

Wind SCADA

Sunil Akula



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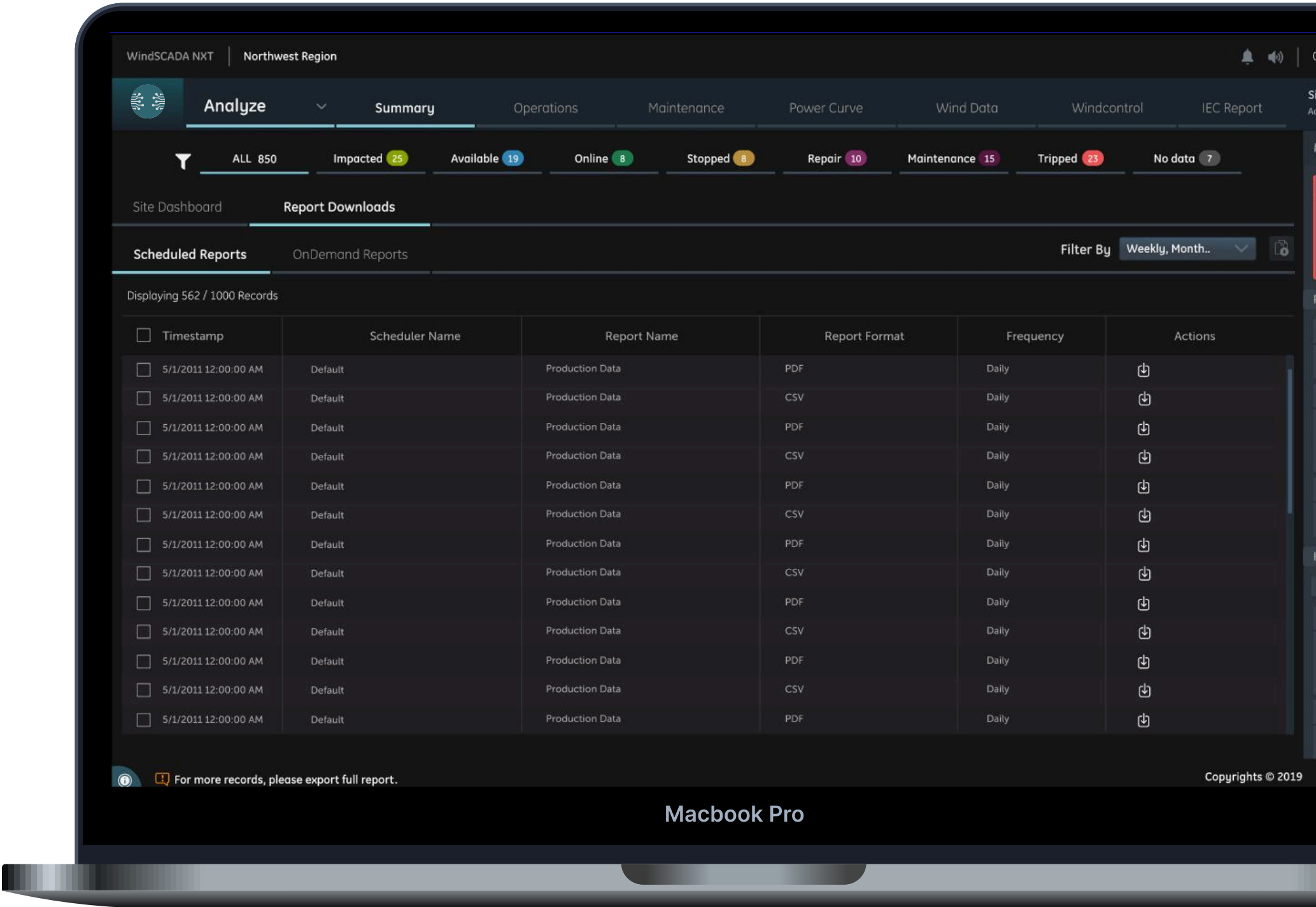
Project Overview

Product

Redesigned a web-based SCADA application for monitoring energy and turbine systems. Improved visual clarity and data presentation by replacing a cluttered, outdated interface. Introduced a structured design approach and created a scalable design system to support consistent future development.

Project duration

Worked for 1 year
April 2021- April 2022



Project Overview



Problem

1. Zero UX direction - teams built with their own interpretations
2. Poor usability and visual design → client dissatisfaction
3. No clear user base, no testing, no feedback loops
4. Design–dev gaps, bias toward old versions
5. Major compatibility and resolution issues



Goal

Bring visual & functional clarity to a broken UX experience, create scalable design systems, and improve client satisfaction.

Project Overview



My Role

UX Lead

Responsibilities

- Led end-to-end UX strategy, from research to final design delivery
- Audited the existing system and identified usability gaps
- Created task flows, wireframes, and a scalable design system
- Collaborated closely with developers to ensure accurate implementation
- Regularly engaged with stakeholders to align on goals and feedback
- Advocated for user-centric design by gathering real user insights

Don't jump into design first.

Understanding the user

User research

Personas

User research

Limited User Access

- There was no direct access to end users initially, and no formal usability testing process in place.
- All user feedback was routed through stakeholders or product owners, which sometimes introduced bias or lacked clarity.

What I did?

- Proactively requested to be included in client/stakeholder discussions to better understand end-user pain points.
- Gathered indirect feedback from stakeholders and synthesized common patterns and needs.
- Used this information to create provisional personas and map general user flows based on feature usage and tasks.
- Conducted competitive analysis of SCADA tools to understand typical user roles and expectations.

Hypothetical Personas (Based on Input from Stakeholders)

- Rajesh – Turbine Operator | Anita – Operations Supervisor | Vikram – System Admin

Personas



Name : Rajesh

Age : 38

Education : Diploma in Electrical Engineering

Domain knowledge : Good

Occupation : Frontline operator managing real-time turbine performance

Brief : Anita reviews operational reports, checks system KPIs, and oversees overall plant performance. She uses dashboards to track real-time metrics and historical trends. She prepares reports for upper management, troubleshoots anomalies with operators, and ensures safety and compliance standards are met.

Goals :

- Monitor real-time turbine data and alerts
- Quickly identify and respond to abnormalities
- Reduce downtime through timely intervention

Pain Points :

- Overloaded dashboard with too much data
- Difficulty in spotting critical alerts quickly
- Lack of full-screen, focused turbine views

Needs :

- Clean, high-contrast visualizations
- Flashing or color-coded alert rows
- Simple navigation to specific turbine metrics

Personas



Name : Anita

Age : 45

Education : Bachelor’s Degree in Energy Systems

Domain knowledge : Good

Occupation : Turbine Operator

Brief : Anita reviews operational reports, checks system KPIs, and oversees overall plant performance. She uses dashboards to track real-time metrics and historical trends. She prepares reports for upper management, troubleshoots anomalies with operators, and ensures safety and compliance standards are met.

Goals :

- Get summarised KPIs at a glance
- Download reports and share updates with leadership
- Track historical performance and trends

Pain Points :

- Hard to find meaningful summaries amid raw data
- Tedious report generation
- Too many graphs with inconsistent filters

Needs :

- KPI panels with snapshot summaries
- Custom filters and downloadable widgets
- Multi-graph view with quick toggles

Personas



Name : Vikram

Age : 45

Education : Bachelor’s Degree in IT

Domain knowledge : Good

Occupation : System Administrator

Brief : Vikram handles backend configuration, including system parameters, user permissions, and alert settings. He ensures the SCADA system runs smoothly, resolves technical issues, and supports both operators and supervisors. He also ensures the application works across various screen resolutions and is responsible for setting up automated notifications and system updates.

Goals :

- Set up system parameters accurately
- Configure real-time alerts and email notifications
- Ensure resolution compatibility across devices

Pain Points :

- Unclear layout for configuration settings
- Email alert setup is hidden or hard to find
- Visuals break on different screen resolutions

Needs :

- Clear form design for configurations
- Easy-to-access alert settings
- Adaptive/responsive layout support

Design

Design solutions

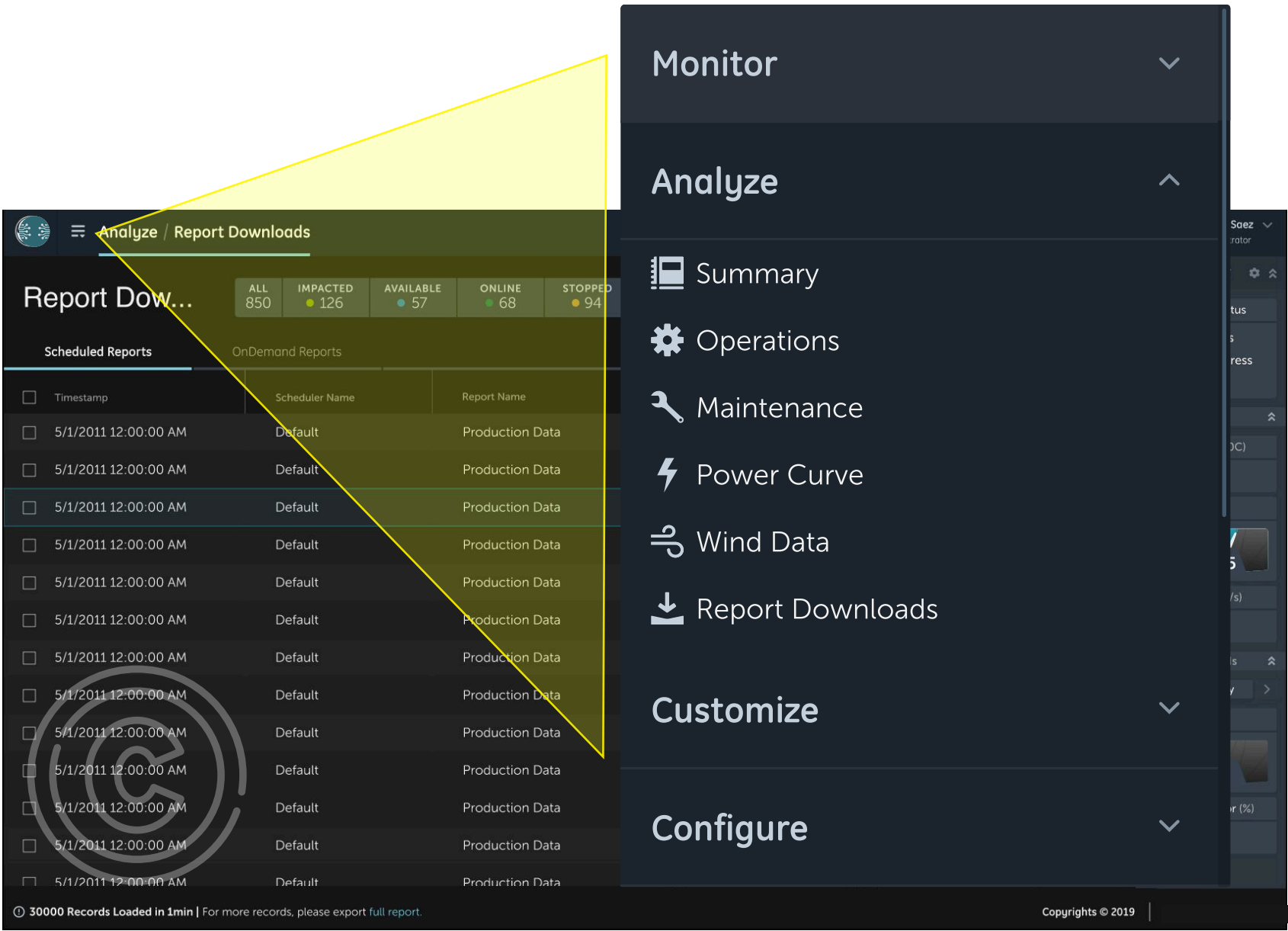
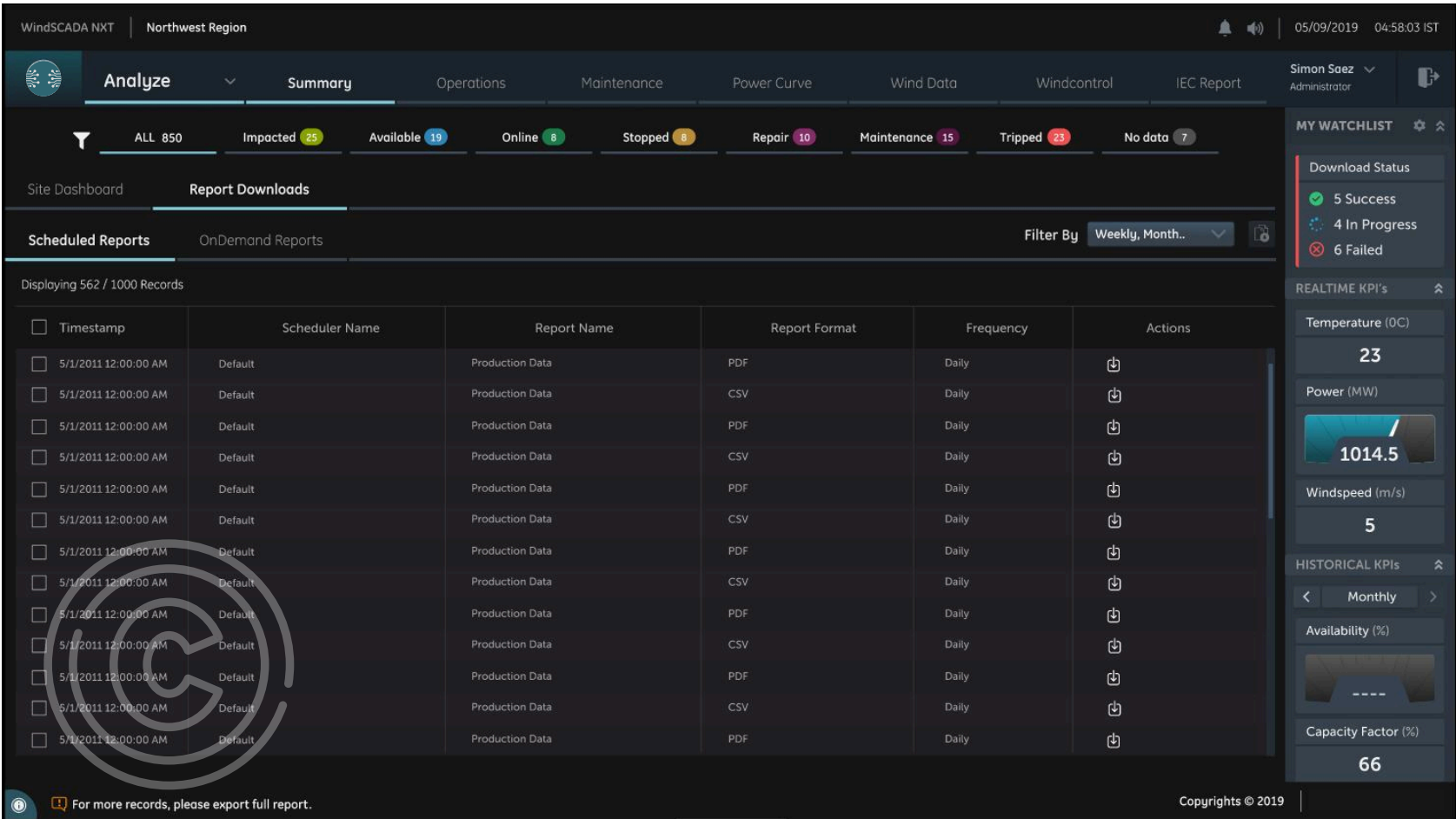
Visual designs

Testing with users

Design iterations

Minimal Header & Vertical Navigation

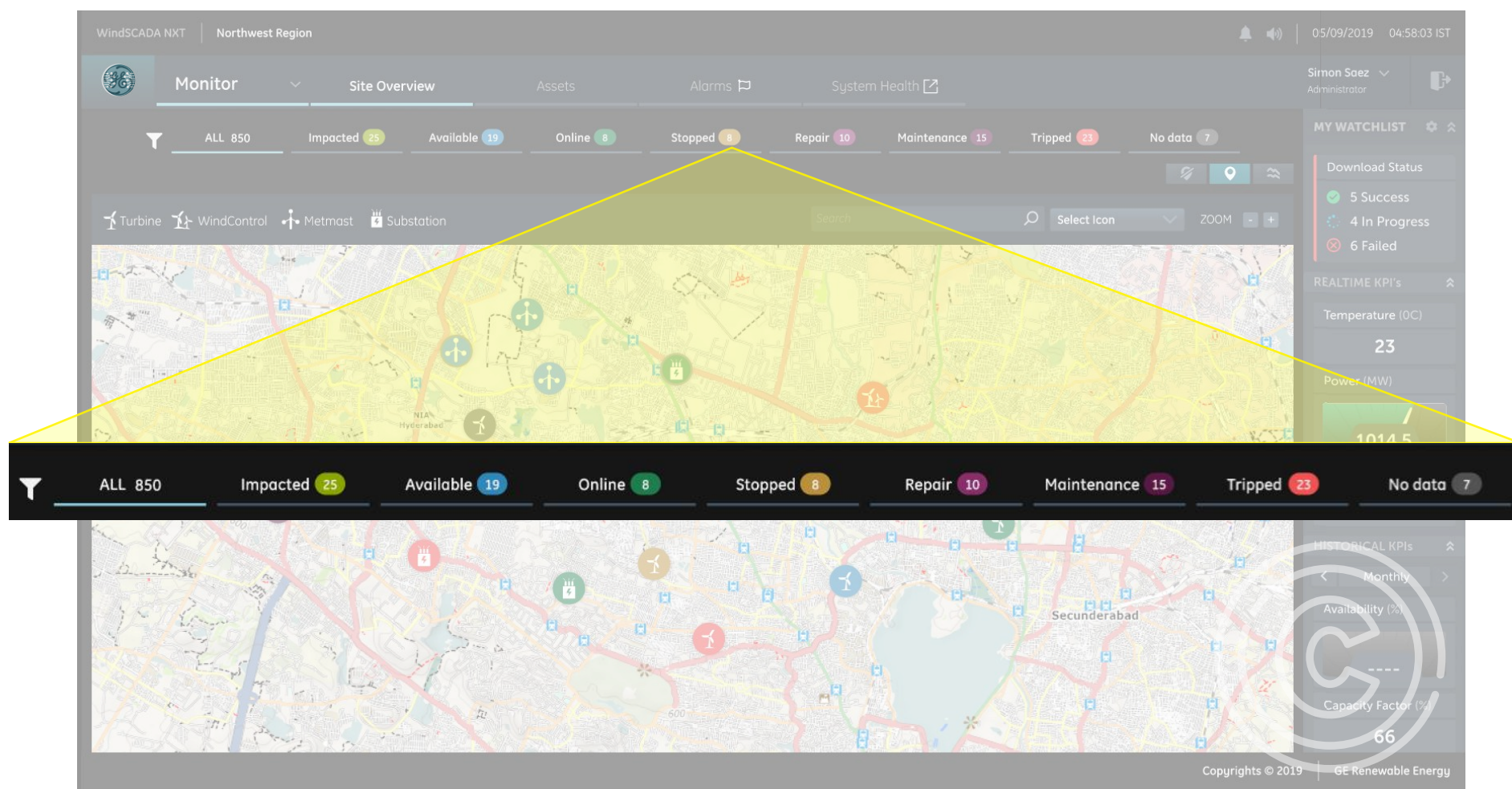
Simplified the header to reduce visual clutter and introduced vertical navigation for better scalability and focus on critical modules.



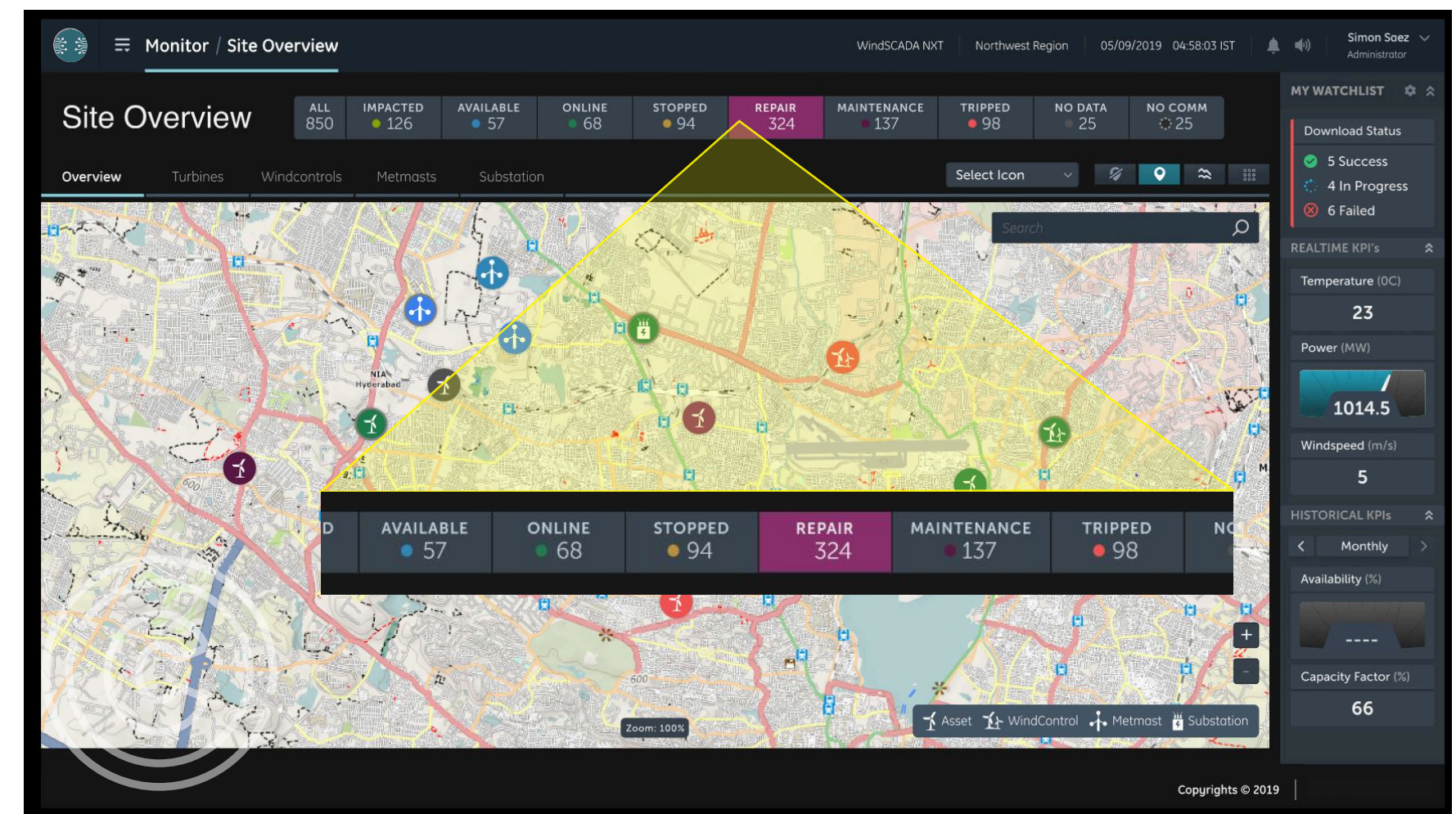
Minimal Version of Top Filters

Replaced bulky filter panels with a compact, collapsible filter bar to prioritize screen real estate while maintaining filter accessibility.

Existing



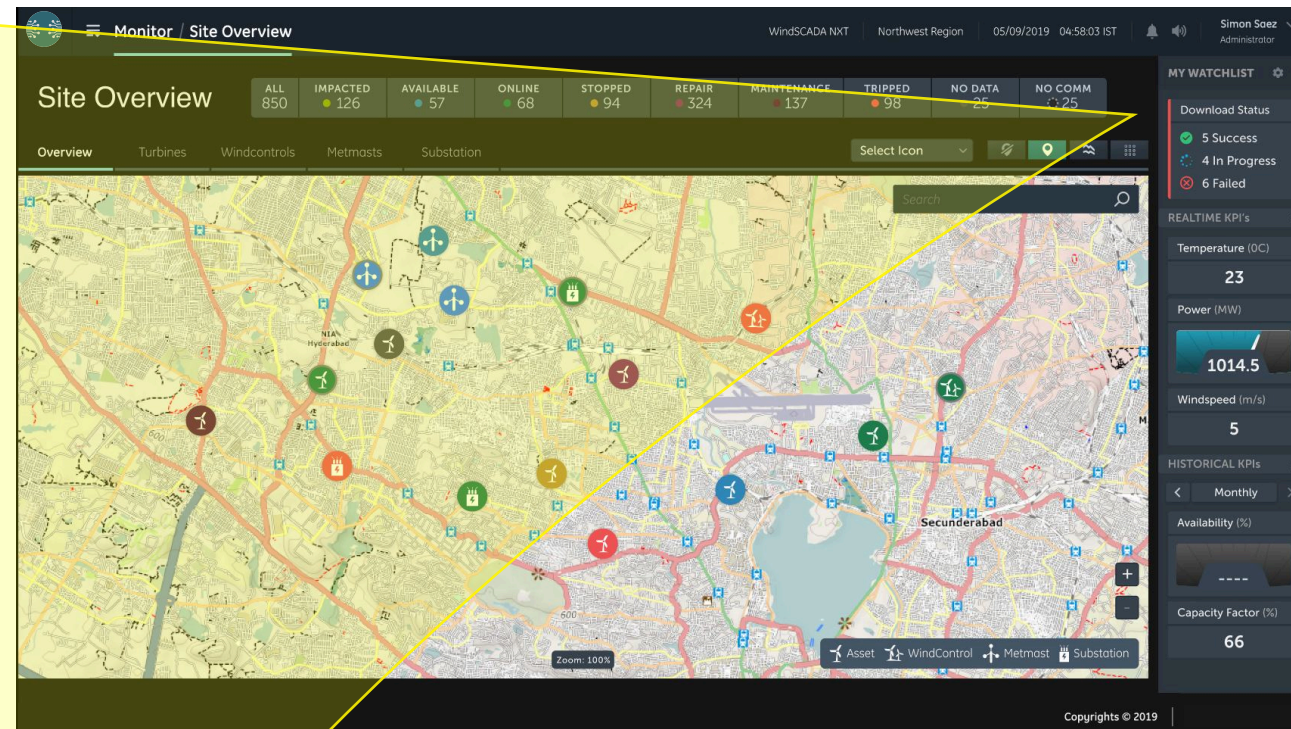
New



Existing



New



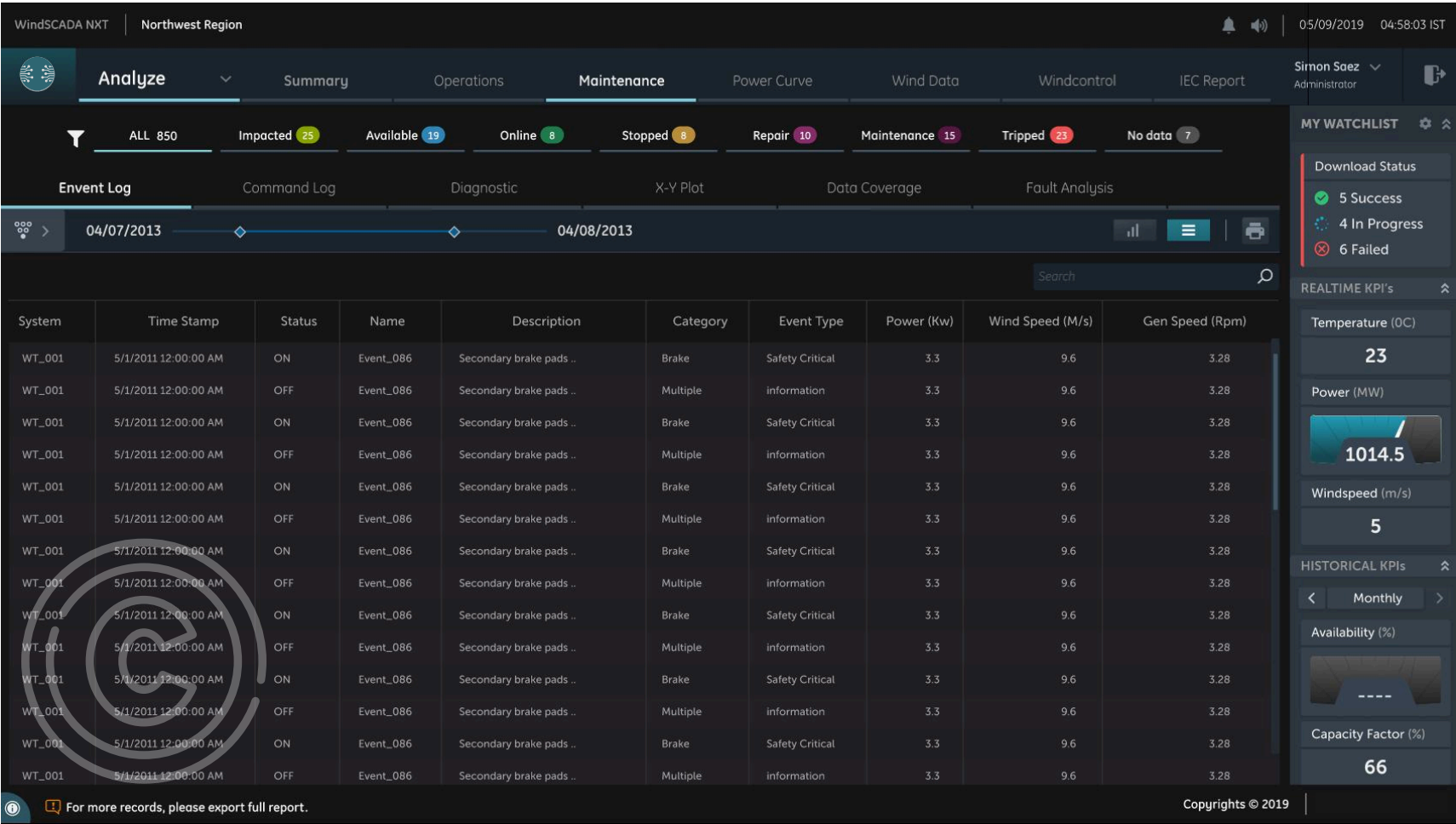
KPI Panel - Redesign along with download status

Revamped the KPI panel using a clean widget-based layout that clearly highlights key metrics and integrates real-time download status indicators, helping users track system-level downloads efficiently within the dashboard.

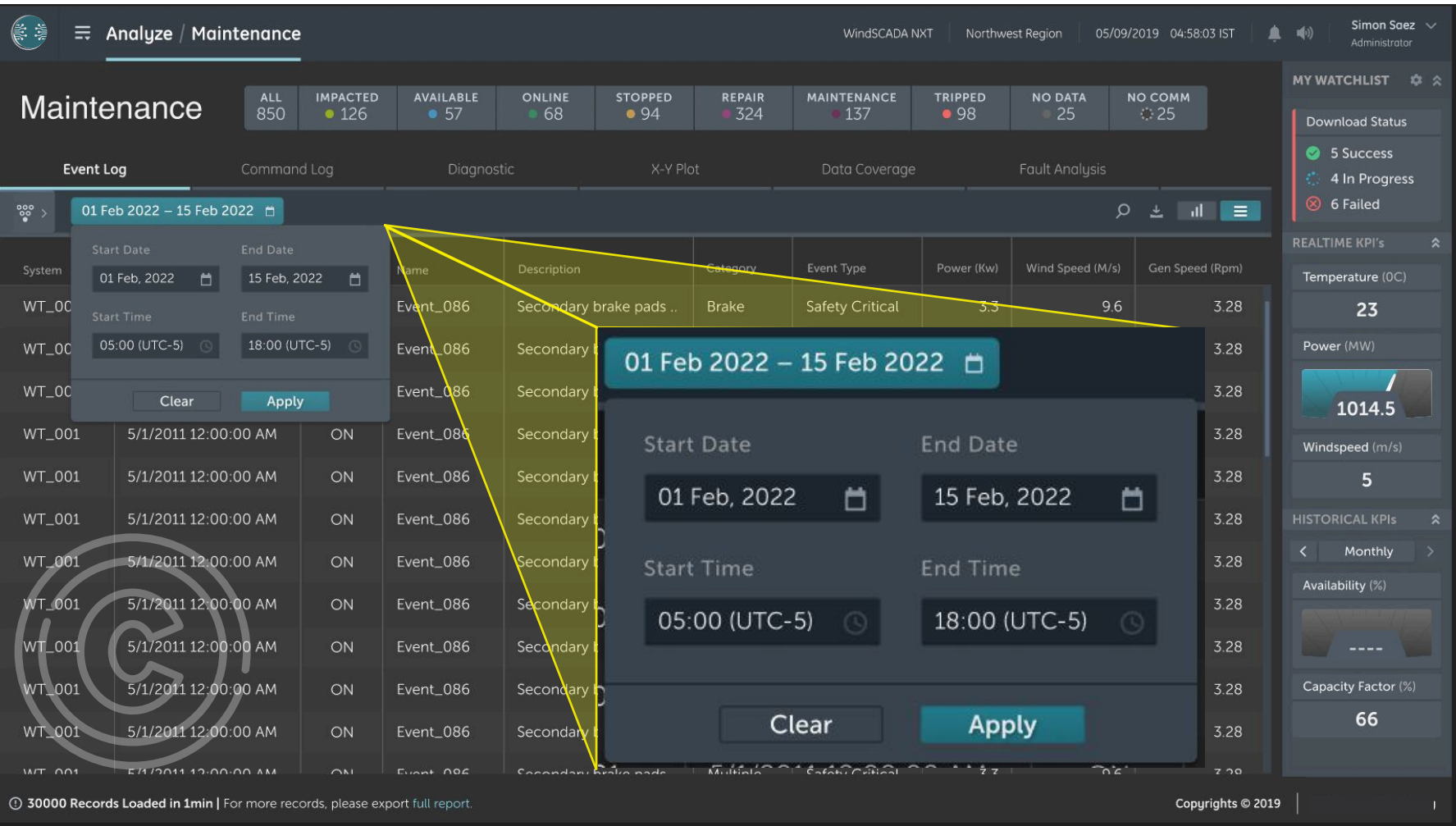
Large Data Issue & No Data Visualization

Implemented responsive charts with progressive data loading and visual cues for empty states to tackle scalability and "no data" confusion.

Existing



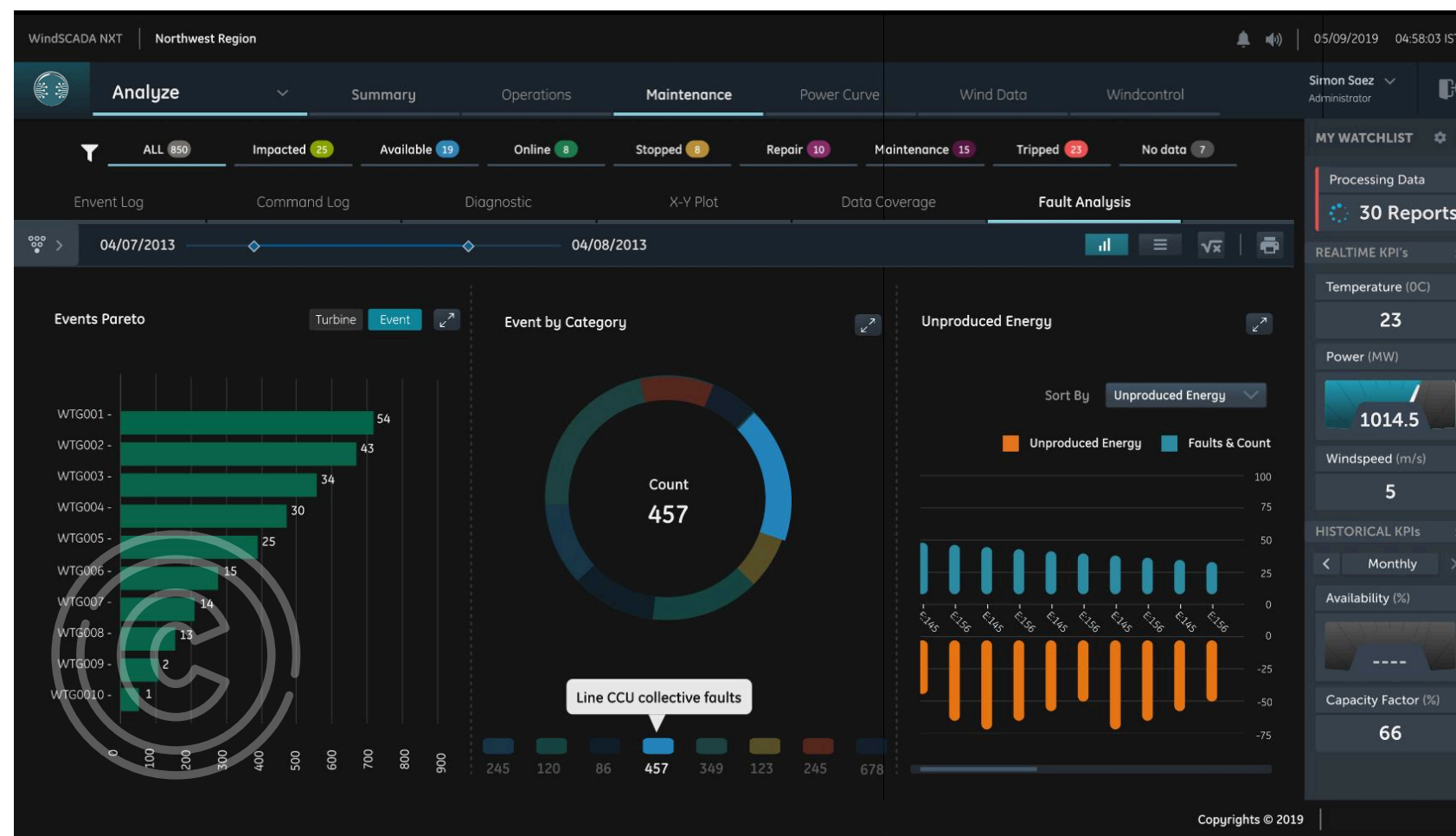
New



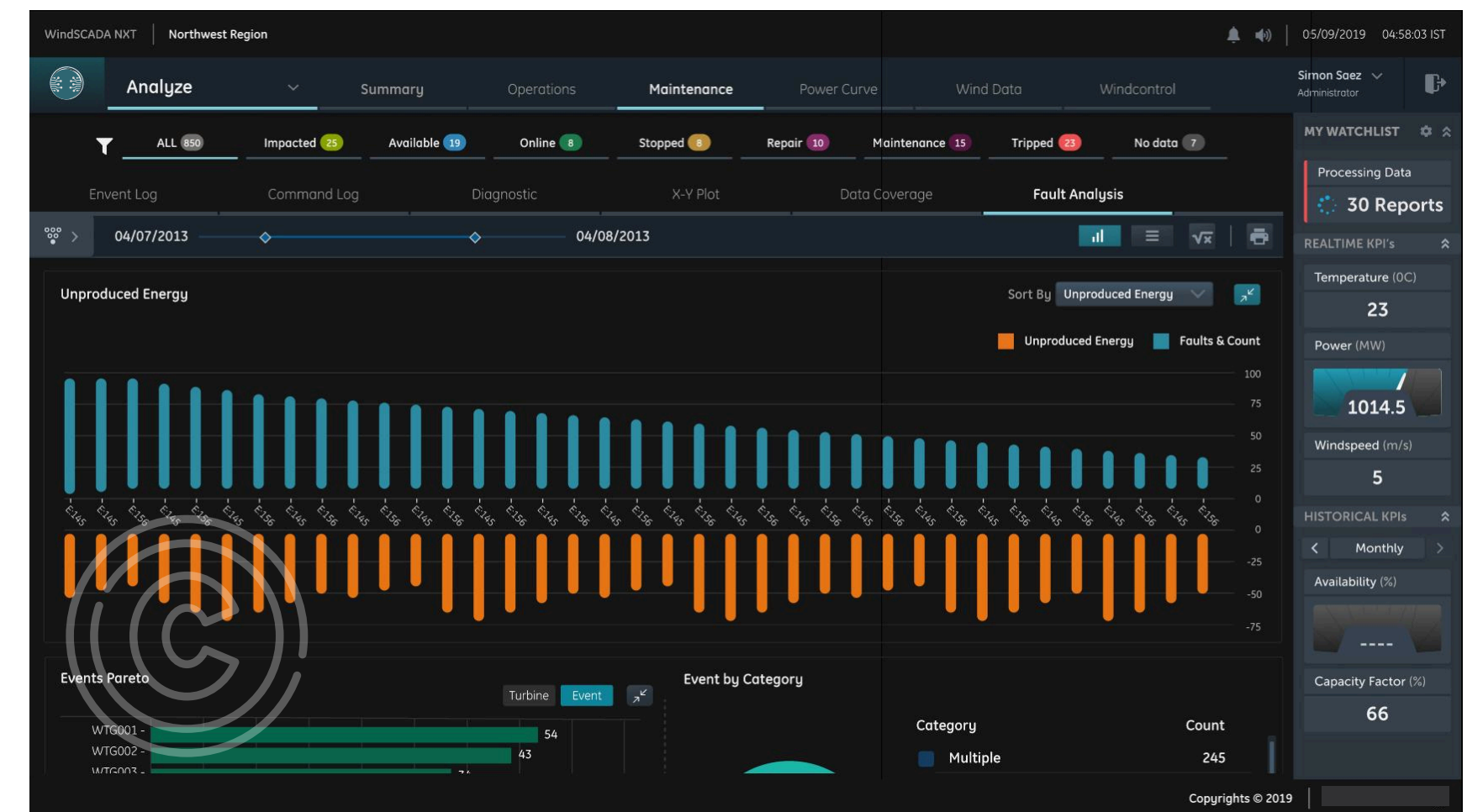
Multiple Graphs Views

Enabled toggling between various chart types (bar, line, trend, etc.) to allow users flexibility in interpreting metrics as per context.

Default view



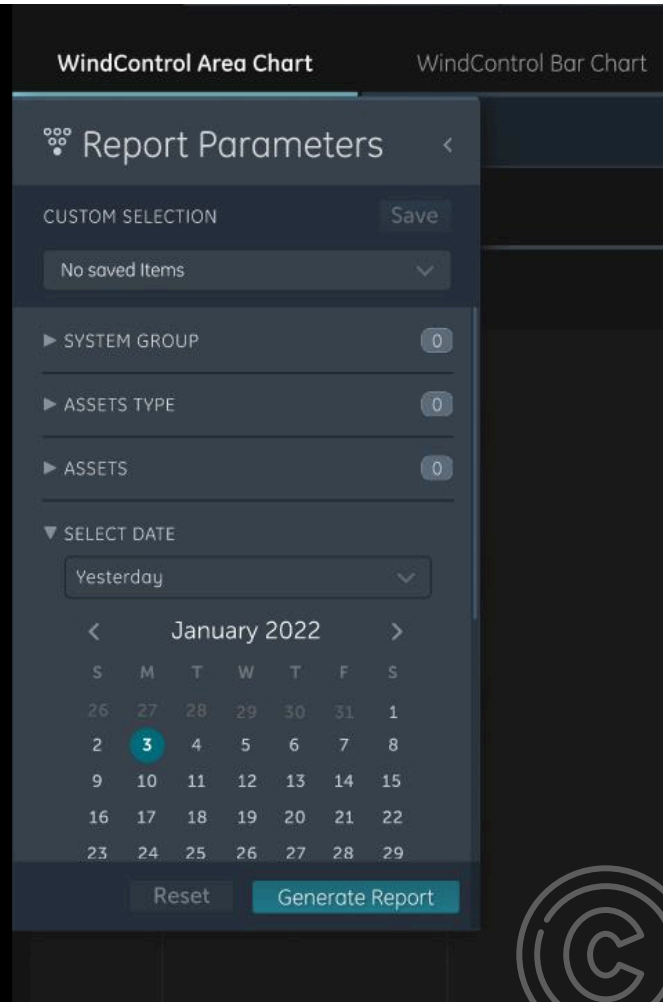
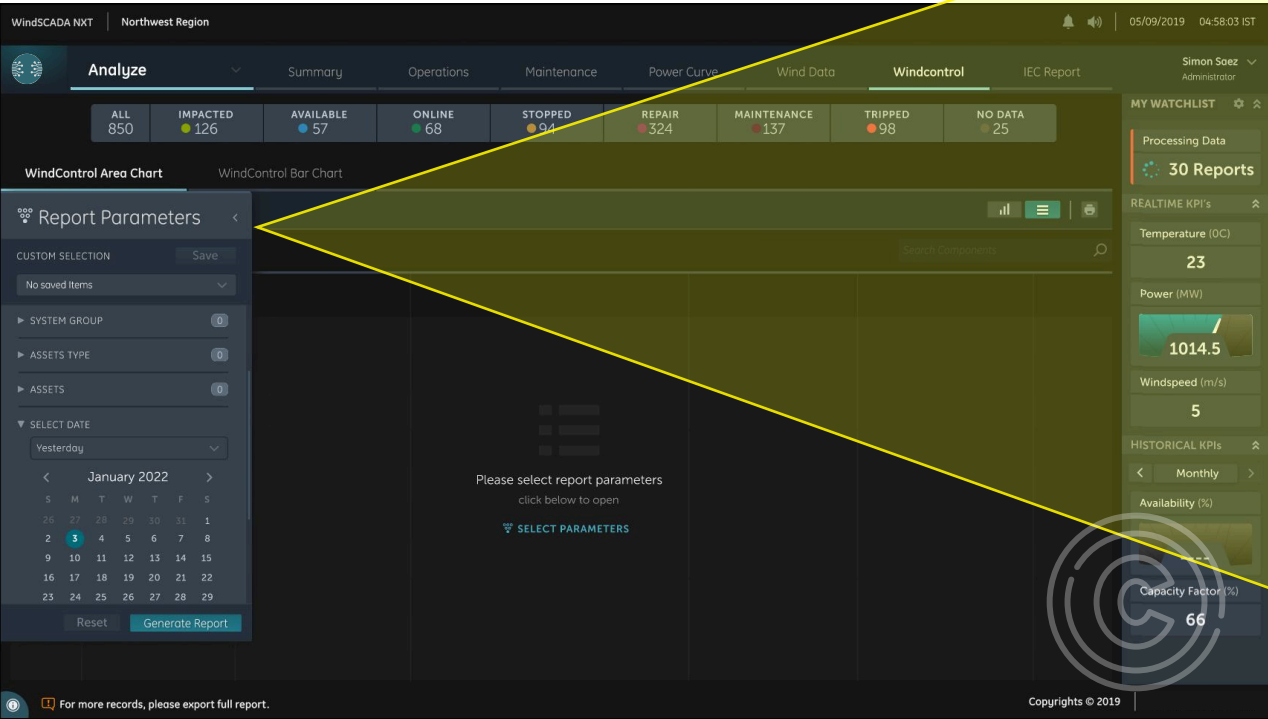
Expanded view



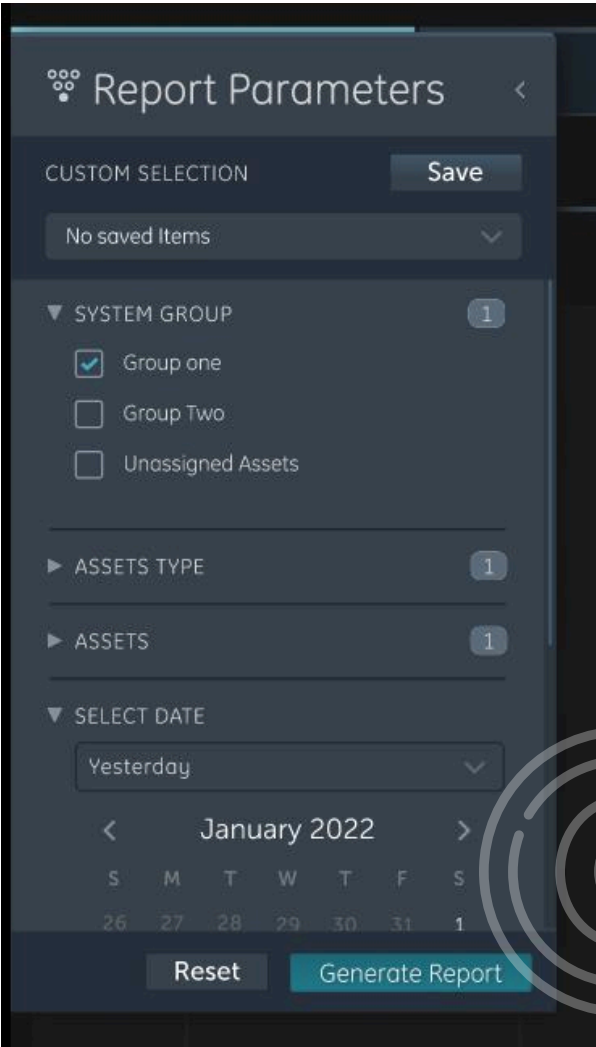
Custom Filters

Provided customizable, saved filter sets tailored to user roles, improving quick access and reducing repetitive filter selection.

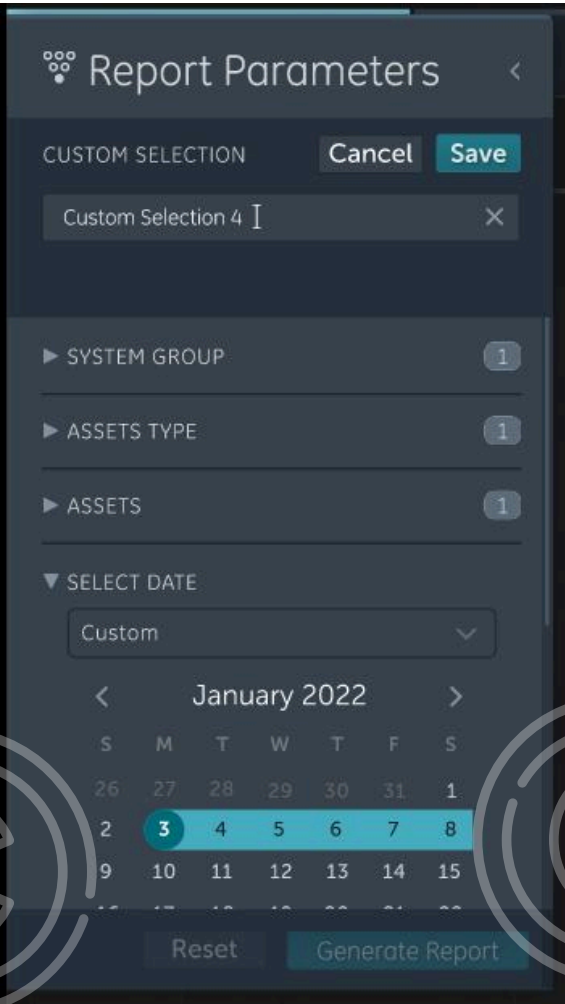
Report



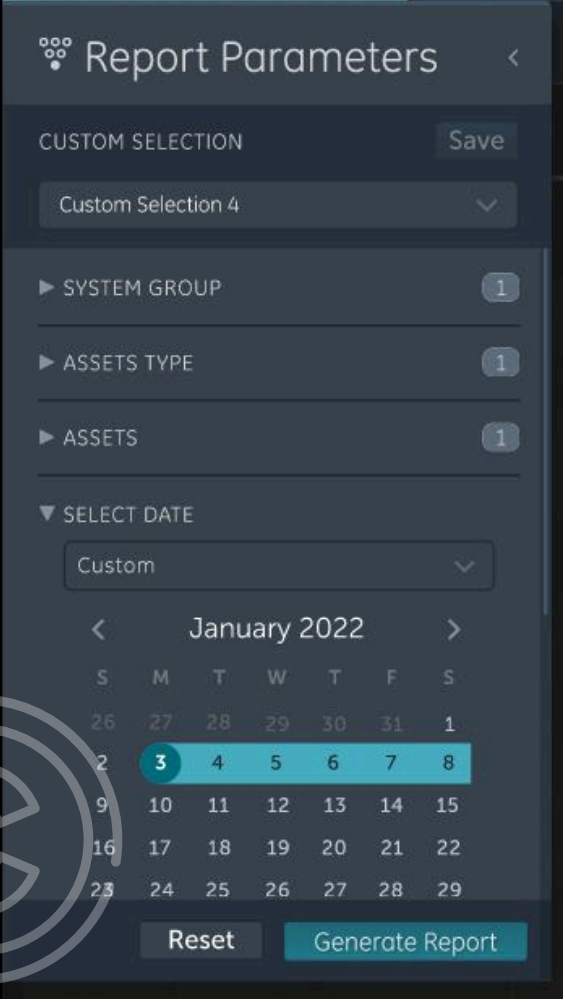
Step 1



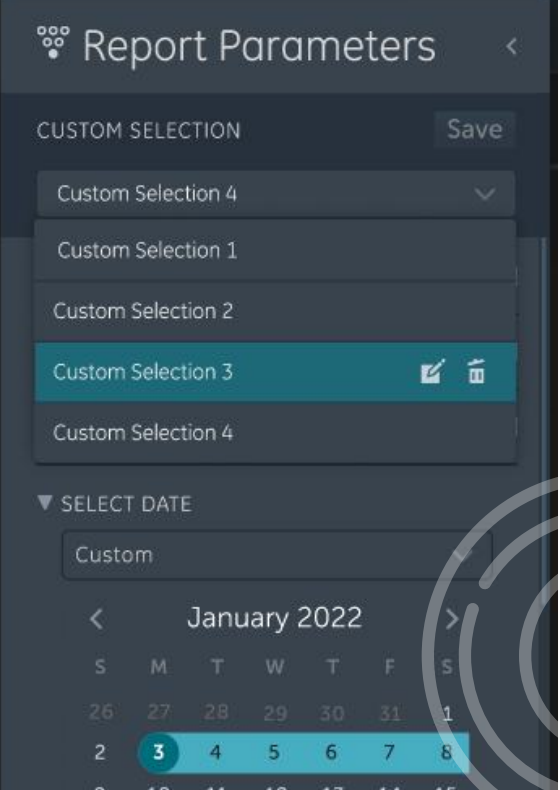
Step 2



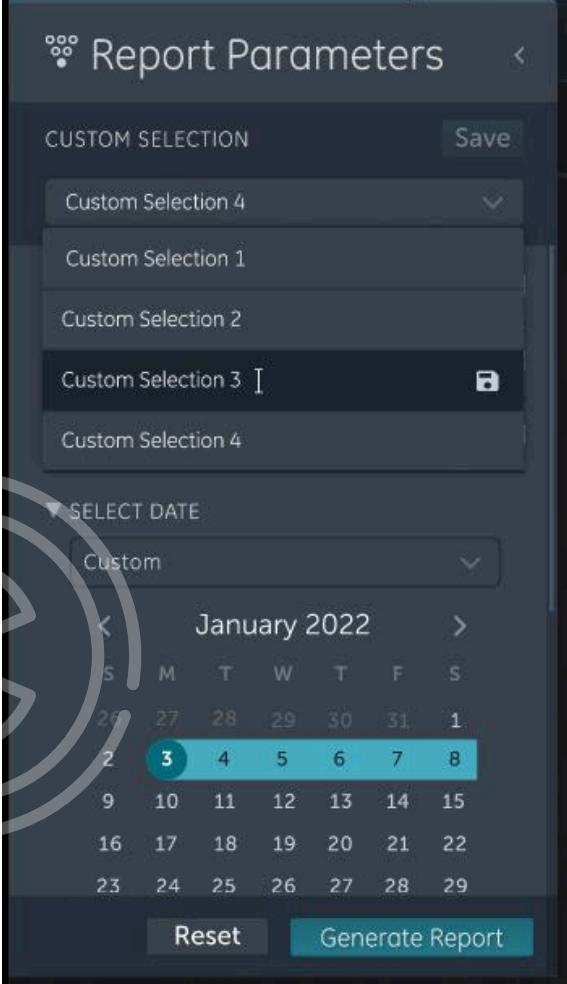
Step 3



Step 4



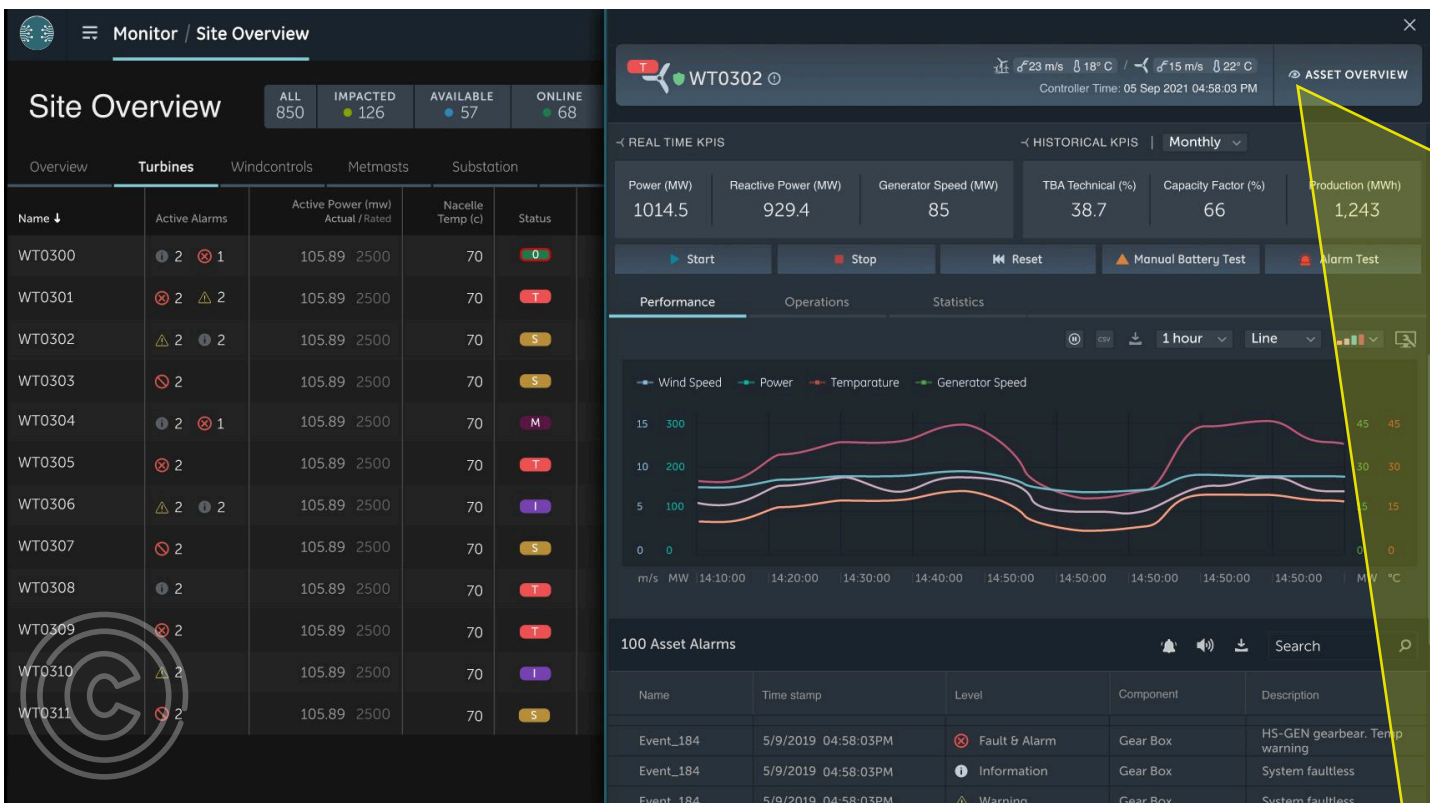
Step 5



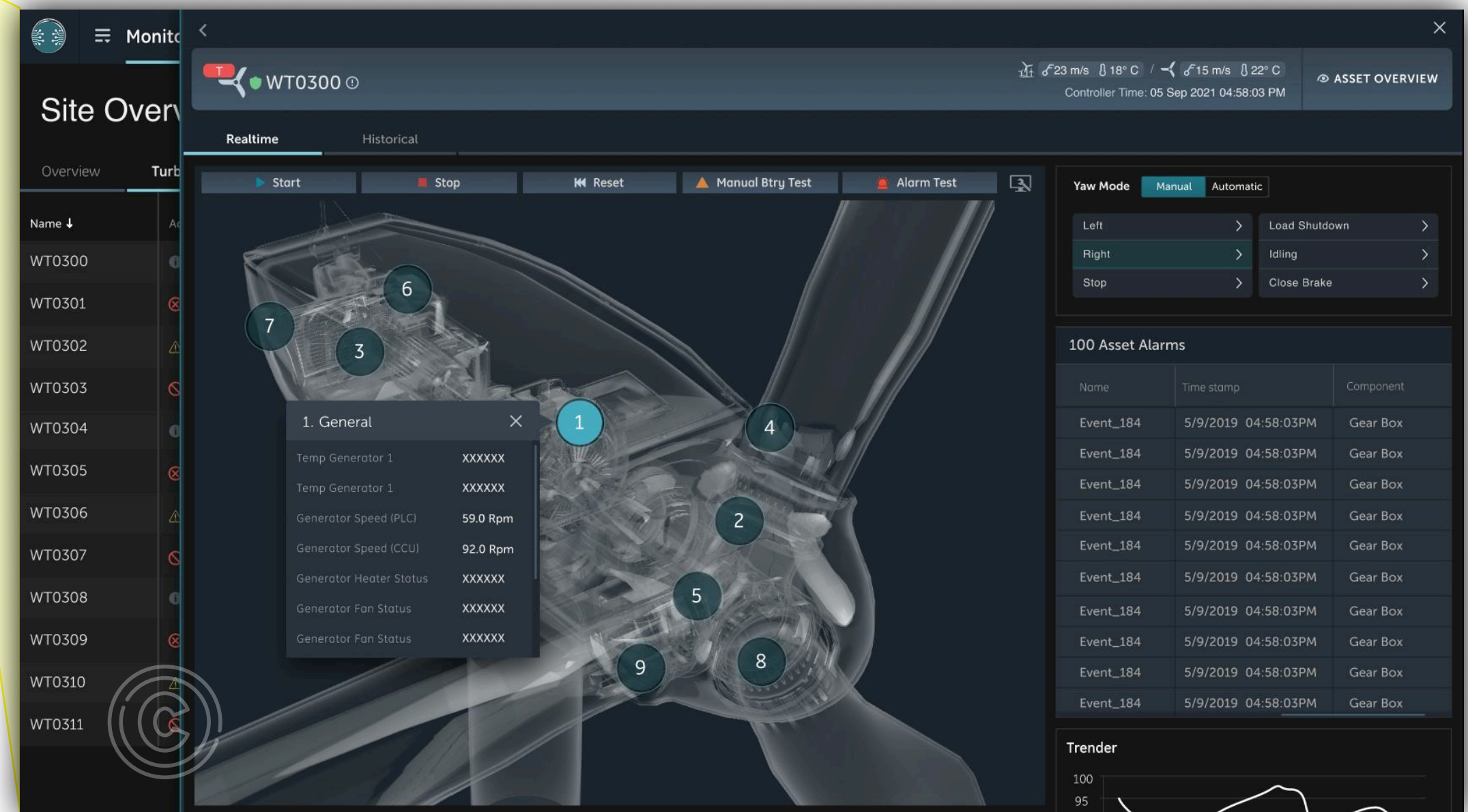
Full Screen Turbine

Introduced a distraction-free full-screen turbine view with drill-down capabilities to assist real-time monitoring and analysis.

Turbine details overview



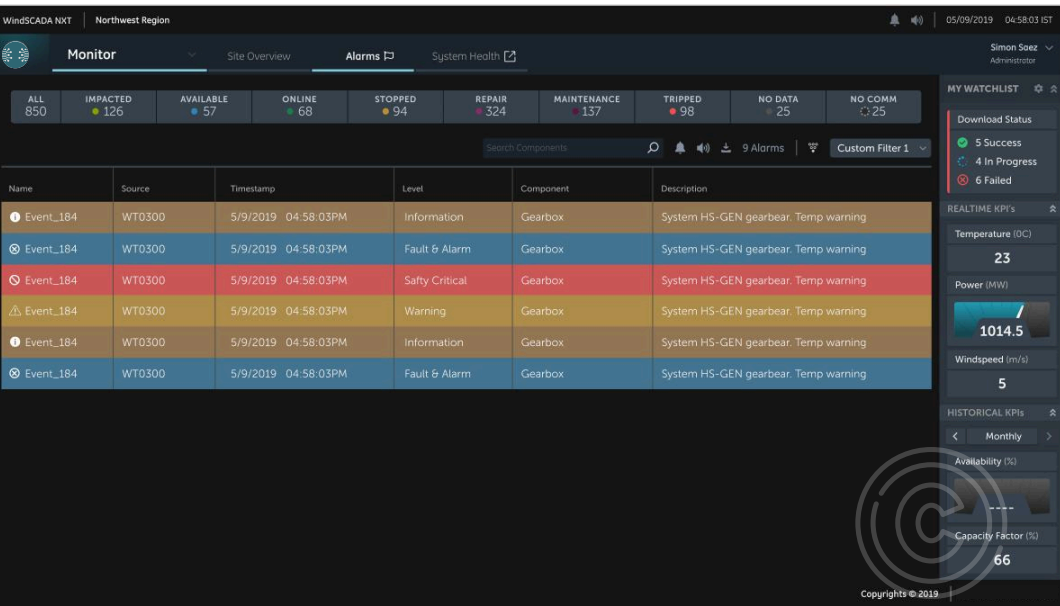
Full Screen turbine view



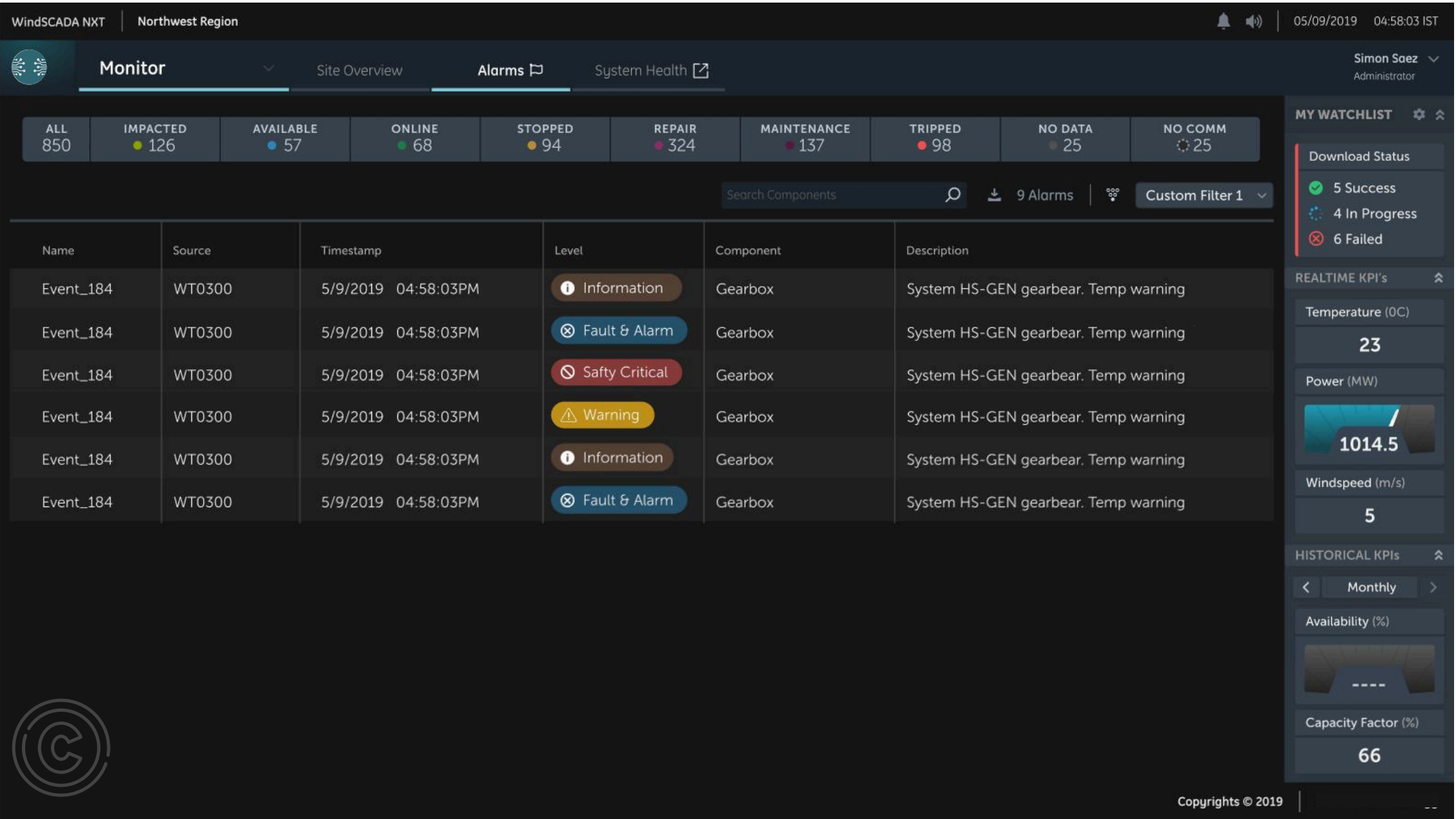
Alarm Row Flashing

Designed a visual flashing pattern for critical alarms in the data table to ensure immediate attention without over-stimulation.

Existing



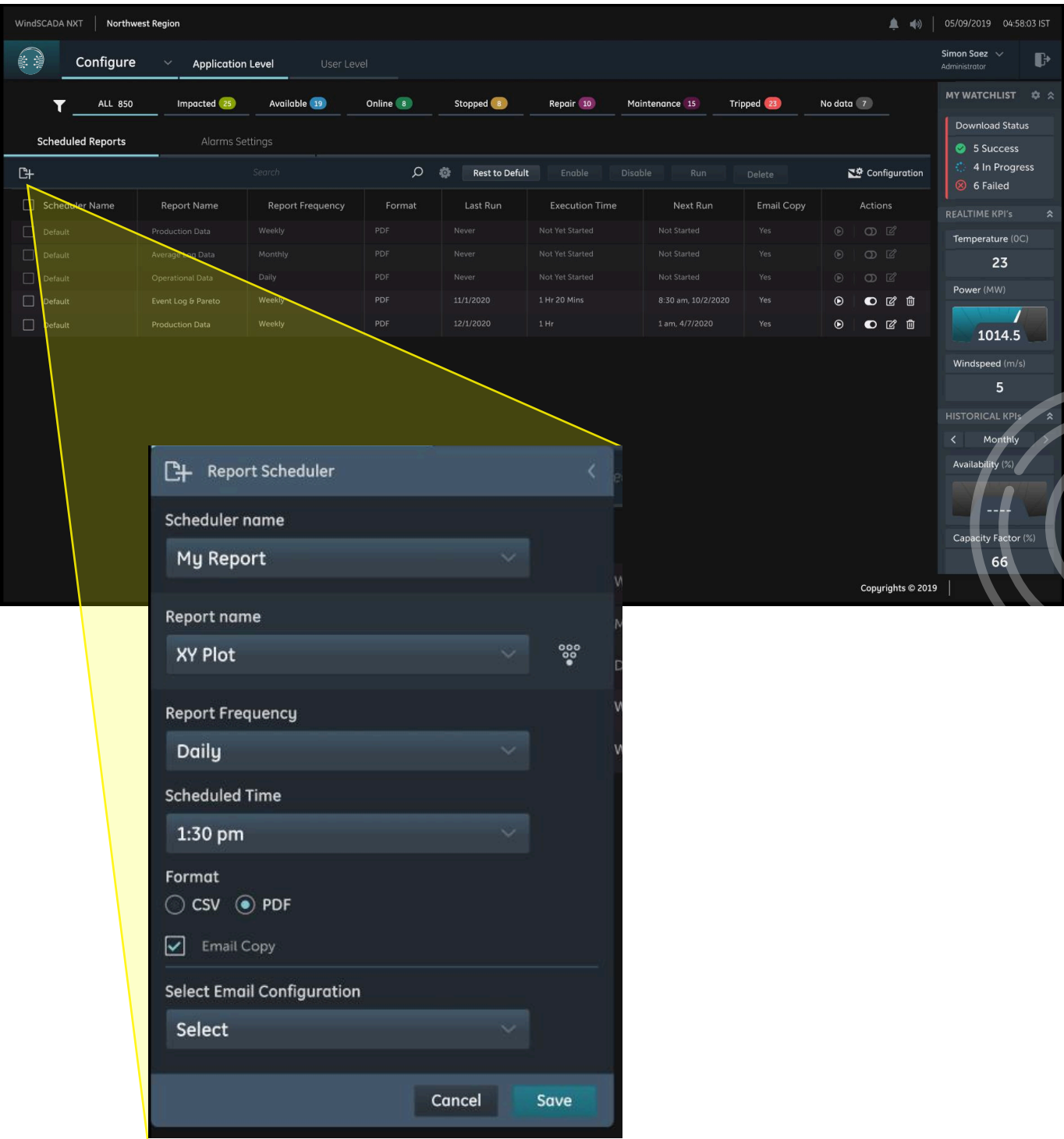
New UI



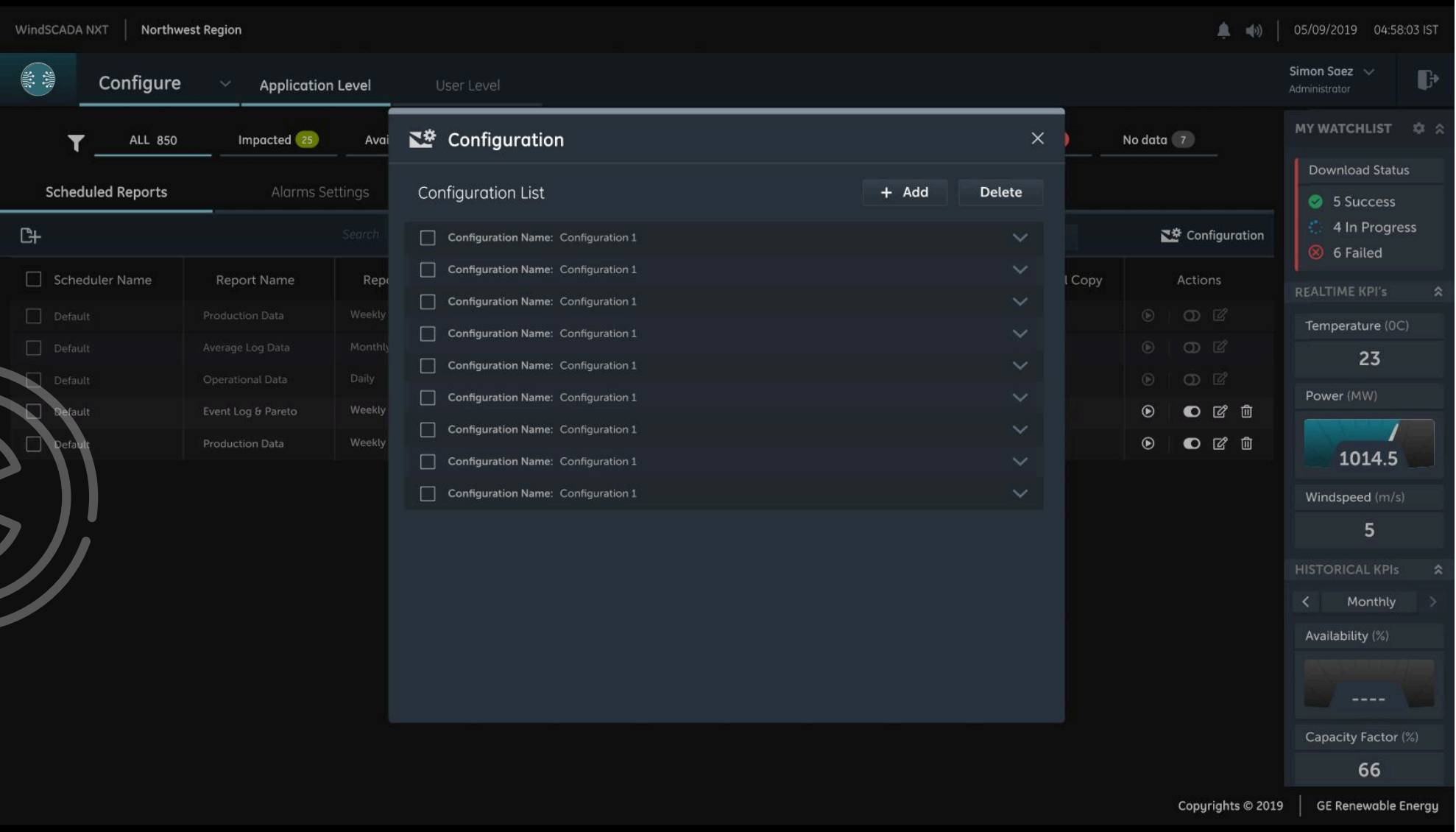
Email Configuration

Streamlined email alert configuration with simplified trigger conditions, ensuring timely communication without user overload.

Step 1



Step 2



Step 3

Configuration

Configuration List

+ Add

Delete

☐

Configuration Name: Configuration 1

^

Configuration Name:

Configuration Name

Subject

text commonly graphic, print, and publishing industries for previewing

Body Text

text commonly graphic, print, and publishing industries for previewing

Recipients (Max 5)

namehere@email.com, namehere@email.com, namehere@email.com,
namehere@email.com,namehere@email.com,

Delete

Edit

☐

Configuration Name: Configuration 1

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Configuration Name: Configuration 1

Step 4

Configuration

Configuration List

+ Add

Delete

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Configuration Name: Configuration 1

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Configuration Name: Configuration 1

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Configuration Name: Configuration 1

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Configuration Name: Configuration 1

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Configuration Name: Configuration 1

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Step 5

Configuration

New Configuration

Configuration Name:

Subject

Body Text

Recipients (Max 5)

Cancel

Save

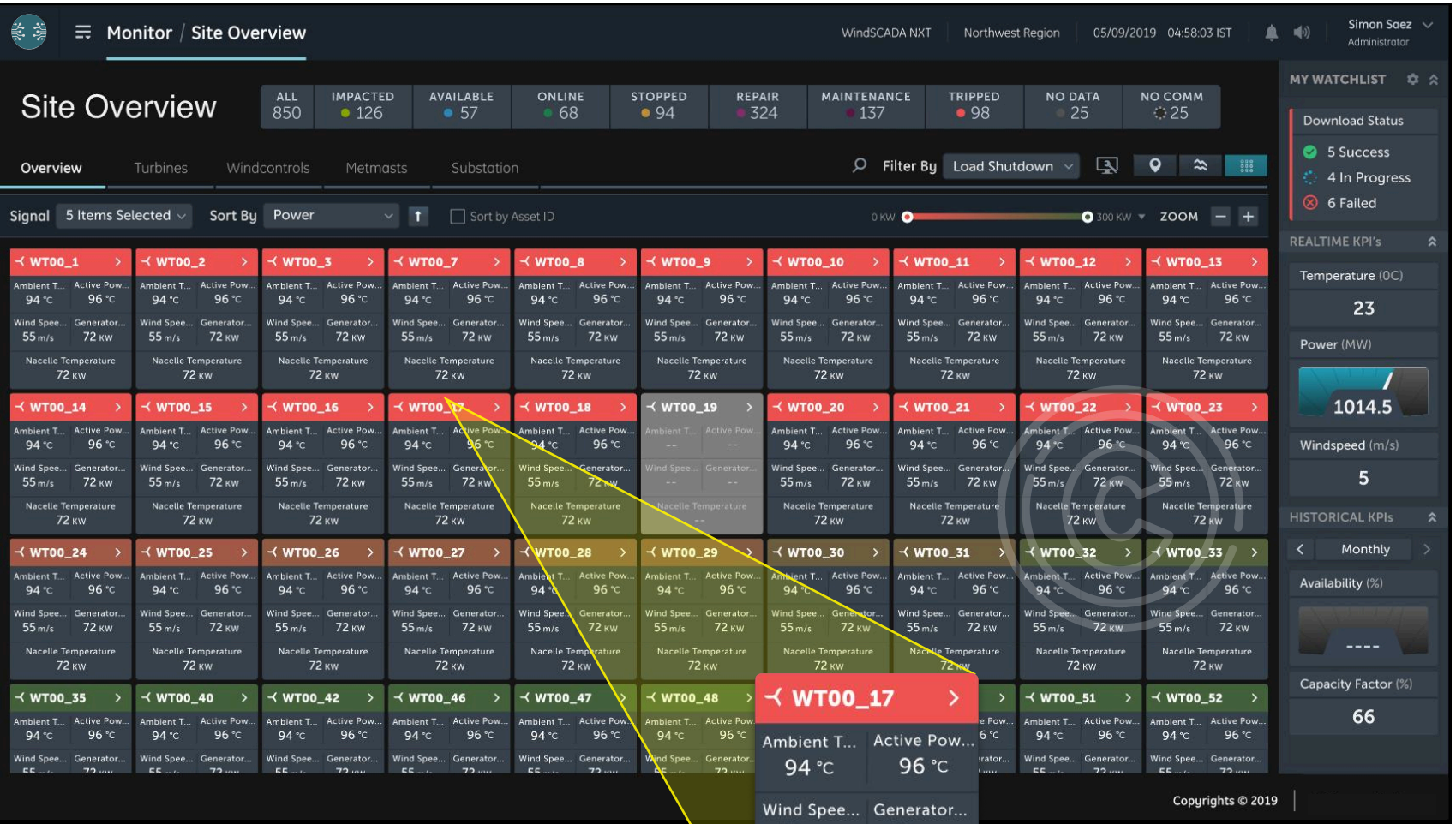
Heat Map View

Integrated an intuitive heat map for at-a-glance pattern detection, aiding faster anomaly spotting across turbine parameters.

Existing



New UI



Takeaways

Impact

- 70% of application redesigned successfully
- Positive feedback from clients & vendors
- Design system is now followed by developers
- Stakeholders more confident in demos
- Vendor satisfaction rising weekly

Learnings

- Real impact happens when you create structure where there was none
- Stakeholders don't always know what's best - but you can guide them
- Consistency in design + dev handoff avoids major UX-code gaps
- Push for user involvement early, even if unofficial
- SCADA UX needs to prioritise clarity, real-time alerting, and high-res adaptability



Scroll down



Thank you for your patience
in reviewing this case study.

-Sunil Akula