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# **PIRP II Stakeholder Processes, Reporting, and Terms**

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**Version 1.0**

**March 26, 2007**

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## Overview

The Participating Intermittent Resource Program (PIRP) II Project provides several enhancements to the PIRP application software and its ability to serve the overall objectives of the PIRP Program. A primary objective of PIRP II is to enhance the PIRP application to provide stakeholders with timely information on their participation in PIRP. This document describes the Stakeholder business processes impacted by the PIRP application changes, describes the new reports offered in PIRP II, and defines the terms used on those reports.

## Definitions

This section lists the terms and definitions used in this document and/or the new PIRP II software enhancements.

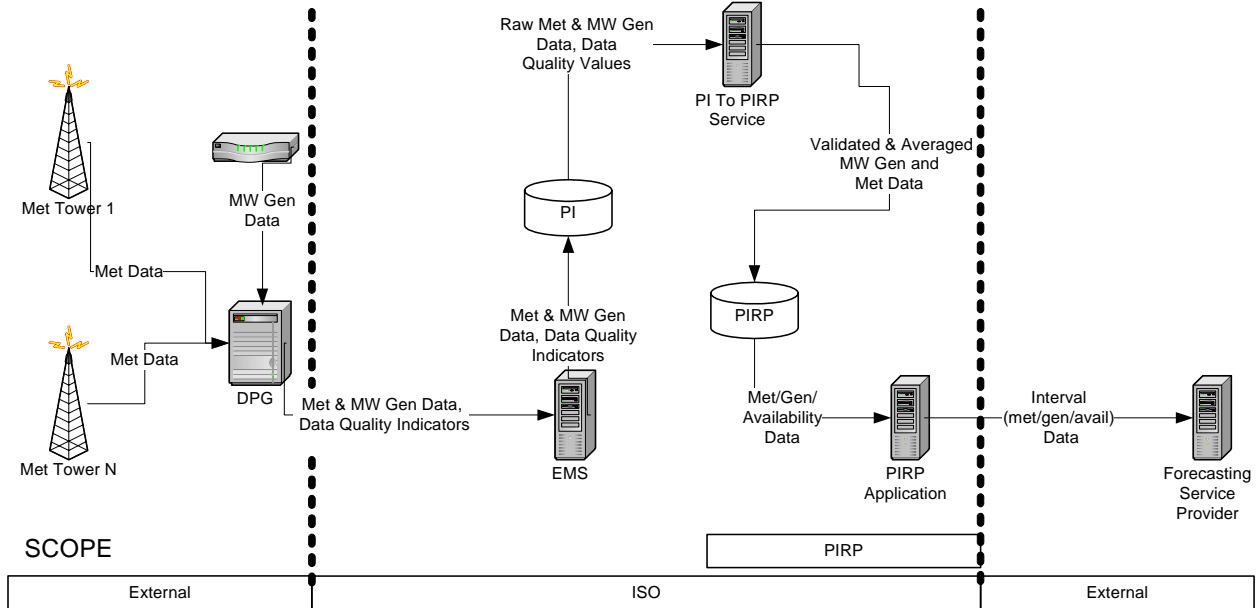
TERM	DEFINITION
Compliant	<p>A field on the Interval Data Quality Report that indicates if the Resource was Compliant for the Interval.</p> <p>A value of 'Y' indicates that the Resource, for the specified Interval, is considered meeting its <i>Continuing Obligation</i> as specified in section 2.4.4 of the Eligible Intermittent Resources Protocol (EIRP) (<a href="http://www.caiso.com/1856/18568d4233b0.pdf">http://www.caiso.com/1856/18568d4233b0.pdf</a>)</p> <p>A value of 'N' indicates that the Resource, for the specified Interval, is not meeting its <i>Continuing Obligation</i> as specified in section 2.4.4 of the EIRP.</p>
Errant Data Indicator	<p>A flag that indicates that a Resource's meteorological and/or MW generation data has not been valid for a recurring number of 10-minute Intervals. Currently, this value is set to 'Y' for a Resource when a minimum of 12 Intervals (2 hours) of Met/Gen data have failed validation.</p> <p>When this flag is set to 'Y', the PIRP application has determined that for one or more reasons, the Resource's Met/Gen data is either unavailable or is not passing one of the many data quality validations.</p> <p>When this flag is set to 'N', the Resource is providing valid Met/Gen data to the ISO per its <i>Continuing Obligation</i> as described in section 2.4.4 of the EIRP.</p>

## Meteorological and MW Generation Data Validation Process

Many of the changes implemented in PIRP II are related in some form to the process of capturing or reporting on the meteorological (Met) and MW generation (Gen) data of Participants. This section of the

document describes the process of capturing the Met/Gen data from the Participants, validating it, and storing it for retrieval by the Forecasting Service Provider (FSP).

The following diagram shows the basic flow of Met/Gen data from the Participating Intermittent Resource (PIR) to the ISO and on to the FSP. A PIR is required to have at least one Meteorological Tower.



Data starts at the PIR (Wind Farm) with each Met Tower reporting Wind Speed, Wind Direction, Air Temperature and Barometric Pressure to the DPG. Additionally, the megawatts being generated by the Wind Farm is reported to the DPG.

The DPG is polled by the California ISO's EMS system every 4 seconds for the above data points. Those values are then passed on to the ISO's PI system, where the data points are stored along with their data quality. Data quality can be listed as Normal (good), or in an error state (ie: Telemetry Error, Alarm, etc.).

Every ten minutes, a PI to PIRP Service is run to collect the Meteorological and MW Generation Data from PI for each Participating Intermittent Resource for the most recently completed 10-minute interval (ie: at 10:40:00 it will query for the interval 10:30:00 – 10:39:59). This service provides two functions:

- 1) Provide data quality validation and data range validation.
- 2) Convert the individual data points into a ten-minute average.

### Data Quality Validation:

Each data value stored in PI has an associated Data Quality Tag as mentioned above. The PI to PIRP Service checks the percentage of Data Quality Tag values for each data point (ie: Air Temp) and checks if it exceeds the configured error threshold for that data point. The current thresholds are

- MW Generation 0%
- Air Temp 20%
- Barometric Pressure 10%
- Wind Speed 5%
- Wind Direction 5%

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LSUPDT: 03/26/2007

For example, if Met Tower 1 for Resource ACME WIND had 85% of its values flagged as 'NORMAL', and 15% flagged as 'Telemetry Error' for the Interval, it would still be considered good data as the threshold for Air Temperature is 20%.

New to PIRP II is a flatline data validation. The PIRP application will now validate that each data point has not reached a flatline condition where the data point value is not varying to the extent the data point would reasonably be expected to vary over time. Flatline conditions are more difficult to detect because the telemetry shows the data point as "Normal" data quality, when in fact, the data point may be flatlined. Data marked as flatlined are considered invalid data.

### Data Range Validation

In addition to the data quality checks, the Interval values for the met data are checked against pre-defined ranges as follows:

- Air Temperature must be greater than or equal to -30° and less than or equal to 55° Celsius.
- Barometric Pressure must be greater than or equal to 700 and less than or equal to 1100 Hecto-Pascals.
- Wind Direction must be greater than or equal to 0 degrees and less than or equal to 360 degrees.
- Wind Speed must be greater than or equal to 0 meters per second and less than or equal to 50 meters per second.

### Valid Interval Determination

The PI to PIRP Service considers an Interval of data valid if the following conditions are met:

- 1) The MW Generation data quality error threshold is not exceeded
- 2) At least one Met Tower for the Resource has not exceeded any error thresholds or data range thresholds for any of its Met data points

### Example 1

ACME WIND has 2 Met Towers. MW Generation Data Quality for the Interval shows 1% 'Telemetry Error'. The entire Interval of data is marked invalid due to data quality. The error threshold for MW Generation is 0%.

### Example 2

ACME WIND has 2 Met Towers. MW Generation Data Quality for the Interval shows 100% good data quality. Met Tower 1 shows that the Barometric Pressure Data Quality has 25% of 'Alarm' readings. 25% exceeds the error threshold for Barometric Pressure, so Met Tower 1 is considered invalid data. Met Tower 2 shows that 100% of the data for all Met data points is good. Because Met Tower 2 passed validation, and because MW Generation passed validation, this Interval is considered valid.

### Example 3

XYZ WIND has 1 Met Tower. MW Generation Data Quality for the Interval shows 100% good data. Met Tower 1 has a data quality of 100% good data for all Met data. However, the Wind Speed for the Interval reads 150 meters per second. Because this value is beyond the defined valid range of 0 to 50 meters per second, the Met Tower is flagged as invalid. Because XYZ WIND only has one Met Tower, the entire Interval is considered invalid, and no data will be passed to the FSP for this interval.

## Stakeholder Business Processes and Reporting

The forecast retrieval process followed by Scheduling Coordinators (SC) for PIRP Participants changes with the release of PIRP II. No longer will the FSP send emails notifying the SC of errant data conditions for a Participant. Instead, the PIRP Application will provide the SC with errant data status upon the retrieval of the Locked Hour Ahead Forecast. Additionally, the PIRP Application will provide new reporting features that will allow the SC to investigate the errant data conditions.

### As-Is Process: Locked Hour Ahead Forecast Retrieval

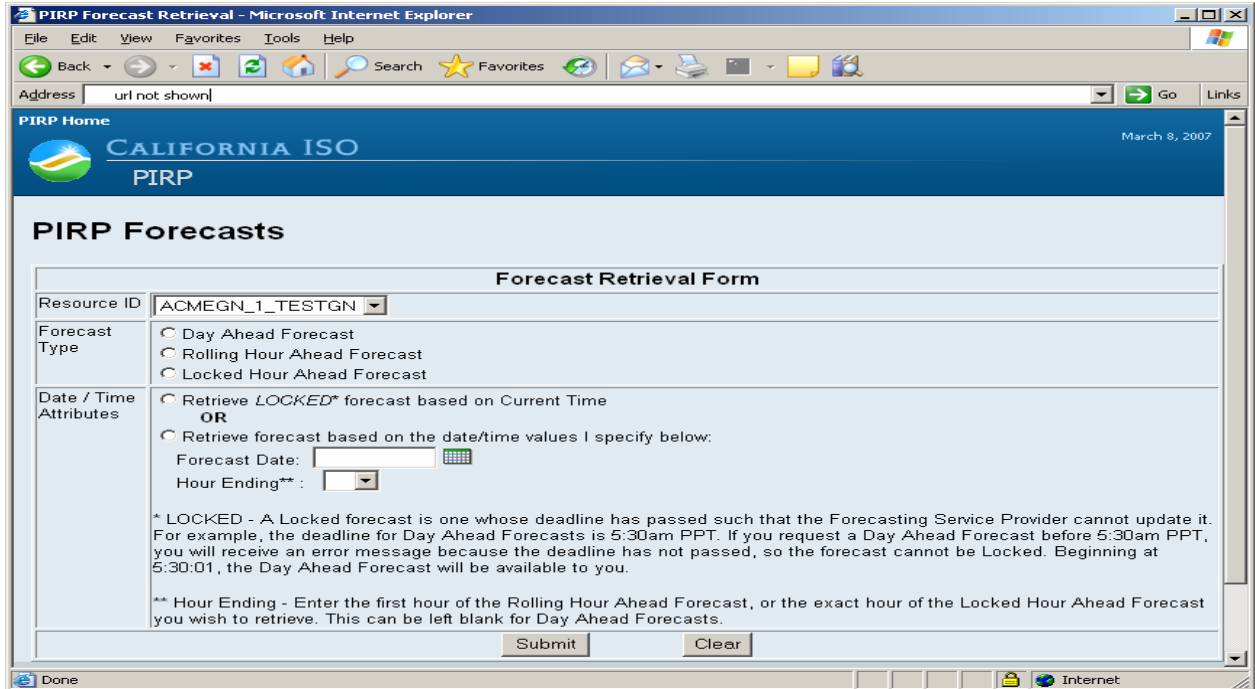
Prior to PIRP II, the SC would retrieve the Locked Hour Ahead Forecast beginning at 15 minutes after the hour, perform any marketing (if applicable), and then schedule the Locked HA Forecast value into the SI System.

The retrieval of the Locked Hour Ahead Forecast is achieved via the Web Page (see Figure 1 below) or via a webservice client, depending on the SC's method of choice.

### To-Be Process: (Enhanced) Locked Hour Ahead Forecast Retrieval

With PIRP II, the Locked Hour Ahead Forecast returns a new field titled *Errant Data*. The SC will retrieve the Locked Hour Ahead Forecast in the same fashion as before. In addition to the forecast information, the SC will now have the opportunity to review the value of the Errant Data indicator (see Figure 2 below). If the Errant Data indicator has a value of 'Y', the SC can utilize the Interval Data Quality Report (see Figure 3) to review the cause(s) of the Errant Data condition. Using the detailed information provided in that report, the SC can communicate with the Participant, the ISO, or both parties depending on the description of the data issues displayed on the Interval Data Quality Report. This contact should occur after the SC has completed any scheduling obligation it has for the hour.

Figure 1 Web Page for Forecast Retrieval



PIRP Forecast Retrieval - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites

Address | url not shown | Go Links

PIRP Home

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March 8, 2007

### PIRP Forecasts

**Forecast Retrieval Form**

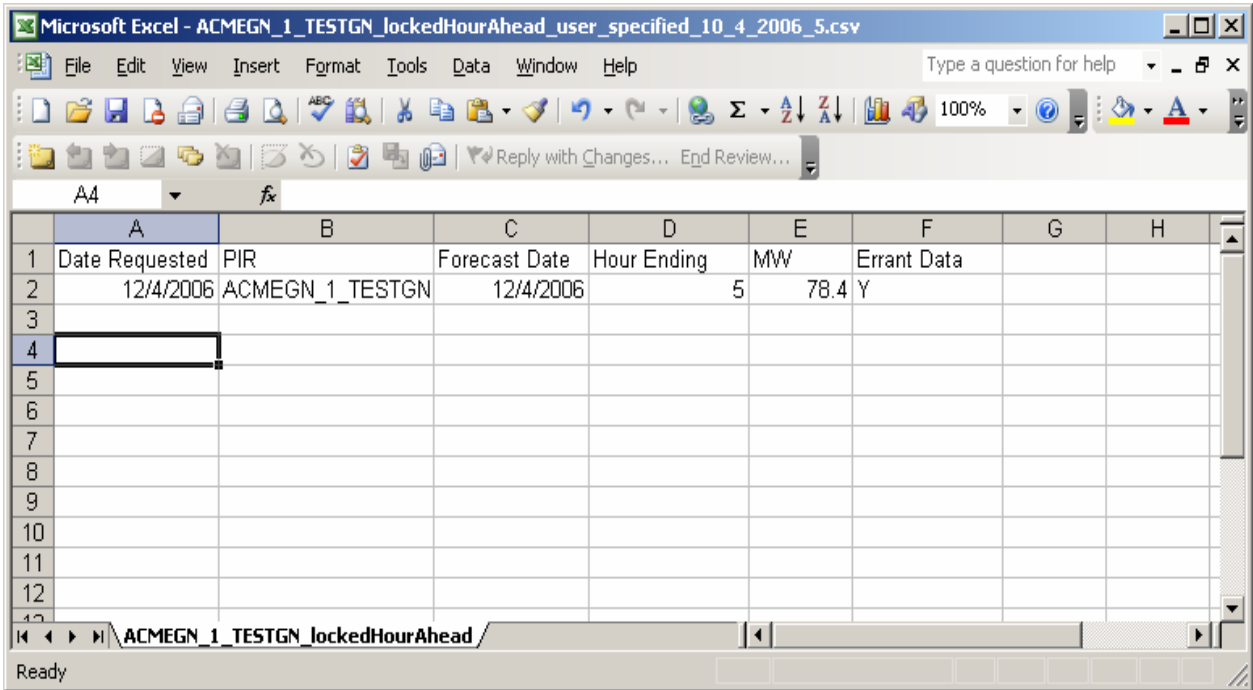
Resource ID	ACMEGN_1_TESTGN
Forecast Type	<input type="radio"/> Day Ahead Forecast <input type="radio"/> Rolling Hour Ahead Forecast <input type="radio"/> Locked Hour Ahead Forecast
Date / Time Attributes	<input type="radio"/> Retrieve <b>LOCKED*</b> forecast based on Current Time <b>OR</b> <input type="radio"/> Retrieve forecast based on the date/time values I specify below: Forecast Date: <input type="text"/> <input type="button" value="Calendar"/> Hour Ending** : <input type="text"/>

\* LOCKED - A Locked forecast is one whose deadline has passed such that the Forecasting Service Provider cannot update it. For example, the deadline for Day Ahead Forecasts is 5:30am PPT. If you request a Day Ahead Forecast before 5:30am PPT, you will receive an error message because the deadline has not passed, so the forecast cannot be Locked. Beginning at 5:30:01, the Day Ahead Forecast will be available to you.

\*\* Hour Ending - Enter the first hour of the Rolling Hour Ahead Forecast, or the exact hour of the Locked Hour Ahead Forecast you wish to retrieve. This can be left blank for Day Ahead Forecasts.

Done Internet

**Figure 2 Sample Enhanced Locked Hour Ahead Forecast with Errant Data Indicator = 'Y'**

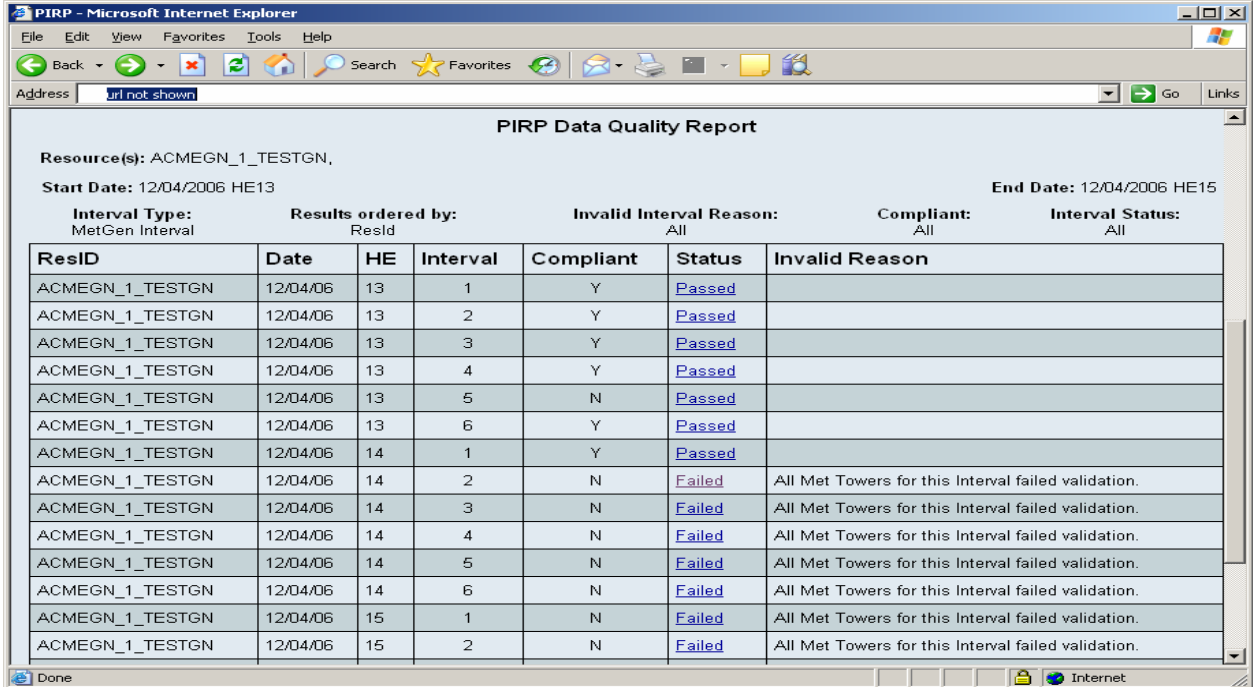


The screenshot shows a Microsoft Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H
1	Date Requested	PIR	Forecast Date	Hour Ending	MW	Errant Data		
2	12/4/2006	ACMEGN_1_TESTGN	12/4/2006	5	78.4	Y		
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								

Figure 2 shows ACMEGN\_1\_TESTGN has an Errant Data condition as of Hour Ending 5 on Dec 4, 2006. The Errant Data indicator provides notice that a data condition exists and should be investigated using the PIRP reports to get the issue corrected as soon as possible.

Figure 3 Interval Data Quality Report



**PIRP Data Quality Report**

Resource(s): ACMEGN\_1\_TESTGN,  
 Start Date: 12/04/2006 HE13  
 End Date: 12/04/2006 HE15

Interval Type: MetGen Interval  
 Results ordered by: Resid  
 Invalid Interval Reason: All  
 Compliant: All  
 Interval Status: All

ResID	Date	HE	Interval	Compliant	Status	Invalid Reason
ACMEGN_1_TESTGN	12/04/06	13	1	Y	<a href="#">Passed</a>	
ACMEGN_1_TESTGN	12/04/06	13	2	Y	<a href="#">Passed</a>	
ACMEGN_1_TESTGN	12/04/06	13	3	Y	<a href="#">Passed</a>	
ACMEGN_1_TESTGN	12/04/06	13	4	Y	<a href="#">Passed</a>	
ACMEGN_1_TESTGN	12/04/06	13	5	N	<a href="#">Passed</a>	
ACMEGN_1_TESTGN	12/04/06	13	6	Y	<a href="#">Passed</a>	
ACMEGN_1_TESTGN	12/04/06	14	1	Y	<a href="#">Passed</a>	
ACMEGN_1_TESTGN	12/04/06	14	2	N	<a href="#">Failed</a>	All Met Towers for this Interval failed validation.
ACMEGN_1_TESTGN	12/04/06	14	3	N	<a href="#">Failed</a>	All Met Towers for this Interval failed validation.
ACMEGN_1_TESTGN	12/04/06	14	4	N	<a href="#">Failed</a>	All Met Towers for this Interval failed validation.
ACMEGN_1_TESTGN	12/04/06	14	5	N	<a href="#">Failed</a>	All Met Towers for this Interval failed validation.
ACMEGN_1_TESTGN	12/04/06	14	6	N	<a href="#">Failed</a>	All Met Towers for this Interval failed validation.
ACMEGN_1_TESTGN	12/04/06	15	1	N	<a href="#">Failed</a>	All Met Towers for this Interval failed validation.
ACMEGN_1_TESTGN	12/04/06	15	2	N	<a href="#">Failed</a>	All Met Towers for this Interval failed validation.

Figure 3 shows the data quality report for ACMEGN\_1\_TESTGN. The *Compliant* field displays the Resource’s compliance with section 2.4.4 of the EIRP (see [Definitions](#)) for each Interval. The *Status* value displays if the Resource passed or failed the minimal data quality thresholds as described in the section [Valid Interval Determination](#). The *Invalid Reason* column will display the primary reason for the Interval failing validation. The User can drill down onto the details of an Interval by clicking the link on the *Status* column (see figure 4).

**Figure 4 Interval Details Report**

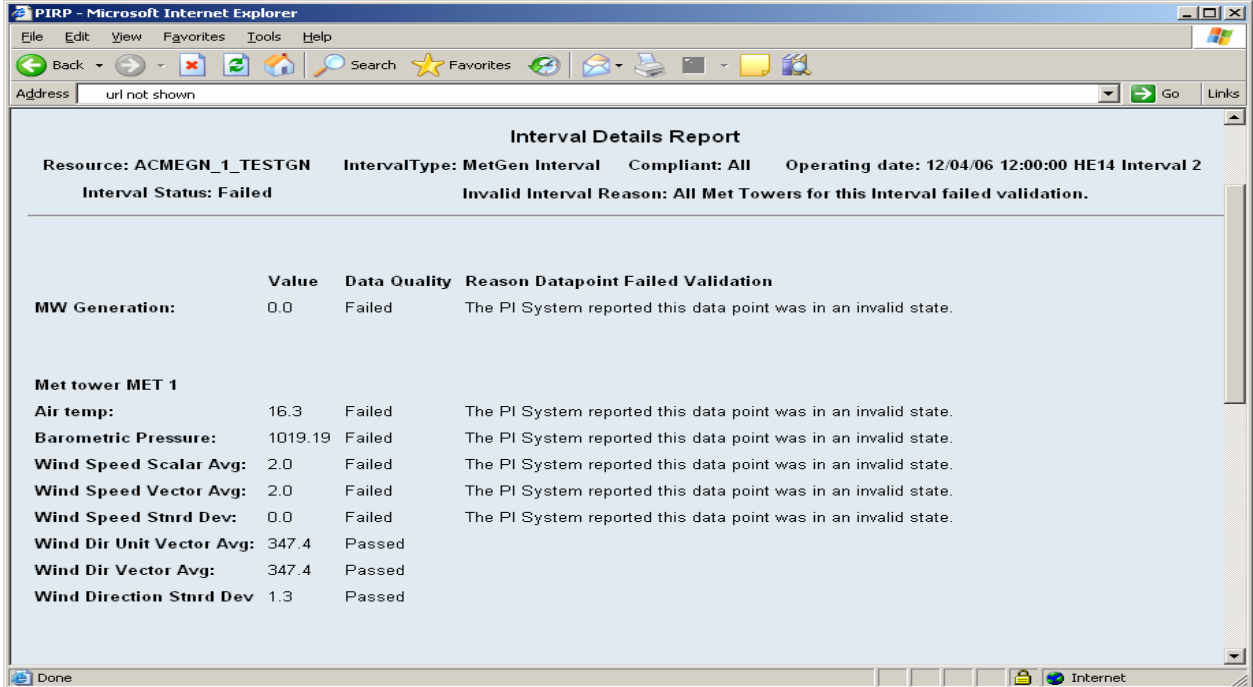


Figure 4 shows the Interval Details for ACMEGN\_1\_TESTGN on 12/04/06, Hour Ending 14, Interval 2. The MW Generation Data Point failed validation. Additionally, on Met Tower 1 (MET 1), the data points for Air Temperature, Barometric Pressure and Wind Speed all failed validation. The Reason listed for these data validation failures is that the PI system reported an invalid data quality state for the points. At this point, the User should engage both the Wind Farm and the ISO to investigate the data point issues.

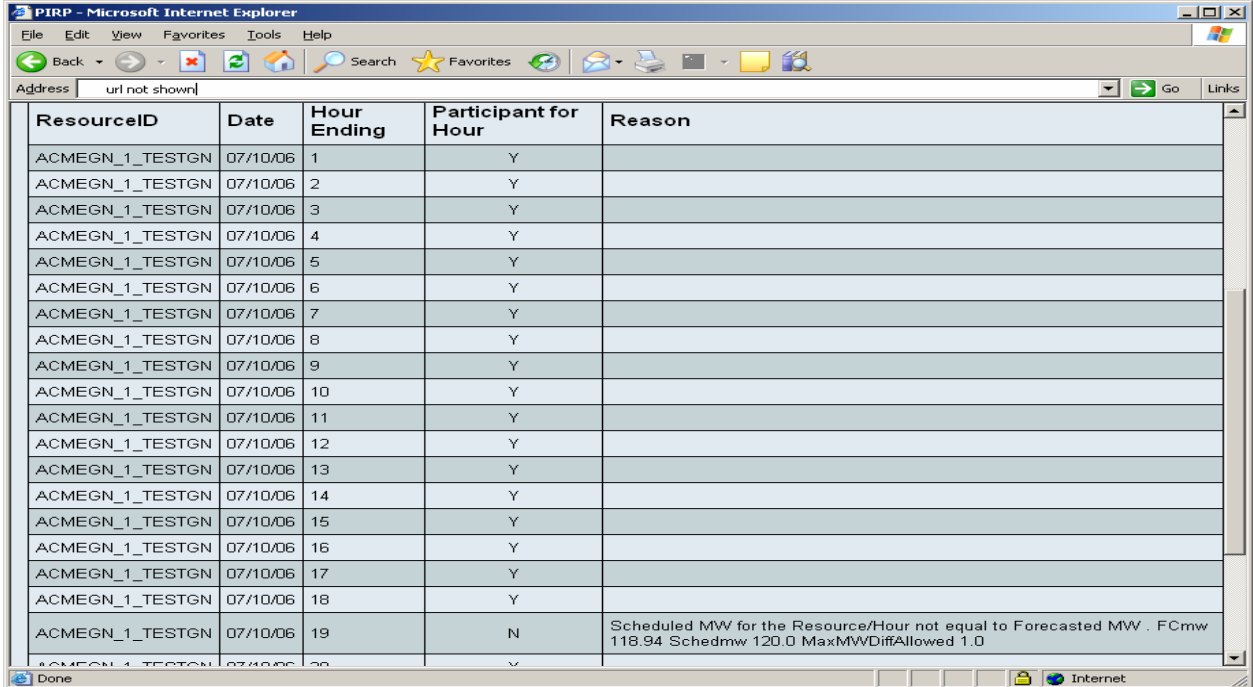
Many of the reasons a data point may fail are listed in the section [Meteorological and MW Generation Data Validation Process](#). Additional issues such as system unavailability, communications errors, and so forth may surface as the reasons behind a failed Interval.

**To-Be: Hourly Participation Status Process**

Prior to PIRP II, the SC had to wait until Settlements published PIRP Participation records fifty days after the trade date to determine if the Resource met the terms of PIRP Participation for all hours of the trade date.

In PIRP II, the SC can run the Hourly PIRP Participation Status Report (see figure 5) shortly after the trade date to review hourly participation status.

**Figure 5 Hourly PIRP Participation Status Report**



ResourceID	Date	Hour Ending	Participant for Hour	Reason
ACMEGN_1_TESTGN	07/10/06	1	Y	
ACMEGN_1_TESTGN	07/10/06	2	Y	
ACMEGN_1_TESTGN	07/10/06	3	Y	
ACMEGN_1_TESTGN	07/10/06	4	Y	
ACMEGN_1_TESTGN	07/10/06	5	Y	
ACMEGN_1_TESTGN	07/10/06	6	Y	
ACMEGN_1_TESTGN	07/10/06	7	Y	
ACMEGN_1_TESTGN	07/10/06	8	Y	
ACMEGN_1_TESTGN	07/10/06	9	Y	
ACMEGN_1_TESTGN	07/10/06	10	Y	
ACMEGN_1_TESTGN	07/10/06	11	Y	
ACMEGN_1_TESTGN	07/10/06	12	Y	
ACMEGN_1_TESTGN	07/10/06	13	Y	
ACMEGN_1_TESTGN	07/10/06	14	Y	
ACMEGN_1_TESTGN	07/10/06	15	Y	
ACMEGN_1_TESTGN	07/10/06	16	Y	
ACMEGN_1_TESTGN	07/10/06	17	Y	
ACMEGN_1_TESTGN	07/10/06	18	Y	
ACMEGN_1_TESTGN	07/10/06	19	N	Scheduled MW for the Resource/Hour not equal to Forecasted MW . FCmw 118.94 Schedmw 120.0 MaxMVDiffAllowed 1.0
ACMEGN_1_TESTGN	07/10/06	20	Y	

Figure 5 shows the hourly participation records for ACMEGN\_1\_TESTGN on July 10, 2006. The Resource met PIRP Participation obligations until Hour Ending 19, when it scheduled a MW amount that was more than 1.0 MW different from the forecasted MW amount for that hour. Thus, ACMEGN was not considered a participant for that hour.