COMMON USE SYSTEM

TRANSMISSION COORDINATION & PLANNING COMMITTEE

NETWORK OPERATING COMMITTEE

Q4 MEETING

December 18, 2012

Black Hills Power Service Center
Rapid City, SD

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TCPC Meeting Overview

- Introductions
- Meeting Policies
- 2011 LTP Recommendations
- 2012 Study Scope Review
- 2012 Study Results
- Stakeholder Input and Questions
- Next Steps

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TCPC Meeting Policies

FERC Standards of Conduct

The FERC Standards of Conduct state that Transmission Function Employees are prohibited from disclosing non-public Transmission Information unless they disclose it on the OASIS. Also, Transmission Function Employees and Shared Employees are expressly prohibited from disclosing non-public information to Energy or Marketing Affiliates.

Anti-Trust Policy

It is the committee's policy to comply with all state and federal anti-trust laws. One objective of the TCPC is top promote or enhance competition. Careful attention should be paid to any discussions regarding you or your competitors prices, allocation of markets, customers, or products, limiting production, and excluding dealings with other companies.

Confidentiality

Certain information may be protected as confidential due to Standards of Conduct concerns or because it is classified as Critical Energy Infrastructure Information. Otherwise, it should be on the OASIS. Committee members agree not to share committee activities with the press and do not discuss ideas or concerns other than your own in a public forum.

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CUS Updates

- Suspended operation at Ben French, Osage, and NSS1 generation facilities, 2014 retirement pending.
- BHP joint ownership in Cheyenne Prairie generation facility
  - Replacement capacity for retired units

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2011 LTP Results & Recommendations

- Modification of Minimum Allowable Frequency Criterion for Wyodak area suggested (Apply Cat. C outage criteria to Cat. B outages).
- Additional Wyodak-Area Transformation Capacity
- Continue Teckla-Osage-Lange 230 kV line as planned
- Monitor need for St. Onge substation as load grows
- Monitor need to replace Lange 230/69 kV transformer as load grows

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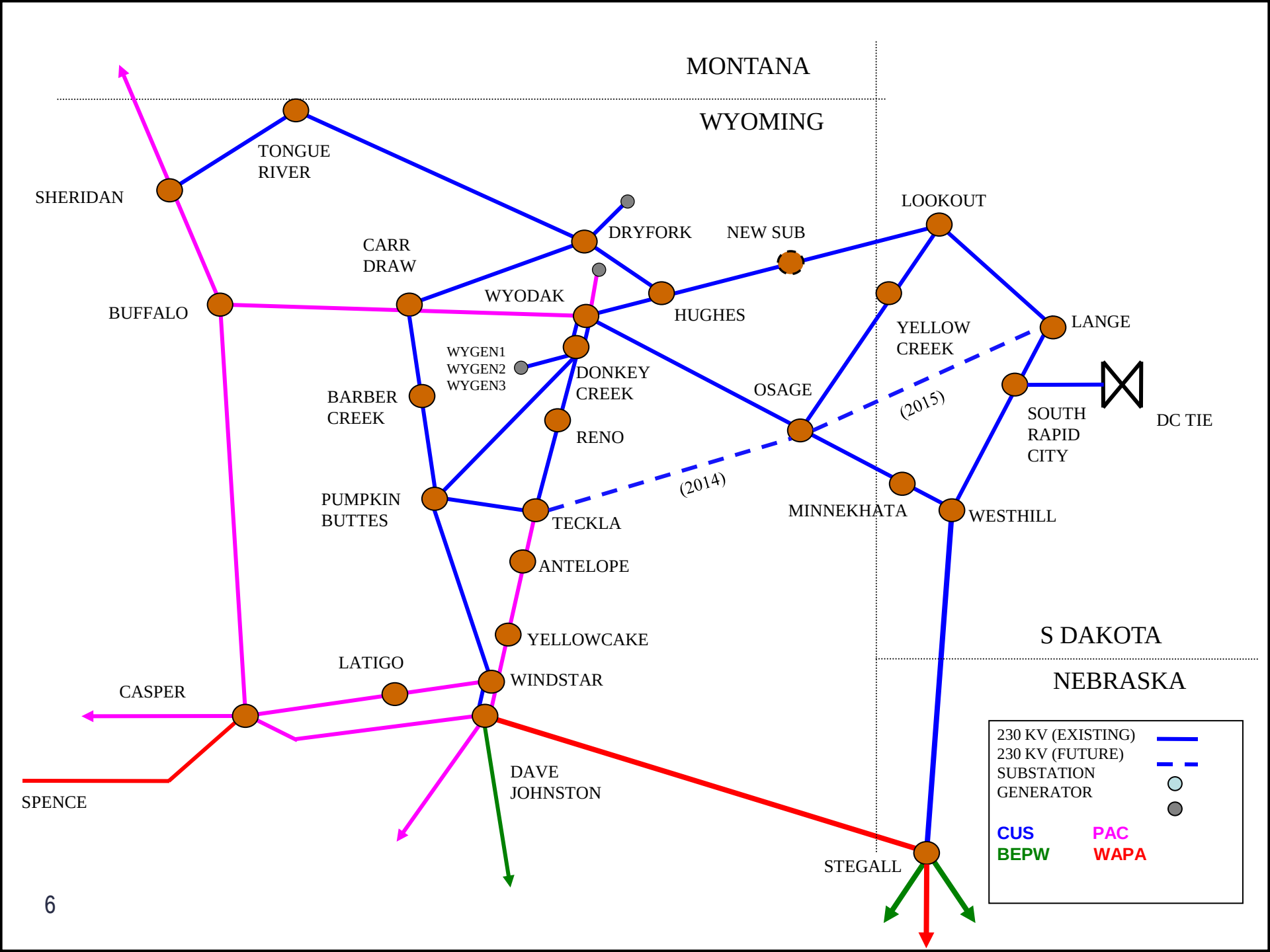
MONTANA
WYOMING
S DAKOTA
NEBRASKA
TONGUE RIVER
SHERIDAN
BUFFALO
CARR DRAW
DRYFORK
NEW SUB
LOOKOUT
WYODAK
HUGHES
YELLOW CREEK
LANGE
WYGEN1
WYGEN2
WYGEN3
DONKEY CREEK
BARBER CREEK
RENO
OSAGE
(2015)
SOUTH RAPID CITY
DC TIE
PUMPKIN BUTTES
(2014)
TECKLA
MINNEKHATA
WESTHILL
ANTELOPE
YELLOWCAKE
LATIGO
WINDSTAR
CASPER
SPENCE
DAVE JOHNSTON
STEGALL
230 KV (EXISTING)
230 KV (FUTURE)
SUBSTATION
GENERATOR
CUS
PAC
BEPW
WAPA

2012 LTP Study Scope

- 2017 (near term) and2022/2023 (far term)
- Analyze peak and off-peak scenarios
  - Power Flow, Transient Stability(2017 only), Voltage Stability(2017 peak case only)
- Use NERC/WECC planning criteria
- Evaluate N-0, N-1, N-2 and N-1-1 scenarios (Category A-C)
- Worst-case Category D outages evaluated
- Validate committed projects/recommend additional solutions

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2017HS Power Flow Results

- N-1-1 Wyodak 230:69 Transformer Overload
- N-1-1 Osage 230:69 Transformer Overload
- N-1-1 Yellow Creek 230:69 Transformer Overload
- N-1-1 Lookout #1 230:63 Transformer Overload

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2017LA Power Flow Results

- N-1-1 Wyodak 230:69 Transformer Overload

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2022HW Power Flow Results

- N-1-1 Wyodak 230:69 Transformer Overloads

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2023HS Power Flow Results

- N-1-1 Wyodak 230:69 Transformer Overload
- N-1-1 Yellow Creek 230:69 Transformer Overload
- N-1-1 Lookout #1 230:63 Transformer Overload
- N-1-1 Osage 230:69 Transformer Overload

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Results Summary

- Forecasted load growth in the northern Black Hills indicated the need for additional 230/69 kV transformation following the loss of two of the three existing transformers.
- There is insufficient 230/69 kV transformation capacity at Wyodak for outages involving the loss of one of the Wyodak transformers.
- The Osage transformer is unable to support all Osage and Hughes area loads following a loss of the Hughes transformer and the Wyodak-Hughes 69 kV line.
- Frequency dip issues remain at the NSS Complex following local N-1 faults.
- Rapid City loads re-adjusted for accuracy and eliminated overloads on Lange 230/69 transformer.

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Initial Recommendations

- Perform cost/benefit analysis and timing requirements on options for increasing northern Black Hills area 230/69 kV transformation capacity; select best option for inclusion in 2013 Ten Year Plan
  - o New St. Onge 230/69 kV substation
  - o Second 230/69 kV transformer at Yellowcreek
  - o N-1-1 demand reduction

- Perform feasibility and cost/benefit analysis and timing requirements on options for increasing Wyodak area 230/69 kV transformation capacity; select best option for inclusion in 2013 Ten Year Plan
  - o New 230/69 kV transformer at Donkey Creek
  - o Third 230/69 kV transformer at Wyodak
  - o Others????

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Initial Recommendations

- Discuss options for reducing Osage 230/69 kV transformer overloads with affected parties
  - Operational alternatives
  - Second or larger 230/69 kV transformer at Osage
  - Potential Sundance Interconnection benefits

- Continue to closely monitor Rapid City load growth and Lange 230/69 kV transformer loading

- Complete request for exemption from WECC System Performance Criterion related to the post-contingency frequency dip issue in the Wyodak area.

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Questions

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Next Steps

- Complete dynamic and voltage stability analysis and compile final results
- Complete and distribute draft report for review
- Address stakeholder comments
- Approve final report
- Update LTP based on study results and recommendations

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Comments / Suggestions

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