

MISO/SPP GENERATOR REPLACEMENT PROCESS

Ben Greene, American Electric Power

bfgreene@aep.com

PJM Interconnection Process Subcommittee, July 31, 2023

BACKGROUND

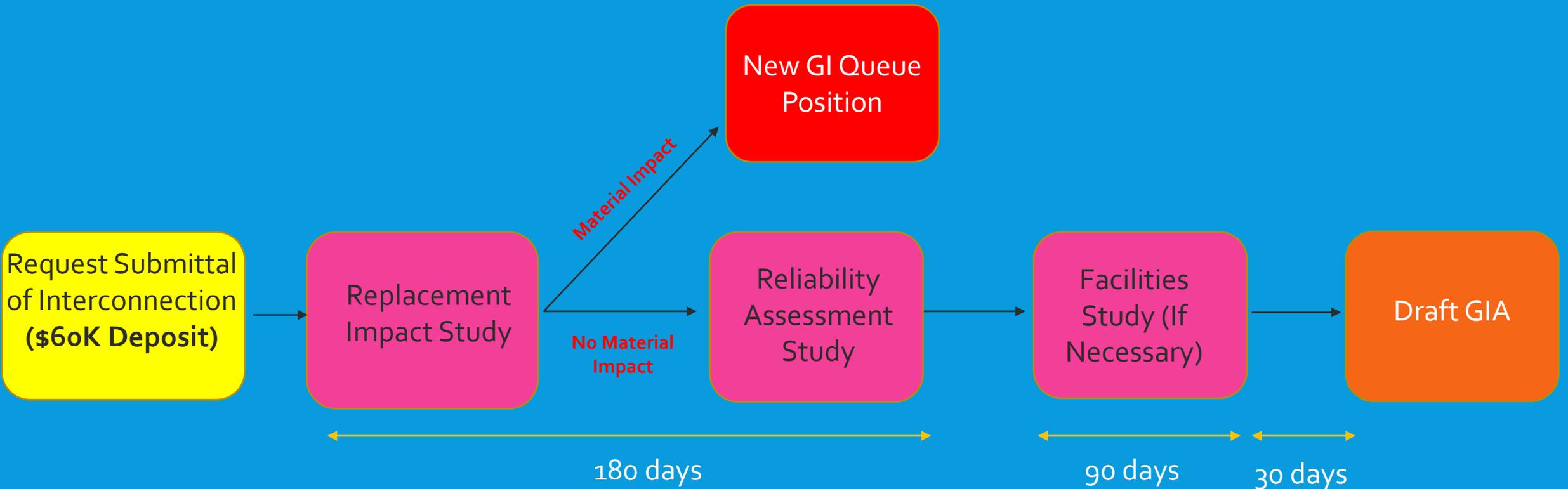
- Over the last 3-4 years FERC (“Commission”) has consistently approved various RTO/ISO generation replacement proposals based on the perceived benefits including but not limited to opportunities for modernizing their generating fleets and lowering overall energy costs.
- The Commission continues to determine that such procedures would avoid duplicative study costs and operational costs that otherwise would occur when the request to replace an existing generating facility proceeds through the interconnection study queue process.

| RTO/ISO | FERC Docket | Order Accepting Tariff Revisions |
|------------------------|-----------------------|----------------------------------|
| MISO | ER19-1065 | May 15, 2019 |
| SPP | ER20-1536 | June 30, 2020 |
| PacifiCorp. | ER23-407 and ER23-408 | January 9, 2023 |
| Arizona Public Service | ER23-1272-001 | July 7, 2023 |

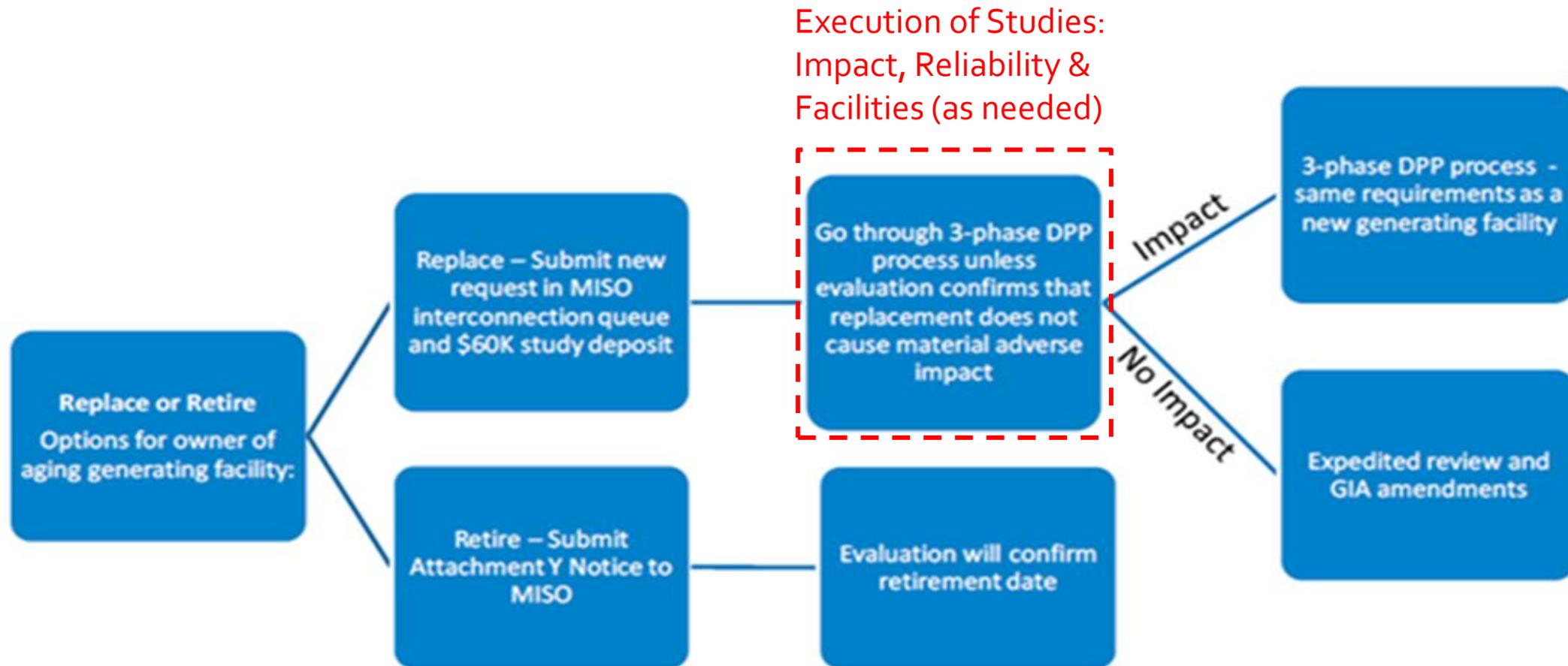
GENERATOR RETIRE/REPLACEMENT PROCESS MATRIX

| | MISO | SPP |
|--|--|--|
| Is the Generator Retire/Replace Process separate from the New Service GI Queue ? | YES, unless material modifications are required | |
| Required Studies | 1. Replacement Impact Study, 2. Reliability Assessment Study, 3. Facilities Study (If Necessary) | |
| Study Deposit | \$60K | |
| Timing Considerations for Generation Replacement Request | <ol style="list-style-type: none"> The request must be made at least one year prior to the planned retirement date of the existing generating facility. The expected Commercial Operation Date of a Replacement Generating Facility shall be no more than three (3) years from the date of cessation of operation of the Existing Generating Facility. | <ol style="list-style-type: none"> At least one year prior to the planned retirement date of the existing generating facility; The replacement generating facility must start operation within three years after the existing generating facility ceases operation (or four years from the date a unit is determined to be in forced outage). |
| Interconnection Customer Request Criteria | Up to the total MW quantity of its existing Service and POI associated with the facility to be replaced, ERIS vs NRIS | |
| Notable Differences | SPP process includes provisions to allow the designation of a Network Resource to be transferred to another generator at the same POI without study by submitting a request no later than 30 days prior to the termination date of the Network Resource in the NITSA. | |

SPP GENERATOR REPLACEMENT PROCESS



MISO GENERATOR REPLACEMENT PROCESS



MATERIAL ADVERSE IMPACT

- The “material adverse impact on the Transmission System” standard is the standard currently used by MISO & SPP to evaluate requests to modify an Existing Generating Facility.
- The same impact criteria is applied to proposed replacements as it does to modifications because ultimately it is the impact to the Transmission System of the change that should matter rather than whether the amount of equipment changes behind the POI.
 - Any change in expected output of the Generating Facility that is higher than what was studied in the interconnection process
 - An increase in short circuit current that degrades transmission system reliability.
 - Angular stability performance and dynamic response that degrades transmission system reliability.
- MISO & SPP measures the same three types of impacts to screen proposed replacements—impacts to i) steady-state thermal or voltage limits, ii) dynamic system stability and response, or iii) short-circuit capability limits.

FERC MAJORITY POSITIONS

Preferential treatment of Owners of Existing Generating Facilities

- *"No undue discrimination or preferential treatment because owners of existing generating facilities are not similarly situated to new entrants for the purpose of obtaining interconnection service." (Chairman Danly)*
- *"Compared to a new interconnection customer that seeks to build a new generating facility, owners of existing generating facilities already have gone through some form of interconnection process and faced cost responsibility for any network upgrades that may have been necessary to permit their operation at their specific points of interconnection."*

Independent Entity Variation Standard

- *The Commission stated, "With respect to the MISO order, that MISO, as an RTO, is subject to Order No. 2003's "independent entity variation" standard, which provides RTOs/ISOs greater flexibility in proposing variations from the pro forma LGIP."*
- *The Commission stated that, "RTOs/ISOs do not raise the same level of concern regarding undue discrimination as a transmission provider that is a market participant, because they do not own generating facilities or have an incentive to obstruct independent generation from accessing the grid."*

APPENDIX

PACIFICORP GENERATOR REPLACEMENT PROCESS

(FERC DOCKET ER23-407-000)

- Generator Replacement Coordinator (GRC) will evaluate Generation Replacement requests in the order in which they are submitted.
- The evaluation will consist of two studies: 1.) a Replacement Impact Study 2.) a Reliability Assessment Study
 - GRC shall use Reasonable Efforts to complete the Replacement Impact Study and Reliability Assessment and share results with the Interconnection Customer within one hundred eighty (180) Calendar Days of the request.
 - GRC will determine whether it will conduct a Generator Replacement Interconnection Facilities Study (30) Calendar Days upon notification from the Interconnection Customer after the two studies.

PACIFICORP GENERATOR REPLACEMENT PROCESS

(FERC DOCKET ER23-407-000)

Role of the Generator Replacement Coordinator

- Collection of all necessary information from the Interconnection Customer and the Transmission Provider for the processing and evaluation of a Generation Replacement request;
- Maintaining a queue for Generation Replacement requests;
- Performing the necessary Replacement Interconnection Studies;
- Independently reviewing and validating data, information, and analyses provided by Transmission Provider in connection with Generator Replacement process;
- Decision making process will be independent of control by an Interconnection Customer, the Transmission Provider, or their Affiliates
- GRC to maintain offices separate from the offices of the Transmission Provider and its Affiliates

RECENT FERC ORDERS

Substantive Matters

- *"The Commission accepted MISO's generator replacement procedures, finding that the procedures "will avoid duplicative study costs and operational costs that otherwise would occur when the request to replace an existing generating facility must proceed through the interconnection study queue process, which can delay the replacement of older resources with more efficient and cost-effective resources."*
- *"In addition, we find that SPP's proposal will prevent generating facility owners seeking to make infrastructure investments from losing their existing interconnection service and potentially incurring significant costs to obtain replacement interconnection service at the same location. We find that it is not necessary to send these owners through a full interconnection process when the replacement generating facility will be using the same type and level of service as the existing generating facility and will cause no material impact on the SPP transmission system."*
- *"We find that PacifiCorp's proposed generator replacement process provides substantial benefits and, in combination with the safeguards against unduly discriminatory implementation provided by the proposed Independent Coordinator, satisfies the consistent with or superior to standard with respect to the pro forma LGIP."*