Reactive Services Credits Proposal Example

DA Reliability and Reactive Cost Allocation

June 17, 2013

Joel Romero Luna

Monitoring Analytics

Proposal

- **The total cost of providing reactive support should be categorized and allocated as reactive services.**
- **Reactive services credits should be calculated consistent with operating reserves make whole payments.**

Examples

- **Example 1: Unit is called on for reactive.**
- **Example 2: Unit is called on for economics and kept on for reactive.**
- **Unit Details:**
  - Fixed Output: 100 MW
  - Fixed Offer: $100/MWh
  - No Load Cost: $1,000/hr
  - Startup Cost: $10,000
  - Min Run Time: 3 hours

Example 1: Unit called on for reactive

Hour	Segment	Output (MWh)	RT LMP ($/MWh)	Offer ($/MWh)	Log Reason
1	1	100	$50	$100	Reactive
2	1	100	$50	$100	Reactive
3	1	100	$110	$100	Reactive
4	2	100	$110	$100	Reactive
5	2	100	$50	$100	Reactive
6	2	100	$50	$100	Reactive
Total		600			

Example 1: Unit's Total Offer

Hour	Segment	A Offer ($/MWh)	B Output (MWh)	C = A x B Energy Offer	D No Load Cost	E Startup Cost	F = C + D + E Total Offer
1	1	$100	100	$10,000	$1,000	$10,000	$21,000
2	1	$100	100	$10,000	$1,000	$0	$11,000
3	1	$100	100	$10,000	$1,000	$0	$11,000
4	2	$100	100	$10,000	$1,000	$0	$11,000
5	2	$100	100	$10,000	$1,000	$0	$11,000
6	2	$100	100	$10,000	$1,000	$0	$11,000
Total			600	$60,000	$6,000	$10,000	$76,000

Example 1: Unit's Energy Revenues

Hour	Segment	A RT LMP ($/MWh)	B Output (MWh)	C = A x B Energy Revenues
1	1	$50	100	$5,000
2	1	$50	100	$5,000
3	1	$110	100	$11,000
4	2	$110	100	$11,000
5	2	$50	100	$5,000
6	2	$50	100	$5,000
Total			600	$42,000

Example 1: Unit's Make Whole Designation

		A	B		C = A - B	
Hour	Segment	Total Offer	Energy Revenues	Total Offer covered by Revenues?	Hourly Make Whole	Log Reason
1	1	$21,000	$5,000	NO	$16,000	Reactive
2	1	$11,000	$5,000	NO	$6,000	Reactive
3	1	$11,000	$11,000	YES	$0	Reactive
Segment 1 Totals		**$43,000**	**$21,000**		**$22,000**	
4	2	$11,000	$11,000	YES	$0	Reactive
5	2	$11,000	$5,000	NO	$6,000	Reactive
6	2	$11,000	$5,000	NO	$6,000	Reactive
Segment 2 Totals		**$33,000**	**$21,000**		**$12,000**	

Example 1: Make Whole Cost Allocation

Step 1: Calculate make whole payment to unit.

Segment	A Energy Offer	B No Load Cost	C Startup Cost	D = A + B + C Total Offer	E Energy Revenues	F = D - E Make Whole Needed
1	$30,000	$3,000	$10,000	$43,000	$21,000	$22,000
2	$30,000	$3,000	$0	$33,000	$21,000	$12,000

Step 2: Allocate costs to BOR or Reactive.

	Positive Hourly Make Whole		Costs Allocation	
	A	B	A / (A + B)	B / (A + B)
Segment	Economic	Reactive	Economic	Reactive
1	$0	$22,000	0%	100%
2	$0	$12,000	0%	100%

Segment	BOR Make Whole	Reactive Make Whole	Total
1	$0	$22,000	$22,000
2	$0	$12,000	$12,000

Example 2: Unit called on for economics and kept on for reactive

Hour	Segment	Output (MWh)	RT LMP ($/MWh)	Offer ($/MWh)	Log Reason
1	1	100	$110	$100	Economic
2	1	100	$130	$100	Economic
3	1	100	$50	$100	Reactive
4	2	100	$50	$100	Reactive
5	2	100	$50	$100	Reactive
6	2	100	$50	$100	Reactive
Total		600			

Example 2: Unit's Total Offer

Hour	Segment	A Offer ($/MWh)	B Output (MWh)	C = A x B Energy Offer	D No Load Cost	E Startup Cost	F = C + D + E Total Offer
1	1	$100	100	$10,000	$1,000	$10,000	$21,000
2	1	$100	100	$10,000	$1,000	$0	$11,000
3	1	$100	100	$10,000	$1,000	$0	$11,000
4	2	$100	100	$10,000	$1,000	$0	$11,000
5	2	$100	100	$10,000	$1,000	$0	$11,000
6	2	$100	100	$10,000	$1,000	$0	$11,000
Total			600	$60,000	$6,000	$10,000	$76,000

Example 2: Unit's Energy Revenues

Hour	Segment	A RT LMP ($/MWh)	B Output (MWh)	C = A x B Energy Revenues
1	1	$110	100	$11,000
2	1	$130	100	$13,000
3	1	$50	100	$5,000
4	2	$50	100	$5,000
5	2	$50	100	$5,000
6	2	$50	100	$5,000
Total			600	$44,000

Example 2: Unit's Make Whole Designation

		A	B		C = A - B	
Hour	Segment	Total Offer	Energy Revenues	Total Offer covered by Revenues?	Hourly Make Whole	Log Reason
1	1	$21,000	$11,000	NO	$10,000	Economic
2	1	$11,000	$13,000	YES	($2,000)	Economic
3	1	$11,000	$5,000	NO	$6,000	Reactive
Segment 1 Totals		**$43,000**	**$29,000**		**$14,000**	
4	2	$11,000	$5,000	NO	$6,000	Reactive
5	2	$11,000	$5,000	NO	$6,000	Reactive
6	2	$11,000	$5,000	NO	$6,000	Reactive
Segment 2 Totals		**$33,000**	**$15,000**		**$18,000**	

Example 2: Make Whole Cost Allocation

Step 1: Calculate make whole payment to unit.

Segment	A Energy Offer	B No Load Cost	C Startup Cost	D = A + B + C Total Offer	E Energy Revenues	F = D - E Make Whole Needed
1	$30,000	$3,000	$10,000	$43,000	$29,000	$14,000
2	$30,000	$3,000	$0	$33,000	$15,000	$18,000

Step 2: Allocate costs to BOR or Reactive.

	Positive Hourly Make Whole		Costs Allocation	
	A	B	A / (A + B)	B / (A + B)
Segment	Economic	Reactive	Economic	Reactive
1	$10,000	$6,000	62.5%	37.5%
2	$0	$18,000	0.0%	100.0%

Segment	BOR Make Whole	Reactive Make Whole	Total
1	$8,750	$5,250	$14,000
2	$0	$18,000	$18,000

Monitoring Analytics, LLC
2621 Van Buren Avenue
Suite 160
Eagleville, PA
19403

(610) 271-8050

MA@monitoringanalytics.com

www.MonitoringAnalytics.com