



Energy Data Acquisition Systems October 2025

Welcome

Our presentation will begin shortly.

Today's Presenter: Jakob Helsher – EDAS Associate Specialist

ISO PUBLIC - © 2025 CAISO
Rev. 10/7/25

Housekeeping



Keep yourself muted to minimize background noise



Unmute to ask verbal questions or write questions in the chat pod



Raise your hand using WebEx interactivity tools

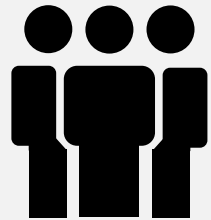
The information contained in these materials is provided for general information only and does not constitute legal or regulatory advice. The ultimate responsibility for complying with the ISO FERC Tariff and other applicable laws, rules or regulations lies with you. In no event shall the ISO or its employees be liable to you or anyone else for any decision made or action taken in reliance on the information in these materials.



Objectives

EDAS Overview
EDAS Documentation Requirements
Telemetry Validation Requirements
Telemetry Non-Compliance/Exemptions
Discussion/Wrap-Up

EDAS Overview



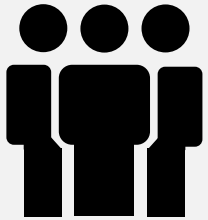
Energy Data Acquisition Specialist Team (**EDAS**) is responsible for engineering requirements and standards for:

- Revenue Metering via:
 - Approved CAISO Meters (CAISO Inspected and Certified)
 - CAISO Meter data processing
 - Settlement Quality meter data (SQMD) plans
- Direct Telemetry via:
 - Distributed Network Protocol 3 (DNP3) devices
- Generation Desk Support Center (GDSC)
- Ancillary Services (AS) Testing

EDAS Overview – The EDAS Team

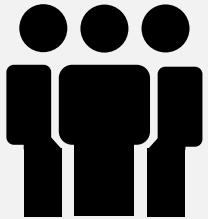
- Full-Time
 - Priyanka Namburi
 - David Acevedo
 - Vitaliy Daniliuk
 - Christian Ramos
 - Stacia Lee
 - Timothy Sysa
 - Jakob Helsher
- Contractors
 - Jeffrey McDonald
 - Joshua Caldeira
 - Mohammed Dhali
 - Ryan Aboueljoud

EDAS Overview: What does EDAS do? (Pre-COD)



- Document Review
 - Single Line Diagram (SLD)
 - Three-Line Diagram (3LD)
 - Communication Block Diagram (CommBlock)
 - Remote Intelligent Gateway (RIG) Details Form
 - Meter Configuration Worksheet (MeterConfig)
 - 24Hour Contact Form
 - Certification Practice Statement for Basic Assurance Certification Authority (CPS) Agreement
 - Energy Communications Network (ECN) Agreement
 - Meter and Site Verification Sheet (MSVS)
 - Point of Receipt (POR) Calculation
 - Meter Exemption (BESS Idle, Dynamic Losses)
 - Metering Overview
- DNP3 Point Building
- Point to Point Testing
- Trial Operations (SYNC) Reviews
 - EDAS SYNC
 - Operational Readiness SYNC
- Commercial Operation Date (COD) Reviews
 - EDAS COD (72-hour Test)
 - Certificate of Compliance (COC)
 - Operational Readiness COD
- WREGIS
 - QRE Requests

EDAS Overview: What does EDAS do? (Post-COD)



- AS Certification Testing
 - Regulation
 - Spin/Non-spin
 - Black Start
- Meter Data
 - Processing
 - Corrections
 - Meter Exemptions
- Telemetry Non-Compliance
 - RIG Notifications & Issue Tracking
 - Weekly SC Notifications
 - Telemetry Exemptions
- WREGIS
 - Uploads
 - Corrections
- Rules of Conduct (Metering & Telemetry)
- Generation Desk Support Center (GDSC)
 - Manual MW Updates
 - Unannounced Ancillary Services (AS) Testing
 - Automatic Generation Control (AGC) telemetry monitoring
- Fieldwork/RIMS Projects
 - P2P Testing (New Points/Devices)
 - RIG Maintenance/Replacements
 - Meter Maintenance/Replacements
 - Communication Maintenance
 - RIG Certificate Renewal
 - Document Requests
- Project Help Line
-and more!

EDAS Overview: What does EDAS do? 2024 Metrics

2024 Fieldwork Appointments

- P2P Tests: **224**
- Meter Maintenance: **1045**
- Meter Replacement: **103**
- RIG Replacements: **15**
- Communication Maintenance: **74**
- RIG Maintenance: **80**
- RIG Certificate Renewal: **639**

GDSC

- Talk Time: **10,615 minutes**
- Unannounced AS Tests: **52**

Telemetry Issue Tracking

- Tickets Created: **2532**
- Exemptions: **1610**

AS Certification Tests: **322**

Meter Exemptions: **392**

EDAS Documentation Requirements

Bucket 1

- SLD/3LD
 - CTs/PTs Correctly Labelled
 - [Checklist](#)
- CommBlock
 - Clearly identify source points
 - Submit updates for any changes
 - [Checklist](#)
- RIG Details Form
 - [Checklist](#)
- Metering Scheme Overview
 - Required for any complex metering
 - BESS IDLE – detail loss of comm to BESS IDLE source device

EDAS Documentation Requirements

Bucket 2

- Meter Configuration Worksheet
 - Correct channels
 - Port numbers
 - Public IP – ISO firewall
 - Multipliers
 - Load/Standby provider

Bucket 3

- 24/7 Contact Form
- CPS Agreement
- External Network Form (Previously ECN Agreement)

Bucket 5

- Meter and Site Verification Sheet (MSVS)
 - Seal numbers
- Point of Receipt (POR) Calculation (If applicable)
- Meter Exemption
 - Required for external inputs to CAISO Meter (e.g. loss schemes, BESS IDLE)

EDAS Notifications - Contact Forms

Metering Non-Comm:

- SC Contacts – managed by SC Requests team
 - Primary Contact
 - Primary Contact Alternate
 - Metering
 - Metering Alternate
- All MSA/PGA contacts – managed by Regulatory Contracts team
- Meter contacts submitted to EDAS using the MeteringContactForm

Telemetry non-compliance:

- Telemetry contacts submitted to EDAS using the 24HourContact-Operations form
 - RT24HOUR
 - Primary
 - Alternate
- SC Contacts – managed by SC Requests team
 - Primary Contact
 - Primary Contact Alternate

Question 1



Raise your hand if you've been part of a P2P test that didn't go exactly as planned.

Telemetry Validation Requirements – Point to Point Testing

- Updated P2P Procedure
- <https://www.caiso.com/documents/rigacceptancetest-rat-procedures.pdf>
- Important topics
 - Pretesting/Comm Check
 - Source Devices
 - Test Kit Requirements
 - BESS IDLE, loss schemes, netting.
 - AGC Setpoint Testing
 - Communication Pulls

4.5.2 Analog Values

Manually input an analog value for each point. Verify that the correct value is displayed at the EMS display. All analog inputs will be verified using a three-point check (0, mid-scale, and full scale). All newly installed meters or relays supplying analog data to the RIG must be validated through test kit injections. All other analog points must be tested from their respective source devices.

The following additional requirements apply:

- For BESS units, BESS IDLE Active must set the UPMW point to 0. Other MW points (e.g. UGMW, UAMW, UNMW) should not be impacted by BESS IDLE logic.
- For units providing AGC, The AGC setpoint test must be validated across all relevant systems to ensure it accurately reflects performance under actual operating conditions.
- Sites reporting weather data must be tested using live data; substituted or forced values will not be accepted.

4.5.3 Digital Values

Toggle each digital value. Verify that the correct value is displayed in the EMS display. Verify each correct state of the digital point. All newly installed devices serving discrete status to CAISO (e.g. circuit breakers, reclosers, switches) must be tested through direct methods such as manual operation, simulating the signal via direct contact closure, or triggering the signal internally via the relay. Testing solely via upstream controller commands does not meet validation requirements. All other discrete points must be tested from their respective source devices.

4.5.4 Calculations

Any data points in the generator's database that rely on calculated values (e.g. UCON, HSLMW, UAGC) must be demonstrated with verification of both input accuracy and resulting outputs. It is expected that both the value and DNP3 quality inputs will propagate up through calculated points. All logic-derived results transmitted to the EMS must be validated for correctness.

Question 2



Raise your hand if you have passed the NRI 72-hour test on the first try.

Telemetry Validation Requirements – 72-Hour Test

New 72-hour Test Procedure

<https://www.caiso.com/documents/nri-72-hour-test-procedure.pdf>

Important topics

- Performance Validation in real-world conditions
- Builds Operator trust
- DNP3 Quality & Operational Data and logic
- Notify EDAS in advance of planned work
- EDAS may request additional runtime
- 10 Business days processing time

AGG UPMW_GEN AGG POINT OF DELIVERY MEGAWATTS	• Check scaling is correct in comparison to HSIDE MW, UGMW • Should report positive polarity when exporting to the grid • Should report slightly less than UGMW unless there is a DCF or small losses. • If resource has child UPMW, sum of Child/Feeder UPMW should equal AGG/Parent UPMW • Child/feeder UPMW should propagate bad quality to AGG/Parent UPMW
AGG UPMV_GEN AGG POINT OF DELIVERY MEGAVARS	• Check scaling is correct in comparison to HSIDE MV, UGMV • Should report positive polarity when exporting to the grid • Should report slightly less than UGMV in simple configurations (smaller sites) – check losses in MSVS to verify. VARS can also differ from UGMV to UPMV for more complex sites. The UPMV value can be affected by VARS from adjacent resources, the discrepancy between UGMV/UPMV is not always problematic. • If resource has child UPMV, sum of Child/Feeder should equal AGG/Parent UPMV • Child/feeder UPMV should propagate bad quality to AGG/Parent UPMV
AGG HSLMW AGG HIGH SUSTAINABILITY LIMIT MEGAWATTS	• Check scaling is correct in comparison to HSIDE MW, UPMW • HSLMW should not report below UPMW • PAIRD should propagate bad quality to HSLMW if all available PAIRD inputs are bad quality • SPD should propagate bad quality to HSLMW if all available SPD inputs are bad quality
HSIDE_BNK_MW TRANSFORMER HIGH SIDE MEGAWATTS	• Should report negative polarity when exporting to the grid • Uncompensated value (inverse of UGMW) • If multiple transformers, check that relevant units under each transformer are correctly summing to respective transformer.

Telemetry Non-Compliance/Exemptions - Critical Points

- Updated Critical Points:
 - **Generation Points – All resources**
 - UPMW - Unit Point of Delivery MW
 - UGMW – Unit Gross MW
 - UNMW – Unit Net MW
 - UAMW – Unit Auxiliary MW
 - UCON – Unit/Resource Connect
 - **Meteorological Points - Solar and Wind Resources**
 - BPTMP - Back Panel Temperature
 - PAIRD – Irradiance
 - SPD - Wind Speed
 - DIR - Wind Direction
- **Battery Specific Points**
 - SOC – Instantaneous State of Charge in MWh
 - MXENERGY – Maximum Continuous Energy Limit in MWh
- **Ancillary Service Specific Points – for units providing Regulation**
 - UOHL - Unit Operating High Limit
 - UOLL - Unit Operating Lower Limit
 - UAGC - Unit Automatic Generation Control
- **Co-Located, and Hybrid, and VERs Providing AS Resource Specific Points**
 - HSL – High Sustainability Limit

Telemetry Non-Compliance/Exemptions – Exemption Timelines

- Initial exemptions are granted in good faith
- Required Information for extensions
 - Detailed description of the steps taken to resolve it along with the timeline
 - Expected date of resolution of the issue
 - Purchase order of the parts
 - Signed agreements of contractors
 - Service tickets with communication service providers
 - Extended generation outages evaluated on case-by-case basis
- Exemptions beyond 90 days will require a phone call discussion with Resource Owner, Scheduling Coordinator and any involved technicians
- When submitting renewals, keep the existing description and append new information with new submissions.

To Recap:

- The EDAS Team
- EDAS Documents
- P2P Test Procedure
- NRI 72-hour Test Procedure
- Telemetry Non-Compliance Updates

- Pre-COD ADS Testing 5320B Procedure

Discussion Ideas

- If you could give advice to a new project team going through EDAS requirements for the first time, what would you tell them?
- Looking ahead, what improvements would you like to see in telemetry or metering standards?
- Can anyone share a time when 72-hour test went flawlessly and what made it successful?

Helpful Links

Certification of Metering Facilities

<http://www.caiso.com/Documents/5710.pdf>

Meter Data Acquisition and Processing Procedure

<http://www.caiso.com/Documents/5740.pdf>

Appointment Scheduling for EDAS Fieldwork

<http://www.caiso.com/fieldworksupport/Pages/default.aspx>

Direct Telemetry BPM

<https://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Direct%20Telemetry>



Helpful Links (Cont.)

Fieldwork Guide

<http://www.caiso.com/Documents/FieldworkGuide.pdf>

RIG Acceptance Test (RAT) Procedures

http://www.caiso.com/Documents/RIGAcceptanceTest_RAT_Procedures.pdf

RIG/DPG Validation Procedure

http://www.caiso.com/Documents/RIG_DPGValidationProcedure.pdf

Metering Exemptions from Compliance

<http://www.caiso.com/Documents/5730.pdf>

Pre-COD ADS Testing Procedure 5320B

<https://www.caiso.com/documents/5320b-pre-commercial-automated-dispatch-system-ads-resource-test-procedure.pdf>



Helpful Links (Cont.)

BPM for Metering

<http://bpmcm.caiso.com/Pages/BPMDetails.aspx?BPM=Metering>

SQMD Template

<http://www.caiso.com/Documents/SQMDPlanTemplate.docx>

SQMD Template Tutorial

<http://www.caiso.com/Documents/SQMDResourceTemplateTutorial.pdf>

Operating Procedure 5750 – Submission and Approval Process

<http://www.caiso.com/Documents/5750.pdf>

EDAS Document Checklists

<http://www.caiso.com/Documents/Checklist-CommunicationBlockDrawing.pdf>

<http://www.caiso.com/Documents/Checklist-MeteringAndRIGDrawingRequirements.pdf>



New EDAS Procedures

New 72-hour Test Procedure

<https://www.caiso.com/documents/nri-72-hour-test-procedure.pdf>

Updated P2P Procedure

<https://www.caiso.com/documents/rigacceptancetest-rat-procedures.pdf>



Wrap Up

Summary, Q&A



Thank you for your participation!

For more detailed information on anything presented, please visit our website at: www.caiso.com or send an email to: CustomerReadiness@caiso.com.

For resource specific questions or concerns, please submit a CIDI ticket.