



Southwest Power Pool
MARKET WORKING GROUP MEETING
August 22, 2008
Conference Call

• Summary of Motions •

- PRR 176 (Demand Response) and its related Tariff language were unanimously approved via an email vote on August 22, 2008.

Southwest Power Pool
MARKET WORKING GROUP MEETING
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• M I N U T E S •

Agenda Item 1 – Administrative Items

Richard Ross (AEP) called the meeting to order at 10:00 a.m. Proxies were received from Tandra Offield (ETEC) to Seth Brown and Gary Clear (OGE) to Darrell Wilson (OGE). The attendance was recorded (Attendance - Attachment 1).

Agenda Item 2 – PRR 176 (Demand Response) Tariff Language

Richard Ross reviewed the updated Tariff language from the MWG meeting. After a lengthy discussion around the following sentence: "The Submitted Real-Time Response methodology can only be used for VDDR Resources that are utilizing strictly behind-the-meter generation to provide the response or where the Retail Provider is offering the Resource under an agreed upon Retail Tariff provision that includes near real-time measurement and verification terms." The group came to a consensus that capitalizing Behind-the-Meter Generation was all that needed to be modified. The same sentence could be found in the PRR so the modification was also done to the PRR (Attachment 2).

There was not a quorum left on the call so Richard Ross requested an email vote to be cast by the end of the day. The email vote resulted in a unanimous approval of the PRR language as well as the suggested Tariff revisions.

Agenda Item 13 – Review of Actions and Future Meetings

Action Items:

1. Emily Davis is to send Richard Ross's request for an email vote on PRR 176 to the exploder with a deadline of COB August 22, 2008.

Agenda Item 14 – Adjournment

With no further business, Richard Ross thanked everyone for participating, and adjourned the meeting at 11:30 a.m.

Respectfully Submitted,

Emily Davis
Secretary

Market Working Group Roster
August 22, 2008

Atten	Full Name	Company	Business Phone
Day 1			
x	Richard Ross (Chair)	AEP	(918) 382-9285
	Angela Easton	Calpine	(713) 570-4606
	James Liao	WFEC	(405) 247-4286
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	Gary Clear	OG&E	(405) 553-2113
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	Max Sherman	Aquila	(816) 737-7455
x	Patty Denny	KCPL	(816) 654-1702
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x	Alice Jackson		
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x	Bob Weishaar		
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	Brian Berkstresser	EDE	
	Brian Coatney	Celeritas	
	Brock Ondayko	AEP	
	Bruce Walkup	AECC	(501) 570-2639
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	Carlos A. Romero	Global Energy Decisions	
	Casey Cathey	SPP	(501) 614-3267
	Charles Wu	Arkansas Tech University	(479) 498-6015
	Charles Yeung	SPP	(832) 742-6142
	Chris Standifer		
	Cindy Holman	OMPA	(405) 359-2533
	CJ Brown	SPP	
	Colin Holtz	Boston Pacific Company, Inc.	
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	Darryl Boggess	WFEC	
	Daryl Cote	The Structure Group	(832) 594-0043
	Dave Felzien	ABB	(919) 807-5068
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	David Toole	Cargill	(952) 984-3848
	Dennis Beutler	Ameren	(314)613-9159
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	Frank Clark	EPV/PSI	(972) 529-8190
	Frank Joiner	Areva	(425) 739-3651
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	James Fife	EPV/PSI	(832) 681-3125
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	Jarrett Friddle	Utilicast	
	Jason Atwood	Redbud	(281) 482-3007
	Jason Kram	PCI	(713) 626-3399
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	Jay Crawford	PCI	(713) 626-3399
	Jeff Brown	Coral	(713) 767-5317
	Jeff Johns	AECI	(417) 885-9397
	Jeff Winkler	Calpine	(918) 486-1840
	Jim Jacoby	AEP	(214) 777-1144
	Jim Krajecki	The Structure Group	
	Jim McAvoy	OG&E	(405) 553-8167
	Jim Sullivan	Boston Pacific Company, Inc.	(202) 296-5520
	John Bastian	New Energy Assoc.	(770) 779-2884
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	John Fontenot	Rayburn Electric Coop	(469) 286-9010
	John Gunesch	OG&E	(405) 553-3409
	John Harvey	John Deere Wind Energy	(515) 287-3532
	JP Harper	Fortegra	(215) 327-0523
	Justin Cook	PCI	(405) 442-6933
	Justin Eeg		
	Karen Wei	The Structure Group	(832) 553-1506
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	Keith Comeaux	CLECO	
	Ken Vormwald	Nexant	(704) 843-7914
	Kip Fox	AEP	

Market Working Group Roster
August 22, 2008

Atten	Full Name	Company	Business Phone
Day 1			
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	Mike Hill		
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x	Patti Kelly	SPP	
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	Steve Massey	Westar	
	Steve Shull	EDE	
	Stuart Wright	ACI	(303) 917-3565
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	Walt Shumate	OG&E	(214) 725-8850
	Walter Hobbs	PCI	(405) 447-6933
	Walter Wolf		
	Wayne Walker	Horizon Wind	(713) 265-0247
	Wendell Drost	AREVA	(318) 410-0034
	Will Franklin	Entergy EMO	
	William Berg	Exelon Generation	(610) 765-6660
	William Simpson	Tenaska	(817) 462-1522

PRR Recommendation Report

PRR Number	176	PRR Title	Demand Response in the SPP EIS Market
Timeline (Normal or Urgent)	Normal	Recommended Action	Approve
Impact Analysis Needed (Yes or No)	Yes		
Protocol Section(s) Requiring Revision (include Section No., Title and Version)	Section 3, 5, 9, 11, 12 and Appendix E section 7		
Revision Description	Compliance with FERC order to review and provide mechanism for Demand Response Participation after the initial EIS market launch. Demand response has always been considered a potential resource in the Market Protocols but has never been fully defined, nor have the SPP Market systems been designed or tested to handle Demand Response.		
PRR Recommendation (indicate whether all segments were present for the vote, and the segment of parties that voted no or abstained)	Unanimously approved in the June 17 – 18, 2008 MWG meeting. Changed PRR language and the suggested Tariff language were approved in the August 22, 2008 conference call.		
RTWG Review			
ORWG Review	Unanimously approved in the June 26, 2008 ORWG conference call.		
MOPC Recommendation (indicate whether all segments were present for the vote, and the segment of parties that voted no or abstained)			

Original Sponsor	
Name	Demand Response Task Force
Company	

PRR Recommendation Report

Comments Received	
Comment Author	Comment Description
DRTF	Revisions made during the February 1, 2008 DRTF conference call.
SPP/MWG	Additional comments and changes reflecting the removal of BDDR Resourced and comments received from Western Resources and Jarrett Friddle during the 5/2/2008 MWG conference call.
MWG	Revisions made during the May 20 – 21, 2008 MWG meeting.

Proposed Protocol Language Revision

3 RESOURCE PLANS

3.1 Introduction

The Resource Plan is submitted by Market Participants with registered Resources to enable the SPP Market Operation System (MOS) to assess Resource and Ancillary Service adequacy for the SPP region, each SPP control area, and each Market Participant. The operator of the Control Area remains responsible for the balance of Load and Resources within the Control Area boundary. See Appendix 7 of SPP Criteria for requirements of data submission.

External Resources have the same requirements for submitting a Resource Plan as those Resources within the SPP Market Footprint, except as specified below. For such External Resource capacity as is offered into the SPP Market, (i) only status available to External Resources is “Available” or “Unavailable”; (ii) the Min MW must be set to zero and (iii) the Max MW may not exceed the transmission service arrangements associated with the External Resource. If Tagged, the Max MW may not exceed the Tag value, including the curtailment limit adjusted by the NERC Interchange Distribution Calculator (IDC).

Market Participants shall submit a Resource Plan for Demand Response Resources (DRR). The Resource Plan shall also reflect the hourly load profile of the Demand Response Load (DRL) expected operations as required by Section 3.6.4.

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- Deleted: for Demand Response Resources

3.2 Contents

The Resource Plan covers a seven-day horizon (with hourly detail) beginning with the Operating Day. See SPP Criteria Appendix 7 and XML Specifications for additional details. Specifically, the Resource Plan contains entries for each Resource for each hour of the seven day horizon, and includes the following:

- Deleted: unless otherwise provided
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- Resource ID - Unique identifier for Resource in SPP Market
- Resource Type - GEN-Generator, VDD – Variable Dispatch Demand Response, or PLT-Plant

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- Deleted: , BDD - Block Dispatch Demand Response,
- Deleted: CLD-Controllable Load

PRR Recommendation Report

- Planned Megawatts - Anticipated dispatch of Resource independent of energy imbalance deployment (This value is within the dispatchable range of the Resource.). VDDR Resources will submit a value of 0 MW for this field.
- Minimum Capacity Operating Limit - Resource physical minimum sustainable output for each Operating Hour (“MinMW”). Variable Dispatch Demand Response Resources must have a 0 MinMW.
- Minimum Economic Capacity Operating Limit - Resource economic minimum output selected by Market Participant for each Operating Hour (“MinEconMW”). Must be equal to or greater than value provided for Minimum Capacity Operating Limit. Variable Dispatch Demand Response Resources must have a 0 MinEconMW.
- Minimum Emergency Capacity Operating Limit - Resource physical minimum emergency output for each Operating Hour (“MinEmerMW”). Must be equal to or less than value provided for Minimum Capacity Operating Limit. Variable Dispatch Demand Response Resources must have a 0 Min EmerMW.
- Maximum Capacity Operating Limit - Resource physical maximum sustainable output for each Operating Hour (“Max MW”). For Variable Dispatch Demand Response Resources, Max MW will be the maximum amount of response or interruption that can be provided.
- Maximum Economic Capacity Operating Limit - Resource economic maximum output selected by Market Participant for each Operating Hour (“MaxEconMW”). For Variable Dispatch Demand Response Resources, this will be the maximum amount of response or interruption that can be provided under normal market operations. Must be equal to or less than value provided for Maximum Capacity Operating Limit.
- Maximum Emergency Capacity Operating Limit - Resource physical maximum emergency output for each Operating Hour (“MaxEmerMW”). For Variable Dispatch Demand Response Resources, this will be the maximum amount of response or interruption that can be provided under emergency operating conditions. Must be equal to or greater than value provided for Maximum Capacity Operating Limit.
- Ramp Rate - Rate at which Resource can change output in MW/min
 - Breakpoint Limit 1– Resource MW output at which Ramp Rate changes from Block 1 Rates to Block 2 Rates.
 - Block 1 Rate Up – Rate at which Resource can change output upward in MW/min at output levels less than or equal to Breakpoint Limit 1.
 - Block 1 Rate Down – Rate at which Resource can change output downward in MW/min at output levels less than or equal to Breakpoint Limit 1.

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PRR Recommendation Report

- Block 1 Rate Emergency – Rate at which Resource can change output upward or downward in MW/min at output levels less than or equal to Breakpoint Limit 1 during an emergency.
- Block 2 Rate Up - Rate at which Resource can change output upward in MW/min at output levels greater than the Breakpoint Limit 1 and less than Breakpoint Limit 2.
- Block 2 Rate Down - Rate at which Resource can change output downward in MW/min at output levels greater than the Breakpoint Limit 1 and less than Breakpoint Limit 2.
- Block 2 Rate Emergency – Rate at which Resource can change output upward or downward in MW/min at output levels greater than the Breakpoint Limit 1 and less than Breakpoint Limit 2 during an emergency.
- Breakpoint Limit 2– Resource MW output at which Ramp Rate changes from Block 2 Rates to Block 3 Rates.
- Block 3 Rate Up - Rate at which Resource can change output upward in MW/min at output levels greater than the Breakpoint Limit 2.
- Block 3 Rate Down - Rate at which Resource can change output downward in MW/min at output levels greater than the Breakpoint Limit 2.
- Block 3 Rate Emergency – Rate at which Resource can change output upward or downward in MW/min at output levels greater than the Breakpoint Limit 2 during an emergency.
- Resource Status:
 - Available – Resource is online and available for SPP Deployment.
 - Unavailable – Resource is offline and unavailable for SPP Deployment or other uses.
 - Supplemental – Resource is offline and available for satisfying Supplemental Reserve requirements. The Resource will NOT be dispatched by the MOS system.
 - Manual - Resource is
 - (a) Not capable of following Dispatch Instructions, either by virtue of: (1) being an Intermittent Resource; or (2) undergoing a Resource Test, Startup, or Shutdown Mode; and
 - (b) Not capable of adhering to a Schedule either by virtue of: (1) being an Intermittent Resource; or (2) operating in Resource Test, Startup, or Shutdown Mode where the inception, termination, or duration of the testing, Start-up or Shut-down process cannot be confirmed or predicted.

PRR Recommendation Report

Manual status is not a valid status for VDD Resources.

Resources in manual status will be permitted to report Ancillary Services if the limitations on their ability to follow Dispatch Instructions or adhere to their Schedules do not preclude them from providing said Ancillary Services.

- Self-dispatched – Resource is online and unavailable for SPP Deployment. Self-Dispatched is not a valid status for a VDD Resource.

Note that the meaning and format and current required fields of this submission are fully defined in the XML Specification document.

The Resource Plan may not be the only source of Resource data required by SPP, in its roles as the Regional Reliability Coordinator and Transmission Service Provider, for the purposes of maintaining system reliability and granting transmission service. Market Participants with registered Resources, or the Balancing Authorities within which such Resources are located, may be requested to provide to SPP additional Resource information beyond that contained in the Resource Plan through mechanisms other than the Portal or API, as deemed necessary by SPP and consistent with its authority as the Regional Reliability Coordinator and Transmission Service Provider.

3.6.3 Load Forecast Gross-up for Demand Response Dispatched

SPP will perform a gross-up in order to continue to forecast the total Load to be served by the Market. The BA will submit actual Real-Time Load and SPP will gross-up the values to account for Demand Response activity. SPP will add the value determined in section 3.6.3.1 or 3.6.3.2 to the actual Load BA Actual Load for any VDDR Resource.

3.6.3.1 Calculated Real-Time Response

The calculated response is the difference between the Hourly Load Profile and real-time value of the associated Demand Response Load received via ICCP, whenever the VDDR Resource's Deployment Instruction is greater than 0 [zero]. This value will represent the actual resource production (ARP).

3.6.3.2 Submitted Real-Time Response

The amount of the submitted response provided shall be sent directly to SPP via ICCP for VDDR Resources that are utilizing strictly Behind-the-Meter Generation to provide the response or VDDR Resources where the Retail Provider is offering the Resource under an agreed upon Retail Tariff provision that includes near real-time measurement and verification terms. This value will represent the actual resource production (ARP).

Deleted: The BA Actual Load submitted to SPP in Real-time via ICCP will be calculated as the Generation less the Net Actual Interchange of the BA. SPP will add 0 [zero] to the BA Actual Load for any VDD Resource that is "Unavailable;" SPP will add 0 [zero] to the BA Actual Load when the VDD Resource's Deployment Instruction is 0 [zero]; SPP will add t

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Comment [h1]: Keeping the alternative language isolated.

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Comment [h2]: (RLD comment) Would it be cleaner to just say, the Market Participant reports behind-the-meter generation specifically through ICCP and report the load gross. For other VDD, SPP will accept the net load from the BA and, during times of instructed dispatch, the difference between the Demand Response Load and Hourly Load Profile will be added to the BA reported net load.

PRR Recommendation Report

3.6.4 Hourly Load Profile for Variable Dispatch Demand Response Resources

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For VDDR Resources using the calculated response method, an hourly load profile must be submitted for the Demand Response Load indicating the level of energy consumption expected at that location in MWh if the Demand Response Resource is not dispatched. The profile must cover, at a minimum, all hours the Resource is submitted as Available in the Resource Plan plus one hour before and one hour following. This profile must be submitted by 1100 am CPT on the day prior to the operating day and may be updated up to 45 minutes in advance of the operating hour.

The hourly load profile may be adjusted by SPP prior to the calculation of URD and EIS Settlement if there have been deviations in hourly integrated metered load from the hourly load profile during periods when the Resource was not dispatched. If the average of the hourly deviation between integrated metered load and submitted hourly load profile values for the previous 30 days of normal operation when the resource was available but not dispatched is \geq 5% below the hourly load profile, the hourly load profile will be adjusted by the average deviation before being applied in the URD evaluation and/or EIS settlement. This assessment will be performed each day by SPP and a notification issued to the Market Participant of any adjustment and the operating day for which the adjustment will be effective.

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If using the submitted response method, the Hourly Load Profile is not necessary.

Comment [h3]: (RLD Comment)
Another option may be to apply a charge after the fact for deviations from the hourly load profile.

Comment [h4]: Alternative measurement language

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PRR Recommendation Report

5 RESOURCE OFFERS

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5.1 Introduction

To submit an offer a Market Participant must have executed the service agreement as specified in Tariff Attachment AH. Offer Curves are submitted by Resource. Resources that offer energy into the SPP EIS market must specify an offer price. The price is specified using an Offer Curve. The Offer Curve allows Resources to offer multiple points at different prices. An Offer Curve is submitted for each Resource with up to ten monotonically increasing pairs of MWh and price. The price may be positive or negative and may be capped. See Section 11 for further details. Owners of Joint Owned Units may agree to register the units as separate Resources.

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5.2 Contents

5.2.1 Offer Curves

The Offer Curve allows Resources to offer multiple points at different prices. An Offer Curve is submitted with up to ten monotonically increasing pairs of MWh and price. For Generator, Plant and Variable Dispatch Demand Response Resources, the Offer Curve will include the following components:

- Date
- Hour Ending
- Resource
- Megawatts
- Price/MWh

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5.2.2 Block

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For BDDR Resources, the offer for each block will consist of a number of MWs and a corresponding Price per MWh, up to ten blocks. If the Resource is Available and a block is determined to be economic for the next hour based on the Price/MWh, the Resource will be dispatched for the total MWs in the block for the entire next hour. The components are similar to those for the offer curve; however, the blocks are considered individual discrete offers and do not have to be monotonically increasing with price.

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<#>Date¶
<#>Hour Ending¶
<#>Resource¶
<#>Megawatt Block¶
<#>Price/MWh¶

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Example of an Offer Curve from the Portal : This is the label for the insert below and should be moved into place in the final document.

PRR Recommendation Report



Helping Our Members
Work Together To
Keep the Lights On..
Today and in the Future!



Market Participant Interface

View Submit XML Upload Administrator

EIS Offers

Market Date: Hour Ending: Resource:

EIS Offers 11/17/2004

<input type="checkbox"/>	Hour Ending	Price Curve									
<input type="checkbox"/>	0100	MW	0.0	10.0	30.0	50.0	100.0	(null)	(null)	(null)	(null)
		Price	0.00	26.10	30.15	55.00	75.00	(null)	(null)	(null)	(null)
<input type="checkbox"/>	0200	MW	0.0	10.0	30.0	50.0	100.0	(null)	(null)	(null)	(null)
		Price	0.00	26.10	30.15	55.00	75.00	(null)	(null)	(null)	(null)

5.3 Timing and Submission Mechanism

Offer Curves may be submitted as early as 7 days prior to the Operating Day and may be submitted or revised until 45 minutes prior to the Operating Hour. If a Resource Plan indicates that the Resource is available for SPP dispatch and an Offer Curve is not submitted, the most recent Offer Curve will be used for deployment. If an Offer Curve has not been submitted to MOS within the last 7 days, consistent with the MOS data purge timeline, the default offer curve price will be \$0 for the entire available capacity.

This data will be submitted via the Portal or the Application Program Interface (API) as defined in Appendix B.

Comment [h5]: Re-wrote this for clarity but WR appeared to want to force an Offer Curve for VDDR resources for Status Available. This original language was written so as to incent an offer curve by providing a non-desirable default. The system can't stop if it doesn't have an offer curve. We have to have some sort of default if it is missing. Do we need anything different for Demand Response?

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- Deleted:** to the Max MW

5.4 Use of Data

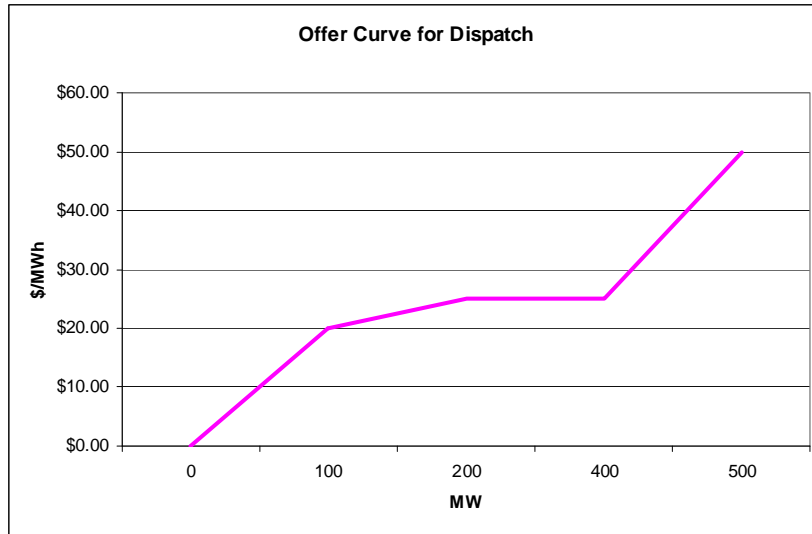
The Offer Curve is used in the calculation necessary for deployment and the resulting Locational Imbalance Price (LIP). The set of Price Points that are submitted are used as the beginning and ending values for calculating a linear slope for each set of beginning and ending values. Therefore, each MW between the two price points has a different price due to the interpolation of the submitted price points. The first Pricing Point must correspond to the zero (0) MW loading level regardless of whether the unit is capable of operating at that level. The last Price Point on the Offer Curve is used for all MWs between that point and the Maximum Capacity from the

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Resource Plan. These examples illustrate the Offer Curve used in the deployment calculations that were developed from the submitted price MW pairs.

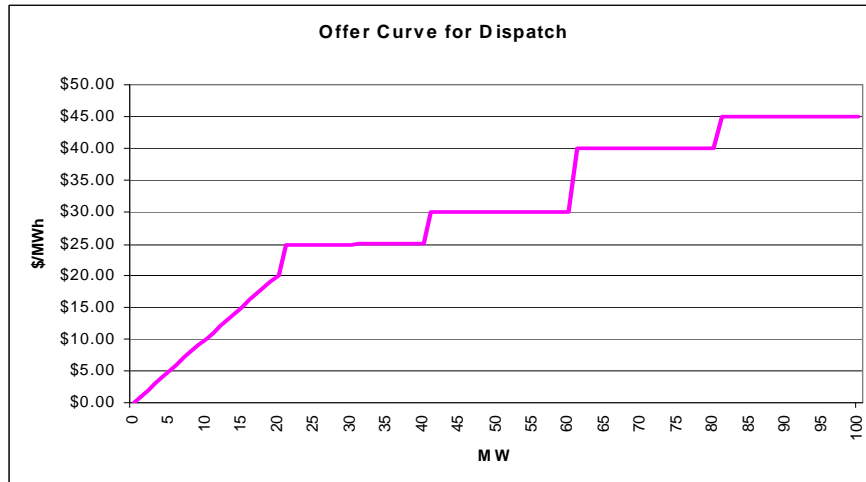
Example 1

<u>Submitted Data</u>	
MW	\$
0	\$0.00
100	\$20.00
200	\$25.00
400	\$25.01
500	\$50.00



Example 2

<u>Submitted Data</u>	
MW	\$
0	\$0.00
20	\$20.00
21	\$25.00
40	\$25.01
41	\$30.00
60	\$30.01
61	\$40.00
80	\$40.01
81	\$45.00
100	\$45.01

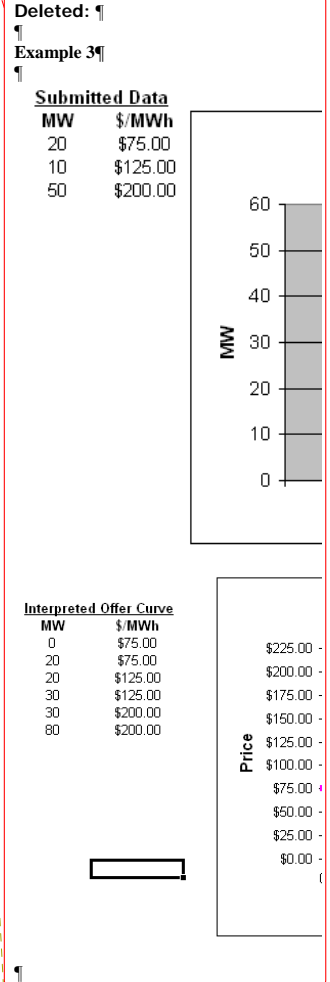


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The deployment is calculated using a security constrained economic dispatch to arrive at a least cost solution. When transmission constraints cause a re-dispatch by SPP, the LIP's may differ.

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Block Offers will be used similarly in that a stepwise offer curve will be constructed based on the submitted blocks.

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9.2 Content

9.2.1 Dispatch Instruction

The dispatch instruction is a MW set-point for the end of the Deployment Interval. They are sent to every Resource in the Market Footprint for every interval. The Dispatch Instruction is determined differently depending on the Status of the Resource in the Resource Plan. Details for this are described in Section 9.4 Use of Data. The following items, however, make up the components of every Dispatch Instruction.

- Resource Name
- Resource Type (GEN, PLT, VDD)
- Date
- Interval Ending (HH MM)
- Dispatch Type (EIS, other)
- MW set-point
- Price \$/MWH

Comment [h6]: Alternative measurement language

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Deleted: measured response provided via ICCP. The tolerance band will be the lesser of 10% of MaxEconMW or 25 MW.¶

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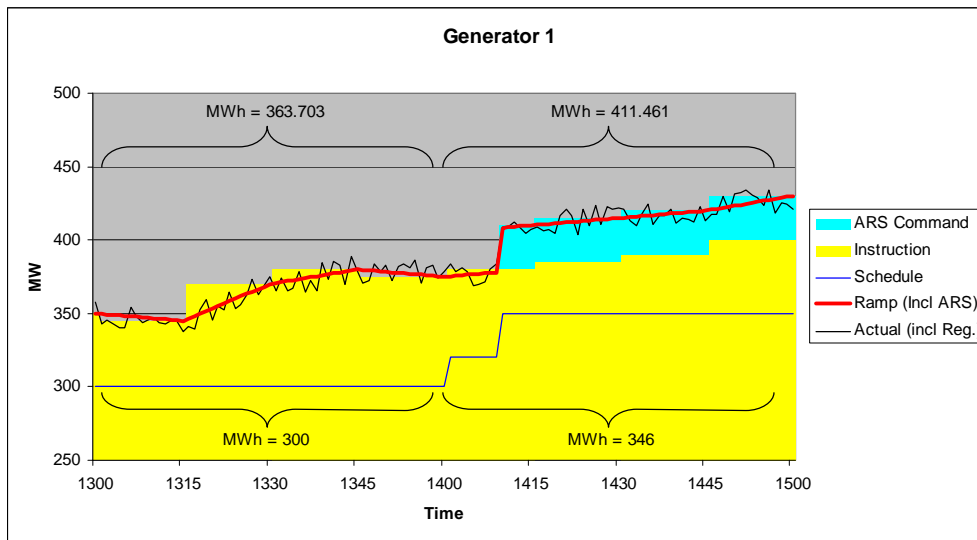
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In the example below, the Resource has both scheduled energy and offered into the imbalance market. Every 5 minutes a new dispatch instruction is sent (represented by the yellow area) and the Resource is ramping to achieve the dispatch (represented by the red line). Regulation results in the Resource moving around the ramp (represented by the black line).



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Note that the schedules (represented by the blue line) are not the same thing as dispatch instructions. The schedules also change when reserve deployment occurs (shown as the cyan area and an increase in the blue schedule line). The integrated MWh from the actual performance and the schedules are reflected for hours ending 1400 and 1500. An imbalance payment would result from the above example for both hours, regardless of the regulation down impacts. The impact of reserve deployment is offset by the change from the net scheduled amount, resulting in no increase in imbalance. Reserves are settled through the reserve sharing agreement.

Where a constraint has been bound on a transmission line and market units redispatched to limit flow across that line, MOS will not release the bound constraint until such time as the flow on the line has been reduced, by an amount determined by SPP no greater than x on a flowgate by flowgate basis, of the total line limit. Delaying release of the bound constraint is designed to prevent oscillating dispatch up and dispatch down instructions on the marginal unit impacting the line.

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Uninstructed Deviation

Uninstructed Deviation is the difference between the dispatch instructions and the actual [resource production \(ARP\)](#). Uninstructed Deviation is calculated for all Resources. The difference is calculated for the end of each Deployment Interval. These differences are captured for integration purposes and further analysis.

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Any Resource that deviates from SPP Dispatch Instructions more than 10%, adjusted for regulation capacity and limited to a minimum of 1 MW, for 6 consecutive intervals will be removed from the dispatch process of the market for the remainder of the day and the day after such deviation is noted. This will result in those identified Resources being designated as Self-dispatched units. For Resources carrying spin and non-spin capacity, the intervals during an SPP Automated Reserve Sharing event will be ignored for the purposes of determining uninstructed deviation.

Uninstructed Deviation vs. Imbalance Example 1

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Generator A is available for SPP deployment

Schedule for hour ending 1300:

Generator A to Load A 100 MWh

<u>Time</u>	<u>Schedule</u>	<u>Dispatch Instruction</u>	<u>Instantaneous Measurement</u>	<u>Uninstructed Deviation</u>	<u>Settlement Measurement</u>
1215	100 MW	100 MW	85 MW	-15 MW	
1230	100 MW	120 MW	129 MW	9 MW	
1245	100 MW	110 MW	130 MW	20 MW	
1300	100 MW	100 MW	100 MW	0 MW	

110 MWh

Imbalance = (Actual MWh - Scheduled MWh)

Imbalance = (110 MWh - 100 MWh) = 10 MWh surplus

Uninstructed Deviation vs. Imbalance Example 2

Generator A is available for SPP deployment

Schedule for hour ending 1300:

Generator A to Load A 100 MWh

<u>Time</u>	<u>Schedule</u>	<u>Dispatch Instruction</u>	<u>Instantaneous Measurement</u>	<u>Uninstructed Deviation</u>	<u>Settlement Measurement</u>
1215	100 MW	125 MW	110 MW	-15 MW	
1230	100 MW	125 MW	110 MW	-15 MW	
1245	100 MW	125 MW	110 MW	-15 MW	
1300	100 MW	125 MW	110 MW	-15 MW	

110 MWh

Imbalance = (Actual MWh - Scheduled MWh)

Imbalance = (110 MWh - 100 MWh) = 10 MWh surplus

9.3 Timing

9.3.1 GEN, PLT and VDD Resources

Dispatch instructions for GEN, PLT, VDD type Resources are calculated every 5 minutes beginning at 0000. The instruction is a set point for the end of the Deployment Interval and is communicated 5 minutes before the beginning of the Deployment Interval. The instructions are

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communicated through the Internet to a listener and use XML format as the primary delivery mechanism. The MW set point portion of the instruction will also be available through an ICCP point defined for each Resource. SPP will communicate the ICCP Deployment Instructions through the SPP Net. The XML instruction will be the basis for all settlement calculations and resolution of any disputes. NSI is calculated every 4 seconds and incorporates the ramping data from the Resource Plans and RTO_SS. The NSI is communicated using ICCP.

The interval between the communication of a Dispatch Instruction and the beginning of the Deployment Interval will be periodically reviewed to determine whether the time lag can be reduced.

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11.2.4 Public Market Data for Settlement

The Commercial Model, COS Entity Validation (SL to TSIN mapping), and SPP Loss Matrix shall be available to all market participants for download via the SPP portal and via the Commercial Operations Systems Programmatic Interface. The data will consist of a separate XML file for each. Each file will contain the following information:

- Commercial Model shall contain SPP's transaction point list with details of transaction point type (e.g. GEN, LOAD, VDDR, etc.), start date, and end date. This list will be maintained by SPP and communicated when transaction points are added, changed, and/or deleted.
- COS Entity Validation (SL to TSIN mapping) shall contain the relationship between Settlement Location, PNode, NERC Source/Sink Name, Start Date, End Date, PSE, and Control Area. This list will be maintained by SPP and communicated when transaction points are added, changed, and/or deleted.
- SPP Loss Matrix shall contain Season, Source, Sink, and the loss % for each Transmission Owner for each Source/Sink pair in the SPP Loss Matrix table.

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11.4.1.6 Settlement for VDD Resources

SPP shall use the following parameters to calculate the settlement quantity for VDD Resources.

- The MW demand at the VDD Resources node for the Deployment Interval immediately prior to the start of deployment the VDD Resource. This parameter is Demand_{PreDeployment}.
- Deployment Instruction MW values.
- The MW demand of the VDD Resource node for those Deployment Intervals that SPP deploys the VDD Resource. This parameter is Demand_{DuringDeployment}
- Planned Megawatt values from the applicable Resource Plan.

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SPP shall calculate VDD Response according to the following:

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VDD Response Settlement Quantity = (Lesser of Planned Megawatt or Demand_{PreDeployment}) – Demand_{DuringDeployment}

Comment [hjf7]: Not saying this is good or bad but it is a rather significant Settlement change. Just stating fact. The WR comments lend to treating the VDD almost to the extent the DRTF had proposed handling Block Dispatch. I think one of the reasons for stripping Block dispatch was for simplification and treating these almost

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12.2.1 Registration of Generation Resources and Loads Acting as a Resource

Any MP operating Resources within SPP must register with SPP. To register a Resource, an applicant must submit a Registration Package (Appendix A) and be capable of performing the functions of a Resource as described herein. Resources are registered on a nodal basis to Settlement Locations. Resources at the same physical and electrically equivalent injection point to the transmission grid may register at the unit or plant level.

12.2.1.1 Responsibilities of the Resource

Each MP shall be responsible for conducting its operations in accordance with all applicable SPP market rules and guidelines. Each MP shall supply operating characteristics of its Resource, including, but not limited to: Capability, Ramp rate, Location of physical Resource, Legal owner. To the extent that Resources are energy limited and/or intermittent it is the responsibility of the MP to ensure that their Resource Plan reflects the proper availability. Registration shall also include the Settlement Location and Settlement Area of the Resource. The MP is responsible for ensuring that real-time settlement meter data is submitted to SPP.

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12.2.1.2 Demand Response Resources

Variable Dispatch Demand Response (VDDR) Resources will require a virtual generator to be created in the EMS Network Model. A VDDR Resource will be registered with its associated Demand Response Load (DRL). A separate pricing node will be established for VDDR Resources; however, those node(s) will be identical to the locations corresponding to the Demand Response Load.

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The DRL for each VDDR Resource must be wholly contained within, or be identical to, an existing Load Settlement Location in the same Settlement Area as the Resource. There will be no EIS market settlement against a DRL but hourly integrated meter data will be a required submission after the fact to determine the integrated Meter Actual for the VDDR as described in Appendix E. Real-time SCADA of the actual energy consumption of the DRL must also be submitted via ICCP in order to validate the operation of VDDRs and for the calculation of Uninstructed Resource Deviation.

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Comment [h8]: Alternative measurement language

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Deleted: A VDDR Resource's registration with SPP is only valid if applicable State Laws and/or the VDDR Resource's host utility's retail tariff enable the VDD Resource's participation in the EIS Market. SPP will validate the VDDR Resource's registration compliance.

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Those VDDR Resources using the submitted response method will be required to submit real-time SCADA the actual response via ICCP the same as generator resources

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Appendix E– Settlement Metering Data Management Protocols

Resources (Generation) Metering

7.1.1 Net

Resource (Generator) Settlement Location data will be provided as net at the SPP Node.

According to the sign convention, a negative [-] value will indicate a net injection at the SPP Node, where a positive [+] value will indicate a net withdrawal at the SPP Node (e.g., auxiliary Load not covered by generation gross output) for that Settlement Location. The “net” shall be determined by the “gross” output (reflected as a negative number) plus the unit auxiliary power and applicable losses.

When metering limitations require “gross” values to be used, the “gross” to “net” calculation method must be mutually agreed upon between SPP, Meter Participant, and Metering Parties.

7.1.2 Joint Owned Unit (JOU) Generation

JOU Settlement Location data reporting must be consistent with the JOU registration outlined in Section 11.2.4.

7.1.3 Generation Loss Compensation

Metering for a Resource must be loss compensated, when the meter is not at the SPP Node. Please reference to Section 9 of this document for the complete loss compensation requirements.

7.2 Load Metering

7.2.1 General

Load data must be submitted in hourly intervals according to the sign convention. All Loads should be reported as a positive [+] value to indicate a net withdrawal at the SPP Node.

7.2.2 Load Loss Compensation

Metering for a Load must be compensated for any distribution and transmission losses.

When the meter is not at the SPP Node, the meter value must be loss compensated for losses up to the SPP Node.

The SPP Node meter value will also be loss compensated by the Host Transmission Owner’s SPP Transmission Tariff Attachment M Loss Percentage, when applicable.

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Please reference Section 9 of this document for the complete loss compensation requirements.

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7.2.3 Residual Load

Residual Load is the Settlement Area NAI plus sum of all Resource Settlement Locations excluding all other Settlement Locations reported separately.

Residual Load is calculated slightly different from other Load Settlement Locations. The calculation for Residual Settlement Location does not include the SPP Transmission Tariff Attachment M Loss Percentage.

Residual Load is submitted in the same manner as other Settlement Locations for Loads.

7.2.4 Demand Response Loads associated with Variable Dispatch Demand Response (VDDR) Resources

Demand Response Load associated with a VDDR Resource will be reported according to the other requirements of this Appendix E. Specific EIS settlement will not be performed on the DRL.

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Prior to settlement, the submitted metered load of the Load Settlement Location within which the DRL is located will be grossed up by the meter value of the associated VDDR Resource. This is to prevent double payment for the same EIS since the demand reduction is settled as Resource output.

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7.3 Variable Dispatch Demand Response (VDDR) Resource Metering

Settlement Meter Data for a VDDR Resource will be calculated by subtracting the submitted meter data for the associated DRL from the lesser of the adjusted Hourly Load Profile of the DRL or the pre-deployment measurement of the DRL.

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For VDDR Resources using the alternative measurement approach, meter data for the hourly integrated actual response may be submitted directly for the Resource instead of being calculated from the Hourly Load Profile and the DRL.

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Proposed Tariff Language

Comment [h9]: Alternative measurement language.

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1.1.29a Variable Dispatch Demand Response Resource

A controllable load that is a Dispatchable Resource and can reduce the withdrawal of energy from the transmission grid when directed by the Transmission Provider.

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1.2.2 (f) Calculation of real-time Demand Response from Variable Dispatch Demand Response Resources.

At the time of registration, the Market Participant that registers a Variable Dispatch Demand Response (“VDDR”) Resource shall notify the Transmission Provider whether it intends to use the Calculated Real-Time Response methodology or the Submitted Real-Time Response methodology. The Submitted Real-Time Response methodology can only be used for VDDR Resources that are utilizing strictly Behind-the-Meter Generation to provide the response or where the Retail Provider is offering the Resource under an agreed upon Retail Tariff provision that includes near real-time measurement and verification terms. If the Market Participant chooses the Submitted Real-Time Response methodology, the Market Participant must notify the Transmission Provider that the appropriate arrangements have been completed.

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(a) Under the Calculated Real-Time Response methodology, the demand response provided by the VDDR Resource is calculated by SPP as the difference between hourly load profile and the real-time value of the associated Demand Response Load (as defined in the Market Protocols) received by an acceptable real time telemetry method as prescribed in the Market Protocols, whenever the VDDR Resource’s deployment instruction is greater than zero [0]. This value represents the actual net generation.

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(b) Under the Submitted Real-Time Response methodology, the demand response provided by the VDDR Resource is sent directly to SPP via ICCP. This value will represent the actual net generation.

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Deleted: This hourly load profile must include, at a minimum, all hours the VDDR Resource is submitted as Available in its Resource Plan plus one hour prior and one hour following.

2.2.3

A VDDR Resource, using the Calculated Real-Time Response methodology, shall include in its Resource Plan an hourly load profile of the Demand Response Load (as defined by the Market Protocols) at the VDDR location in MWh absent dispatch by the Transmission Provider.

The hourly load profile may be adjusted by SPP prior to the calculation of URD and EIS Settlement, as described in the Market Protocols, if there have been deviations in hourly integrated metered load from the hourly load profile during periods when the Resource was not dispatched, but in the Available status.

An hourly load profile is not necessary for a VDDR Resource using the Submitted Real-Time Response option methodology.

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5.1.1

VDDR Resource Settlement Quantity

For a VDDR Resource using the Calculated Real-Time Response methodology, the Resource’s actual net generation for settlement purposes, shall be calculated by SPP as follows:

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(i) Resource's actual net generation = Lesser of (hourly load profile or Demand_{PreDeployment}) - Demand_{DuringDeployment}

(ii) Demand_{PreDeployment} is the MW demand at the VDDR Resource's node for the Deployment Interval immediately prior to the start of deployment of the VDDR Resource.

(iii) Demand_{DuringDeployment} is the MW demand of the VDDR Resource node for those Deployment Intervals that SPP deploys the VDDR Resource.

For those VDDR Resources using the Submitted Real-Time Response methodology, SPP shall use the MWh value submitted by the VDDR Resource's meter agent for settlement.

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Deleted: This parameter is Demand_{PreDeployment}.

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Deleted: This parameter is Demand_{DuringDeployment}

Deleted: Hourly load profile values from the applicable Resource Plan.

(v) . The Transmission Provider shall calculate VDD Response according to the following:
 ARP (VDDR Resource Imbalance Energy Settlement Quantity) = (Lesser of Planned Megawatt or Demand_{PreDeployment}) - Demand_{DuringDeployment}

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Estimated Impact Analysis

<p><u>SPP Staffing Impacts (across all areas)</u></p>	<p><u>No additional personnel</u></p>
<p><u>SPP Computer System Impacts</u></p>	<p><u>Registration: New VDD Resource Type needs to be defined and Demand Response Load also needs to be defined and added. Also need a linkage between these two and add that relationship to the COS/MOS transfer.</u></p> <p><u>XML Message: New Resource Type added to document for dispatch instructions and Resource Plan. New notification for deviations from Hourly Load Profile. Need to create new message type for submittal of Hourly Load Profile</u></p> <p><u>MOS: New table for Hourly Load Profile. Code development to handle new resource type. Code development to calculate URD.</u></p> <p><u>RTOSS: N/A</u></p> <p><u>Short-term Load Forecast: Must gross up BA load by Resource actual. Capability exists but need calculated SCADA points defined.</u></p> <p><u>MOS Operator Interface: Add new display for demand response resources which would include the hourly load profile, dispatch and calculated/reported response.</u></p> <p><u>MOS User Interface: Add new screen(s) for VDDR Resources, DRL and Hourly Load Profile. Be able to import Hourly Load Profile from XML file or receive through API and allow modification using MUI.</u></p> <p><u>Settlement: Modify Settlement calculation process for demand response to calculate amount from Hourly Load Profile and meter data from Demand Response Load. Filter DRL from EIS settlement. Develop application to calculate the average deviation from the Hourly Load Profile when not dispatched. Settlements functionality presumably frozen until new Settlement System delivered.</u></p>

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<p><u>SPP Business Function Impacts</u></p>	<p><u>Market Monitoring will have increased need to monitor verification of demand response.</u></p> <p><u>Market Operator training on Demand Response</u></p> <p><u>Settlements training on new calculations for Demand Response</u></p> <p><u>Testing</u></p> <p><u>External Testing</u></p>
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