Request for Information

Analysis of Feasibility, Costs and Benefits of Contingency Reserve and Regulation Sharing Enhancements Among the WestConnect Parties

April 2, 2007

Request for Information

WestConnect is a group of transmission owners[1] acting to develop cost-effective wholesale market enhancements within the Western Interconnection. WestConnect formally acts through a Steering Committee comprised of representatives of each WestConnect party and through agreements executed by its parties.

This Request for Information (RFI) seeks submittals from individuals or entities interested in performing an analysis of the feasibility, costs and benefits of (1) enhanced sharing of contingency reserves and (2) sharing regulation among the WestConnect parties over the electric systems that they operate within the Western Interconnection (the WestConnect Footprint).

Upon review of the attached Study Scope, interested parties should submit in writing:

(1) a description of their experience and expertise in performing the study work described in the Study Scope, including knowledge of current reliability criteria and regulatory issues associated with implementing Virtual Control Area services;

(2) suggestions for analysis in addition or as an alternative to what is defined in the Study Scope;

(3) identification of the data required to perform the study work;

(4) an estimate of the time required to perform the study work and report the results;

(5) suggestions for administrative tools for operating an expanded Contingency Reserves Sharing group and Regulation Sharing, e.g. expanding existing reserve sharing group agreements, systems and procedures; using software tools already in use for reserves and regulation sharing; or developing new software tools;

[1] Current WestConnect Parties include: Arizona Public Service Company, El Paso Electric Company, Imperial Irrigation district, Public Service Company of Colorado, Public Service Company of New Mexico, Sacramento Municipal Utility District, Salt River Project, Sierra Pacific Resources (Nevada Power Company and Sierra Pacific Power Company), Southwest Transmission Cooperative, Tri-State Generation and Transmission Cooperative, Tucson Electric Power Company, and Western Area Power Administration.

(6) an estimate of fees and costs for performing the study work; and
(7) an indication of the responder's willingness to execute confidentiality agreements to protect the WestConnect parties' commercially sensitive information relative to reserves and regulation sharing.

Bidder's web conference Friday April 20, 2007: WestConnect will hold a bidders' web conference to clarify and answer questions about this RFI on Friday April 20, 2007, 10 a.m.- 12 noon Mountain Daylight Time, 9 a.m.-11:00 am Pacific Daylight and Phoenix Time. Details for the web conference will be posted on the WestConnect website www.westconnect.com and sent to the distribution list for this RFI well in advance of April 20.

Response due date is Friday May 4, 2007: Responses should be in writing and sent via e-mail to Charlie Reinhold, WestConnect Project Manager, reinhold@globalcrossing.net.

Estimated timeline: The WestConnect parties may or may not issue an RFP after they review the responses to this RFI. It is anticipated that if the study work goes forward, it would be conducted towards the end of 2007, with results reported in early 2008.

Questions: Questions may be directed to Charlie at reinhold@globalcrossing.net, 208-253-6916 (office phone) or 480-215-0299 (cell phone).

Disclaimer
WestConnect makes no commitment to issue a contract for performance of the study work described in this RFI.

WESTCONNECT

Draft Study Scope

Analysis of Feasibility, Costs and Benefits of Contingency Reserve and Regulation Sharing Enhancements Among WestConnect Parties

Prepared by:
WestConnect Virtual Control Area Work Group

February 15, 2007

The WestConnect parties seek input on this draft Study Scope from responders to the RFI and may revise the Study Scope based on that input.

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I. Introduction

The WestConnect parties (see Footnote 1) wish to have study work performed to evaluate the feasibility and extent of the potential for the parties to reduce their requirements for carrying Contingency Reserve and Regulation capacity through sharing such capacity.

WestConnect parties are NERC Balancing Authorities (BAs) that, with the exception of Sacramento Municipal Utility District (SMUD) and Sierra Pacific Power Company (Sierra Pacific), participate either in the Southwest Reserve Sharing Group (SRSG) or the Rocky Mountain Reserve Sharing Group (RMRG). SRSG and RMRG allow their participants (see Exhibit A) to carry a lower required Contingency Reserve Capacity than if each participant had to meet its NERC and WECC-determined Contingency Reserve Capacity requirement on its own. The WestConnect parties wish to investigate whether additional Contingency Reserve Capacity Sharing benefits (lower individual responsibilities) may be achieved by addressing transmission constraints between RMRG and SRSG, in particular between north and south, on a real time basis rather than on a reservation basis.

Additionally, the WestConnect parties wish to evaluate whether beneficial opportunities exist for Regulation Sharing through ACE diversity among their electric systems in the WestConnect footprint.

As used in this Study Scope, the term "Virtual Control Area (VCA)" is intended to cover collaborative regional efforts among WestConnect parties as individual BAs, not the actual collapse or consolidation of functions into a single control area.

Contingency Reserve Capacity Sharing: The study should examine functional requirements for allocation of Contingency Reserves Capacity among the WestConnect parties. The study will consider the full operational feasibility of a participant's change in its Contingency Reserve allocation, including an estimate of the number of hours where required reserves may decrease from current requirements, how often the requirements might change, etc. For example, a reduction in a party's allocation of Contingency Reserves in real-time will be simple to accommodate operationally, but changes that would increase a party's allocation must be incorporated into generation operational plans, including potential unit commitment decisions. This study will evaluate the periods during which increased allocations would be issued. Additionally, the study will estimate the number of time intervals (minimum interval of an hour) when deployment of Contingency Reserves across a broader footprint can be accommodated.

Regulation Sharing: The study will examine functional requirements necessary to allocate regulating response among the WestConnect parties and will estimate the amount of Regulation Sharing that can be achieved by the Participants.

The study will not address potential future changes in the WECC or NERC Standards with regards to reserve requirements, frequency response requirements and/or tagging. There is a possibility that new WECC and/or NERC Standards will be approved within the time line of this study work. In the event that this happens, WestConnect reserves the right to make changes to the Study Scope to properly analyze the impacts of the new standard on a VCA.

Because the penetration of wind generation resources in the region, while relatively low at present, is expected to increase, the study will evaluate the potential impact of wind integration on a VCA. This aspect will initially focus on the sharing of the Regulation responsibility associated with wind generation and other intermittent resources among the WestConnect parties, but could identify benefits in other areas.

The study should consider methods of implementing a VCA, including expanding existing Reserve Sharing Group agreements, systems and procedures; using software tools already in use for reserves and regulation sharing; or developing new software tools.

The WestConnect parties recognize that contractual, reliability and regulatory requirements associated with implementation of a VCA need to be evaluated as well as technical changes. Responders to this RFI should indicate their knowledge of current reliability criteria and regulatory issues associated with implementing VCA services.

II. Time Line

The project schedule for this study will begin once the WestConnect Steering Committee has authorized funds and the selection of a consultant(s) is completed. The WestConnect parties presently estimate that the study work would be completed by the end of 2007. However, responders should submit in their responses their own estimates of the time required to perform the study work.

III. Study Scope

A. Contingency Reserve Consolidation

1. Today the WestConnect parties operate primarily within the Rocky Mountain Reserve Group (RMRG) and the Southwest Reserve Sharing Group (SRSG). The Reserve Sharing Groups function as distinct entities, each with its own Contingency Reserve allocation and without any procedures for Contingency Reserve activation between the Reserve Sharing Groups, except during Energy Emergency Alert conditions under the direction of the WECC Reliability Coordinators. The study will

evaluate the potential benefit of sharing reserves (including the calculation of the total Contingency Reserve requirement, allocation of the Contingency Reserve requirement, activation of reserves in response to a contingency, and settlement of the reserve activation) between the WestConnect parties, subject to the following:

- First, that each party achieves a reduction in costs or other acceptable commercial benefit due to allocation changes.
- Second, the allocation changes produce no risk of degradation to reliability.
- Third, contractual and settlement mechanisms for Contingency Reserve activation are satisfactory to the parties.

The study will also need to recognize the participation of independent power producers under the proposal.

2. The WestConnect parties recognize that a single fixed allocation of Contingency Reserves is not feasible given the existing allocation of Available Transfer Capability (ATC) within the WestConnect Footprint. For example, RMRG and SRSG were previously combined in the Inland Power Pool but had to sever the relationship pursuant to FERC Order 888, due to transmission availability issues to support a fixed allocation of reserves among the Participants.

   The intent of this study is to evaluate a real-time approach to make a reduced overall allocation of Contingency Reserves during those periods when the transmission system can provide an expanded zone of sharing for various contingencies. The study should estimate hours where these allocation values can be reduced given sufficient transmission availability in real-time (for some minimum period of time) to permit a broader base of participants in the allocation. The variable allocation would be calculated as a reduction from the worst-case maximum allocation levels carried today.

   The allocation of the Contingency Reserve requirement between the WestConnect parties would be based on the transmission transfer capability, as established based on real-time actual and projected data. The WestConnect parties have questions whether minimum periods of the revised allocations can be established for purposes of managing unit commitment and related issues.

   - The study should assess the expected variability (e.g. hourly, on/off-peak blocks, daily) of the potential changes to the parties' Contingency Reserve allocations.
   - The study should estimate for each party the number of hours of reduced Contingency Reserve allocation made possible through the mechanism of spreading the consolidated Contingency Reserve obligation over a broader footprint of participating load.

- The study should evaluate the number of hours the parties are driven by Most Severe Single Contingency (MSSC) as compared with load-basis.
- The study should produce an illustration of the "Contingency Reserve Duration Curve" for each party (see Exhibit B). This curve would be an estimate of the number of annual hours for each amount of Contingency Reserve allocation expected. From this information the parties could estimate production cost savings associated with their individual reduced reserve obligation.
- The study should evaluate potential transmission limitations (forecast based on analysis of total transfer capability versus actual flow) to identify if any natural zones of consolidation are present or if a footprint-wide method is feasible.
- The study should evaluate the necessity for any changes to existing data collection methods to perform re-allocations of Contingency Reserve obligations among the parties.

B. Regulation Consolidation

- Study the potential reduction in the regulation margin expectation for all parties if the parties target a combined ACE requirement rather than individual ACE.
- Study methods for allocating or sharing any reduction in the regulation bandwidth required for each BA considering that transmission limitations may not support a complete sharing arrangement at all times.
- Study potential transmission limitations (forecast based on analysis of transmission transfer capability versus actual flow) to identify if any natural zones of consolidation are present or if a footprint-wide method is feasible.

IV. Investigation of Data Requirements

To perform the study, WestConnect parties will be required to submit data for time periods in April, June, October and December of 2005 (the WestConnect Pricing Work Group has already done a data retrieval for the same time period). Data submittal may include but is not limited to what is listed below. Responders should define any additional data requirements. The WestConnect parties will need to confirm availability of the requested information.

-Hourly Most Severe Single Contingency (MSSC)
-Hourly Balancing Authority (BA) Load
-BA L_{10}
-Hourly On-Line Generation (Thermal, Hydro)
-Each BA's resources and their respective maximum and minimum capabilities.
-Hourly Contingency Reserve requirements.
-Hourly actual and scheduled flow data at known posted transmission paths within the WestConnect Footprint.

-Actual path Total Transfer Capability (TTC) data for comparable time periods to evaluate remaining delivery capability.
-Examine existing IT communication and infrastructure for suitability to expanded functions.

V. Deliverables of Study

1. Report on the feasibility and benefits of sharing Contingency Reserve.
2. Report on the feasibility and benefits of Regulation Sharing.
3. Identify any transmission constraints and other impediments to achieving the benefits of 1 and 2.
4. Report on alternate methods of implementing a VCA, for example expanding existing reserve sharing group agreements, systems and procedures; using software tools already in use for reserves and regulation sharing; or developing new software tools.
5. The study should estimate hours where these allocation values can be reduced given sufficient transmission availability in real-time (for some minimum period of time) to permit a broader base of Participants in the allocation. The variable allocation would be calculated as a reduction from the worst-case maximum allocation levels carried today.
6. How implementation of a VCA may mitigate impacts of wind generation on a party's Contingency Reserves and Regulation requirements.

EXHIBIT A

POTENTIAL VCA PARTICIPANTS

	Balancing Authorities	WestConnect	Southwest Reserve Sharing Group	Rocky Mountain Reserve Group	Northwest Power Pool	Other
Aquila Inc.				X		
Arizona Public Service Company	X	X	X			
Basin Electric Power Cooperative				X		
Black Hills Power				X		
Colorado Springs Utilities				X		
El Paso Electric Company	X	X	X			
Entegra Power Group			X			
Farmington Electric Utility System			X			
Harquahala	X		X			
Imperial Irrigation District	X	X	X			
Los Alamos County			X			
LS Power Group			X			
Municipal Energy Agency of Nebraska				X		
Nevada Power Company	X	X	X			
Platte River Power Authority				X		
Public Service Company of Colorado	X	X		X		
Public Service Company of New Mexico	X	X	X			
Sacramento Municipal Utility District	X	X				X
Salt River Project	X	X	X			
Sierra Pacific Power Company	X	X			X	
Southwest Transmission Cooperative		X	X			
Tri-State Generation &Transmission		X	X	X		
Tucson Electric Power	X	X	X			
Western Area Power Administration - WACM	X	X		X		
Western Area Power Administration – WALC	X	X	X			
Wyoming Municipal Power Agency				X		

EXHIBIT B

EXAMPLE OF A CONTINGENCY RESERVE ALLOCATION CURVE

Below is a pictorial representation only, no actual data was used to create the graph.

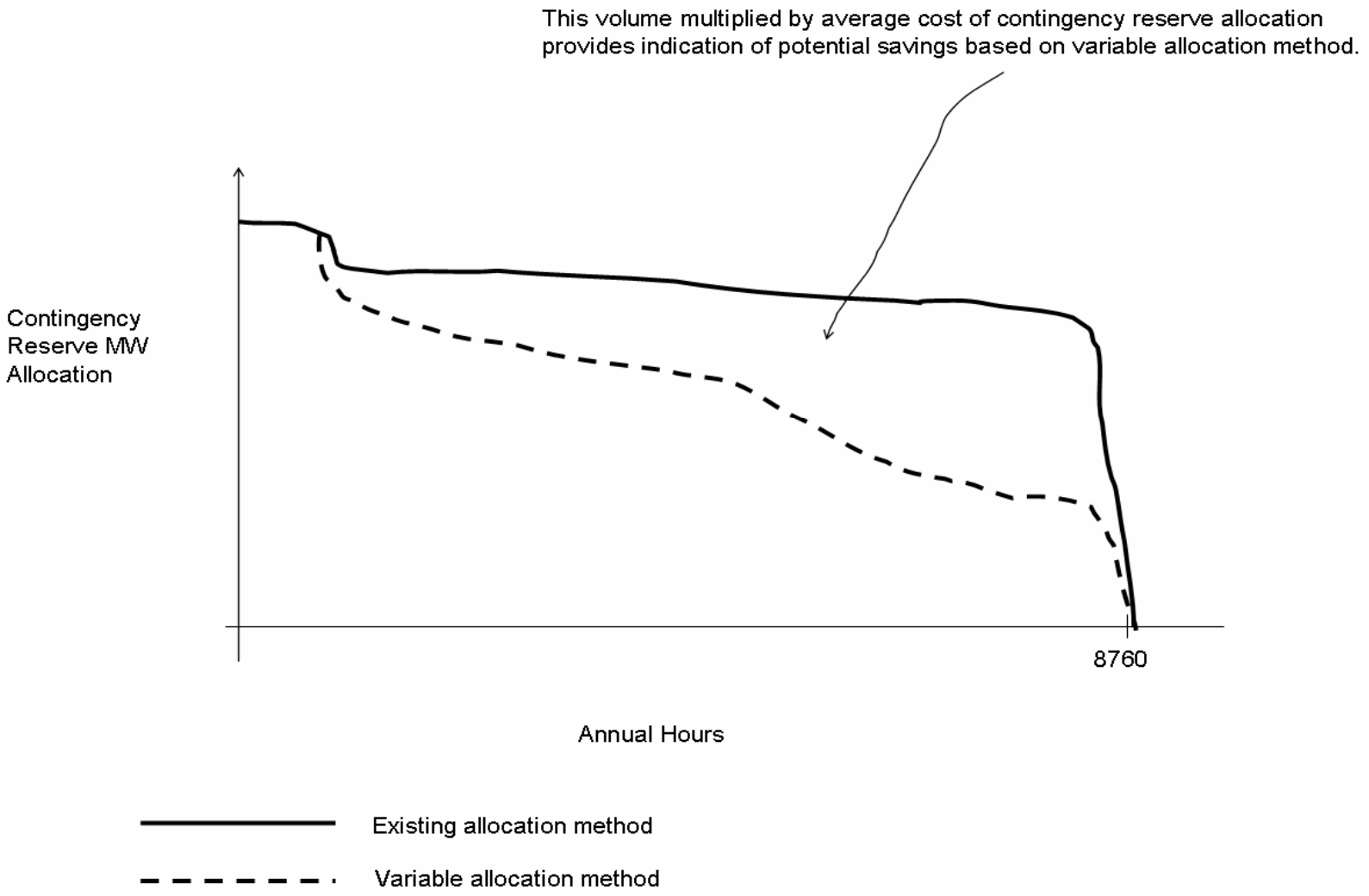

EXHIBIT C

STUDY GUIDELINES

1. Modifications to Balancing Authority (BA) Processes
   - The parties will function as a single entity for purpose of reporting Contingency Reserve availability, deployment response and group compliance with the Disturbance Control Standards (DCS).
   - Other typical BA reliability requirements, such as WECC Reliability Management System requirements, will remain with the parties.

2. Area Control Error (ACE) Calculation and Reporting
   - The study will assume the parties will maintain ACE-related reliability standards, i.e. Control Performance Standards (CPS), with the exception of DCS.
   - Allocation of penalties for non-compliance will be a commercial issue addressed among the parties for DCS.

3. Emergency Assistance Schedules Adjust Parties' Automated Generation Control (AGC)
   - Dynamic Schedule and Generator Adjustments

4. Visibility of Actual Reserves
   - Hourly Computation of Reserve Requirement
   - Real Time View of Actual Reserves Being Carried

EXHIBIT D

GLOSSARY OF TERMS

Area Control Error (ACE) - The instantaneous difference between a Balancing Authority's net actual and scheduled interchange, taking into account the effects of Frequency Bias, Time error, and correction for meter error.

Automatic Generation Control (AGC) -

Balancing Authority (BA) – The responsible entity that integrates resource plans ahead of time, maintains load-interchange-generation balance within a Balancing Authority Area, and supports Interconnection frequency in real time.

Contingency Reserve – An amount of spinning and nonspinning reserve, sufficient to meet the Disturbance Control Standard.

This Contingency Reserve shall be at least the greater of:

(1) The loss of generating capacity due to forced outages of generation or transmission equipment that would result from the Most Severe Single Contingency (at least half of which must be spinning reserve); or

(2) The sum of five percent of the load responsibility served by hydro generation and seven percent of the load responsibility served by thermal generation (at least half of which must be spinning reserve).

For generation-based reserves, only the amount of unloaded generating capacity that can be loaded within ten minutes of notification can be considered as reserve.

Control Performance Standard (CPS) – The reliability standard that sets the limits of a Balancing Authority's Area Control Error over a specified time period.

Disturbance Control Standard (DCS) - The reliability standard that sets the time limit following a Disturbance within which a Balancing Authority must return its Area Control Error to within a specified range.

Energy Emergency Alert – Emergency procedure, not a daily operating practice, not intended as an alternative to compliance with NERC Reliability Standards or power supply contracts.

Federal Energy Regulatory Commission (FERC) – An independent federal agency that regulates the transmission and sale of natural gas for resale in interstate commerce; regulates the transmission of oil by pipeline in interstate commerce; regulates the transmission and wholesale sales of electricity in interstate commerce; licenses and inspects private,

municipal, and state hydroelectric projects; approves the siting of and abandonment of interstate natural gas facilities, including pipelines, storage and liquefied natural gas; ensures the reliability of high voltage interstate transmission system; monitors and investigates energy markets; uses civil penalties and other means against energy organizations and individuals who violate FERC rules in the energy markets; oversees environmental matters related to natural gas and hydroelectricity projects and major electricity policy initiatives; and administers accounting and financial reporting regulations and conduct of regulated

Most Severe Single Contingency (MSSC) – That single contingency which results in the most adverse system performance under any operating condition or anticipated mode of operation.

North American Electric Reliability Corporation (NERC) – Mission is to ensure that the bulk electric system in North America is reliable. NERC develops and enforces reliability standards; monitors the bulk power system; assesses future adequacy; audits owners, operators, and users for preparedness; and educates and trains industry personnel.

Northwest Power Pool (NWPP) – The geographic area encompassed by the electric systems of the NWPP Agreement Signatories where there exists coordinated operations and reserve sharing. This includes the states of Washington, Oregon, Idaho, Montana, Utah, and Wyoming; portions of northern California and northern Nevada; British Columbia and Alberta.

Party – A party to the WestConnect Restated and Amended Memorandum of Understanding.

Regulation Sharing – The process whereby one participating Balancing Authority contracts to provide corrective response to all or a portion of the ACE of another participating Balancing Authority.

Reliability Coordinator - The entity that is the highest level of authority who is responsible for the reliable operation of the bulk power system.

Reserve Sharing Group (RSG) - A group whose members consist of two or more Balancing Authorities that collectively maintain, allocate, and supply Operating Reserves required for each Balancing Authority's use in recovering from contingencies within the group. Scheduling energy from an Adjacent Balancing Authority to aid recovery need not constitute reserve sharing, provided the transaction is ramped in over a period the supplying party could reasonably be expected to load generation in (e.g.10 minutes). If the transaction is ramped in quicker (e.g. between zero and ten minutes) then, for the purposes of Disturbance Control Performance, the Area becomes a Reserve Sharing Group.

WestConnect – Is composed of utility companies providing transmission of electricity in the southwestern United States, working collaboratively to assess stakeholder and market needs and develop cost-effective enhancements to the western wholesale electricity market.

Western Electricity Coordinating Council (WECC) – One of the NERC Regional Reliability Organizations that is responsible for the coordinated operation of the Western Interconnection.