shall be conducted annually addressing the Near-Term Transmission Planning Horizon and can be supported by current or past studies as qualified in Requirement R2, Part 2.6. The analysis shall be used to determine whether circuit breakers have interrupting capability for Faults that they will be expected to interrupt using the System short circuit model with any planned generation and Transmission Facilities in service which could impact the study area.

Comment [MO7]: Does all generation need to be online for the short circuit models?

**PC role: Run short circuit analysis; provide a list of total bus fault currents to the TP, however members can provide on their own internal programs if they choose to and report the results to SPP**

**TP role: TP provides feedback to PC as to whether or not the breakers should be included in the list**

**2.4.** For the Planning Assessment, the Near-Term Transmission Planning Horizon portion of the Stability analysis shall be assessed annually and be supported by current or past studies as qualified in Requirement R2, Part 2.6. The following studies are required:

2.4.1. System peak Load for one of the five years. System peak Load levels shall include a Load model which represents the expected dynamic behavior of Loads that could impact the study area, considering the behavior of induction motor Loads. An aggregate System Load model which represents the overall dynamic behavior of the Load is acceptable.

Comment [MO8]: Mo: There is a gap unless SPP Compliance can tell us differently.

Comment [MO9]: Will a 60/20/20 cover this requirement. Scott: 50/0/0

2.4.2. System Off-Peak Load for one of the five years.

2.4.3. For each of the studies described in Requirement R2, Parts 2.4.1 and 2.4.2, sensitivity case(s) shall be utilized to demonstrate the impact of changes to the basic assumptions used in the model. To accomplish this, the sensitivity analysis in the Planning Assessment must vary one or more of the following conditions by a sufficient amount to stress the System within a range of credible conditions that demonstrate a measurable change in performance:

- Load level, Load forecast, or dynamic Load model assumptions.
- Expected transfers.
- Expected in service dates of new or modified Transmission Facilities.
- Reactive resource capability.
- Generation additions, retirements, or other dispatch scenarios.

2.5. For the Planning Assessment, the Long-Term Transmission Planning Horizon portion of the Stability analysis shall be assessed to address the impact of proposed material generation additions or changes in that timeframe and be supported by current or past studies as qualified in Requirement R2, Part 2.6 and shall include documentation to support the technical rationale for determining material changes.

**Comment [MO10]:** Jason will check with compliance for more clarification.

2.6. Past studies may be used to support the Planning Assessment if they meet the following requirements:

**Comment [MO11]:** Previous studies can be used to meet the Planning Assessment requirement if there are no material changes from the previous study used. The Planning Assessment will be performed annually.

2.6.1. For steady state, short circuit, or Stability analysis: the study shall be five calendar years old or less, unless a technical rationale can be provided to demonstrate that the results of an older study are still valid.

2.6.2. For steady state, short circuit, or Stability analysis: no material changes have occurred to the System represented in the study. Documentation to support the technical rationale for determining material changes shall be included.

2.7. For planning events shown in Table 1, when the analysis indicates an inability of the System to meet the performance requirements in Table 1, the Planning Assessment shall include Corrective Action Plan(s) addressing how the performance requirements will be met. Revisions to the Corrective Action Plan(s) are allowed in subsequent Planning Assessments but the planned System shall continue to meet the performance requirements in Table 1. Corrective Action Plan(s) do not need to be developed solely to meet the performance requirements for a single sensitivity case analyzed in accordance with Requirements R2, Parts 2.1.4 and 2.4.3. The Corrective Action Plan(s) shall:

2.7.1. List System deficiencies and the associated actions needed to achieve required System performance. Examples of such actions -include:

- Installation, modification, retirement, or removal of Transmission and generation Facilities and any associated equipment.
- Installation, modification, or removal of Protection Systems or Special Protection Systems
- Installation or modification of automatic generation tripping as a response to a single or multiple Contingency to mitigate Stability performance violations.
- Installation or modification of manual and automatic generation runback/tripping as a response to a single or multiple Contingency to mitigate steady state performance violations.
- Use of Operating Procedures specifying how long they will be needed as part of the Corrective Action Plan.
- Use of rate applications, DSM, new technologies, or other initiatives.

2.7.2. Include actions to resolve performance deficiencies identified in multiple sensitivity studies or provide a rationale for why actions were not necessary.

2.7.3. If situations arise that are beyond the control of the Transmission Planner or Planning Coordinator that prevent the implementation of a Corrective Action Plan in the required timeframe, then the Transmission Planner or Planning Coordinator is permitted to utilize Non-Consequential Load Loss and curtailment of Firm Transmission Service to correct the situation that would normally not be permitted in Table 1, provided that the Transmission Planner

or Planning Coordinator documents that they are taking actions to resolve the situation. The Transmission Planner or Planning Coordinator shall document the situation causing the problem, alternatives evaluated, and the use of Non-Consequential Load Loss or curtailment of Firm Transmission Service.

- 2.7.4. Be reviewed in subsequent annual Planning Assessments for continued validity and implementation status of identified System Facilities and Operating Procedures.
- 2.8. For short circuit analysis, if the short circuit current interrupting duty on circuit breakers determined in Requirement R2, Part 2.3 exceeds their Equipment Rating, the Planning Assessment shall include a Corrective Action Plan to address the Equipment Rating violations. The Corrective Action Plan shall:
  - 2.8.1. List System deficiencies and the associated actions needed to achieve required System performance.
  - 2.8.2. Be reviewed in subsequent annual Planning Assessments for continued validity and implementation status of identified System Facilities and Operating Procedures.
- R3. For the steady state portion of the Planning Assessment, each Transmission Planner and Planning Coordinator shall perform studies for the Near-Term and Long-Term Transmission Planning Horizons in Requirement R2, Parts 2.1, and 2.2. The studies shall be based on computer simulation models using data provided in Requirement R1. *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*
  - 3.1. Studies shall be performed for planning events to determine whether the BES meets the performance requirements in Table 1 based on the Contingency list created in Requirement R3, Part 3.4.
  - 3.2. Studies shall be performed to assess the impact of the extreme events which are identified by the list created in Requirement R3, Part 3.5.
  - 3.3. Contingency analyses for Requirement R3, Parts 3.1 & 3.2 shall:
    - 3.3.1. Simulate the removal of all elements that the Protection System and other automatic controls are expected to disconnect for each Contingency without operator intervention. The analyses shall include the impact of subsequent:
      - 3.3.1.1. Tripping of generators where simulations show generator bus voltages or high side of the generation step up (GSU) voltages are less than known or assumed minimum generator steady state or ride through voltage limitations. Include in the assessment any assumptions made.
      - 3.3.1.2. Tripping of Transmission elements where relay loadability limits are exceeded.
    - 3.3.2. Simulate the expected automatic operation of existing and planned devices designed to provide steady state control of electrical system quantities when such devices impact the study area. These devices may include equipment such as phase-shifting transformers, load tap changing transformers, and switched capacitors and inductors.
  - 3.4. Those planning events in Table 1, that are expected to produce more severe System impacts on its portion of the BES, shall be identified and a list of those Contingencies

**Comment [MO12]:** SPP will run analysis with all contingencies in the Steady State analysis.

**Comment [MO13]:** TPLTF will recommend to TWG to create a list of breaker-breaker contingencies for this requirement.

**Comment [MO14]:** Make sure BES definition doesn't affect this.

**Comment [MO15]:** PRC-023-2 standard. Captured in Powerflow limits due to relay limiting for some companies.

to be evaluated for System performance in Requirement R3, Part 3.1 created. The rationale for those Contingencies selected for evaluation shall be available as supporting information.

- 3.4.1. The Planning Coordinator and Transmission Planner shall coordinate with adjacent Planning Coordinators and Transmission Planners to ensure that Contingencies on adjacent Systems which may impact their Systems are included in the Contingency list.
  - 3.5. Those extreme events in Table 1 that are expected to produce more severe System impacts shall be identified and a list created of those events to be evaluated in Requirement R3, Part 3.2. The rationale for those Contingencies selected for evaluation shall be available as supporting information. If the analysis concludes there is Cascading caused by the occurrence of extreme events, an evaluation of possible actions designed to reduce the likelihood or mitigate the consequences and adverse impacts of the event(s) shall be conducted.
- R4.** For the Stability portion of the Planning Assessment, as described in Requirement R2, Parts 2.4 and 2.5, each Transmission Planner and Planning Coordinator shall perform the Contingency analyses listed in Table 1. The studies shall be based on computer simulation models using data provided in Requirement R1. *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*
- 4.1. Studies shall be performed for planning events to determine whether the BES meets the performance requirements in Table 1 based on the Contingency list created in Requirement R4, Part 4.4.
    - 4.1.1. For planning event P1: No generating unit shall pull out of synchronism. A generator being disconnected from the System by fault clearing action or by a Special Protection System is not considered pulling out of synchronism.
    - 4.1.2. For planning events P2 through P7: When a generator pulls out of synchronism in the simulations, the resulting apparent impedance swings shall not result in the tripping of any Transmission system elements other than the generating unit and its directly connected Facilities.
    - 4.1.3. For planning events P1 through P7: Power oscillations shall exhibit acceptable damping as established by the Planning Coordinator and Transmission Planner.
  - 4.2. Studies shall be performed to assess the impact of the extreme events which are identified by the list created in Requirement R4, Part 4.5.
  - 4.3. Contingency analyses for Requirement R4, Parts 4.1 and 4.2 shall :
    - 4.3.1. Simulate the removal of all elements that the Protection System and other automatic controls are expected to disconnect for each Contingency without operator intervention. The analyses shall include the impact of subsequent:
      - 4.3.1.1. Successful high speed (less than one second) reclosing and unsuccessful high speed reclosing into a Fault where high speed reclosing is utilized.
      - 4.3.1.2. Tripping of generators where simulations show generator bus voltages or high side of the GSU voltages are less than known or assumed generator low voltage ride through capability. Include in the assessment any assumptions made.

**Comment [MO16]:** One option is to have a list of extreme contingencies. These would be identified through the naming convention.



- 4.3.1.3. Tripping of Transmission lines and transformers where transient swings cause Protection System operation based on generic or actual relay models.
- 4.3.2. Simulate the expected automatic operation of existing and planned devices designed to provide dynamic control of electrical system quantities when such devices impact the study area. These devices may include equipment such as generation exciter control and power system stabilizers, static var compensators, power flow controllers, and DC Transmission controllers.
- 4.4. Those planning events in Table 1 that are expected to produce more severe System impacts on its portion of the BES, shall be identified, and a list created of those Contingencies to be evaluated in Requirement R4, Part 4.1. The rationale for those Contingencies selected for evaluation shall be available as supporting information.
  - 4.4.1. Each Planning Coordinator and Transmission Planner shall coordinate with adjacent Planning Coordinators and Transmission Planners to ensure that Contingencies on adjacent Systems which may impact their Systems are included in the Contingency list.
- 4.5. Those extreme events in Table 1 that are expected to produce more severe System impacts shall be identified and a list created of those events to be evaluated in Requirement R4, Part 4.2. The rationale for those Contingencies selected for evaluation shall be available as supporting information. If the analysis concludes there is Cascading caused by the occurrence of extreme events, an evaluation of possible actions designed to reduce the likelihood or mitigate the consequences of the event(s) shall be conducted.
- R5. Each Transmission Planner and Planning Coordinator shall have criteria for acceptable System steady state voltage limits, post-Contingency voltage deviations, and the transient voltage response for its System. For transient voltage response, the criteria shall at a minimum, specify a low voltage level and a maximum length of time that transient voltages may remain below that level. *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*
- R6. Each Transmission Planner and Planning Coordinator shall define and document, within their Planning Assessment, the criteria or methodology used in the analysis to identify System instability for conditions such as Cascading, voltage instability, or uncontrolled islanding. *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*
- R7. Each Planning Coordinator, in conjunction with each of its Transmission Planners, shall determine and identify each entity's individual and joint responsibilities for performing the required studies for the Planning Assessment. *[Violation Risk Factor: Low] [Time Horizon: Long-term Planning] 1-1-2015 due date*

**PC role:**

TP role:

**R8.** Each Planning Coordinator and Transmission Planner shall distribute its Planning Assessment results to adjacent Planning Coordinators and adjacent Transmission Planners within 90 calendar days of completing its Planning Assessment, and to any functional entity that has a reliability related need and submits a written request for the information within 30 days of such a request. *[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]*

**8.1.** If a recipient of the Planning Assessment results provides documented comments on the results, the respective Planning Coordinator or Transmission Planner shall provide a documented response to that recipient within 90 calendar days of receipt of those comments.



**Southwest Power Pool, Inc.**  
**MODEL DEVELOPMENT WORKING GROUP**  
**Report to the Transmission Working Group**  
**June 5, 2014**

**Organizational Roster**

The following members and staff represent the Model Development Working Group (MDWG):

Joe Fultz, Chairman – Grand River Dam Authority (GRDA)  
Nate Morris, Vice Chairman – Empire District Electric (EDE)  
Scott Rainbolt – American Electric Power (AEP)  
Derek Brown – Westar Energy (WR)  
Dustin Betz – Nebraska Public Power District (NPPD)  
John Boshears – City Utilities of Springfield (CUS)  
Mike Clifton – Oklahoma Gas & Electric Company (OGE)  
Reen  Miranda – Southwestern Public Service (SPS)  
Scott Schichtl – Arkansas Electric Cooperative Corporation (AECC)  
Jason Shook – GDS Associates (GDS)  
Brian Wilson – Kansas City Power & Light (KCPL)  
Nathan McNeil – Midwest Energy (MIDW)  
Anthony Cook, Secretary – Southwest Power Pool (SPP)

**Activity Update**

During the May MDWG meeting, the group discussed ways to improve the timeliness of the MDWG model building schedule. SPP Staff presented improvements that will apply to all modeling data reporting entities. The members are to provide additional improvement suggestions to SPP Staff to discuss at the next conference call.

The 2015 Series MDWG models were selected. The group accepted the TPLTF recommendation of year one adjusted the model selection accordingly.

Upon discussion at the meeting, SPP Staff has proposed two schedules to the MDWG which will be discussed in an upcoming conference call. Current improvements to the schedule do include holding a conference call during each pass to get a status update of data, and member review ends December 31.

The group approved the SPP Staff recommendations for modeling generator parameters.

Respectfully submitted,

Anthony Cook, MDWG Secretary