

ASSET PERFORMANCE MANAGEMENT PLATFORM

Voltara Intelligence User Guide

Operations, maintenance, safety, assets and finance

ABOUT THIS DOCUMENT

This guide describes every working module of the Voltara Intelligence platform: what each screen is for, what the figures on it mean, and the sequence a user follows to complete the task the screen exists for.

It is written for the people who run a plant. Where a rule is enforced by the platform rather than by procedure, the guide says so, because those are the points at which the system will stop you.

Document
Revision
Platform release
Applies to

Classification

Issued by

VI-UG-001

1.0

Version 2.7

**Browser and Android
application**

**Commercial in
Confidence**

Voltara Intelligence

Front matter

Document control

Purpose and scope

This guide covers the seventy one modules of the Voltara Intelligence platform, grouped into the nine working groups presented in the platform navigation. It describes normal operation. Installation, integration engineering and system administration beyond day to day configuration are covered in the Technical Solution Description, document VI-TSD-001.

Intended readers

READER	WHAT TO READ FIRST
Technician, cleaning operator, helper	Chapters 2 and 3, then 10, 12 and 15. These cover signing in, receiving work, doing it in the field and accepting a permit.
Supervisor, shift in charge	Add chapters 6, 11, 14 and 26. Dispatch, planning, the shift logbook and the team.
Performance and maintenance engineer	Add chapters 5, 7, 8, 9, 13 and 25. Fleet operations, analytics, the digital twin, failure analysis and KPI management.
Plant manager	Add chapters 4, 16, 17 and 24. The Command Center, HSE, ESG and reporting.
Commercial, finance and asset owner	Chapters 4, 22, 23, 24 and appendix A. The commercial picture and the definitions behind it.
Administrator	Chapters 3, 30 and 31, and appendix B.

Conventions used in this guide

Bold	Names an element you act on: a button, a tab, a field or a menu entry, exactly as it is labelled on screen.
Path	A navigation path is written as Group > Module > Tab , for example Maintenance Hub > Work Order Center > Dispatch .
Note	A tinted block explains why a screen behaves the way it does, or names a rule the platform enforces. Read these. They are where the system will stop you.
Figures	Screenshots are taken from the live platform. Figures are correct for release 2.7. Your figures will differ; the layout will not.

Roles

Where a function is restricted, the guide names the role that holds it. If you cannot see a described control, your role does not carry it.

Front matter

Contents

1	Getting started	7
2	The application frame	10
3	Roles and what each one sees	13
4	Command Center	15
5	Live fleet operations	18
6	Alarm management	20
7	SCADA intelligence, weather and grid metering	23
8	Analytics platform	25
9	Digital twin and performance engineering	28
10	Work Order Center	30
11	Maintenance planner	33
12	Field operations and the mobile application	35
13	Failures, FMEA and root cause analysis	38
14	Shift logbook and commissioning	40
15	Safety permits	42
16	HSE Center	44
17	ESG reporting	46
18	Asset intelligence	47
19	Warranty management	49
20	Inventory and stores	51
21	Procurement	53
22	Financial Center and budget	55
23	SLA and contracts	58
24	Report Center	59
25	KPI management	61
26	People, teams and technician analytics	62
27	Voltara Agents	65
28	Knowledge Center	68
29	PVsyst builder	69

30 Integration hub	70
31 Administration, audit and security	72
A Appendix A KPI and formula reference	75
B Appendix B Role and access matrix	77
C Appendix C Glossary	78
D Appendix D Troubleshooting and support	80

Chapter one

1. Getting started

Everything in the platform is bound to who you are: the plants you can see, the work you can approve, the permits you may sign. Signing in correctly is therefore the first step of every workflow in this guide.

1.1 Signing in

1. Open the platform address supplied by your administrator in a current browser. Chrome, Edge and Safari are supported.
2. Enter your **email or username** and your **password**.
3. Select **Sign In**. If two factor authentication is enabled on your account, you are asked for a six digit code before the session is created.

On success you arrive at the landing screen for your role. A technician lands on their work. A manager lands on the Command Center. The landing screen is a property of the role, not a preference, so two people signing in on the same device will not see the same first page.

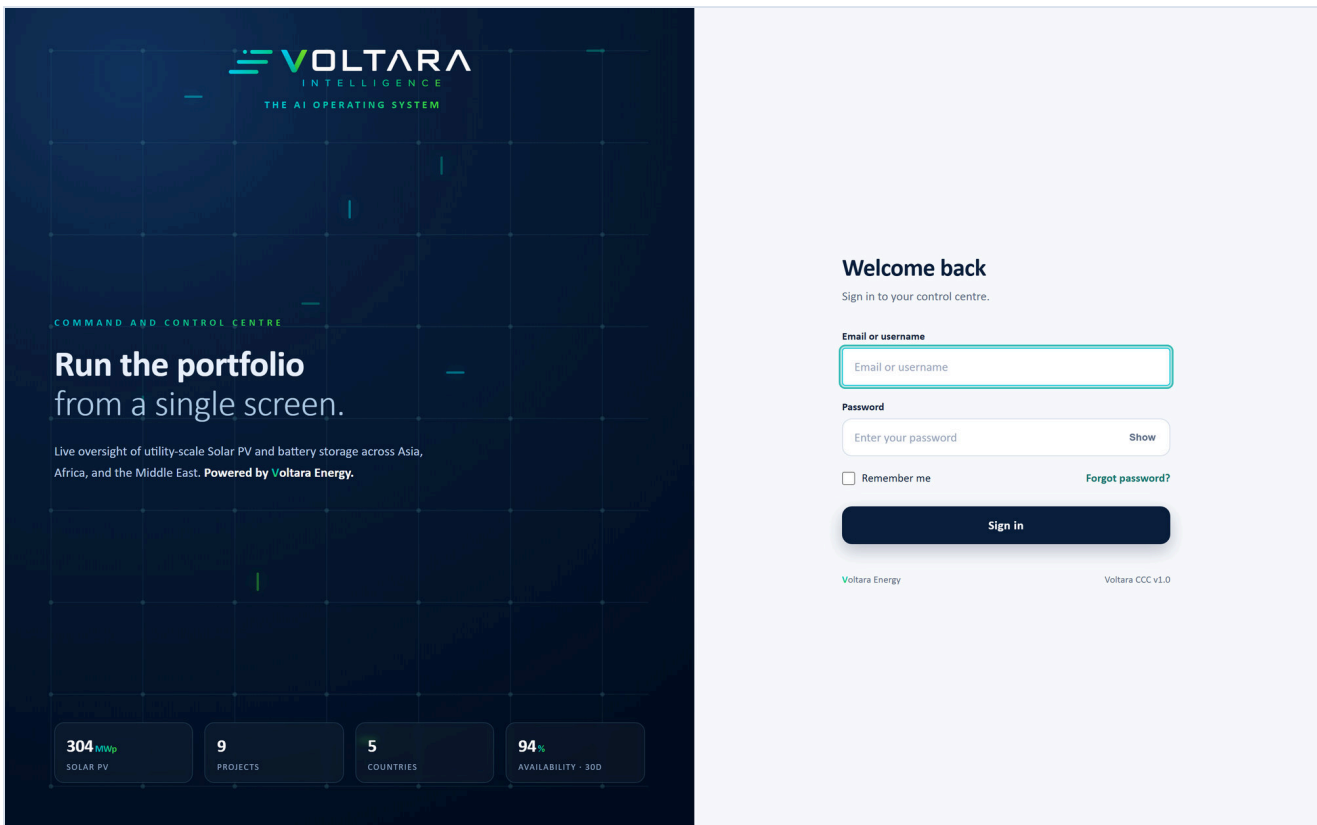


Figure 1.1 The sign in screen. The platform release is shown on the page so that a support request can always state the version it was raised against.

FAILED SIGN IN ATTEMPTS

Repeated failures are recorded and rate limited. If you are locked out, an administrator clears it from **People & System > Security Dashboard**; the lockout is deliberate and cannot be bypassed by trying a different browser.

1.2 Two factor authentication

Two factor authentication is set up from **People & System > Two-Factor Auth (2FA)**. The platform uses time based one time passwords, so any standard authenticator application will work.

1. Open **Two-Factor Auth (2FA)** and select **Enable**.
2. Scan the displayed code with your authenticator application, or enter the secret manually.
3. Enter the six digit code the application shows to confirm the pairing.
4. **Record the backup codes.** They are shown once. Each can be used a single time if you lose the device.

IF YOU LOSE BOTH THE DEVICE AND THE CODES

Only an administrator can reset the second factor, and doing so is recorded in the audit trail with the administrator's name. There is no self service path, by design.

1.3 Passwords and sessions

- Change your password from the user menu at the top right, under **My Preferences**.
- Signing out ends the session immediately on the device you are using.
- If your account is suspended or your role is changed, every live session for that account is invalidated at once, including sessions on other devices and in the mobile application. You will be returned to the sign in screen at the next action.

1.4 Installing the mobile application

The Android application carries the same modules as the browser. Install it from the download control in the top bar, marked with a device icon, or from the link an administrator issues. Chapter 12 covers field use in detail.

Chapter two

2. The application frame

Every module sits inside the same frame: a top bar that stays constant, a sidebar that holds the nine navigation groups, and a working area. Learning the frame once means every one of the seventy one modules is already half familiar.

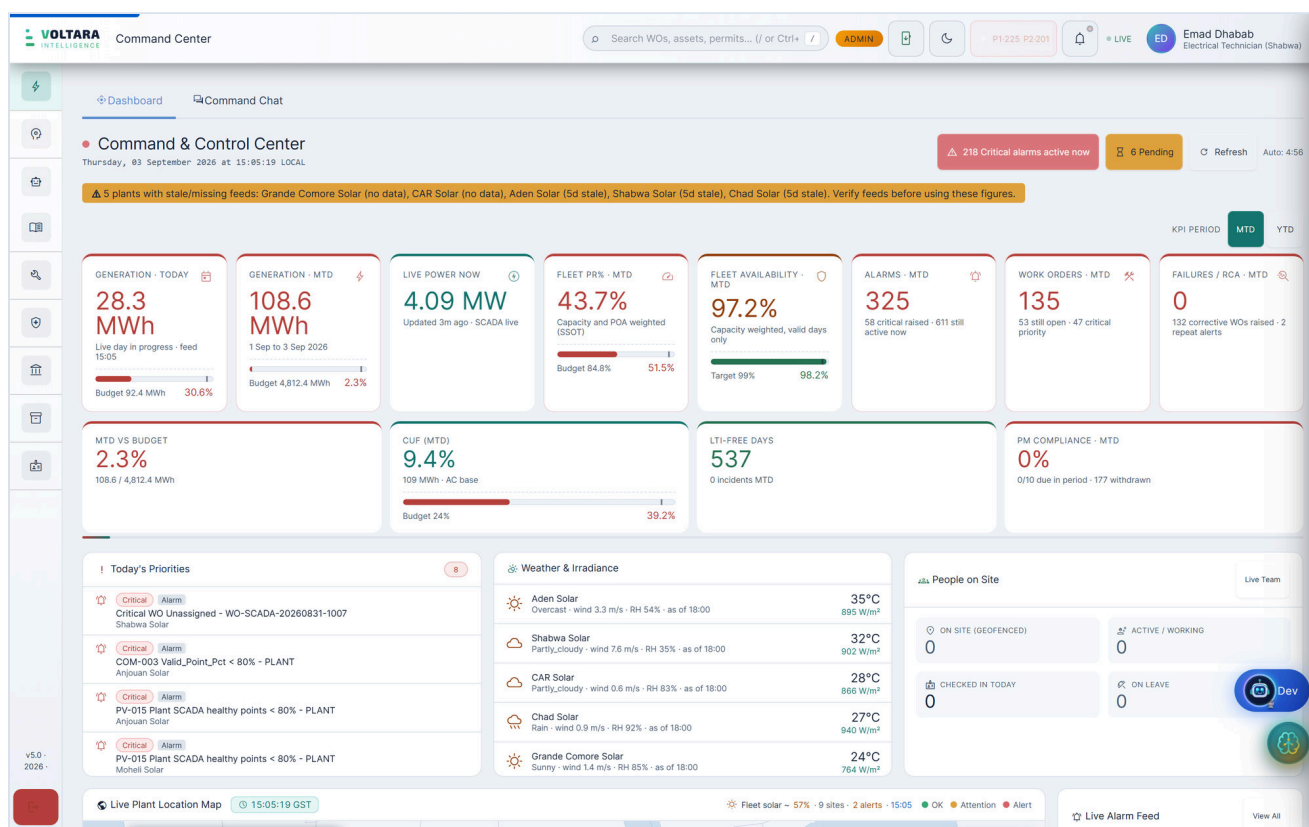


Figure 2.1 The frame. Top bar across the width, the group rail on the left, and the module working area filling the remainder.

2.1 The top bar

Brand	The Voltara mark at the far left returns you to the Command Center from anywhere.
Page title	Names the module you are in. It is the same name used in the navigation and in every report the module produces.
Search	Global search across work orders, assets and permits. Press / or Ctrl + / from anywhere to focus it without using the mouse.
Role chip	Shows the effective role of the current session. If a screen is missing, check this first.

Get the app	Downloads or updates the Android application.
Theme	Switches between the light and dark presentation. The choice follows your account, not the device.
Alarm chip	Live count of priority one and priority two alarms across the plants you can see. Selecting it opens Alarm Management filtered to those.
Notifications	Personal and fleet notifications. A dot indicates unread items.
Live indicator	Confirms the page is receiving updates. If it stops, the data on screen is no longer refreshing and the page should be reloaded.
Account	Your name, title and plant. Opens preferences, profile and sign out.

2.2 The navigation groups

The sidebar holds nine groups. Hovering a group expands it; selecting a module loads it in place. The groups and their module counts are listed below, and each is the subject of one or more chapters in this guide.

GROUP	MODULES	COVERED IN
Live Ops	10	Chapters 4, 5, 6 and 7
Intelligence	12	Chapters 8, 9, 24, 25 and 30
Voltara Agents	6	Chapter 27
Knowledge	2	Chapters 28 and 29
Maintenance Hub	11	Chapters 10 to 14
Safety Center	3	Chapters 15, 16 and 17
Finance	7	Chapters 22 and 23
Asset Vault	5	Chapters 18 to 21
People & System	15	Chapters 26 and 31

2.3 The corporate view bar

Most registers carry a dark bar above the working area holding a chip for every plant you can see, plus **All Plants**, a time window and a people filter. Selecting a plant chip scopes the entire screen, including its totals and its exports, to that plant. The selection persists while you move between tabs of the same module.

2.4 Data tools

Registers that accept bulk data carry a **DATA TOOLS** strip with four controls, which behave identically everywhere they appear.

Download CSV	Exports the current register, honouring the filters in force.
Template	Downloads an empty file with the exact columns the importer expects. Always start from this rather than from a previous export.
Upload	Imports a completed template. Rows that fail validation are reported with the row number and the reason, and no partial import is committed.
Data Hub	Opens the central import and export history, where previous loads can be reviewed.

WHY IMPORTS ARE REJECTED RATHER THAN CORRECTED

The importer will not guess. A column it does not recognise, a plant name it cannot resolve or a date it cannot parse causes the row to be rejected and reported. This is deliberate: a silently corrected import is how a register quietly stops matching the plant.

2.5 Printing and exporting

Every module prints to a single document identity. Use the printer control on the corporate view bar, or your browser print command. The printed output drops the navigation, converts the screen to a light document, applies the Voltara letterhead and footer, and keeps status colours where a status must still be readable.

Chapter three

3. Roles and what each one sees

A role is not a label. It resolves to a set of modules, a set of actions inside them and a set of plants. If you cannot see something described in this guide, the role is the reason.

3.1 How access is decided

Three questions are answered on every request, in order.

- 1. Which plants?** Corporate and portfolio roles see the fleet. Plant roles see their own site. A user may be granted access to more than one plant explicitly.
- 2. Which modules?** The role resolves to a navigation set. A module that is not in the set is not merely hidden; requesting its address directly is refused.
- 3. Which actions?** Within a module, create, edit, approve, delete and export are separate permissions. Seeing a register does not imply being able to change it.

3.2 The role families

FAMILY	TYPICAL ROLES AND WHAT THEY CARRY
Field	Technician, electrical technician, cleaning operator, helper, driver, medic. Their own work orders, permits to accept, attendance, checklists and evidence capture.
Supervisory	Supervisor, HSE supervisor, shift in charge. Dispatch, verification, the shift logbook, toolbox talks and the team view.
Engineering	Maintenance engineer, electrical engineer, performance engineer, SCADA engineer, HV engineer. Analytics, the digital twin, failure analysis, alarm rules and KPI definition.
Plant management	Plant manager, HV manager, HSE officer, admin officer, warehouse user. Approvals for their site, planning, stores, HSE and the site reporting pack.
Portfolio	Regional manager, portfolio manager. Multiple plants, comparative analytics and fleet reporting.
Executive and owner	Chief operating officer, chief executive, asset owner. Fleet position, commercial performance and the reporting pack, generally without transactional edit rights.
Administrative	Administrator. Users, roles, plants, integrations, security and the audit trail.

APPROVAL LIMITS ARE SEPARATE FROM ROLES

Financial approval is governed by an approval level and a value limit held on the user record, not by the operational role. A plant manager and a corporate approver may hold the same operational rights and quite different signing authority. See chapter 21.

3.3 Changing what a user can see

Administrators manage this from **People & System > Master Admin Console** and **People Center > Directory > Manage Users**. Every change to a role, a plant grant or an approval limit is written to the audit trail with the actor, the time and the previous value.

Chapter four

4. Command Center

The Command Center answers one question: is the fleet doing what it should be doing right now, and if not, what is the most important thing to act on. It is the default landing screen for management roles and refreshes itself on a timer.

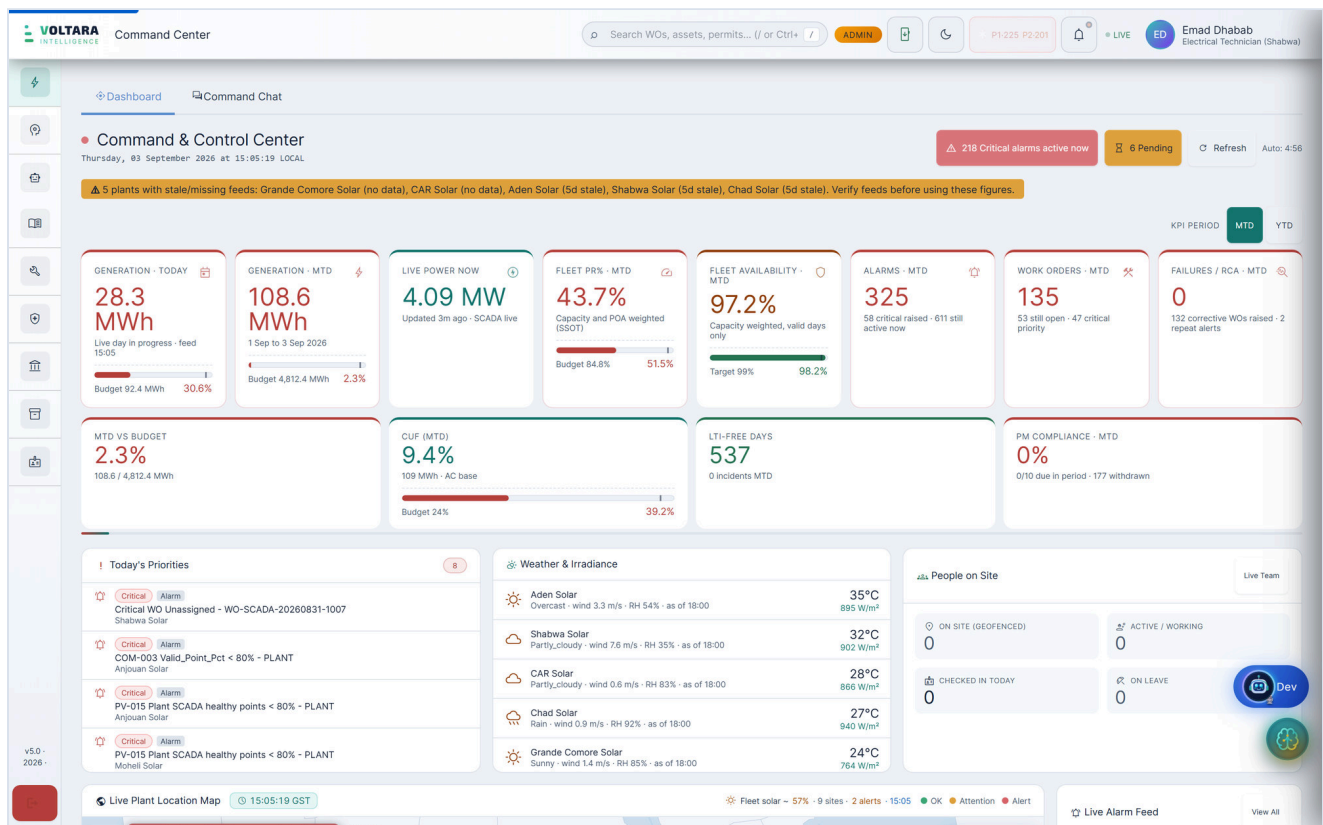


Figure 4.1 Command Center. The data quality banner sits above the tiles, so coverage is read before any figure is.

4.1 Reading the screen in order

1. **The banner.** If any plant has a stale or missing feed it is named here, with how long it has been silent. Read this first. It tells you which of the figures below are complete.
2. **The alert strip.** Critical alarms active now, and approvals pending. These are the immediate calls on your attention.
3. **The KPI period.** Switch between **MTD** and **YTD**. Every tile below follows the selection.
4. **The tiles.** Generation, performance, availability, alarms, work and safety, each against its target.
5. **The panels.** Today's priorities, weather and irradiance, people on site, the plant map and the live alarm feed.

4.2 The tiles

Generation today	Energy today against the day's share of budget, with the day marked as in progress and the age of the feed stated.
Generation MTD	Month to date energy against the month to date budget, with the period covered stated explicitly.
Live power now	Instantaneous fleet power with the age of the reading. An old reading is labelled as old rather than presented as current.
Fleet PR	Performance ratio, capacity and plane of array weighted, against the design and budget performance ratio.
Fleet availability	Capacity weighted availability over valid days only, against the contractual target.
Alarms	Raised in the period, still open, and critical right now.
Work orders	Raised in the period, still open, and how many carry critical priority.
Failures and RCA	Corrective work orders raised and repeat alerts, the early indicator of an unresolved root cause.
MTD versus budget	The shortfall or surplus in percentage and in megawatt hours.
CUF	Capacity utilisation factor on the alternating current base.
LTI free days	Days since the last lost time injury across the plants in view.
PM compliance	Preventive maintenance completed against due in the period.

4.3 Today's priorities

A ranked list of what needs attention now, drawn from alarms, overdue work, expiring permits and agent recommendations. Selecting an entry opens the record it refers to. The list is ordered by consequence rather than by age, so an old low priority item never displaces a new critical one.

4.4 Weather, people and the map

- **Weather and irradiance** shows conditions and plane of array irradiance per site, with the source stated. Where a ground station is unavailable the platform falls back to a weather service and says which is in use.
- **People on site** shows who is inside the geofence, who is actively working, who checked in today and who is on leave.

- **The plant map** plots every site with its current status. Weather warnings such as lightning risk are overlaid, because they change what work may proceed.

4.5 Command chat

The second tab of the Command Center is a fleet conversation attached to the operational context. Use it for shift handover notes that concern more than one site. Anything that concerns a specific job belongs on the work order instead, where it stays with the record.

Chapter five

5. Live fleet operations

Where the Command Center summarises, Live Fleet Operations compares. It puts every site side by side on the same measures so that an outlier is visible without opening anything.

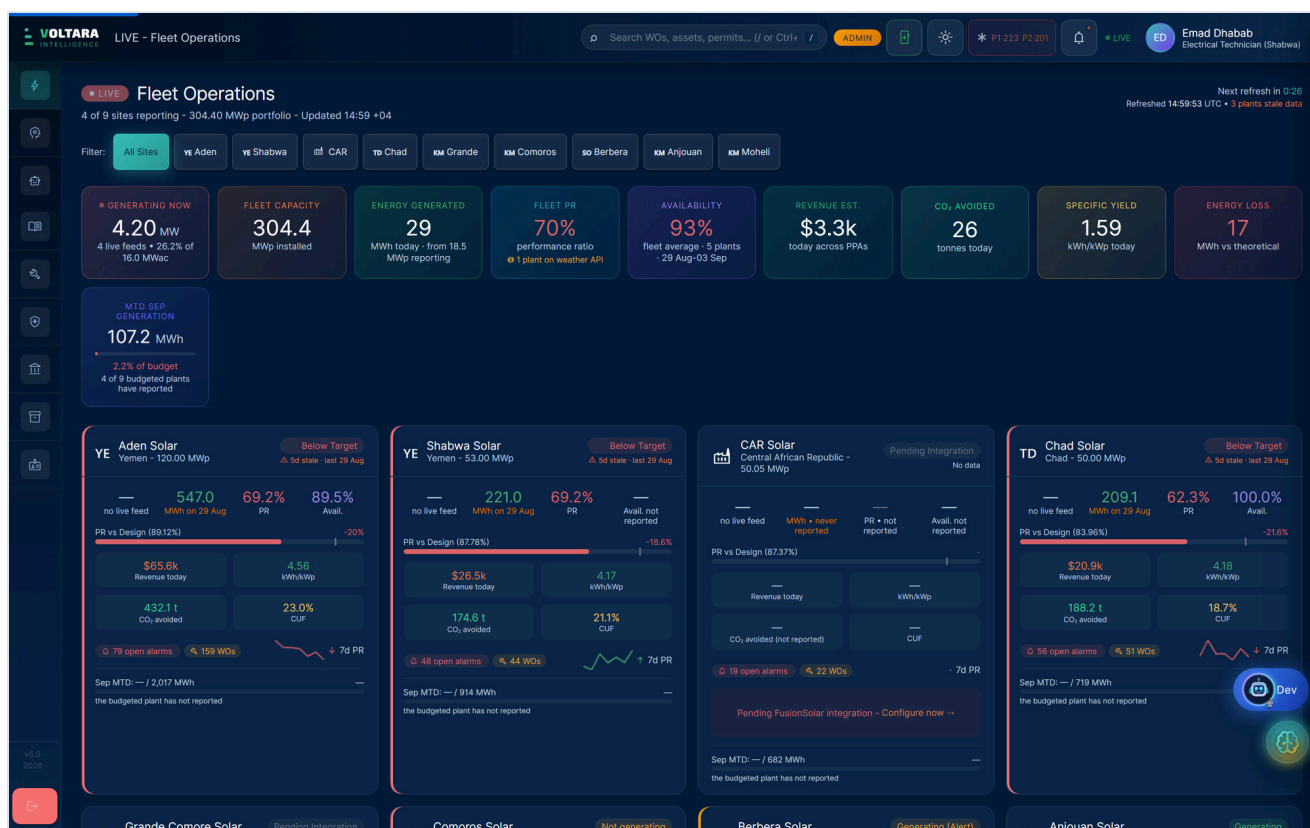


Figure 5.1 Live Fleet Operations. The header states how many sites are reporting out of how many exist, which is the first thing to read.

5.1 The header

The header states the number of sites reporting, the total portfolio capacity, the time of the last refresh and the countdown to the next. Where sites are not reporting, the count says so directly, for example four of nine sites reporting. Every fleet figure on the page is computed on the reporting subset, and the page says so rather than implying full coverage.

5.2 Fleet tiles

Generating now

Live power and the number of live feeds behind it, as a percentage of installed alternating current capacity.

Fleet capacity	Installed direct current capacity in megawatt peak.
Energy generated	Energy today and the capacity that reported it.
Fleet PR	Performance ratio, with a note where a plant is running on the weather service rather than a ground station.
Availability	Fleet average, with the number of plants and the date range it covers.
Revenue estimate	Today's generation valued at the applicable tariff.
Carbon dioxide avoided	Today's tonnes avoided, using each plant's own emission factor.
Specific yield	Kilowatt hours per kilowatt peak today, the fairest comparison between sites of different sizes.
Energy loss	Megawatt hours against theoretical, the headline number the analytics platform decomposes.
MTD generation	Month to date energy, the percentage of budget achieved, and how many budgeted plants have reported into it.

5.3 Plant cards

Below the tiles each plant carries a card with its capacity, status, performance ratio against design, availability, revenue today, specific yield, carbon dioxide avoided, capacity utilisation factor, open alarms, open work orders and a seven day performance ratio trend.

A card states its own condition plainly. **Below Target**, **Generating (Alert)**, **Not generating** and **Pending Integration** are distinct, and a plant that has never reported says so rather than showing a zero that could be mistaken for a real measurement.

A DASH IS NOT A ZERO

Throughout the platform a dash means no data and a zero means a measured zero. The distinction matters most on this screen, where a zero would drag a fleet average down and a dash correctly excludes the site from it.

Chapter six

6. Alarm management

Alarm Management is where a condition becomes an action. The module is organised so that triage, analysis and rule maintenance are separate activities that do not interfere with one another.

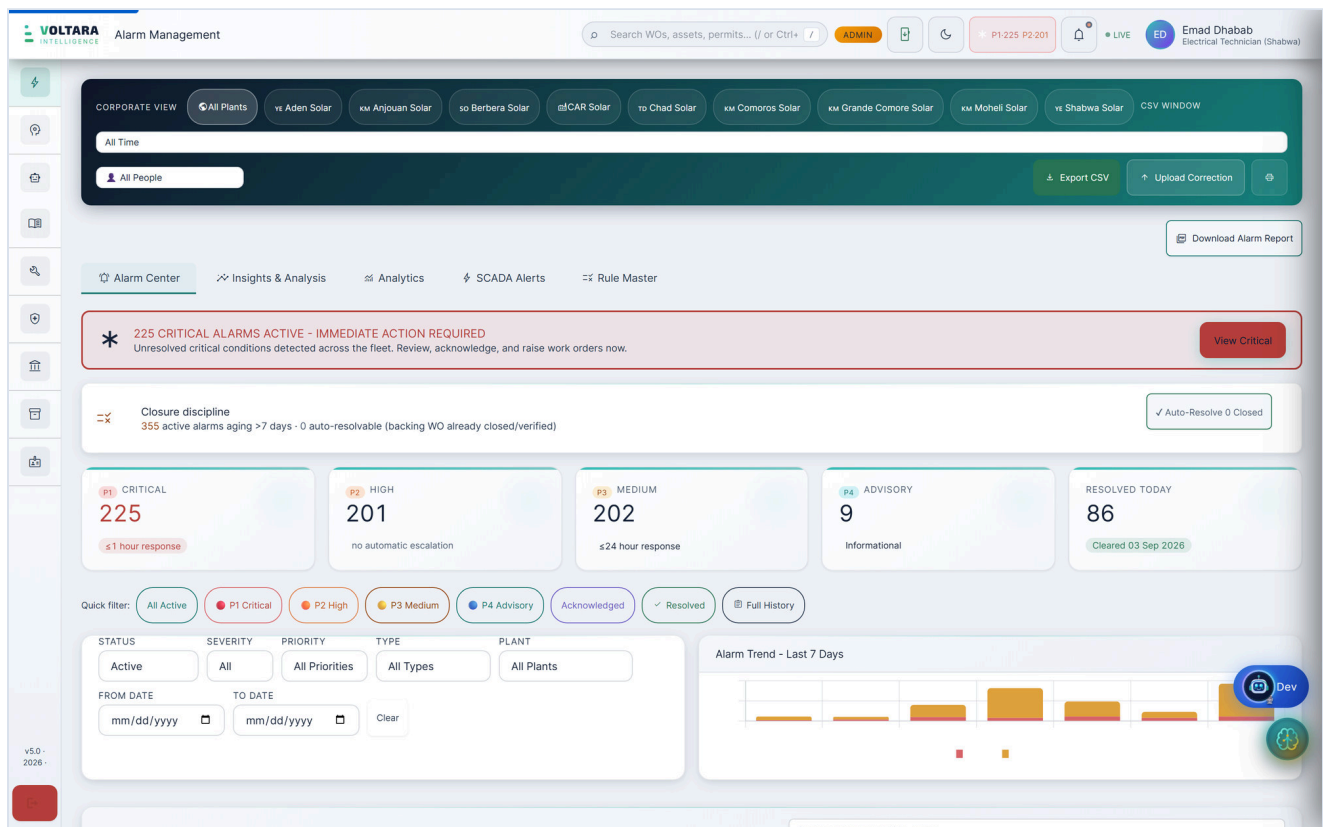


Figure 6.1 Alarm Management, Alarm Center tab, with the severity tiles and the closure discipline panel.

6.1 The tabs

Alarm Center	The working list. Triage, acknowledge, raise work orders and resolve.
Insights & Analysis	Pattern analysis: what is repeating, where and how often.
Analytics	Trend, Pareto and resolution time analysis across the period.
SCADA Alerts	Conditions arriving directly from plant systems, before platform rules are applied.

Rule Master	The rule catalogue: what each rule tests, on which plants, and at what severity.
--------------------	--

6.2 Severity and response

SEVERITY	RESPONSE	MEANING
P1 Critical	Within 1 hour	Generation, safety or asset integrity is affected now. Immediate action required.
P2 High	No automatic escalation	Significant condition requiring attention in the current shift, escalated by judgement rather than by timer.
P3 Medium	Within 24 hours	Degradation or a developing condition. Plan it into the coming day.
P4 Advisory	Informational	Recorded for context and trend. No response obligation.

6.3 Triaging an alarm

1. Filter with the quick filters or the field filters: status, severity, priority, type, plant and date range.
2. Open the alarm to see the rule that fired, the asset, the measured value and the threshold crossed.
3. **Acknowledge** it. This records who has taken ownership and stops it being triaged twice.
4. If work is needed, **Raise Work Order** from the alarm. The plant, asset, evidence and priority are carried across, so nothing is retyped.
5. **Resolve** when the condition has cleared. An alarm whose backing work order is closed and verified can be auto resolved from the closure discipline panel.

6.4 Closure discipline

The closure discipline panel counts active alarms ageing beyond seven days and how many of them are auto resolvable because their work order is already closed. It exists because the common failure of an alarm system is not missing a condition, it is never closing one, until the active list is too long to be read at all.

6.5 Rule master

Every rule is a data record, not code: an identifier, a description, the signal it tests, the threshold, the severity, the plants in scope and whether it is enabled. Engineering roles can review and tune them, and every change is versioned.

DAYLIGHT GATING

Irradiance dependent rules are gated on solar elevation. Below the standby threshold a plant that is not generating is standby, not faulted, so night hours do not fill the register with conditions that are simply darkness.

6.6 Fault prioritisation

Live Ops > Fault Prioritization ranks open conditions by consequence rather than by age: energy at risk, safety implication, asset criticality and whether the fault is repeating. Use it when the open list is longer than the crew available, which is the normal case.

Chapter seven

7. SCADA intelligence, weather and grid metering

These three modules describe the health of the data itself: what the plant systems are reporting, what the sky is doing, and what the revenue meter says. Every performance figure elsewhere in the platform depends on them.

7.1 SCADA intelligence

Live Ops > SCADA Intelligence shows the state of every configured signal: whether it is reporting, when it last did, the proportion of healthy points and the devices behind it. Use it to answer whether a performance question is a plant problem or a data problem, which should always be established before an engineer is dispatched.

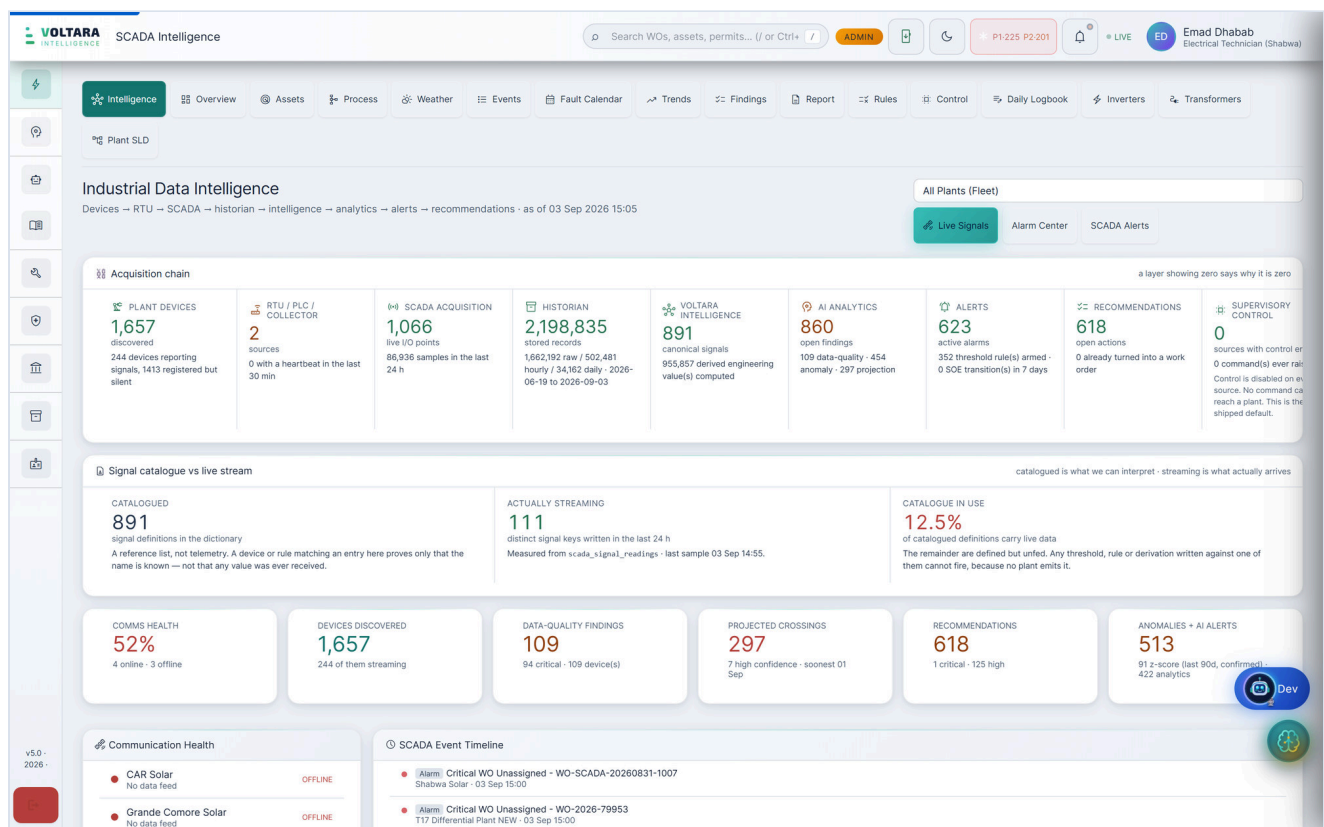


Figure 7.1 SCADA Intelligence. Signal health is presented as a first class measurement rather than assumed.

7.2 Weather and irradiation

Live Ops > Weather & Irradiation carries current conditions, plane of array irradiance, forecast and the alerts that affect work planning, such as lightning risk and high wind.

WHICH IRRADIANCE SOURCE IS IN USE

A ground station is used when it is reporting. Where it is not, a weather service is used instead, and every screen that consumes irradiance states which of the two it used. A performance ratio computed on a modelled irradiance is not the same evidence as one computed on a measured one, and the platform never lets that distinction disappear.

Weather also feeds work planning. Where a condition makes work unsafe, affected work orders can be placed on weather hold automatically, with the reason recorded on the work order.

7.3 Grid metering

Live Ops > Grid Metering holds the revenue meter readings: export, import, reactive energy, power factor and the readings that support invoicing. Because commercial figures must reconcile to the meter rather than to the inverters, this register is the authority for delivered energy and is separated from the performance telemetry for that reason.

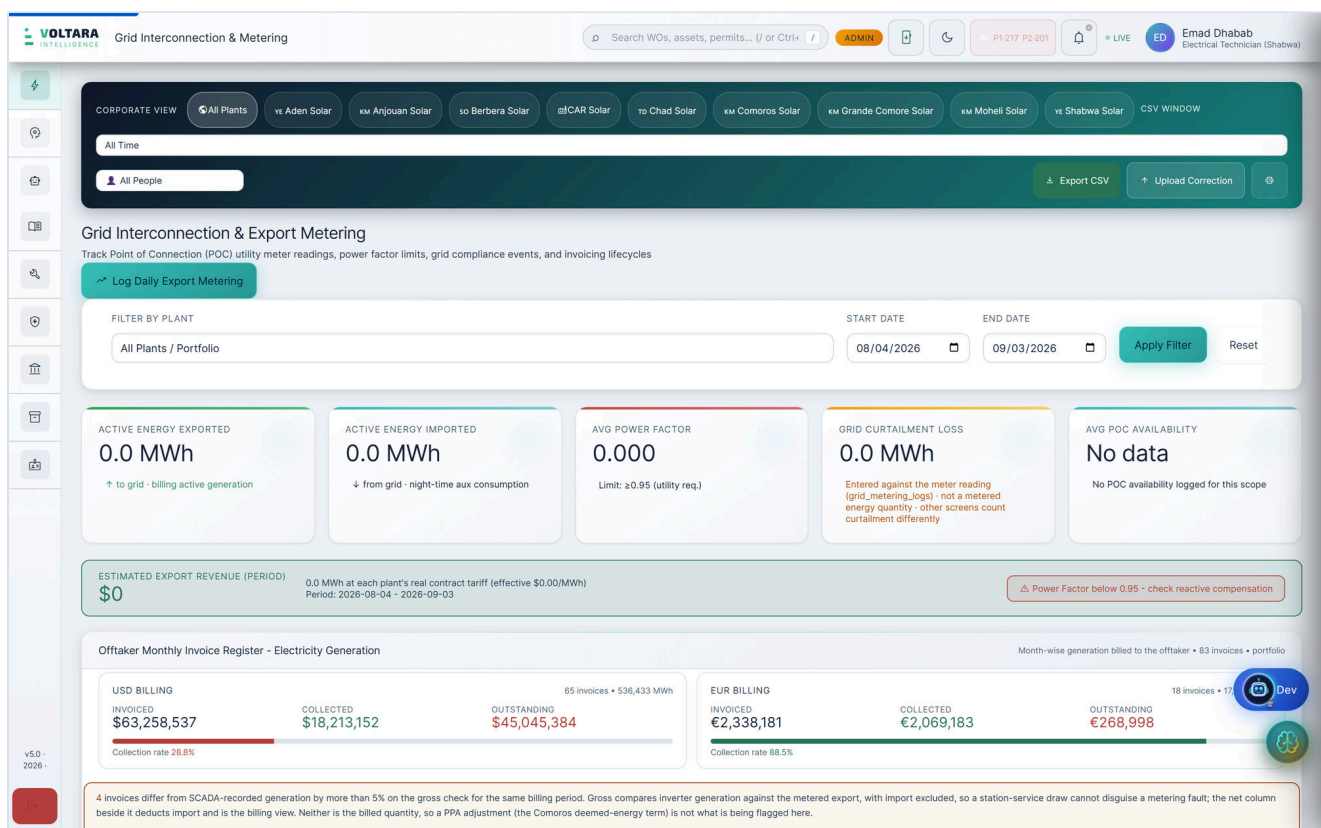


Figure 7.2 Grid Metering. The meter is the commercial record; inverter telemetry is the operational one.

7.4 BESS operations

Where a site carries storage, **Live Ops > BESS Operations** holds state of charge, state of health, cycle count, throughput and the temperature and cell balance conditions that govern battery life.

Chapter eight

8. Analytics platform

The analytics platform holds twenty five modules. They share one expected value: a temperature corrected, irradiance driven model of what each plant should have produced. Everything else is a decomposition of the gap between that and what arrived.

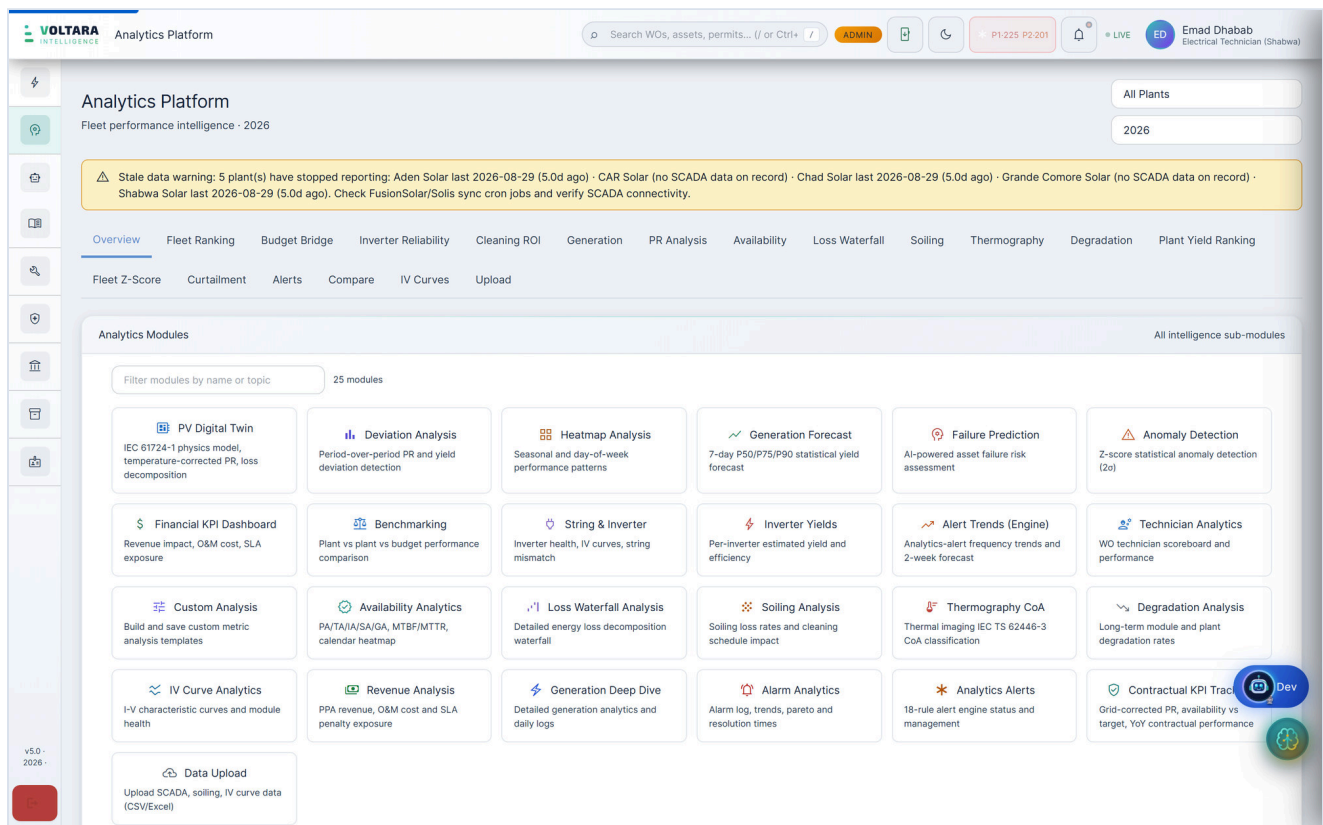


Figure 8.1 Analytics Platform. Every sub module is addressable from the grid, and the data quality statement sits above them.

8.1 The analytics modules

MODULE	WHAT IT ANSWERS
PV Digital Twin	What should this plant have produced, hour by hour, given measured irradiance and temperature. Modelled to IEC 61724-1.
Deviation Analysis	Where does actual depart from expected, period over period.
Loss Waterfall	The gap decomposed into named causes: soiling, temperature, availability, curtailment, mismatch and the rest.

MODULE	WHAT IT ANSWERS
PR Analysis	Performance ratio over time, temperature corrected, against design and budget.
Availability Analytics	Plant, technical, inverter, string and grid availability, with mean time between failures and mean time to repair.
Soiling Analysis	Soiling loss rate and the effect of the cleaning schedule.
Cleaning ROI	Whether the next clean is worth its cost at the current soiling rate and tariff.
Degradation Analysis	Long term module and plant degradation against the warranted curve.
String & Inverter	Inverter health, string mismatch and the underperforming strings a threshold alarm would never catch.
Inverter Yields	Per inverter estimated yield and efficiency, ranked.
IV Curve Analytics	Current voltage characteristics and module health from field measurement.
Thermography CoA	Thermal imaging classified to IEC TS 62446-3, with the certificate of analysis.
Heatmap Analysis	Seasonal and day of week performance patterns.
Generation Forecast	Seven day statistical yield forecast at P50, P75 and P90.
Failure Prediction	Asset failure risk assessment from condition and history.
Anomaly Detection	Statistical anomalies at two standard deviations, for conditions no fixed threshold describes.
Fleet Z-Score	Which plant is the outlier this period, normalised for size and resource.
Benchmarking	Plant against plant against budget.
Plant Yield Ranking	Specific yield league table across the fleet.
Budget Bridge	The walk from budgeted energy to actual, cause by cause.
Curtailment	Energy not delivered because the grid or the offtaker limited it, separated from energy lost to plant condition.
Revenue Analysis	Power purchase agreement revenue, operations cost and penalty exposure.
Financial KPI Dashboard	Revenue impact of operational performance.
Alert Trends	Analytics alert frequency and a two week forward view.
Technician Analytics	Work order throughput and quality by technician.

8.2 Running an analysis

1. Select the plant or **All Plants**, and the year or period.
2. Read the data quality banner. If a plant has stopped reporting it is named there, and any comparison including it must be read with that in mind.
3. Open the sub module from the grid, or from the tab strip for the most used ones.
4. Set the comparison basis: against design, against budget, against the same period last year, or against another plant.
5. Export from the module, or add it to a scheduled report from the Report Center.

LOSS MUST RECONCILE

The loss waterfall is built so that the named causes sum to the measured gap. If they do not, the residual is shown as unexplained rather than distributed across the named causes. An unexplained residual is a finding in itself and usually points at an instrumentation problem.

8.3 Uploading field measurements

The **Upload** tab accepts soiling measurements, IV curve files, thermography results and supplementary SCADA data. Use the supplied template. Uploaded measurements carry the same provenance as telemetered ones: who uploaded, when, and against which asset.

Chapter nine

9. Digital twin and performance engineering

The digital twin is the platform's model of the plant as designed. Performance engineering is the discipline of explaining why the plant as built differs from it.

9.1 Digital twin

Intelligence > Digital Twin holds the plant topology: blocks, inverters, combiner boxes, strings and modules, with the electrical relationships between them. Selecting a node shows its live condition and its history, and the topology is what allows a string level anomaly to be attributed to the correct inverter and block.

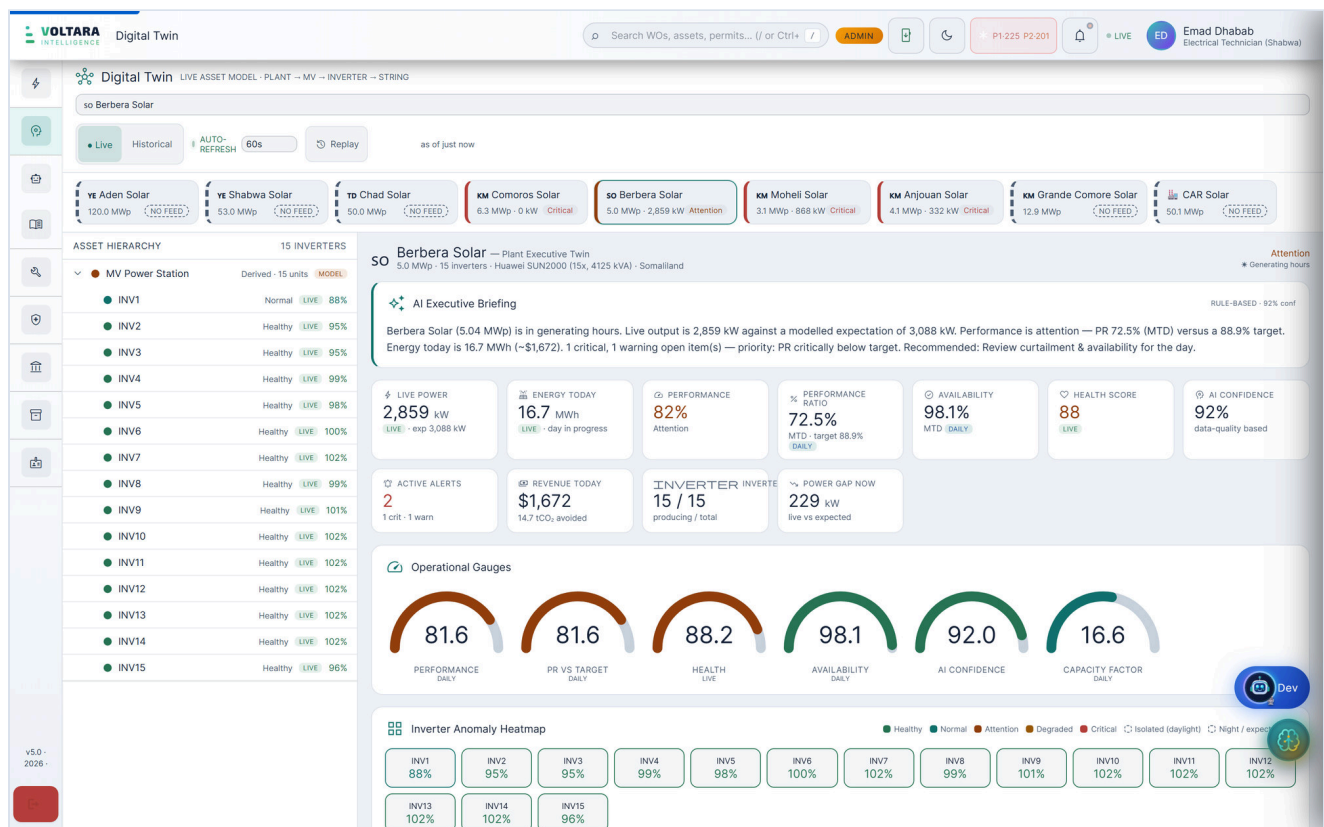


Figure 9.1 Digital Twin. The topology is the same hierarchy the asset register holds, not a separate drawing.

9.2 Performance and reliability

Intelligence > Performance & Reliability produces the engineering report: availability decomposition, mean time between failures, mean time to repair, failure distribution by asset class and the reliability trend.

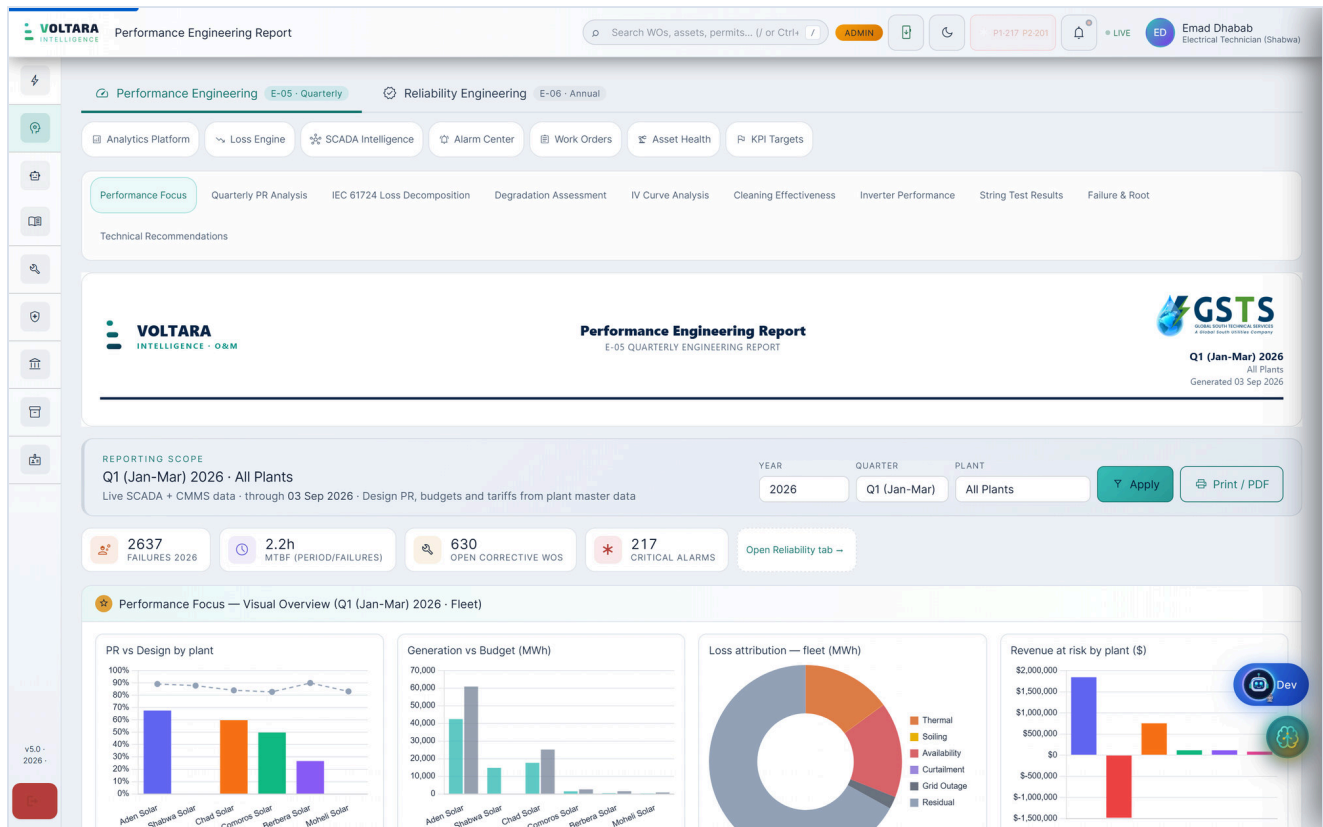


Figure 9.2 Performance and reliability engineering.

MEAN TIME TO REPAIR IS MEASURED, NOT ASSERTED

Mean time to repair is computed only across work orders that carry a resolution timestamp. Where too few do, the platform states the sample size instead of publishing a number that a handful of records cannot support.

9.3 Curtailment analytics

Intelligence > Curtailment Analytics separates energy the plant could not deliver because it was instructed not to from energy it failed to deliver. The distinction is commercial: one is generally compensable under the offtake agreement and the other is an operations problem.

Chapter ten

10. Work Order Center

The Work Order Center is the operational core of the platform. Every intervention on a plant, whatever raised it, becomes a work order, and the work order is the record that carries the permit, the parts, the hours and the evidence.

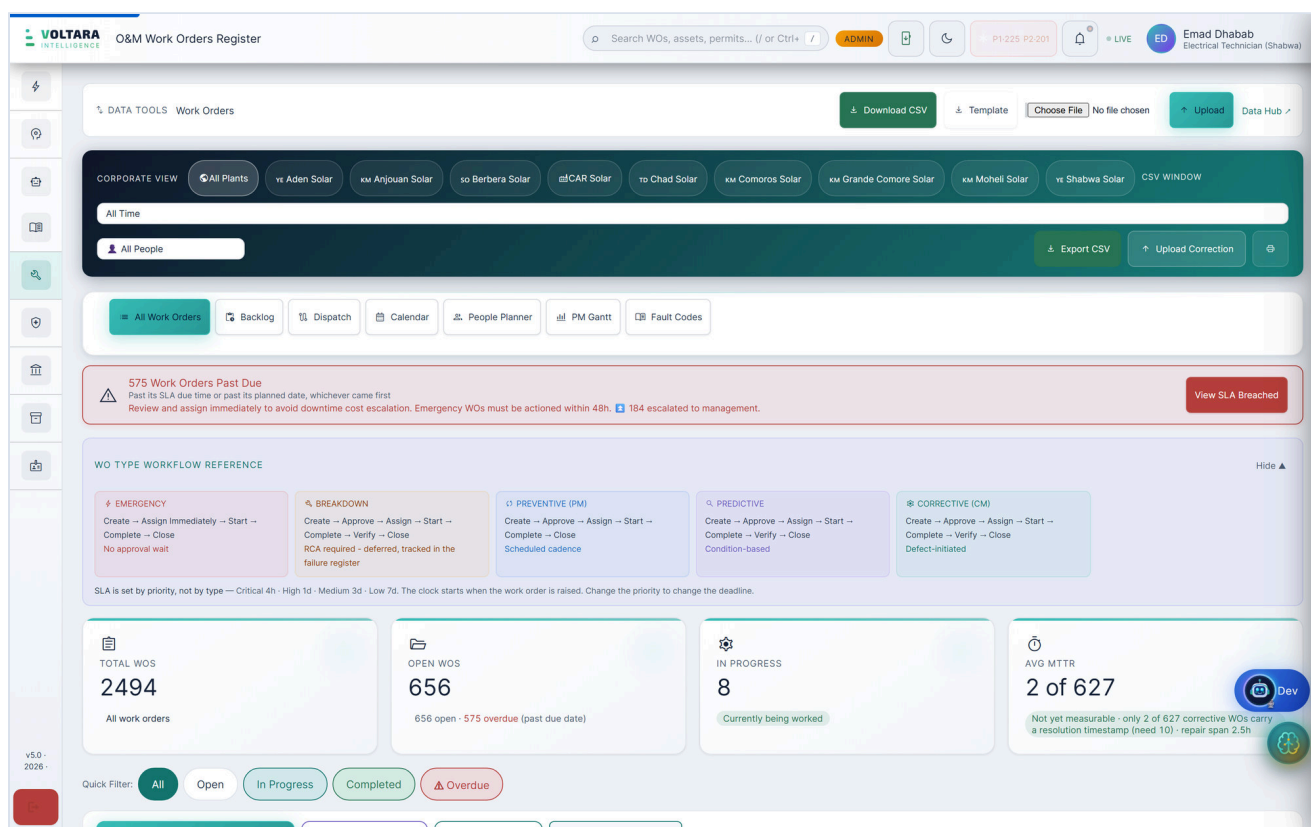


Figure 10.1 Work Order Center. The workflow reference is printed on the page so routing does not depend on memory.

10.1 Work types and their routes

TYPE	ROUTE
Emergency	Create, assign immediately, start, complete, close. There is no approval wait, because waiting is the hazard.
Breakdown	Create, approve, assign, start, complete, verify, close. Root cause analysis is required and is tracked in the failure register.
Preventive	Create, approve, assign, start, complete, close. Raised on a scheduled cadence by the maintenance planner.

TYPE	ROUTE
Predictive	Create, approve, assign, start, complete, verify, close. Raised from a condition rather than a date.
Corrective	Create, approve, assign, start, complete, verify, close. Raised from a defect found during inspection or analysis.

10.2 Service levels

The service level clock is set by **priority**, not by work type. This is the single most misunderstood rule in the module and the reason it is stated on the page itself.

PRIORITY	TIME TO RESOLVE	BEHAVIOUR
Critical	4 hours	Escalated to management before breach.
High	1 day	Escalated on approaching breach.
Medium	3 days	Reported in the overdue list.
Low	7 days	Reported in the overdue list.

The clock starts when the work order is raised. Changing the priority changes the deadline, and the change is recorded with who made it.

10.3 Raising a work order

1. Select **New Work Order**, or raise it from the source record: an alarm, an analytics finding, an inspection or an agent recommendation. Raising it from the source carries the plant, asset and evidence across automatically.
2. Set the **type**, which determines the route, and the **priority**, which determines the deadline.
3. Select the **asset**. The register is searchable by tag, serial and description.
4. Describe the work. Be specific enough that the technician does not have to ask.
5. Attach the safety requirements: the permit type required, isolation points and the risk assessment.
6. Reserve parts from stores if the job needs them, so they are not consumed by another job first.
7. Save. The work order enters its route at the first step.

10.4 Approving, assigning and dispatching

- **Approve** is a role held by supervisory and management roles. Approval is recorded with the approver and the time.
- **Assign** from the **Dispatch** tab, which shows who is on site, who is qualified and who is already committed. **People Planner** shows the same information as a workload plan.
- **Calendar** and **PM Gantt** present scheduled work over time, which is where clashes and shutdown windows become visible.

10.5 Executing and closing

1. The assigned technician **starts** the work order. The platform refuses this while a required permit, isolation or risk assessment is still open.
2. Work is recorded as it happens: labour hours, parts consumed, readings taken and photographs.
3. **Complete** records the resolution, the fault code and the failure mode where the type requires it.
4. **Verify**, on the types that require it, is performed by a different person from the one who did the work.
5. **Close**. The record becomes part of the asset history and feeds mean time to repair, technician analytics and the failure register.

WHY VERIFICATION IS A SEPARATE STEP

Completion says the work was done. Verification says it was done correctly, by someone who did not do it. On breakdown, predictive and corrective work the platform requires both, because those are the types where an incomplete repair returns as a repeat failure.

10.6 The register views

All Work Orders	The full register with quick filters for open, in progress, completed and overdue.
Backlog	Everything not yet complete, ordered by age and priority.
Dispatch	Assignment against available, qualified and present people.
Calendar	Scheduled work by date.
People Planner	Workload by person over the coming period.
PM Gantt	Preventive programme across assets and time.
Fault Codes	The controlled list of fault codes and failure modes used at completion.

Chapter eleven

11. Maintenance planner

The planner turns a maintenance strategy into dated, assigned, evidenced work. It is the difference between having a preventive programme and running one.

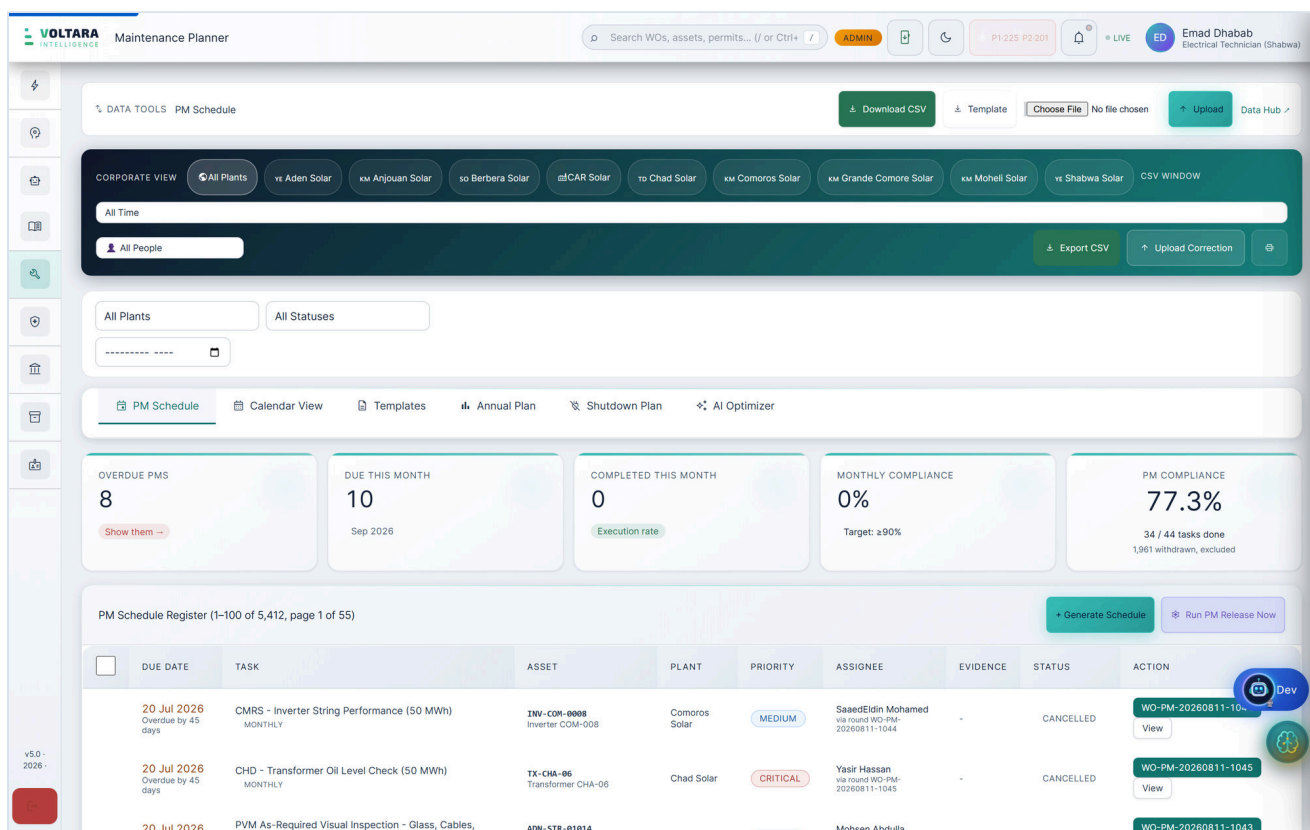


Figure 11.1 Maintenance Planner, PM Schedule tab, with compliance measured against the ninety percent target.

11.1 The tabs

PM Schedule	The register of scheduled tasks: due date, task, asset, plant, priority, assignee, evidence and status.
Calendar View	The same programme by date, for spotting clustering and clashes.
Templates	The task library: what a task consists of, its frequency, its duration and its required skills and parts.
Annual Plan	The year at a glance per asset class, which is the view an owner asks for.

Shutdown Plan	Work that requires an outage, grouped so that one shutdown covers as much as possible.
AI Optimizer	Proposed resequencing to reduce travel, outages and clashes while holding compliance.

11.2 Compliance measures

Overdue PMs	Tasks past their due date and not completed.
Due this month	Tasks falling due in the current month.
Completed this month	Execution rate for the month.
Monthly compliance	Completed against due for the month, against a target of ninety percent or better.
PM compliance	The programme figure, stated as tasks done over tasks due, with withdrawn tasks excluded and the exclusion count shown.

WITHDRAWN TASKS ARE EXCLUDED AND COUNTED

A task withdrawn because the asset was replaced or the strategy changed is excluded from compliance, and the number withdrawn is displayed beside the figure. Excluding them silently is how a compliance percentage becomes meaningless.

11.3 Generating the schedule

1. Confirm the task templates are correct for the asset class and the site.
2. Select **Generate Schedule** to project the programme forward across the period.
3. Review the generated register, particularly the assignee and priority columns.
4. Select **Run PM Release Now** to release due tasks as work orders. Released tasks then follow the preventive route described in chapter 10.

Chapter twelve

12. Field operations and the mobile application

Field work is the point at which the record is either created accurately or lost. The mobile application exists so that the record is created where the work happens, by the person who did it, at the moment they did it.

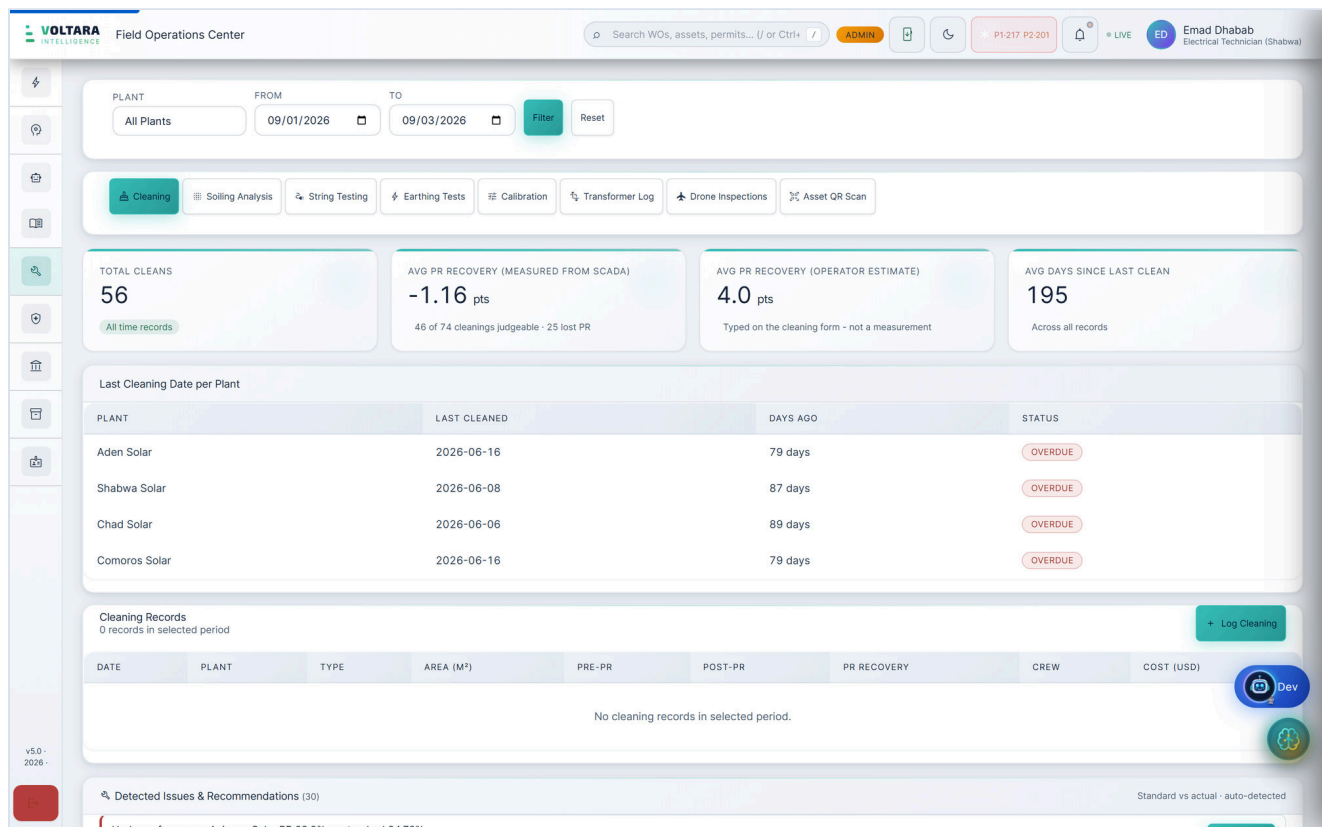


Figure 12.1 Field Operations, the desk side view of what the field is doing now.

12.1 A technician's working sequence

1. **Check in.** Attendance is geofenced: a check in is valid inside the plant boundary and belongs to that plant.
2. **Open the day's work.** Assigned work orders appear with priority, asset, location and the safety requirements.
3. **Accept the permit.** Where a Permit to Work applies, accept it on the device. Acceptance is signed and timestamped.
4. **Confirm isolation.** Confirm lockout tagout points and the proof of dead test where the work requires it.
5. **Start.** The application refuses to start work whose safety preconditions are open.

6. **Record as you go.** Readings, parts consumed, hours and photographs. Photographs are the evidence a later warranty claim or audit depends on.
7. **Complete.** Enter the resolution, the fault code and the failure mode.
8. **Check out.** Attendance closes for the day.

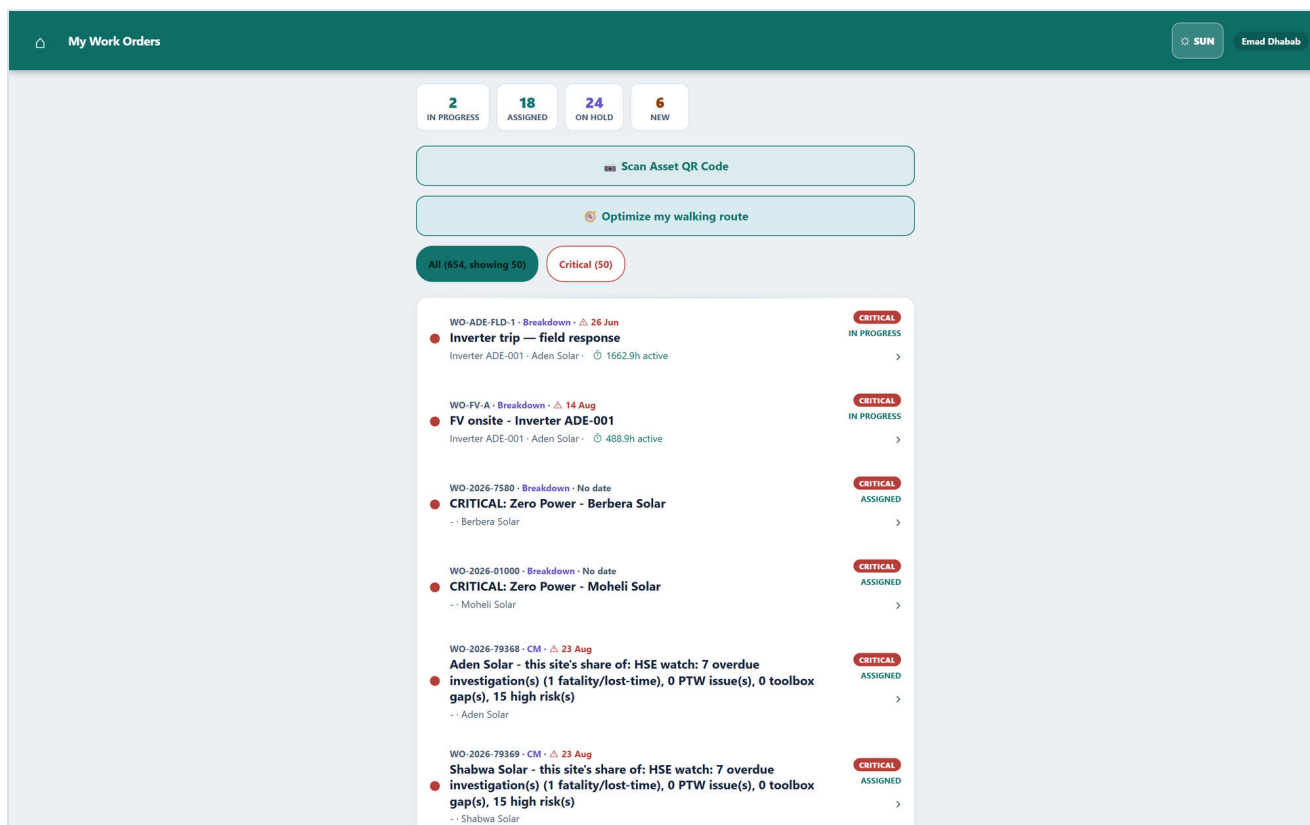


Figure 12.2 Mobile work orders. The same records as the browser, laid out for one hand and bright sunlight.

12.2 Working offline

The application works without a connection. Work started, readings taken and photographs captured are held on the device and synchronised when connectivity returns. The queue is visible, so a technician can see what has not yet reached the platform before leaving site.

BEFORE LEAVING A SITE WITH NO COVERAGE

Check that the synchronisation queue is empty. Anything still queued exists only on that handset until the device is back in coverage.

12.3 Safety features in the field

- **Personal protective equipment verification** captured at the start of a job.

- **Emergency alerting** which fans out to the responders on shift and to management, with the reporter's location.
- **Background location** while on shift and inside a geofence, used for lone worker safety and attendance validation.

12.4 New modules on the phone

The application builds its navigation from the same catalogue as the browser. A module added to the platform appears on the phone for the roles entitled to it without a new application release.

Chapter thirteen

13. Failures, FMEA and root cause analysis

A failure register that only counts failures is a tally. This one records why each happened, what was done, and whether it worked, so that the second occurrence is a question the platform can answer.

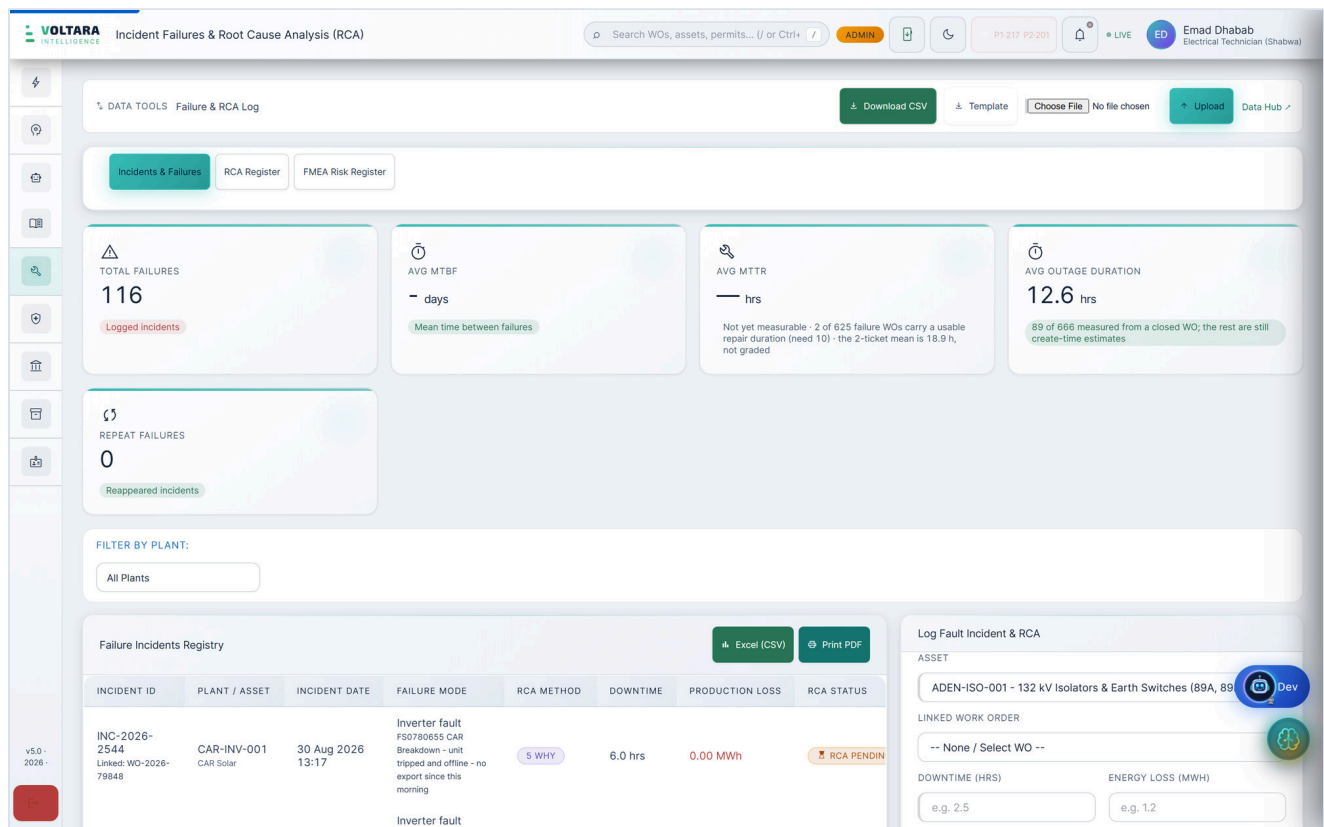


Figure 13.1 The failure register.

13.1 What enters the register

Every breakdown work order creates a failure record. Corrective and predictive work may create one where a genuine failure mode was found. The record carries the asset, the failure mode, the detection method, the consequence in energy and cost, and the corrective action.

13.2 Root cause analysis

1. Open the failure record from the work order or from the register.
2. Record the **failure mode** from the controlled list, not as free text. The list is what makes analysis possible later.

3. Work the analysis: the immediate cause, the contributing conditions and the underlying cause.
4. Record the **corrective action** and, where it is a change to the maintenance strategy, raise the change against the task template so it is applied everywhere.
5. Record the **consequence**: energy lost and cost incurred. This is what turns a reliability argument into a commercial one.

13.3 FMEA

The failure mode and effects register holds, per asset class, the credible failure modes, their effect, their detectability and their criticality. It is the input to both the preventive programme and the critical spares list. Where a failure occurs that is not in the register, add it there as well as recording the instance.

REPEAT FAILURES

The Command Center counts repeat alerts separately for a reason: a repeat is evidence that the first root cause analysis was wrong or was never acted on. Treat a repeat as a finding about the process, not only about the asset.

Chapter fourteen

14. Shift logbook and commissioning

14.1 Shift logbook

Maintenance Hub > Shift Logbook is the running record of a shift: what happened, what was left open and what the next shift must know. Entries are timestamped and attributed, and a handover is a formal event with an outgoing and an incoming signature.

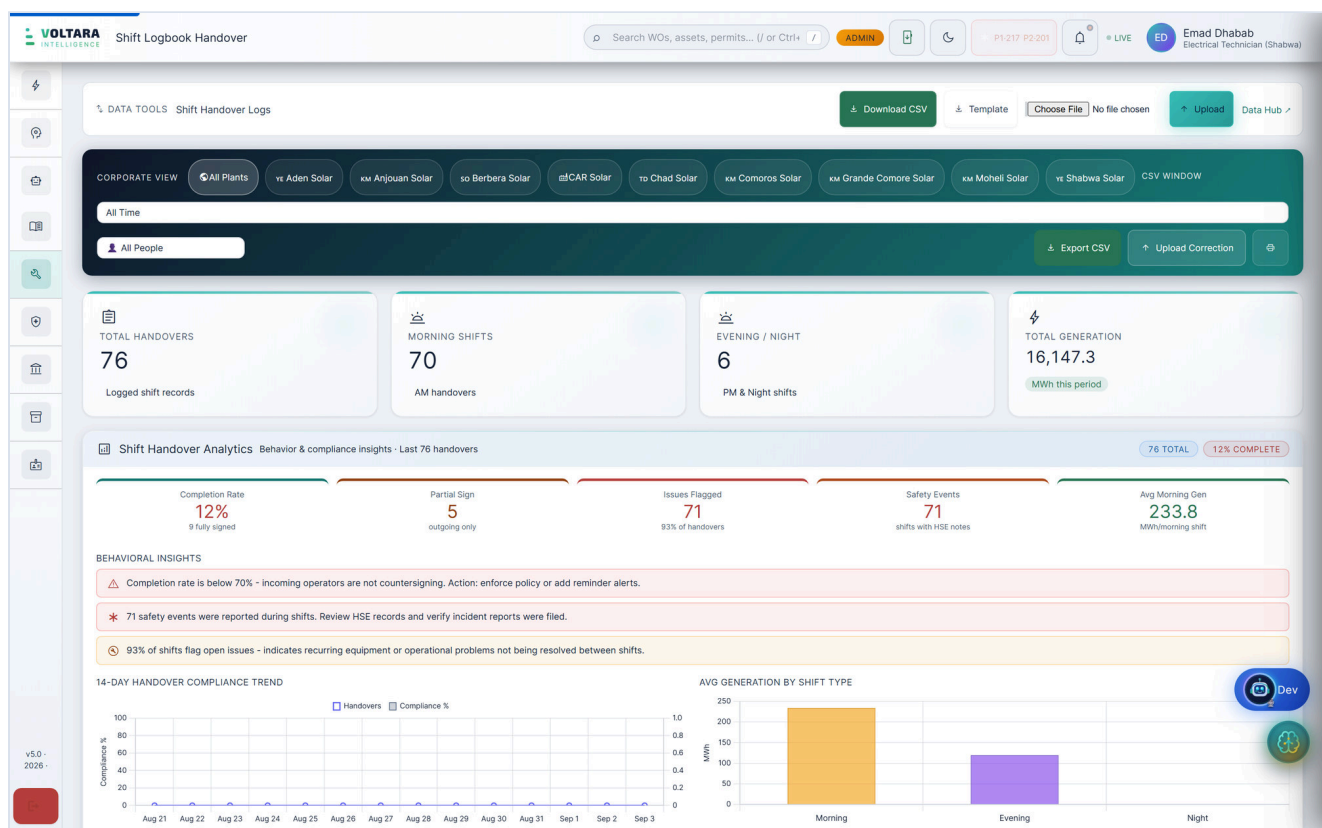


Figure 14.1 Shift logbook.

- Record events as they occur rather than reconstructing them at the end of the shift.
- Reference work orders and permits by number so the log links to the records.
- The handover summary is generated from the entries and the open items, and can be printed or sent.

14.2 Commissioning

Maintenance Hub > Commissioning holds the handover of new plant or replaced equipment: the test schedule, the results, the punch list and the sign off. Commissioning records become the baseline the asset is later measured against, which is why they belong in the platform rather than in a contractor's folder.

14.3 Forms and checklists

Maintenance Hub > Forms holds the controlled forms used in the field: inspection checklists, meter reading sheets and site specific records. A completed form is attached to the work order or the asset it concerns.

Chapter fifteen

15. Safety permits

The permit system is the one part of the platform designed to stop people rather than help them. It is in the same system as the work it controls so that the control cannot be worked around by doing the work somewhere else.

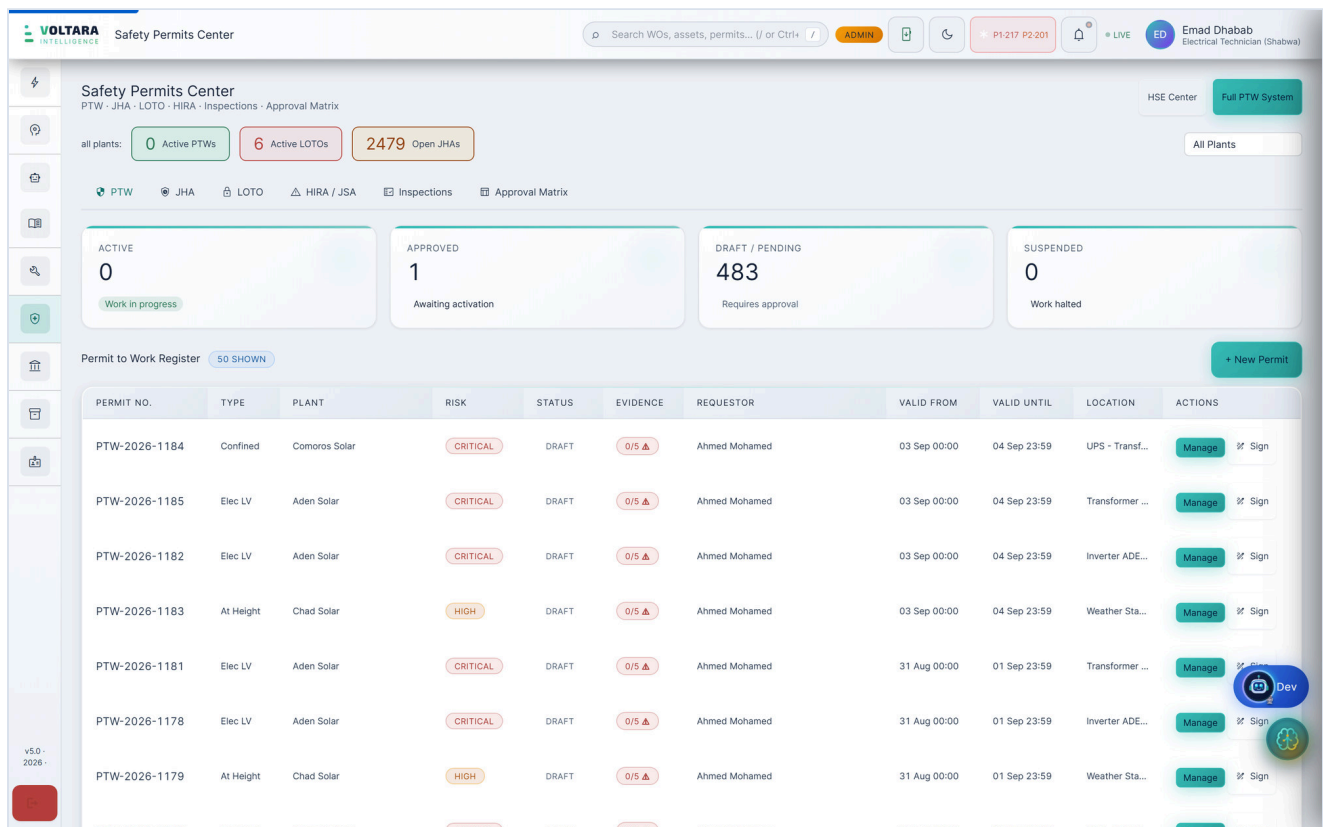


Figure 15.1 Safety Permits Center.

15.1 Permit lifecycle

STAGE	WHAT HAPPENS
Request	Raised against the work order, naming the work, the location, the hazards and the isolation required.
Issue	Signed by the authorised issuer. The issuer must hold the permit issuing authority for that permit type.
Accept	Signed by the person in charge of the work, on the device, before work starts.

STAGE	WHAT HAPPENS
Suspend and resume	Used when work stops and restarts, each transition signed and timestamped.
Extend	Where the work outruns the permit validity, an extension is signed rather than the permit being allowed to lapse.
Close	Work complete, isolations removed, area returned to service, signed by both parties.
Cancel	Where the work will not proceed. The reason is recorded.

15.2 Lockout tagout

The isolation register records every isolation point, the lock applied, the lock owner and the proof of dead test. A permit that requires isolation cannot be accepted until the isolation is confirmed, and the isolation cannot be removed while the permit is live.

15.3 Job hazard analysis

The job hazard analysis is bound to the work order, not filed separately. It records the steps of the job, the hazards of each step, the controls and the residual risk, and it is reviewed at the point of acceptance rather than at the end of the month.

THE HARD GATE

A work order whose permit, isolation or risk assessment is open cannot be moved to started. The platform enforces this in the browser and in the mobile application. There is no override; the correct response is to complete the safety document, not to find another route to the button.

Chapter sixteen

16. HSE Center

The HSE Center holds the leading and lagging indicators together, because a safety record read only through injuries is read too late.

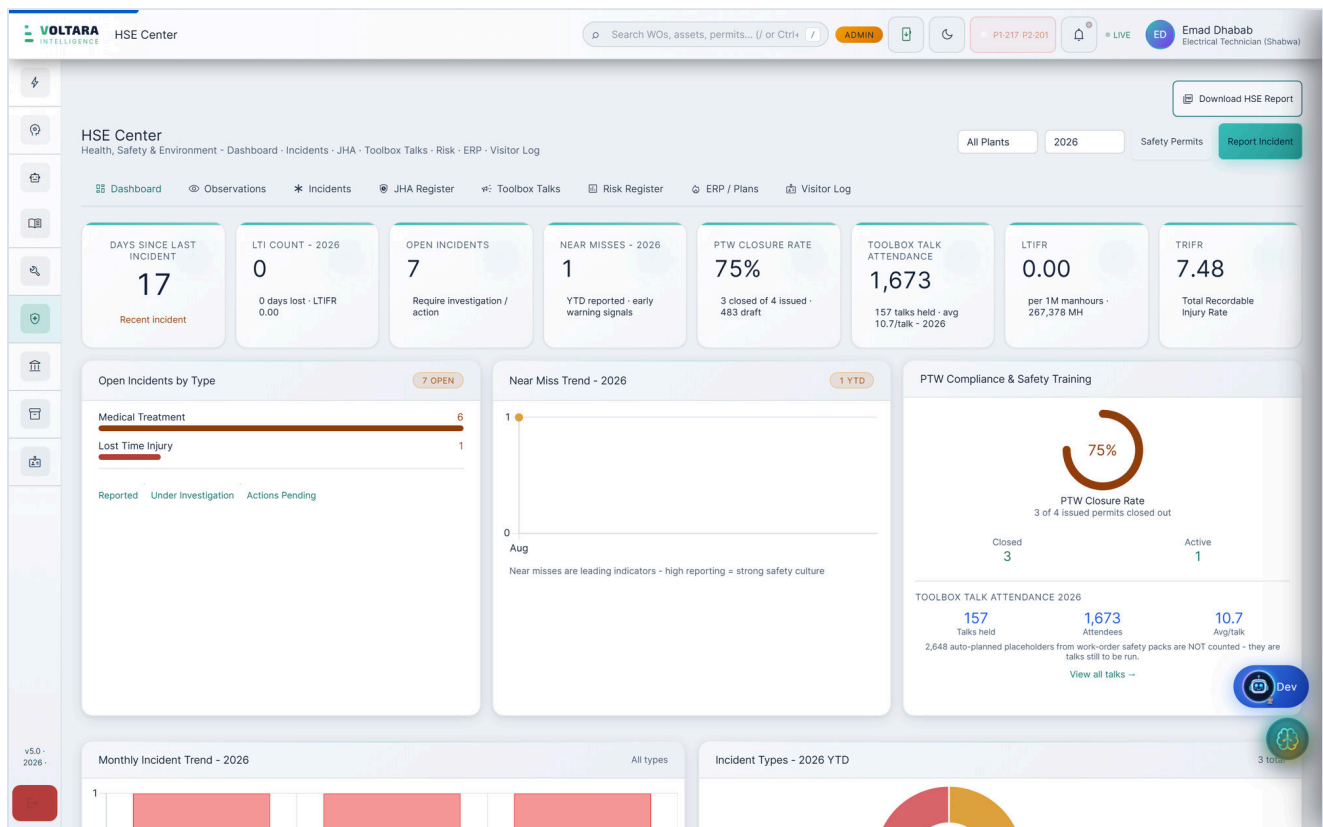


Figure 16.1 HSE Center dashboard, with leading indicators beside the lagging ones.

16.1 The tabs

Dashboard	The indicator set and the trends.
Observations	Safety observations, the earliest leading indicator there is.
Incidents	Incident register with classification, investigation and actions.
JHA Register	Job hazard analyses across the fleet.
Toolbox Talks	Talks held, attendance and topics.

Risk Register	Assessed risks, controls and owners.
ERP / Plans	Emergency response plans and site specific procedures.
Visitor Log	Who is on site who is not staff.

16.2 The indicators

Days since last incident	The headline lagging indicator.
LTI count	Lost time injuries in the year, with days lost.
Open incidents	Incidents still requiring investigation or action.
Near misses	Reported near misses. A high number is a healthy reporting culture, not a deteriorating one.
PTW closure rate	Issued permits properly closed out.
Toolbox talk attendance	Talks held, attendees and the average per talk.
LTIFR	Lost time injury frequency rate per million manhours, with the manhours stated.
TRIFR	Total recordable injury frequency rate.

PLANNED IS NOT HELD

Toolbox talk attendance counts talks that were actually held. Automatically planned placeholders generated from work order safety packs are excluded and reported separately, so the attendance figure describes what happened rather than what was scheduled.

16.3 Reporting an incident

1. Select **Report Incident**. This is available to every role, including from the mobile application.
2. Record what happened, where, when and who was involved. Attach photographs.
3. Classify the incident. Classification drives which indicators it affects and which investigation is required.
4. The investigation, actions and closure are tracked on the record, with owners and dates.

Chapter seventeen

17. ESG reporting

Environmental, social and governance reporting is generated from records the platform already holds, rather than assembled once a year from memory.

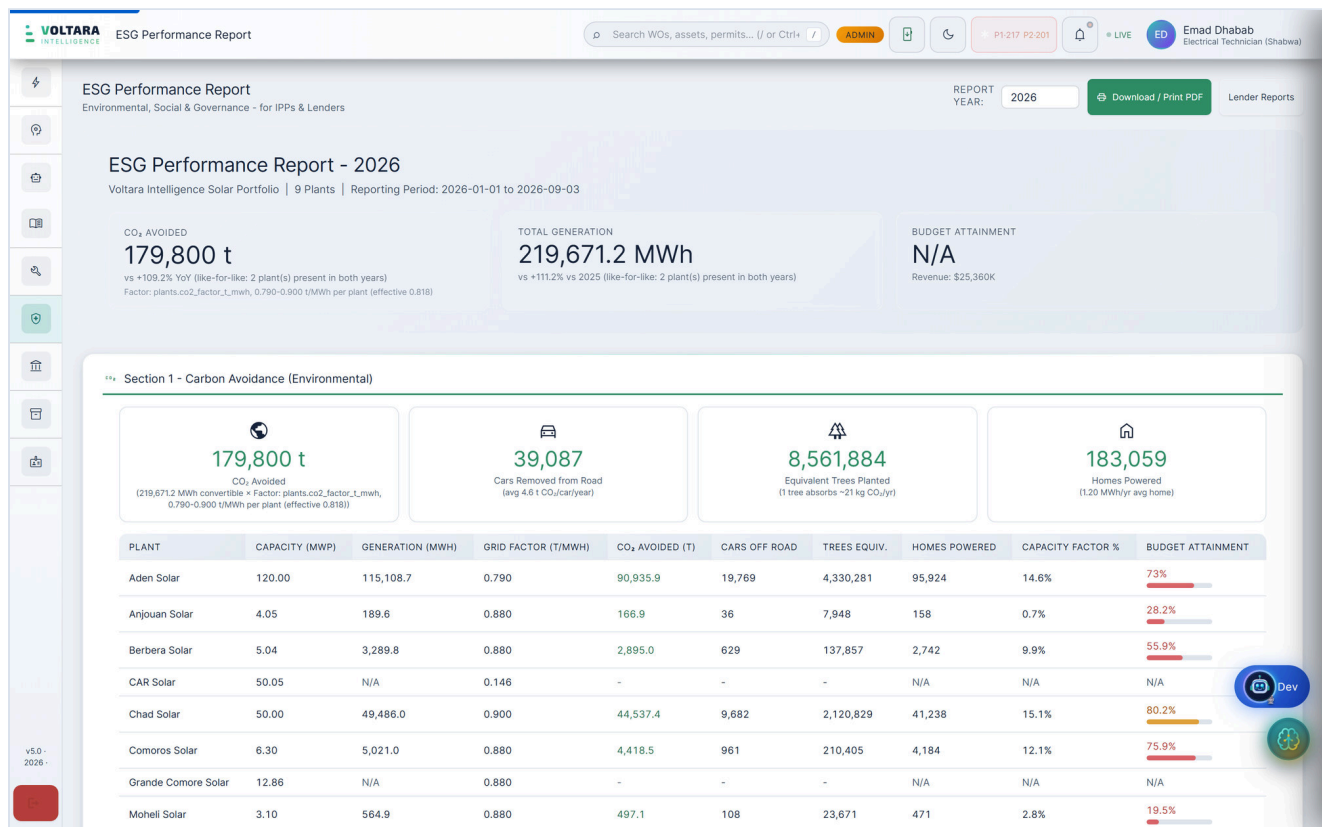


Figure 17.1 ESG reporting.

- **Environmental.** Energy delivered, carbon dioxide avoided using each plant's own emission factor, water used in cleaning, and waste and hazardous material handling from the hazmat register.
- **Social.** Workforce composition, training and certification, safety performance and local employment.
- **Governance.** Approval trails, audit records, policy acknowledgement and controlled document status.

CARBON FACTORS ARE PER PLANT

Avoided emissions use the emission factor held against each plant, reflecting the grid or the displaced generation at that site. A single global factor would misstate a hybrid diesel site substantially, so the platform does not use one.

Chapter eighteen

18. Asset intelligence

The asset register is the spine of the platform. Work orders, permits, spares, warranties and performance all attach to it, which is why its completeness is displayed on the register itself.

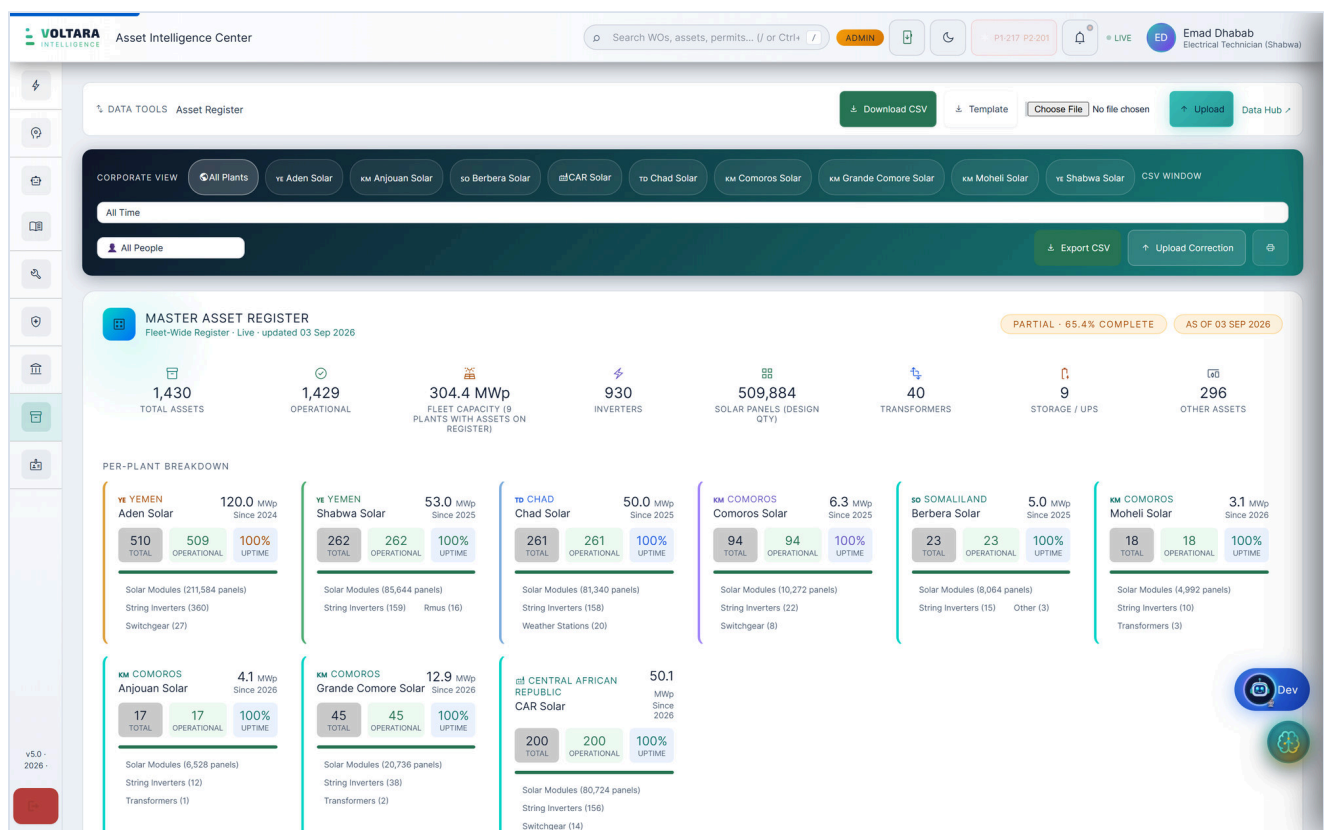


Figure 18.1 Asset Intelligence Center. The register states its own completeness rather than presenting a partial register as a full one.

18.1 The hierarchy

Assets are held as a tree: plant, block, then equipment, then the components beneath it. A string belongs to an inverter, an inverter to a block, a block to a plant. That relationship is what allows a fault at one level to be attributed correctly at another.

18.2 What an asset record carries

Identity	Tag, description, class, manufacturer, model and serial number.
Position	Plant, block, parent asset and physical location.

Dates	Installation, commissioning and, where applicable, replacement.
Warranty	Term, start, expiry and the party who carries the obligation.
Condition	Operational status and uptime.
History	Every work order, failure, part and reading recorded against it.

18.3 Register completeness

The register displays its completeness as a percentage with an as at date. A register that is sixty five percent complete is useful and should be described as such; presenting it as complete would make every count drawn from it wrong. Improving completeness is a normal onboarding activity, done through the data tools import.

Chapter nineteen

19. Warranty management

A warranty is only worth what can be proven inside its term. This module holds the term, the evidence and the claim in the same place as the failure.

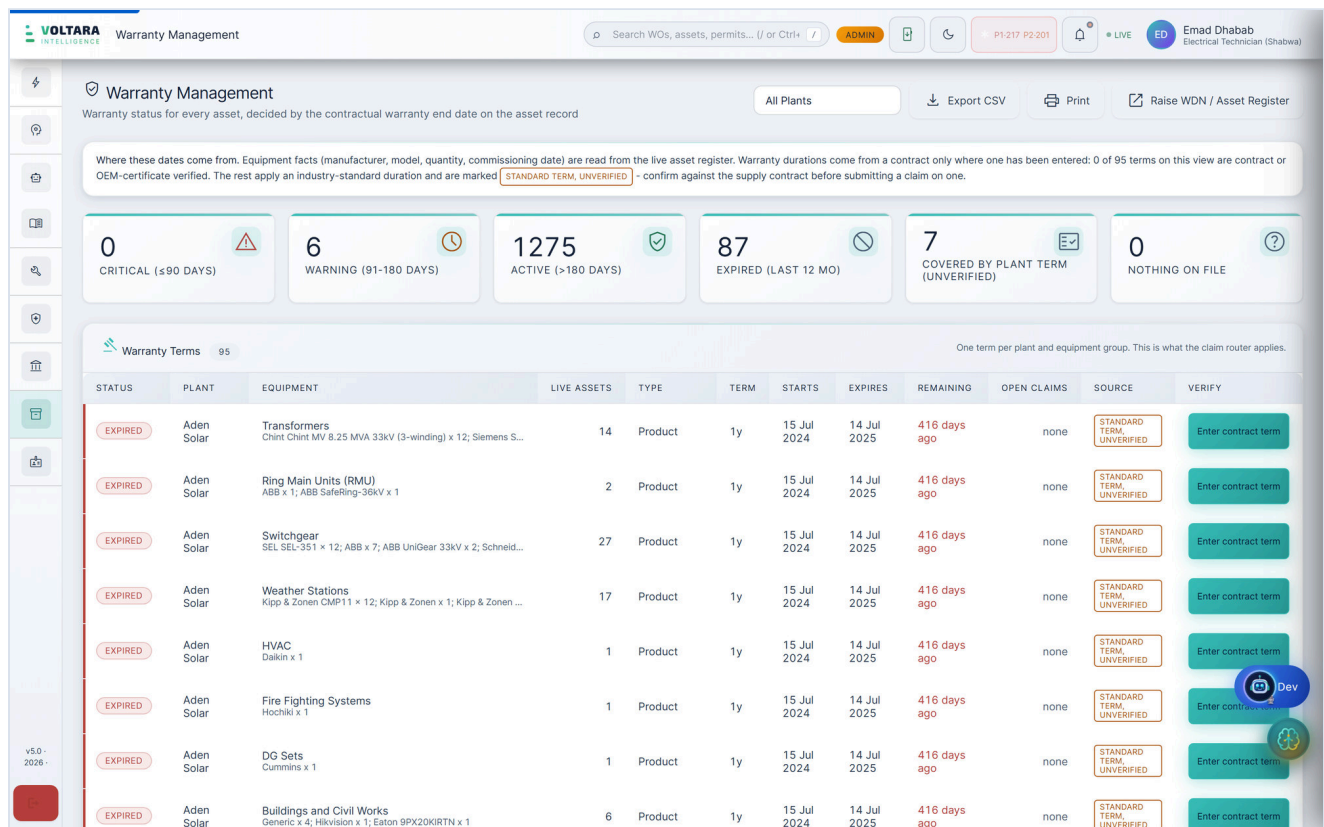


Figure 19.1 Warranty management.

19.1 Default terms

ASSET CLASS	DEFAULT TERM	NOTES
PV modules	30 years	Performance warranty, tracked against the warranted degradation curve.
Inverters	5 years	Product warranty from commissioning unless the contract states otherwise.
All other equipment	1 year	Applied on creation and overridden where a contract provides a longer term.

These defaults are applied automatically to newly created assets, so a register import never produces assets with no warranty position at all.

19.2 Raising a claim

1. Open the failed asset and confirm the warranty is live at the failure date, not at today's date.
2. Select **Raise Claim**. The serial, install date, failure record and work order evidence are attached automatically.
3. Confirm the responsible party. The platform routes to the manufacturer, the engineering and procurement contractor or the insurer according to the coverage held against the asset.
4. Track the claim through submission, acceptance, replacement and closure.

WARRANTY AND INSURANCE ARE DIFFERENT REMEDIES

A failure may be covered by warranty, by insurance, by neither or by both. The coverage routing on the asset decides which is pursued first, and pursuing the wrong one first is how a claim window is lost.

Chapter twenty

20. Inventory and stores

Stores exists to make the repair possible. Every measure in this module is therefore about whether the part will be there when the work order needs it.

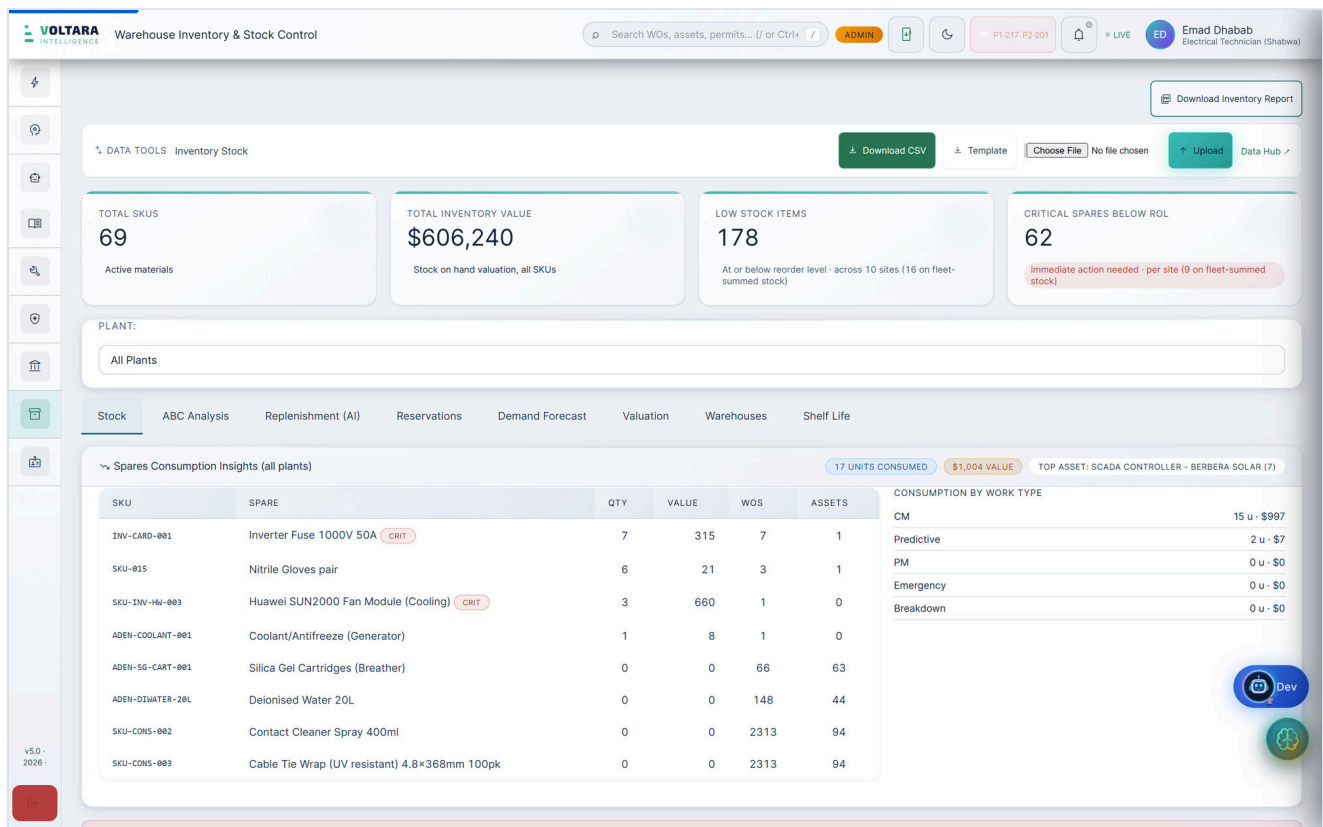


Figure 20.1 Warehouse Inventory and Stock Control, with consumption attributed to the work orders that used the parts.

20.1 The tabs

Stock	Stock on hand by item and by site, with consumption insight.
ABC Analysis	Value classification, so attention goes where the money is.
Replenishment	Suggested reorder based on consumption, lead time and criticality.
Reservations	Parts committed to a work order and therefore not available to another.
Demand Forecast	Expected consumption from the preventive programme and failure history.

Valuation	Stock value on hand.
Warehouses	Locations, bins and transfers between sites.
Shelf Life	Items with an expiry, so consumables are used before they lapse.

20.2 The measures

Total SKUs	Active materials in the catalogue.
Total inventory value	Valuation of stock on hand across all items.
Low stock items	At or below reorder level. The count is given per site as well as on fleet summed stock, because a fleet total can hide a site that has none.
Critical spares below reorder level	The subset where a stockout stops a repair. Immediate action.

PER SITE, NOT FLEET SUMMED

A spare held at Aden does not help a technician at Moheli. Where a figure can be read either way the platform shows both, and treats the per site position as the one that matters operationally.

20.3 Issuing and consuming

1. Reserve the part on the work order when the job is planned.
2. Issue it from stores against that work order.
3. Consumption is booked to the work order, the asset and the work type, which is what makes the consumption analysis meaningful.
4. Unused reservations are released back to available stock when the work order closes.

Chapter twenty one

21. Procurement

Procurement runs from requisition to receipt to invoice, with the approval chain and the matching that a finance function requires.

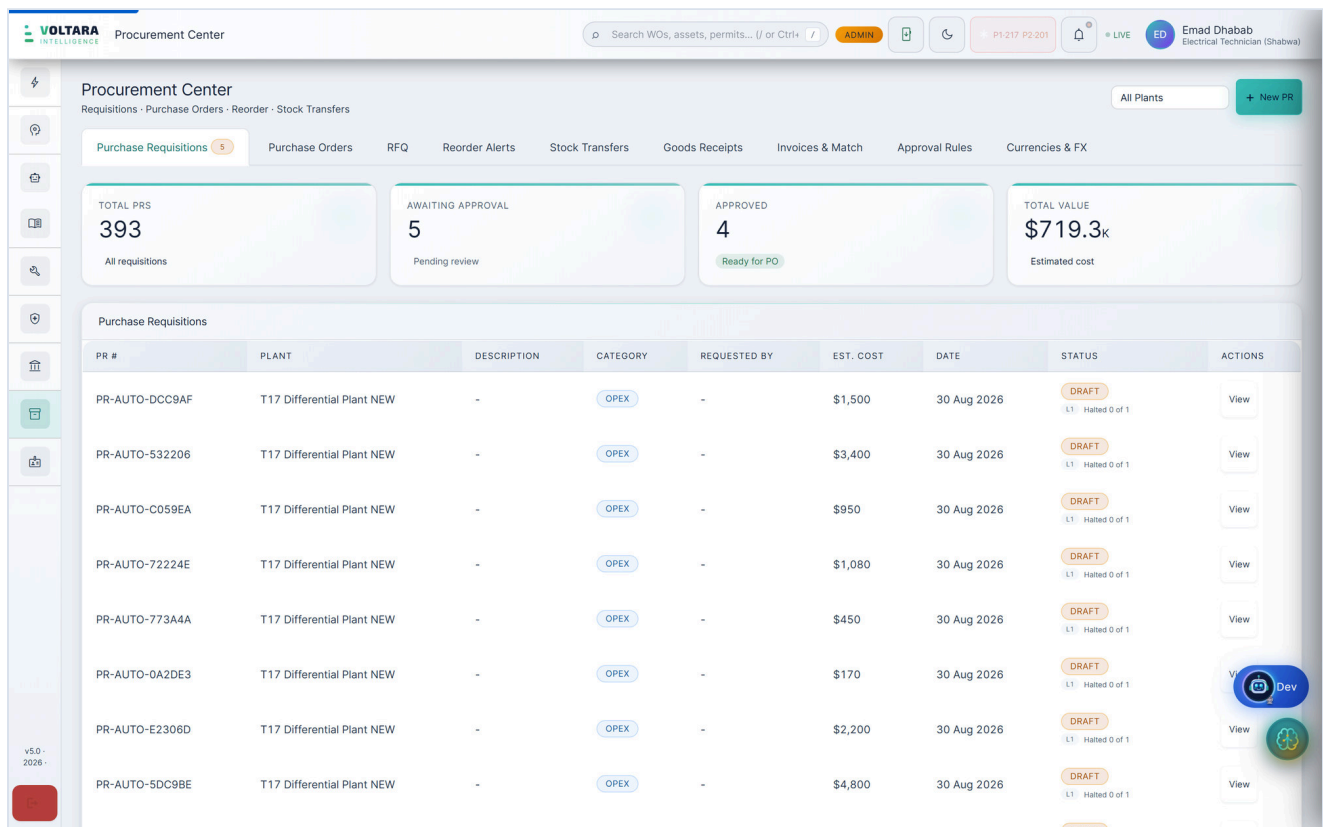


Figure 21.1 Procurement Center.

21.1 The flow

1. **Requisition.** Raised from a stock shortfall, a work order need or a project. It carries the plant, the cost centre and the justification.
2. **Approval.** Routed by value through the approval levels. Each approver has a limit; a requisition above it escalates rather than stopping.
3. **Purchase order.** Issued to the supplier, in the supplier's currency where multi currency is in use.
4. **Receipt.** Goods received against the order, with quantity and condition recorded.
5. **Invoice.** Matched three ways against the order and the receipt. A mismatch is held rather than paid.

21.2 Approval levels

Approval authority is held on the user record as a level and a value limit, separately from the operational role. Three levels of corporate approval are supported above plant level. Every approval and rejection is recorded with the approver, the time and any comment.

21.3 Suppliers

People & System > Supplier Center holds supplier records, contacts, terms, performance and the documents that qualify them. Purchase orders can only be issued to a qualified supplier.

21.4 Budget commitment

An approved requisition commits budget before the invoice arrives, so the remaining budget shown in the Financial Center reflects money already spoken for rather than only money already spent.

Chapter twenty two

22. Financial Center and budget

The commercial modules read the same records as the operational ones. There is no separate finance dataset to reconcile, which is the point.

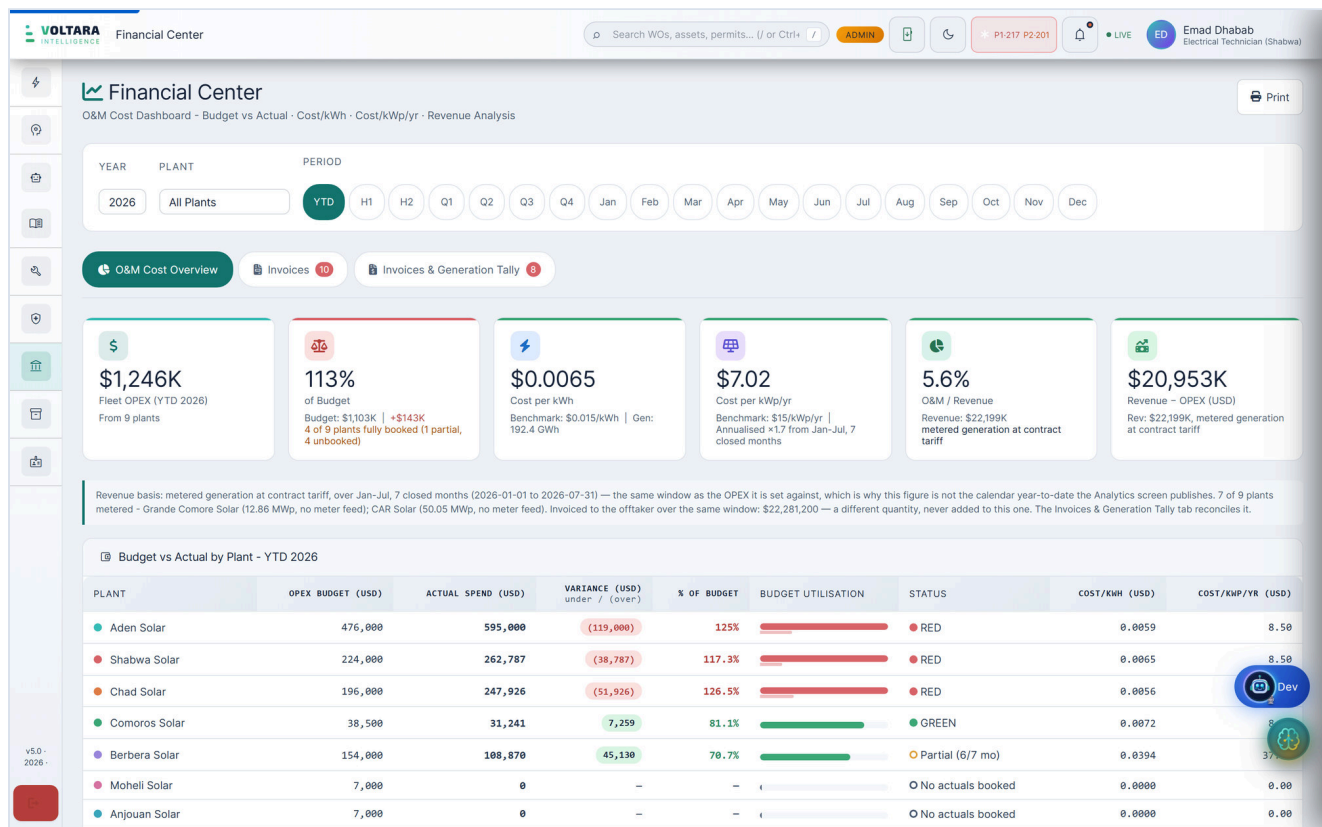


Figure 22.1 Financial Center.

22.1 The revenue chain

Four figures describe revenue and they are never added together. Each answers a different question, and confusing them is the most common error in solar portfolio reporting.

FIGURE	QUESTION IT ANSWERS
Budgeted	What the financial model said this period would earn.
Expected	What the metered energy actually delivered should earn at the applicable tariff.
Invoiced	What has been billed to the offtaker.

FIGURE	QUESTION IT ANSWERS
Received	What has been collected.

The gaps between them are the management information: budgeted against expected is performance, expected against invoiced is a billing gap, invoiced against received is a collection problem.

GENERATED BUT NEVER INVOICED

The gap between expected and invoiced is reported explicitly, per plant and per month. A month that generated energy and was never billed is one of the most expensive and most easily missed failures in portfolio operation, so the platform surfaces it as a standing figure rather than waiting for an audit.

22.2 Budget management

Finance > Budget Management holds the approved budget: energy, performance ratio, revenue and cost, by plant and by month.

THE BUDGET COMES FROM THE WORKBOOK

Performance targets always resolve from the approved budget model. They are never typed into a screen. This is what keeps the target on an operations dashboard identical to the target in the financial case, twelve months after anyone has looked at either.

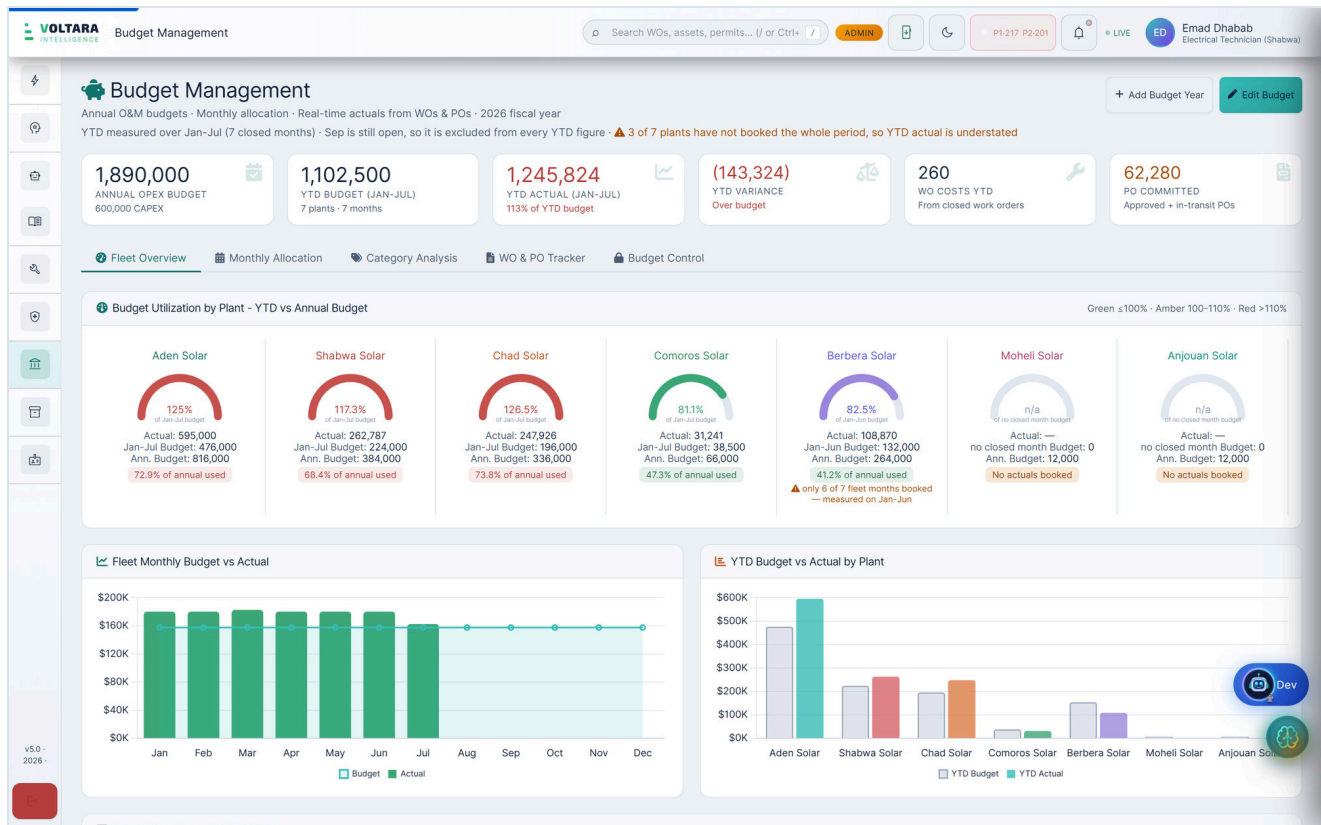


Figure 22.2 Budget management.

22.3 Invoicing and receivables

- The invoice register holds issue date, period, energy billed, value, due date and status.
- Ageing is reported in bands, with the proportion beyond one hundred and eighty days called out because that is where recovery risk becomes material.
- Collection rate is stated per plant, since a fleet collection rate can conceal a single offtaker who has never paid.

22.4 Capital projects, insurance and covenants

- **Capital Projects** tracks pipeline and in flight projects with budget, spend and milestones.
- **Insurance & Claims** holds policies, coverage and claims in progress.
- **Covenant Tracker** monitors lender covenants and the ratios that must be maintained, with a forward view of any that are approaching a limit.

Chapter twenty three

23. SLA and contracts

Contractual performance is measured continuously rather than argued about at the year end.

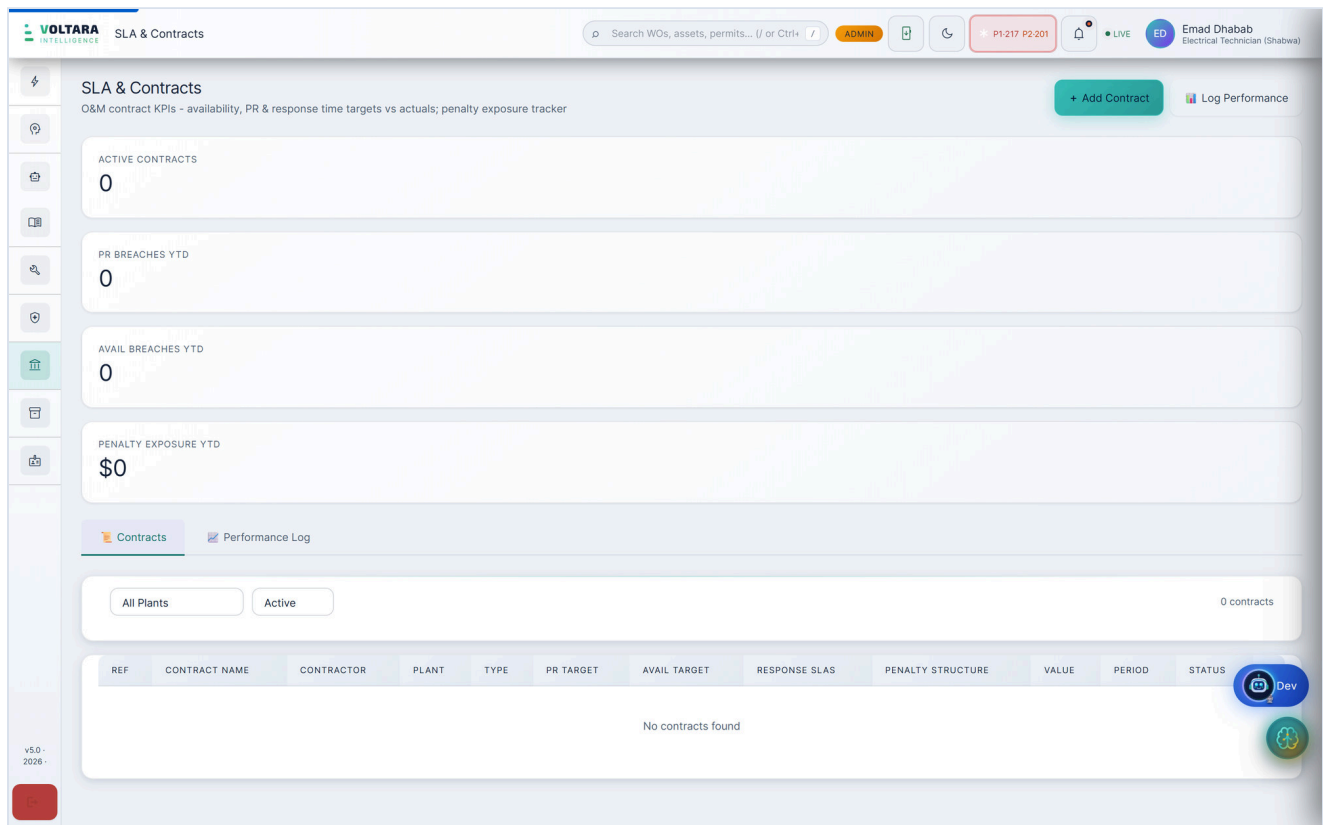


Figure 23.1 SLA and contracts.

- **Contract register** with parties, term, scope, obligations and the measures that govern them.
- **Guaranteed measures** such as availability and performance ratio, computed on the contractual definition rather than the operational one where the two differ.
- **Response and rectification times** measured against the service level clock described in chapter 10.
- **Liquidated damages and penalty exposure** calculated as the period progresses, so the exposure is known while it can still be influenced.
- **O&M Agreement Builder** for drafting the agreement for a new site from the standard scope.

CONTRACTUAL AND OPERATIONAL DEFINITIONS

A contract may define availability differently from the way operations measures it, for example by excluding force majeure or grid outage hours. The platform holds both definitions and states which one a figure is computed on, rather than choosing one and hoping the reader assumes the same.

Chapter twenty four

24. Report Center

Reports are generated from the record. Nothing in a Voltara report is typed by hand, which is what makes a report reproducible six months later.

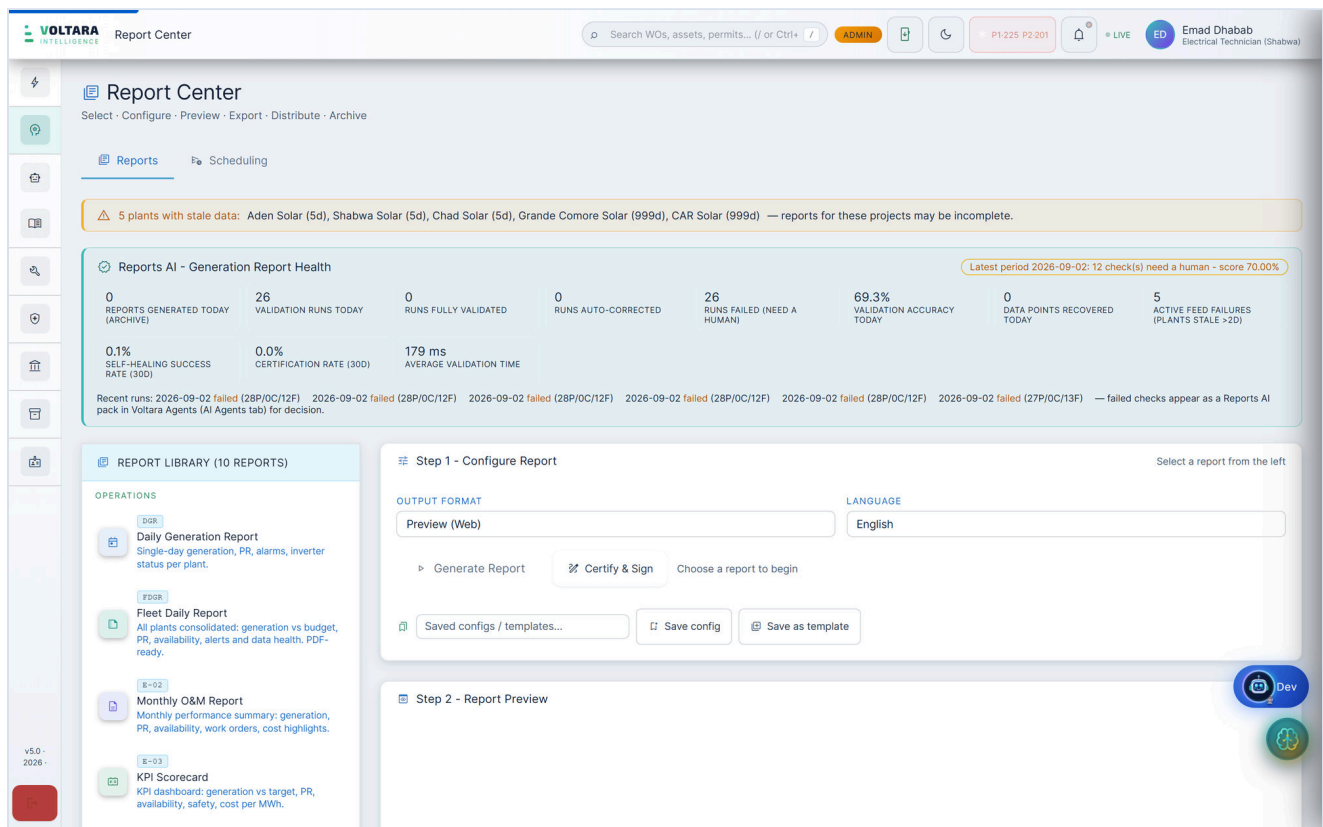


Figure 24.1 Report Center.

24.1 Standard reports

Daily generation	Yesterday's generation, performance and events, per plant and for the fleet.
Monthly performance	The month against budget, with loss decomposition and the maintenance summary.
Availability	Availability and downtime attribution for the period.
Maintenance	Work completed, compliance, backlog and mean time to repair.
HSE	Indicators, incidents, permits and toolbox talks.

Management pack	The combined operational and commercial position for a management meeting.
------------------------	--

24.2 Scheduling delivery

1. Open **Intelligence > Report Center** and select the report.
2. Set the scope: plants, period and level of detail.
3. Set the schedule: daily, weekly or monthly, and the time of day.
4. Set the recipients, by individual or by role, and the channel: email, Microsoft Teams or both.
5. Save. Delivery runs on the server, so it does not depend on anyone being signed in.

SCHEDULED DELIVERY IS SERVER SIDE

A scheduled report is produced and sent by the platform's own scheduler. Closing your browser, going on leave or losing a laptop does not interrupt it. Equally, a schedule that is no longer wanted must be turned off rather than ignored.

24.3 Exports and the API

Every register exports to CSV and Excel, and every report to PDF. For systematic consumption, the versioned REST API delivers the same data to a client data warehouse or business intelligence tool. Interface documentation is at **People & System > API Docs**.

Chapter twenty five

25. KPI management

KPI management is where a measure is defined once. Every screen and every report then reads that definition, which is why two pages in this platform cannot disagree about performance ratio.

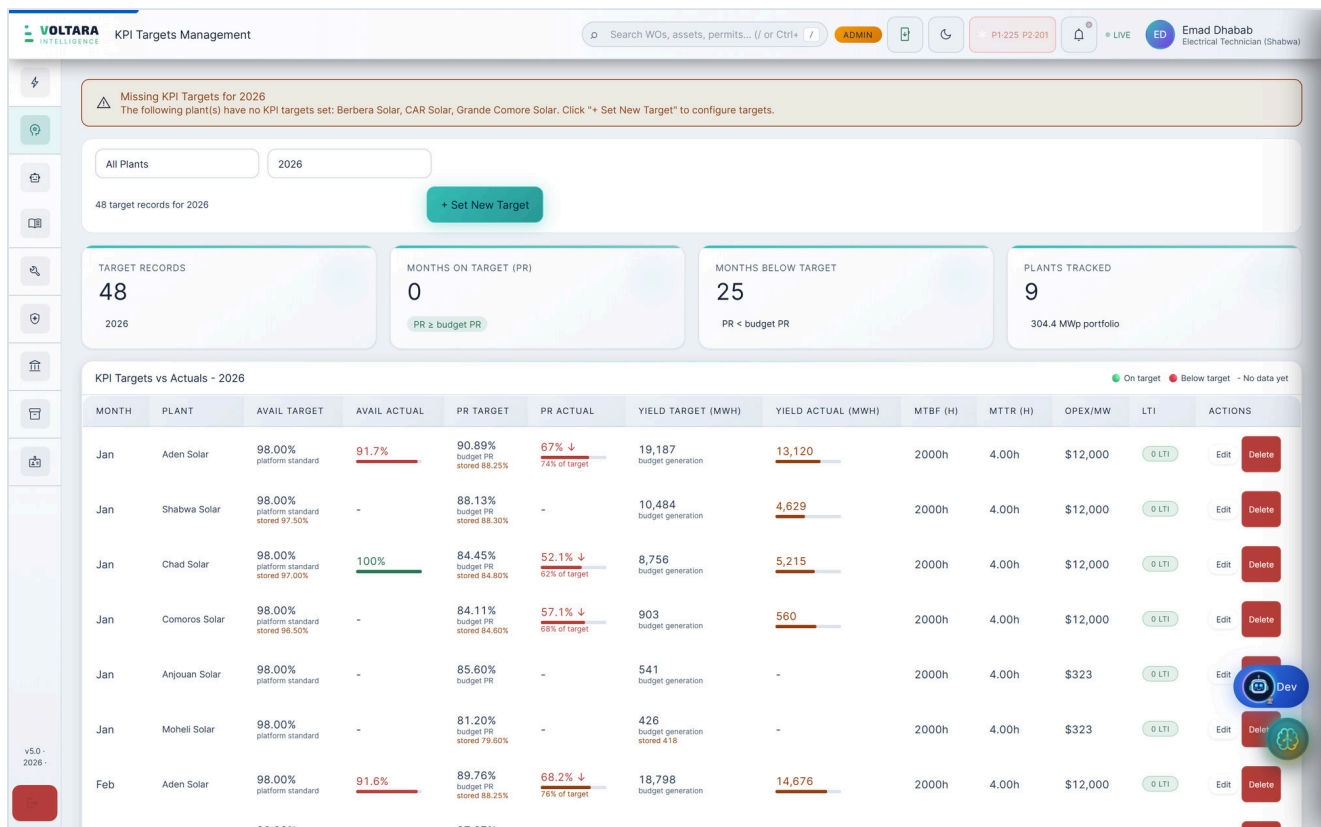


Figure 25.1 KPI management.

- **Definition.** The formula, the inputs and the exclusions.
- **Target.** The value to be achieved, and where it comes from. Performance targets resolve from the budget model.
- **Scope.** The plants and the period the measure applies to.
- **Scoring.** How the measure contributes to a composite score, where one is used.

ONE DEFINITION, EVERYWHERE

Availability, performance ratio, budget target and tariff each resolve through one shared calculation. A screen cannot compute its own version. This constraint is deliberate and it is the reason a figure quoted from the Command Center will match the figure in the monthly report.

Chapter twenty six

26. People, teams and technician analytics

The people modules cover who is employed, who is present, what they are qualified to do and what they got done.

NAME	ROLE	PLANT	TITLE	EMAIL	PHONE	ACTIVE WOS	CERTS	STATUS
CU Corporate User	CORPORATE	-	Corporate / Fleet HQ	corporate@voltara.ae	-	0	0	ACTIVE
MH Mohammed Al Helali	CORPORATE	-	Corporate Approver (Level 3)	mohammed.h@gsts.ae	-	0	0	ACTIVE
MA Musab Ahmed	CORPORATE	-	Corporate Approver (Level 2)	musab.a@gsts.ae	-	0	0	ACTIVE
MM Majed Morshed	SITE TECH	Aden Solar	Electrical Technician (Aden)	Maged.Murshed@uvec.ae	-	12	0	ACTIVE
MA Mohsen Abdulla	PLANT MGR	Aden Solar	Plant Manager (Aden)	mohsen.abdullah@uvec.ae	-	4	2 (1 EXP)	ACTIVE
SR Saba Raoof	PLANT MGR	Aden Solar	Asst. Plant Manager (Aden)	saba.raoof@uvec.ae	-	4	2	ACTIVE
AR Amjad Rashed	SITE TECH	Shabwa Solar	Electrical Engineer (Shabwa)	amjad.rashed@uvec.ae	-	10	0	ACTIVE
EM Eyad Moghales	PLANT MGR	Shabwa Solar	Plant Manager (Shabwa)	Eyad.Mohammed@uvec.ae	-	5	0	ACTIVE
FG Faisal Ghazi	PLANT MGR	Shabwa Solar	HSE Engineer (Shabwa)	Faisal.Saleh@uvec.ae	-	5	0	ACTIVE
CE Chad Test Engineer	PLANT MGR	Chad Solar	Performance Engineer (Chad)	chad.eng@test.voltara.local	-	1	0	ACTIVE
CT Chad Test Technician	SITE TECH	Chad Solar	Site Technician (Chad)	chad.tech1@test.voltara.local	-	1	0	ACTIVE

Figure 26.1 People Center, Directory tab.

26.1 People Center tabs

Directory	Staff record: role, plant, title, contact, active work orders, certifications and status.
Attendance	Check in and check out, geofenced to the plant.
Shifts	Shift patterns and rosters.
Timesheets	Hours, including hours booked to work orders.
Leave	Requests, approvals, balances and the country public holiday calendar.

Skills & Training	Competencies, certifications and expiry.
Skill Hub	Training content and the qualification programme.
Welfare & HSE	Welfare records and safety training status.
Performance	Individual performance against objectives.
Payroll	Payroll inputs derived from attendance and timesheets.
People Analytics	Workforce composition, utilisation and trends.

CERTIFICATION EXPIRY BLOCKS ASSIGNMENT

A technician whose certification for a task has expired will not appear as available for that task in dispatch. The expiry is shown in the directory before it becomes an operational problem.

26.2 My Team, live

People & System > My Team - Live shows who is on site now, where they are within the plant, what they are working on and who is on leave. It is the supervisor's working view and the basis for lone worker safety.

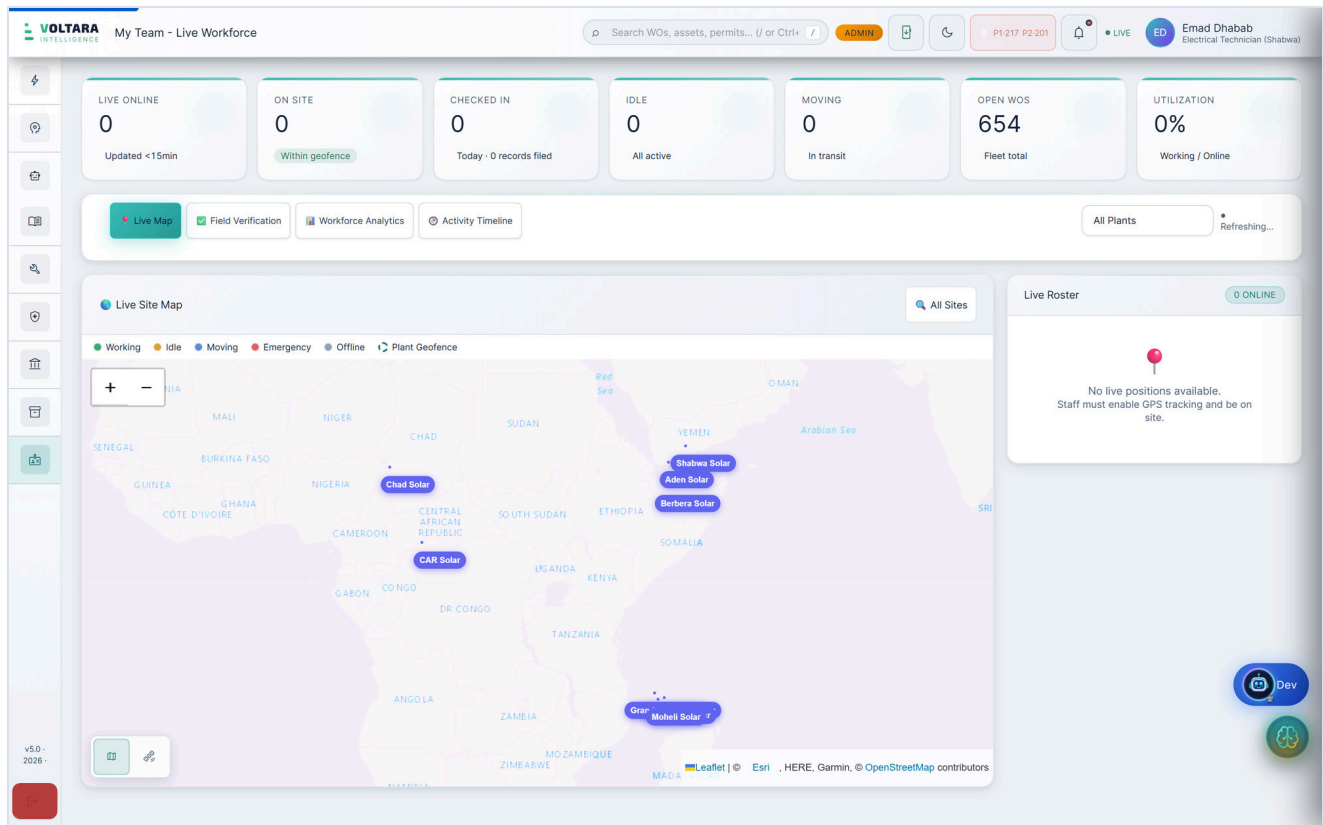


Figure 26.2 My Team, live.

26.3 Technician analytics

Work orders completed, first time fix rate, mean time to repair, rework and safety compliance, per technician. Use it to direct training and to balance workload. It is a coaching instrument and reads best when it is used as one.

26.4 Weekly off days and holidays

Each plant carries its own weekly off day and its country's public holiday calendar. Attendance nudges, checklist reminders and compliance measures respect them, so a plant is not marked absent on its own weekend.

Chapter twenty seven

27. Voltara Agents

The agent layer reads the same records an engineer would read, decides what warrants action, and raises the work order itself. Its output is auditable, because an autonomous decision that cannot be reviewed is not one you can rely on.

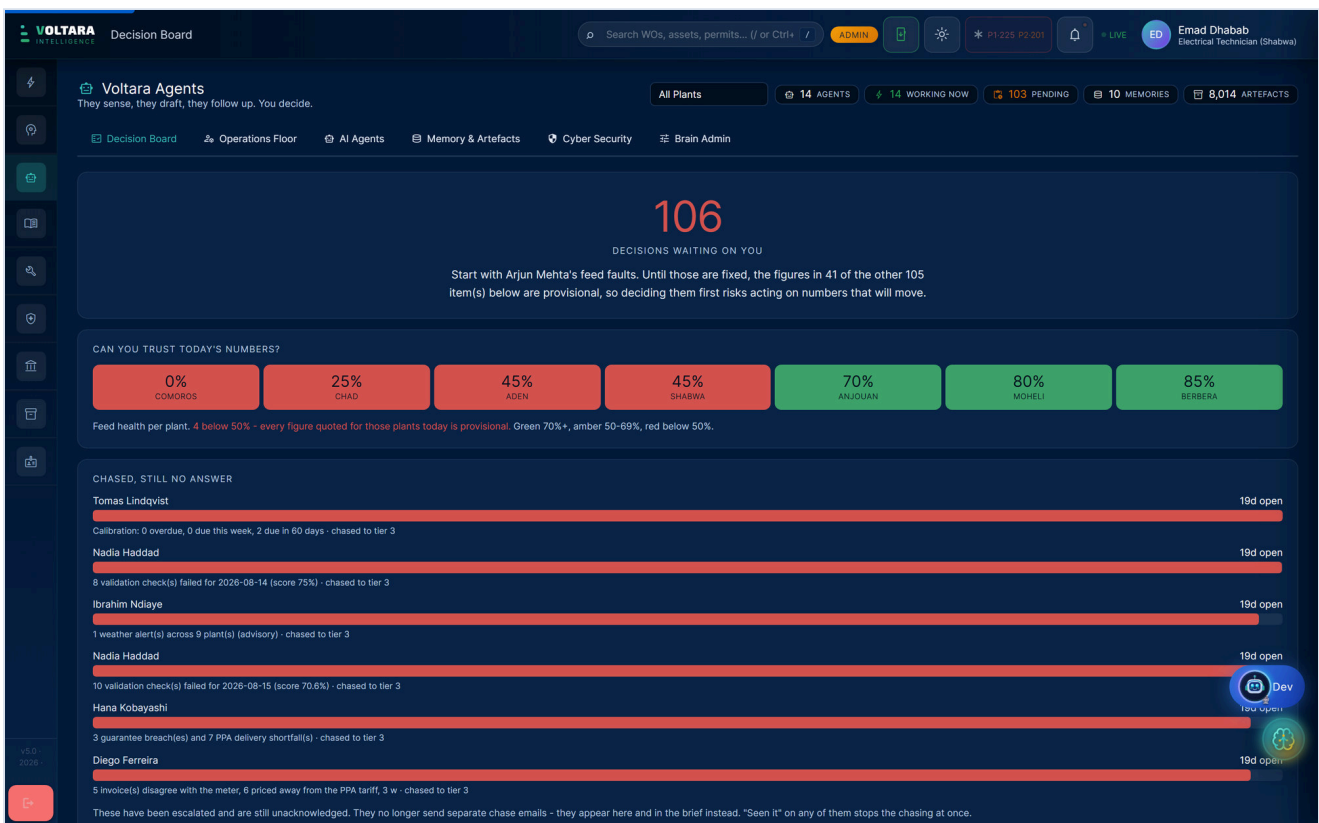


Figure 27.1 The decision board. Each decision carries the evidence it was made on.

27.1 The tabs

Decision Board	What the agents decided, on what evidence, and what happened next.
Operations Floor	The agents at work: what is running, what is queued and what is blocked.
AI Agents	The roster: what each agent is responsible for and how it is configured.
Memory & Artefacts	What the agents have learned and the artefacts they produced.

Cyber Security	Security monitoring and anomalous access review.
Brain Admin	Configuration, thresholds and the approval gates.

27.2 How an agent decision becomes work

1. The agent runs on its schedule and reads the operational record.
2. Where it finds a condition that meets its criteria, it forms a recommendation with the evidence attached.
3. Recommendations that spend money or dispatch a crew go to a human approval gate. Recommendations within the configured autonomy raise the work order directly.
4. The decision, its evidence and its outcome are recorded on the decision board.
5. Accountability is scored afterwards: was the recommendation correct. That score is what makes the agent layer improvable rather than merely busy.

27.3 AI decisions and insights

Intelligence > AI Decision & Insights presents the same intelligence in an operational rather than administrative form: what the platform believes is wrong, what it suggests, and the confidence and evidence behind each item.

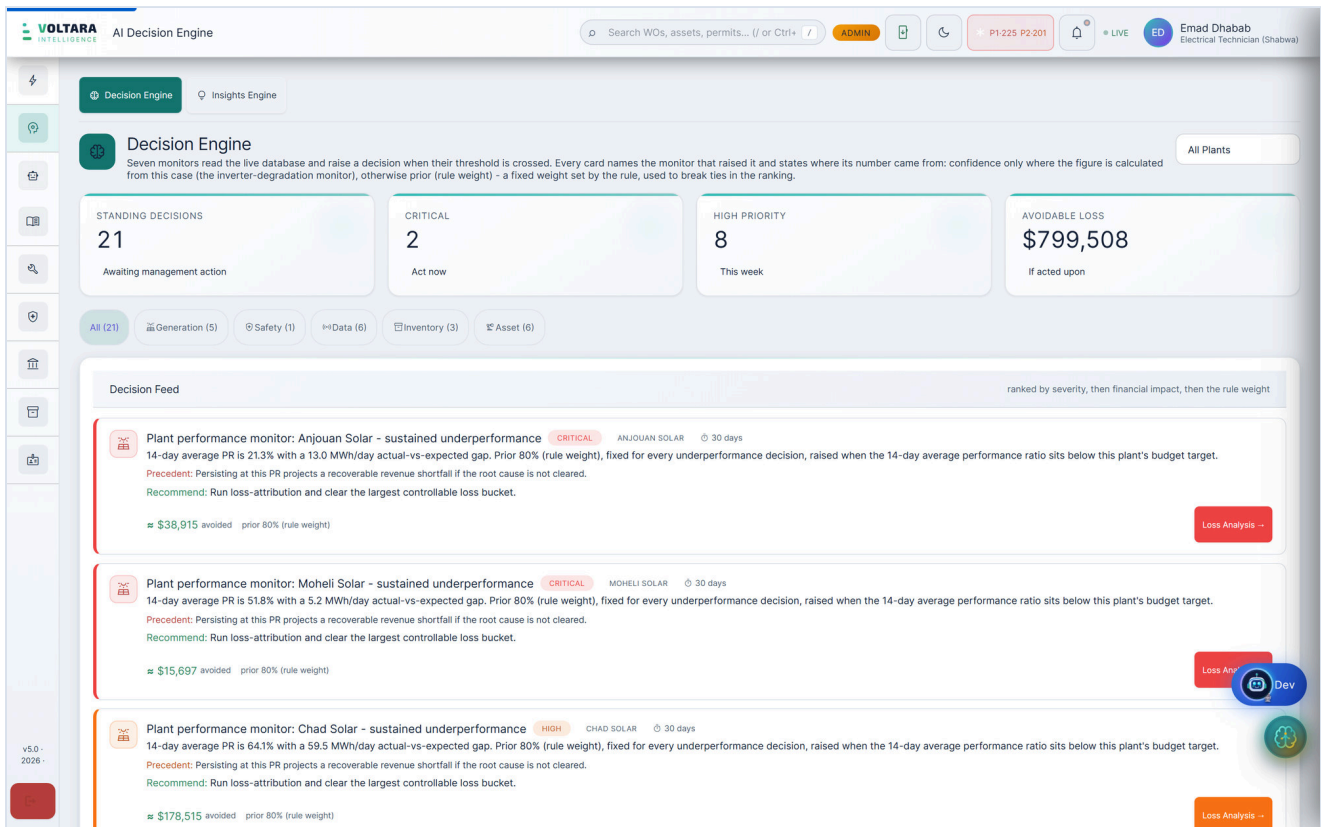


Figure 27.2 AI decisions and insights.

27.4 The assistant

The assistant, shown as a floating control in the lower right of every screen, answers questions about the platform and about the data you are entitled to see. It navigates, explains a figure and looks up equipment fault codes. It answers from the record and declines where it cannot, rather than producing a plausible number.

Chapter twenty eight

28. Knowledge Center

The Knowledge Center holds the controlled documents: procedures, manuals, drawings and the training material that goes with them.

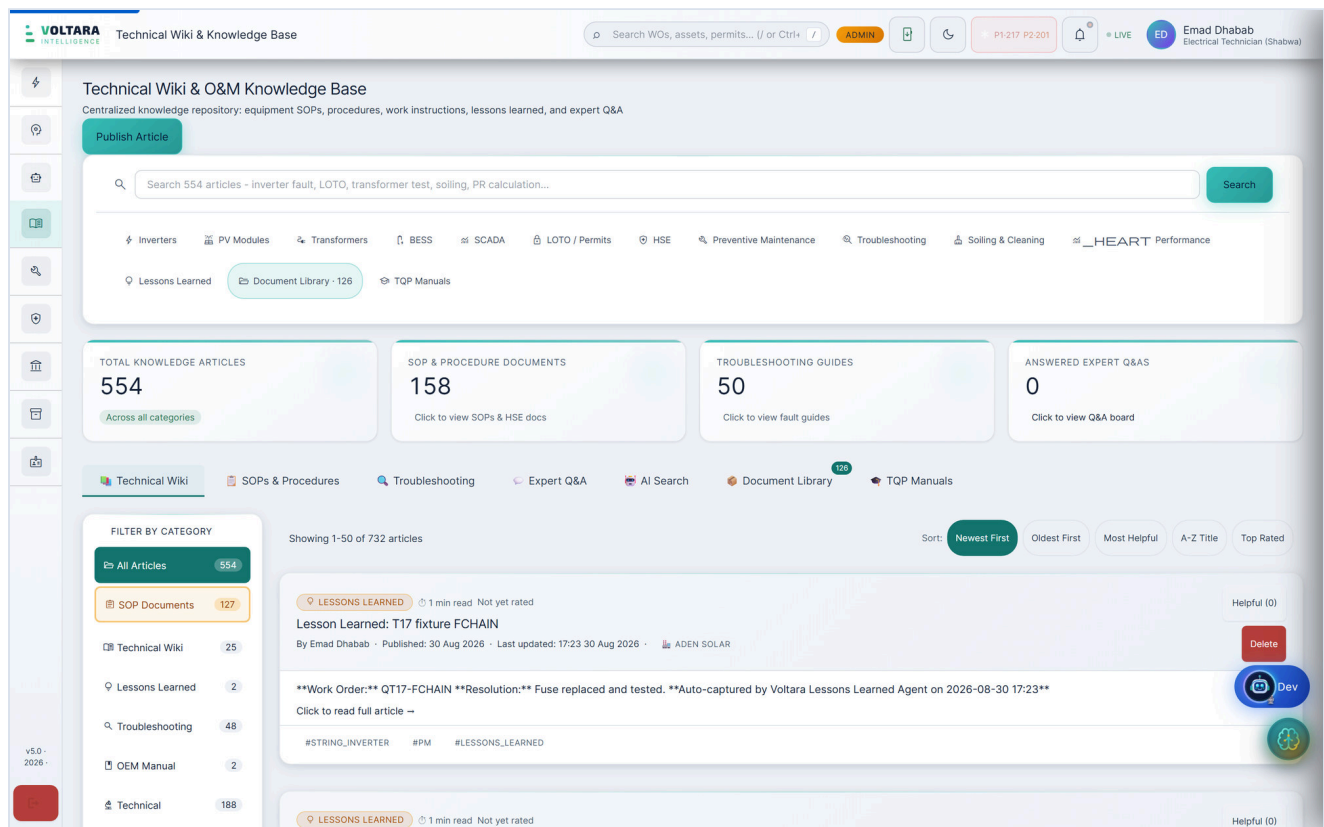


Figure 28.1 Knowledge Center.

- **Controlled documents** with version, owner, review date and approval, so the copy in the field is the current one.
- **Electronic signature** on documents that require acknowledgement, recorded against the individual.
- **Equipment manuals and drawings** linked to the asset class they describe, so they are reachable from the asset rather than from a folder.
- **Learning analytics** showing what has been read, by whom, and where a procedure is being consulted repeatedly, which usually means it is unclear.

Chapter twenty nine

29. PVsyst builder

The PVsyst builder holds the design basis of each plant, which is what every expected value in the platform is ultimately measured against.

The screenshot displays the PVsyst Builder interface. On the left, a sidebar lists steps: STEP 1 Location & Meteo (selected), STEP 2 PV Array, STEP 3 Inverter & AC, STEP 4 Mounting, STEP 5 Losses, and STEP 6 Advanced. Below the steps, it shows 'DC Capacity - MWp' and 'MW AC'. The main area is titled 'PVsyst Builder' and includes a search bar, user profile (Emad Dhabab), and buttons for 'Report PDF', 'Export Data', and 'Run Simulation'. The interface is divided into sections: 'Location & Meteorological Data' with 'QUICK LOAD - VOLTARA INTELLIGENCE FLEET SITES' (listing various sites like Aden-120MWp, Shabwa-53MWp, etc.) and 'BULK SIMULATION - EXCEL FLEET UPLOAD'. Below these are input fields for 'SEARCH LOCATION (CITY / COUNTRY)', 'PROJECT IDENTITY', 'PROJECT NAME', 'SITE NAME', 'GEOGRAPHIC POSITION' (Latitude, Longitude, Altitude, Timezone), and 'GROUND & METEOROLOGICAL SOURCE' (Ground Albedo, Meteorological Data Source).

Figure 29.1 PVsyst builder.

- **Array configuration:** modules, strings, inverters, tilt, azimuth, ground coverage ratio and mounting.
- **Meteorological basis:** the resource dataset the design was built on.
- **Loss chain:** soiling, thermal, ohmic, mismatch, inverter and availability losses, as designed.
- **Expected yield:** monthly and hourly, at P50, P75 and P90.

TWO CHECKS WORTH MAKING ON ANY IMPORTED DESIGN

Confirm that the number of strings divides evenly across the inverter's maximum power point trackers, since an uneven split costs yield that no amount of maintenance will recover. Confirm the azimuth convention against the site's hemisphere rather than assuming it.

Chapter thirty

30. Integration hub

The integration hub is where the platform's connections to the outside world are configured and monitored.

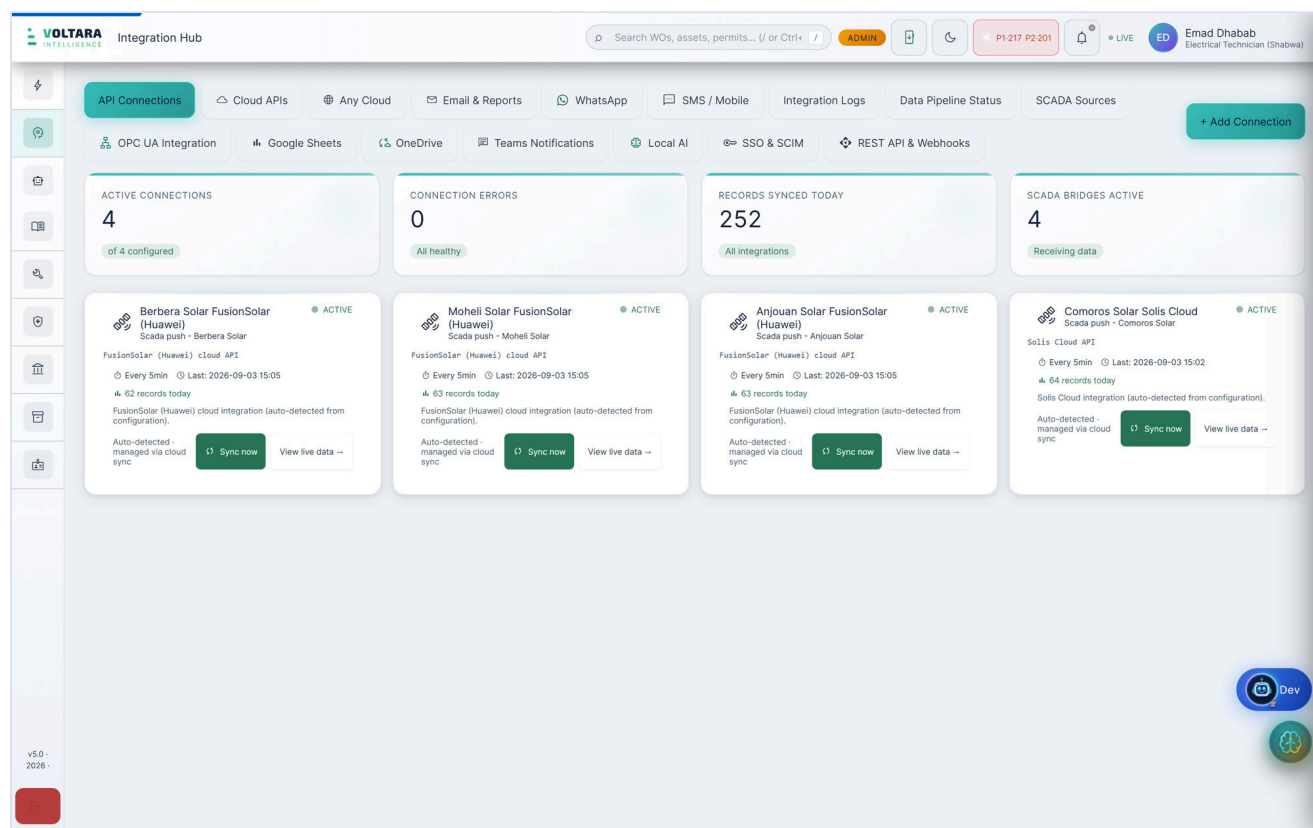


Figure 30.1 Integration Hub.

30.1 Cloud connections

Vendor cloud connections are configured per vendor and scoped to the plants that use them. Credentials are held encrypted. The hub shows, for each connection, when it last succeeded, what it returned and any error, so a broken integration is visible as a broken integration rather than as a plant that appears to have stopped generating.

30.2 Site collector

The collector runs on the plant network and establishes an outbound session to the platform. The hub shows its status, the signals it is delivering and its buffer state. Nothing dials in to the plant.

30.3 Outbound channels

- **Email** for scheduled reports and notifications.
- **Microsoft Teams** for channel delivery of alerts and reports.
- **WhatsApp and SMS** for field notification where email is not practical.
- **REST API** for systematic consumption by client systems.

30.4 Scheduled task health

Every scheduled job reports its health: last run, duration, outcome. A job that has stopped running is reported as stopped. Silence is never treated as success.

Chapter thirty one

31. Administration, audit and security

31.1 Plant and site management

People & System > Plant & Site Management holds the master record of each site: name, project code, country, coordinates, geofence radius, capacity, commissioning date, weekly off day, tariff, emission factor and personnel. Every other module reads these values, so this is the only place they are set.

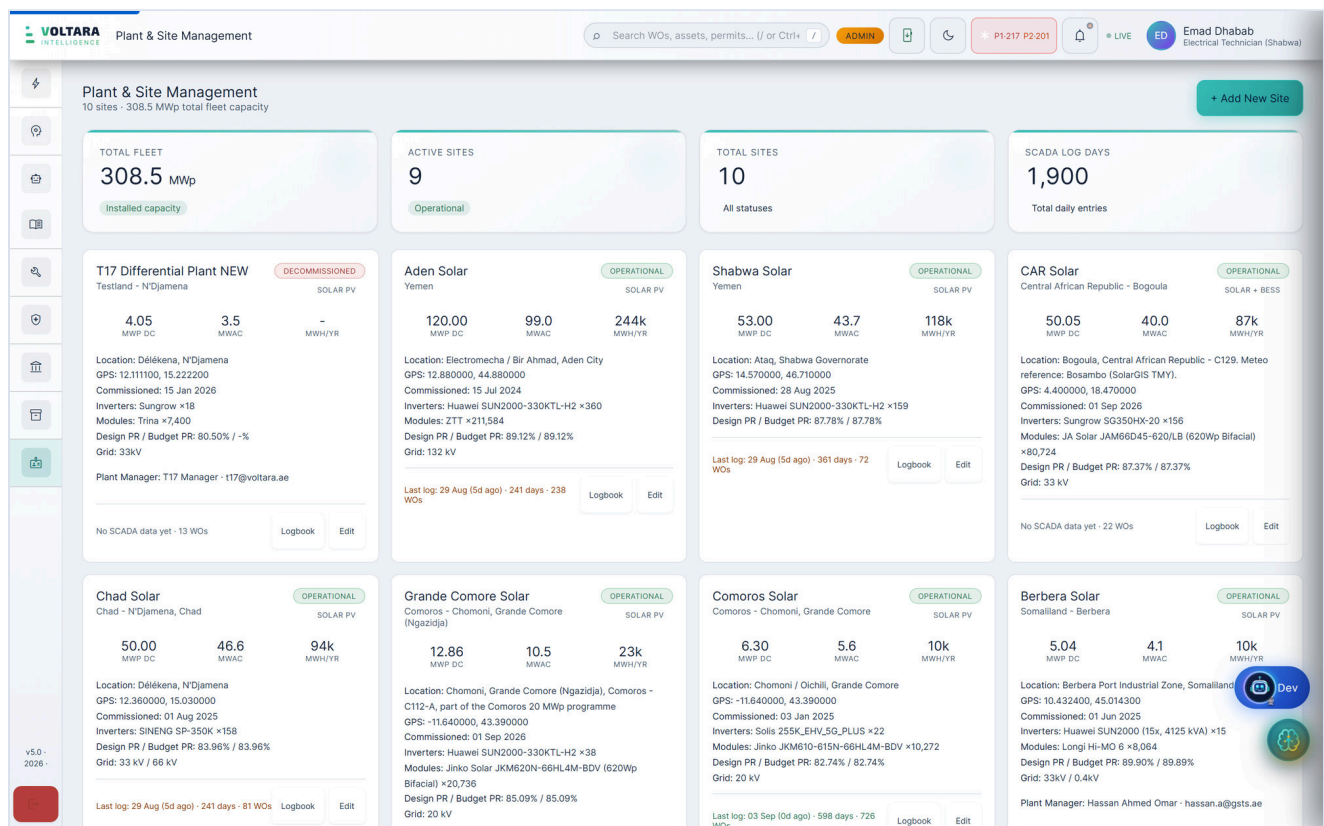


Figure 31.1 Plant and site management.

RENAMING A PLANT

Work order numbering is derived from plant identity. Renaming a plant is an administrative action with consequences for existing references, and should be done deliberately rather than to correct a spelling. Use the project code as the stable identifier.

31.2 Users and roles

Users are managed from the Master Admin Console and from **People Center > Directory > Manage Users**. A user record carries the role, the plant access, the approval level and limit, the certifications and the account

status.

31.3 Audit trail

People & System > Audit Trail records every create, update, approval and deletion attempt with the actor, the time, the record affected and the previous value. It is searchable by user, module, record and date range, and it is the evidence an owner audit will ask for.

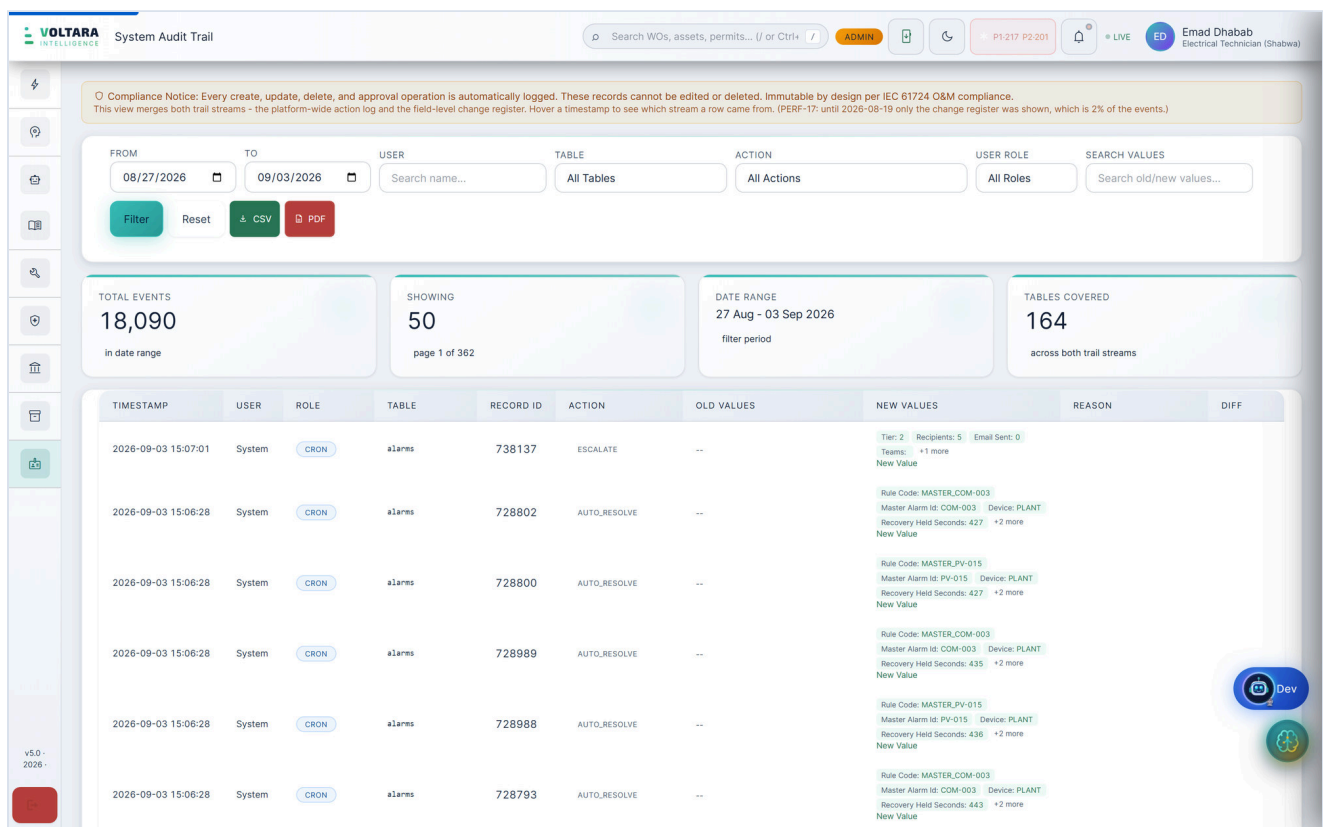


Figure 31.2 Audit trail.

31.4 Security dashboard

- Sign in activity, including failures and lockouts.
- Two factor authentication adoption across the user base.
- Sessions in progress and the ability to end them.
- Permission changes and role assignments over the period.

31.5 System configuration and backups

Intelligence > System Settings & Backups holds platform level configuration and the backup position: when the last backup completed, its size and the retention held. Restores are tested rather than assumed.

RECORDS ARE RETIRED, NOT DELETED

The platform retires records rather than removing them, so that history and the audit trail remain intact. Where an operation appears to delete something, it is marking it inactive and excluding it from working views.

Appendix

Appendix A. KPI and formula reference

These are the definitions the platform computes. They are given here so that a figure taken from the platform can be reconciled against a figure computed anywhere else.

MEASURE	DEFINITION AS COMPUTED
Performance ratio	Actual energy divided by the energy the array would produce at reference conditions for the measured plane of array irradiance, temperature corrected. Fleet performance ratio is weighted by capacity and by plane of array irradiance, never a plain average of plant values.
Availability	Capacity weighted, computed over valid reporting days only. Days on which a plant did not report are excluded from the denominator rather than counted as zero.
Specific yield	Energy delivered divided by installed direct current capacity, in kilowatt hours per kilowatt peak.
Capacity utilisation factor	Energy delivered divided by the energy that would be delivered at continuous rated alternating current output over the same period.
Budget achievement	Actual energy divided by the budget for the same period, from the approved budget model. The number of budgeted plants that reported is stated alongside.
Soiling loss	Performance shortfall attributable to surface contamination, referenced to the clean baseline. The standard threshold is one and a half percent, tightened to three percent for sites with a high soiling rate.
Mean time to repair	Mean elapsed time from work order raised to resolution recorded, across corrective work orders that carry a resolution timestamp. The sample size is stated.
Mean time between failures	Operating time divided by the number of failures for the asset class in the period.
PM compliance	Preventive tasks completed divided by tasks due in the period. Withdrawn tasks are excluded and the exclusion count is displayed.
LTIFR	Lost time injuries per one million manhours worked. The manhours used are stated.
TRIFR	Total recordable injuries per one million manhours worked.
Carbon dioxide avoided	Energy delivered multiplied by the emission factor held against that plant. No single fleet factor is used.
Revenue, expected	Metered energy delivered valued at the applicable tariff. Distinct from budgeted, invoiced and received, which are never summed with it.

MEASURE	DEFINITION AS COMPUTED
SLA compliance	Work orders resolved within the service level for their priority, divided by work orders raised at that priority in the period.

Appendix

Appendix B. Role and access matrix

An indicative summary. The authoritative position for any deployment is what is configured in the Master Admin Console for that installation.

CAPABILITY	FIELD	SUPERVISORY	ENGINEERING	PLANT MGMT	PORTFOLIO	ADMIN
View own work orders	Yes	Yes	Yes	Yes	Yes	Yes
Raise work order	Yes	Yes	Yes	Yes	Yes	Yes
Approve work order	No	Yes	Yes	Yes	Yes	Yes
Verify completed work	No	Yes	Yes	Yes	Yes	Yes
Accept a permit	Yes	Yes	Yes	Yes	No	No
Issue a permit	No	Yes	No	Yes	No	No
Edit alarm rules	No	No	Yes	No	No	Yes
Edit asset register	No	No	Yes	Yes	No	Yes
Issue stock	No	Yes	No	Yes	No	Yes
Approve procurement	No	No	No	By limit	By limit	Yes
View financial modules	No	No	No	Yes	Yes	Yes
Edit budget	No	No	No	No	Yes	Yes
Fleet wide visibility	No	No	Site	Site	Yes	Yes
Manage users and roles	No	No	No	No	No	Yes
View audit trail	No	No	No	Yes	Yes	Yes

Appendix

Appendix C. Glossary

TERM	MEANING
Availability	The proportion of the period in which the plant, or a defined part of it, was capable of producing.
BESS	Battery energy storage system.
CUF	Capacity utilisation factor.
Curtailement	Energy not delivered because the grid or offtaker limited output, as distinct from energy lost to plant condition.
Digital twin	The modelled representation of the plant used to compute expected production.
FMEA	Failure mode and effects analysis.
Geofence	The boundary around a plant inside which attendance and field actions are valid.
IEC 61724-1	The standard governing photovoltaic system performance monitoring and analysis.
IEC TS 62446-3	The technical specification governing infrared thermography of photovoltaic modules.
JHA	Job hazard analysis.
LOTO	Lockout tagout, the isolation discipline that makes equipment safe to work on.
LTI, LTIFR	Lost time injury, and its frequency rate per million manhours.
MTBF, MTTR	Mean time between failures, mean time to repair.
MWp	Megawatt peak, the direct current capacity of the array at reference conditions.
P50, P75, P90	Yield estimates with a fifty, seventy five or ninety percent probability of being exceeded.
Plane of array irradiance	Irradiance measured in the plane of the modules, the correct basis for performance ratio.
PM	Preventive maintenance.
PPC	Power plant controller.
PR	Performance ratio.
PTW	Permit to Work.

TERM	MEANING
PVsyst	The design and yield simulation tool whose output forms the design basis of each plant.
RCA	Root cause analysis.
SCADA	Supervisory control and data acquisition, the plant's own control system.
SLA	Service level agreement, and in this platform the response and rectification clock set by priority.
Soiling	Performance loss from surface contamination of the modules.
Specific yield	Kilowatt hours delivered per kilowatt peak installed.
TRIFR	Total recordable injury frequency rate.

Appendix

Appendix D. Troubleshooting and support

D.1 Common situations

SITUATION	WHAT TO CHECK
A module described here is not in my navigation	Check the role chip in the top bar. Modules are granted by role; an administrator can confirm what your role carries.
A plant shows no generation	Read the data quality banner first. Check the Integration Hub for that vendor connection and SCADA Intelligence for signal health, before treating it as a plant problem.
I cannot start a work order	A required permit, isolation or risk assessment is still open. The work order names which. This gate cannot be overridden.
A technician does not appear in dispatch	They may be off shift, outside the geofence, on leave, already committed, or holding an expired certification for that task.
An import was rejected	Read the row level reasons returned by the importer. Start from the current Template rather than from a previous export, since the columns may have changed.
The live indicator has stopped	The page is no longer receiving updates. Reload it. If it recurs, report it with the module name and the time.
A figure differs from my own calculation	Check appendix A for the definition as computed, particularly the weighting and the treatment of non reporting days.
Mobile work is not appearing in the browser	Check the synchronisation queue on the device. Items captured offline reach the platform only when the device regains connectivity.

D.2 Raising a support request

A support request is answered fastest when it carries five things: the module name as it appears in the top bar, the plant, the time the problem occurred, what you expected and what happened instead, and the platform release shown at the foot of the sidebar. A screenshot of the whole window, including the top bar, is worth more than a description of the area that looked wrong.

D.3 Contact

Platform support	saeed@uvec.ae
Controlled documents	Knowledge > Knowledge Center
Interface documentation	People & System > API Docs

Technical solution
description

Document VI-TSD-001