

**UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION**

**Improvements to Generator) RM22-14-000
Interconnection Procedures)
And Agreements)**

**WATT COALITION COMMENTS
October 13, 2022**

The WATT Coalition appreciates the opportunity to comment on the Federal Energy Regulatory Commission’s (“the Commission”) June 16th, 2022, Notice of Proposed Rule Making (NOPR) in the above-captioned proceeding. We support the Commission’s general findings about the need for reform and offer guidelines for the Commission’s proposed requirements to consider the use of dynamic line ratings (DLR) and advanced power flow control (APFC) in the interconnection process.

I. WATT Coalition

The Working for Advanced Transmission Technologies (WATT) Coalition is a trade association supporting wide deployment of Grid-Enhancing Technologies (GETs), to accelerate the clean energy transition and lower energy costs. Members include grid technology, renewable energy, and investment companies. WATT works on three technologies in particular: 1) Dynamic Line Ratings which determine the true, real-time capacity of power lines. 2) Advanced Power Flow Control which allows operators to reroute power to lines with available capacity. 3) Topology Optimization which identifies the best grid reconfigurations to reroute flow around bottlenecks. These three technologies reduce congestion costs and improve economic dispatch, situational awareness and reliability.

II. Need for Reform

We agree with the Commission’s preliminary finding that “that the Commission’s *pro forma* LGIP, *pro forma* LGIA, *pro forma* SGIP, and *pro forma* SGIA result in rates, terms, and conditions pursuant to which transmission providers provide generator interconnection service are unjust and unreasonable and unduly discriminatory or preferential” and “the Commission’s *pro forma* LGIP, *pro forma* LGIA, *pro forma* SGIP, and *pro forma* SGIA result in rates, terms, and conditions in the wholesale electric markets that are unjust and unreasonable and unduly discriminatory or preferential.” We urge the Commission to make these findings in the final rule.

The delays of interconnection queues speak for themselves. It is the Commission’s responsibility to act and replace current processes and agreements when the current ones are unjust, unreasonable, and/or unduly discriminatory.

III. Requirement to Incorporate Alternative Transmission Technologies

The Commission’s Notice of Proposed Rulemaking (NOPR) proposes to “require transmission providers, upon request of the interconnection customer, to evaluate the requested alternative

transmission solution(s) during the LGIP cluster study and the SGIP system impact study and facilities study within the generator interconnection process.” (P 297).

WATT supports this requirement. To date, the Commission has provided limited guidance for transmission providers (TPs) on how to consider alternative transmission technologies, such as Grid Enhancing Technologies (GETs) in operations, planning, or the interconnection process. Interconnection is one important process where GETs can play a significant role in making rates just and reasonable for consumers.

APFC and DLR provide significant opportunities to achieve just and reasonable interconnection service. A study by the Brattle Group in February 2021 looked specifically at the value of GETs to accelerate interconnection timelines and reduce power costs. *Unlocking the Queue with Grid Enhancing Technologies* showed that application of the three GETs technologies in the Kansas and Oklahoma grids would enable twice as much renewable energy to interconnect out of the queues without any traditional transmission upgrades. The one-time installation cost of the GETs would be only \$90 million, compared to yearly production cost savings of \$175 million. The full study is available at <https://watt-transmission.org/unlocking-the-queue/>.

A DLR is the transmission line's actual real-time or forecasted power carrying capacity and is based on measurements of the conductors actual operating temperature using real-time line measurements of the conductor's sag and nearby ambient weather conditions. A US Department of Energy report demonstrated that a 3 ft/sec increase in wind speed perpendicular to the conductor will increase its carrying capacity by 44%, indicating that significant increases in transmission capacity can be realized by utilizing DLR.¹ This increased transmission capacity is highly valuable in potentially advancing renewable energy projects through the queue process as DLR allows us to safely increase the speed limit of the power line so we can put more electricity on existing assets.

IV. Opt-In Approach

WATT suggests that the requirement be an “opt-out” standard rather than “opt-in.” We believe advanced transmission technologies should be considered as a routine matter in interconnection processes in all regions under the commissions’ jurisdiction.

Automatically evaluating appropriate GETs as viable solutions in system impact studies will shorten overall study timelines and improve transmission project performance for several reasons. High network upgrade costs associated with typical transmission projects can lead to project withdrawals and associated restudies which are often primarily responsible for the delays in project advancement through the queue process. More frequent initial identification of lower-cost network upgrades featuring GETs applications will result in fewer project withdrawals resulting in a reduction in restudies and overall process delay. Consistent application of GETs across system impact and facility studies will also enable fair and non-discriminatory deployment of all generation technologies.

In those instances where projects withdraw for other reasons, GETs offer additional value because they are scalable to address evolving grid needs. APFC are modular deployments of multiple devices that can be installed in phases to address immediate, then medium, and

¹ U.S Department of Energy, "Dynamic Line Rating Systems for Transmission Lines Topical Report," in Smart Grid Demonstration Program, 2014.

ultimately long-term needs. As projects withdraw, the identified APFC solution can be scaled back without need for identifying new solutions. Similarly, many DLR sensors and systems can be redeployed as grid needs change.

V. Implementation

WATT recommends the commission adopt specific measures in the Final Rule to assure GETs adoption by TPs. This includes compliance directives to include “opt-out” election by customers in interconnection applications, in addition to specific tariff references in both Generation Interconnection Procedures (GIP) and business manual adoption. Further, implementation steps should require adoption of GETs solutions in Transmission Owner Facility Studies. As such, WATT is concerned that the use of Local Planning Criteria (LPC) does not invalidate the use and application of GETs in the interconnection process.

VI. Technologies

We support the Commission’s definition of “alternative transmission technologies” includes Advanced Power Flow Control and Dynamic Line Ratings. We support inclusion of APFC and DLR in the definition.

VII. Advanced Power Flow Control (APFC) considerations

Contrary to the Background description (P289), like SSCs and SVCs, APFC does not depend on ambient or transmission system conditions. APFC changes the electrical characteristics of the circuit(s) on which it is installed. These devices, which include modular-SSSCs (not only Phase Shifting Transformers as mentioned in P298) are just as effective and reliable as changing the conductor (reconductoring) to mitigate overloads. However, APFC is the only FACTS device that suffers from the “perverse incentive” identified by stakeholders in the NOPR comments, because installation costs for these devices are much lower than the comparable traditional upgrades they compete with.²

VIII. Studies and reporting

System impact studies are typically conducted by first identifying thermal overload percentages under steady state conditions. These results could easily be augmented by reporting the requisite impedance change to mitigate the overload, using line characteristics built into the grid models. Reporting this impedance change would then equate to a preliminary APFC solution size using publicly available specifications and rule-of-thumb unit costs.

To promote transparency and ensure the regional effectiveness of interconnection studies, TPs should be required to adhere to a strict set of standards and reporting requirements, as delineated in the NOPR (P299). TPs should first document procedures for applying GETs in business practices manuals, and further provide annual detailed reporting on the evaluation process in applying GETs solutions to both individual generators and queue cluster cycles. In the event a TP expressly rejects GETs for a given interconnection project, the TP should be obligated to inform customers as to the basis for rejection and provide technical reasons for dismissal of a GETs solution. The justification should contain sufficient information and transparency for customers to validate the TP’s conclusions, including the TP’s cost-benefit analysis that

² CPUC NOPR comments at 49

otherwise informed their preferred solution. These reporting requirements must also extend to mandatory filings on GETs considered by each TP. These annual reports need to include the same level of detail (to the extent reproducible under CEII regulations) as the project-by-project decisions communicated to ICs.

Compliance obligations set forth in Order 845 required the filing of periodic informational reports to the commission on TP study performance and adherence to tariff specific timelines. The informational nature of this reporting has been valuable to stakeholders, in addition to the commission in assessing the scope and breadth of queue backlogs, and the need for queue reform. With respect to the use and deployment of GETs, and the inherent advantage and capability of this technology presents, WATT urges the commission to order mandatory reporting as a part of the final rulemaking's compliance obligation for all jurisdictional entities.

Further WATT encourages the commission to invite the filing of Section 206 complaints based on a showing of a TPs objection and refusal to consider a GETs alternative.

Relevant GETs are comparable to legacy FACTS and other transmission infrastructure solutions so there is no need for special treatment related to study costs. As mentioned previously, GETs evaluation should simplify and shorten overall queue processing times, and therefore WATT suggests that any marginal increase of study cost to accommodate GETs evaluation be allocated evenly across IC cluster study participants. When treated as a tool in the toolkit, relevant GETs are as simple to study as legacy FACTS devices and therefore a “reasonable number” of study requests is merely a function of the number of relevant constraints associated with the cluster of ICs.

IX. Dispute Resolution

Transmission Provider decisions regarding the use and deployment of GETs in the interconnection process should be subject to review by commission approved Alternative Dispute Resolution (ADR) procedures. To the extent there are formal and informal ADR processes, timeliness in conflict resolution should be considered. WATT submits that ADR procedures and decisions should be subject to review and appeal by the commission in recognition of potential opposition to GETs implementation.

X. Software and Operational Barriers

The NOPR also requests comment on whether there are significant “software, operational or other barriers” to the use of the proposed alternative technologies (P301). When examining evaluative processes, the existing market offerings are both adequate and valid; however, implementing forward-looking policy that promotes the optimization of these assets presents a valuable investment for the future of transmission systems. Thus, FERC should require that RTO/ISO/TPs augment their software by requesting and validating device models for advanced transmission technologies, either directly from suppliers (user-defined models) or by coordinating with software providers for module updates. One example is the MISO grid reconfiguration tool—the Reconfiguration for Congestion Cost Task Team (RCCTT)—an existing model that can be adapted to assist in a wide spectrum of planning horizons.

XI. NRIS vs. ERIS and Provisional Service

Regarding NRIS and ERIS guarantees, since APFC devices change the physical characteristics of the circuits on which they are installed, yielding a specific MW capacity increase for each given deployment regardless of ambient or system conditions, these devices can readily accommodate ICs seeking delivery to aggregate system load as network resources and should be appropriately qualified for NRIS service. ERIS generators that deploy GETs should be treated comparably in procurement of point-to-point transmission service in order to qualify as a capacity resource and thereby receive resource adequacy accreditation for the term of the transmission service product.

Provisional or Interim interconnection service facilitated by relevant GETs may be valuable for some ICs that would otherwise be unable to connect to the grid on a timely manner until larger, regional transmission solutions are commissioned. This would be particularly true in the case of long lead time facilities and the application of limited output restrictions until relevant transmission is energized. For example, ICs could benefit from DLR deployment on a lightly overloaded line, deferring reconductor or new line construction decisions as the system need materializes. Because many DLR systems are modular, when no longer needed the DLR system could be redeployed on another line or network area.

From WATT's perspective, project-specific GETs should not themselves be treated as provisional solutions. Similar to legacy FACTS devices, GETs are designed for 40-year lifetimes. Their flexibility and ability to redeploy should not be misconstrued or deemed temporary-only applications, but rather as a benefit to rapidly changing electricity systems.

Signed on behalf of the WATT Coalition,

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