

Wind Power Forecasting Pilot Project

Event Analysis

March 14 – Benefit of Human Assessment

Reliable **Power**

Reliable **Markets**

Reliable **People**



Operations and Reliability

aeso

ALBERTA
ELECTRIC
SYSTEM
OPERATOR

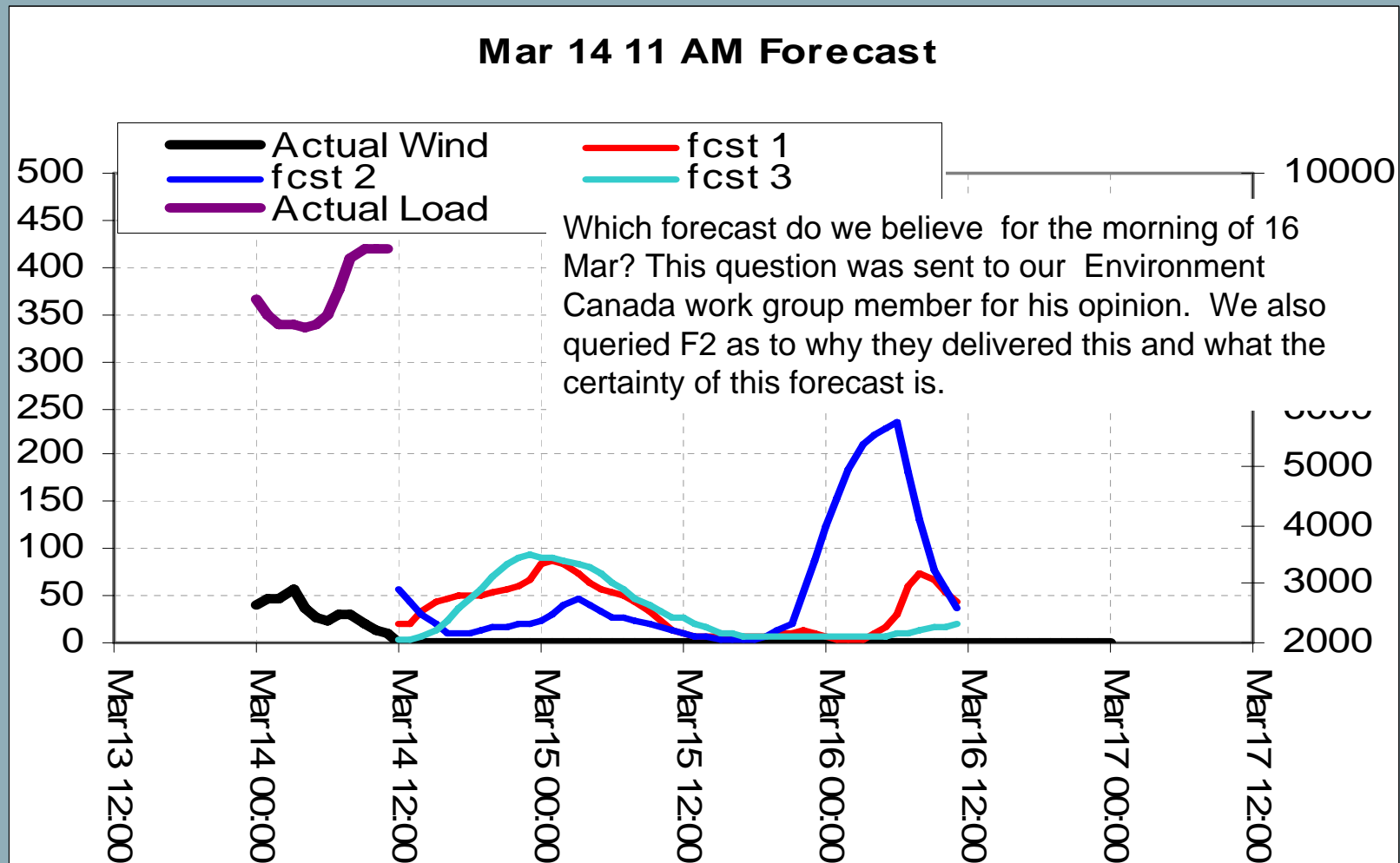


Purpose



- The purpose of this event analysis is:
 - To demonstrate the value of having a human assessment done on forecasts
 - To demonstrate the value of associating a level of certainty with a forecast

Forecasts 11am March 14



Human Assessment

Environment Canada Work Group Member

Sent to AESO 1636 MDT 14 Mar 08



- Based on what limited information I have here... I would follow Forecaster 1...
- Forecaster 2 seems to be following a different computer model. There is a small system that will cross the mountains and generate winds for a short time Very localized and short lived.... But FCST 2 seems to have overdone it and brought it in a bit early.... I like the timing of FCST 1 and the amplitude also
- Please note ... This is based on a 30 min work up from a home computer... A forecaster should have more data than what I have AND about 2 hours to look at the data before making a decision on timing.

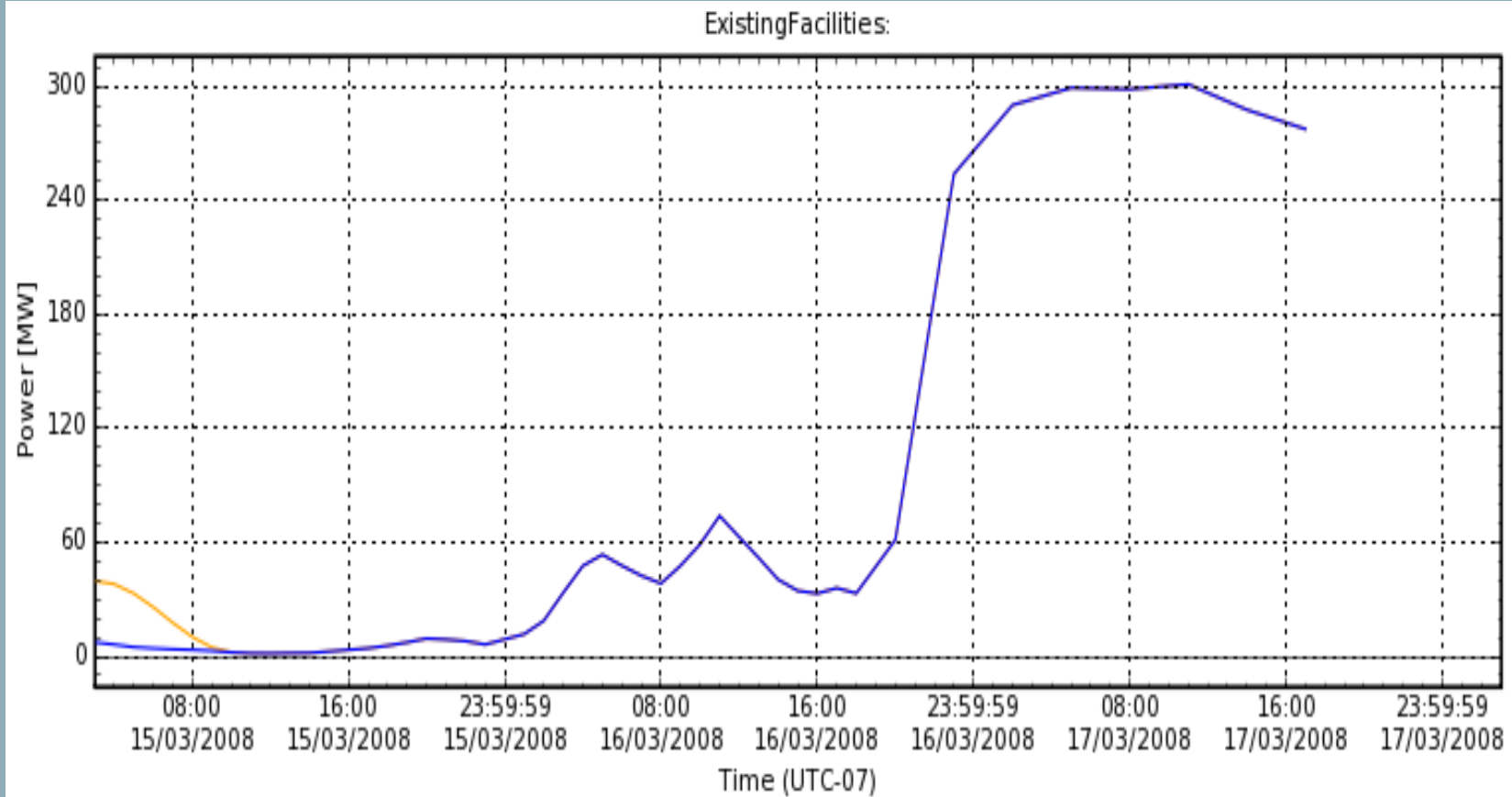
Forecaster 2 Assessment

Sent to the AESO 0536 MDT 15 Mar 08



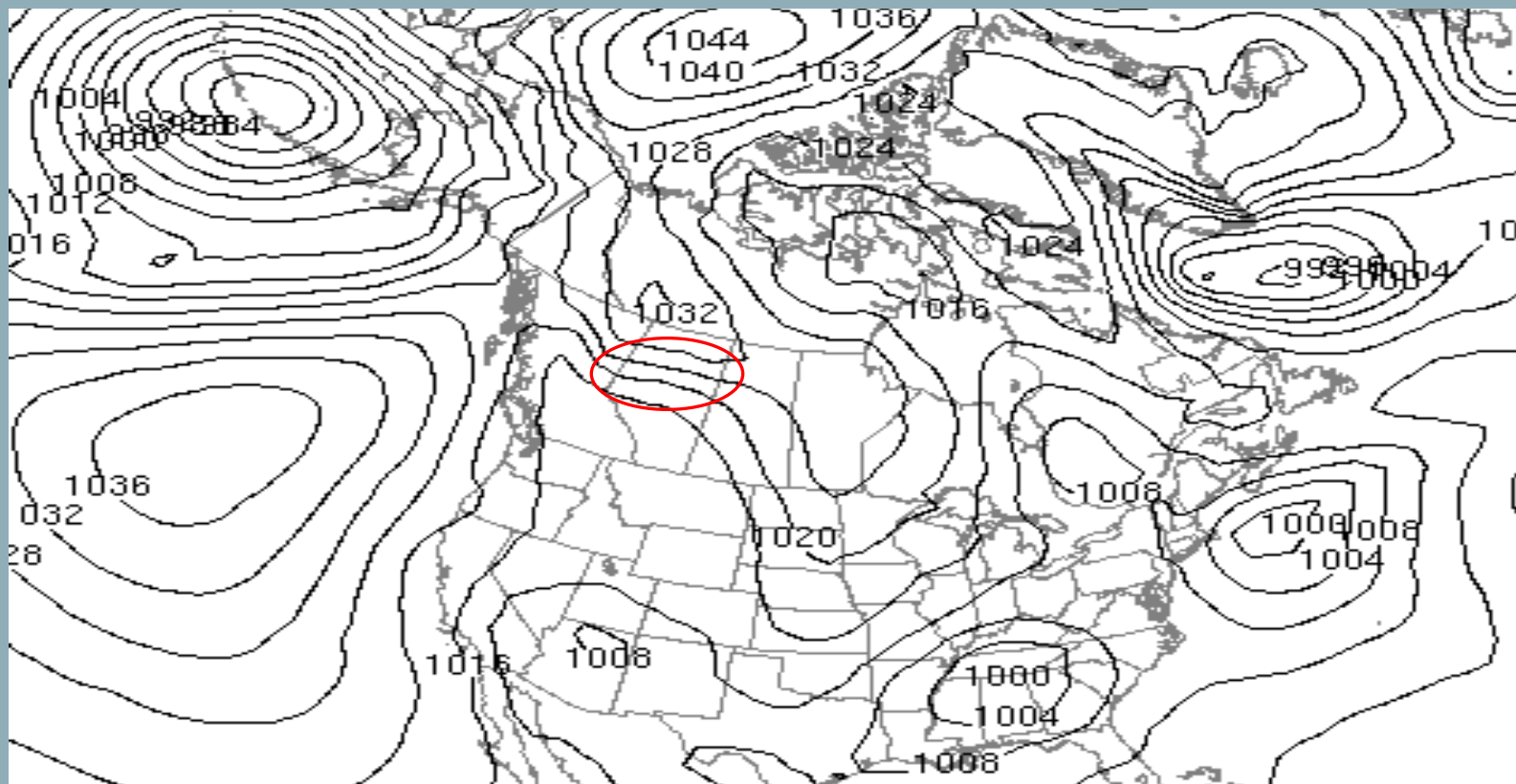
- I have attached some plots (next slides) describing the overall weather situation. The surface pressure is shown. As a rough estimation it can be said, the closer the lines, the higher the wind.
- It can be seen, that a high pressure situation in the north is “fighting” with a low pressure situation in the south part of Alberta. The whole system moves southeast. The question is: if the system only moves south, there will be wind. If the system moves more east then south, there will be no wind.
- The sites in the east will have more wind then the sites near the Rockies. The red circle shows where the wind will be.
- So the ramp is quite **uncertain**. Small changes in the strength of the low or the high changes the weather at the wind farms very much. The weather services do not agree on what will happen. What is clear is that if there is wind, it will be a short time period with high winds.
- It looks that this ramp will be smaller then predicted.
- In contrast to that the ramp up at the evening march 16th is quite sure, and could have been forecasted earlier then 48 hours in advance. The low above BC, which you can see in the surface pressure plot for March 16th, 11 am will hit Alberta for sure. Only the timing could be wrong.

Forecaster 2 New Forecast Delivered at 3am 15 Mar 08



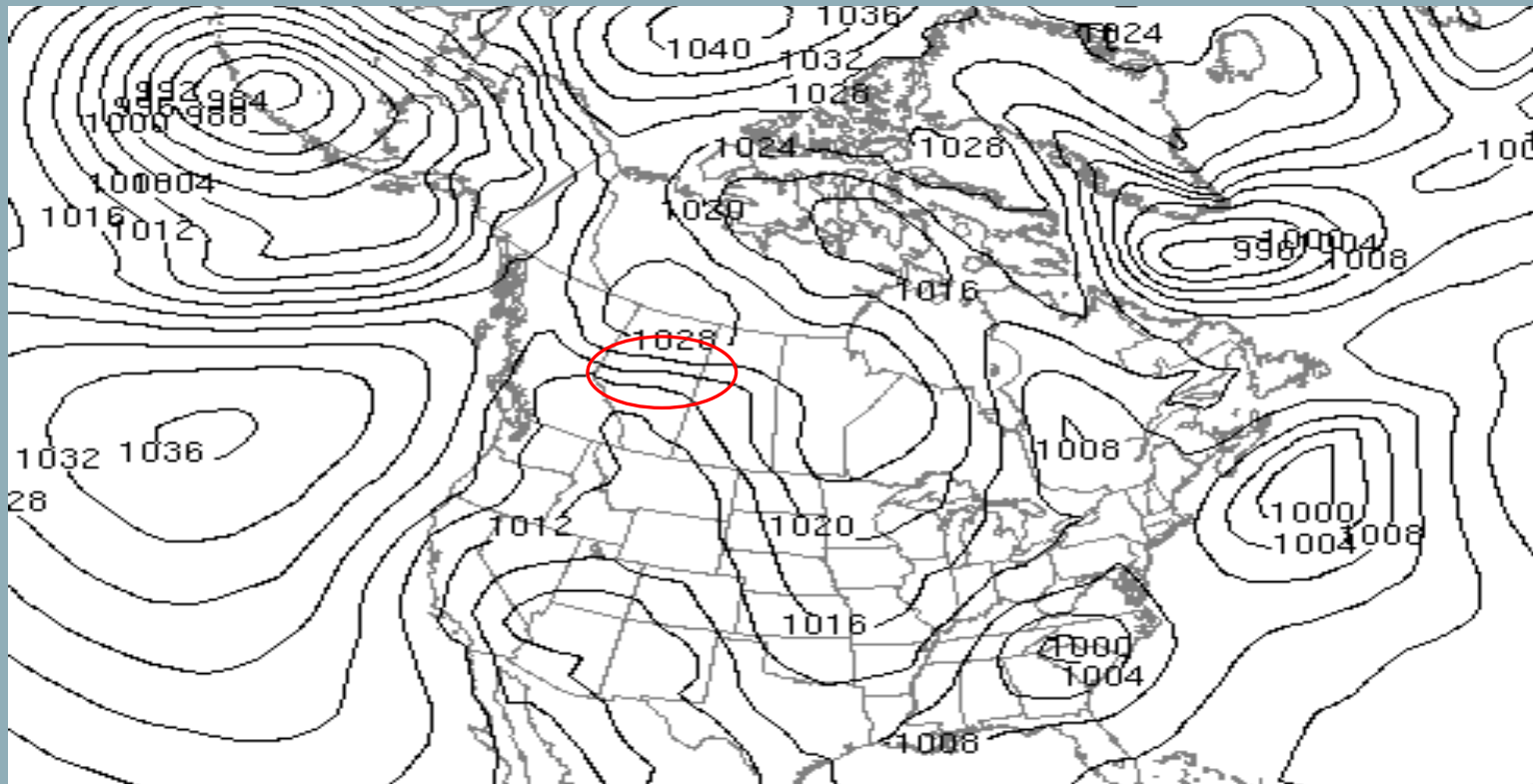
Forecaster 2 Weather Plots Forecasted at 3am 15 Mar for 11am 15 Mar

- Wind in the middle of Alberta, but not in the south, where the wind farms are located.



Forecaster 2 Weather Plots Forecasted at 3am 15 Mar for 5pm 15 Mar

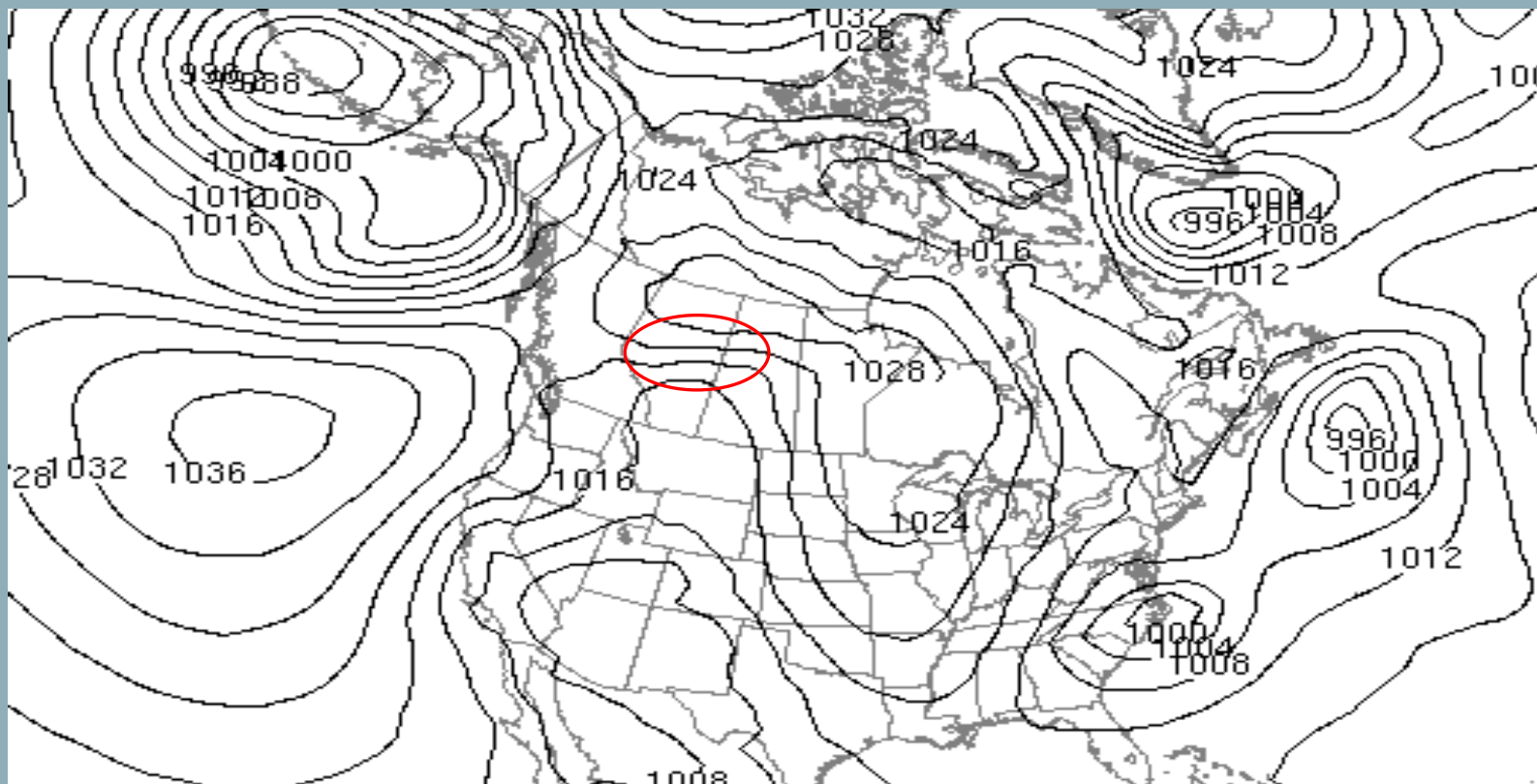
- The whole system moves slowly southeast.



Forecaster 2 Weather Plots Forecasted at 3am 15 Mar for 11pm 15 Mar

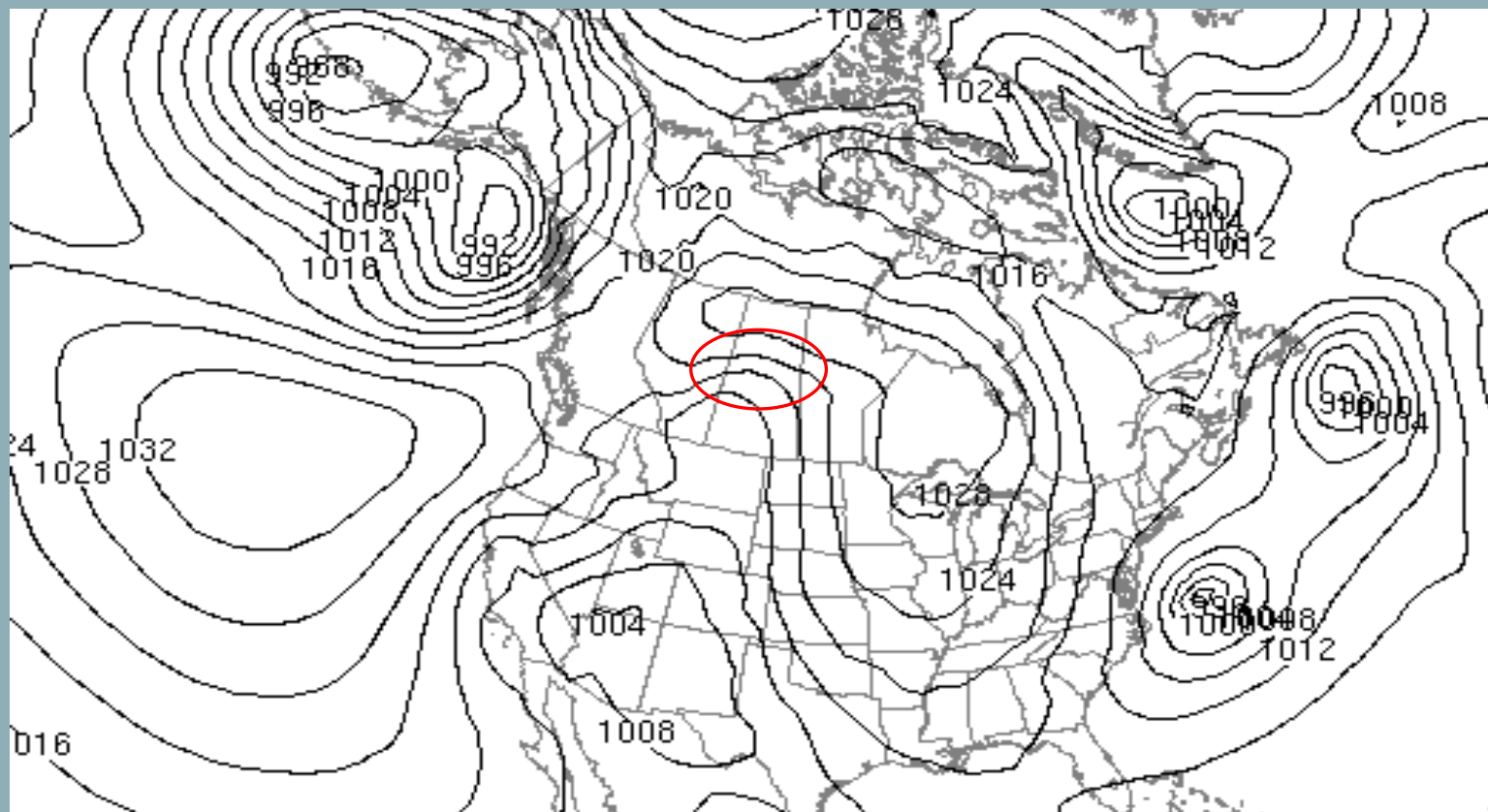


- The windy area comes quite close to the wind farms.



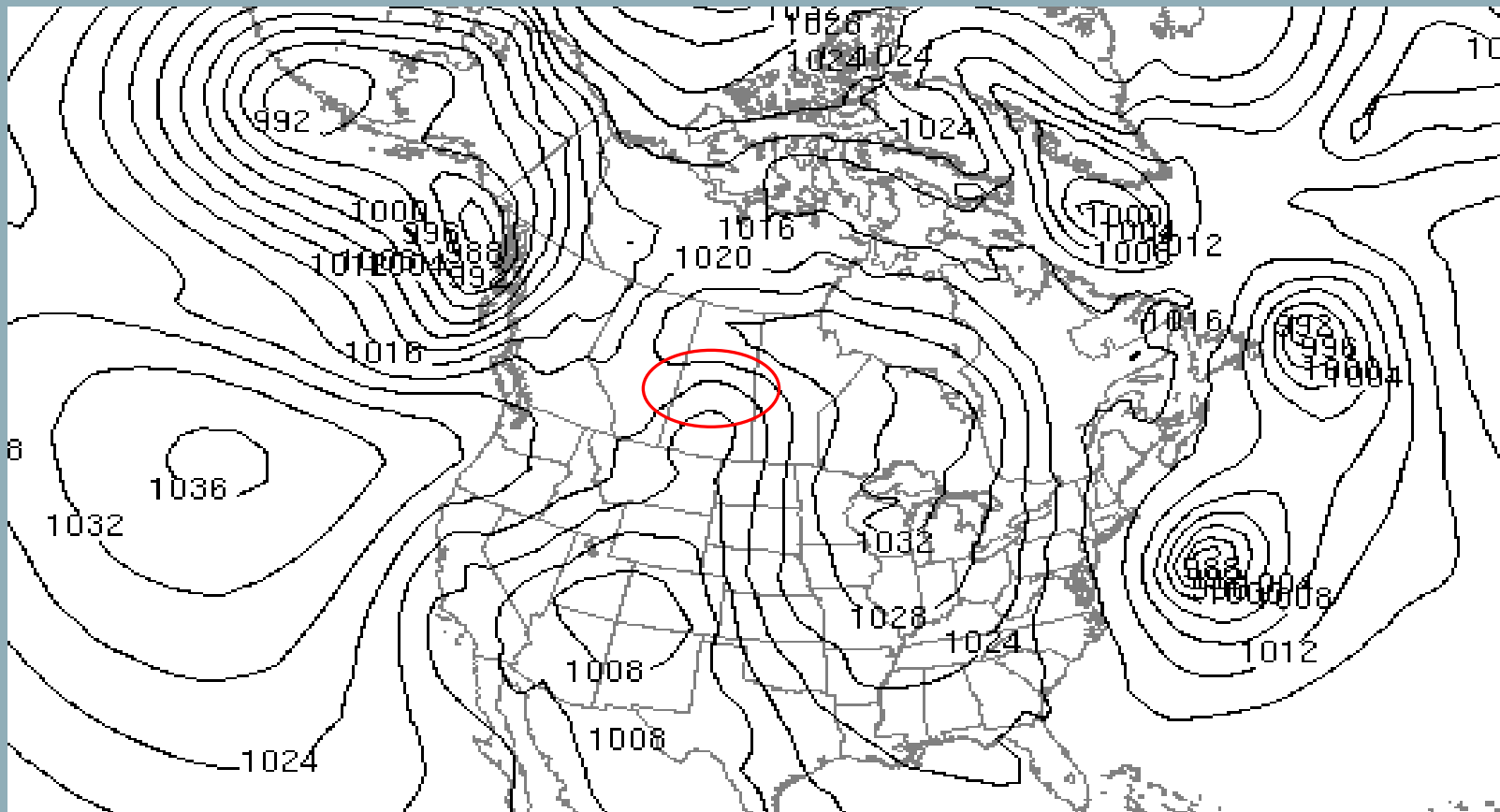
Forecaster 2 Weather Plots Forecasted at 3am 15 Mar for 6am 16 Mar

- The wind will be more at the eastern sites then at the sites near the rocky mountains.



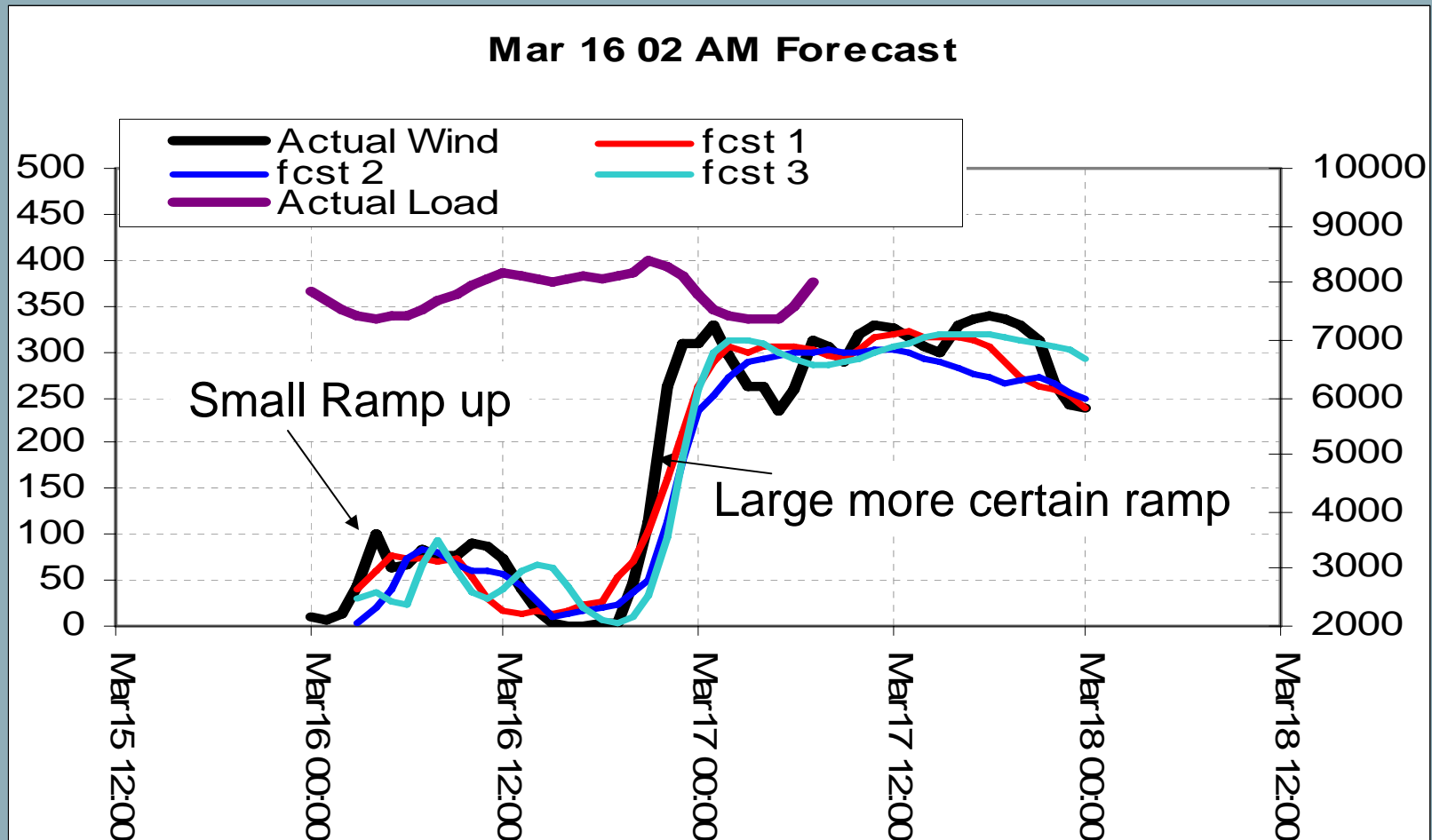
Forecaster 2 Weather Plots Forecasted at 3am 15 Mar for 11am 16 Mar

- No wind anymore.



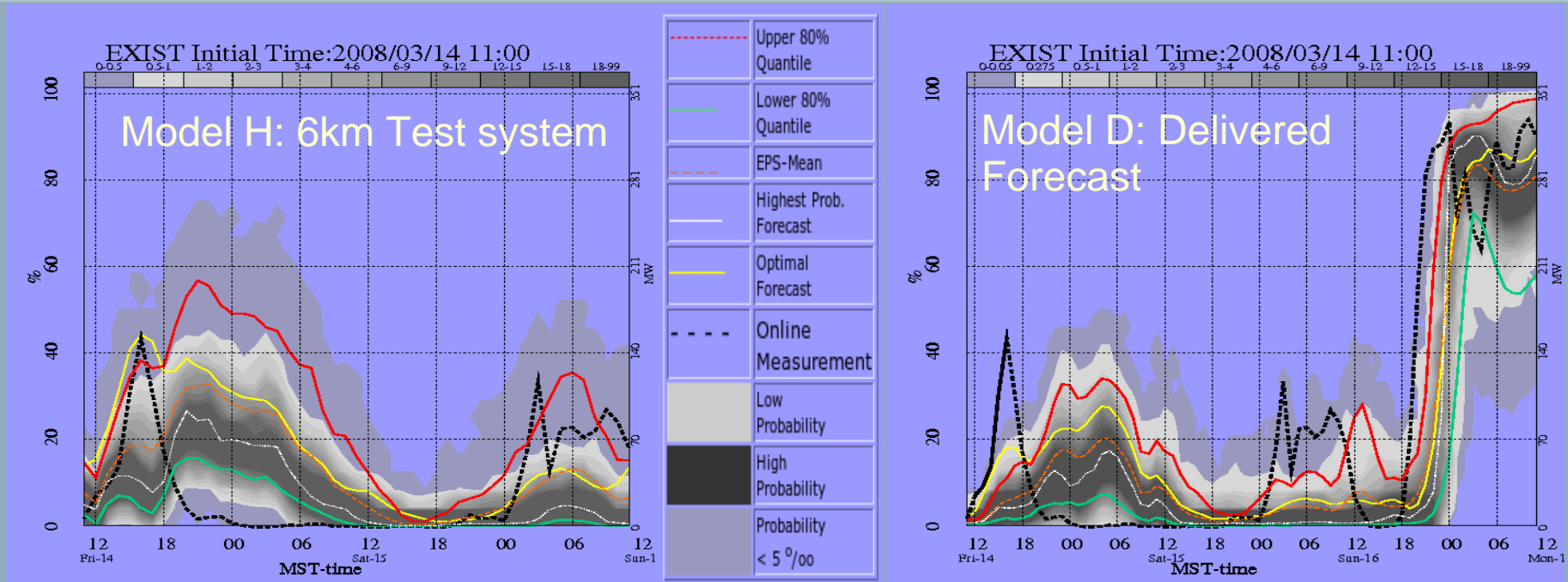
Forecasts 02AM March 16

Black trace is what actually happened 16 Mar



WEPROG Forecasts

11am March 14



- FC 1 and FC 3 were lying within the ensemble spread of our test system (not delivered), which indicates that the comments from the workgroup member are also confirmed by the ensemble forecasts.
- FC 2 could be an outlier as it is very much outside the ensemble spread of our test system and was very uncertain.
- The ramp on the evening of the 16th is also confirmed by the ensemble, but 58h prior to the event it is predicted about 3-4 hours too late

Summary



- Human Assessment from EC was correct that the ramp up and down on the morning of 16 Mar would be small, localized and short lived
- F2's certainty assessment after delivery was correct indicating that their original forecast for the morning 16 Mar was uncertain and would likely be smaller in amplitude
- F2's certainty assessment for the large ramp in the evening of 16 Mar was correct
- This event demonstrates the possible benefit in having a human assess the automated outputs before making operating or AS procurement decisions