

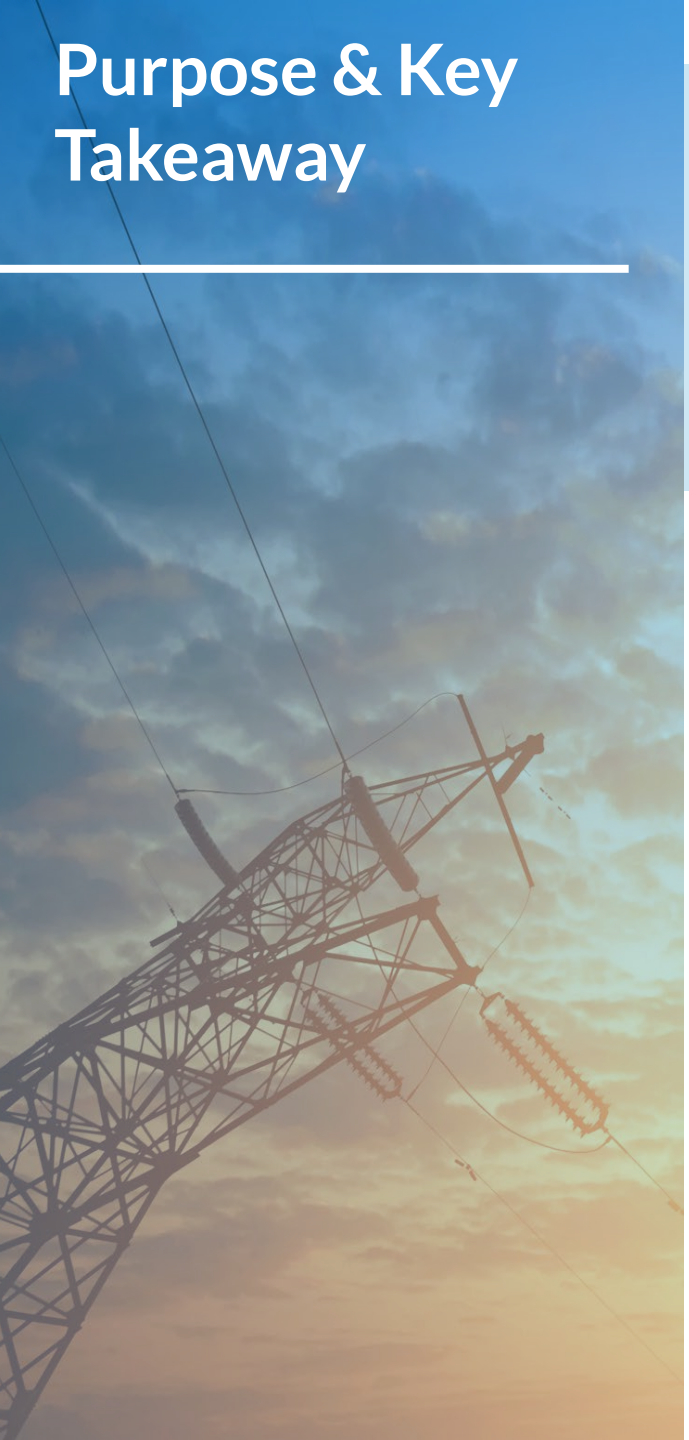
Large Load Addition Resource Study (LARS)

Update: 9-29-2026
Slide 20 – Clarified multiple generators can be behind one POI

Large Load Working Group (LLWG)

September 23, 2026

Purpose & Key Takeaway



Purpose

Propose a new process, Large Load Addition Resource Study (LARS), for concurrently studying large loads and associated generation

Key Takeaways

- The proposed new process for studying **200+** MW loads allows MISO to align studies for planned large loads and associated generation to increase speed to approval and optimize network upgrades within 120 days
- This solution harmonizes with the spirit of FERC's show-cause order for interconnection process arrangements to address the speed of adding generation to serve large load
- MISO is presenting final Tariff changes based on member feedback and reviewing additional details on the modeling process

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Journey through LLWG

LARS is built off existing process for load and generation studies



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MISO's framework will enable members to integrate large loads quickly and reliably while delivering value for the entire region

	1	2	3
Objectives	***Connect Quickly*** Get MISO approval **within 120 days** with all studies completed and GIAs signed	***Transition and Scale with Flexibility & Transparency*** **Transition and scale with flexible options** consistent with timing of network upgrade buildouts and **without cost shifting**	***Ensure Long-Term Reliability*** Sustain **reliable operations** with **ability to withdraw or inject** energy based on conditions and signals
Needs	Certainty on transmission needs and associated costs: Generation only, load only, generation-load combination	Curtailment capability, resource adequacy coordination, efficient use of existing transmission capacity	Real-time telemetry and coordination, curtailment capability, ride-through, stability control, resilience, security
Solutions	• Co-located resources • Expedited generation • Fast load studies • Aligned load / generation studies	• Transparent alignment of costs with large load drivers • Co-located resources • Non-firm service option • Firm service step-up option	• Clear requirements • Operations system enhancements • Market pricing signals • Demand response and new reserve market products

GIA: Generator Interconnection Agreement

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The proposed alignment of large load and generation studies offers customers certainty for their generation and transmission needs within 120 days

Proposed Process

- The LARS Associated Transmission Customer initiates a submission for the proposed load and associated generation.
  - Interconnection Customer supports the generation
  - Transmission Owner supports the load
- MISO studies the generation and load in parallel using the same assumptions and rigorous methodology applied in generation interconnection and MTEP processes
- The generation and load studies conclude at approximately the same time—within 120 days
- **Outcomes:**
  - Allocation of generation Interconnection Service
  - Transmission service for reliable load withdrawal
  - A more optimized set of network upgrades

CURRENT PROCESS	LARS
1. Transmission Study 2. Generation Study	Transmission and generation studies remain separate but run in parallel and conclude at approximately the same time
180+ days	120 days

LARS: Large Load Addition Resource Study

LARS Associated Transmission Customer shall mean the entity that is responsible for submitting the LARS application and procures Transmission Service in order to serve LARS Associated Load and designates such load as formally paired with an Interconnection Customer's LARS Interconnection Request.

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Proposed Requirements

- Cycle size: 10 load-generation pairs
- Load size: **200+** MW
- $250,000 nonrefundable application fee (D1)
- Generation is verified to directly support the large load with firm offtake agreement between generation and load
- Generation is geographically aligned to the need (same local resource zone/LRZ)
- Generation Interconnection Service is max 150% of identified load need
- Full site control through Point of Interconnection and all other associated land requirements with transmission owner sign-off of valid point of interconnection/POI at submission
- At submission, electromagnetic transient modeling requirements are met for load and for generation (if inverter-based resource/IBR)
- RERRA approval is not required

OUTCOMES

- MTEP-approved transmission for reliable load withdrawal
- Allocation of generation Interconnection Service (GIA)
- Optimized set of network upgrades

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Requirements Overview

Load

- Complete and deficient-free LARS application
- Enhanced submission forms requiring information similar to information required today
- Similar to today, the Transmission Owner's initial set of transmission solutions identified and submitted to MTEP
- MISO process will focus on accounting for cumulative impacts of new loads and coordination with affected systems
- If the generation does not materialize, the load must move through normal process to secure withdrawal rights

Generation

- Complete and deficient-free LARS application
- Must be able to reach commercial operation within 3 years (plus 3-year grace period)
- $250,000 nonrefundable application fee (D1)
- ~15% increase in Study Deposit (D2) for each of the levels on the sliding scale
- $30,000/MW milestone payment (M2)
- If the load does not materialize, the generation must move through normal interconnection queue to secure Interconnection Service

Study Process + GIA = 120 calendar days

Aligns with current study process that are being further enhanced with *Large Load Application & Study Process* (LLWG-2026-7) including steady state and stability with the inclusion of new large load interconnection reliability requirements

Aligns with generator interconnection steady state, stability, and short circuit

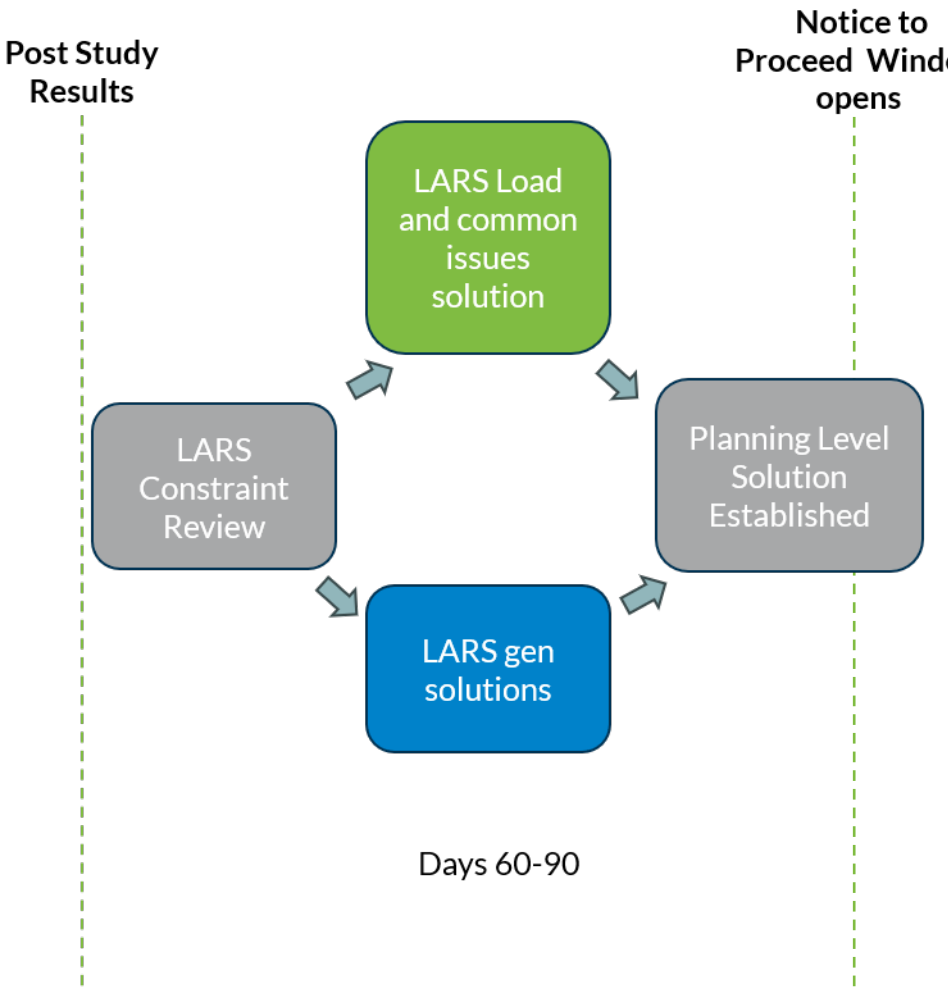
MTEP Project Type

Baseline Reliability Project and Other

Generator Interconnection Project

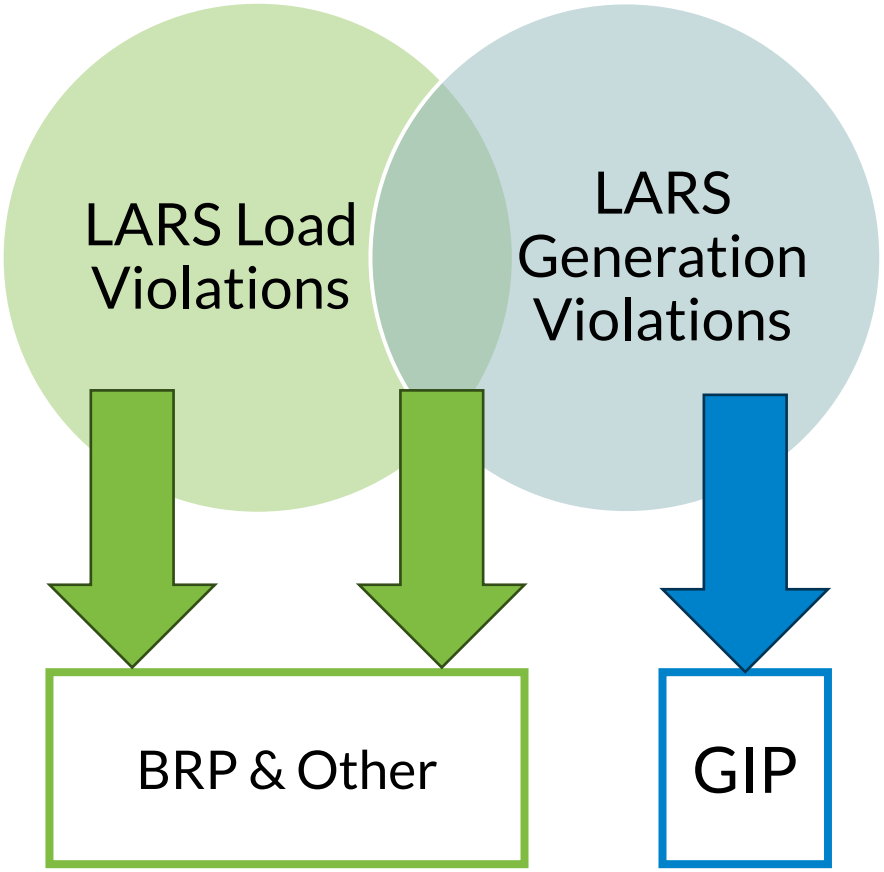
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LARS provides a single application and study process that produces an optimized set of Network Upgrades in 120 days for any paired large load and generation



Common facilities addressing violations found in both generation and load study tracks (common issues) are allocated to Baseline Reliability Project and Other

Resulting MTEP Project Types



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MISO works collaboratively with Transmission Owners on contingency development

Contingencies

Load Study Evaluates NERC TPL planning events (P0–P7) and extreme events

- Includes single and multiple element outages, breaker failures, relay failures, and common structure outages
- Selection focuses on contingencies that produce the most severe system impacts
- Considers both steady-state and stability extreme events
- Contingencies are developed collaboratively with Transmission Owners

MTEP reliability studies will always include scenarios where GIA resources are offline

Generator Study Evaluates NERC TPL planning events (P0, P1, P2, P4, P5, P7)

- Includes single and multiple element outages, breaker failures, relay failures, and common structure outages
- Considers both steady-state and stability contingencies
- Contingencies are developed collaboratively with Transmission Owners

GIP reliability studies will always include scenarios where Load is offline

Contingency Collaboration

MISO works collaborative with Transmission Onwers to ensure:

- The modeled load loss reflects the largest credible common-mode event for the facility configuration under study
- The contingent loss of the load is based on the electrical design, feeder or transformer configuration, protection segmentation, ride-through capability, or other substantiated operating characteristics

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LARS Tariff language has changed based on member feedback

LARS Associated Load

- Attachment FF section I.D.1.b tariff language for the LARS associated load and inclusion of LARS associated generator, provisions for including each together, application process, requirements for the load submission, and action for load and generation misalignment or generation withdraw
- **Minimum Load Size** - 200 MW min requirement
- **MTEP Project Types** - Cost impacts of study outcomes is impacted by Cost Shifting Risk Among Transmission Customers and determined to be Other and Baseline Reliability Project

LARS Generation Interconnection Customer

- Attachment X (GIP), Appendix 6/19 (GIA), and Appendix 1 (Interconnection Request) tariff language for the LARS associated generation
- Language flexibility if LARS Associated Load is taking longer to commence service to use QOL
- **Aggregation of Generation -** Multiple generation POIs for one large load but must be submitted in separate LARS applications and all must be in the same LRZ
- **3 years grace period –** COD set in LLGIA may be extended up to 3 years

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Stakeholder feedback centered on several key themes

1. Capping available interconnection service
2. Setting minimum load threshold
3. LARS associated Transmission Customer submitting the LARS application
4. Off-take agreement requirements and long-term process
5. Study process coordination and cumulative impacts
6. Local Resource Zone (LRZ) criteria
7. Other application requirements and fees
8. Support of the LARS objective

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Stakeholder feedback themes and MISO response

Theme	Feedback	MISO response
Capping Available Interconnection Service	Requests to eliminate or increase the 150% of Large Load Generator Interconnection Service request restriction to promote resource diversity.	In August MISO has modified the 150% moving it from nameplate to Interconnection Service. MISO established the 150% of Large Load Generator Interconnection Service limitation to ensure the generation is required to reliability serve the load within the same LRZ. The 150% Interconnection Service allows for generation type diversity while preventing bypassing of the GI DPP queue. **MISO seeks to establish a closer connection between what is needed to serve the Large Load and what is being proposed by the LARS Interconnection Customer. The limitation of 150% of identified MW need will strike the proper balance between having a sufficient amount of Interconnection Service advancing through the study process to support the identified Large Loads.**
Setting Minimum Load Threshold	Request to review the 250 MW limit and reduce to 200 MW to align with data center growth blocks.	The LARS process minimum Large Load value will now be **200 MW.** This changed is based on signification stakeholder feedback that many emerging data center and large industrial projects in the 200-250 MW range can have significant system impacts and would benefit from the coordinated study process. Lowering the threshold allows access to the LARS framework while maintaining its focus on large, impactful load additions.

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Stakeholder feedback themes and MISO response

Theme	Feedback	MISO response
LARS Associated Transmission Customer submitting the LARS Application	The LARS Transmission Customer gatekeeping may disadvantage other entities	MISO retained that the LARS Transmission Customer is the entity that can submit a LARS application but also acknowledges that the Transmission Owner and Interconnection Customer will need to support the application. MISO received mixed feedback across all stakeholders to support this change. LARS Interconnection Customers and LARS Associated Transmission Customers are separately responsible for adhering to all Applicable Laws and Regulations. **LARS Associated Transmission Customer** shall mean the entity that is responsible for submitting the LARS application and procures Transmission Service in order to serve LARS Associated Load and designates such load as formally paired with an Interconnection Customer's LARS Interconnection Request.
Off-take Agreement Requirements and Long-term Process	Three-party signature requirement unclear; advocates for bilateral agreements and longer terms (≥5–15 years).	MISO revised the Tariff redlines to explicitly state the power purchase or off-take agreement can be executed simply between the generator and large load. MISO did not change the minimum application terms on showing a 5-year contract between the load and generation and clarified that load or generation no longer pairing results in both load and generation returning through the applicable process (load review process, MTEP, or DPP).

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Stakeholder feedback themes and MISO response

Theme	Feedback	MISO response
Off-take Agreement Requirements and Long-term Process	Clarification of whether generation-load pairings may change over time What occurs if the associated load materially decreases, is delayed, or withdraws after the generation resource has been developed Clarification of whether the generator retains its interconnection rights if the original associated load no longer exists	If load relationship ends, the generation LLGIA is void. Generation may apply for the next available DPP cycle The Interconnection Customer takes on responsibility to submit a project into the DPP process if the load does not materialize
Off-take Agreement Requirements and Long-term Process	Clarification whether large load will be allowed to reach commercial operation in phases and whether each phase would require a new LARS request or could be encompassed within the first LARS request for the entire size of the load	The LARS request should include the total expected Large Load aligned with the full Generator Interconnection Service request not to exceed 150% of the full Large Load value. The Large Load may utilize other MISO processes to phase in operationally. The load paired with the generation included in the LARS request will need to come online by end of 3 years post GIA grace period to match the COD of the generator.

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Stakeholder feedback themes and MISO response

Theme	Feedback	MISO response
Study Process Coordination & Cumulative Impacts	Need clarity on modeling assumptions across all parts of the process and how they align or diverge	MISO LARS will incorporate two study perspectives into the gen/load/transmission combination. Both processes will begin using the latest MTEP set. The transmission/load study will draw upon the fundamentals of the load process and the generator interconnection perspective will draw upon the fundamentals of the ERAS process for study. The entire gen/load/transmission combination will be fully represented in both studies with MTEP and GIA approvals utilized as the base.
Study Process Coordination & Cumulative Impacts	Parallel/siloed studies risk inconsistent assumptions	The LARS process produces a single application and study process for any paired Large Load Transmission Customers and Interconnection Customers that meet the application criteria. While the generation and load studies are performed in parallel, they are not siloed. Transmission capacity headroom is protected between different DPP cycles, ERAS, and LARS based on established modeling procedures for each base case. LARS projects will be studied on a different MTEP base case than DPP.

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Stakeholder feedback themes and MISO response

Theme	Feedback	MISO response
Study Process Coordination & Cumulative Impacts	Recommend that LARS include a process for how MISO will handle any restudies	There will be **no restudy with the LARS process**. If either portion withdraws, the LLGIA is void and non-refundable deposits are forfeited. The applicable withdraw of approved MTEP project(s) is evaluated to ensure no reliability violations need to be further addressed. If parties cancel a LLGIA after notice to proceed, the parties will be responsible for all assigned Network Upgrades.
Study Process Coordination & Cumulative Impacts	Classify study violations/mitigations, and document cost assignment to avoid duplication and discrimination.	LARS generation violations are allocated via the GIP. All other violations (LARS load violations and common violations) are allocated to Baseline Reliability Project (BRP) and Other.
Local Resource Zone (LRZ) Criteria	Some stakeholders want proximate load-gen pairing; others want flexibility to cross LRZs or rely on alternative boundaries (state, LBA)	The intent of this process is to demonstrate an optimized network upgrade solution for the load and generation, and MISO retains the flexibility in the LRZ because that aligns with our Resource Adequacy construct.
	Same-LRZ pairing may block optimal solutions; stakeholders propose electrically-proximate or LBA-level criteria.	

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Stakeholder feedback themes and MISO response

Theme	Feedback	MISO response
Other Application Requirements and Fees	Requests ability to use multiple Point of Interconnections for generation located with the same LRZ to meet Large Loads	MISO made a change to allow generators at different Points of Interconnection to supply the Large Load in the same LRZ but must occur through multiple applications. The Large Load must be located behind one Point Of Withdrawal. ***A LARS Associated Load may be served by multiple Generating Facilities provided that:*** 1. *All Generating Facilities serving a LARS Associated Load behind the same Point of Interconnection must be identified in the LARS Application for the specific LARS Associated Load and must request a minimum of 200 MW of Generator Interconnection Service in the aggregate; or,* 2. *Multiple Generating Facilities serving a LARS Associated Load may be located behind different Points of Interconnection must:* a. *Be located in the same LRZ as the LARS Associated Load,* b. *Request a minimum of 200 MW of Generation Interconnection Service for each Generating Facility behind a separate Point of Interconnection; and,* c. *Be submitted as a separate LARS Application for the amount of demand of the LARS Associated Load it will serve through that Point of Interconnection.*

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Stakeholder feedback themes and MISO response

Theme	Feedback	MISO response
Other Application Requirements and Fees	100% site control and high fees (D1 $250k; M2 $30k/MW) disadvantage entities; requests alignment/refunds.	MISO appreciates the inputs on readiness requirements, no significant changes have been made. MISO will accept valid application on first-in (timestamp-based) and application must meet all requirements. Site control, study fees, and milestone requirements are sufficient to ensure project readiness. In the event of a project withdrawal before study kick-off the next project in the queue will take its place in the study cycle.
Other Application Requirements and Fees	Questions on how fees are treated if a load or generation ultimately does not materialize and the application is withdrawn.	If an application is withdrawn all non-refundable fees will be forfeited similar to MISO's other generator interconnection study processes. Any difference between study deposit and actual cost of the applicable study will be refunded as applicable. If generation is withdrawn before the execution of the GIA, M2 milestone will be refunded. In the event that the LARS Interconnection Customer withdraws from LARS, then the LARS Interconnection Customer shall remain responsible for the identified GIPs. In the event that the LARS Associated Load Customer withdraws from LARS, then the LARS Associated Load Customer shall remain responsible for the identified BRPs and Other Local Reliability assigned projects.

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Stakeholder feedback themes and MISO response

Theme	Feedback	MISO response
Distinction Between Retail Service and Wholesale LARS Service	Need clarity that LARS does not convey any rights to serve, or rights to transmission service to serve retail customers, and that Interconnection Service associated with the LARS request does not supercede state or local laws or regulations.	The Interconnection Service for the LARS Associated Load does not provide a right to serve, or a right to transmission service to serve, a retail customer except as specifically allowed by state laws and regulations. Interconnection Service granted through LARS does not supersede any state or local laws or regulations nor does it authorize operations that would violate state or local laws and regulations, including those establishing which entities have the right or obligation to serve load. LARS Interconnection Customers and LARS Associated Transmission Customers are separately responsible for adhering to all Applicable Laws and Regulations.
Cost Allocation & Transparency	Requests to establish a distinct project type with clear cost allocation for tracking going forward.	Existing project types will be used for LARS related costs (GIP for Generation Interconnection, Other or Baseline Reliability Project for load related changes). Cost transparency will be enhanced through the Show Cause requirements on Cost Shifting Risk Among Transmission Customers (LLWG-2026-8) and will include transparency for tracking going forward.

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What happens if…

Scenario	Generation	Load
Load Withdraws from ongoing Study	Generation study discontinues and application is considered withdrawn. Generation may apply for the next available DPP cycle.	
Generation Withdraws from ongoing Study		Large Load study stops and application is considered withdrawn. The Large Load may enter the next available study cycle.
GIA is Terminated by Interconnection Customer or Associated Load Customer withdraws from LARS	Large Load study stops and application is considered withdrawn. Parties are still responsible for Network Upgrades designated as GIP project type upon GIA execution.	Large Load study stopes and application is considered withdrawn. Parties are still responsible for BRPs and Other Local Reliability assigned projects shall remain responsible for such projects.
Generation Is Delayed Operationally		Large Load may take advantage of other transmission service products MISO is developing.
Signed LLGIA and Load Is Delayed Operationally	Generation cannot operate before the load comes online	
Application is incomplete for generation or load	MISO issues a deficiency notice to cure within 10 business days. If not resolved, application is withdrawn from LARS and $250K D1 non-refundable Application Fee is forfeited.	MISO issues a deficiency notice to cure within 10 business days. If not resolved, application is withdrawn from LARS and $250K D1 non-refundable Application Fee is forfeited.
Large Load is unable to be served by resource(s) behind one POI	Break up the Large Load into no smaller than 200 MW parts. A LARS application will need to be submitted for each part of the whole paired with generator(s) behind one POI within the same LRZ.	Break up the Large Load into no smaller than 200 MW parts. A LARS application will need to be submitted for each part of the whole paired with generator(s) behind one POI within the same LRZ.
The Large Load wants to come online in phases after LLGIA	The generator must go through the Annual ERIS (AERIS) and Quarterly Operating Limit (QOL) processes as specified in BPM-015 Section 6.6.	Large Load may take advantage of other transmission service products MISO is developing.

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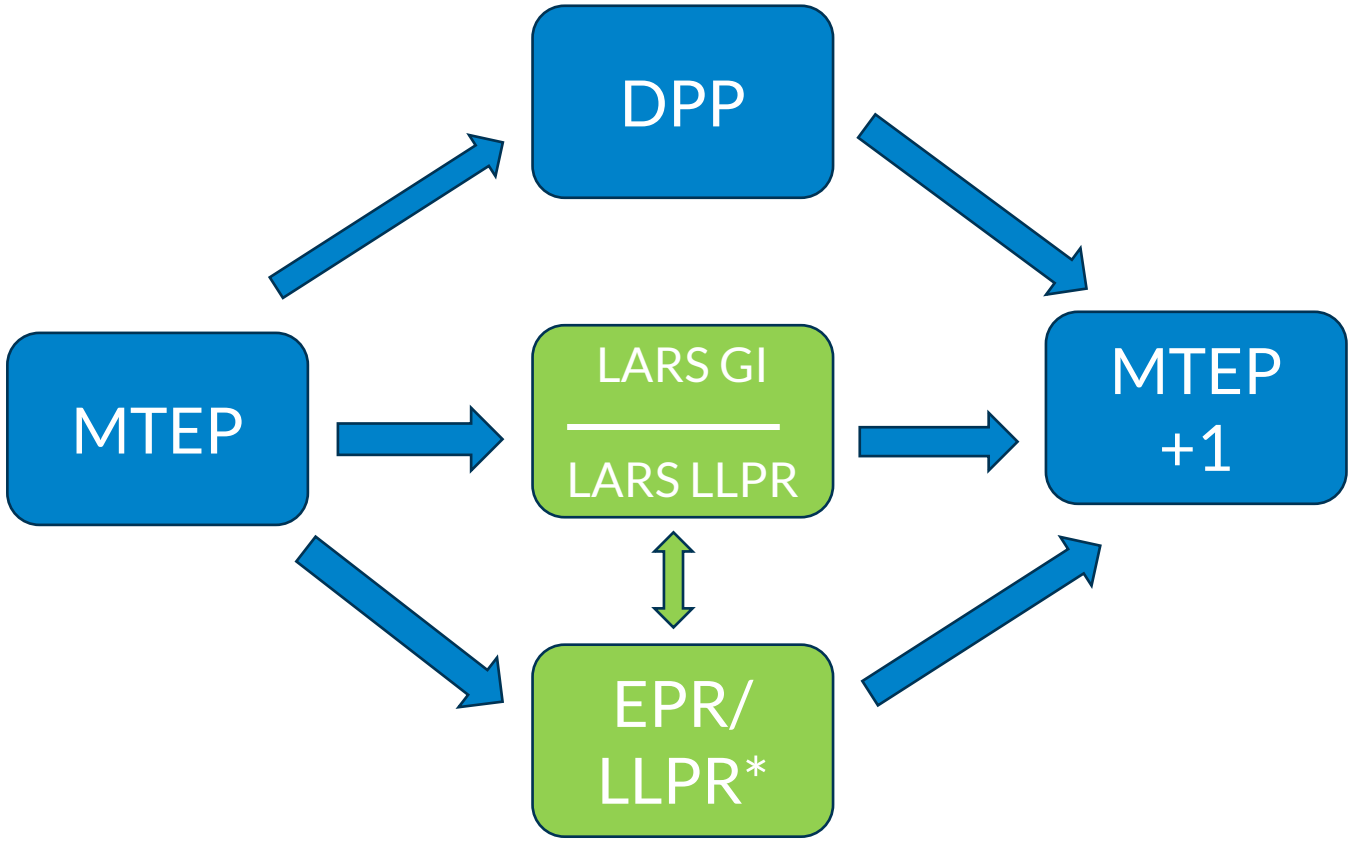
Each cycle, members provide information to build MISO Series models which create an updated base for the annual Planning Studies.

Year	Spring Light Load (SLL)	Summer Peak	Summer Shoulder (SSHW)	Summer Shoulder (SHAW)	Winter Peak
2 Year		MTEP			MTEP*
5 Year	MTEP*, GI	MTEP, GI	MTEP*, GI	MTEP	
10 Year		MTEP			

SSHW = Summer Shoulder High Wind
SHAW = Summer Shoulder Average Wind
Wind and solar dispatch value can be found in the Planning Modeling Manual posted on the Planning Modeling Web Page
*Sensitivity Models

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All studies begin with the MTEP models as a base to contain consistent topology, generation, and load assumptions.



- Each process may modify the base model to meet the needs of the individual studies
- As projects are approved, they are incorporated into the intra-cycle LARS and Large Load Project Request/EPR processes
- All approved and completed studies flow into the next MTEP models

*Large Load Project Review (LLPR) is being developed to provide an avenue for Large Load expedited studies going forward.

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LARS Modeling assumptions must meet the needs of the individual study processes to provide a complete analysis of the request

Model Assumption	LARS Load Study	LARS GI Study	Benefit
Provided Transmission Solution, Large Load, Generator	Fully represented in all applicable models	Fully represented in all models	Consistency of representation
Tranche 2.1 and JTIQ representation	10-year Models In-Service dates 2032 – 2034	5-year Models	Explore common solutions to observed constraints in the 10-year transmission/load and 5-year generation models. Mitigate near-term issues for load interconnection. Tranche 2.1 and JTIQ projects can be used for mitigations in 5 year models.
Load Representation	All approved and proposed loads represented in LARS cycle	All approved and proposed individual loads represented in LARS cycle	See the full impact of the load within one area
Generation Representation	All approved GIA and proposed generators in LARS cycle	All approved GIA and proposed individual generation in LARS	Isolate the projects required to interconnect the generation from those needed to support load.
Impact of Load and Generation Representation	Load and gen pairs impacts individualized and cumulative reliability	Load and gen pairs impacts individualized	Reliable system
Attachment Y	3-year suspension	3-year suspension	Adjust dispatch for anticipated retirements
Generation Dispatch	LBA based before new generation New generation at fuel type dispatch levels to meet total load	LBA based before new generation New generation at maximum output per NRIS request	Test multiple generation dispatches to determine constraints
Contingency Analysis	P0-P7 including loss of Large Load and loss of Generator	P0, P1, P2, P4, P5, P7 including loss of Large Load	Full spectrum of contingencies across timeframes and processes are analyzed
Solution Development	Individual impacts considered, coordinate with TO	SUGAR recommendations Coordinate with TO and IC (AdHoc Group)	Bring Sugar developed solutions to the TO and IC for coordination (AdHoc Group)

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Next Steps



September 23, 2026 (LLWG)



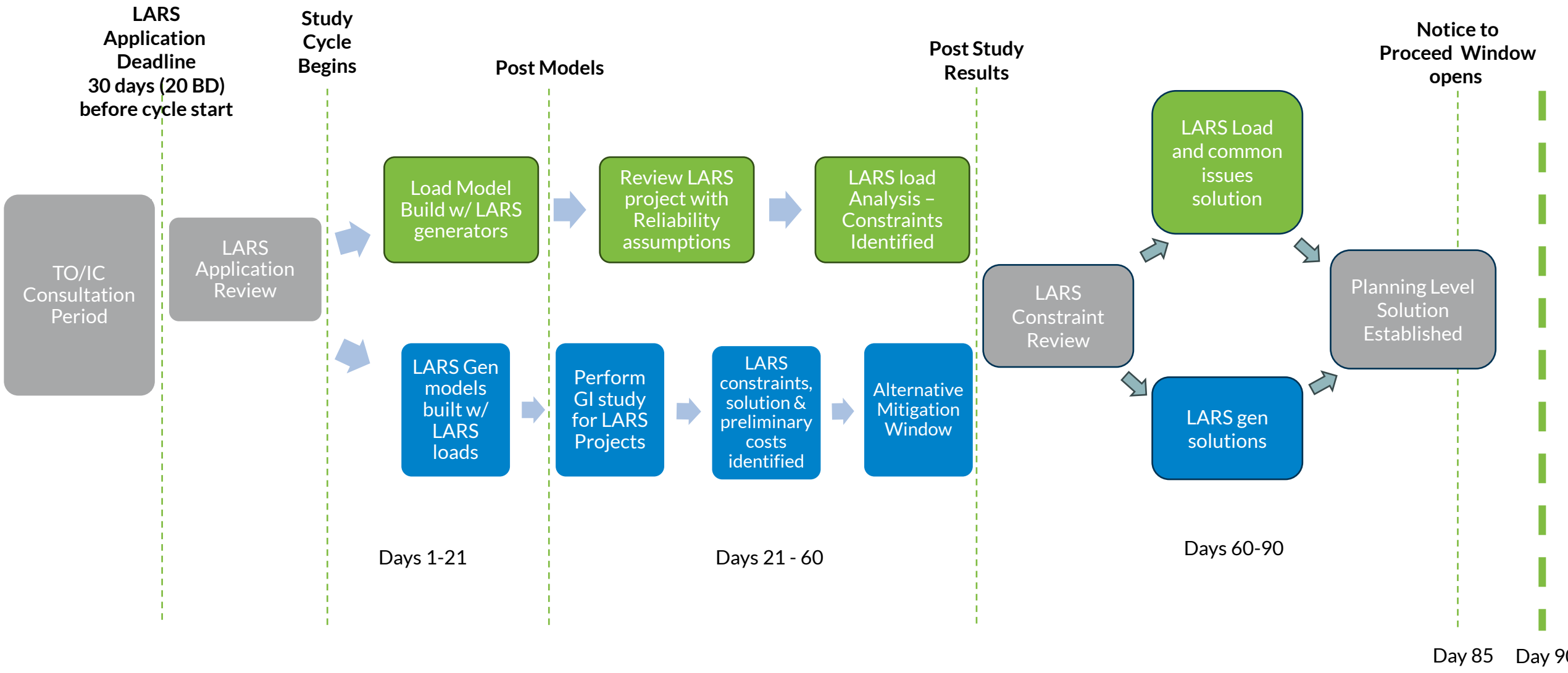
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Appendix



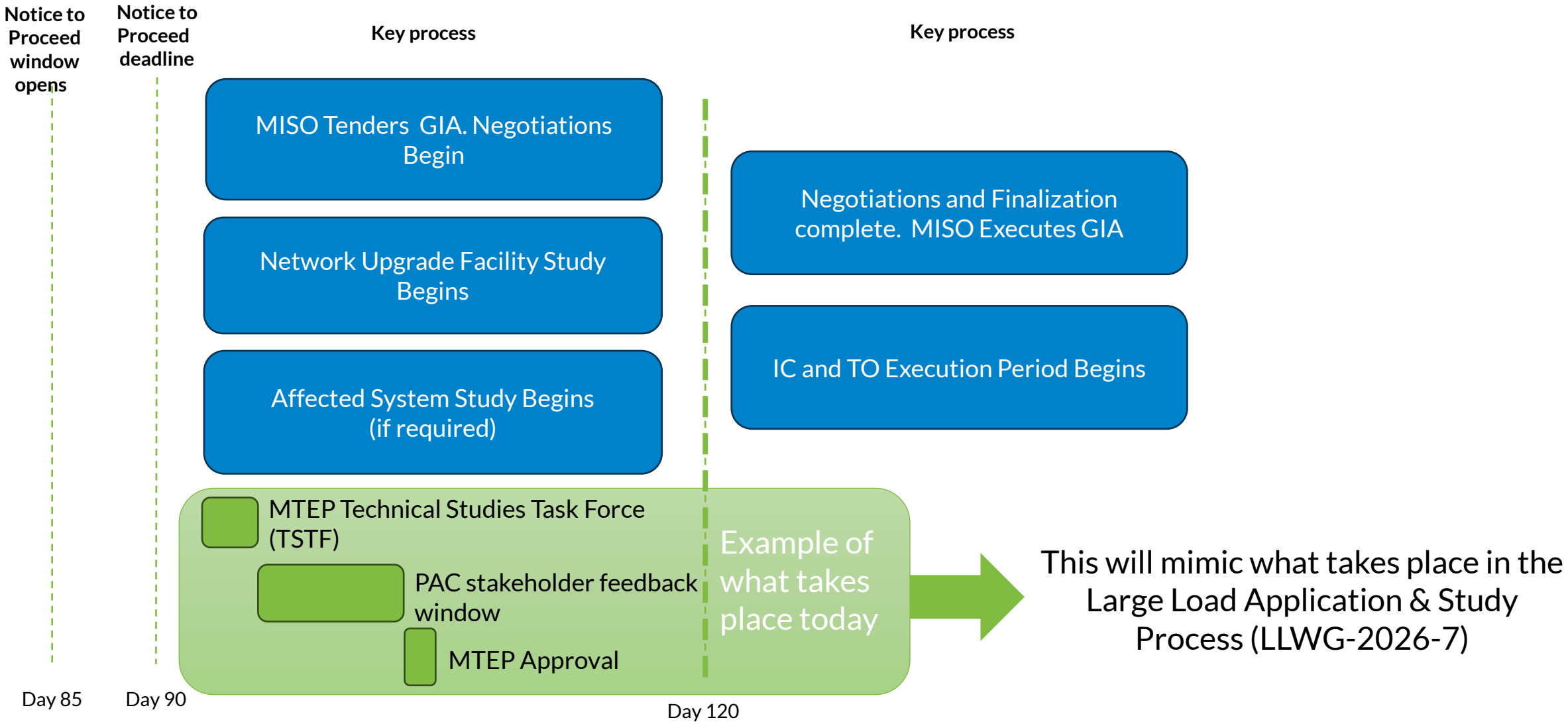
High Level Timeline



BD Business Day

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After election to proceed high level timeline



This will mimic what takes place in the Large Load Application & Study Process (LLWG-2026-7)

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LARS parallel studies overview

Pair Up	Engagement	Project Submission to MISO	Study	Violation Mitigation	Continuous Coordination	Outcome
Load customer identifies a generator to pair with Contract signed	Defined time period where Load customer engages appropriate TO(s) and both agree on a POI and POW The parties determine preliminary transmission upgrades to interconnect load	Transmission Owner/ Generation Owner/ Load Serving Entity submit application to MISO	Project gets incorporated into next available LARS model building cycle including transmission, load, and generation	If new or worsened reliability violations are found, MISO works with TO(s) to identify solutions	Results and solutions are repeatedly shared between studies to ensure the most efficient buildout	MTEP approval
Generator customer identifies a load to pair with Contract signed	Defined time period where IC meets with appropriate TO(s) to determine POI	Transmission Owner/ Generation Owner/ Load Serving Entity submit application to MISO	Project gets incorporated into next available LARS model building cycle including transmission, load, and generation	Generation interconnection study using SUGAR identifies constraints and proposed mitigations	Results and solutions are repeatedly shared between studies to ensure the most efficient buildout	GIA

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