Utilization of VRR Curve
by
Limited and Extended Summer DR

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PJM Concerns with Current Implementation

- Unintended use of vertical demand curve for Annual resources; therefore, benefits of a sloped demand curve as identified in Hobbs analysis are not realized

- Results in procurement of Limited and ES DR quantities well in excess of the DR Reliability Targets
  - No immediate adverse reliability impact; however, additional quantities procured above DR Reliability Targets provide little incremental reliability benefit, if any
  - PJM procures and customers pay for additional capacity having little incremental reliability benefit

Minimum Annual and ES Resource Requirements

- Current implementation based on premise that procuring Limited and ES DR in excess of DR Reliability Targets has no adverse reliability impact provided that the total capacity procured in the auction is greater than or equal to the target reliability requirement and the minimum requirements for the less limited, better availability products are satisfied
- approach can result in procurement of Limited and ES DR well in excess of DR Reliability Target
- Procuring quantities of these capacity products in excess of DR Reliability Targets provides little incremental reliability benefit, if any
- Adverse reliability impact due to reduction in long-term incentive for annual resources to invest

Cleared Limited and ES DR in Past Two BRAs

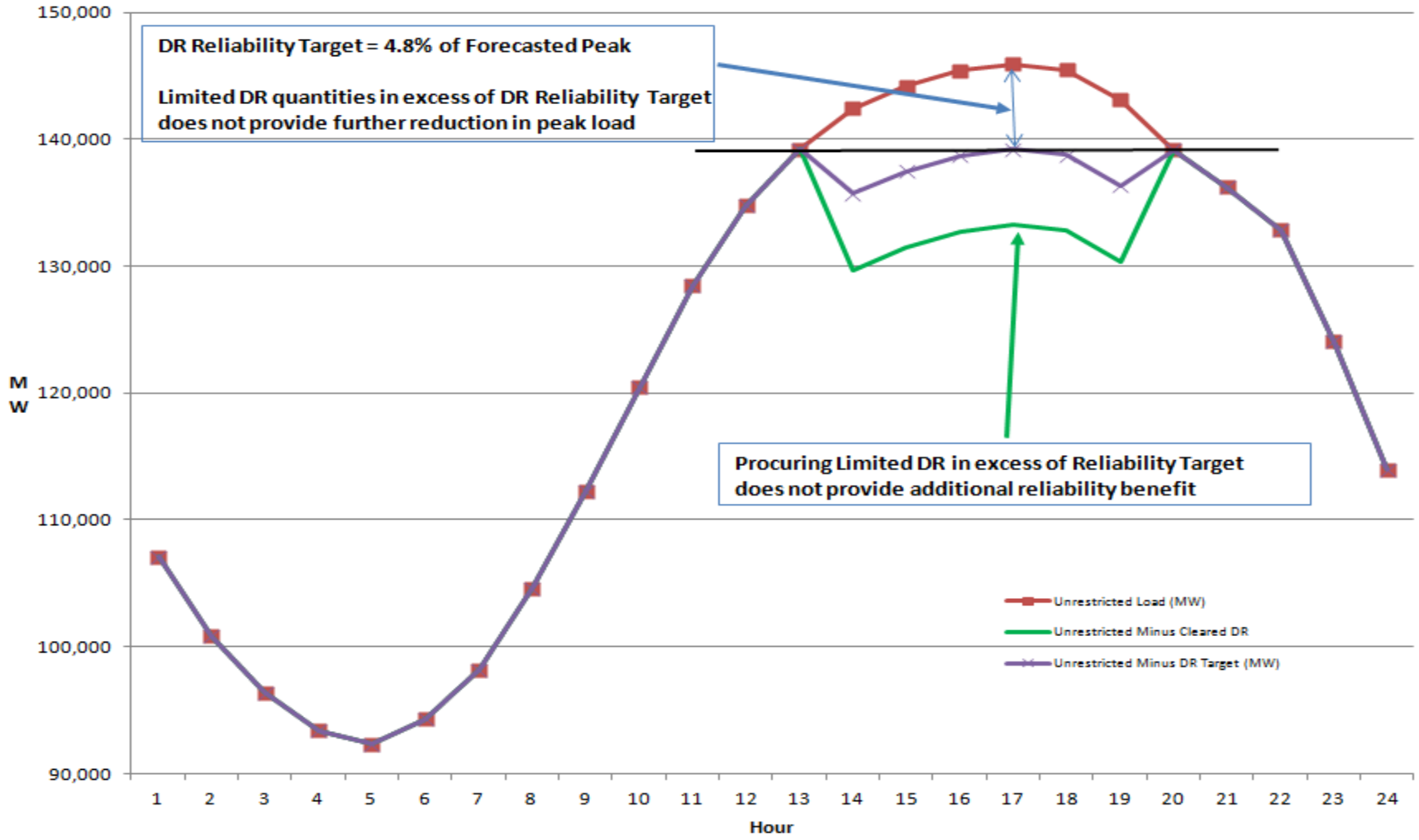
	2015/2016 Delivery Year		
Capacity Type	Procured Quantitiy (UCAP MW)	DR Reliability Target (UCAP MW)	Excess Procured above Reliability Target (UCAP MW)
Limited*	13,317	7,462	5,855
Extended Summer	5,202	n/a	n/a
Total	18,519	16,321	2,198

	2016/2017 Delivery Year		
Capacity Type	Procured Quantitiy (UCAP MW)	DR Reliability Target (UCAP MW)	Excess Procured above Reliability Target (UCAP MW)
Limited*	14,004	7,615	6,389
Extended Summer	2,470	n/a	n/a
Total	16,473	16,658	-185

* Procured quantity of Limited DR includes the 2.5% holdback which can be met entirely by Limited DR. 2.5% holdback equal to 4,069 MW and 4,153 MW for 2015/16 and 2016/17, respectively.

Note: The ES DR Reliability Target is the maximum quantity of the combined total of Limited and and Extended Summer DR to be consistent with maintenance of reliability.

DR Reliability Target Determination



Sloped Demand Curve

- The sloped VRR curve recognizes value in additional capacity over and above the target reserve margin
- Sloped VRR curve facilitates higher capacity commitment level (increased reliability) if it can be achieved at lower total capacity cost
- However, higher commitment level of Limited and ES DR does not translate to increased reliability when procured in quantities exceeding the DR Reliability Targets

Implementation of DR Reliability Target as Maximums

- Implementation of DR Reliability Targets as maximum limits provides following benefits:
  - restores the sloped demand curve for the Annual capacity product
  - ensures that capacity procured above the target reliability requirement is of type that provides incremental reliability benefit
- PJM has simulated such an implementation and compared results to actual BRA results (see presentation of 7/31/2013)

Sloped Minimum Annual and ES Resource Requirements

- One suggestion has been made to implement Minimum Annual and Minimum Extended Summer Resource Requirements as sloped demand curve parallel to existing VRR curve
- Such an approach would provide a sloped curve for the Annual and ES product but would result in procurement of Limited and ES DR capacity in quantities greater than the DR Reliability Targets (i.e. procurement of additional capacity not providing additional reliability benefit)
- This approach would therefore retain the same unintended consequences that PJM proposes to eliminate

Higher Generation Reserve Levels yield Lower Energy Prices

- An ancillary benefit of procuring capacity above the target reserve margin is that higher installed reserve levels yield lower energy prices and reduced energy costs; however, this benefit is not realized if additional capacity procured in the form of DR

Reserve Cleared in Auction	Cleared Capacity (UCAP MW)	Wtd Avg LMP ($/MWh)	Annual Load Payment for Energy ($ Million)	Reduction in Annual Load Payment for Energy ($ Million)
IRM	166,128	$46.24	$40,197	--
IRM +1%	167,565	$45.37	$39,442	$755
IRM +5%	173,313	$42.32	$36,793	$3,404