

The background is a dark purple gradient. On the left, there are two vertical neon lines, one blue and one magenta, with a horizontal magenta line intersecting the blue one. On the right, a large magenta arc curves from the top towards the bottom. The text 'AVEVA WORLD' is centered in white, with the 'E' in 'AVEVA' being a stylized three-bar character.

AVEVA WORLD

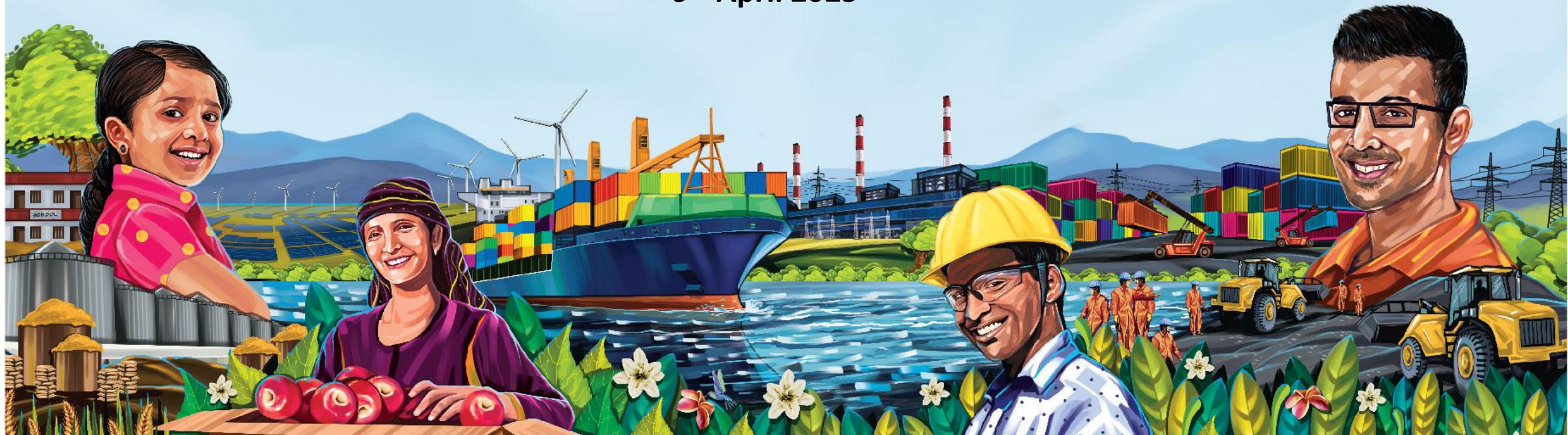


Digital Transformation : Asset Performance Management

Adani Energy Solutions Ltd

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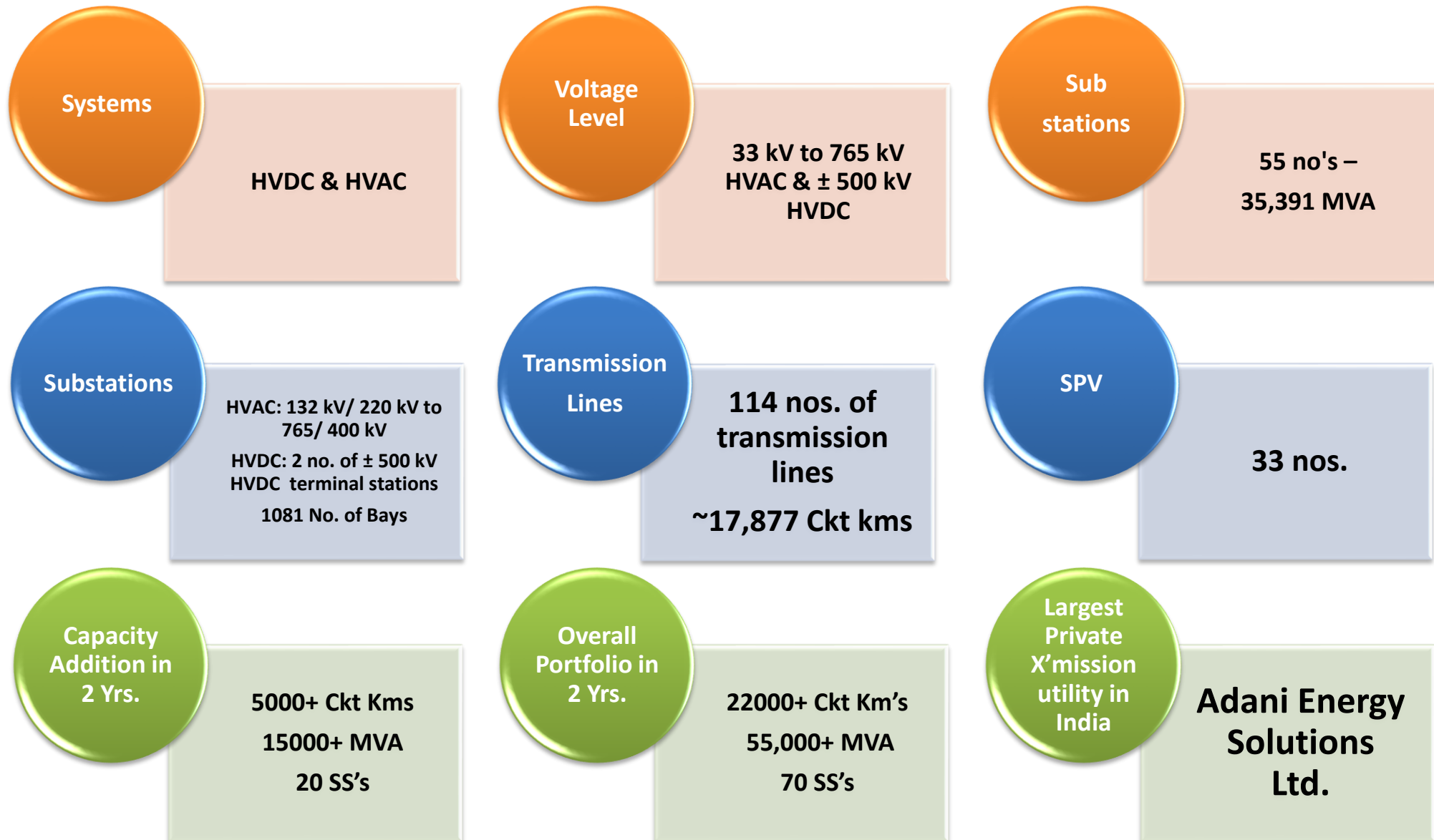
9th April 2025



Agenda

- Introduction
- Business Challenge
- Driving Digital transformation
- Data driven decision
- Business Value

Adani Energy Solutions Ltd : Introduction



CEREBULB At a Glance

CereBulb is a global company that helps organizations navigate the ever-evolving world of digital transformation. Our mission is to act as a catalyst, empowering businesses to leverage technology and data to achieve their goals





Start-Up of the Year

Entrepreneur of the Year



GLOBAL
ENERGY
DIGITALISATION
CONCLAVE



3

Global Locations



USA IND AUS



75+

Technology Portfolio

Open Source & Licensed



140+

Team of
Global Experts

Project Management | Software
Development | IoT | Analytics
| Strategy Building



450+

Years Combined
Industrial Experience

AVEVA

Solution
Provider

Technology Portfolio





SI Partner

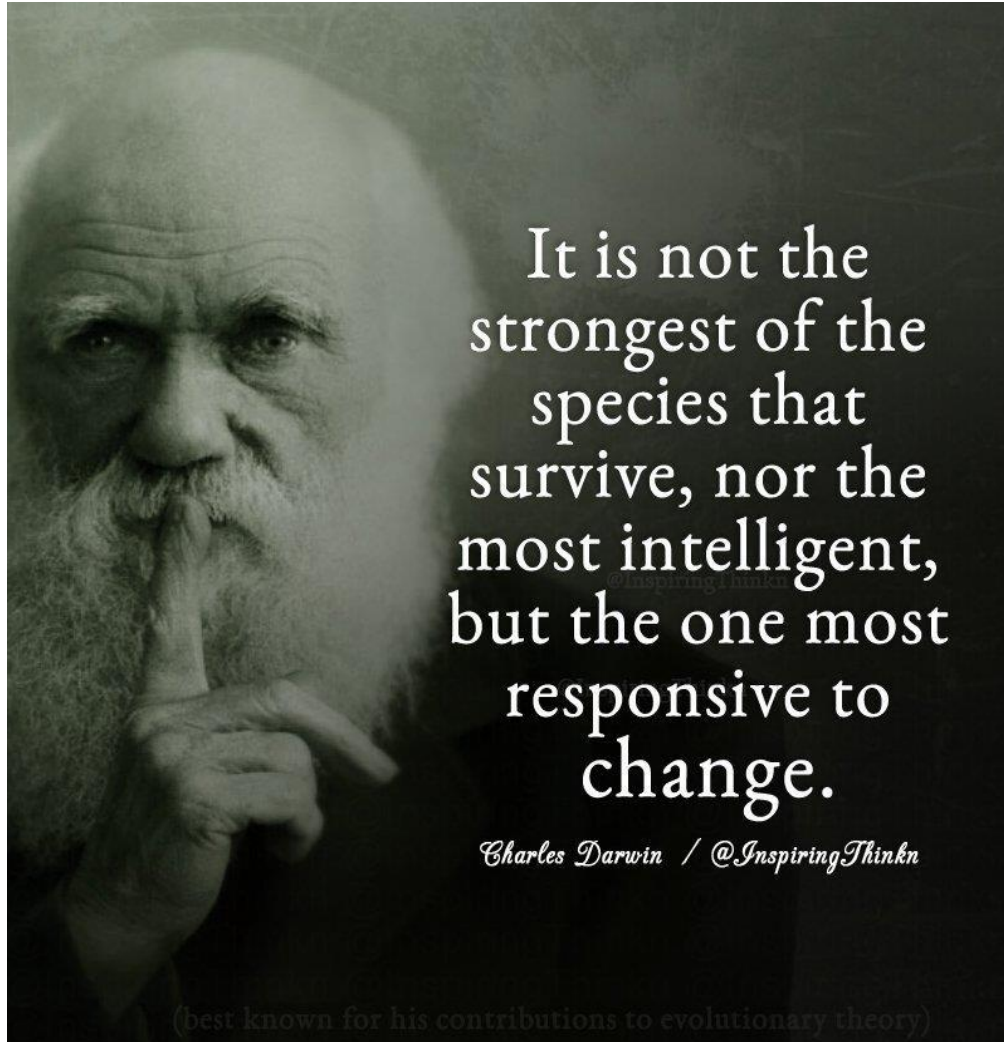


Partner

Evolving Business Challenges

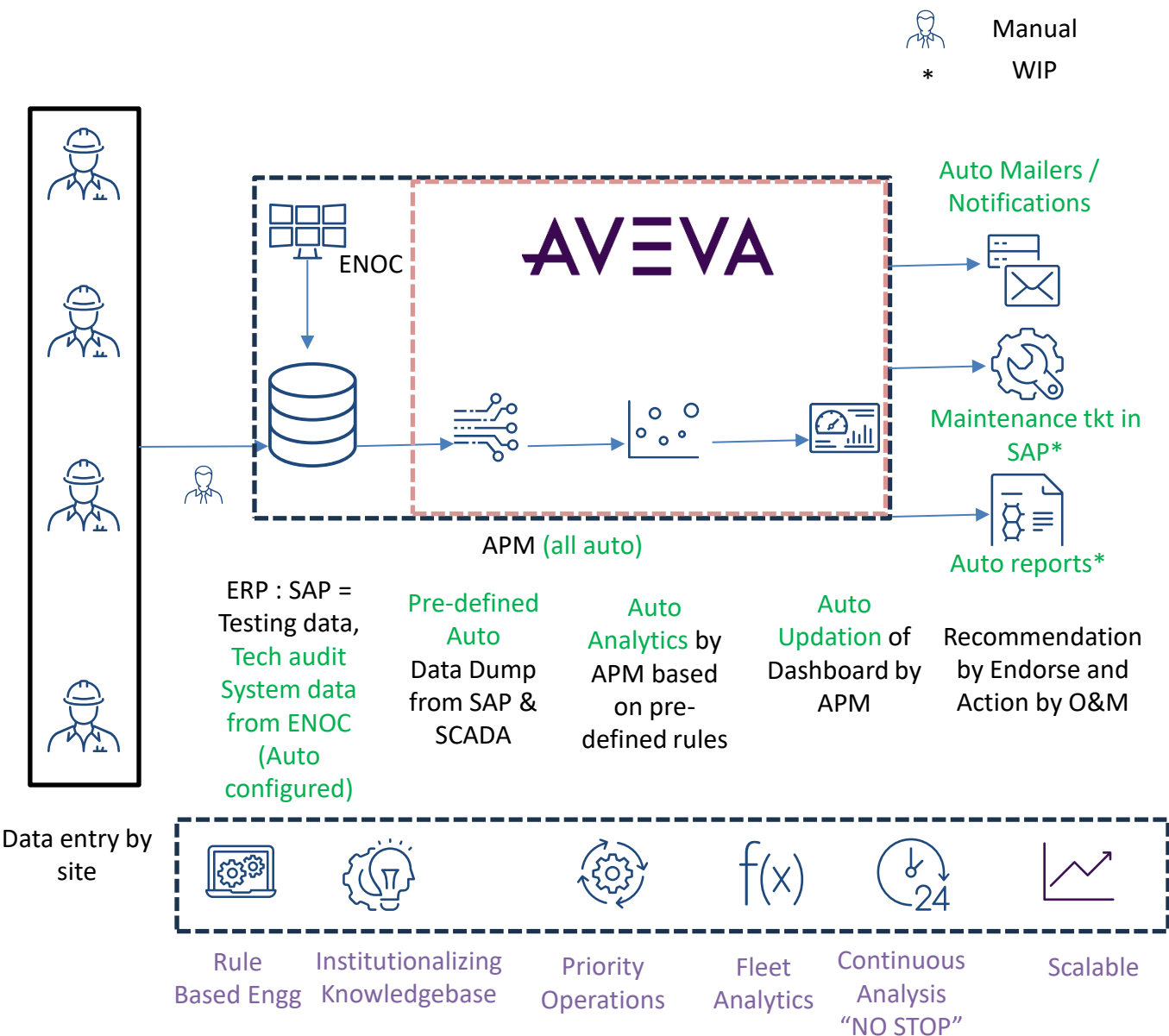
- 1) How do we maintain **high availability of our assets** and ensure 24x7 Power to all stake holders
- 2) **Climate change** impacting electrical assets
- 3) **Cost Optimization** with no compromise on health of electrical assets
- 4) **Decentralization of Data** and Data visualization.
- 5) Need to have **Data based decision making**
- 6) **Institutionalize** our operational experience.
- 7) More visibility on health of distributed assets and **prioritize maintenance actions.**

High NEED to have a DIGITAL Tool to help in institutionalizing knowledge and help in decision making



- It is very vital for all utility to operate the Grid overcoming all above challenges and ensure 24x7 quality power for all the stake holders maintaining high level of Grid Security, Resilience and operate at high efficiency.
- Advanced condition monitoring, Data analytics, IoT sensorization, AI-ML, robotics, Remote – Secured- Reliable operations and strong communication network will be backbone for evolving grids.
- We maintain our Assets at an availability of more than 99.8%

New Process Flow with Adani APM



Business Value:

- 1) Creation of Data Dashboards
- 2) O&M review on dashboard
- 3) Saving of OPEX and CAPEX started...

Business Challenges

- 1) Data naming non – standardized, Critical need for having data rules
- 2) Data Integration / mapping in APM was a challenge. Team developing this solution for the first time.
- 3) Performance Model testing getting affected

Solution Implemented

- 1) Established standard names and text for tags / measuring points.
- 2) These measuring points have been in SAP, SCADA and PI System
- 3) Data Governance Rules now to be implemented right from engineering stage.

Solution Implemented

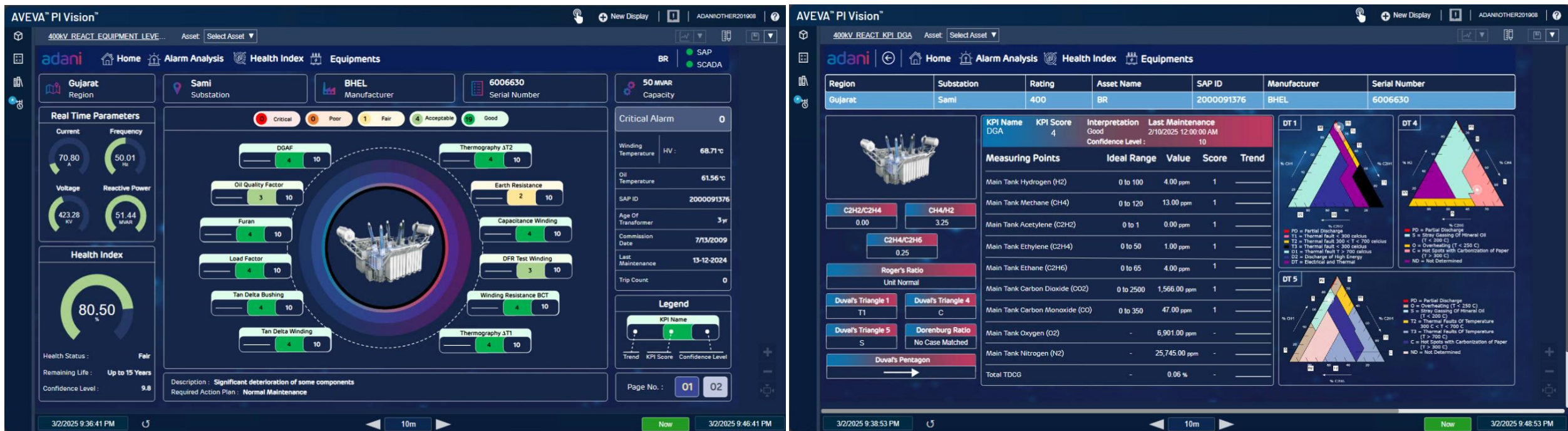
- 1) Established

adani	Work Instructions for Standardization of Tag Names used in APM AHI (Asset Health Indexing) Model, SAP, SCADA and PI Systems for a 765 kV Transformer	Doc No: O&M/APM/WI/801
		Version No: 1.0
		Date: 27/06/2024

Version No.	Date	Details of Change	Reason for Change
1	27-06-2024	New Document	-

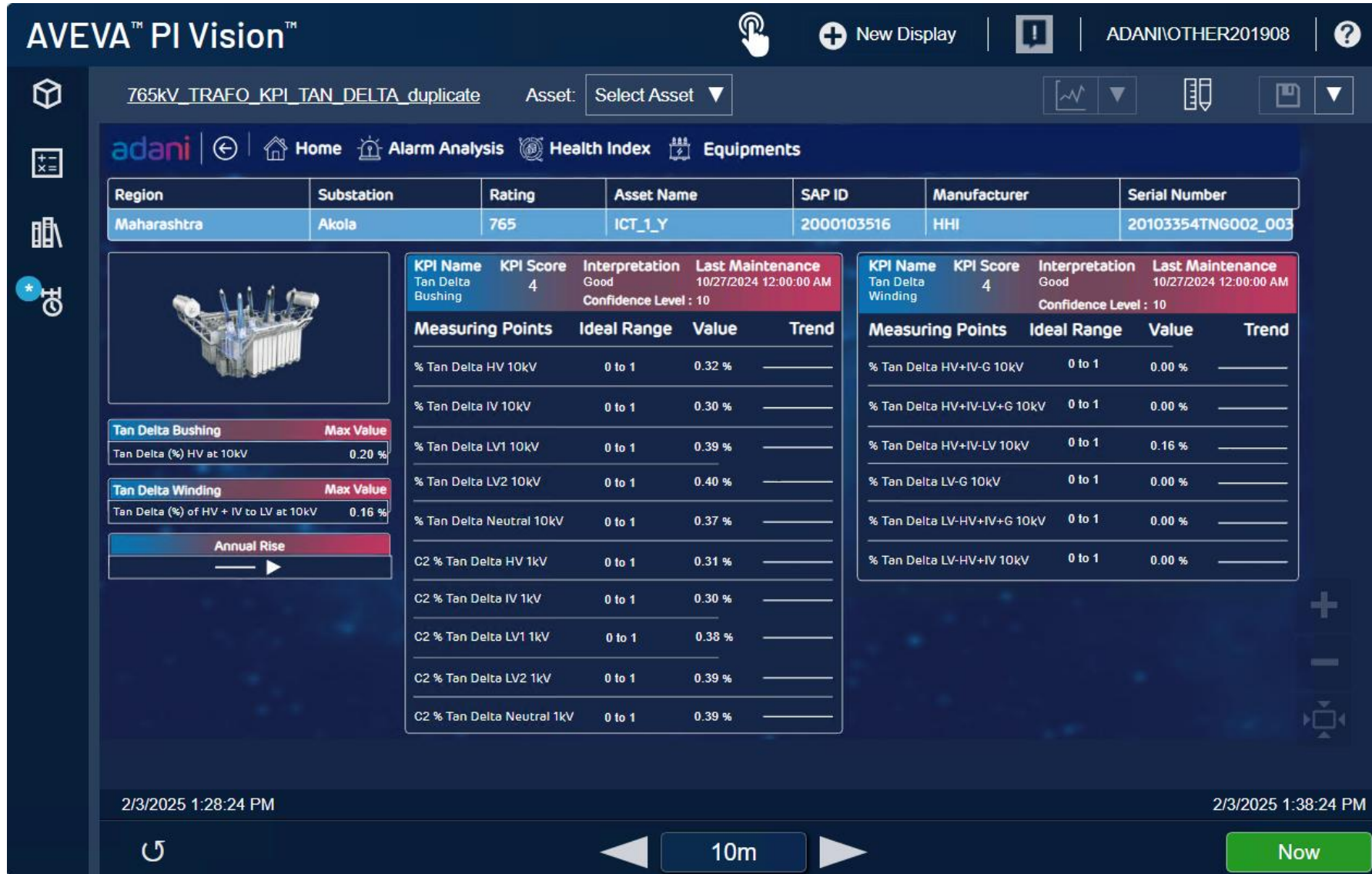
	Name	Signature
Prepared By: SCADA, SAP, PI and Asset Performance SMEs and APM Super Users	Naman Vyas Ranveer Singh Tawar Vijay Kumar Sharma	
Reviewed By: Head – Protection	Sunil Kumar Raval	
Reviewed By: Head – O&M (SS and TL)	Milan Popat	
Reviewed By: Head – O&M (SS and TL)	Ravindra Atale	
Reviewed By: Head – Automation and SCADA	Sumeet Sharma	
Reviewed By: Lead - O&M Transformation	Atul Solanki	
Approved By: Head-O&M	Nihar Raj	
Issued & Controlled By: Document Controller	Pavan Kumar Gupta	

APM : Transformer & Reactor Dashboard



1. All critical Transformer parameters monitored.
2. Oil analysis done based on inputs from 9 gases.
3. Critical gas ratio monitored
4. Health Index available for each transformer along with Confidence level as per CIGRE Standards.

APM : Transformer & Reactor Dashboard



1. Each transformer parameter can be drilled for detailed analysis.
2. Actual values can be compared with the ideal range set in the software based on operational experience
3. Trends based on past historian data can be seen for each parameter.

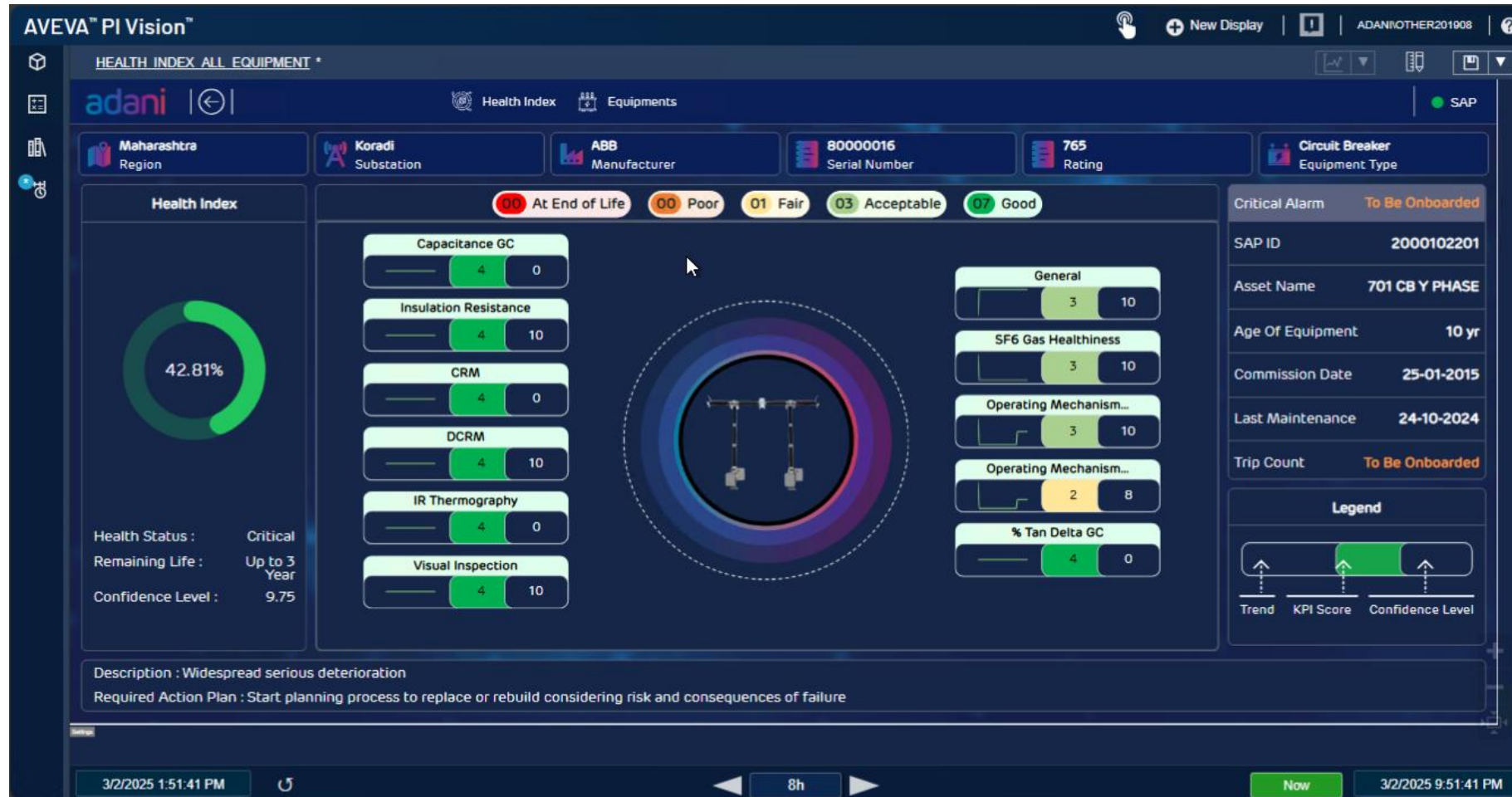
Adani APM : Fleet Analytics



Key Insights from Fleet Analytics

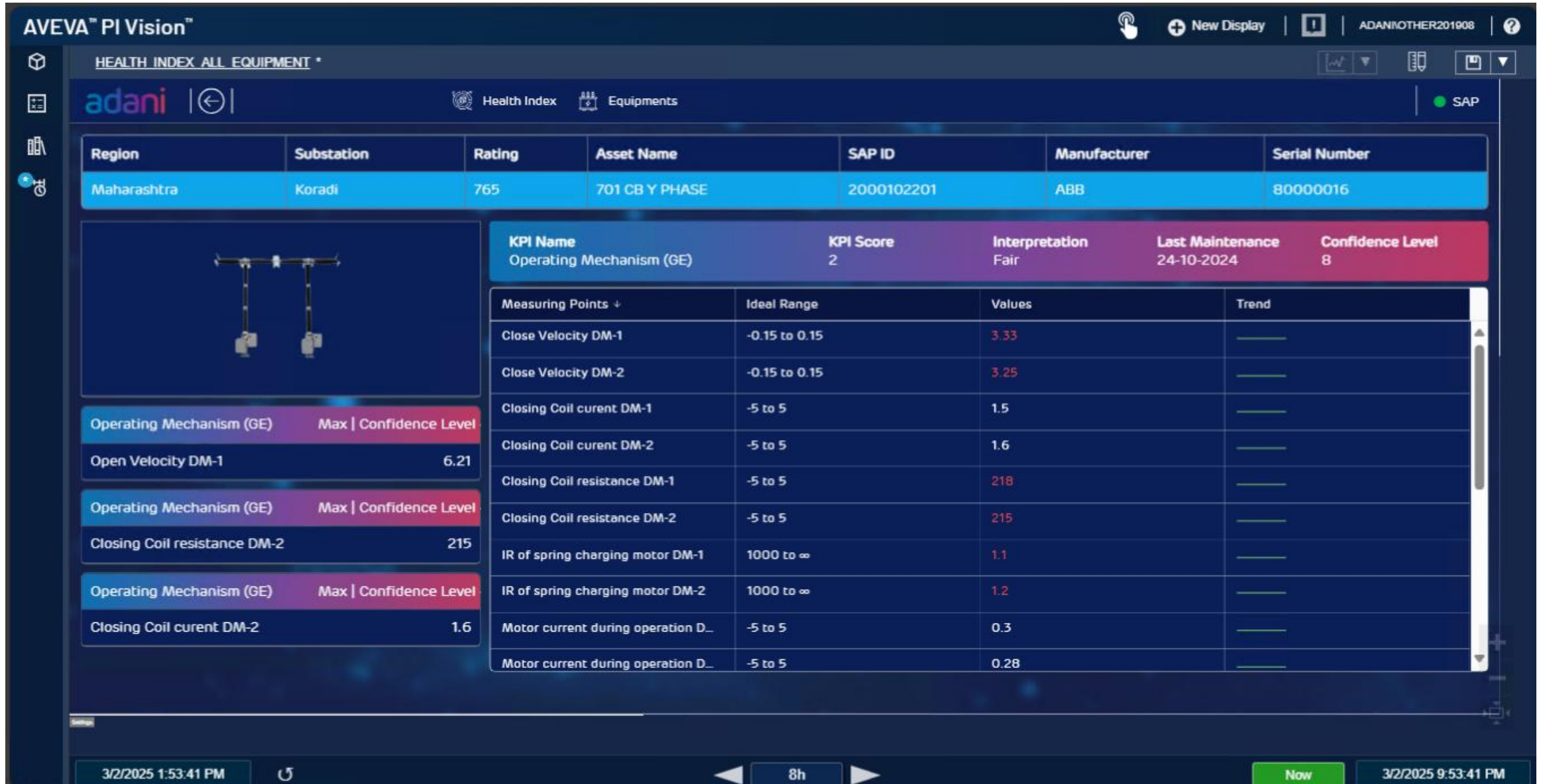
- To compare the performance of “MAKE OF EQUIPMENT” over lifetime.
- Compare the performance of make of transformer
 - At different voltage levels
 - Different Geographies
 - Different SPV
- Further Analytics on
 - What should be the change in maintenance strategy Age wise
 - What should be the changes specific to geography
 - What aspects to be taken care during design stage.
- This fleet analytics will be done for EACH Equipment (Trafo, Reactor, CB, CT, CVT, LA)
- Risk vs Importance criteria under preparation.

APM : Circuit Breaker Dashboard

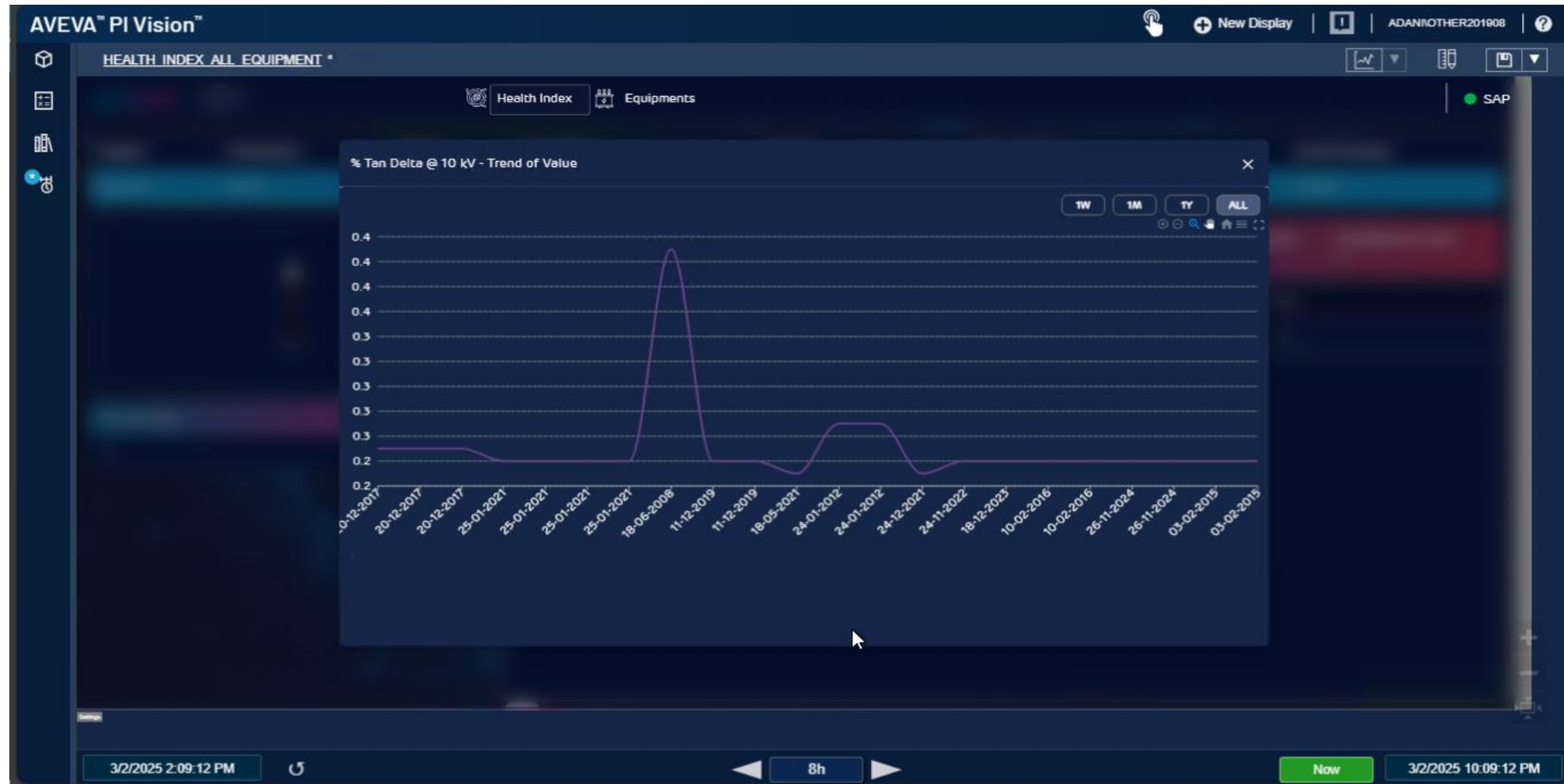


1. All important CB data and their respective trends visible on CB Dashboard.
2. Every Measuring point is drilled down.
3. Asset manager now knows the exact issues just a click away...
4. Relative comparison of CB's common parameters is also possible.

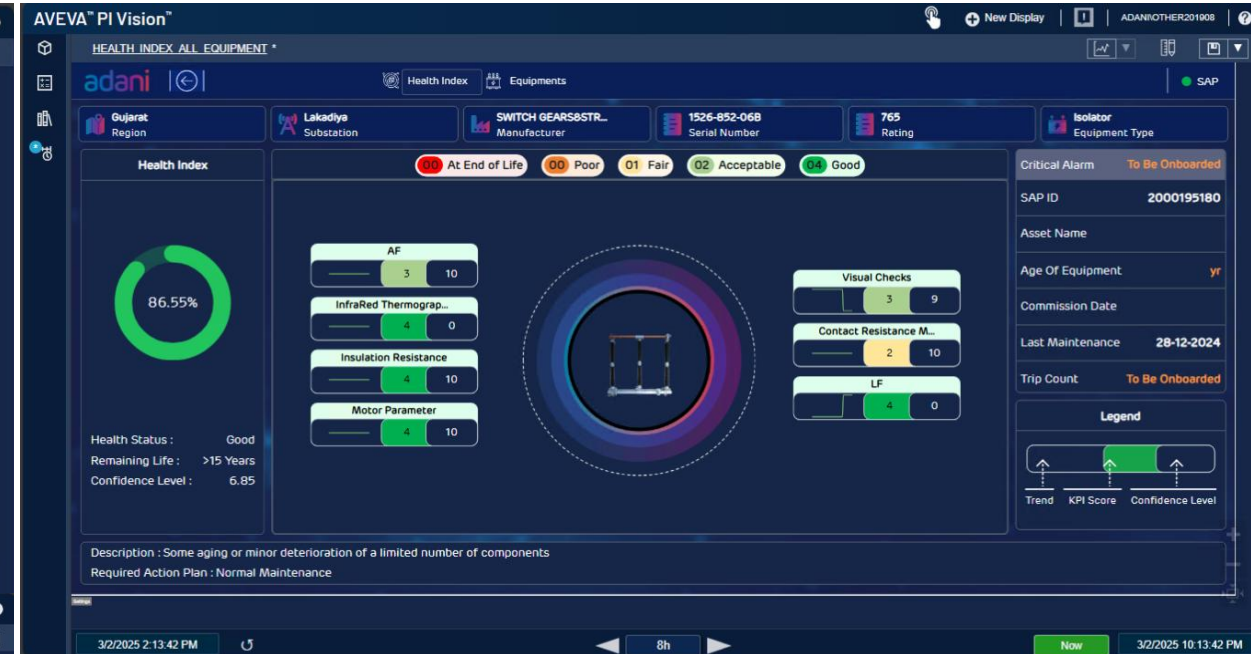
APM : Circuit Breaker Dashboard



APM : Checking the trend of Tan delta

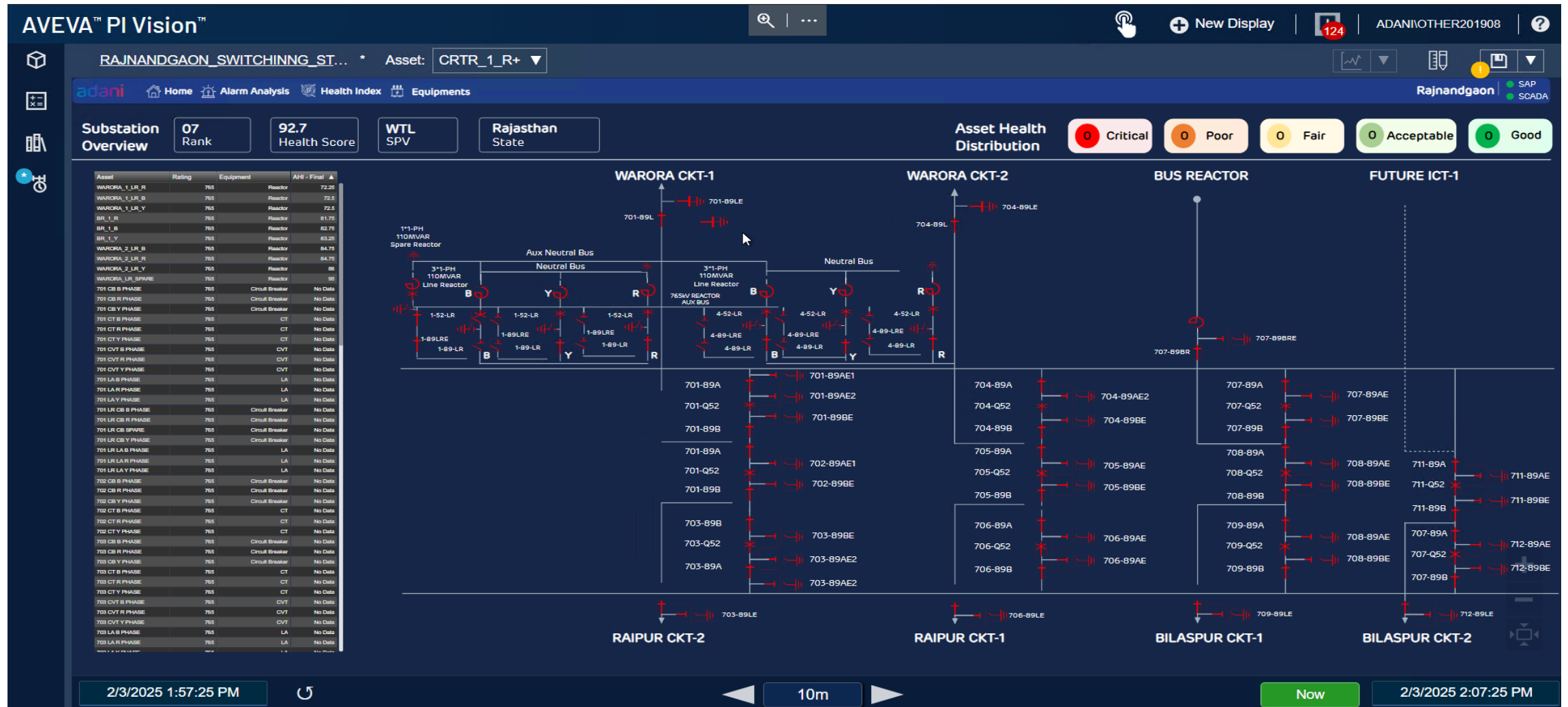


APM : CVT, Isolator, NGR



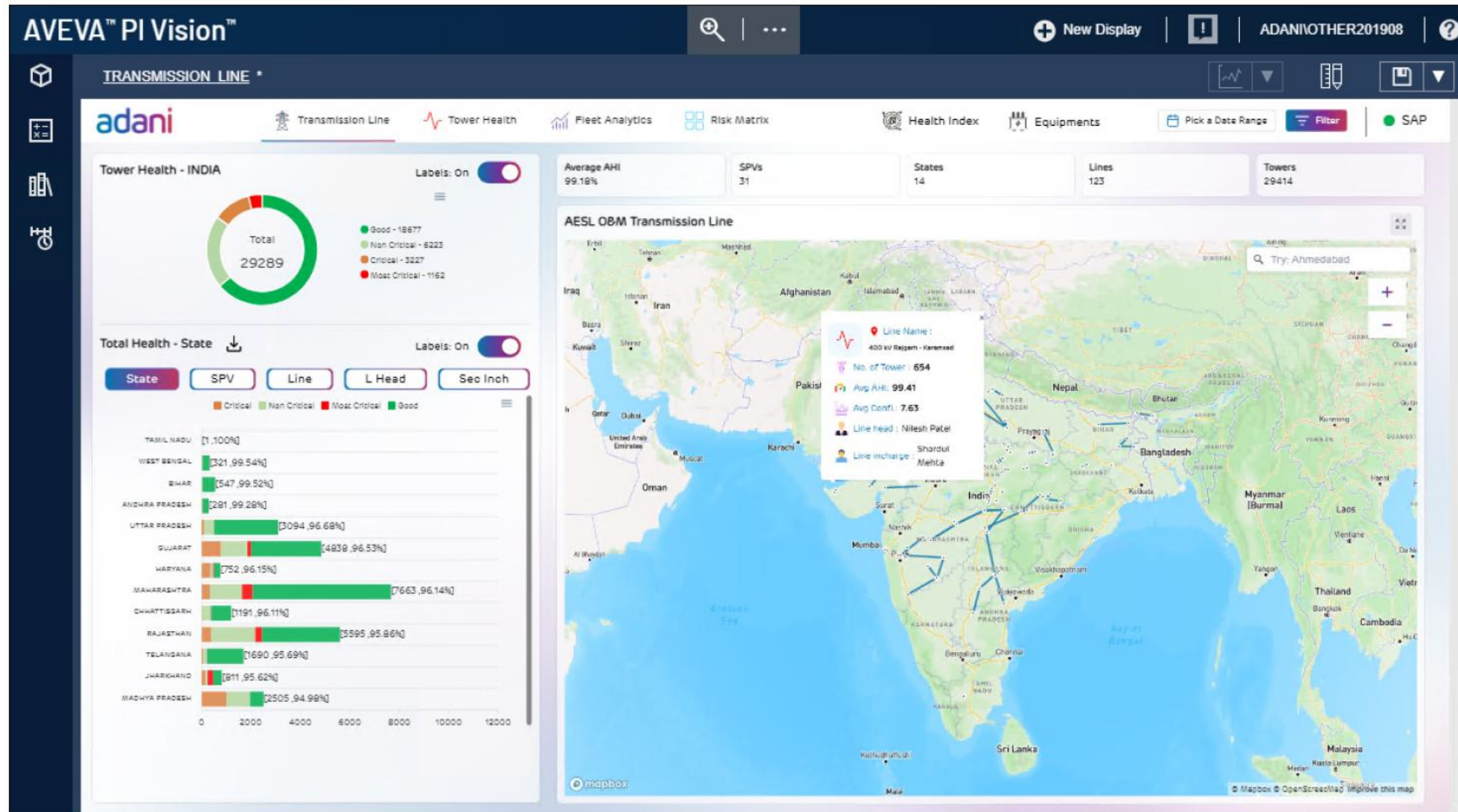
1. All Dashboards have been released
2. Outliers are being monitored by Endorse and HO team members.
3. Suitable maintenance actions are planned by team members based on the outlying parameters.
4. Complete visibility of health status of all the equipments.

APM : Substation level dashboard



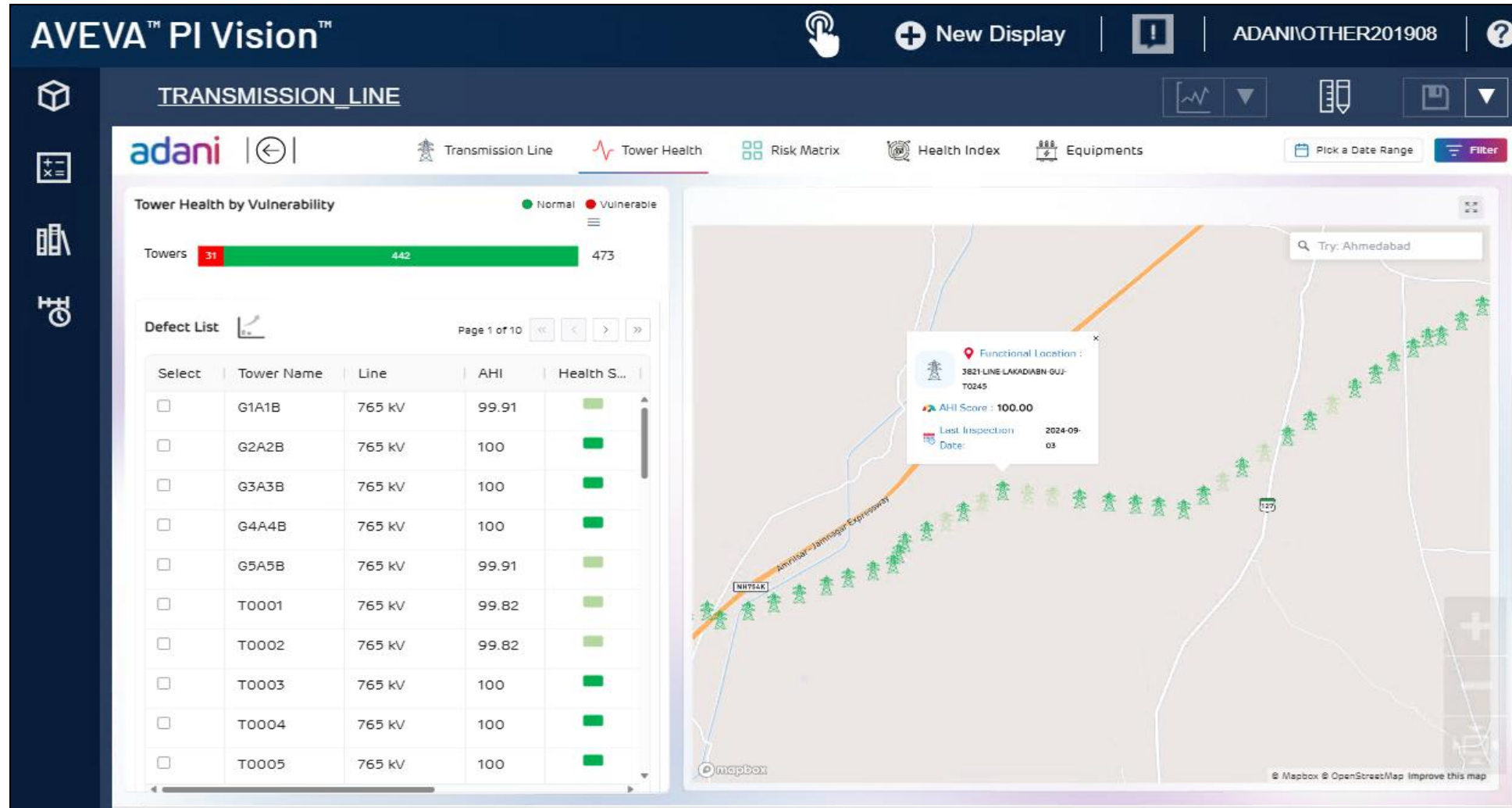
Every station head, gets a unique dashboard to identify the equipments with high risk. This helps to prioritize substation level maintenance.

Transformer Line Dash Boards



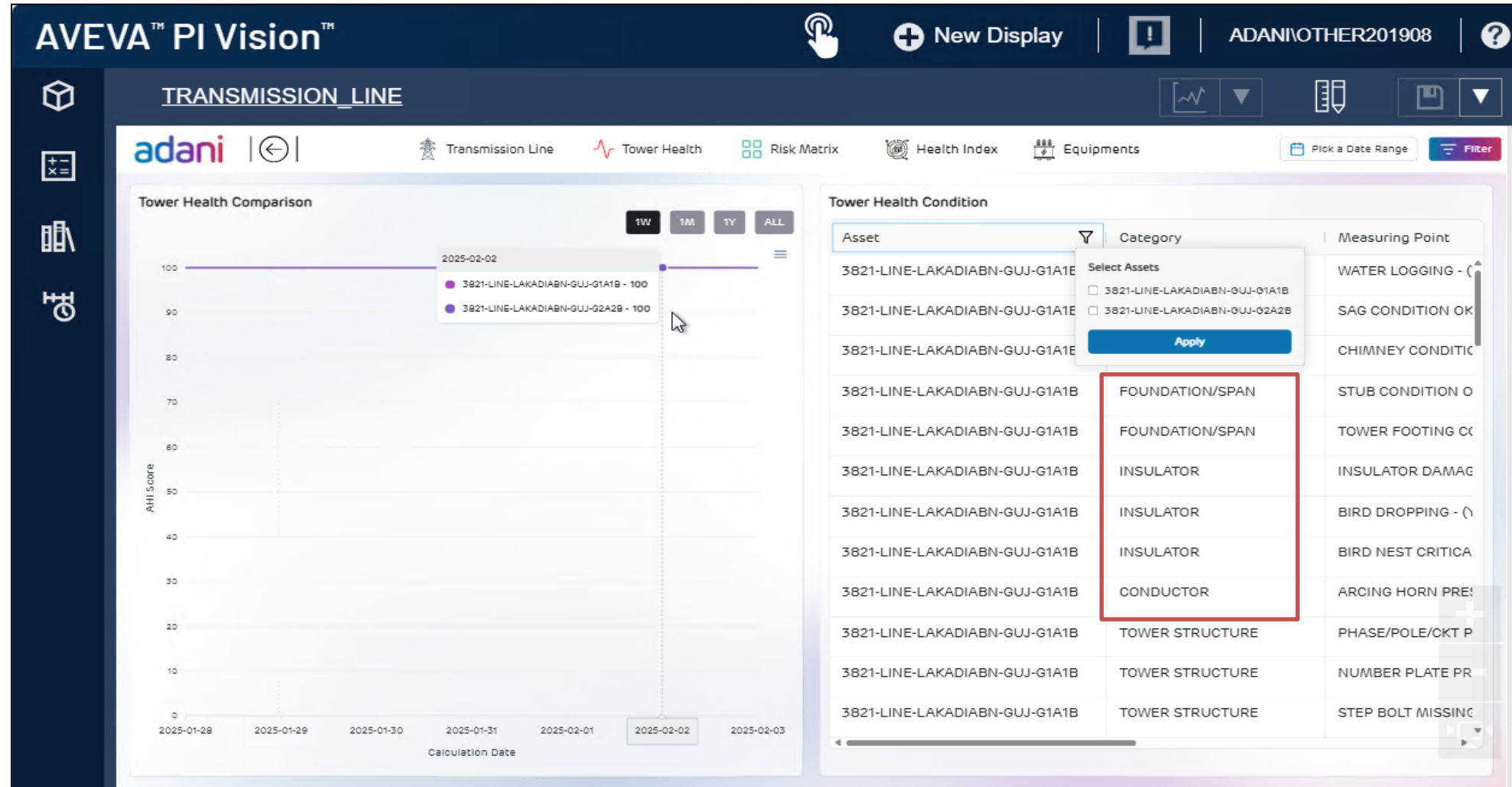
All tower assets health condition is available on single dashboard. State wise, SPV wise and Line wise performance can be checked by asset manager, to prioritize the asset health

Transformer Line Dash Boards



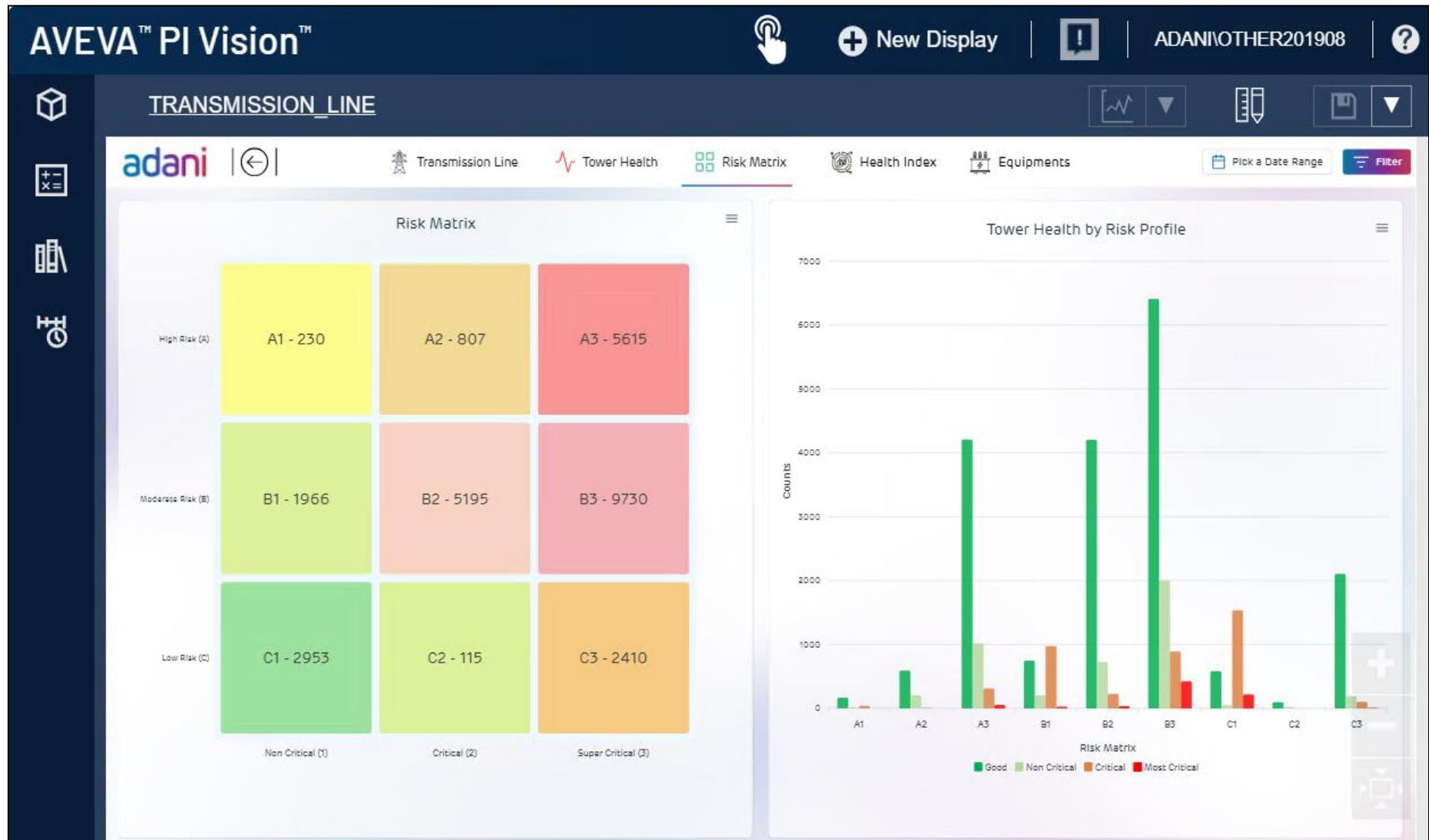
Possible to analyze each tower and also compare the health score for any 2 selected towers

Transformer Line Dash Boards



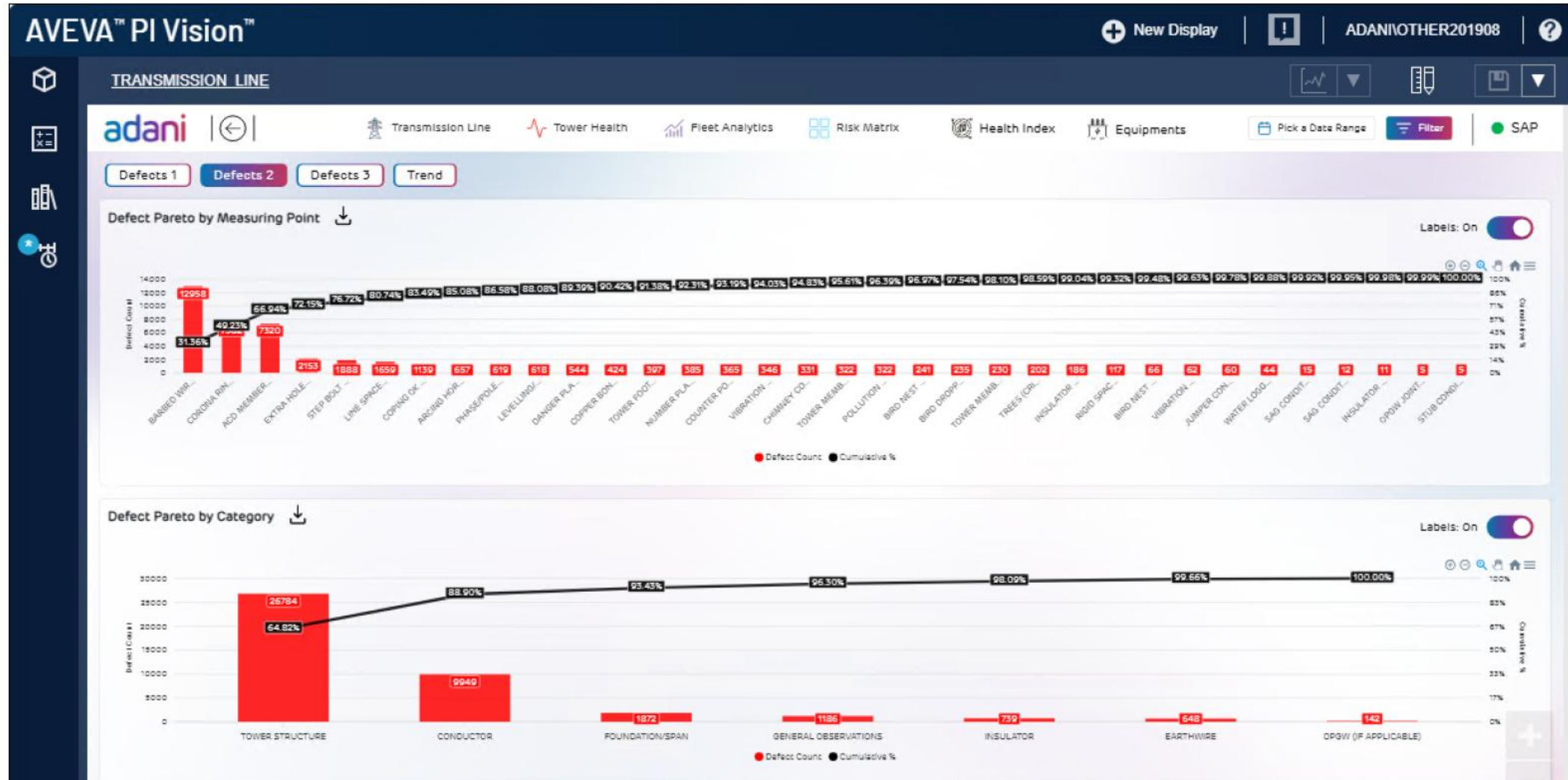
AHI Comparison at subcomponent level is also possible. This is UNIQUE and FIRST time done in Linear assets for electrical utility. This helps asset manager to compare the degradation on account of climate change / geographical aging

Transformer Line RISK Dash Boards



Risk profiling helps to monitor the inventory aspects and also plan prioritization of maintenance by asset manager.

Transformer Line Fleet Analytics

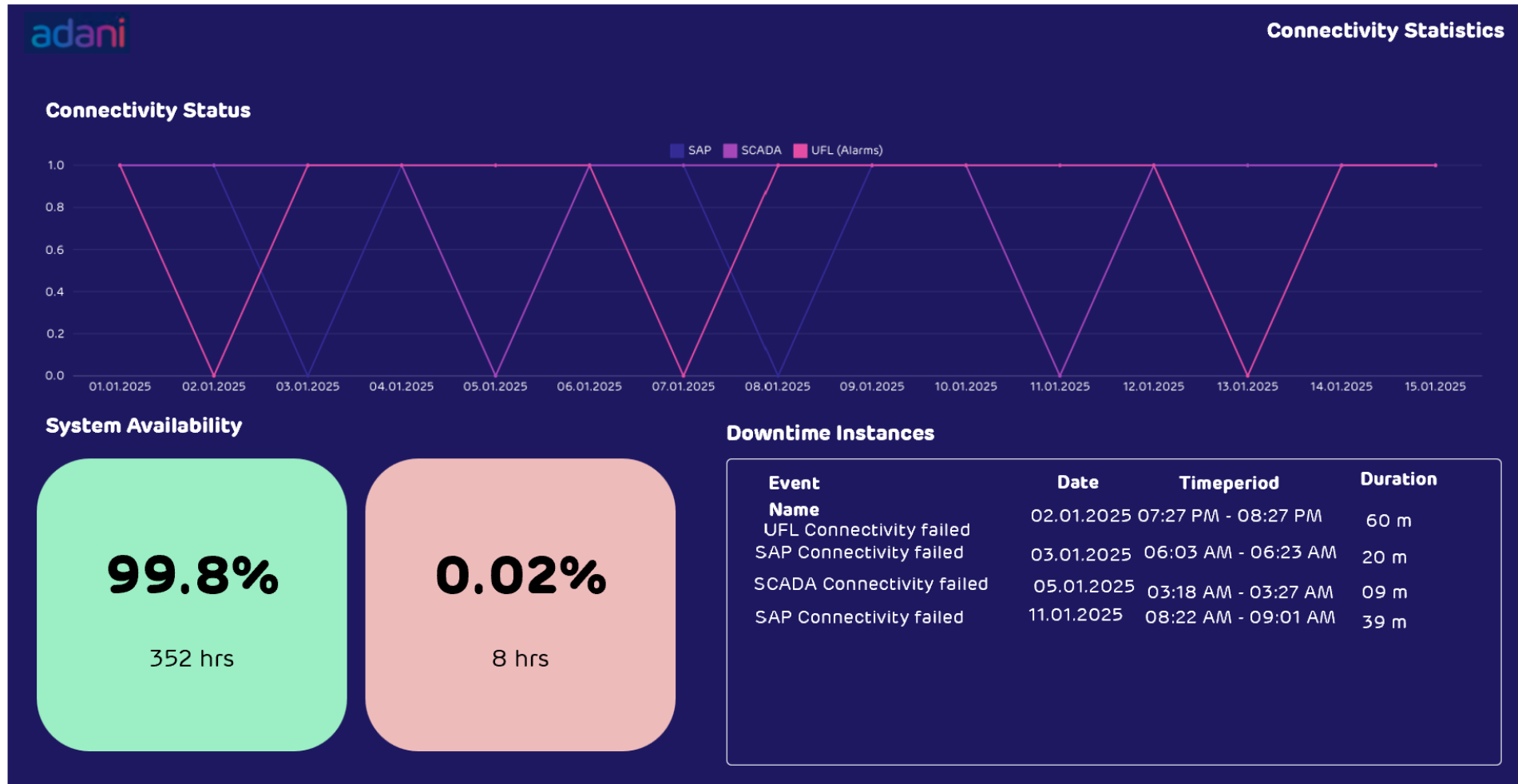


Data Quality Dash Boards



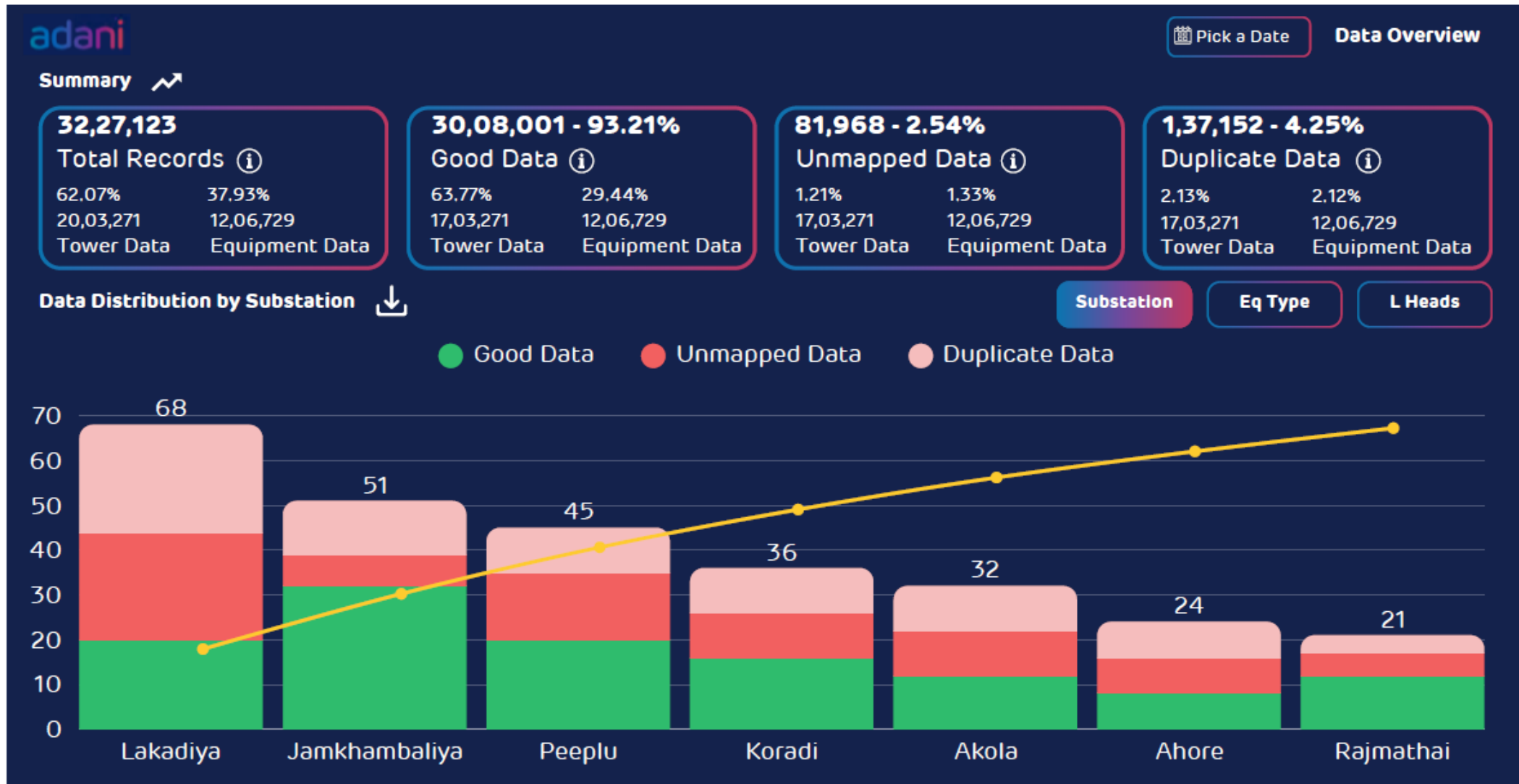
Monitoring the trends of CPU, disk free space, memory utilization. Notifications for activity violations

Data Quality Dash Boards – “Connectivity Status”

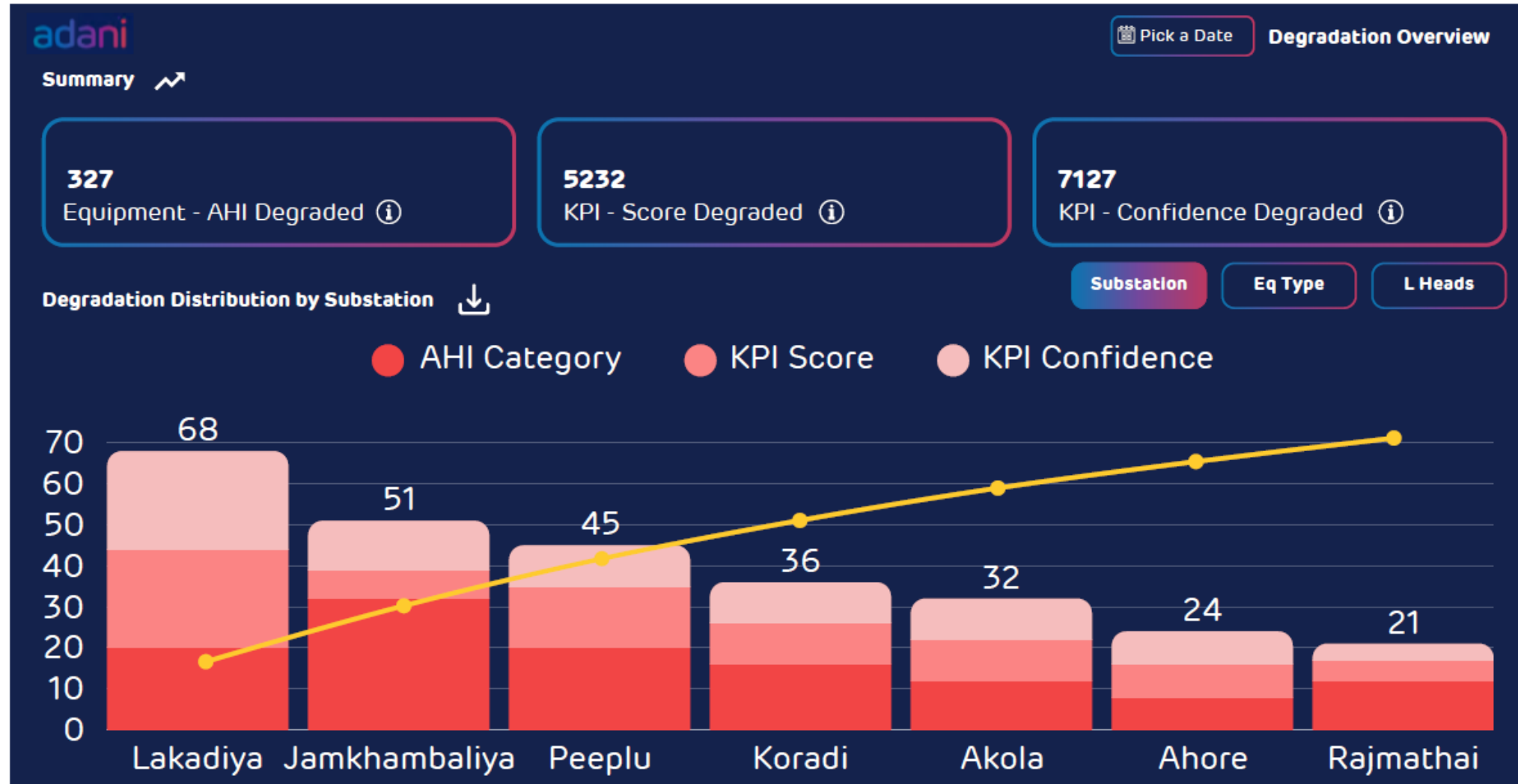


Monitoring the data connectivity status with failure events, failure duration and total uptime for connectivity

Data Quality Dash Board



Data Quality Dash Board



Use Case -1 Risk Identification – ATIL



Business Problem

1. Acetylene gas trend increase in HVDC Converter transformer.
2. Risk of Power interruption

Solution Adopted

1. Central monitoring of data in APM. Gas violation detected on set rules.
2. Transformer put on critical monitoring zone. OEM consulted.

Business Benefit

1. Early risk identified and monitoring aspects implemented.
2. Early decision making and avoiding failure of nearly 2500 MW of power

Use Case – 2 Failure Avoidance



Business Problem

1. 765kV reactors had abnormal gas increase.
2. Huge cost incurred in FY 22-23 & FY 23-24;

Solution Adopted

1. Continuous monitoring of assets on APM by SME (All critical gases)
2. Adapting operation strategy based on asset condition
3. Discussion with OEM on identified risks

Business Benefit

1. No failure in FY 24-25. Avoiding cost overrun
2. System availability of nearly 99.87%

Way Ahead for Adani Energy Solutions Ltd



- 1) Ramping up **Technology inclusion and proliferation**.
- 2) Enabling high system **“Availability”**, integrating **ESG**
- 3) **Ramping our digitalization journey**. Evolving maintenance strategies to overcome climate change issues
- 4) More inclusion of **Digital work force** (BOTS) and **continuous upskilling** of our workforce.
- 5) More, **Data driven** decision making
- 6) **Creating resilient networks** incorporating IT and OT security
- 7) Creating more **insights from Data**
- 8) Making O&M, **“In a BOX Solution”**.

Adani Energy Solutions enables faster decision-making to optimize reliability and profitability

Challenge

- To maintain high availability of assets and 24x7 power to all stakeholders
- Retain and systematize operational experience of its aging and transient workforce
- To increase visibility on the health of distributed assets and prioritize maintenance actions
- To optimize costs without compromising the health of electrical assets

Solution

- Uses AVEVA™ PI System™ as the core of its centralized scheduling monitoring system to enable comprehensive asset performance and alarm analytics across its complex distribution network.

Results

- Improved operational efficiency and enabled data-driven decisions
- Early risk identified and monitoring aspects implemented
- Early decision making and avoiding failure of nearly 2500 MW of power
- Continuous monitoring means failure avoidance, with no failure in FY 24-25. Avoiding cost overruns.
- System availability of nearly 99.87%



adani

Growth
with
Goodness

CEREBULB

AVEVA

Thank You !

