



BPA Wind Integration Team Initiatives Update to WIT E-mail List September 2010

This is the monthly update on BPA's Wind Integration Team initiatives for September 2010. If you have questions about any of these initiatives, contact Eric King, WIT project manager, at 503-230-5236.

All WIT projects are up and running! October 2010 marks the original deadline to launch five pilot projects in BPA's June 2009 Wind Integration Team Work plan. We are pleased to report that all five, plus one more, were operating as of Sept. 1. BPA has met all its commitments in the WIT work plan and more. BPA appreciates the extensive cooperation and collaboration of wind project owners and operators, Northwest utilities and others in achieving these results. Here's a recap.

1) DSO-216 implemented: Fully implemented on Oct. 1, 2009, Dispatchers Standing Order 216 is BPA's primary reliability tool for managing variable generation. To date, DSO 216 has resulted in 41 limit events to reduce overgeneration compared to transmission schedules. There have been 39 curtailments of transmission tags in response to undergeneration of wind compared to transmission schedules. This is a lower frequency of curtailments than expected when rates were set for fiscal years 2010-2011. In addition, since this June, BPA has allowed customers with more than one wind project in BPA's balancing authority area to net the output of those projects in responding to DSO 216, increasing wind operation flexibility while maintaining system reliability. Also, three wind projects have requested and gained direct integration with BPA's automatic generation control, which enables them to respond automatically to DSO 216 events.

2) Dynamic transfer capability studied, identified, awarded, used: The WIT work plan called for completion of a dynamic transfer limits methodology and application of that methodology to four transmission paths by February 2009. BPA completed the methodology and applied it to nine transmission paths, on which it found 90 megawatts to 225 megawatts of available dynamic transfer capability. BPA then developed and implemented a process to allocate and award this DTC to requesting utilities. That process, collaboratively developed with customers, resulted in new DTC offers, awards and Dynamic Transfer Operating Agreements that are now in effect. BPA is discussing further enhancements of this pilot project with customers and system operators, and a second DTC offer is on hold pending customers' requests to align the DTC award period with the BPA rate period.

3) Forecasting, state awareness tools developed, deployed: BPA installed 14 anemometers by September 2009 and has since developed and deployed an in-house wind forecasting system. For the next year, BPA is also purchasing two commercial vendor-supplied wind generation forecasts. Data from all three forecasts will be used to help determine the most accurate forecasting approach. The cost of all three forecasting tools combined is below the budget originally established for one. On the state awareness side, BPA has applied for patents for its new wind displays now available to BPA and wind project operators on BPA's Integrated Curtailment and Redispatch System or iCRS (pronounced Icarus). The new tool includes generation data from each wind plant in BPA's balancing authority area plus wind speed and direction information from the anemometers. Further improvements of forecasting and state awareness tools are ongoing. (See item below.)

4) Intra-hour power scheduled: In fall 2009, BPA developed a business practice and tools to allow half-hour scheduling of wind generation. Intra-hour scheduling began Dec. 1, 2009. The pilot was evaluated



a success in March 2010 and has been extended indefinitely. Intra-hour schedules have reduced the need to use DSO 216, thus benefiting wind project operators while maintaining system reliability. BPA is working with individual Northwest utilities and with the Joint Initiative of ColumbiaGrid and Northern Tier Transmission Group on broader use of intra-hour scheduling.

5) Customer-supplied generation imbalance realized: BPA invited participation in this pilot in 2009 and developed a generation imbalance business practice in June 2010. The pilot launched ahead of schedule Sept. 1, 2010. Iberdrola Renewables is the only wind project owner in the pilot. It is the single largest wind power operator in the BPA balancing authority. Several other utilities and organizations are watching this pilot closely for potential future participation. (See item below.)

6) Third-party supply purchased: BPA had originally proposed a sixth WIT pilot to test access to non-federal generating resources as BPA balancing reserves. This pilot was deferred in favor of customers' priorities, but after the other pilots were assured of timely launch, BPA implemented this pilot as well. Drawing on responses to an earlier request for information, BPA purchased 75 MW of generation imbalance reserves for September through November 2010 from a Calpine Corporation natural-gas fired generator located in BPA's balancing authority area. (See item below.)

What's next for WIT: With the June 2009 WIT work plan essentially completed (and in many areas, exceeded), BPA is identifying new targets to further its ability to cost-effectively and reliably integrate wind power in the Northwest. Our principles are to:

- Support renewable resource development
- Assure reliable operations
- Cost recovery follows cost causation – avoid cost shifts
- Meet hydro system fish obligations

Some of the specific areas we're working on are noted in the items that follow. We expect to discuss components of WIT 2.0 (as it were) this fall.

Iberdrola Renewables supplies its own generation imbalance reserves for 1,100 MW: This capstone WIT project enables a wind project owner in BPA's balancing authority area to supply its own generation imbalance reserves rather than relying on the federal hydropower system.

[Iberdrola](#) contracted with Constellation Energy to manage its generation imbalance control and dispatch. It purchased hydropower generation imbalance reserve rights from Grant County PUD and arranged for output reductions from TransAlta's Centralia coal plant in Washington as another form of generation imbalance reserves. Iberdrola is also supplying reserves from its own natural gas fired plant in Klamath Falls, Ore. Launching the pilot project required designing, installing and testing communication protocols and telemetry, signaling systems and business and operating procedures among all these balancing resources, Iberdrola, Constellation and BPA.

The pilot produced benefits while still in test mode. On Aug. 17, Iberdrola drew 300 MW of reserve generation from its non-federal reserves instead of federal hydropower. The action avoided Northwest wind power projects' over consumption of federal hydro reserves that were about to reach their limit,

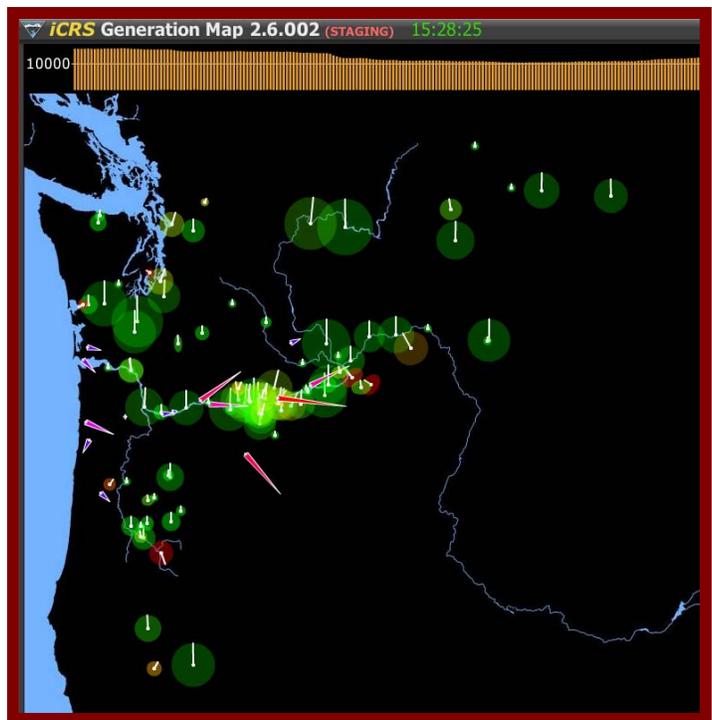
and BPA was able to cancel an imminent DSO 216 event. The pilot is so far operating smoothly and is meeting BPA performance expectations.

Calpine purchase adds reserves, reduces emissions: In September, BPA began a [three-month purchase](#) of up to 75 megawatts of generation flexibility from the Calpine Corporation’s natural gas-fired Hermiston Power Project in Oregon. When wind generators produce more electricity than scheduled, BPA can ask Calpine to quickly reduce Hermiston generation. Calpine will then buy the excess power on BPA’s system to fulfill its existing obligations to customers. Thus, the agreement will allow wind overgeneration to be used by wind power customers without reducing hydropower production. Hydropower will instead displace some natural gas-fired production. This arrangement optimizes use of renewable, non-CO2 emitting resources while conserving natural gas supplies and maintaining power system reliability.

Dispatchers get new real-time generation map: Dispatchers responded so well to BPA’s new [wind generation display](#) that the agency is expanding the tool to include all generation – hydro and thermal output as well as wind power. The goal of the application is to allow BPA system dispatchers to view any generator within BPA’s balancing authority, along with associated wind data provided by BPA anemometers.

In this real-time generation map program, information on wind, hydro, thermal and other plant types may be toggled on and off. A display across the top of the screen shows current total system generation. For each generator, the display shows location, current generation, previous hour’s generation, capacity and any station control error (divergence from scheduled output).

This computer application also allows operators to run displays over time periods within the preceding 24 hours. “As you work with this, you get a better understanding of the interaction of resources and weather that no amount of data printouts would ever show,” explained Will Rogers, electrical engineer in BPA Transmission Congestion and Dispatch Support. “Our dispatchers asked for this once they started using the wind generation advisor, and we’re glad to be able to provide it.” The generation map will be located in BPA’s iCRS dispatchers’ tool kit.



Firm contingent proposal delayed: In June, BPA requested comments on a proposal to require the [firm contingent energy code](#) on e-Tags for wind power originating in its balancing authority beginning Oct. 1, 2010. BPA said that it expected to issue a draft business practice on the subject this summer. This schedule has been delayed, and we have not yet reached disposition of this proposal.



Simultaneously, BPA has been working with the Northwest Power Pool to reach agreement on sink balancing authority responsibility for responding to under-generation by variable generation when BPA has exhausted the balancing resources set aside as part of the 2010-2011 rate case to firm the schedule. There has been some progress in this effort, and we continue to work with the NWPP on solutions.

We proposed use of firm contingent as an interim measure to provide visibility for wind energy that is subject to DSO 216 until the industry develops new product codes or other tools that more accurately reflect the operating characteristics of variable generating resources. This need remains. As we continue to work on this issue, we intend to curtail firm wind schedules when balancing reserves are exhausted per DSO 216, and we expect the sink balancing authority to adjust its generation to make up the difference. We are continuing to confer with other organizations in the industry on the best way to meet this need on an interim basis and to jointly develop a long-term solution. We will inform you when we reach conclusion on this matter.

Wind in BPA's grid tops 3,000 MW: BPA now hosts more than [3,000 megawatts](#) of wind power in its transmission grid — 3,011 MW to be precise. At full capacity, that's as much energy as three large nuclear plants. Wind power in BPA's balancing authority area topped 1,000 MW in 2007, 2,000 MW in 2009 and 3,000 MW in 2010. It is expected to exceed 4,000 MW in 2011 and up to 6,000 by 2013. BPA's average balancing authority load ranges between 5,000 MW and 7,000 MW. Peak load in the balancing authority area is 10,500 MW.

BPA asks California PUC to focus on delivering power, not just RECs

California ratepayers could see unintended consequences from the amount of tradable Renewable Energy Credits the California Public Utilities Commission has proposed allowing utilities to use to satisfy that state's expected 33 percent Renewable Portfolio Standard, BPA said in [comments to the California Public Utility Commission](#) Sept. 27. The California PUC proposed allowing California utilities to meet 40 percent of their obligations with tradable RECs. It also would exempt purchases from existing contracts from counting toward this limit. BPA asked the CPUC to recognize the effects of RECs on the likelihood of generation oversupply in the originating region. Oversupply, if unable to reach consumers, would increase wind power curtailments during severe ramps and require rate mechanisms to assure that costs incurred are appropriately recovered, BPA noted.

BPA encouraged policies that assure that renewable energy can be physically delivered to end-use consumers, including strengthened interregional transmission planning. It requested that California limit its definition of bundled RECS to energy scheduled and delivered to a California balancing authority within the hour in which the energy is actually generated.

During high runoff-events, BPA suggested California should allow utilities to accept zero cost, carbon-free Northwest federal hydropower as a REC-qualified replacement for wind generation, where the wind generation is curtailed to allow BPA to operate the hydrosystem to meet the requirements of Biological Opinions under the Endangered Species Act. BPA referenced its experience this past June in which the region experienced more electricity production than was needed to serve load, with no place to put it, even after taking extreme actions to reduce electricity production.



High water management workshop Oct. 12: BPA has issued a [report](#) that outlines the steps it and others took this June during high Columbia River stream flows to avoid harming fish because of excess spill. This was the first high-runoff event since large amounts of wind power were added to the Northwest power mix. BPA is using the report as a starting point for an open regional discussion about additional operational and policy tools that may be available or needed to respond effectively to future high-runoff events and protect fish listed under the Endangered Species Act.

BPA has scheduled a first workshop on its Columbia River high water report from 1-5 p.m., Tuesday, Oct. 12. The meeting will be in the Rates Hearing Room at BPA headquarters in Portland. A phone bridge is available for participants unable to attend in person. The call in number is 503-230-5566, and the pass code is 8277#. If you plan to attend the Oct. 12 workshop — either in person or via phone bridge — please e-mail Steve Kerns at srkerns@bpa.gov.