Microgrid Resources Coalition

June 22, 2018

FEDERAL ENERGY REGULATORY COMMISSION

Participation of Distributed Energy Resource Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators	)))))	Docket No. RM18-9-000
Distributed Energy Resources – Technical Considerations for the Bulk Power System	)))	Docket No. AD18-10-000

COMMENTS OF THE MICROGRID RESOURCES COALITION

The Microgrid Resources Coalition ("MRC") welcomes the opportunity to provide comments in response to the Commission's recent Notice of Technical Conference, dated February 15, 2018, relating to Participation of Distributed Energy Aggregations in Markets Operated by Regional Transmission Organizations and Independent System Operators (Docket No. RM18-9-000) and Distributed Energy Resources – Technical Considerations for the Bulk Power System (Docket No. AD18-10-000) (the "Notice").[1] The MRC is a consortium of leading microgrid owners, operators, developers, suppliers, and investors formed to advance microgrids through advocacy for laws, regulations and tariffs that support their access to markets, compensate them for their services, and provide a level playing field for their deployment and operations. In pursuing this objective, the MRC intends to remain neutral as to the technology deployed in microgrids and the ownership of the assets that form a microgrid. The MRC's

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[1] FERC Notice of Technical Conference, February 15, 2018 [hereinafter "Notice"].

members are actively engaged in developing and operating advanced microgrids in many regions of the United States.[2]

In its Notice, the Commission has carried forward the discussion, begun in Docket No. RM16-23-000[3] about the appropriate participation model for distributed energy resource (DER) aggregations. The MRC filed comments in the earlier docket that were largely directed at this question.[4] As we indicated at the time, we appreciated the proposal that DER aggregations be allowed to register with Regional Transmission Organizations ("RTOs") and Independent System Operators ("ISOs," and together with RTOs, "RTO/ISOs") under the participation model that best suits the characteristics of the aggregation.[5] Subsequently, in Order 841, the Commission determined that storage resources that do not make net exports should participate as demand response resources, not as electric storage resources.[6] Aggregations of diverse, behind-the-meter resources that are under common control, whether as a single microgrid or as a collection of resources at different locations, often can deliver performance characteristics that are very different than any of the individual resources included in the aggregation. The MRC

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[2] The MRC is actively engaged in advancing the understanding and implementation of microgrids across the country. MRC members own significant energy assets connected to the electric grids, provide energy generation and supply services, and are undertaking microgrid construction in different locations throughout the country. MRC members include: Anbaric Transmission, Commonwealth Edison, Concord Engineering Group, Eaton, ENGIE, ICETEC Energy Services, Inc., Massachusetts Institute of Technology, NRG Energy, Inc., Princeton University, and Thermo Systems. The MRC is affiliated with the International District Energy Association ("IDEA"), which connects members from all over the country operating combined heat and power plants and microgrids. This filing reflects the position of the MRC as an organization and should not be construed to reflect on the positions of any individual member.

[3] Federal Energy Regulatory Commission, *Notice of Proposed Rulemaking: Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 81 Fed. Reg. 86522, proposed Nov. 30, 2016.

[4] Docket No. RM16-23-000, *Comments of the Microgrid Resource Coalition*, filed January 30, 2017.

[5] *See* Federal Energy Regulatory Commission, *Notice of Proposed Rulemaking: Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators*, 81 Fed. Reg. 86522 at 86523, proposed Nov. 30, 2016; Docket No. RM16-23-000, *Comments of the Microgrid Resource Coalition*, filed January 30, 2017, at p. 6.

[6] 162 FERC ¶ 61,127, Order No. 841: Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators, issued February 15, 2018, errata issued February 28, 2018.

continues to strongly support the ability of aggregations of behind-the-meter resources to participate in RTO/ISO markets to the fullest extent of their capability.

The Commission's Notice of Technical Conference raised questions about the performance of DER and aggregations of DER. Some of those questions raised suggestions about the structural implications of DER participation that the MRC wishes to address. Those interrelated questions can be summarized as follows:

- What types of grid architecture will support the integration of DER aggregations into the RTO/ISO markets?[7]
- How should RTO/ISOs, DSOs and aggregators coordinate on the registration and dispatch of DER aggregations?[8]
- How can RTO/ISOs and DSOs distinguish between markets and services so as to prevent double counting and double compensation for aggregated resources?[9]

What follows begins with a foundational discussion of certain distinctions among microgrids – physically connected[10] "unified resource aggregations," non-physically connected "virtual DER aggregations" (such as curtailment service provider aggregations of demand resources), and DER generally. It continues with a discussion of each of the questions above and finally draws certain conclusions about participation of microgrids and other aggregated DER in RTO/ISO markets.

Introduction to DER, Microgrids and Aggregations

The MRC's principal interest in this proceeding is to establish a just and reasonable

[7] See Notice, Panel 6, introduction, bullet 5, and note 9.
[8] See Notice, Panel 6, introduction, and bullets 4 and 5, and Panel 7, introduction, and bullets 3, 4 and 5.
[9] See Notice, Panel 2, bullet 2, and Panel 3, introduction, and bullets 2 and 3.
[10] "Physically connected" refers to having the distribution lines and switching in place to collectively island from the grid.

participation model for microgrids. We define grid-connected microgrids[11] as physically-connected unified load and generation resource aggregations capable of operating in a collective island or in parallel with the grid providing services to the grid on a price responsive basis. In all of our advocacy, we seek opportunities for microgrids to compete to provide services that they are capable of providing and to receive competitive compensation for those services.[12] Equally, where other DER or virtual aggregations (non-physically connected) of DER can provide the same services as microgrids their treatment should be the same. It should be clear, however, that not all DER are capable of providing equal, or in many cases any, services to the grid. As unified aggregations, microgrids represent some of the most flexible, dispatchable and high-performance resources available to RTOs/ISOs and DSOs.

The notice raises a number of questions about DER and DER aggregations as if they were a single category, but clearly, they are not. Some DER, such as most currently installed residential solar, is neither capable of controlled output nor connected and visible to the grid operator (either the RTO/ISO or the DSO). At the other end of the spectrum, aggregated DER such as microgrids and demand resource networks, as well as some individual DER generation and electric storage resources have flexible, controllable output and are capable of being monitored and dispatched by grid operators. We refer to the former as "non-responsive" and the latter as "responsive." To deliver real-time services of any sort to the grid, resources (demand, generation and storage, aggregated or individual) must be

[11]For a full definition and discussion of microgrid characteristics, see discussion below on p. 5.

[12] As a corollary, we expect that microgrids will pay for (but only for) services received at competitive prices for those services.

responsive, and RTO/ISOs can appropriately set criteria for responsiveness.[13] These criteria will vary appropriately with the service. Contrast frequency regulation resources that respond to signals in two seconds with resources that provide ten-minute reserves. As the commission recognized with respect to electric storage resources, arbitrary service definitions that exclude the capabilities of otherwise valuable resources reduce the depth and breadth of grid capacity and the competitiveness of RTO/ISO markets.[14]

Our concern in this filing is with groups of DER, whether organized as microgrids or virtual aggregations, that are collectively responsive.[15] Widespread deployment[16] of non-responsive DER may cause operational difficulties such as the California "Duck Curve,"[17] and giving grid operators visibility to these resources (even without control) may have some benefits for both operation and planning. In contrast, microgrids and other responsive DER, however, not only do not cause operational problems, but they are capable of providing grid services that mitigate the systemic effects of non-responsive resources. Responsive DER are not the problem, they are the solution.

The MRC defines a microgrid as "a local electric system or combined electric and thermal system that: (1) includes retail load and the ability to provide energy and energy

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[13] This related to communications capability as well as resource capability. Virtual aggregations may be capable of near instantaneous dispatch through secure, smart communications channels, but many involve telephone calls to independent operators.

[14] Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators, Order No. 841, 162 FERC ¶ 61,127 (2018). We have commented previously on the potential opportunities and benefits presented by competitive distribution support solution markets for DSOs. *See* Docket No. AD18-7-000, *Comments of the Microgrid Resource Coalition*, filed May 9, 2018, p. 13-15.

[15] Specifically, the MRC encourages the Commission to distinguish responsive DER from the challenges presented by non-responsive DER and to fairly recognize the capabilities of responsive DER.

[16] We strongly suggest that the use of the word "penetration" is inappropriate at a number of levels. DER are system resources, not enemy forces.

[17] *See e.g.* California ISO, *Fast Facts: What the Duck Curve Tells Us About Managing a Green Grid* (2016), available at www.caiso.com/Documents/Flexibleresourceshelprenewables_FastFacts.pdf. However, as we have pointed out elsewhere, microgrids can assist in solving this problem. Docket 16-EPIC-01, *Comments of the Microgrid Resource Coalition in Response to the October 2, 2017 Review Draft of the roadmap for Commercializing Microgrids in a California,* filed November 13, 2017.

management services needed to meet a significant proportion of the included load on a non-emergency basis; (2) is capable of operating either in parallel or in isolation from the electrical grid; and (3) when operating in parallel, can provide some combination of energy, capacity, ancillary or related services to the grid." A microgrid can be as simple as a cogeneration facility serving included load behind a single meter with an isolation breaker, but sophisticated microgrids often serve larger facilities or campuses and are increasingly serving multiple customers. The included loads have diverse needs and are served by diverse generating and storage resources as well as direct controls such as building management systems. The same advanced control functionality that permits them to manage complex host operational requirements behind the meter also allows them to provide increasingly sophisticated services to the larger grid. As we have argued elsewhere, collocating advanced resource functionality with load is the real source of grid resilience.[18] The grid has only begun to take effective advantage of the capabilities of microgrids.

Microgrids can be developed and operated by a variety of parties. Princeton University is a single electric customer that owns its microgrid. The nearby Princeton Medical Center has a microgrid operated for its benefit, which is owned and operated by NRG. In certain jurisdictions, it can be very difficult to organize an efficient aggregation of customers to support a multi-customer microgrid or other distribution level resource because of limitations on retail sales or distribution of electricity.[19] Nevertheless, special purpose entities formed as retail electric suppliers, co-operatives or owners associations can either develop and own or

[18] Docket No. AD18-7-000, *Microgrid Resources Coalition, Motion to Intervene and Comments on Grid Resilience in Regional Transmission Organizations and Independent System Operators*, filed May 9, 2018.
[19] Docket No. ER16-1085, *Microgrid Resources Coalition, Motion to Intervene and Comments on California Independent System Operator Corporation's ("CAISO") Distributed Energy Resource Provider Initiative*, filed March 25, 2016.

contract with third parties to own and/or operate a microgrid for multiple customers.[20] A microgrid can be developed as a utility-private partnership, in which the distribution utility owns the wires and meters the retail customers, but generation and other operating services are provided by customers or third parties, as is being done in the Hudson Yards project. In Borrego Springs, California, San Diego Gas & Electric has created a microgrid to improve the resilience of the local community. It owns the wires and storage resources, while customers supply included generation. [21]

Characterizing DER Aggregation Capabilities

Participation by microgrids and other aggregations in the RTO/ISO market can also take many forms. In the experience of MRC members, owner operators of single enterprise microgrids rarely become RTO/ISO members, but more typically participate in the markets through agents who are RTO/ISO members. In the case of several MRC members, the agent also provides consulting services on the optimization of the microgrid to serve both internal thermal and electric loads and provide services to the RTO/ISO market. The agent acts, in effect, as the aggregator of the resources within the microgrid ranging from generation to building load management. Third-party owner operators of microgrids for commercial,

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[20] See discussions of regulatory structures and utility partnerships in District of Columbia Public Service Commission, Formal Case No. 1130, *Comments of the Microgrid Resource Coalition on Formal Case No. 1130 Modernizing the Energy Delivery System for Increased Sustainability*, filed April 15, 2016; Robert Walton, *ConEd's Hybrid Service Model for Large Microgrid Could Become Standard*, UTILITYDIVE, Feb. 21, 2018, https://www.utilitydive.com/news/coneds-hybrid-service-model-for-large-microgrid- could-become-standard/517413/; and Discussions of utility private partnerships in Maryland Public Service Commission, ML#199669, *Microgrid Resources Coalition, Comments in Response to Notice of Public Conference In the Matter of Transforming Maryland's Electric Distribution Systems to Ensure that Electric Service is Customer-Centered, Affordable, Reliable, and Environmentally Sustainable in Maryland* ("PC44"), filed October 29, 2016; Formal Case No. 1130, *Comments of the Microgrid Resource Coalition on Formal Case No. 1130 Modernizing the Energy Delivery System for Increased Sustainability*, filed April 15, 2016.

[21] Berkeley Lab, *Microgrids at Berkeley Lab: Borrego Springs*, available at https://building-microgrid.lbl.gov/borrego-springs

industrial or institutional facilities, may manage many such installations and act as their own direct participant in RTO/ISO markets. However, their contractual obligations to each customer are likely to require them to act to optimize separately on behalf of each customer. Aggregators that assemble portfolios of individual demand response resources under separate management, may not be involved in the day to day management of those resources, but have either fixed or flexible rights to call on the contracted assets into their virtual aggregations.

Whether agents act as virtual aggregators or simply bid in one resource at a time is currently largely a matter of RTO/ISO policies. Often if individual resources are below a minimum bid threshold, they can only participate through aggregations. In PJM, a single agent is generally forced to aggregate across demand resources. Under ISO New England's new market integration rules, agents can generally register sizeable demand resources individually or in multiple tranches.

The MRC suggests that RTO/ISO market participants acting as agents or aggregators should have flexibility to define and bid their DER resources and resource aggregations under their control. Power markets for decades have accommodated, on the one hand, unit specific contracts and ownership or bidding control of partial resources, and, on the other hand, non-specific contracts which may involve delivery of power from multiple sources. The principle of responsiveness requires that the grid operators know where power is coming from, but operators and agents of multiple resources within a single microgrid or across many locations in a virtual aggregation should be able to bid those resources in part or in whole, in aggregation or separately and as demand response below included load and as delivered power above included load.[22] Lower limits on resource size are appropriate and limits on frequency of reconfiguration may be also be appropriate in some circumstances, but as discussed more extensively below, the MRC believes that the metering and communications to accomplish this flexibility as a technical matter are commercially available at reasonable costs.

In its Order in the California Independent System Operator Corporation's Distributed Energy Resource Provider Initiative,[23] the Commission permitted participation in aggregations of separately metered resources independent of the various attributes of the other loads and resources behind the meter. The critical feature of this arrangement is the ability to define the limits of participation so that the aggregator, and hence the system operator, can dispatch the aggregation within those limits. For a microgrid operator, it should likewise be enough to present a defined and measurable group of resources in a unified aggregation or otherwise that is dispatchable within defined limits.[24] An aggregation may be able to absorb power (have a charging rate) and deliver power (have a discharge rate) but that likely will not fully describe its capabilities. The Commission should act to require RTO/ISOs to give agents and aggregators as much flexibility as feasible to define resources, resource aggregations, and their capabilities in the RTO/ISO markets.

Grid Architecture and the Grid of the Future

Many forces are driving the deployment of DERs. The forces operate first at the

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[22]A customer may elect to install a 40 MW resource behind the meter in order to meet its summer peak load in island mode and have 10 MW to export in a winter crisis. Currently, PJM would not permit this, and ISO New England would limit exports to 5MW. Capacity market participation by behind-the-meter resources faces even greater hurdles.

[23] *California Independent System Operator Corporation's Distributed Energy Resource Provider Initiative,* 155 FERC ¶ 61,229 (June 2, 2016).

[24] Like any other resource, such an aggregation would be subject to penalties if it does not meet dispatch instructions.

customer level, including customer desires for low price, high power quality, low carbon power and local resiliency. But each of these forces is reflected and amplified at the grid level as well: low cost resources drive the competitiveness of RTO/ISO markets; resources with the capability to produce high power quality locally will help preserve power quality on the grid; low carbon resources directly implement societal environmental goals; and the MRC believes that widespread deployment of microgrids is a critical part of any strategy to create a more resilient grid. As we outlined at some length in our filing in Docket AD18-7-000,[25] the MRC concurs with the Commission that a new grid architecture is required to implement the expansion of DER. We believe that the development of a resilient grid will rely on a partnership between RTO/ISOs, utilities and local resources, where utilities act as a platform for responsive DER, such as microgrids, on the distribution system. We focused on the importance of developing resilient grid delivery architecture by reference to the 2017 report prepared by the National Academy of Science, Engineering and Medicine: Enhancing the Resilience of the Nation's Electricity System.[26]

The MRC also anticipates that a new control architecture will be required as an integral component of this efficient, resilient new grid. In their paper, A Strategic Framework for Integrating Advanced Grid Functionality, June 2014, ("Strategic Framework") Jeffrey Taft, Paul De Martini, and Rick Geiger, argue that the increasing complexity of the grid arising from the multiplication of locally controlled resources, communication loops, and grid configuration options can give rise to problems that stem "from coupling of otherwise apparently siloed

[25] Docket No. AD18-7-000, *Microgrid Resources Coalition, Motion to Intervene and Comments on Grid Resilience in Regional Transmission Organizations and Independent System Operators*, filed May 9, 2018.
[26] National Academy of Science, Engineering and Medicine: Enhancing the Resilience of the Nation's Electricity System, 2017, available at https://www.nap.edu/catalog/24836/enhancing-the-resilience-of-the-nations-electricity-system.[hereinafter "NAS Report"].

systems through the operation of markets and the electric physics of the grid."[27] They suggest that future grid architecture must exhibit "federation" to allow relative autonomy at each level while operating in a coordinated fashion, and must fuse complex and wide-ranging constraints that manifest at different levels into comprehensive control solutions.[28] They believe that this approach will achieve resilience "in a world where maintenance of normal operation is desired and expected in spite of device and system failures"[29] and will work to accomplish "[f]low reconfiguration, stabilization, and regulation across discontinuous failure events, ride through for critical loads, minimized recovery times after extreme events, and tolerance of unpredictable market behavior. . . ."[30] Overall, the MRC believes the grid is beginning an evolution from a traditional hub-and-spoke type system to a cellular mesh of resources deployed in aggregations that enable federated functionality.

Achieving networked control architecture, as with physical grid architecture, will require a collaboration between RTO/ISOs, distribution utilities, and the customers and communities on their systems. That collaboration must begin with the Commission including state and local authorities in grid planning. The MRC anticipates a future where, technology, cost and customer empowerment trends will push our grid architecture to be smarter, self-healing, flexible, competitive, efficient, visible and resilient.

Registering and Tracking Aggregated Resources

[27] A Strategic Framework for Integrating Advanced Grid Functionality, June 2014, Taft, J., De Martini, P., and Geiger, R., Pacific Northwest National Laboratory, at 6, available at https://gridarchitecture.pnnl.gov/media/advanced/ULS%20Grid%20Control%20v3.pdf [hereinafter "Strategic Framework"].
[28] Id. at 8.
[29] Strategic Framework at 8.
[30] Strategic Framework at 9.

Fully enabling a networked grid and further enabling agents to bring the full capabilities of responsive DER aggregations into the system requires effective tracking of resources across the system. To properly permit resource aggregations to make flexible bids and to avoid double counting and double compensation,[31] a networked control architecture will need to provide a unique "address" for each portion of a resource or aggregation of resources that is providing services at any level of the system. This process must begin with the interconnection of the resource. Just as any generating resource must specify its parameters of operation in connection with the design of its interconnection, including ones that are interconnected at the distribution level, responsive DER that expects to participate in the markets needs to specify its expected modes of operation. As with other resources, within safety and technical parameters, such specification should be allowed to include a range of operational modes, products and services. Responsive DER can establish their physical capabilities subject to any residual distribution system constraints (e.g. within a microgrid's or a local utility's distribution system). That will establish the limits of its ability to provide services to the grid as an initial element of registration. The Commission has jurisdiction and visibility into the interconnection process to help establish uniform processes that do not unnecessarily restrict open access.[32]

Distinguishing Between Markets and Services; Avoiding Double Counting

A responsive DER resource providing services to an RTO/ISO must directly or through an agent or aggregator register as a market resource (for an organized market) or otherwise

[31] In its Notice, the Commission expressed a need to be able to track performance of resources to avoid double counting and double compensation. Notice, Panel 2, bullet 2, and Panel 3, introduction, and bullets 2 and 3.
[32] Federal Energy Regulatory Commission, *Order 828: Requirements for Frequency and Voltage Ride through Capability of Small Generating Facilities*, 156 FERC ¶ 61,062, issued July 21, 2016.

contract to provide services to the relevant grid operator. A services contract, as discussed further below, will set the terms (including price and performance) for a relevant set of resource capabilities. In an organized market, those parameters will be set by tariff definitions of a product and the results of the auction. In either case, each agent or aggregator must be required to specify by bid or contract a non-overlapping (mutually exclusive) committed capacity range for each potentially overlapping product or service that it offers in each time frame for which it makes a bid or contract.[33] Each market participant must be responsible for not double committing its capacity across markets, and a grid operator (at any level) can assure itself that a proffered resource has no conflict as a condition of market participation.

As an example of this fundamental condition to participation in markets, A 100 MW power plant can bid 70 MW for energy and 30 MW for spinning reserve in day-ahead ISO/RTO markets, but its bid in both markets cannot be greater than its total physical capacity. Similarly, a customer with a microgrid including a 30 MW average load and a 20 MW behind-the-meter generator can elect to reserve 15 MW of self-generation capacity for its own use as it decides and make a 10 MW demand response bid by reserving 5 MW of generation capacity and confirming that the building and process management systems for its facilities are ready to shed 5 MW of load across non-critical functions. It cannot use the last 5 MW of generation capacity to serve its own load unless called by the system operator.[34]

Once the identity / address of an as bid or as contracted resource or aggregation is

[33] Overlap must be parsed carefully, providing capacity doesn't overlap with offering reserves or energy in a day ahead market, and being called to run and provide energy when selected for reserves does not create an overlap. Having the same tranche of capacity committed for both reserves and energy is overlap.

[34] Further, a customer could bid 5 MW of demand response and satisfy that obligation with generation, storage, load shedding, or a combination so long as it has the collective capability to meet all its bid obligations.

established though registration at any level of the system, that commitment of capacity from the identified resource or resources must propagate through the system to be available to grid operating systems at all levels.[35] This will allow the systems serving RTO/ISO and DSO markets to flag contradictory commitments and reject incompatible bids. When a responsive resource does run, it will be compensated for the (customized or standardized) service it is providing with the applicable tranche of resource capability directly or as a component of an aggregation per its contract with the aggregator. Not all products are overlapping, of course. Disambiguating potentially overlapping services that do not have commensurate definitions will be an important function of the cooperation between RTO/ISOs and DSOs.[36] In sum, double counting of aggregated DER resources can be controlled through restrictions on bidding the same increment of physical capacity into multiple overlapping markets.

Integrated RTO/ISO and DSO Operation

The difficulty of identifying overlapping service commitments from DER aggregations goes beyond the bid commitment and aggregated resource information flow issues described in the previous sections. Markets and services simply are poorly specified or non-existent at the DSO level. The Notice asked the question:

> Should distribution utilities be able to override RTO/ISO decisions regarding day-ahead and real-time dispatch of DER aggregations to resolve local distribution issues? If so should DER aggregations none-the-less be subject to non-delivery penalties in such circumstances?[37]

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[35] While ideally this will eventually happen through automated, integrated control processes, it can be accomplished through secure communication channels established for the purpose and capable of communicating with existing IT systems.

[36] Single responsive DER resources (including unified aggregations) that participate in markets directly and through virtual aggregations, must avoid double bidding the same capacity across both paths to market.

[37] Notice at 10.

This is a frightening question, as it suggests unilateral conscription of resources. A DSO should not be able to call on the services of a local resource unless it has acquired that right in a market or by other contract for distribution support services. It can't simply commandeer them. In addition, the parameters of a DER's ability to deliver services over the distribution system should be established in connection with interconnection (as revised from time to time through normal processes) and so long as the resource operates within those parameters, it should not be subject to penalties arising from the DSO's failure to perform. To the extent that NERC rules empower DSOs to disconnect responsive DER in a load-shedding emergency (including during times a DER is committed by bid to the RTO/ISO), that eventuality should not create a barrier to a DER resource aggregation's eligibility to participate in RTO/ISO markets.[38] A multi-location aggregation may still be able to meet its market commitment in such circumstances, and, in any event, a DER should not be penalized for failures beyond its control.

Overall, this question is a symptom of the poorly defined relationship between DSOs and DERs. In the networked grid of the future, the economic consequences of alternative modes of grid operation to respond to emergencies need to be clear to all market participants, and DER and DER aggregations providing emergency services (such as shedding internal load to permit export of power) should be compensated appropriately.

There are, at best, early stirrings of markets at the DSO level. While it is important to develop DSO markets, they need not take the same form as current ISO/RTO markets. As an example, where local resources can improve the stability of a substation or decrease pressure on a radial circuit, or support essential community and distribution grid control services, the MRC

[38] Nor should it create a barrier to participation in DSO markets or contracts for "distribution support services" as discussed below.

has suggested that the distribution utility run a Request for Proposals for resources that can provide “distribution support services” on a mid- to long-term contracted basis as a preferred, customized alternative to the distribution utility implementing a traditional physical system capacity upgrade (often called a “wires solution”).[39] The California Public Utilities Commission has taken the lead in requiring that distribution utilities identify the locations on their system where distributed energy resources can make a contribution, and is exploring how to compensate distribution utilities so that they are indifferent between the distribution support service solution and the wires solution.[40] The Potomac Electric Power Company’s filing with the Maryland Public Service Commission for public purpose microgrids, proposes to acquire generation resources for the microgrids through RFPs and to treat the contracts for microgrid generation services as regulatory assets.[41] The MRC supports these approaches.

The MRC also suggests the consideration of a process for unsolicited proposals from DER providers to meet needs identified in a distribution system plan. In particular, we suggest a model based on Virginia’s Public Private Transportation Act, which allows private developers to make unsolicited proposals to resolve transportation system issues identified in state and regional transportation plans. This statute permits but does not require that unsolicited projects be bid out before they are awarded, in the discretion of the relevant public planning agency. In this context, we assume that the Commission or the relevant state public utility commission would either directly approve or give policy guidance on when a supplier would be permitted to proceed with

[39]Docket No. RM16-23-000, *Comments of the Microgrid Resource Coalition*, filed January 30, 2017; Microgrid Resources Coalition, *Comments to the Proceeding on Motion of the Commission in Regard to Reforming the Energy Vision*, New York Public Service Commission Case 14-M-0101, filed September 22, 2014. Note that we address “wires solutions” to mean traditional substation and line capacity upgrades.

[40] *California Independent System Operator Corporation’s Distributed Energy Resource Provider Initiative*, 155 FERC ¶ 61,229 (June 2, 2016).

[41] Potomac Electric Power Company, *Updated Proposal for a Pilot Program to Create and Evaluate Public Purpose Microgrids*, Maryland Public Service Commission Case No. 9361, February 15, 2018.

a non-competitive procurement based on factors such as the quality of the proposal and the urgency of the need. This has been a successful model in Virginia for over 20 years.

The existence of markets for services or products that support the transmission system on the one hand, and the distribution system on the other hand, raises issues similar to the issues raised by incompatible commitments of physical capacity in federally regulated markets. The MRC suggests that the regulatory response should be similar: no resource can commit the same capacity to two overlapping markets. Only one system operator is responsible for dispatching the increment of capacity that is committed to its market. The resource can only be compensated for that increment of capacity in the market to which it is committed and in which it is dispatched. If a grid edge resource has a long-term contract for distribution support services, it can't make an inconsistent commitment in an ISO/RTO day-ahead market. If it does, it is subject to penalties for non-performance.[42] Careful design of markets at all levels on a collaborative basis to avoid conflicts is prudent.

Conclusion

In conclusion, the MRC respectfully suggests:

- Responsive DER should be permitted to specify the mode of their participation in markets, whether full, partial, or through an aggregation.
- The Commission should take the lead in spurring development of intercommunicating, "federated" grid architecture that permits unique commitment of

[42] *Federal Energy Regulatory Commission v. Electric Power Supply Association (EPSA*) 136 S. Ct. 760, 764 (2016)(stating that transactions occurring at the wholesale level have "natural consequences" on the retail level and not seeing interference or problematic cross-price impacts between services at different market layers). Wholesale market access for behind-the-meter resources is natural, but inconsistent commitments for the same increment of a resource's (or an aggregation's) capacity is not. Unified resource aggregations such as microgrids are able to fulfill commitments using combinations of generation, load and storage resources. *See also*, Federal Energy Regulatory Commission, *Order 719: Wholesale Competition in Regions with Organized Electric Markets*, 125 FERC ¶ 61,071, issued October 17, 2008.

resources including DER and DER aggregations, across markets and other commitment systems operated by RTO/ISOs and DSOs.

- An architecture with unique addresses for all resources (both physical and as-bid) can prevent double counting and double compensation.

- The Commission should work with state regulators to define and limit the powers of RTO/ISOs and DSOs to countermand market or contractually committed dispatch in emergencies and define the compensation and protection from penalties for resources that are redirected.

- The commission should work with DSOs and state regulators to encourage compatible market and service contract structures at the DSO level.

The MRC believes that these steps are needed not only to resolve the questions raised by the Notice but also to achieve grid resilience.

Respectfully submitted,

Microgrid Resources Coalition

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CERTIFICATE OF SERVICE

I hereby certify that I have this day served the foregoing document upon each person designated on the official service list compiled by the Secretary of the Federal Energy Regulatory Commission in this proceeding.

Dated at Washington, D.C. this 22nd Day of June 2018.

/s/*Christopher Berendt*

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