UNITED STATES OF AMERICA

BEFORE THE

FEDERAL ENERGY REGULATORY COMMISSION

Interconnection of Large Loads to the	**)**	**Docket No. RM26-4-000**
Interstate Transmission System	**)**	

COMMENTS OF CRITICAL LOOP

Critical Loop respectfully submits these comments in response to the Commission's proceeding on interconnection of large loads to the interstate transmission system. We appreciate the Commission's focus on creating a timely, orderly, and non-discriminatory path to power for new industrial and digital loads.

I. About Critical Loop and Summary of Recommendations

Critical Loop is a system integrator and developer of time-to-power solutions. We help industrial and digital customers such as manufacturers, fleet depots, logistics hubs, and datacenters connect rapidly and reliably. We integrate flexible interconnection with on-site resources such as battery energy storage (BESS) to bridge capacity constraints. In multiple jurisdictions, we have urged regulators to scale flexible service connections and pair them with transparent planning tools (e.g., hosting-capacity or ICA-style information) so customers can commit to predictable limited-load profiles from day one. By providing a realistic, low-cost, timely option, these same frameworks can reduce the proliferation of 'phantom' large-load projects, speculative or oversized requests that sit in queues and distort transmission planning and investment signals.

Over the past year, large-load customers have increasingly sought flexible pathways at both distribution and transmission levels. Utilities are beginning to acknowledge that curtailment-ready loads and co-located supply can unlock faster time-to-power without compromising reliability. The technology to operate large loads flexibly exists today; the bottleneck is the commercial and procedural pathway.

To deliver timely connections while safeguarding reliability and affordability, Critical Loop recommends that FERC:

1. Establish a Large-Load Flexibility Commitment (LLFC) in the pro forma tariff; an opt-in construct under which a load accepts specified curtailment and/or relies on on-site or adjacent supply under defined conditions and require transmission providers to model LLFC parameters explicitly in interconnection studies.
2. Direct studies to model enforceable flexibility, not a static maximum-withdrawal assumption. Where an LLFC sets binding net-withdrawal and curtailment limits with operator-enforceable controls, transmission providers should evaluate interconnections against those limits with explicit non-performance contingencies rather than defaulting to a static, all-resources-unavailable maximum-withdrawal assumption that obscures the value of on-site batteries.
3. Define and use operating envelopes. Under an LLFC, the transmission provider should issue time-varying operating envelopes that cap a site's net withdrawals (and, if applicable, net injections). The customer's certified control system must enforce the envelope autonomously and provide real-time telemetry confirming compliance
4. Make the LLFC resource-agnostic inside the fence (co-located BESS/generation/controllable station load) and adjacent behind the same POI. Transmission providers should credit such flexibility when the customer's power control system enforces non-export and import-limit setpoints at the POI and the onsite resource meets the study screens in Section IV.
5. Systematize and automate flexible interconnections by requiring publication of hosting-capacity-style data for load (hourly and seasonal headroom, constraints, expected curtailment windows) and by offering standardized flexible options (limited-load profiles, non-firm service, and joint-study paths for hybrid or adjacent resources).
6. Create a non-firm network service (withdrawal) option and allow non-firm injection for hybrid or adjacent resources participating in LLFCs, with joint study for load and supply at or near a common point of interconnection.

7. Recognize LLFCs for capacity/resource adequacy (capacity accreditation or reduced procurement obligations), enabling faster energization when capacity constraints would otherwise delay interconnection.
8. Stand up a transparent load-interconnection queue with expedited timelines and standardized telemetry/verification, and adopt a 60-day initial determination requirement to provide a limited-load capacity profile, identified constraints and telemetry, and a provisional queue position while full studies proceed.
9. Recognize BESS-enabled bridge operation as a low-impact, fast-permitting path that accelerates time-to-power and reduces reliance on long-lead export interconnections.

II. Large Loads Are Technically Flexible Today

High-performance datacenter clusters and modern industrial loads require power-quality stabilization and fast ramping support. Industry practice now routinely deploys BESS-based stabilization that measures and controls instantaneous load, provides ride-through, follows rapid rise and drop profiles, and switches between charge and discharge quickly. These battery buffers are essential when new loads must energize on constrained or provisional grid connections, and they can be orchestrated with grid supply through certified power-control systems and grid-interactive switchgear.

II-A. Why the Static Maximum-Withdrawal Assumption Masks Battery Value

Today, the default large load study focuses on a static, all-resources-unavailable maximum-withdrawal assumption (“worst-case”), treating co-located flexibility as absent or charging and the load as non-curtailable. That deterministic extreme answers the question ‘what if everything fails at once,’ but it does not represent how an LLFC site operates under enforceable controls. The result is overstated upgrades, delayed time-to-power, and the loss of the measurable reliability contribution of BESS operated to cap net withdrawals during stressed conditions.

In practical operation, properly configured BESS can deliver fast ramping, ride-through, and power-quality stabilization. These benefits disappear under the static assumption but properly reduce peak withdrawal and upgrade scope when modeled against LLFC limits. On-site BESS can be credited without compromising safety or protection of the common binding constraints, including voltage and thermal loading that necessitate upgrades.

II-B Accurate Scenario Construction and Planning for Large Load Flexibility

A rights-based, controllability-based approach is more accurate and transparent for large, flexible loads. Transmission providers and RTOs/ISOs should certify this method of LLFC flexibility for use in base interconnection and planning cases, not solely as sensitivities. The resulting scenario planning and scheduling must be evidence-based, defining the operating envelope limits at the POI, the ramp and duration capability, the telemetry latency and visibility, and providing periodic test results.

This screening method can be resource agnostic for onsite and adjacent resources behind the same point of interconnection. Non-performance (e.g. storage offline) can be modeled as a contingency with associated operating procedures and financial consequences, but base upgrade requirements should not be set by those sensitivities when enforceable LLFC controls materially bound risk.

We suggest that the LLFC define and prescribe operating envelopes for load operation in the study. For example, if a customer commits to a tariff-backed LLFC with firm net-withdrawal limits (for example, seasonal N-0 and N-1 limits), defined curtailment triggers, and verified battery response, then studies should use those limits for normal and contingency cases. The operating envelope is the control primitive that the studies, operators, and customers can all respect in real time.

III. DOE's Advanced Notice Identifies Flexibility as the Path to Expedited Interconnection

Curtailable loads and dispatchable hybrids should receive expedited treatment through a tariffed LLFC option with standardized terms such as triggers, notice, limits, and telemetry, which transmission providers must incorporate into studies to determine whether flexibility can avoid or defer network upgrades and shorten time-to-power.

IV. Proposed Tariff Construct: Large-Load Flexibility Commitment

An LLFC is a contractual, tariff-backed commitment by a transmission-connected load to curtail to pre-specified levels when directed under defined system conditions and/or rely on co-located or adjacent supply (generation or storage) to meet a site's net profile. LLFCs specify curtailment triggers, maximum hours or MWh per year, notice windows, telemetry and verification, and financial consequences for non-performance. Transmission providers should model LLFC terms explicitly in interconnection and network-upgrade studies rather than assuming non-coincident peak at all hours, revealing least-cost paths to interconnect safely. LLFC participants should also be eligible for non-firm network withdrawal rights and non-firm injection rights for co-located or adjacent supply, with joint study of load and supply at or near a common point of interconnection.

Study instructions for LLFC projects:

1. Set the operating envelope based on normal and contingency capabilities by season and by hour, instead of by peak load.
2. Determine whether the site's operation within the envelope can resolve the identified constraints.
3. Evaluate explicit non-performance sensitivities (for example, storage unavailable or control failure) but do not set base upgrade requirements on those sensitivities when enforceable LLFC controls materially bound risk.
4. Publish a side-by-side upgrade table showing which facilities are driven by the LLFC envelope versus non-performance sensitivities, and the expected frequency or conditions under which each would bind.

Minimum controls and telemetry for LLFC participants:

1. Import-limit enforcement and non-export protection, with charge-inhibit windows aligned to identified stress periods.
2. State-of-charge floors and defined ramp-rate commitments sized to the LLFC envelope.
3. Real-time, SCADA-grade net-withdrawal telemetry and operator dispatch confirmation.
4. Event performance verification with financial consequences for violations.

5. Use of certified power‑control systems and open standards‑based communications (for example, UL 3141‑class PCS; IEEE 2030.5/OpenADR) as available, while keeping tariff requirements technology‑neutral.
6. Acceptance screens for LLFC participation.

Onsite LLFC credit shall be granted when:

1. The onsite resource is co‑located or adjacent behind the same POI.
2. The UL‑3141‑class PCS enforces import‑limit and non‑export at the POI such that physics based binding constraints (thermal, voltage, and/or protection) are met for every time step of operation without requiring a system upgrade

V. Capacity and Reliability Benefits

Small, predictable curtailment rates translate to large system value. Loads that cap peak withdrawals via LLFCs reduce incremental capacity needs and avoid or defer upgrades, enabling faster energization without sacrificing reliability. RTOs/ISOs should recognize LLFCs in capacity accreditation or allow appropriate adjustments to procurement obligations when loads accept enforceable limits and provide verifiable response. To ensure these resources are countable, both performance penalties and event testing should be aligned to times of peak grid stress, such as heat waves, winter peaks, and renewable production dips.

VI. Queue Design, Timelines, and the 60‑Day Initial Determination

FERC should require each transmission provider to establish a transparent load‑interconnection queue, publish standardized timelines and datasets, and prioritize LLFC projects for expedited study. A 60‑day requirement for all large‑load requests should provide a binding initial determination that includes a limited‑load capacity profile, identified constraints and telemetry, and a provisional queue position so developers can plan and finance while full engineering studies continue.

VII. Telemetry, Measurement, and Verification

FERC should direct transmission providers to file uniform data interfaces and performance‑verification protocols, including real‑time net‑load telemetry, dispatch confirmation, and, where applicable, state‑of‑charge for site storage, all interoperable with utility SCADA systems.
Done correctly, this structure will also reduce so‑called 'phantom' data centres and other speculative large‑load requests. When developers must anchor a queue position in transparent hosting‑capacity data, tariff‑backed LLFC commitments, and enforceable telemetry and non‑performance provisions, it becomes far less attractive to hold multiple oversized, purely optional positions that inflate apparent load growth.

Verification should at minimum cover (1) envelope compliance (no exceedances), (2) response time to dispatch, (3) power‑quality conformance during transitions, and (4) event summaries (MWh supplied by on‑site resources and any non‑performance). Performance test history should be referenced in interconnection and planning cases to support continued base‑case use of the LLFC envelope.

Each transmission provider should be directed to publish a constraint‑to‑flexibility mapping template that specifies, for each constraint, the available headroom, ramp requirements, expected duration windows, acceptable telemetry latency, and test history fields. LLFC participants shall submit this template so planners can study flexibility mitigations in a standardized manner.

VIII. Data Transparency and Automation

To systematize and automate flexible interconnections, FERC should require publication of hosting‑capacity‑style information for load at candidate points of interconnection, including hourly and seasonal headroom, expected curtailment windows, identification of binding constraints, and clear eligibility and process for flexible options such as LLFCs and hybrid joint‑study paths. This transparency will reduce soft costs, direct requests to viable locations, and make LLFCs practical and scalable.

IX. Alignment with State Programs

States are creating flexible service-connection options to relieve distribution constraints using predictable limited-load profiles and site controls. FERC's transmission-level LLFC framework should be complementary so a project can take a partial distribution connection quickly and transition seamlessly as transmission capacity comes online.

X. Environmental and Permitting

Recognize BESS-enabled bridge operation as a low-impact path that can permit faster than new combustion generation, improves power quality and ride-through for large loads, and buys time while export or transmission upgrades for new generation proceed. This approach accelerates time-to-power and reduces pressure on near-term export interconnections.

XI. Implementation Roadmap

FERC should:

1. Issue a policy statement and NOPR establishing LLFCs, non-firm network service, and joint load-supply studies for hybrids and adjacent resources, with clear telemetry requirements.
2. Require compliance filings within 12 months that include LLFC tariff sheets, a load-interconnection queue with LLFC prioritization, non-firm withdrawal and injection rights for LLFC participants, and capacity-market coordination proposals to credit LLFCs.
3. Convene technical conferences with DOE national labs, utilities, large-load customers, and integrators to finalize telemetry and hosting-capacity-for-load specifications and align LLFCs with state-level flexible service connection programs.
4. Encourage DOE to provide worked examples and anonymized case studies of flexible large loads in interconnection, transmission planning, and resource-adequacy models, and to prioritize in Grid Resilience and Innovation Partnership solicitations those projects that pair upgrades with contracted LLFC commitments.

XII. Conclusion

Large loads already have the flexibility the grid needs through battery‑based stabilization, controllable demand, and co‑located or adjacent supply. By adopting an LLFC framework, publishing hosting‑capacity‑style data for load, enabling non‑firm service and joint studies, crediting capacity value, and standardizing telemetry and verification, FERC can deliver timely, orderly, and non‑discriminatory interconnections to connect new industrial and digital load at scale. Speed‑to‑power is a core reliability metric for U.S. industry and AI infrastructure; policy should meet the moment.

Respectfully submitted,

/s/ Andrew Grinalds

Chief Operating Officer
Critical Loop, Inc.
criticalloop.com
andrew@criticalloop.com

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