



GridStrong

DATA CENTER INTERCONNECTION AND COMPLIANCE

Model the load. Prove compliance. Interconnect faster.

2026



NERC NAMED YOUR LOAD A COMPUTATIONAL LOAD ENTITY.

NERC LEVEL 3 ALERT · MAY 4, 2026

AUGUST 3, 2026

Every utility in North America must report to FERC how they will handle loads like yours.

THE ALERT NAMED YOU

Computational Load Entity: ≥ 20 MW connected at 60 kV, with more than 1 MW of IT load. AI training, inference, crypto, and traditional data centers all qualify.

SEVEN ESSENTIAL ACTIONS NERC IS DIRECTING

01

MODELING DATA

Detailed dynamic models, separately for IT and non-IT load.

02

STUDIES

SOLs, P-Q / P-V analysis, contingency planning for aggregate loss.

03

QUALIFIED CHANGE

Even repurposing crypto to AI triggers a new study.

04

COMMISSIONING

As-built model verification, full and no-load testing, $\pm 10\%$ voltage tests.

05

PROTECTION COORDINATION

Ride-through to equipment capability. No firm load loss from cleared faults.

06

FAULT RECORDING

Continuous monitoring + trigger-based high-resolution capture.

07

OPERATIONAL COMMUNICATION

Voice and SCADA channels with TOPs, RCs, BAs.



COMPUTE BECAME BASE LOAD. THE GRID NOTICED WHEN IT BROKE.

THREE THINGS CHANGED IN THE LAST TWENTY-FOUR MONTHS.

SCALE

1-2 GW

PER CAMPUS

Hyperscale and AI training campuses now propose individual sites at the size of the largest fossil plants. Demand growth is the highest in two decades.

SPEED

5 → 30 MW

IN SECONDS

AI training cycles ramp real power faster than conventional generators can follow. Step changes the size of a peaker plant, on a single facility, in seconds.

SHAPE

40-60%

POWER ELECTRONICS

Servers, GPUs, UPS systems, and VFD-driven cooling are converter-based loads. They behave nothing like motors. The grid models them as motors anyway.



THIS IS WHY THE ALERT EXISTS.

DOCUMENTED DATA-CENTER-DRIVEN GRID EVENTS.

JULY 10, 2024

1,500 MW

LOST IN 82 SECONDS

A single 230 kV fault in the Eastern Interconnection. Six reclose attempts. Voltage-sensitive data center loads tripped simultaneously. Many facilities transferred to UPS or backup power. Some required manual reconnection.

SOURCE: NERC INCIDENT REVIEW

ERCOT WEST TEXAS

50%

OF LEL LOAD AT RISK

ERCOT modeling of a severe West Texas fault (voltage dip below 0.70 p.u. for over 20 ms) projects a 1,500 MW Large Electrical Load loss. Enough simultaneous loss to threaten conventional generators' own ride-through margins.

SOURCE: ERCOT JUNE 2025 LEL WORKSHOP

Real events on the system. Federal and regional regulators are responding to what they have already seen, not theoretical risk.



THE COMPLIANCE TICKING TIME BOMB

CASCADING DEADLINES FOR LARGE DYNAMIC LOADS THROUGH 2030

2025

OCT 2025

DOE Section 403 letter directs FERC to standardize >20 MW load interconnections.

NOV 2025

ERCOT NOGRR-282 ride-through requirements adopted (57-61.8 Hz / 299s; 0.20 p.u. / 150 ms).

DEC 18 2025

FERC finds PJM tariff 'unjust and unreasonable' for AI/co-located large loads (EL25-49).

2026

APR 30 2026

FERC final action deadline on DOE 403 large-load rulemaking.

MAY 4 2026

NERC Level 3 Alert issued. Distribution to every TO/TP/BA/RC/TOP.

AUG 3 2026

NERC Level 3 Alert reporting deadline. U.S. responses aggregated to FERC.

2027

Q1-Q2

NERC Project 2026-02 standard ballot. First mandatory standard for computational loads.

Q2-Q3

PJM tariff revisions per FERC EL25-49 directive in effect across co-located queues.

Q3

ERCOT NPRR 1308 LLIS Phase 2 implementation; ride-through testing baseline.

Q3-Q4

AESO Phase 2 capacity allocation framework launches following Phase 1 cap.

THROUGHOUT

Dominion PEILL v2; CAISO PTOs publish standardized data center handbook updates.

2028

JAN

ERCOT deep voltage sag cliff. Proportional consumption mandatory at 0.5-0.8 p.u.

Q1-Q2

NERC computational load registry fully operational. CLE registration enforceable.

Q2

First-wave 90-day investigation triggers active for non-compliant facilities.

Q3

PJM, MISO, ISO-NE align composite load model and dynamic data expectations.

Q4

GO/GOP-style obligations begin for large load owners.

2029-30

Q1 2029

Cross-region NERC reliability standard updates rolled out. EMT/RMS dual-model baseline.

Q2 2029

International alignment: IESO Ontario and AESO Alberta data center frameworks harmonized.

Q3 2029

FERC oversight reviews of regional implementations; refiling cycle begins.

Q1 2030

Sunset for legacy load models in TP/PC submissions. EMT becomes the floor.

THROUGHOUT

Hyperscale procurement specs assume regulatory baseline; EMT is no longer a differentiator.



WHEREVER YOU'RE BUILDING, THE RULES ARE TIGHTENING.

REGIONAL THRESHOLDS AND MECHANISMS, STATUS AS OF MAY 2026

ERCOT

≥75 MW LLI · ≥25 MW visibility
NOGRR-282 ride-through · NPRR 1308 LLIS

ACTIVE

PJM

Manuals 14H / 14C / 14G
FERC EL25-49 directive (Dec 2025)

RULEMAKING

DOMINION

PEILL ≥ 50 MW
PSS/E dynamic models · six-event ride-through

ACTIVE

SPP

HILL framework
~90-day study, RR696

ACTIVE

MISO

TO-led with MISO planning
MTEP Attachment FF · local TO guides

ACTIVE

NYISO

TEI process
SIS/SR with dynamics + telemetry

ACTIVE

CAISO

Via PTOs (PG&E / SCE / SDG&E)
PG&E TIH primary reference

ACTIVE

ISO-NE

PTO-led
PP5-6 studies · composite load model

EVOLVING

AESO

Phase 1 cap: 1,200 MW DTS
Phase 2 consultations underway

CAPACITY-LIMITED

IESO

≥20 MW step loads recognized
Market Rules Ch. 4

EVOLVING

Common floor: dynamic models, ride-through, telemetry, curtailment terms. The DOE 403 push standardizes the floor; regional specifics layer on top.



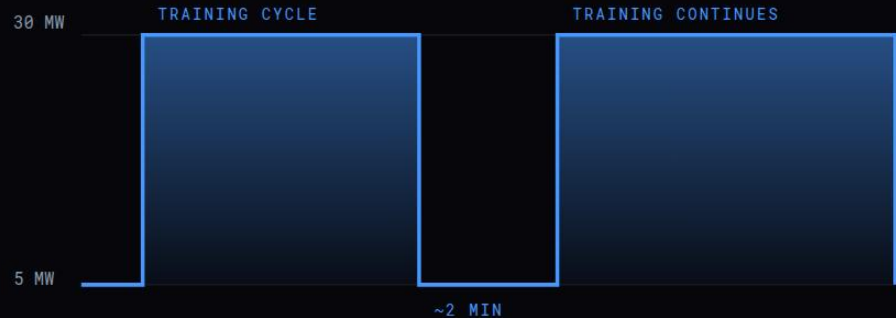
INVERTERS, NOT JUST LOAD.

COMPOSITION AND DYNAMICS THAT BREAK CLASSICAL LOAD ASSUMPTIONS

TYPICAL DATA CENTER LOAD COMPOSITION

SERVERS		30-40%
COOLING		20-40%
UPS / PDU		10-15%
STORAGE		5-10%
NETWORKING		5-10%

AI TRAINING IN ONE CHART



Real measurement: a 5 MW baseline jumps to a 30 MW sustained load during a training cycle. A two-minute drop. Then back to 30 MW. These are step changes the size of a peaker plant, happening on a single facility in seconds.

SOURCE: EDGETUNEPower MEASUREMENT, PRESENTED AT NERC LMWG

Up to 75% of a data center's load is converter-based. Steady-state phasor models cannot capture the switching, harmonic injection, or fault behavior of converters.

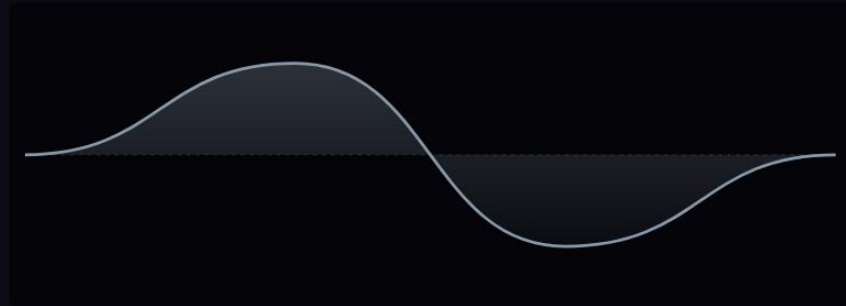


THE GRID IS STUDIED WITH MODELS THAT CAN'T SEE YOUR LOAD.

WHAT THE STANDARD COMPOSITE LOAD MODEL (CMLD) MISSES

WHAT CMLD MODELS SHOW

A CLEAN VOLTAGE EVENT



SMOOTH SAG · CLEAN RECOVERY · NO RECLOSE

WHAT ACTUALLY HAPPENED

JULY 10, 2024



FAULT · SWELL · FIVE RECLOSSES · SUB-CYCLE DETAIL



NO VOLTAGE SWELLS

Real grids have both. Swells damage power supplies.



NO TIME DELAYS

Real protection has delays. The delays are what matter.



NO AUTO-RECLOSEING

Real faults always reclose. July 10, 2024 had six.



VOLTAGE-ONLY TRIGGERS

Real data centers trip on frequency too.



AGGREGATED LOAD

Real facilities have layered, vendor-specific protection.



EMT MODELING SEES WHAT PHASOR MODELS CAN'T.

THE SHIFT FROM RMS PHASOR SIMULATION TO ELECTROMAGNETIC TRANSIENT

OLD

PSPD / RMS / PHASOR

~4 ms (¼ cycle)

TIME STEP

CAPTURES

Steady-state Slow dynamics below 10 Hz

MISSES

Sub-cycle transients Harmonic interactions Weak-grid behavior DC-link protection trips

NEW

ELECTROMAGNETIC TRANSIENT

10-50 μ s (SUB-CYCLE)

TIME STEP

CAPTURES

Full waveform Sub-cycle transients Harmonics Fast switching Weak-grid behavior

REQUIRED FOR

Power-electronic load Ride-through proof DC-link protection NOGRR-282 compliance

When NERC says **verify ride-through**, they mean EMT.
When ERCOT says **demonstrate NOGRR-282 compliance**, they mean EMT.
When your TO won't approve a study, **this is why**.

SOURCE: NERC DATA CENTER LOAD MODELING TECH REF R1 · GRIDSTRONG TWO-PAGER



WHAT GRIDSTRONG IS

EMT MODELING AT THE CENTER. EVERY ADJACENT CAPABILITY BUILT AROUND IT.

LOAD CHARACTERIZATION

INTERCONNECTION STUDIES

RIDE-THROUGH COMPLIANCE

PROTECTION COORDINATION

**EMT
MODELING**

FAULT RECORDING

THE WEDGE.

TELEMETRY & VISIBILITY

REGULATORY FILING

COMMISSIONING SUPPORT

Seven of seven NERC Level 3 essential actions covered. One firm. One platform.



WHY OUR MODELS WORK WHEN OTHERS DON'T.

THE DATA AND THE DISCIPLINE BEHIND GRIDSTRONG'S EMT PRACTICE

91,000+

REQUIREMENTS INDEXED

Every NERC, regional, and ISO standard parsed into a structured database. Cited automatically in every study, every filing, every model package.

OEM
DATA MOAT

VENDOR DATABASE

Protection systems, power plant controllers, fault recorders catalogued by OEM, model, and settings. No other firm has built this corpus.

PSCAD

+ PSS®E + UDM FLUENCY

Custom user-defined models that preserve OEM IP via black-box embedding. Studies clear utility review the first time, not the third.

7 / 7

NERC LEVEL 3 ACTIONS

Modeling data, studies, qualified change, commissioning, protection, fault recording, operational communication. All seven are in scope from day one.



FOUR STEPS FROM SITE PLAN TO ENERGIZATION.

THE GRIDSTRONG DATA CENTER INTERCONNECTION PLAYBOOK

01

LOAD CHARACTERIZATION

Full electrical characterization of power electronics, UPS, cooling, auxiliary loads. Harmonic profiles, fault current contribution, dynamic response.

02

EMT MODEL DEVELOPMENT

Detailed electromagnetic transient models capturing converter switching, control loops, and protection scheme behavior at sub-cycle resolution.

03

INTERCONNECTION STUDIES

Power flow, short circuit, stability, ride-through analysis. Grid impact studies per ISO/RTO requirements with full documentation.

04

COMPLIANCE & FILING

Ride-through compliance demonstration, NERC standard mapping, regulatory filing support. Audit-ready documentation from day one.

From kickoff to TO approval. Audit-ready by design, not by retrofit.



WHY DEVELOPERS PICK GRIDSTRONG.

FOUR REASONS OUR CUSTOMERS STOP SHOPPING AFTER THE FIRST CALL

EMT MODELING DEPTH

We build EMT models that pass utility review the first time. PSCAD, PSS®E, and custom UDMs that preserve OEM IP. Sub-cycle resolution where it matters.

FIRST PASS STUDIES CLEAR UTILITY REVIEW

REGULATORY FLUENCY

Every NERC standard, every regional rule, every active rulemaking, indexed and cited. We know which paragraph of which order applies before the kickoff call.

91,000+ REQUIREMENTS INDEXED

SPEED TO STUDY

Pre-staged model libraries, parameter packages drawn from our database, audit-ready documentation by default. Weeks where competitors take months.

WEEKS NOT MONTHS

VENDOR KNOWLEDGE

Protection systems, power plant controllers, fault recorders. Every major OEM, every model, every setting catalogued. The only firm that has built this database.

OEM VENDOR-EQUIPMENT DATA MOAT



START SMALL. GET CONNECTED.

AN ENGAGEMENT MODEL THAT COMPOUNDS, NOT A PROCUREMENT MARATHON

01

LOAD CHARACTERIZATION

We document your facility's electrical behavior: composition, ride-through capability, ramp envelopes. Output is the parameter package your TO will need on day one of the interconnection conversation.

02

EMT MODEL

Custom EMT model in PSCAD or PSS®E, validated against manufacturer data, packaged for utility submission. Black-box wrapping if OEM IP is sensitive.

03

INTEGRATED STUDY

Ride-through, voltage sag, harmonic, short-circuit, and stability analyses. One coordinated package, one responsible firm, one set of citations.

04

FILING & APPROVAL

Compliance demonstration, regulatory filing support, TO/RTO/ISO review cycles closed out. Every assertion tied back to a NERC standard or regional rule.

FILING-READY PACKAGE IN MONTHS, NOT YEARS. WE STAY THROUGH COMMISSIONING, PTO, AND POST-ENERGIZATION DATA VERIFICATION.





LET'S TALK

30-minute discovery call. You bring the questions, we'll bring the data.

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