Dynamic Transfers in the Western Interconnection

Joint Meeting of the Committee on Regional Electric Power Cooperation and the State and Provincial Steering Committee

Boise, Idaho
Introducing the Regulatory Assistance Project (RAP)

RAP is a non-advocacy, non-profit organization providing technical and educational assistance to government officials around the world on energy and environmental issues.

RAP Staff on this Project:
Carl Linvill, Rich Sedano, and John Shenot
What is the Western Renewable Energy Zones (WREZ) Initiative?

• An initiative of the Western Governors’ Association (WGA)

• Aims to:
  – develop areas in the Western Interconnection with abundant, high-quality renewable resources
  – establish an efficient network of interstate transmission lines to deliver the energy to load centers
WREZ Initiative - Phase I
WREZ Initiative - Phase II
Dynamic Transfers Outreach Project

• Focuses on implementing just one of the June 2012 recommendations to facilitate dynamic transfers, specifically:
  – “Conduct outreach and disseminate information to stakeholders on the implications of dynamic transfer limits and potential system impacts of dynamic scheduling in order to help identify solutions”
Today’s Expert Presenters

• Kyle Hoffman
  Manager of Energy Scheduling

• Jim McIntosh
  Senior V.P., Operations
Dynamic Transfers for Renewable Energy in the Western Interconnection

Presented by ZGlobal Engineering and Energy Solutions
Consultant for the Regulatory Assistance Project

Jim McIntosh and Kyle Hoffman
EIM / CREPC / SPSC Meeting
The Grove Hotel, Boise, ID
April 10, 2013
Key Objectives

1. Understand how Dynamic Transfers have been utilized historically and can be expanded to contribute toward integrating renewable resources at a lower cost

2. Consider next steps and recommendations going forward
Overview

High Level Scheduling Overview

What is Dynamic Transfer?

Impacts of Dynamic Transfer Implementation

Dynamic Transfer Challenges

Questions and Next Steps
“Static” or Normal Interchange Schedules

Today, interchange scheduling consists primarily of hourly “blocks” of energy
28 out of 38 BAs have utilized dynamic transfer for decades to transfer energy between them to help maintain their internal supply/demand balance.
Static or “Normal” Schedule Functionality

- Fixed blocks of energy for the operating hour
- Limited ability to implement mid-hour or real-time changes
- Dynamic transfer “automates “ the intra-hour interchange scheduling process
What is Dynamic Transfer?

A High Level Overview of what Dynamic Transfer is, is not, and how Dynamic Transfer fits in with current energy delivery policies
Dynamic Transfer Applications

Dynamic Transfer provides a means to:

• Decrease scheduling intervals from the current hourly standard to intra-hour intervals as short as four (4) seconds
• Facilitate intra-hour transfers between BAs
• Enable variable energy transfers between BAs
• Accommodate real-time energy imbalance markets

Defines a Dynamic Transfer as...

The provision of the real-time monitoring, telemetering, computer software, hardware, communications, engineering, energy accounting (including inadvertent interchange), and administration required to electronically move all or a portion of the real energy services associated with a generator or load out of one Balancing Authority Area into another.
Dynamic Transfer Functionality

Split Unit Share (Jointly Owned Units)

Ancillary Services
- Regulation Import
- Operating Reserve Imports
- Load following

Real Time Market / Balancing Energy Dispatch

Renewable or Variable Energy Resource (VER) Integration & Scheduling
Dynamic Transfers in Use Across the Western Region

- Sutter Energy Center, CA
  - Ancillary Services
- Copper Mountain Solar, NV
  - Renewable Scheduling
- Hoover Dam, NV
  - Regulation Imports
- Four Corners, NM
  - Split Unit Share (Jointly Owned Units)
- Aragonne Mesa Wind, NM
  - Renewable Scheduling

BC hydro
Energy Markets
Dynamic Transfer enables generators with multiple owners to “divvy up” the energy output produced by the generator and “schedule” the energy to serve load in their respective BAs.
Dynamic Transfer of Renewable or Variable Energy Resource Scheduling in Action

Dynamic Transfer enables renewable or variable energy resources to transfer the energy produced by the generator to the customer load’s BA on an as-generated basis.
Impacts of Dynamic Transfer Implementation

How Dynamic Transfer can be a useful tool going forward
VER rich regions are often located remotely in sparsely populated areas distant from large load centers.

Dynamic Transfer allows source BAs to transfer energy from areas where resources reside to sink BAs where renewable energy is needed.
Dynamic Transfer allows source BAs with large renewable energy potential to interconnect VERs to the grid and dynamically transfer the RPS energy along with the balancing obligation to sink BAs.
Supply Diversification

Dynamic Transfer provides a means to increase VER supply diversity, blending resource’s with different production patterns that complement each other, to better match the load curve within the sink BA.

Source Data: 2010 Energy Storage Summit April 20th, 2010 Hosted by PJM and EPRI – Jim McIntosh

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Geographic Diversification

Access to broadly dispersed renewable resources helps with integration
Increases the Pool of Resources to Call Upon for Services

Scheduling Flexibility

Ability to change interchange schedules to allow participation in various energy initiatives

Access to External Resources

Allows for participation by external resources in energy markets “within the Trade hour”

Facilitates Ancillary Services

Facilitates Ancillary Services market participation, including AGC Regulation and Flexible Ramping services

Bottom Line?

Increased options result in decreased cost
Dynamic Transfers Complement New Energy Initiatives

Dynamic transfers are associated with and useful mechanisms for implementation of a number of initiatives throughout the West.

- Dynamic Scheduling Service (DSS)
- Intra-Hour Scheduling Initiatives (ITAP, FERC 764)
- Energy Imbalance Market (EIM)
Dynamic Transfer Challenges

What is the best use of transmission capacity?
Areas Best Suited for Dynamic Transfer Implementation

- Transmission capacity
- Ability for BAs to withstand variability of dynamic energy transfers
  - Voltage Limits
  - Reactive Support
  - Outages

Competing Uses for Transmission

• Optimize use of existing transmission capacity
  – Energy vs. Integration Services
• Need for additional transmission capacity is driven by both energy and integration
  – Identify needs in the transmission planning process
Prioritizing Improvements to Accommodate Dynamic Transfers

There are numerous options for system improvements and upgrades. By prioritizing the right improvements, Dynamic Transfers can be implemented to maximize effectiveness with minimum associated cost.

System control and automation, e.g. Remedial Action Schemes (RAS) and Special Protection Schemes (SPS)

Transmission system equipment upgrades

System visibility and assessment
Clarifying Questions
ZGlobal, Inc. Engineering and Energy Solutions

604 Sutter Street, Suite 250
Folsom, CA 95630
P: 916.985.9461 • F: 916.985.9467
Email: info@zglobal.biz
www.zglobal.biz

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Next Steps

• What remains to be done by RAP and ZGlobal?
  – Publication of a final report that can be used as a resource by regulators and policy makers in the West
  – June 1, 2013
Next Steps

• **Actions that States could take:**
  – Support determination of availability and limits on your utilities’ transmission lines
  – Explore technology and operations improvements that could increase availability of capacity on existing transmission
  – Include future needs for dynamic transfer when evaluating transmission additions and electricity system improvements
Next Steps

• Actions that SPSC could take:
  – Support state information gathering
  – Collect, compile and publish information on WIEB’s proposed Dashboard
    • Dynamic Transfer capacity limits
    • Facilitating Technology deployed
    • Operational practices implemented
    • Planning practices implemented
About RAP

The Regulatory Assistance Project (RAP) is a global, non-profit team of experts that focuses on the long-term economic and environmental sustainability of the power and natural gas sectors. RAP has deep expertise in regulatory and market policies that:

- Promote economic efficiency
- Protect the environment
- Ensure system reliability
- Allocate system benefits fairly among all consumers

Learn more about RAP at www.raponline.org

Carl Linvill: clinvill@raponline.org
775-450-0603