

Load Drop Reporting Guidelines - Impact on Planning in PJM

**Jeff Brown, Economic Forecasting Manager
American Electric Power Service Company
(918) 599-2166
jebrown1@aep.com**



Scope

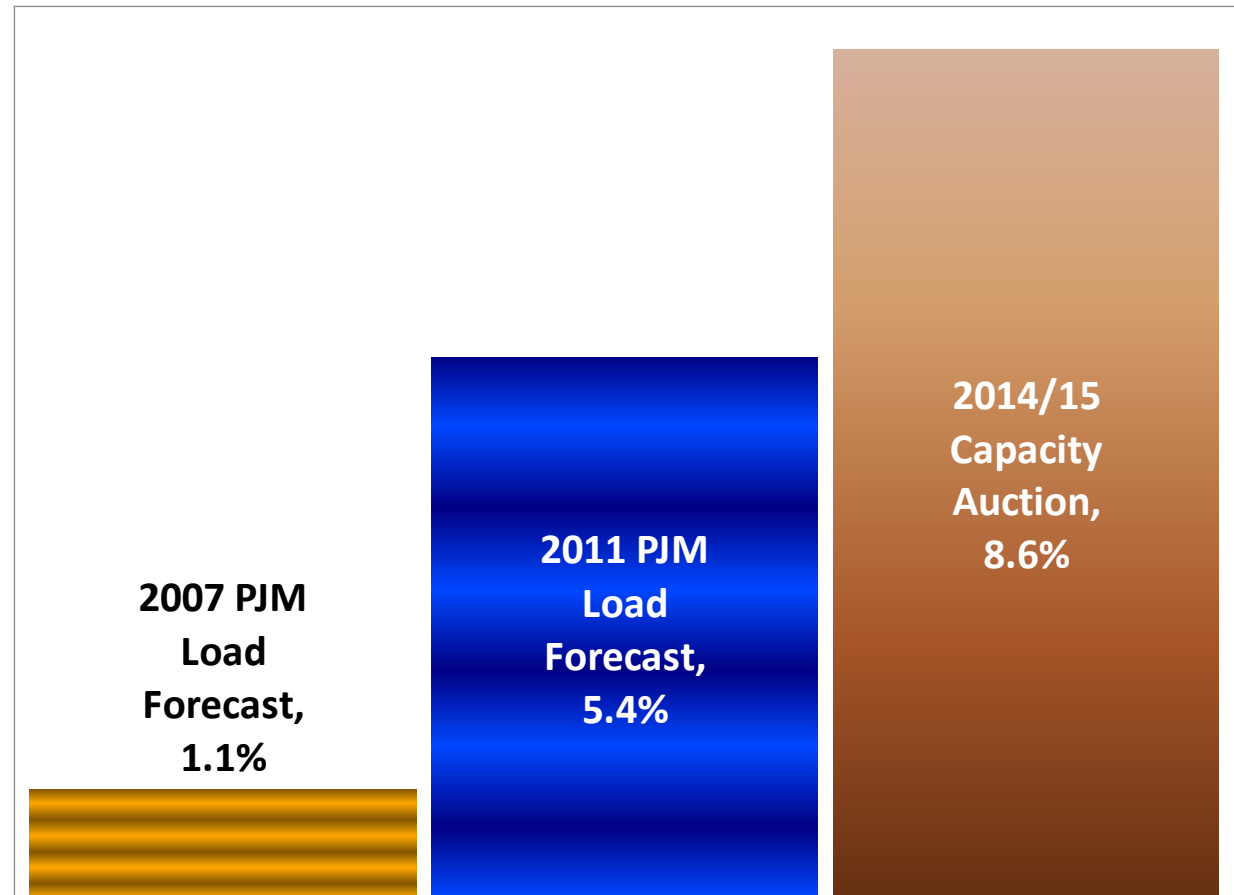
- Background...
 - Normalized and forecast peaks are the basis for determining future year generation and transmission capacity requirements for the RTO, zones and utilities.
 - Load drop estimates are used for weather normalization and forecasting as well as for utility cost of service and rate design.

- Concern...
 - PJM's weather normalized peaks and load forecast may be understated due to lack of available load management (LM) load drop event data.
 - The current rules for collecting load drop estimates (addbacks) may be usable for market settlements, but are insufficient for load forecasting.

- Therefore...
 - Rules may be needed to require the reporting of impacts from all LM programs to PJM and utilities. LM programs are those of PJM, Curtailment Service Providers, the utilities and perhaps others in the market.

Load Management as a Percentage of Forecast Peak Demand in 2014

In 4 years, PJM load management reductions in the load forecasts have increased from 1,673 MW (1.1%) to 8,979 MW (5.4%). The recent 2014/15 capacity auction cleared 14,118 MW (8.6%).



Background

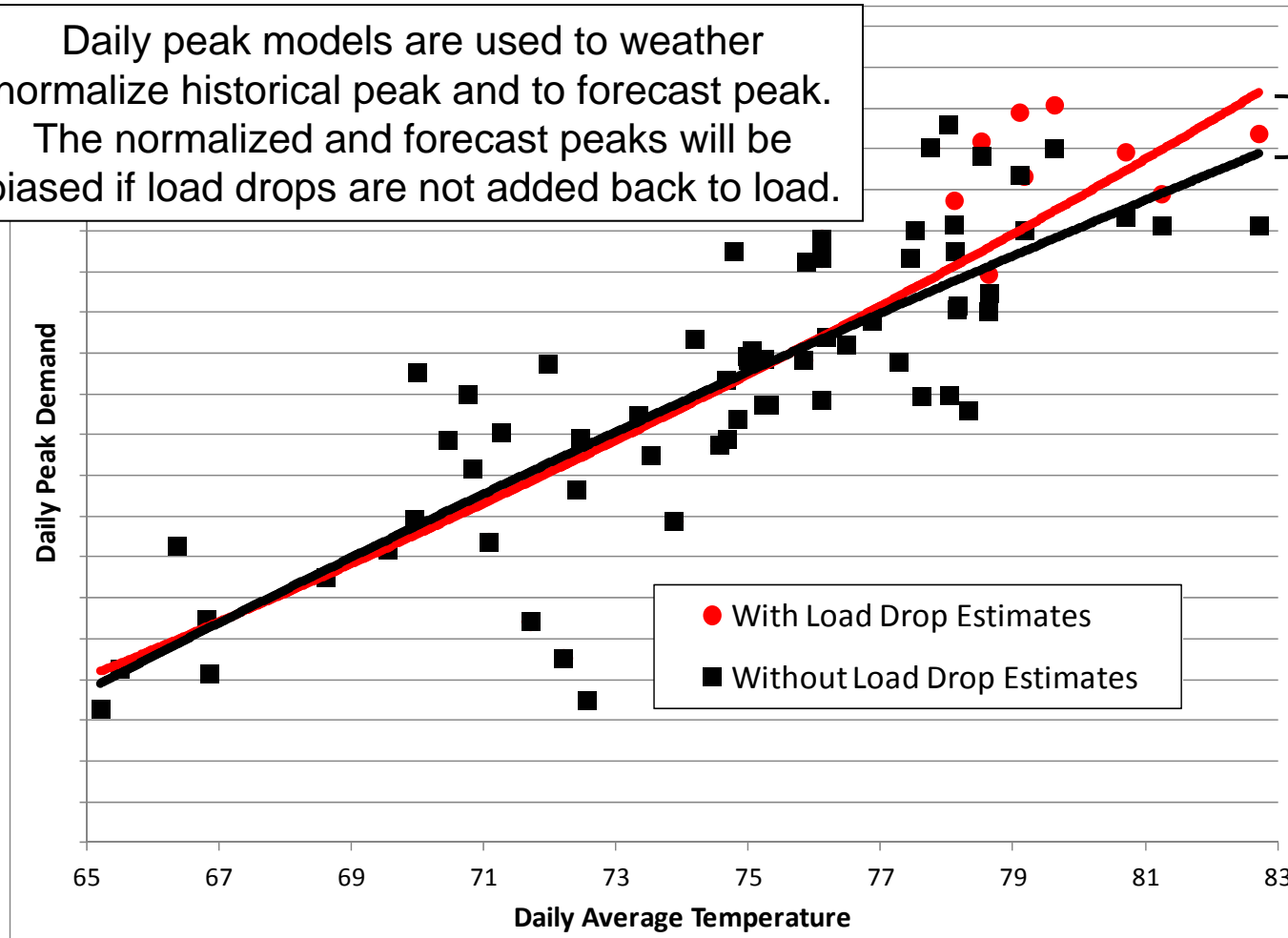
- A load drop is the amount of load not consumed or reduced from normal operations due to a load management event. The process of calculating load drops are discussed in Manual 19, Attachment A, Load Drop Estimate Guidelines.
- Currently, PJM requests load drop estimates from PJM called events during the 5 RTO peaks be identified for determining peak load contribution (PLC). Otherwise, PJM paid events are the only events available to PJM for consideration in the load forecast.
- A retail customer load can participate in both utility tariff based and PJM curtailment programs. PJM Economic and EDC or CSP initiated curtailments do not require load drop estimates to be provided to PJM.

Concept

- Curtailed load (load drop) is added back to historical system loads for forecasting to 1) properly calculate the relationship between load and weather and 2) to eliminate potential double counting of LM that is historically used and is planned to be used again in the future.
- The load drops can be driven by events called from all market participant - PJM, Utility, curtailment service provider, etc.
- Load drops for all affected hours are needed to effectively model the load-weather relationship.

Daily Peak to Temperature Relationship: Hypothetical Example

Daily peak models are used to weather normalize historical peak and to forecast peak. The normalized and forecast peaks will be biased if load drops are not added back to load.



e.g.,
bias

Two Customer Zone Example

Without Load Drop Addbacks

Without Load Drop Addbacks

	Peak Load Contribution (5-CP)			Historical Summer Daily Peak Load				Forecast
	Customer A	+ Customer B	= Zonal Load	Customer A	+ Customer B	= Zonal Load	+ Addbacks = Zonal Load	Zonal Load
Load	100	100	200	100	60	160	160	160
Load Management	0	50	50					50
Firm Load	100	50	150					110

- Customers A & B each have 100 MW of total load making up the zone total of 200 MW. Customer B has 50 MW of load management. The firm load is 150 MW
- Customer B sheds load such that its the average peak day load is 60 MW.
- PJM's load forecast models each days peak such that the forecast zonal peak is 160 MW.
- The forecast load is then 160 MW with 50 MW of load management for a firm load responsibility of 110 MW.

Two Customer Zone Example

With Load Drop Addbacks

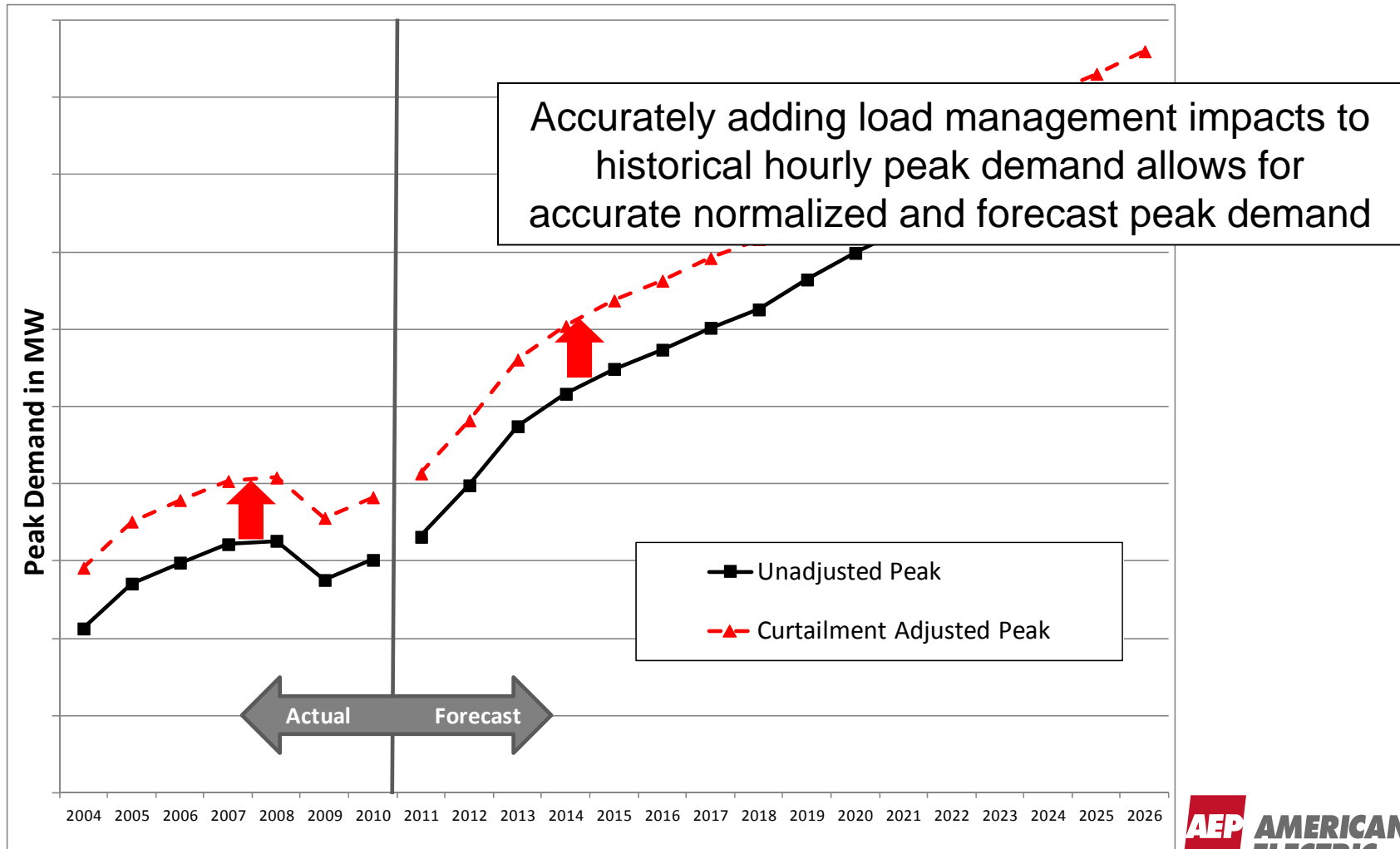
With Load Drop Addbacks

	Peak Load Contribution (5-CP)			Historical Summer Daily Peak Load					Forecast
	Customer A	+ Customer B	= Zonal Load	Customer A	+ Customer B	= Zonal Load	+ Addbacks	= Zonal Load	Zonal Load
Load	100	100	200	100	60	160	40	200	200
Load Management	0	50	50						50
Firm Load	100	50	150						150

- The same scenario except...
- Load drops of 40 MW are added back to the zonal load for forecasting.
- PJM's load forecast models each days peak such that the forecast zonal peak is 200 MW, 50 MW of LM and a firm load responsibility of 150 MW.

With load drop addbacks, load responsibility is 40 MW higher than the load without addbacks.

Estimated Load Drop Impact: Hypothetical Example



Summary

- The 2014/15 capacity auction cleared 14,118 MW of load management for the RTO. This is 8.6% of PJM's expected load in 2014.
- For PJM at 158,000+ MW, even as small as a 1% bias would equate to 1,580 MW.
- An investigation is necessary to determine to what extent rules are needed to require the reporting of impacts from PJM, EDC & CSP load management programs.