**Generator Interconnection Process**

DPP Phase 1 + DPP Phase 2 + DPP Phase 3 + GIA = ~ 505 Days

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**Acronyms:**
- **BD**: Business Days
- **IC**: Interconnection Customer
- **DPP**: Definitive Planning Phase
- **IF**: Interconnection Facility
- **D1**: Application Fee
- **M1, M2, M3, M4**: Milestones
- **D2**: DPP Study Funding Deposit
- **NU**: Network Upgrades
- **POI**: Point of Interconnection
- **FS**: Facilities Study
- **GIA**: Generator Interconnection Agreement
- **SIS**: System Impact Study

**Notes:**
1. Effective September 19th, 2018, for new cycles, Affected System, Stability, and Short Circuit Studies are required only for DPP phase 2 and DPP phase 3.
2. M3 and M4 will be adjusted based on previously paid M3 and M4 for Provisional Requests.
3. DPP Phase 1 and Phase 2 of each cycle will model higher queued assumptions from previous Phase 3 studies as available during the time of the study.
4. Days on this diagram are Calendar Days unless where noted as Business Days – “BD”
Generator Interconnection Process

Milestones:

M1: 

Non-Technical Requirements

- Complete Application (Appendix 1 with Attachments A, B and C)
- The (D1) Application fee paid at Application time
- The (D2) DPP Study Funding deposit paid at Application time
- Proof of minimum of seventy-five percent (75%) Site Control or $100,000 deposit in lieu of Site Control (Refer to the BPM-015 Section 4.2.1.1.1 for more details on Site Control):
  - Project site map indicating lease/ownership interest boundaries
  - Copies of each agreement or agreement signature pages with a complete sample agreement
  - Document signed by a company executive that states all the listed agreements are on file in their entirety, all referenced land is within the proposed project boundaries, and those agreements constitute 75% or greater ownership of the project’s total site. This document should also include a statement as necessary regarding land for which Site Control cannot be obtained due to federal, state, or local regulatory/permitting requirements or obligations.
- Must supply a W-9 form and banking information for accounting purposes

Technical Requirements

- Definitive gross and net generator output (MW) as measured at the POI
- Definitive POI
  - Only one POI may enter into DPP, unless required by State regulations to take two POI’s
- Definitive one-line diagram for the POI
  - Information shall include:
    - Breaker layout and bus configuration (if available)
    - Number of generators
    - The zero sequence impedance for the generators (if available)
    - Distance from the collector substation to the POI, referenced in miles, including line impedance
    - If the POI is a line tap: the distance from the tap to the endpoints of the existing line, referenced in miles
    - Generator step up (GSU) transformer data and the collector substation transformer data (if applicable)
    - For inverter based generators, FERC Order 827 requires:
      - Location and size of any dynamic and/or static VAR compensation devices
      - Equivalent collector system impedance
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  - FERC Order 842* requires newly interconnecting units to install, maintain and operate equipment capable of providing primary frequency response as a condition of interconnection. The order requires ICs to provide a plant controller for inverter based generation or a governor model for thermal units in the provided dynamics model
  - For inverter based/non-synchronous generators, FERC Order 827* requires:
    - Demonstration that the plant can meet a Power Factor (PF) of 0.95 lead/lag at the high side of the main Generator Step Up Transformer (The TO’s Local Planning Criteria* will supersede if they require a more stringent PF)
    - Base turbine or inverter reactive capability
  - For inverter based (wind or solar) generators, the IC shall provide the short circuit modeling instruction manual and associated model data
- All Generator Types: All applicable information requested in Attachment A of Appendix 1

During the Application Process, any changes require a resubmission of the corrected documents.

M2: Requirements

- Definitive Planning Phase Entry Milestone Deposit
  - Cash or irrevocable letter of credit in the amount of $4,000 per MW for the project paid at Application time

DPP Study Cycle Begins:
Once the DPP Study cycle begins, any material changes (see Tariff) will result in withdrawal of the project

Notes:
*FERC Order 842:

* FERC Order 827:

*TO Local Planning Criteria:
https://www.misoenergy.org/planning/transmission-planning/#t=10&p=0&s=&sd=
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Inverter based (wind or solar) short circuit modeling data examples:

- In general, type 3 wind generators are modeled as a constant voltage source. In that case, MISO would need the following impedance values:
  - Synchronous
  - Transient
  - Subtransient
  - Negative sequence
  - Zero sequence

- In general, type 4 wind and solar are modeled as current-limited generators. In that case, MISO would need the following data:
  - Fault-current magnitude (normally no more than 150% of full load current)
  - Impedances:
    - Synchronous
    - Transient
    - Subtransient
    - Negative sequence
    - Zero sequence

An IC requesting a reduction in MWs after DPP Phase 1 by any amount and/or after DPP Phase 2 by 10% is acceptable.

For detailed information regarding milestones, please see Attachment X of the MISO Tariff and the Generation Interconnection Business Practice Manual.

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