# Feedback Form

# Technical Requirements for Large Computational Loads Connecting to the Ontario Power System – May 1st, 2026

## Feedback Provided by:


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Date: 28th May 2026

To promote transparency, feedback submitted will be posted on this engagement page unless otherwise requested by the sender.

☐ **Yes – there is confidential information, do not post**

X **No – comfortable to publish to the IESO web page**

Following the posting of Technical Requirements for Large Computational Loads Connecting to the Ontario Power System, the Independent Electricity System Operator (IESO) is seeking feedback from stakeholders on the requirements. The stakeholders can request one-on-one sessions with the IESO for clarification and discussion if needed before submitting feedback. Please submit the meeting request to engagement@ieso.ca.

**Please submit feedback to engagement@ieso.ca by May 28th, 2026.**

## General Comments/Feedback

BBA Consultants ("BBA") welcomes the opportunity to comment on the IESO's draft Technical Requirements for Large Computational Loads dated May 1, 2026. We commend the IESO for moving early to provide clarity to the sector - ahead of the NERC Large Loads Task Force's final guidance, and in parallel with other similar development across the industry including the ERCOT Large Load Working Group, AESO Phase I Large Load Integration, and others. The July 10, 2024 Eastern Interconnection event, in which a 230 kV fault cleared in 42-66 ms tripped ≈ 1.5 GW of voltage-sensitive data centre load across multiple sites and pushed system voltage to 1.07 p.u., underscores why this work is timely for Ontario.

BBA is a multidisciplinary engineering firm with deep specialization in power system planning, Ontario IESO interconnections, and the design of large industrial and data-centre/ computational load facilities.

# General Observations

BBA supports the direction of the draft, which is well aligned with IEEE Std 2800-2022, and with discussions occurring in other ISO jurisdictions. Three thematic viewpoints frame our detailed comments that follow.

1. **Constructability and CAPEX of the load-side ride-through requirements.** Several clauses - most notably the proportional active power reduction between 0.5 and 0.8 p.u. (Section 6.7.1(2)) and the 1-second active power restoration default - describe a load behaviour not natively achievable by today's commercially deployed double-conversion UPS fleet, which is designed to IEC 62040-3 and ITI/CBEMA standards. As written, hyperscale-sized data centre compliance would require supplemental grid-forming BESS, controllable load banks, or dynamic VAR devices sized at hundreds of MW per site. BBA recommends pairing the requirements with (i) a defined ***transition period*** plus IESO-led vendor consultation with UPS equipment manufacturers and OEMs, and (ii) an explicit alternative compliance path - analogous to AESO Phase I - that accepts equivalent system-level outcomes via alternative mitigations that limits coincident load loss to a pre-defined system-acceptable value, or one defined by the outcomes of a system impact assessment.

2. **Vendor capability gaps in protective relays and UPS controllers.** Several requirements assume settings and measurement windows not configurable in standard relays and UPS controllers in service today - notably the 0.5-s RoCoF averaging window (6.7.3), the 3–6 cycle frequency window (6.7.2), and the 25° phase-angle-jump capability (6.7.4).

   Confirmation with relay vendors (e.g. SEL, GE Multilin, ABB, Siemens) and UPS OEMs (e.g. Vertiv, Eaton, Schneider, ABB, Toshiba, Mitsubishi, etc.) ahead of finalization would protect against requirements that are technically prescriptive but commercially unimplementable. Grid-interactive UPS product class is now becoming commercially available and supports programmable grid services; however, industry adoption is still gaining ground and availability is varied. Framing requirements in the *transition period* around current vendor capability would greatly benefit the data centre industry.

3. **Differentiation by connection voltage and project size.** In some cases, the draft applies one set of thresholds (e.g. 20 MW/min ramp) across all projects ≥ 10 MW, whereas a tiered classification system or zonal-relevant values may be more appropriate. BBA recommends the IESO consider a tiered structure indexed to POI voltage (115 / 230 / 500 kV) and project size, so that a 20 MW distribution-connected facility is not subject to the same technical burden as a 500 MW campus connected at 500 kV.
4. **Equivalence with other industrial load facilities.** The guiding principle should be that large computational load requirements are treated consistently with other large industrial loads - neither subject to more lenient standards nor disproportionately stringent requirements.

## Detailed Observations

The following comments provide our detailed perspective to various technical clauses proposed in the *Technical Requirements for Large Computational Loads Connecting to the Ontario Power System V1.0*.

1. Section 5 - "All primary equipment data." "Primary" is undefined and may be ambiguous to some readers. Recommend specifying whether this is referring to primary connection voltage (high voltage) or referring to main ("primary") power system equipment.
2. Section 5 - Type of large computational loads. The current taxonomy (cloud, AI training, AI inference, crypto) describes use cases. Grid impact, however, is driven by hardware class (GPU clusters, ASIC, CPU-dominant, liquid- vs. air-cooled). Recommend the data submission also list, or primarily focus on, aggregate hardware type, which drives the fluctuation and ramp profile and varies most rapidly with technology generation.
3. Section 5 - "Post-fault active power recovery (PFAPC) time." It is unclear what the IESO would expect to be listed against this parameter if it is proposing to establish 1 second as the restoration time after system disturbance (ref. 6.7.1) (also discussed further below).
4. Section 5 - "UDM/Generic composite model for PSS/E and DSA tools." We recommend a joint technical working group – along with the IESO – to develop and publish a guiding technical specification (PSS/E version, DSAT version, parameter ranges, benchmarking criteria vs. EMT modeling, and acceptance tests) analogous to current IBR modelling guidance. PSCAD/UDM models capturing data-centre load behaviour are not generally available from OEMs and will be built by the applicant; an Ontario IESO-led technical working group, publishing an acceptance template would be materially beneficial to the industry.
5. Section 6.4 - Periodic Oscillations. Recommend defining "periodic" with a minimum duration threshold and an assessment window (e.g., oscillations sustained beyond X seconds/ minutes at the POI within the sub-synchronous band). As written, any transient oscillations during a workload step, which are inherent in many data centre use cases, would technically be non-compliant. Aligning Section 6.4 with the load-fluctuation assessment under A.7 closes the interpretation gap.

6. Section 6.6 - Load Ramping. A homogeneous 20 MW/min cap is significantly limiting for large projects. We recommend either (i) scaling the ramp rate with project size and POI voltage, or (ii) making it explicitly negotiable per project through SIA, with 20 MW/min as the default for projects connected at lower system voltages.
7. Section 6.7.1(2) - Proportional load reduction between 0.5 and 0.8 p.u. This is, in our view, the single highest-impact clause in the draft requirements. Modern double-conversion UPS systems transfer the DC-bus to battery on a voltage sag, similar to droop response. They are activated in this range to protect downstream IT equipment per IEC 62040-3. Requiring, instead, a proportional modulation would require either supplemental BESS / grid-forming devices at hundreds of MW per site, or UPS firmware / topology changes not yet uniformly available.

   BBA recommends the IESO that in the ***transition period***: (i) re-frame this as a permitted MW ceiling on load reduction based on SIA outcomes rather than a mandated proportional response; (ii) consider a vendor-readiness assessment alongside the requirement; (iii) adopt a reasonable transition period with grandfathering for existing projects, or projects already in SIA queue; and (iv) accept alternative site-level control logic as equivalent compliance.
8. Section 6.7.1(2) - 1-second active power restoration default. As specified, this is significantly faster than typical industry-practice for load restoration, especially for critical loads such as data centres. It is common practice in the industry to wait a few minutes for power restoration to stabilize before load restoration back to utility power. Compliance would require site-wide supplemental BESS or controllable load banks. BBA recommends (i) revisiting the default time proposed with the recovery time discussions happening in the NERC LLTF and other forums and/ or explain the explicit need for a 1-second restoration; and (ii) requiring staged restoration across UPS blocks so that simultaneous reconnection does not itself create a voltage step at the POI, and also preserves the required data centre reliability and resilience philosophies.
9. Section 6.7.2 - Frequency Ride-Through measurement window. A 3–6 cycle window is not universally available in commercially deployed protective relays and controllers. We recommend (i) alignment with relay vendors (SEL, GE Multilin, ABB) and UPS OEMs prior to finalization; and (ii) a more flexible approach would be to rely on established measurement algorithm families (e.g., zero-crossing, DFT-based, PMU-style estimators).
10. Section 6.16 - Commissioning Tests and Performance Validation. Please refer to our comments provided for Item #4.

## Closing

BBA thanks the IESO for the opportunity to comment, and for the open and constructive engagement process to date. We would welcome the opportunity to participate in one-on-one technical sessions ahead of the June 18, 2026 public webinar, where we can offer detailed input from our active data-centre design engagements as well as our subject-matter-experts.

Please contact the undersigned to coordinate further discussions or facilitate any required technical debriefings.

Sincerely,

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cc: Keven Van Velzen, P.Eng., Lead – Power Plant Performance Modeling, BBA Consultants