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Regarding PJM's Response to Order 2222

Junichi Ogasawara
Senior Research Fellow, Assistant Director,
Electric Power Industry & New and Renewable Energy Unit,
The Institute of Energy Economics, Japan

Currently, northeastern U.S. wholesale power market and grid operator PJM is running into difficulty in considering its response to Order 2222, which the Federal Energy Regulatory Commission (FERC) is requiring it to comply with. Order 2222 was published in September 2020. It directs RTOs and ISOs that undertake wholesale power market and grid operations across wide areas to ensure that aggregators, which aggregate distributed energy resources (consumer equipment, including demand response sources), are able to participate in the wholesale power market in the same way as conventional power generation is. PJM filed proposed rules in response to FERC's order in February 2022, but in March 2023, FERC issued a directive instructing PJM to look at modifying its proposal, whose content it found lacking. FERC is seeking modification in a number of areas, but here I would like to take up those points that could be considered important.

The first point is that the distributed energy resources covered by aggregation belong to distribution grids. PJM administers and manages transmission grids, so administering and managing distribution grids is outside its sphere of operations. FERC is seeking the clarification of PJM's agency and procedure for determining the pros and cons of participation by aggregations of distributed energy resources, but conceivably, there was hesitation at PJM over how far it could clarify the procedures of distribution companies, which are outside its own jurisdiction. In addition, in PJM's proposed rules, when constraints develop in distribution grids, distribution companies are permitted to override dispatch instructions to distributed energy resources. However, FERC is seeking clarification of that procedure, and the removal of dispatch agent to individual distributed energy resources by PJM (aggregators designate distributed energy resources directly). The monitoring systems within distribution grids are outside PJM's jurisdiction, so in some respects clarifying the procedure is difficult, and alongside that, removing dispatch agent to distributed energy resources

is incompatible with PJM's idea of seeking overall optimization. Other RTOs and ISOs have frameworks for issuing dispatch orders by the aggregation unit, but this is having the effect of increasing administration costs on the aggregator side, including requiring aggregators to manage distributed energy resources while considering grid restraints, by sharing information on grid constraints in advance so constraints on distribution grids can be taken into account.

The second point is an issue concerning the geographical scope of aggregation. PJM and the majority of RTOs and ISOs are filing proposals that would halt aggregation at each transmission nodes (transformer substations). However, FERC is calling for further widening of geographical scope. If aggregation is undertaken for each transmission node, it will end up limiting the distributed energy resources that can be gathered, potentially reducing aggregators' operating breadth. On the other hand, if aggregation that straddles a number of transmission nodes is permitted, there is a possibility that aggregators will undertake the utilization of distributed energy resources without consideration for congestion between transmission nodes, thus posing the risk of further worsening grid constraints.

The third point is telemeters. Telemeters are devices that are equipped with a transmission function for exchanging data such as distributed energy resources' output values, and supply order values from PJM. Other RTOs and ISOs are requiring such data to be exchanged in a matter of seconds through telemeters, per aggregation unit, and as a result, it is necessary for distributed energy resources to be equipped with small versions of the telemeters that are installed at conventional power plants. This is making participation by small-scale distributed energy resources difficult. On the other hand, PJM is allowing the utilization of readings on distributed energy resources' inverters, making participation by even small-scale distributed energy resources possible. However, because telemeters are not installed, these distributed energy resources will not meet the requirements for participating in the capacity market. (At several other RTOs and ISOs, because telemeters will be installed, participation in the capacity market is being allowed). It appears this is also a matter being raised by FERC.

In response to these numerous points identified by FERC, at a June 5, 2023 meeting of PJM's in-house Distributed Resources Subcommittee, which is considering responses to Order 2222, a document titled "Where and How Much? MW

responsibilities of supply” was presented. This document noted the different roles of demand and generation. The challenges it raised included: “Must share the same primary transmission node (Where)” (In cases where market participants belong to the same transmission node, responsibility for grid constraints need to be shared); and “Capacity market participation includes real-time telemetry requirements (How much)” (Do distributed energy resources want to take part in the capacity market so much that they will install high-priced telemeters?). In some respects, there is also a sense that FERC is calling for the aggregation of distributed energy resources to be handled the same as conventional generation. Up to now, the responsibilities and capabilities required of the generation-side that provides capacity (MW) have not been required of distributed energy resources, which are consumer equipment. If an attempt is made to put them on an equal footing, it will require the same responsibilities and capabilities of the demand-side as those required of the generation-side, which the document pointed out “would be a much larger change than Order 2222.”

Distributed energy resources consist of a variety of technologies, including photovoltaic power generation, storage batteries and demand response sources. The New York ISO sets conditions for participating in the wholesale market according to each supply capacity, such as energy storage supply, demand response sources, dispatchable distributed energy resource, and net metering generation. Conceivably, it may be more appropriate to set conditions for distributed energy resources’ participation in the wholesale market according to their capacity to supply, rather than uniformly.

Contact: report@tky.ieej.or.jp