

## Transmission Services

# Summary of DSO 216 - Phase II Update

## Limiting Wind Output to Scheduled Value and Curtailing Schedules to Actual Wind Generation

Updated: December 13, 2013

### I. PURPOSE

The purpose of Dispatcher Standing Order (DSO) 216 is to provide instructions on limiting wind generation to the scheduled value when there is insufficient DEC balancing reserves available to offset the over-generation of wind. This DSO will also provide instructions about curtailing wind plant's schedules/e-Tags when their actual generation output is less than their scheduled amount and there are insufficient INC balancing reserves available to offset the under-generation of wind. The following procedure is used to implement Limit Wind to Schedule and Curtail Wind Schedules to Actual Generation.

### II. PROPOSED ACTIONS

BPA will calculate the total amount of balancing reserves needed at any given time for all users (Load DERBS and VERBS) within BPA's Balancing Authority. Using this information, BPA will implement the practices described in this DSO when 85%, 90%, or 100% or greater of INC or DEC balancing reserves are deployed from the FCRPS. BPA will continue to establish the amount of balancing reserves available, consistent with the amounts of installed variable generation. Changes to the amount of balancing reserves available will be consistent with and included in the Gen Inputs section of the BPA Rate Case.

### III. PROCEDURES FOR LIMITING WIND TO SCHEDULE

- A. When wind plants are over-generating and BPA supplied DEC balancing reserves are near or are depleted, BPA will require wind generators to reduce generation. Through the use of BPA's Automatic Generation Control (AGC) system or BPA's web application, Generation Advisor, BPA Dispatchers will send generation output limits alarms and notifications to each wind plant, relative to their schedule. Changes must be made by wind plants within 10 minutes of receiving electronic directives from BPA. The limitation will remain in effect for the remainder of the hour, at which time each wind plant should have their actual generation modified as indicated below. BPA Dispatch has the opportunity to immediately enact limit when an alarm comes in or, if the wind is not causing the deployment of reserve, to discard the limit.
  1. A warning alarm will be issued by BPA Dispatch automatically via the AGC system if 85% of DEC balancing reserves have been deployed for at least 30 seconds and a message will be sent to the wind plants informing them of the situation. The wind plants are not required to make any changes upon receipt of this message, since it only a warning. The warning is reset if total DEC balancing reserves drops below 75% for 30 seconds or more.
  2. A limit alarm will be issued to BPA Dispatch automatically via the AGC system if 90% or greater DEC balancing reserves for over-generation of wind are deployed for a sustained period of 30 seconds or more. The directive to limit will be issued to the wind plants 4½ minutes after the limit alarm has occurred, unless BPA Dispatch manually issues the directive. If the DEC reserve deployment drops below 85% at the end of the 4½ minute period, the limitation event is automatically discarded. If the limitation directive goes through, wind plants will be required to go back to their scheduled generation plus their proportional allocation of DEC balancing reserves plus any Supplemental Service DEC purchased for that hour within 10 minutes of receiving Dispatch directives from BPA.
  3. A limit alarm will be issued to BPA Dispatch automatically via the AGC system if 100% or greater DEC balancing reserves for over-generation of wind are deployed for a sustained period of 30 seconds or more and there has already been a 90% alarm in that hour. The directive to limit will be issued to the wind plants 4½ minutes after the limit alarm has occurred, unless BPA Dispatch manually issues the directive. If the DEC reserve deployment

drops below 90% at the end of the 4½ minute period, the limitation event is automatically discarded. If the limitation directive goes through, wind plants will be required to go back to their scheduled generation plus any Supplemental Service DEC purchased for that hour within 10 minutes of receiving Dispatch directives from BPA.

4. Limitations will not be initiated during the start of the hourly ramping period, from 10 minutes prior to the top of the hour to the top of the hour. This will allow wind generators to ramp to their new schedules which could possibly mitigate the Station Control Error issue without BPA taking action.
5. The limitation will remain in effect for the remainder of the hour. If conditions indicate that the limit must continue into the following hour, the limitation initiated at 90% reserve deployed will be in effect at the start of the hour. The wind generators should have increased their schedules to more closely match the actual generation of their project(s).
6. If a wind plant fails to lower its generation output within 10 minutes of a Dispatcher directive, Dispatch has the capability of disconnecting the wind plant by opening the breaker(s) for the wind facility if the over-generation is determined to be detrimental to the reliability of the system. The Senior Dispatcher will make the determination if the over-generation is detrimental to the reliability of the system.
7. A wind plants failure to comply with Dispatchers directives may result in penalties as determined in BPA's Failure to Comply Business Practice.
8. Any wind plant that fails to comply with these Dispatch directives three times within a 24 months period will be required to install equipment that accepts an upper limit from BPA and automatically adjusts the output of the facility down to that level.
9. Wind plants will always be given the directive to limit their generation to their schedule plus their proportional allocation of balancing reserves prior to directing wind plants to limit to schedule only.

#### IV. PROCEDURES FOR CURTAILING SCHEDULES TO WIND GENERATION

- A. When wind plants are under-generating and BPA is supplying INC balancing reserves, BPA will have the ability to automatically curtail transmission schedules for each plant, relative to its actual generation. If a curtailment is needed, the wind plants or their agents will be electronically notified of the curtailment through the existing NERC e-Tagging system. BPA Dispatch has the opportunity to immediately enact curtailments when an alarm comes in or, if the wind is not causing the deployment of reserve, to discard the curtailment.
- B. Approval of the e-Tagging action will be consistent with the current e-Tagging timelines and requirements per transmission scheduling procedures. Curtailing the scheduled e-Tags will reduce the schedule closer to actual generation and decrease the amount of INC balancing reserves deployed for that plant. The curtailment will remain in effect for the remainder of the hour.
  1. A warning alarm will be issued by BPA Dispatch automatically via the AGC system when 85% of INC balancing reserves are deployed for at least 30 seconds. A message will also be sent to the wind plants informing them of the situation. The wind plants are not required to make any changes upon receipt of this message, since this action is only a warning. The warning is reset if total INC balancing reserves drop below 75% for 30 seconds or more.
  2. A curtailment alarm will be issued to BPA Dispatch automatically via the AGC system when BPA has deployed 90% or more of its INC balancing reserves for under-generation of wind for a sustained period of 30 seconds or more. The curtailment will occur 4½ minutes after the curtailment alarm has occurred, unless BPA Dispatch manually issues the curtailment. If the INC reserve deployment drops below 85% at the end of the 4½ minute period, the curtailment

event is automatically discarded. If the curtailment goes through, the transmission schedule (e-Tags) for each wind generator will be curtailed to the amount of generation output plus their proportional allocation of INC balancing reserves plus any Supplemental Service INC purchased for that hour for wind generation.

3. A curtailment alarm will be issued to BPA Dispatch automatically via the AGC system when BPA has deployed 100% or more of INC balancing reserves for under-generation of wind for a sustained period of 30 seconds or more and a level 1 curtailment has already been enacted during the hour. The curtailment will occur 4½ minutes after the curtailment alarm has occurred, unless BPA Dispatch manually issues the curtailment. If the INC reserve deployment drops below 90% at the end of the 4½ minute period, the curtailment event is automatically discarded. If the curtailment goes through, the transmission schedule (e-Tags) for each wind generator will be curtailed to the amount of generation output plus any Supplemental Service INC purchased for that hour.
4. If more than one curtailment is taken in an hour, the length of time that must elapse between initiating one curtailment before another curtailment can be sent, whether it is 90% or 100% deployment of INC balancing reserves, is 10 minutes. Up to one 90% curtailment and three 100% curtailments may occur in one hour.
5. If there are multiple curtailments taken in the same hour, the last curtailment will override the prior from that point in the hour until the end of the hour.
6. No curtailments will occur between 15 minutes prior to the top of the hour the top of the hour in order to allow the ramp to new schedules to occur and possibly mitigate the issue without BPA taking action.
7. Curtailments sent to the wind plants will be in effect for the remainder of the hour.
8. BPA Dispatch will enter any controller total changes (changes to the wind schedules sinking in other Balancing Authorities) immediately; the schedules will not be ramped in.

## V. HISTORY

October 1, 2009: Phase II of DSO 216 was created to provide BPA Dispatch with instructions on the automated systems available to limit wind generation to their schedule or curtail e-Tags/schedules to generation output when available balancing reserves near or are depleted.

October 20, 2011: Phase II Update of DSO216 allows for triggering Limit Level 1 (90% DEC), Limit Level 2 (100% DEC), Curtailment Level 1 (90% INC) and Curtailment level 2 (100% INC) during the last ten minutes of the ramp (the first ten minutes of the hour).

March 8, 2012: Added immediate curtailment of controller totals and Dispatch options when limitation or curtailment alarms come in. Added description of automatic discard of limitation and curtailment events if reserve levels recover.

November 21, 2013: Added language to address multiple curtailments at 100% and Supplemental Service.