

# Economic Measurement and verification – current process

DRS

2/27/2013

- Ensure load can be forecast on a reasonably accurate basis before participation
- If load can be forecast on a accurate basis then load reductions can be quantified
- Variable Customers = Hourly load can not be forecast on an accurate basis
  - Based on existing CBL methods.
- RRMSE test is objective way to determine accuracy of CBL to forecast load.

- **CBL Certification Process**
- The CBL Certification process will identify variable load customers. All customers must use a CBL with an error (RRMSE) no greater than 20% unless otherwise approved by PJM.
- If a customer's CBL error is greater than 20% then the customer is considered to be a variable load customer and another CBL must be used.
- If an alternate CBL with an error less than 20% (unless otherwise approved by PJM) cannot be found then the registration will be terminated by PJM.
- All new Economic DR registrations require CBL Certification.
- Registration extensions will not require CBL Certification. Note: All registrations will be terminated as part of the implementation plan and therefore need a new registration which will go through the CBL certification process. Once the registration goes through the CBL certification once, subsequent Registration extensions will not be required to go through the CBL certification process.
- **Exception**
  - CSPs shall inform PJM of any significant operational changes that affect the load which in turn require an evaluation of the existing CBL.
  - Registrations with significant operation changes require CBL Certification.
- PJM may review and request accuracy of registration CBL on a periodic basis

CBL Certification is performed prior to submitting the registration. This process eliminates current alternative CBL process and focus on getting CBL correct on registration.

1. Copy or create new Registration & save registration (New status)
2. Input Load Data
3. CSP should run RRMSE
  - a. Standard CBL with SAA must be run
  - b. CSP may run other alternative CBLs
4. CSP can select any CBL from drop down on registration if CBL has RRMSE in successful status
  - if registration has “successful” RRMSE  $\leq 20\%$  for CBL selected on registration with 30 CBL test days AND RRMSE is lower than Standard CBL THEN CSP may submit and PJM does not need to approve.
    - i. Load Data used must be contiguous where most current date of load data is  $\leq$  current date minus 60.

- b. Otherwise, CSP can initiate a “CBL Review Task” for PJM to review CBL exception. **CSP should only request an exception to the Standard CBL if the exception more accurately reflects what the load would have been absent the reduction.** The following is a list of potential exception reasons:
  - i. RRMSE >20%
  - ii. Alternative CBL RRMSE > Default CBL RRMSE
  - iii. Insufficient load data (not able to get 30 CBL Test Days)
  - iv. Outdated load data (most current load data is older than 60 days from current date)
  - v. Use of Manual CBL.
- c. Once CSP submits CBL Review Task or submits registration the CSP cannot change the CBL on the registration.
- d. PJM CBL Review Task will use same logic and timeline today embedded in alternative CBL process (including settlement hold process).
- e. Registration goes through normal Registration approval process

Meter data must first be submitted in order to run the CBL test.

1. Need Registration ID and EDC Account Number(s) to submit hourly meter data.
  - Registration ID from Saved and not Submitted Registrations.
2. The meter data can be uploaded from the registration screen or from the Meter Data Management screen.
  - a) Only meter data for the registration location(s) can be uploaded from the registration screen.
  - b) Meter data for either a single registration location(s) or all registration locations can be uploaded from the Meter Data Management screen.
    - Bulk Upload



# CBL Certification Process – Submit Meter Data

- Submit enough hourly load data in order to calculate RRMSE for at least 30 days
- Load Data used must be contiguous where most current date of load data is <= current date minus 60.
- 24 hours of meter data must be submitted for each day
- Templates for uploading Meter data is posted on the PJM website under:  
**markets & operations> eTools > eLRS > eLRS Meter Data Management (non web services)**
  1. Meter Data Example EconEnergy
  2. Meter Data Example EconEnergy Aggregate

## Example of file format for EconEnergy Aggregate

Registration	Account	Date	Type	UOM	HE1	HE2	HE3	HE4	HE5	HE6	HE7	HE8	HE9	HE10	HE11	HE12	HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21	HE22	HE23	HE24	
R2141	000110	2/10/2012	HourlyLoad	KW	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90	90
R2141	000111	2/10/2012	HourlyLoad	KW	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
R2141	000112	2/10/2012	HourlyLoad	KW	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110	110
R2141	000110	2/9/2012	HourlyLoad	KW	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000

- Status is Successful when the calculation finishes without errors.
- RRMSE Score and # of days has been calculated.

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**Registration Details (2046)** Registrations

**Action** ▾

<b>Name</b>	Test Registration	<b>Program</b>	Economic
<b>Registration Id</b>	R2046	<b>CSP</b>	ECI
<b>Effective Date</b>	02/04/2012	<b>Status</b>	New
<b>Termination Date</b>	02/01/2013	<b>Hold Status</b>	<input type="checkbox"/> Scheduling <input type="checkbox"/> Settlements

Locations | Energy | **CBL Test** | Comments | Process History | RERRA Evidence | Data History



Window Start Date	Window End Date	Start Hour	End Hour	CBL Method	Date Run	RRMSE Score (%)	# of days	Status	Summary	Submitted By
Dec 4, 2011	Feb 1, 2012	14	19	Standard (3 Day Types)	Feb 2, 2012	16.63	40	Successful		rmick



- Report types that were previously selected can be viewed by clicking on Report button
- Reports are only generated for Successful CBL Tests

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**Registration Details (2021)** **Registrations**  

**Program** Economic

**CSP** ECI

**Status** Pending

**Hold Status**  Scheduling  Settlements

vidence | **Data History**

Registration Type	Date	Value 1	Value 2	Status	Error	Manager	Action
Standard (3 Day Types) with SAA	Feb 9, 2012			Unsuccessful	Error:null	manager	
Standard (3 Day Types) with SAA	Feb 9, 2012	12.7	40	Successful		manager	<a href="#">Report</a>
Standard (3 Day Types) with SAA	Feb 9, 2012			Unsuccessful	Error:null	manager	
Standard (3 Day Types)	Feb 9, 2012	16.63	40	Pending		manager	
Alternative  5 Day Types with SAA	Feb 9, 2012			Unsuccessful	Error:null	manager	
Alternative  5 Day Types	Feb 9, 2012			Unsuccessful	Error:null	manager	
Standard (3 Day Types) with SAA	Feb 9, 2012	13.11	49	Successful		manager	<a href="#">Report</a>



# CBL Certification Process – CBL Detailed Report

## CBL Detailed Report

User will be able to select 1 day at a time and view a CBL detailed report (same type of report that is available today for settlements).

### Summary Tab of CBL Report

Calculated Baseline Report						
<b>RegReference</b>	TestRRMSE23					
<b>Registration</b>	R6648					
<b>Method</b>	Standard3-SAA					
<b>Results</b>	Baseline and reduction calculated successfully					
<b>Updated</b>	4/16/2012 2:52					
<b>Event</b>						
<b>Date</b>	<b>Start HE</b>	<b>End HE</b>	<b>HE1</b>	<b>HE2</b>	<b>HE3</b>	
3/16/2012	14	19	N	N	N	
<b>Days Evaluated</b>						
<b>Date</b>	<b>Rejection</b>	<b>Note</b>	<b>Type</b>	<b>HE1</b>	<b>HE2</b>	<b>HE3</b>
3/16/2012	Event Day		Fri	135.75	137.85	138.6
3/15/2012	High/Low [		Thu			
3/14/2012	Included		Wed	119.04	120.66	133.68
3/13/2012	Included		Tue	129.66	129.99	138.6
3/12/2012	Included		Mon	151.29	165.06	168.24
3/11/2012	Wrong Day	DST Day	Sun			
3/10/2012	Wrong Day		Sat			
3/9/2012	Included		Fri	147.03	148.89	161.52
<b>Results</b>						
<b>Date</b>	<b>Name</b>		<b>HE1</b>	<b>HE2</b>	<b>HE3</b>	
3/16/2012	RawBaseline		136.755	141.15	150.51	
3/16/2012	Adjustments		0	0	0	
3/16/2012	Baseline		136.755	141.15	150.51	
3/16/2012	Measurement		135.75	137.85	138.6	
3/16/2012	Reduction		0	0	0	

HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21
N	Y	Y	Y	Y	Y	Y	N	N
HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21
540.57	450.84	423.63	281.52	213.21	166.83	148.62	138.42	132.96
515.43	469.35	441.03	315.15	246.78	196.68	179.76	151.86	142.02
533.7	485.46	466.17	319.59	258.03	226.83	201.9	156.15	141.81
515.73	462.93	447.21	341.13	267.75	222.24	204.06	167.01	158.13
539.13	487.98	444.57	329.52	273.75	253.56	236.34	181.41	168.78
HE13	HE14	HE15	HE16	HE17	HE18	HE19	HE20	HE21
525.9975	476.43	449.745	326.3475	261.5775	224.8275	205.515	164.1075	152.685
0	25.92993	25.92993	25.92993	25.92993	25.92993	25.92993		
525.9975	502.3599	475.6749	352.2774	287.5074	250.7574	231.4449	164.1075	152.685
540.57	450.84	423.63	281.52	213.21	166.83	148.62	138.42	132.96
0	51.51993	52.04492	70.75745	74.29744	83.92743	82.82492	0	0



# CBL Certification Process - RRMSE Report

## RRMSE Report

RegID	Customer	Date	HOUR Ending	Type	Baseline Hourly Loads (kW)	Actual Hourly Loads (kW)	Error	Square Error
1123	Jones Hospital	5/1/11	14	Sun	508	492	16	256
1123	Jones Hospital	5/1/11	15	Sun	520	494	26	676
1123	Jones Hospital	5/1/11	16	Sun	517	500	17	289
1123	Jones Hospital	5/1/11	17	Sun	506	502	4	16
1123	Jones Hospital	5/1/11	18	Sun	488	502	-14	196
1123	Jones Hospital	5/1/11	19	Sun	461	481	-20	400
1123	Jones Hospital	4/30/11	14	Sat	83	64	19	361
1123	Jones Hospital	4/30/11	15	Sat	82	59	23	529
1123	Jones Hospital	4/30/11	16	Sat	72	38	34	1156
1123	Jones Hospital	4/30/11	17	Sat	53	47	6	36
1123	Jones Hospital	4/30/11	18	Sat	47	5	42	1764
1123	Jones Hospital	4/30/11	19	Sat	35	5	30	900
1123	Jones Hospital	4/29/11	14	Fri	349	326	23	529

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1123	Jones Hospital	4/22/11	14	Fri	6397	7165	-768	589824
1123	Jones Hospital	4/22/11	15	Fri	6377	7098	-721	519841
1123	Jones Hospital	4/22/11	16	Fri	6322	7047	-725	525625
1123	Jones Hospital	4/22/11	17	Fri	6308	6918	-610	372100
1123	Jones Hospital	4/22/11	18	Fri	6411	6799	-388	150544
1123	Jones Hospital	4/22/11	19	Fri	6343	6820	-477	227529
							Average Pct Error	-2%
							RRMSE	16.36%

CSP can initiate a “CBL Review Task” for PJM to review CBL exception for one of the following reasons and then be able to submit the registration for approval:

- i.  $RRMSE > 20\%$
- ii. Alternative CBL  $RRMSE > \text{Default CBL } RRMSE$
- iii. Insufficient load data (not able to get 30 CBL Test Days)
- iv. Outdated load data (most current load data is older than 60 days from current date)
- v. Use of Manual CBL.

If CBL Exception is approved by PJM then the CSP may submit the registration.

Parameter/CBLs	3 DayTypes		3 Day Types with SAA (Tariff Default)		3 Day Types with WSA	
	Weekdays	Sat, Sun/Hol	Weekdays	Sat, Sun/Hol	Weekdays	Sat, Sun/Hol
DayType	Weekdays	Sat, Sun/Hol	Weekdays	Sat, Sun/Hol	Weekdays	Sat, Sun/Hol
Calculation <sup>1</sup>	Average	Average	Average	Average	Average	Average
CBL Basis Window <sup>2</sup>	5	3	5	3	5	3
CBL Basis Window Limit <sup>3</sup>	45	45	45	45	45	45
Start Selection From Days Prior to Event <sup>4</sup>	1	1	1	1	1	1
Exclude Previous Curtailment Days <sup>5</sup>	Y	Y	Y	Y	Y	Y
Exclude Long/Short DST Days <sup>6</sup>	N/A	Y	N/A	Y	N/A	Y
Exclude Avg. Event Period Usage Less than Threshold <sup>7</sup>	25%	25%	25%	25%	25%	25%
Exclude # of Low Usage Days <sup>8</sup>	1	1	1	1	1	1
Use Previous Curtailment if CBL Basis Window incomplete <sup>9</sup>	Yes	Yes	Yes	Yes	Yes	Yes
Use Highest or Recent Previous Curtailment Day <sup>10</sup>	Highest	Highest	Highest	Highest	Highest	Highest
Adjustments <sup>11</sup>	None	None	Symmetric Additive	Symmetric Additive	Weather Sensitive	Weather Sensitive
Allow Negative Adjustments <sup>12</sup>	N/A	N/A	Yes	Yes	Yes	Yes
Adjustments Start (HE0-x) <sup>13</sup>	N/A	N/A	4	4	0	0
Adjustment Basis Hours <sup>14</sup>	N/A	N/A	3	3	Event Hours	Event Hours

Parameter/CBLs	7 DayTypes	7 Day Types with SAA	MBL(Max Base Load) <sup>A</sup>		Metered Generation <sup>B</sup>
	Mon,Tue,Wed, Thu,Fri,Sat, Sun/Hol	Mon,Tue,Wed, Thu,Fri,Sat, Sun/Hol	Weekdays	Sat,Sun/Hol	
DayType					N/A
Calculation <sup>1</sup>	Average	Average	Average	Average	N/A
CBL Basis Window <sup>2</sup>	3	3	5	3	N/A
CBL Basis Window Limit <sup>3</sup>	60	60	45	45	N/A
Start Selection From Days Prior to Event <sup>4</sup>	1	1	1	1	N/A
Exclude Previous Curtailment Days <sup>5</sup>	Y	Y	Y	Y	N/A
Exclude Long/Short DST Days <sup>6</sup>	Y	Y	N/A	Y	N/A
Exclude Avg. Event Period Usage Less than Threshold <sup>7</sup>	25%	25%	25%	25%	N/A
Exclude # of Low Usage Days <sup>8</sup>	0	0	0	0	N/A
Use Previous Curtailment if CBL Basis Window incomplete <sup>9</sup>	Yes	Yes	Yes	Yes	N/A
Use Highest or Recent Previous Curtailment Day <sup>10</sup>	Highest	Highest	Recent	Recent	N/A
Adjustments <sup>11</sup>	None	Symmetric Additive	None	None	N/A
Allow Negative Adjustments <sup>12</sup>	N/A	Yes	N/A	N/A	N/A
Adjustments Start (HE0-x) <sup>13</sup>	N/A	4	N/A	N/A	N/A
Adjustment Basis Hours <sup>14</sup>	N/A	3	N/A	N/A	N/A

- MBL was designed as a default to accommodate variable load that cannot be forecast
  - Based on average of min hourly load on previous non-event days for event period.
  - Since load is so unpredictable this provides a dynamic FSL type approach to determine quantifiable load reductions
    - MBL comes from terminology used in NAESB M&V requirements

- **3 Before + 2 After CBL**
  - Average hourly load for 3 hours before event (skip 1 hour before start) plus 2 after (skip 1 hour after)
  - Must be available for dispatch or offer in DA market for at least 4 contiguous hours
    - Avoid any cherry picking issues
- Typically improved results for Variable load customers ~20 to 40% based on standard RRMSE