



Capacity Senior Task Force Proposal Summary Report

Last updated: October 18, 2013

Clearing Limited Demand Response in RPM



1. Status Quo

a. Base Residual Auction (BRA) clearing

Clear all product types against VRR curve in least-cost manner subject to Minimum Annual Resource Requirements and Minimum Extended Summer Resource Requirements

b. Reliability Requirement for Variable Resource Requirement (VRR) Curve

Reliability Requirement for the VRR curve = Reliability Requirement (100%) minus STRPT

$$\mathbf{RR \text{ for VRR} = RR - STRPT}$$

Where:

RR for VRR = Reliability Requirement for Variable Resource Requirement Curve

STRPT = Short-Term Resource Procurement Target

c. Minimum Annual Resource Requirement

Reliability Requirement (100%) minus Extended Summer DR Reliability Target

$$\mathbf{SUM(ANL) \geq \text{Minimum Annual Requirement}}$$

Where:

ANL = Annual Resources (GEN, ANL DR, EE)

d. Minimum Extended Summer Resource Requirement

Reliability Requirement (100%) minus Limited DR Reliability Target

$$\mathbf{SUM(ANL + ESDR) \geq \text{Minimum Extended Summer Requirement}}$$

Where:

ANL = Annual Resources (GEN, ANL DR, EE)

ESDR = Extended Summer Demand Response

2. Package A: The PJM Package

a. Base Residual Auction (BRA) Clearing

Clear all product types against VRR curve in least-cost manner subject to Maximum Limited DR and Maximum Extended Summer DR constraints.

b. Reliability Requirement for Variable Resource Requirement (VRR) Curve

Status quo.

$$\mathbf{RR \text{ for VRR} = RR - STRPT}$$

c. Maximum Limited Demand Response (DR) Constraint

The package uses the Limited DR Reliability Target minus STRPT to establish a Maximum Limit on the amount of Limited DR cleared in the BRA.

$$\mathbf{SUM(LDR) \leq LDRRT - STRPT}$$

Where:

LDR = Limited Demand Response

LDRRT = Limited Demand Response Reliability Target

STRPT = Short Term Resource Procurement Target

d. Maximum Extended Summer Demand Response (DR) Constraint

The package uses the Extended Summer DR Reliability Target minus STRPT to establish a Maximum Limit on the amount of Extended Summer DR plus Limited DR cleared in the BRA.

$$\mathbf{SUM(LDR, ESDR) \leq (ESDRRT - STRPT)}$$

Where:

ESDR = Extended Summer Demand Response

STRPT = Short Term Resource Procurement Target

ESDRRT = Extended Summer Demand Response Reliability Target

3. Package B: The Wilson/SMECO Package

a. Base Residual Auction (BRA) clearing

Clear all product types against VRR curve in least-cost manner subject to Maximum Limited DR constraint and Minimum Annual Resource Requirement.

b. Reliability Requirement for Variable Resource Requirement (VRR) Curve

Status quo.

RR for VRR = RR – STRPT

c. Maximum Limited Demand Response (DR) Constraint

The package uses the Limited DR Reliability Target minus a portion (TBD) of the STRPT to establish a Maximum Limit on the amount of Limited DR cleared in the BRA. The Limited DR Reliability Target will increase (by an amount designated as "X") to reflect DR as an Operational Resource

SUM(LDR) <= LDRRT + X – portion of STRPT
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Where:

LDR = Limited Demand Response

LDRRT = Limited Demand Response Reliability Target

STRPT = Short Term Resource Procurement Target

d. Maximum Extended Summer Demand Response (DR) Constraint

No limit on procurement of Extended Summer DR once minimum annual resource requirement is satisfied.

e. Minimum Annual Resource Requirement

Reliability Requirement (100%) minus Extended Summer DR Reliability Target and Minimum annual resource requirement reflects Variable Resource Requirement curve slope at prices above net Cost of New Entry (CONE).

SUM(ANL) >= Minimum Annual Requirement
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Where:

ANL = Annual Resources (GEN, ANL DR, EE)

Package Removed – Elimination of STRPT not in scope

4. Package C: The LS Power/Shanker Package

a. Limited Demand Response (DR) Reliability Target

Maximum Limited DR allowed to be cleared in the BRA at 4.8% of peak for RTO.

$$\text{Max(LDR)} = \text{LDRRT}$$

Where:

LDR = Limited Demand Response

LDRRT = Limited Demand Response Reliability Target

b. Extended Summer Demand Response (DR) Reliability Target

Status quo.

Currently the Extended Summer DR Reliability Target is 10.5% of the peak for the RTO. Extended Summer Reliability Target includes Limited DR as a component.

$$\text{Max(ESDR)} = \text{ESRRT}$$

Where:

ESDR = Extended Summer Demand Response

ESRRT = Extended Summer Demand Response Reliability Target

c. Reliability Requirement for Variable Resource Requirement (VRR) Curve

100% of Reliability Requirement for VRR Curve

$$\text{RR for VRR} = \text{RR}$$

d. Base Residual Auction (BRA) clearing

Clear all product types against VRR curve in least-cost manner subject to Maximum Limited DR and Maximum Extended Summer DR constraints.

5. Package D: The Johnson Controls Package

a. Base Residual Auction (BRA) clearing

Clear all product types against VRR curve in least-cost manner subject to Maximum Limited DR constraint and Minimum Annual Resource Requirement.

b. Reliability Requirement for Variable Resource Requirement (VRR) Curve

Status quo.

$$\text{RR for VRR} = \text{RR} - \text{STRPT}$$

c. Maximum Limited Demand Response (DR) Constraint

The package uses the Limited DR Reliability Target minus STRPT to establish a Maximum Limit on the amount of Limited DR cleared in the BRA.

$$\text{SUM(LDR)} \leq \text{LDRRT} - \text{STRPT}$$

Where:

LDR = Limited Demand Response

LDRRT = Limited Demand Response Reliability Target

STRPT = Short Term Resource Procurement Target

d. Maximum Extended Summer Demand Response (DR) Constraint

No limit on procurement of Extended Summer DR once minimum annual resource requirement is satisfied.

e. Minimum Annual Resource Requirement

Reliability Requirement (100%) minus Extended Summer DR Reliability Target and Minimum annual resource requirement reflects Variable Resource Requirement curve slope at prices above net Cost of New Entry (CONE).

$$\text{SUM(ANL)} \geq \text{Minimum Annual Requirement}$$

Where:

ANL = Annual Resources (GEN, ANL DR, EE)

6. Package D: The EnerNOC Package

a. Base Residual Auction (BRA) clearing

Use minimum resource requirements for Annual and Extended Summer resources to create sloped demand curves for those products respectively, akin to the manner in which the VRR curve is created. There would be no cap on the Limited DR product. All products would clear in the same way they do today, i.e. merit order, unless the minimum requirement has not been met. This would prevent Limited DR from clearing until the minimum requirements of the Annual and Extended Summer resources have been met. The auction would use the same clearing mechanism as today, but would have to clear to the sloped curves instead of the vertical curves, before resuming clearing in merit order for all products.

b. Reliability Requirement for Variable Resource Requirement (VRR) Curve

Status quo.

$$\mathbf{RR \text{ for VRR} = RR - STRPT}$$

c. Annual VRR Minimum Resource Requirement

Original VRR Shifted to the left by Extended Summer DR Reliability Target plus STRPT.

$$\mathbf{Annual \ VRR \ (a) = VRR(a) - ESDRRT + STRPT}$$

$$\mathbf{Annual \ VRR \ (b) = VRR(b) - ESDRRT + STRPT}$$

$$\mathbf{Annual \ VRR \ (c) = VRR(c) - ESDRRT + STRPT}$$

Where:

VRR(a,b,c) = Points A, B, C from Original VRR Curve from RR

ESDRRT = Extended Summer DR Target

STRPT = Short Term Resource Procurement Target

d. Extended Summer VRR Minimum Resource Requirement

Original VRR Shifted to the left by Limited DR Reliability Target plus STRPT

$$\text{Extended Summer VRR (a)} = \text{VRR(a)} - \text{LDRRT} + \text{STRPT}$$

$$\text{Extended Summer VRR (b)} = \text{VRR(b)} - \text{LDRRT} + \text{STRPT}$$

$$\text{Extended Summer VRR (c)} = \text{VRR(c)} - \text{LDRRT} + \text{STRPT}$$

Where:

VRR (a,b,c) = Points A, B, C from Original VRR Curve from RR

LDRRT = Limited DR Target

STRPT = Short Term Resource Procurement Target

e. Maximum Limited DR Constraint

No Limit

f. Coupled DR Offers

TBD