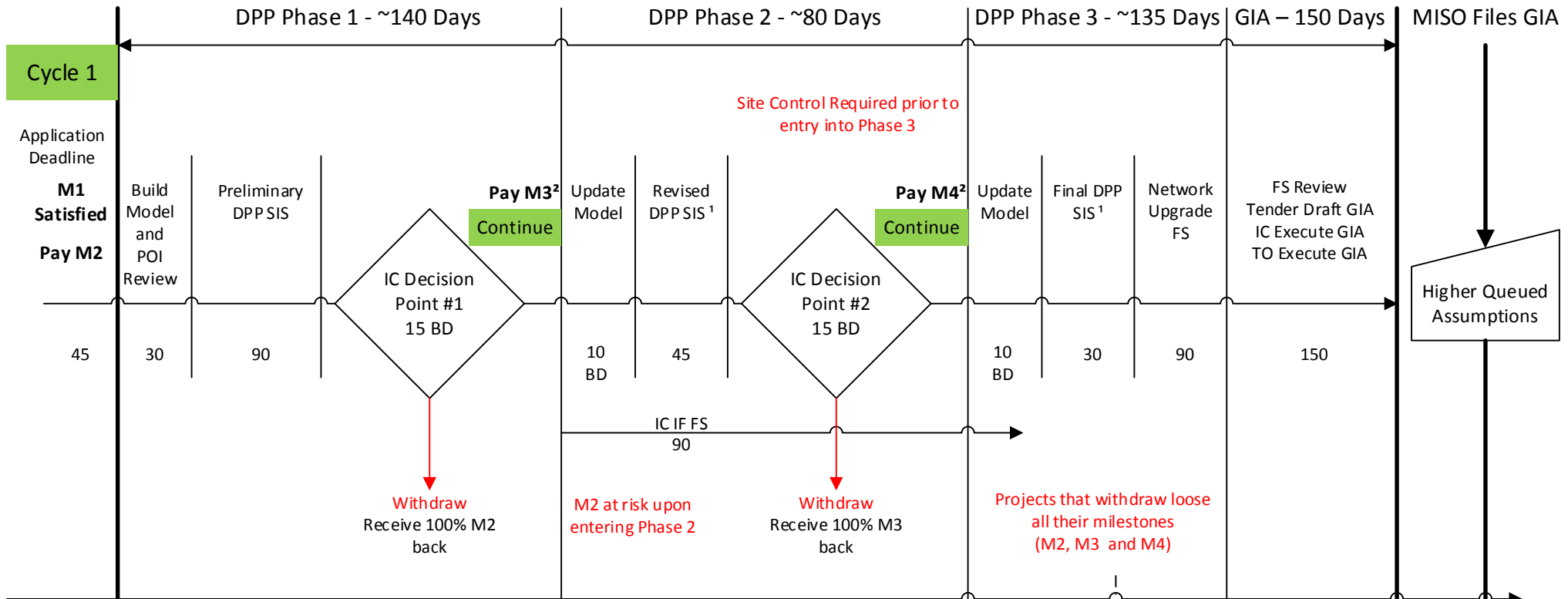


Generator Interconnection Process

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



M1 = Technical requirements, D1 + D2 + Site Control Requirement
 M2² = \$4000/MW
 M3² = (10% of NU) – M2
 M4 = (20% of NU) – M3 – M2

Acronyms:
 BD : Business Days
 DPP : Definitive Planning Phase
 D1 : Application Fee
 D2 : DPP Study Funding Deposit
 FS : Facilities Study
 GIA : Generator Interconnection Agreement
 IC : Interconnection Customer
 IF : Interconnection Facility
 M1, M2, etc. : Milestones
 NU : Network Upgrades
 POI : Point of Interconnection
 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”

DPP Cycle 2
 Phase 3 starts
 after GIAs from
 Cycle 1 are either
 executed or filed
 unexecuted with
 FERC

Generator Interconnection Process

Milestones:

M1:

Non-Technical Requirements

- Complete Application (Appendix 1 with Attachments A, B and C).
- The (D1) Application fee paid at least forty-five (45) Calendar Days prior to the start of the next DPP cycle.
- The (D2) DPP Study Funding deposit paid at least forty-five (45) Calendar Days prior to the start of the next DPP cycle.
- 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.
- Attend a mandatory Scoping Meeting.

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

Generator Interconnection Process

- All Generator Types: Library Stability Model representing the dynamics of the Generating Facility in a .dyr format. Models submitted must be acceptable and recommended in the NERC Acceptable Model List posted at: [https://www.nerc.com/comm/PC/Pages/System-Analysis-and-Modeling-Subcommittee-\(SAMS\)-2013.aspx](https://www.nerc.com/comm/PC/Pages/System-Analysis-and-Modeling-Subcommittee-(SAMS)-2013.aspx) and also comply with MISO's Model Data Requirements and Reporting Procedures posted at: <https://www.misoenergy.org/planning/planning-models/mod-032-1/>
 - 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

Any material changes (see Tariff) after this point will result in withdrawal of the project

Notes:

*FERC Order 842:

<https://cdn.misoenergy.org/2018-02-15%20162%20FERC%201%2061,128%20Docket%20No.%20RM16-6-000133298.pdf>

* FERC Order 827:

<https://cdn.misoenergy.org/2016-08-30%20Docket%20No.%20ER16-2374-00150851.pdf>

*TO Local Planning Criteria:

<https://www.misoenergy.org/planning/transmission-studies-and-reports/#nt=%2Freport-study-analysis?type%3ATO%20Planning%20Criteria&t=10&p=0&s=FileName&sd=asc>

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

