



December 13, 2006
ColumbiaGrid Forum

Elements of Reliability
Functional Agreement



Functional Agreement

- Single Reliability Functional Agreement
 - Begin drafting late 1st quarter 2007
- Early authorization for ColumbiaGrid to staff up and begin work on WECC process, BPA's Redispatch Pilot Project, and Scheduled Outage Coordination



Scope

- Visibility
- Reliability Redispatch
- Feasibility Work Regarding Consolidation of Traditional Control Area Responsibilities
- Scheduled Outage Management Process



Visibility - Goal

- Enhance monitoring, modeling, analysis, and data exchange during real-time (current hour), pre-operating hour (next hour), day-ahead (24 hours prior to operating hour), and planning periods to improve operations within ColumbiaGrid while maintaining regional reliability and security



Visibility - Problems

- Lack of specific information regarding what generation and load are going to do in real-time makes it impossible to analyze and use proactive tools to manage system
 - Load and generation information gaps both inside ColumbiaGrid footprint and outside ColumbiaGrid
 - E.g., many tags do not provide enough information on sink and source to allow for an accurate assessment of the impact of a particular transaction to the transmission system
 - Lack of information about how transmission rights will be used



Visibility - Problems

- Many times, generation located within a BA's area that is serving load within that same BA area is not tagged



Visibility - Solutions

- Create a robust database that will help forecast how the transmission system could be used in the short-term (pre-operating hour out to pre-schedule)
- Obtain better information from those using the transmission system about how they anticipate they will operate in the short-term
- Work with regulators and policy makers to help modify procedures to mandate better data flow from those using the transmission system to the transmission operators
- Ensure that the transmission operators deploy supplied data to better operate their systems



Visibility - Tasks

- Work to develop a common central database or clearinghouse (ColumbiaGrid portion of the WSM Database)
 - Become involved in the WECC's West-Wide System Model project (participate in the data model development process on behalf of participating entities)



Visibility – Tasks

- Work with the Generator Operators, TOPs, and BAs to obtain load forecasts, generation forecasts, and generator and transmission outage information to populate ColumbiaGrid's portion of the WSM Database
 - Develop protocols to provide protection for confidential information as well as address SOC issues



Visibility – Tasks

- Become involved in the effort to implement transient and voltage stability tools within the WECC's West-Wide System Model development process on behalf of participating entities
- Develop a plan to perform system studies and inform participating reliability entities of near real-time and future hour operating issues
- Exercise ColumbiaGrid mechanisms, if any, where appropriate to resolve issues, e.g., reliability redispatch



Visibility Enhancements

- Incorporate all critical future hour information (e.g., load and generation forecasts, transmission and generation outage information , etc.), into WSM tools, including transient and voltage stability applications
- Provide information to the participating reliability entities so they can develop mitigation plans to avoid potential real-time operating issues and OTC violations
- Develop plans to establish the longer-term goal of having ColumbiaGrid develop mitigation plans and mechanisms



Visibility Enhancements

- Ensure WSM data and tools will support congestion management mechanisms and ATC calculations for future hours
 - Determine if the Western Interchange Tool (WIT) can supplement these processes
- Explore opportunities to improve regional reliability by installing additional monitoring devices on the interconnected system
 - For example, disturbance monitoring and phase-angle measurements, temperature and wind conditions on critical transmission facilities to provide accurate information to calculate dynamic thermal line capacities resulting in increased transfer capabilities (provide a report 6 months after the completion of WSM Stage 2)



Visibility - Staffing

- More work needed



Reliability Redispatch

- Goal – Provide transmission operators additional tools to address congestion
- ColumbiaGrid Role - Lead effort to develop and implement regional redispatch for reliability
 - Initiator
 - Actual or imminent threat of OTC violation
 - Priorities
 - Within hour
 - Hour ahead
 - Will require development of visibility tools



Reliability Redispatch Stage 1

- Begin developing business practices and infrastructure to facilitate voluntary reliability redispatch that includes bids for increasing and decreasing federal and non-federal generation; specifically, assist BPA in development, implementation, and assessment of the summer of 2007 BPA redispatch pilot project



Reliability Redispatch Stage 1

- Possible Involvement
 - Steering Committee?
 - Technical Implementation Team
- Implementation Responsibilities
 - Before Hour
 - After Hour



Reliability Redispatch Stage 2

- Transition to ColumbiaGrid implementation of reliability redispatch for footprint (Functional Agreement signatories) control areas by developing business practices and infrastructure to facilitate voluntary reliability redispatch that includes bids for increasing and decreasing federal and non-federal generation and load



Reliability Redispatch Stage 3

- Transition to ColumbiaGrid implementation of congestion management using pre-real-time information for footprint control areas by developing business practices and infrastructure to facilitate hour-ahead voluntary redispatch that includes bids for increasing and decreasing federal and non-federal generation and load



Reliability Redispatch Staffing

- More work needed



Feasibility Goal

- Through investigation and analytical work provide sufficient information for the Parties to decide what aspects of those traditional control area operations that should be combined to improve reliability and enhance operating efficiencies
 - Initial focus on Balancing Authority/Transmission Operator tasks



Design Parameters

- Monitor and work within larger evolving framework of new reliability entities, roles and responsibilities; identify tasks that would benefit from consolidation under single entity
- Include options regarding analytical tools that promote reliability and efficient operations
 - Options to provide operators and appropriate parties broad regional visibility of system operating conditions
 - Identify specific functions that might benefit from consolidation
 - Do preliminary cost/benefit or cost/effectiveness analysis on such functions
- Be creative as to how functions might be consolidated and accomplished



Design Parameters

- Consolidation is voluntary
- Participation in markets (if any) is voluntary
- Participants submit balanced schedules
- Impacts to existing Tx rights and business practice flexibilities should be identified
- Services provided by CG should have identified benefits to the participants
- ColumbiaGrid will not have physical operational control, e.g., will not perform any switching, although could direct or coordinate switching
- Considerable thought and evaluation should go into where the line should be drawn between ownership and operational responsibility (authority versus responsibilities versus delegation)
- Address confidentiality concerns, including critical infrastructure, market sensitive information, standards of conduct, and general access to information (who gets it and under what protections)



Design Parameters

- Options within changing framework (changing reliability entities, roles and responsibilities)
 - Nested Control Area (WAPA Model)
 - Virtual Control Area
 - New control center
 - Status Quo
 - Logical sequence of functions that may merit consolidation based on the outcome of reliability and cost/benefit or cost/effectiveness analyses of with and without consolidation of the various increments of consolidation (this will facilitate reasoned decision making and staged implementation consistent with cost/benefit or cost/effectiveness and reliability analyses)
 - Other?



Design Parameters

- Staged Design
 - First Stage – sufficiently detailed design (range of options) to enable parties to make decision on whether to proceed with consolidation design
 - Feasibility
 - Cost Effectiveness or Cost/Benefit (short-term and long-term), as appropriate
 - Reliability Analyses
 - Acceptability
 - Second Stage – after decision to go forward, detailed technical proposal capable of implementation



Design Parameters

- Evaluate legal and practical limitations
- Establish an open, public stakeholder process for developing the design
- Discuss potential limits on budget and authority of ColumbiaGrid and what to do when these limits are approached



Timeline

- 15 months from Effective Date



Staffing

- Will need one FTE and the equivalent funds needed to use a contractor to do the feasibility study
 - Up to ColumbiaGrid to determine who work is accomplished



Scheduled Outage Management Process

- By coordinating with and enhancing the existing NWPP regional scheduled outage process
 - Help the participating entities comply with Balance Authority and Transmission Operator requirements to coordinate outages in a manner that maintains system reliability
 - Reduce the hours of operation under constrained conditions
 - Facilitate an open, transparent and responsive decision-making process
 - Contribute to optimal use of the transmission system



Scheduled Outage Management Process

- Existing NWPP Coordination of Scheduled Outages Procedure (Procedure) works well for the region, but can be improved
- Participation of an independent entity such as ColumbiaGrid can increase the credibility
- BPA has been the major contributor to the Procedure
 - Leading effort to establish the Procedure
 - Playing lead role in the NWPP Coordinated Outage Group Subcommittee (COGS)
 - BPA technical staff performs much of study work necessary to determine the system impacts of the proposed outages
 - BPA performs this role, not only for outages within its own system but also, in whole or in part, for many of the smaller transmission operators that have interconnected facilities with BPA



Scheduled Outage Management Process

- Recognizing the regional nature of the Procedure, BPA has expressed a commitment to identify and turn over to ColumbiaGrid a significant portion of its responsibilities relating to the Procedure



Scheduled Outage Enhancements

- Ensure that all scheduled outages in the region are timely entered into the NWPP COS system
- Include generation outages in the Procedure to provide a more accurate assessment of the system
 - Create opportunity to minimize resource impacts by reducing duplicate outages to critical facilities (for example, transmission facilities connected to generation projects could be maintained at the same time as planned unit outages)
- Minimize phone calls and e-mails between entities by having ColumbiaGrid play a central role in coordinating ColumbiaGrid participants' outages
- Investigate the use of an automatic processing tool such as CROW



Scheduled Outage Enhancements

- Enhance the Procedure to promote more interaction between transmission owners, operators, and customers
 - Establish more refined criteria for making outage scheduling decisions, particularly with respect to decisions made to resolve scheduling conflicts and the consideration given to the financial impacts to both transmission operator and transmission customer
Investigate the modification of existing tools or procurement of additional tools to address this issue
- Provide a more open and transparent Procedure while keeping market sensitive information confidential
- Provide a more active and robust scheduled outage planning Procedure that will accommodate time frames beyond today's 45 days Procedure
- Refine the Procedure to provide a ranking system for high risk, high cost infrastructure or maintenance projects to minimize costly cancellations



ColumbiaGrid Role

- First Stage
 - Work with BPA staff



ColumbiaGrid Role

- Second Stage
 - Parties (including BPA) and ColumbiaGrid, in consultation with the NWPP members and staff, develop transition plan that describes how ColumbiaGrid will assume fuller coordination responsibilities regarding scheduled outages within the footprint of the ColumbiaGrid participants
 - Determine the degree to which ColumbiaGrid assumes the central role of coordinating regional scheduled outages for the Parties as described by the plan
 - Transition to ColumbiaGrid performing all necessary studies



ColumbiaGrid Role

- Establish more refined criteria for making outage scheduling decisions, particularly with respect to decisions made to resolve scheduling conflicts and the consideration given to the financial impacts to both transmission operator and transmission customer