

Substation Information System (SIS)

*A Unified Digital Platform
of
Purvanchal Vidyut Vitran Nigam Limited*



Presentation to
All India Discom Association (AIDA)



Date
29/06/2026



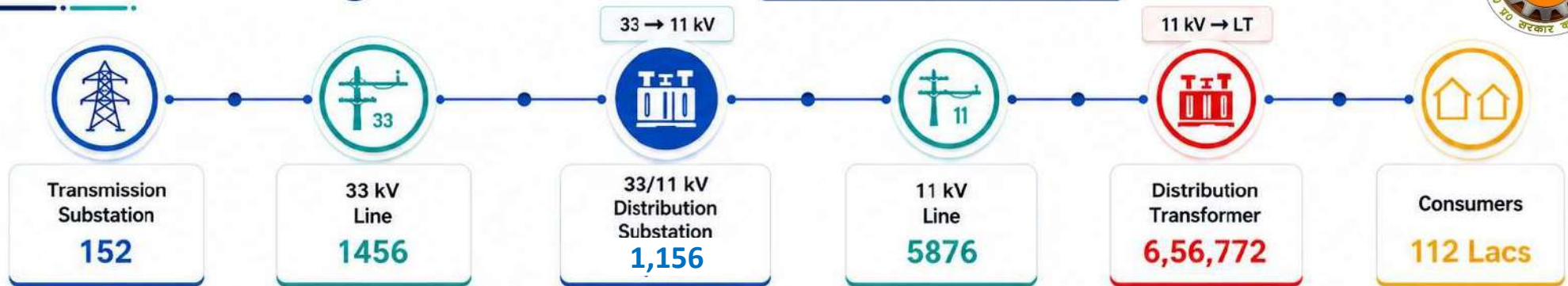
**Purvanchal Vidyut Vitran
Nigam Limited (PuVVNL),**

(A DISCOM UNDER UPPCL)

PUVVNL at a glance



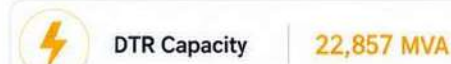
Network + Administrative Profile



Administrative footprint



Infrastructure + capacity map



Demand profile



Line network length



OPERATIONAL HURDLES AT A GLANCE: KEY CHALLENGES IN UTILITY MANAGEMENT



DATA & VISIBILITY GAPS



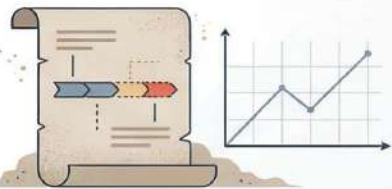
Zero Visibility of Field Data

Essential operational information from the field was completely inaccessible for real-time decision-making.



No Unified Asset Records

Lacked a central system for asset testing and tracking, preventing performance comparison.



Missing Historical Failure Data

No records were kept on transformer damage history, failure patterns, or repair timelines.

MANUAL PROCESS INEFFICIENCIES



Difficult Outage Tracking

Manually tracking power outages was slow, with no real-time fault identification.



Cumbersome Asset Management

The hierarchy of lines and transformers was maintained manually, making asset tracking difficult.



Disconnected Project Planning

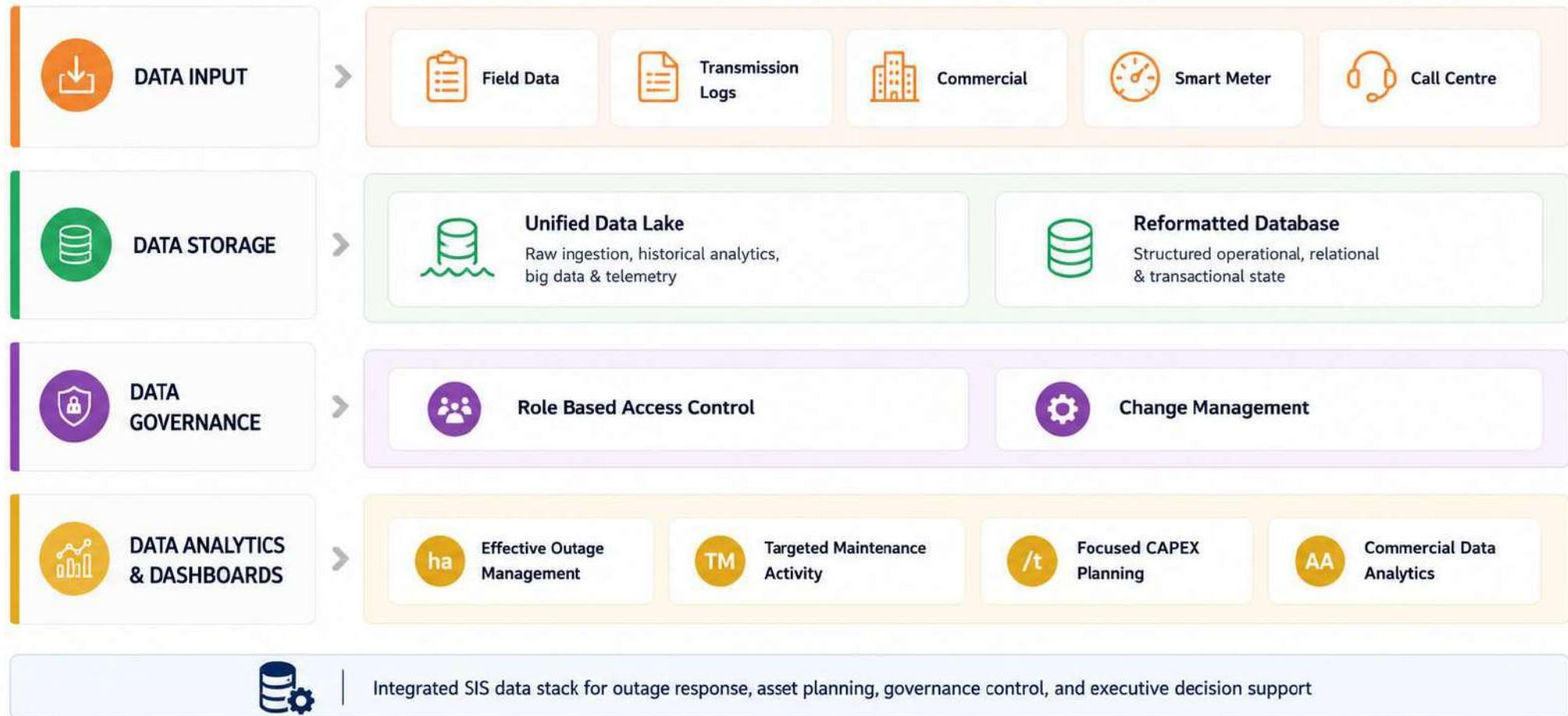
The project planning process was manual and not linked to financial payback analysis.

Solution is journey towards Digitalization from Manual Process



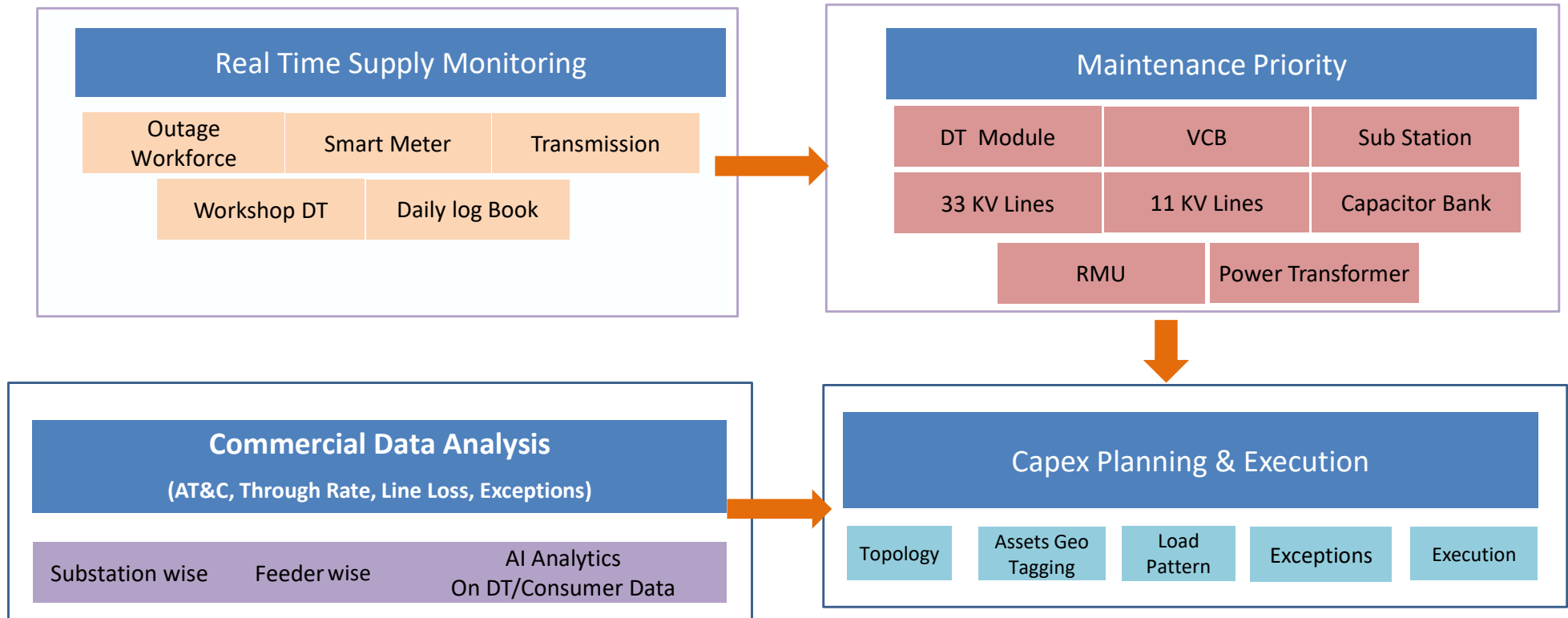
Broad Data Architecture of Substation Information System (SIS)

● Data Input ● Data Storage ● Data Governance ● Analytics & Dashboards





Operation Philosophy of Substation Monitoring System (SIS)



AI based Analytics from Data to take out Predictive Analysis, Exceptions etc.



DASHBOARDS



1. REAL TIME SUPPLY MONITORING

REAL TIME SUPPLY MONITORING

-  **1. Outage Workforce**
-  **2. Smart meter**
-  **3. Transmission**
-  **4. Daily Log Book**
-  **5. Workshop DT**

	Data Source	Workforce Mobile App
	Data Entry	SSO / JE
	Captured Data	Outage Events
	Updation	Real-Time

ACTIONABLE INPUTS

- 1. No. of fault**
- 2. Type of fault**
- 3. Cause of fault**
- 4. Fault Duration**
- 5. Expected Uptime etc.**

1. OUTAGE WORKFORCE

Real-Time Dashboard
Generated from Workforce Mobile (APP)



**Data indicates various Outages of Power element.
This helps to improve better serve of electricity.**



SUBSTATION INFORMATION SYSTEM
Outage Analysis Dashboard (WORKFORCE)

 **Anurag Pandey**  English 

 Search

2307

TOTAL OUTAGE

1179

BREAKDOWN SHUTDOWN

396

PLANNED SHUTDOWN

176

SCHEDULED ROSTERING

194

EMERGENCY ROSTERING

362

TRIPPING

 [11KV Feeder Dashboard](#) >

 [DT Dashboard](#) >

 [DT Proposal \(IC/Additional\)](#) >

 [Workshop DT Monitoring](#) >

 [Substation Testing Dashboard](#) >

 [Business Plan](#) >

 [Outage Analysis](#) >

[Outage Analysis Dashboard \(WORKFORCE\)](#)

[1912 Supply Related Complaint Dashboard](#)

[Complaint Aging Analysis Dashboard](#)

Shutdown/Scheduled Shutdown (Down Time)

208

Less than 1-Hrs

161

Between 1-Hrs-3-Hrs

27

More than 3 Hrs

Breakdown/Breakdown Shutdown (Down Time)

512

Less than 1-Hrs

481

Between 1-Hrs-3-Hrs

187

More than 3 Hrs

2308

SDBD REASONS

104

Outage Beyond Time (Open)



Reliable Supply



Digital Workforce



Data-Driven Decisions



24x7 Consumer

REAL TIME SUPPLY MONITORING

-  **1. Outage Workforce**
-  **2. Smart meter**
-  **3. Transmission**

-  **4. Daily Log Book**
-  **5. Workshop DT**

	Data Source	Smart Meter
	Data Entry	Through API
	Captured Data	Outage Events
	Updation	Real-Time

ACTIONABLE INPUTS

- No. of fault**
- Fault Duration**
- SAIFI SAIDI**

2.1 Smart Meter

Real-Time Dashboard

Real Time Dashboard from Smart Meter Data



**Data indicates various Outages of Power element.
This helps to improve better serve of electricity.**

Genus
energizing lives

Live Feeder Power Status

1 viewing

Download CSV

View Filters

Data as on: 24 Jun 2026, 10:13:16 AM

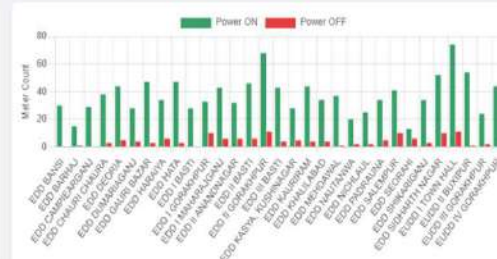
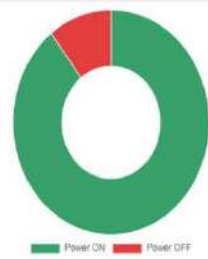
10:13 AM

1299
TOTAL METERS

1163
POWER ON
CURRENT 0.116

136
POWER OFF
DI PORT: 93 ALARM: 43

STATUS PERCENTAGE
ON: 89.53% OFF: 10.47%



Filtered Meter List - Off (Filtered)

Download XLS

DI PORT: 93

ALARM: 43

CURRENT 0.0

Show All

ZONE	CIRCLE	DIVISION	SUB DIVISION	SUB STATION	FEEDER CATEGORY	FEEDER NAME	METER ID	STATUS	ALARM DATE	INSTANT DATE
GORAKHPUR	EUDC GORAKHPUR	EUDC III GORAKHPUR	EDSD KHORABAR	KHORABAR	Urban	11KV DIVYA NAGAR, 43571310138DNR	CE8836442	Off	24-06-2026 09:56:01	24-06-2026 10:00:00
GORAKHPUR	EUDC GORAKHPUR	EUDC I TOWN HALL	EDSD GOLGHAR	CIRCUIT HOUSE	Urban	11KV LAKEVIEW, 4357124078LKV	CE8836490	Off	24-06-2026 09:54:35	24-06-2026 09:55:00
GORAKHPUR	EUDC GORAKHPUR	EUDC I TOWN HALL	EDSD GOLGHAR	CIRCUIT HOUSE	Urban	11KV STP, 4357124018STP	CE8836491	Off	24-06-2026 05:54:36	24-06-2026 05:45:00
GORAKHPUR	EUDC GORAKHPUR	EUDC I TOWN HALL	EDSD GOLGHAR	CIRCUIT HOUSE	Urban	11KV CORPORATE PARK, 4357124019CRP	CE8836492	Off	24-06-2026 05:54:35	24-06-2026 05:45:00
GORAKHPUR	EUDC GORAKHPUR	EUDC I TOWN HALL	EDSD GOLGHAR	CIRCUIT HOUSE	Urban	11KV GAUTAM VIHAR, 4357124019GTV	CE8836493	Off	24-06-2026 05:54:36	24-06-2026 05:45:00
GORAKHPUR	EUDC GORAKHPUR	EUDC I TOWN HALL	EDSD GOLGHAR	CIRCUIT HOUSE	Urban	11KV WATER SPORT COMPLEX, 4357124018WSC	CE8836497	Off	24-06-2026 05:54:36	24-06-2026 05:45:00
GORAKHPUR	EUDC GORAKHPUR	EUDC I TOWN HALL	EDSD GOLGHAR	RAMGARH (TARA MANDAL)	Urban	11KV Indranagar	CE8836496	Off	24-06-2026 10:12:03	24-06-2026 10:00:00
GORAKHPUR	EUDC GORAKHPUR	EUDC I TOWN HALL	EDSD GOLGHAR	RAMGARH (TARA MANDAL)	Urban	11KV GAUTAM VIHAR, 4357120120GVR	CE8836504	Off	24-06-2026 10:04:13	24-06-2026 10:00:00
GORAKHPUR	EUDC GORAKHPUR	EUDC I TOWN HALL	EDSD GOLGHAR	CIRCUIT HOUSE	Urban	11KV CIRCUIT HOUSE, 4357124018CKT	CE8836547	Off	24-06-2026 09:54:36	24-06-2026 09:45:00
GORAKHPUR	EUDC GORAKHPUR	EUDC II BUXIPUR	EDSD INDUSTRIAL ESTATE	INDUSTRIAL ESTATE	Urban	11KV GORAKHNATH EAST, 4357122014GDE	CE8836598	Off	24-06-2026 08:34:11	24-06-2026 10:00:00
GORAKHPUR	EUDC GORAKHPUR	EUDC IV GORAKHPUR	EUDSD RAPTNAGAR	MEDICAL COLLEGE NEW	Urban	11KV MEDICAL COLLEGE	CE8836609	Off	16-05-2026 18:54:38	16-05-2026 18:45:00
BASTI	EDC SANT KABIR NAGAR	EDC KHALILABAD	EDSD MAGHAR	KHALILABAD	Rural	11KV MAGHAR KATU MLL, 4357110588MAG	CE8836826	Off	24-06-2026 10:06:39	24-06-2026 10:00:00



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Data-Driven Decisions



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REAL TIME SUPPLY MONITORING

-  **1. Outage Workforce**
-  **2. Smart meter**
-  **3. Transmission**

4.  **Daily Log Book**

5.  **Workshop DT**

	Data Source	Smart Meter
	Data Entry	Through API
	Captured Data	Outage Events
	Updation	Real-Time

ACTIONABLE INPUTS

- 1 No. of fault**
- 2 Fault Duration**
- 3 SAIFI SAIDI**

2.2 Smart Meter

Real-Time Dashboard

Real Time Dashboard from Smart Meter Data



**Data indicates various Outages of Power element.
This helps to improve better serve of electricity.**

Filter Panel

Discom, Cluster
All

Zone
All

Circle Name
All

Division name
All

Sub-Division Name
All

Sub-Station Name
All

Feeder Category
All

Total Feeders
3,999

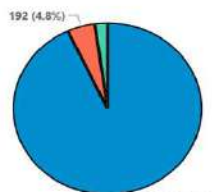
Power ON/DI OFF/Power OFF
3721/192/86

Last Refresh Time: 24-Jun-2026 10:18:12 AM

Communicated Feeder Bifurcation

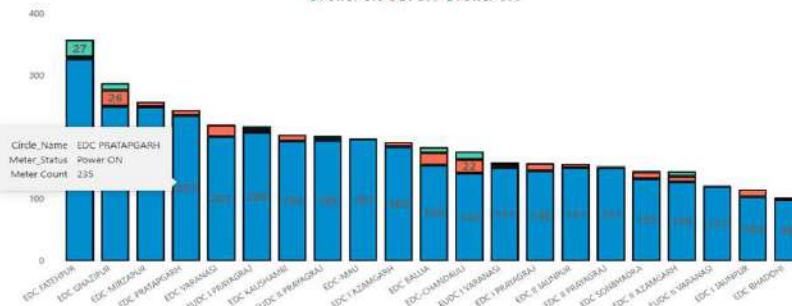
Power ON and Power OFF

Power ON DI OFF Power OFF



Communicated Feeder Circle Bifurcation

Power ON DI OFF Power OFF



Cluster	Zone	Circle Name	Division Name	Sub-Division Name	Sub-Station Name
Triveni	PRAYAGRAJ 1	EUDC II PRAYAGRAJ	EUDD MEOHALL	EUDSD CIVIL LINE	CIVIL LINES_40063
Kashi	AZAMGARH	EDC I AZAMGARH	EDD SAGADI, AZAMGARH	4260123-EDSD MAHARAJGANJ	33/11 KV KAPASA
Kashi	AZAMGARH	EDC I AZAMGARH	EDD AZAMGARH	4260112-EDSD CHANDESWAER	33/11 KV CHANDESHAR
Triveni	PRAYAGRAJ 1	EUDC I PRAYAGRAJ	EUDD NAINI	EUDSD JHUNSI	AWAS VIKAS JHUNSI_40046
Kashi	AZAMGARH	EDC I AZAMGARH	EDD AZAMGARH	4260112-EDSD CHANDESWAER	33/11 KV KOTWA
Kashi	VARANASI 1	EDC VARANASI	EDD HARAHUA, VARANASI	EDSD III BARAGAON	33/11 KV ANEI



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REAL TIME SUPPLY MONITORING

-  **Outage Workforce**
-  **Smart meter**
-  **Transmission**
-  **Daily Log Book**
-  **Workshop DT**

	Data Source	Entry form on SIS.
	Data Entry	SSO / JE (Transmission)
	Captured Data	Outage Events
	Updation	Near Real-Time

ACTIONABLE INPUTS

- No. of fault**
- Type of fault**
- Cause of fault**
- Fault Duration**
- Expected Uptime etc.**

3. Transmission

Real-Time Dashboard
Generated from SIS Entry Form



Data indicates various Outages of 33 kV & above Voltage level outages of Power element.


SUBSTATION INFORMATION SYSTEM
Transmission Outage Dashboard





From Date: dd-Mon-yyyy
To Date: dd-Mon-yyyy
Circle: --Select--
Division: --Select--
Outage Status: --Select--

Zone: --Select--
Transmission Substation: --Select--

251
Total

0
Scheduled Rostering

13
Emergency Rostering

151
Tripping

14
Shutdown/Breakdown (Transmission)

73
Shutdown/Breakdown (Distribution)

Details

OUTAGE_DATI	OUTAGE_DATI	RESTORATION	TRANSMISSIC	CIRCLE	TRANS_DIVIS	PRIMARY_SOI	THREETHREE	OUTAGE TYPE	ESTIMATED OUTAGE DURATION	REMARKS	CLOSING_DAI	MOBILE NO	CLOSING_REP	ACTUAL_OUTA
24-06-2026 13:06:49	23-06-2026 00:15:00	24-06-2026 12:00:00	TSE PRAYAGRAJ	ETC PRAYAGRAJ-I	ETD-I PRAYAGRAJ	132 KV SAIDABAD	33 KV BAJAHA MIS	Emergency Rostering	1 H 45 M	Close	24-06-2026 18:04:53	9621750746	feeder normal	1 Days 11 Hours 45 Minutes
24-06-2026 13:06:49	23-06-2026 00:15:00	24-06-2026 12:00:00	TSE PRAYAGRAJ	ETC PRAYAGRAJ-I	ETD-I PRAYAGRAJ	132 KV SAIDABAD	33 KV BAMEILA	Emergency Rostering	1 H 45 M	Close	24-06-2026 18:05:30	9621750746	feeder normal	1 Days 11 Hours 45 Minutes
24-06-2026 13:06:49	23-06-2026 00:15:00	24-06-2026 12:00:00	TSE PRAYAGRAJ	ETC PRAYAGRAJ-I	ETD-I PRAYAGRAJ	132 KV SAIDABAD	33 KV GHARAGHANPU R	Emergency Rostering	1 H 45 M	Close	24-06-2026 18:06:12	9621750746	feeder normal	1 Days 11 Hours 45 Minutes
24-06-2026 18:29:47	24-06-2026 18:24:00	24-06-2026 00:00:00	TSE PRAYAGRAJ	ETC VARANASI-II	ETD-II VARANASI	132 KV SADAT	33 KV SIRGITHA	Emergency Rostering	0 H 5 M	changeover 33kv Tbc	24-06-2026 18:31:09	8601615238	Normal self Breaker	0 Days -18 Hours -24 Minutes
24-06-2026 17:43:42	24-06-2026 17:28:00	24-06-2026 01:00:00	TSE PRAYAGRAJ	ETC VARANASI-I	ETD-I VARANASI	132 KV DLW	33 KV DPH	Emergency Rostering	H M	33kv dph je informed cable burning so cb open	24-06-2026 18:43:44	8004924632	sd return by je dph rakesh yadav	0 Days -16 Hours -28 Minutes
24-06-2026 19:27:37	24-06-2026 07:40:00	24-06-2026 00:00:00	TSE PRAYAGRAJ	ETC VARANASI-II	ETD-II VARANASI	132 KV SADAT	33 KV SIRGITHA	Emergency Rostering	0 H 5 M	due to over load, changeover 33kv Tbc	24-06-2026 19:30:00	8601615238	Total Load of 33 kv TBC	0 Days -7 Hours -40 Minutes
24-06-2026 00:31:09	23-06-2026 23:45:00	24-06-2026 00:00:00	TNE GORAKHPUR	ETC AZAMGARH	ETD MAU	132 KV MAU NFW	33 KV KOTWA (BADHUWA)	Emergency Rostering	H 25 M	heavy Wind	24-06-2026 00:34:51	9453043664	Normal	0 Days 0 Hours 15 Minutes



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Data-Driven Decisions



24x7 Consumer

REAL TIME SUPPLY MONITORING

-  **1. Outage Workforce**
-  **2. Smart meter**
-  **3. Transmission**

-  **4. Daily Log Book**

-  **5. Workshop DT**

	Data Source	Entry form on SIS.
	Data Entry	JE (DISTRIBUTION)
	Captured Data	Max/Min Volt./Curr.
	Updation	Periodic

ACTIONABLE INPUTS

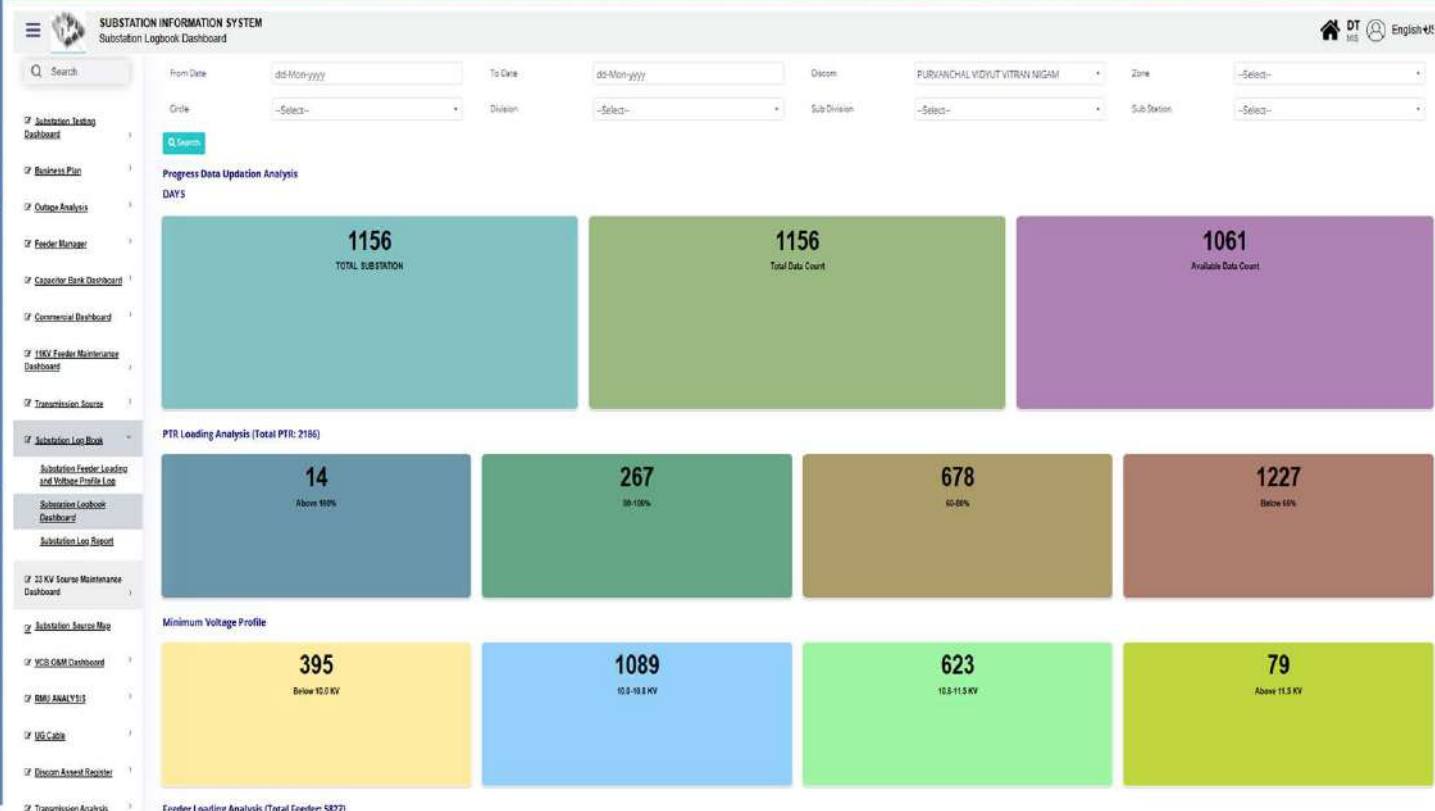
- 1. Prevent Overloading**
- 2. Voltage Regulation**
- 3. Predictive Maintenance Scheduling**
- 4. Optimize Field Workforce Deployment**
- 5. Data-Driven (CapEx) Planning**

4. Daily Log Book

Dashboard
Generated from SIS Entry Form



Data indicates Max. Current & Max/Min Voltage of PTR's & 11 kV Feeders.



REAL TIME SUPPLY MONITORING

-  **1. Outage Workforce**
-  **2. Smart meter**
-  **3. Transmission**

4.  **Daily Log Book**

5.  **Workshop DT**

	Data Source	Entry form on SIS.
	Data Entry	JE/AE WORKSHOP
	Captured Data	DT Damage related Data
	Updation	Periodic

ACTIONABLE INPUTS

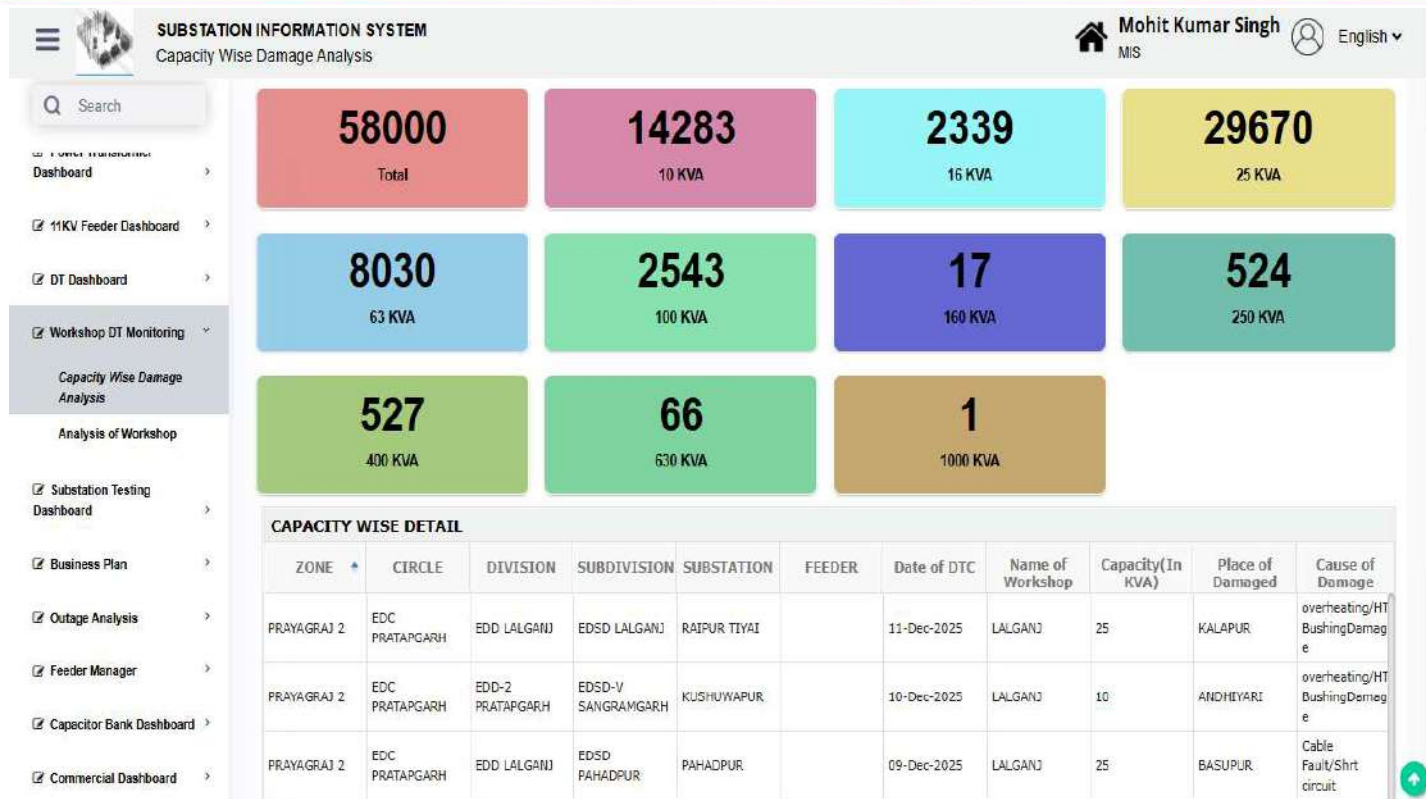
- 1 Root Cause Analysis**
- 2 Overloaded DTs Identified**
- 3 Repeat Failure Locations**
- 4 Preventive Action Required.**
- 5 DTs Awaiting Replacement**

5. DT Capacity Wise Damage Analysis

Dashboard
Generated from SIS Entry form



Data indicates various DT Damage Analysis to find out the possible route cause of DT damage to prevent of further loss & outages.





2. MAINTENANCE MONITORING



1. DT Survey Exception Dashboard

Dashboard
Generated from SIS Entry form



Data indicates various Exception of install DTs. This helps to maintain DT health & plan regular/routine activity as per visual/test survey to maintain DTs trouble free.

MAINTENANCE MONITORING		
1. DT Module	2. VCB	3. Sub Station
4. 33 KV Lines	5. 11 KV Lines	6. Capacitor Bank
7. RMU	8. Power Transformer	

	Data Source	Entry form on SIS.
	Data Entry	Lineman / JE/ AE
	Captured Data	DT Survey
	Update	Periodic

ACTIONABLE INPUTS	
1	High Priority Exceptions
2	Survey Pending DTs
3	Exception Resolution Status
4	Peak hours Load Analysis
5	Missing DT Details

Substation Information System

DT Survey Exception Dashboard

Q Search

Circle: --Select--

Division: --Select--

Sub Division: --Select--

Sub Station: --Select--

Feeder: --Select--

DT Capacity: --Select--

Q Search

DT Exception Analysis

1156

Total Substation

5827

Total Feeder

583751

Total DT

1144

Updated Substation

4670

Updated Feeder

205070

Updated DT

277727

Pending Exceptions

45600

SILICA GEL/BREATHERS ISSUES

17076

LONG TERMinals RELATED ISSUES

65124

LA RELATED ISSUES

7659

UNBALANCING

11436

VEGETATION STATUS

11144

HT Protection

30358

LT Protection

16639

BODY EARTHING

22389

NEUTRAL EARTHING

20096

FOUNDATION/PLINTH DAMAGED

17640

OIL RELATED ISSUES

12572

BUSHINGS DAMAGED

DT Exception Details

ENTRY DATE	ZONE	CIRCLE	DIVISION	SUBDIVISION	SUBSTATION	FEEDER	DT_CAPACITY	DT_NAME	LOCATION_OF_DT	PROTECTION	STATUS
16-09-2025 12:31:47	GORAKHPUR 1	EUDD GORAKHPUR	EUDD-1 GORAKHPUR	EUDD-11 GOLGHAR	Lohiya Enclave	Dangipar	16	KONA DIH	KONA DIH	BALANCING	No
10-02-2026 09:50:22	GORAKHPUR 1	EDC-II GORAKHPUR	EDD KAIRIRAM	EDSD KAIRIRAM	KAIRIRAM	BAJDAULI	63	PARESAPAR 0	PARESAPAR 0	BALANCING	No
22-02-2026 14:45:36	AZANGARH	EDC-II AZANGARH	EDD-4 PHOOLPUR	EDSD PAWAI	BAGBAHAR	KALAN	63	KALAN	KALAN	BALANCING	No
22-02-2026 14:46:53	AZANGARH	EDC-II AZANGARH	EDD-4 PHOOLPUR	EDSD PAWAI	BAGBAHAR	KALAN	63	GAY ME ROAD KE KINARE	DANAPUR	BALANCING	No
16-09-2025 14:38:36	BASTI	EDC BASTI	EDD-1 BASTI	EDSD-1 BASTI	33 KV PURANI BASTI	DAKSHIN DARWAZA	100	TATA MOTOR	TATA MOTOR	BALANCING	No

Reliable Supply | Digital Workforce | Data-Driven Decisions | 24x7 Consumer



MAINTENANCE MONITORING		
1.  DT Module	2.  VCB	3.  Sub Station
4.  33 KV Lines	5.  11 KV Lines	6.  Capacitor Bank
7.  RMU	8.  Power Transformer	

	Data Source	Entry form on SIS.
	Data Entry	Vendor / SDO / SE
	Captured Data	VCB Related Data
	Updation	Periodic

ACTIONABLE INPUTS	
1	Installation Status
2	VCB Health Status
3	Quarterly Inspection Due
4	High-Risk VCBs
5	Resolution Progress

2. VCB



Data indicates VCB installation/updation status, quarterly inspection schedules, delayed inspections, asset-wise non-working status, technical exception categorization, and pending-versus-resolved resolution metrics.

Dashboard

Generated from SIS Entry form



Reliable Supply



Digital Workforce



Data-Driven Decisions



24x7 Consumer



MAINTENANCE MONITORING

1.  DT Module	2.  VCB	3.  Sub Station
4.  33 KV Lines	5.  11 KV Lines	6.  Capacitor Bank
7.  RMU	8.  Power Transformer	

	Data Source	Entry form on SIS.
	Data Entry	SSO / JE
	Captured Data	Outage Events
	Updation	Periodic

ACTIONABLE INPUTS

1	Critical Deficiencies Identified
2	High-Risk Substations
3	Annual Testing Compliance
4	Testing Pending
5	Resource Requirement

3. SUBSTATION

Dashboard

Generated from SIS Entry form



Data indicates various shortcoming observed during testing log here for further resolution/planning. This helps to maintain healthy system with streamline efforts.

- ☒ Power Transformer Dashboard
- ☒ 11KV Feeder Dashboard
- ☒ DT Dashboard
- ☒ DT Proposal (C/Additional)
- ☒ Workshop DT Monitoring
- ☒ Substation Testing Dashboard
- ☒ Test Report Shortcoming Analysis
- ☒ Resolved Shortcoming Analysis
- ☒ Substation Testing Progress Analysis
- ☒ Substation Testing Plan Entry Form
- ☒ Business Plan
- ☒ Outage Analysis
- ☒ Feeder Manager
- ☒ Capacitor Bank Dashboard

101 33KV CRP Unhealthy	22 11KV Circuit Breaker Unhealthy	8 11KV CT Unhealthy	8 11KV PT Unhealthy
36 OT/WTI Unhealthy	1 BUCHOLZ Unhealthy	58 Silica Gel Pink	10 Isolator Related Issue
97 LA Related Issue	53 Oil Level Low	1 Oil Leakage From CT	2 Oil Leakage From PT
33 Oil Leakage From PTR	4 Earthing Related Issue	5 Oil BDV Low	1 Spare Cable Related Issue
68 Capacitor Bank Related Issue	11 Equipment (CT/PT/CB etc. not Installed)	234 Other Shortcomings	



Reliable Supply



Digital Workforce



Data-Driven Decisions



24x7 Consumer



Dashboard

Generated from SIS Entry form

4.1 33KV Lines



Data indicates 33 KV Source for Sub Station. This helps in planning for increasing reliability. Module also provide maintenance related exceptions of 33 kv lines, maximum load & Tripping etc.

MAINTENANCE MONITORING

1. DT Module

2. VCB

3. Sub Station

4. 33 KV Lines

5. 11 KV Lines

6. Capacitor Bank

7. RMU

8. Power Transformer

	Data Source	Entry form on SIS.
	Data Entry	EE / JE
	Captured Data	33 kv Line Related Data
	Updation	Periodic

ACTIONABLE INPUTS

1. Single Source Substations

2. Critical 33 kv Lines

3. 33 kv Line Maintenance Due

4. Breakdown-Prone 33 kv Lines

5. Pending Corrective Actions

SUBSTATION INFORMATION SYSTEM
33KV Source Analysis

Search

Discom: PURVANCHAL VIDYUT NIGAM LTD. Zone: --Select-- Circle: --Select-- Division: --Select--

Sub Division: --Select-- Substation: --Select-- Search

Substation Information

33KV Dashboard

33KV Source Analysis

33KV Line Load Analysis

33KV Line Length Analysis

33KV Line Conductor Analysis

33KV Line Analysis having More Than One SubStation

33 KV Circuit Breaker Analysis

Primary Source-Feeding Substation Analysis

Power Transformer Dashboard

11KV Feeder Dashboard

DT Dashboard

Mohit Kumar Singh MIS

English

1312

TOTAL

959

Single 33KV Source Substation

145

Double 33KV Source Substation

21

Triple 33KV Source Substation

33 KV FEEDER DETAIL

Zone	Circle	Division	Sub Division	Sub Station	Primary Source Name	Source Name	View Substation
GORAKHPUR 1	EDC GORAKHPUR	EDD-1 GORAKHPUR	EDSD-1 MOHADDIPUR RURAL	FCI (SECTOR)	132 KLV S/S FCI, Gorakhpur	05 MVA T/F-I	View Substation
GORAKHPUR 1	EDC GORAKHPUR	EDD-1 GORAKHPUR	EDSD-1 MOHADDIPUR RURAL	FCI (SECTOR)	132 KLV S/S FCI, Gorakhpur	05 MVA T/F-II	View Substation
GORAKHPUR 1	EDC GORAKHPUR	EDD-1 GORAKHPUR	EDSD-2 PIPARICH	JAGDISHPUR	132 KLV S/S FCI, Gorakhpur	City	View Substation
GORAKHPUR 1	EUCC GORAKHPUR	EUDD-2 GORAKHPUR	EUDD-4 BUXIPUR	INDUSTRIAL STATE	132 KLV S/S FCI, Gorakhpur	City	View Substation
GORAKHPUR 1	EUCC GORAKHPUR	EUDD-2 GORAKHPUR	EUDD-3 BUXIPUR	DURGA BANI	132 KLV S/S FCI, Gorakhpur	Durgabari	View Substation
GORAKHPUR 1	EUCC GORAKHPUR	EUDD-2 GORAKHPUR	EUDD-6 SURAJKUND	SURAJKUND	132 KLV S/S FCI, Gorakhpur	Durgabari	View Substation



Reliable Supply



Digital Workforce



Data-Driven Decisions



24x7 Consumer



MAINTENANCE MONITORING

- DT Module
- VCB
- Sub Station
- 33 KV Lines
- 11 KV Lines
- Capacitor Bank
- RMU
- Power Transformer

4.2 33KV Lines

Dashboard

Generated from SIS Entry form



Data indicates 33 KV Line Peak Load & type of conductor. This helps in planning for Addition of 33/11kV Substation, load bifurcation to increasing reliability



SUBSTATION INFORMATION SYSTEM 33KV Line Load Analysis



Mohit Kumar Singh
MIS

English

Search

Discom

PURVANCHAL VID*

Zone

--Select--

Circle

--Select--

Division

--Select--

Substation Information

33KV Dashboard

33KV Source Analysis

33KV Line Load Analysis

33KV Line Length Analysis

33KV Line Conductor Analysis

33KV Line Analysis having More Than One SubStation

33 KV Circuit Breaker Analysis

Primary Source-Feeding Substation Analysis

Power Transformer Dashboard

11KV Feeder Dashboard

DT Dashboard

369

Total

40

ACSR Panther

320

ACSR Dog

4

ACSR Weasel

5

ACSR Rabbit

DETAILS

ZONE	CIRCLE	DIVISION	SUBDIVISION	SUBSTATION	NAME OF CONDUCTOR	MAXIMUMLOAD	NAME OF 33KV FEEDER
AZAMGARH	EDC-II AZAMGARH	EDD-4 PHOOLPUR	EDSD SARAI MEER	SARAI MEER	ACSR Dog	375	Faridabad
AZAMGARH	EDC BALLIA	EDD-1 BALLIA	EDSD-IV BELTHRA	BELTHRA ROAD	ACSR Dog	400	Belthra Road
AZAMGARH	EDC-I AZAMGARH	EDD-2 AZAMGARH	EDSD-II JEANPUR	LATGHAT	ACSR Dog	385	Latghat-II
AZAMGARH	EDC-II AZAMGARH	EDD-4 PHOOLPUR	EDSD SARAI MEER	KHUTAU LI	ACSR Dog	94	Khutauli
AZAMGARH	EDC-II AZAMGARH	EDD-4 PHOOLPUR	EDSD SARAI MEER	CHHAUN	ACSR Dog	220	Thekma
AZAMGARH	EDC BALLIA	EDD-4 BALLIA	EDSD-SAHATWAR	SAHATWAR	ACSR Dog	165	Sahatwar
AZAMGARH	EDC MAU	EDD-3 GHOSI	EDSD-II MADHUBAN	MOLNAPUR	ACSR Dog	258	Madhuban
AZAMGARH	EDC-I AZAMGARH	EDD-2 AZAMGARH	EDSD-I BILARIAGANJ	MAU KUTUBPU	ACSR Dog	390	Latghat-II



Reliable Supply



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Data-Driven Decisions



24x7 Consumer



Dashboard
Generated from SIS Entry form

5.1 11 kV Lines

Data indicates various Exception of install 11kV Feeders. This helps to maintain 11kV Feeders health & plan regular/routine activity as per visual/test survey to maintain 11kV feeder trouble free.

Q Search

From Date dd-Mon-yyyy

To Date dd-Mon-yyyy

Zone --Select--

Circle --Select--

Division --Select--

Subdivision --Select--

Substation --Select--

Feeder --Select--

Feeder Sections --Select--

Q Search

11KV Feeder Survey Updation Status

1156

Total Substation

5827

Total Feeder

71014

Total Feeder Sections

1149

Updated Substation

5241

Updated Feeder

49502

Updated Section

11KV Feeder Section Exception Analysis

16783

Pending Exceptions

1623

Vegetation Clearance Tree Branches

2087

Foundation Stays in Good Condition

603

Cable Condition

597

Conductor Condition

660

Pole Structure Condition

918

Conductor Sag Clearance Maintained

684

Insulator Condition Burst Cracked

832

Jumpers Connectors Tight Free Form

8779

Guarding Arrangement Cradle V Guard

Details

ENTRYDATE *	ZONE	CIRCLE	DIVISION	SUBDIVISION	SUBSTATION	FEEDER	TYPE OF SECTION	LINE_LENGTH_IN	LOCATION OF SECTION	STATUS
30-09-2025 15:16:22	BASTI	EDC SIDDHARTH NAGAR	EDD-2 DUMARIYAGANG	EDSD ITWA II	KATHAUTIYA	BISKOCHAR	NORMAL SECTION	2.3	POWER HOUSE GATE	NOT OK
30-09-2025 20:12:15	GORAKHPUR 2	EDC DEORIA	EDD GAURI BAZAR	EDSD DESHI DEORIA	DESAHI DEORIA	PAKRI	ROAD CROSSING (OH)	1.5	CHANDPUR CHAURAH	NOT OK
30-09-2025 20:49:37	GORAKHPUR 2	EDC DEORIA	EDD GAURI BAZAR	EDSD DESHI DEORIA	DESAHI DEORIA	PAKRI	ROAD CROSSING (OH)	1.5	CHANDPUR CHAURAH	NOT OK

MAINTENANCE MONITORING

1.



DT Module

2.



VCB

3.



Sub Station

4.



33 KV Lines

5.



11 KV Lines

6.



Capacitor Bank

7.



RMU

8.



Power Transformer



Data Source

Entry form on SIS.



Data Entry

JE / Lineman



Captured Data

Outage Events



Updation

Real-Time



ACTIONABLE INPUTS

1

Feeder Health Status

2

High-Risk Feeders

3

Inspection Compliance

4

Safety Deficiencies

5

Priority Action Plan



Reliable Supply



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Data-Driven Decisions



24x7 Consumer



MAINTENANCE MONITORING

1. 
DT Module

2. 
VCB

3. 
Sub Station

4. 
33 KV Lines

5. 
11 KV Lines

6. 
Capacitor Bank

7. 
RMU

8. 
Power Transformer

	Data Source	Entry form on SIS / Backend
	Data Entry	EE TEST / BACKEND
	Captured Data	11 kV feeders Supply related information
	Updation	Periodic

ACTIONABLE INPUTS

1 Substation & Feeder Mapping Status

2 Smart Meter Coverage

3 Feeder Type-wise Analysis

4 Supply Hours Compliance

5 Industrial Feeder Performance

5.2 11 kV Lines



Data indicates substation and feeder mapping totals, feeder smart meter installation analysis, categorizations by feeder type (urban, rural, agricultural, industrial), and supply hours wise metrics.



SUBSTATION INFORMATION SYSTEM
Feeder Supply Dashboard

Search

33KV Dashboard

Power Transformer Dashboard

11KV Feeder Dashboard

DT Dashboard

DT Proposal (IC/Additional)

Workshop DT Monitoring

Substation Testing Dashboard

Business Plan

Outage Analysis

Feeder Manager

Feeder Head Entry Form

Feeder Manager Head Dashboard

Substation Employee Dashboard

Feeder Supply Category Entry Form

Feeder Manager Entry Form

Feeder Supply Dashboard

Feeder Code Entry Form

Capacitor Bank Dashboard

Home

Divesh Bhaskar

MIS

English

4K

1156
Total Substation

5827
Total Feeder

1149
Updated Substation

5785
Updated Feeder

4697
Smart Meter Installed

1087
Smart Meter Not Installed

4767
Smart Meter No. - Updated

986
Smart Meter No. - Not Updated

1128
Urban

293
Tahsil

2995
Rural

359
Agriculture

145
Independent Industrial

236
Independent Non Industrial

98
Industrial

530
Substation Feeder

334
10 Hours

2872
18 Hours

62
20 Hours

348
21.5 Hours

2168
24 Hours



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Data-Driven Decisions



24x7 Consumer



MAINTENANCE MONITORING		
1. DT Module	2. VCB	3. Sub Station
4. 33 KV Lines	5. 11 KV Lines	6. Capacitor Bank
7. RMU	8. Power Transformer	

Data Source	Entry form on SIS.
Data Entry	EE Test
Captured Data	Working / AMC status etc.
Updation	Periodic

ACTIONABLE INPUTS	
1	Installation Status
2	Operational Status
3	Capacity-wise Analysis
4	AMC Coverage Status
5	AMC TKC Performance

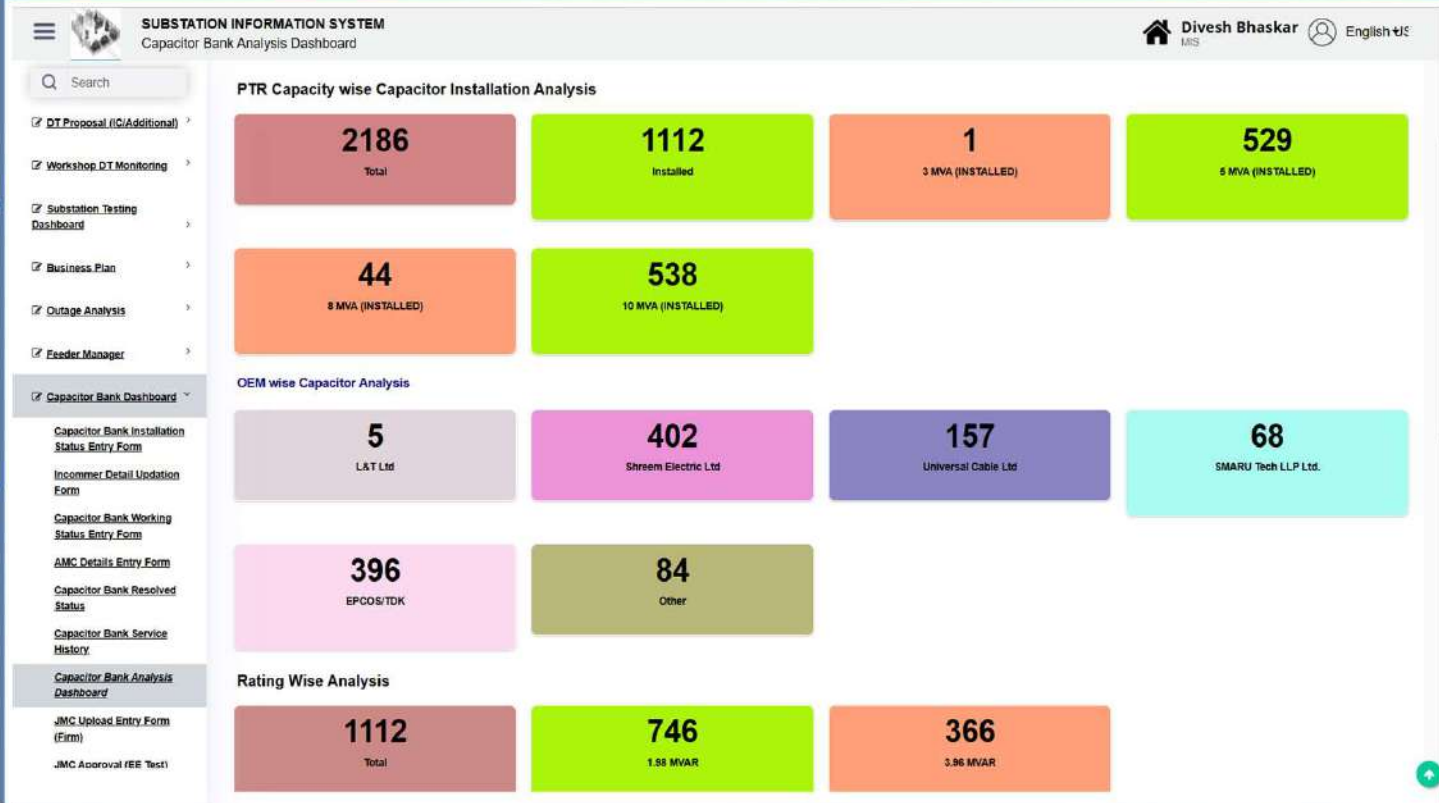
6. Capacitor Bank Dashboard

Dashboard

Generated from SIS Entry form



Data indicates PTR capacity-wise Capacitor Bank installations, OEM and rating-wise metrics, structure types, non-working breakdown analysis (firm/issue-wise), AMC coverage status, and operational aging analysis.



Reliable Supply



Digital Workforce



Data-Driven Decisions



24x7 Consumer



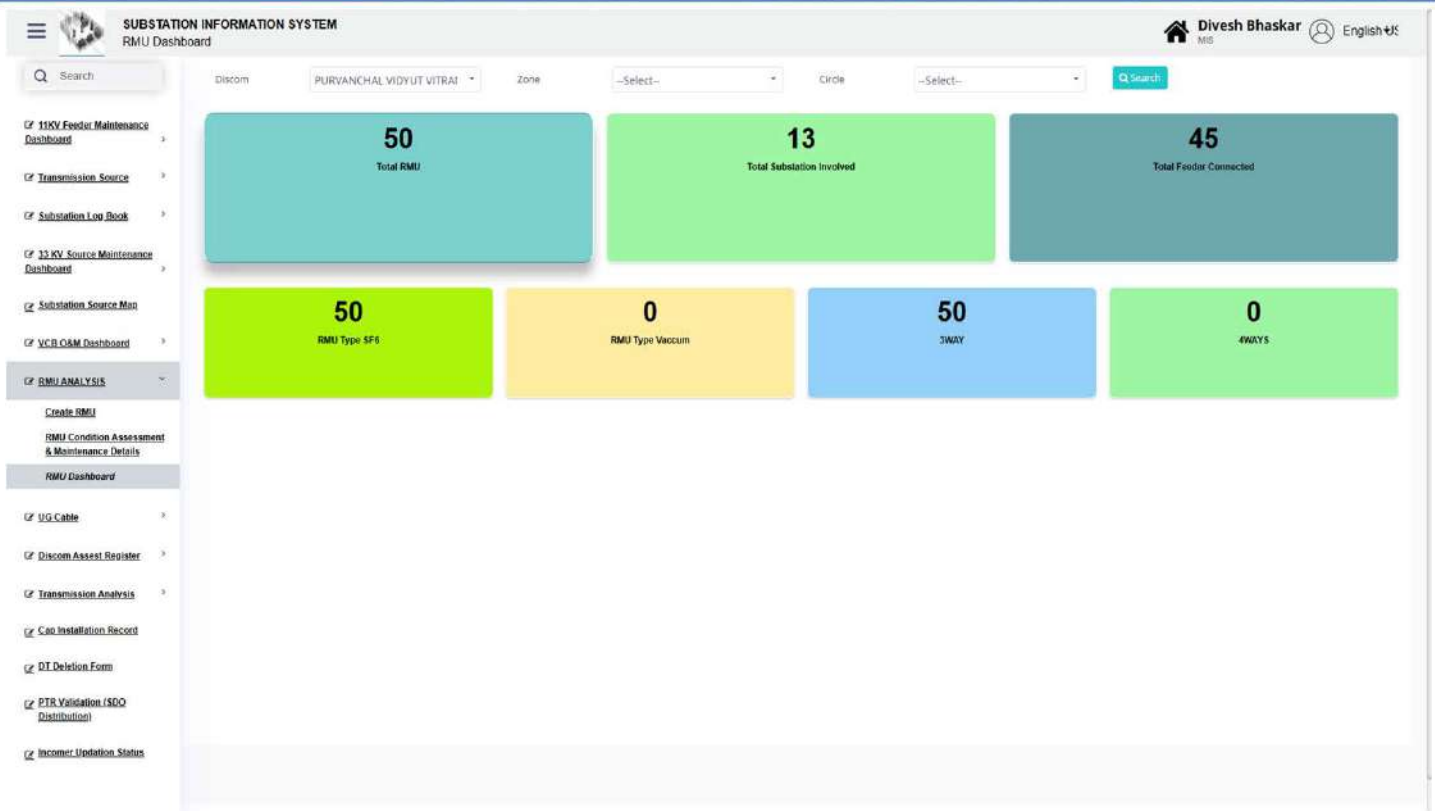
MAINTENANCE MONITORING		
1.  DT Module	2.  VCB	3.  Sub Station
4.  33 KV Lines	5.  11 KV Lines	6.  Capacitor Bank
7.  RMU	8.  Power Transformer	

	Data Source	Entry form on SIS.
	Data Entry	EE
	Captured Data	RMU Installation / Working Data
	Updation	Periodic

ACTIONABLE INPUTS	
1	RMU Health Status
2	3-Way / 4-Way Configuration
3	Critical Operational Exceptions
4	Inspection Pending
5	Ageing RMUs

7. RMU

 Data indicates RMU configuration way-metrics (3-Way/4-Way) and handles critical operational data..





MAINTENANCE MONITORING

1.  DT Module
2.  VCB
3.  Sub Station
4.  33 KV Lines
5.  11 KV Lines
6.  Capacitor Bank
7.  RMU
8.  Power Transformer

	Data Source	Entry form on SIS.
	Data Entry	SE STORE
	Captured Data	PTR Failure Related Data
	Updation	Periodic

ACTIONABLE INPUTS

1. Root Cause Analysis
2. OEM-wise Failure Analysis
3. Failure Trend
4. Warranty/Guarantee failures
5. Reliability Improvement Plan

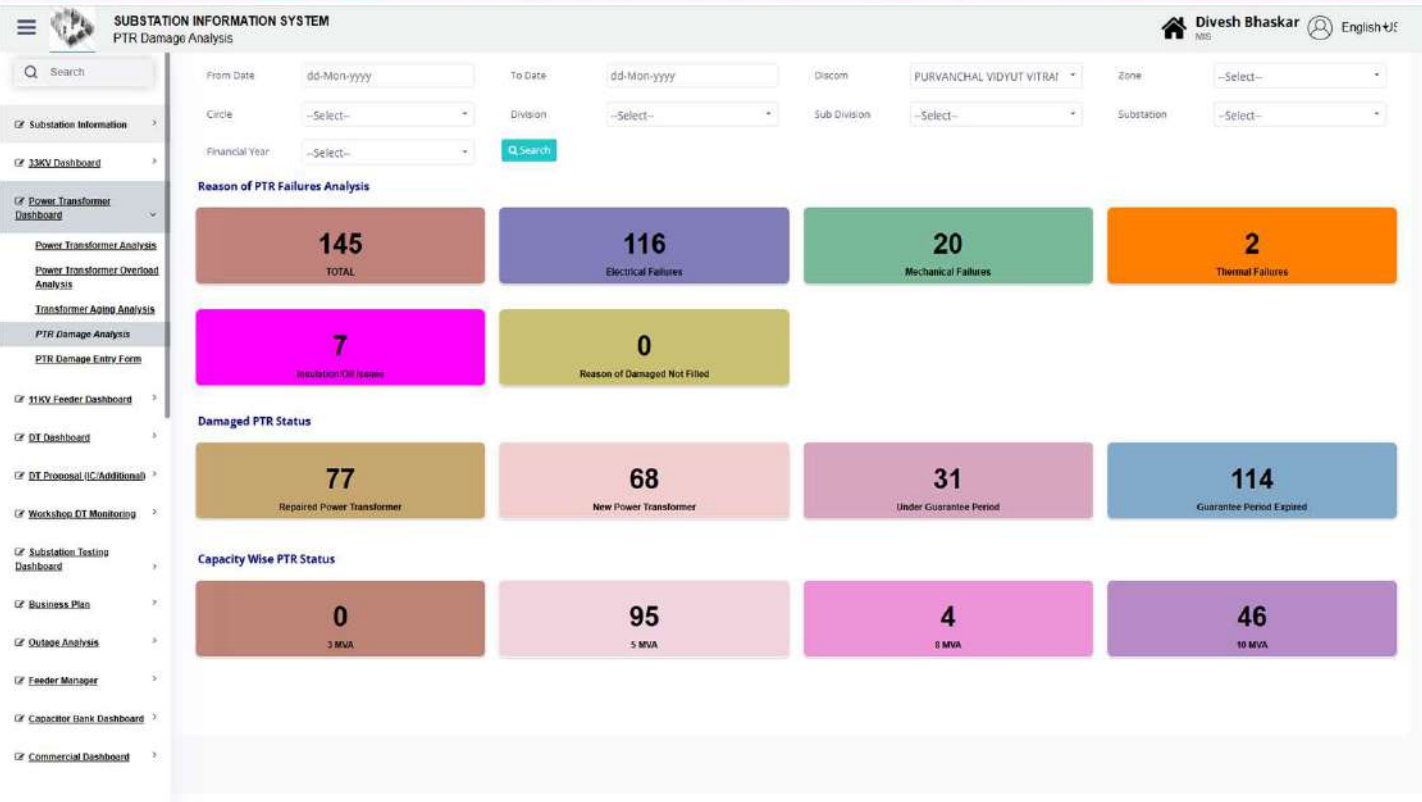
8. POWER TRANSFORMER



Data indicates provides data on capacity wise installation of PTR at Different SS, reasons for power transformer failures (electrical, mechanical, thermal, insulation), damaged PTR replacement status, guarantee period timelines, and capacity-wise status tracking.

Dashboard

Generated from SIS Entry form



Reliable Supply



Digital Workforce



Data-Driven Decisions



24x7 Consumer



3. COMMERCIAL DATA ANALYSIS

COMMERCIAL DATA ANALYSIS

(AT&C, Through Rate, Line Loss, Exceptions)

1.



Substation wise

2.



Feeder wise

3.



AI Analytics
On DT/Consumer Data



Data Source

Backend



Data Entry

Backend



Captured Data

Commercial
Parameters



Updation

Monthly Basis



ACTIONABLE INPUTS

1

Substations Requiring Improvement

2

Monthly Performance Trend

3

Target vs Achievement

4

Theft-Prone Areas

5

Priority Action Areas

1. SUBSTATION WISE



Data indicates monthly commercial performance metrics segmented by percentage slabs, covering line losses, AT&C losses, collection efficiency categories, and turnup slab metrics on Substation Level.

Dashboard

Generated from Backend Data



SUBSTATION INFORMATION SYSTEM

Substation Loss Analysis

Divesh Bhaskar

M3

English

Search

Discom

PURVANCHAL VIDYUT VITRAI

Zone

--Select--

Circle

--Select--

Division

--Select--

Subdivision

--Select--

Substation

--Select--

Financial Year

2026-27

Month

APRIL

Search

1156

TOTAL SUBSTATION

Line Loss Slab : April

126

Below 10%

42

(10-15)%

208

(15-30)%

379

(30-50)%

213

Above > 50 %

145

Abnormal

AT & C Slab : April

86

Below 10%

28

(10-15)%

143

(15-30)%

277

(30-50)%

504

Above > 50 %

75

Abnormal

Collection Efficiency Slab : April

3

Below 10%

55

(10-30)%

291

(30-60)%

246

(60-80)%

518

Above 80%

0

Abnormal

Turnup Slab : April

79

Below 10%

325

(10-20)%

450

(20-40)%

127

(40-60)%

127

(60-80)%

5

Above 80%



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Data-Driven Decisions



24x7 Consumer

(AT&C, Through Rate, Line Loss, Exceptions)

1. 
2. 
3. 

Substation wise	Feeder wise	AI Analytics On DT/Consumer Data
-----------------	-------------	-------------------------------------

	Data Source	Backend
	Data Entry	Backend
	Captured Data	Commercial Parameters
	Updation	Monthly Basis

ACTIONABLE INPUTS

- 1 Feeders Requiring Improvement
- 2 Monthly Performance Trend
- 3 Target vs Achievement
- 4 Theft-Prone Areas
- 5 Priority Action Areas

Data indicates monthly commercial performance metrics segmented by percentage slabs, covering line losses, AT&C losses, collection efficiency categories, and turnup slab metrics on Feeder Level.

Generated from Backend Data



Substation Information

11kV Dashboard

Power Transformer Dashboard

11kV Feeder Dashboard

DT Dashboard

DT Proposal (IC) Additional

Workshop DT Monitoring

Substation Testing Dashboard

Business Plan

Outage Analysis

Feeder Manager

Capacitor Bank Dashboard

Commercial Dashboard

Substation Loss Analysis Dashboard

Feeder Loss Analysis Dashboard

11kV Feeder Maintenance Dashboard

Transmission Source

Substation Information System

Feeder Loss Analysis Dashboard

Om Narayan

English

5036

Updated Feeder Line Loss

Line Loss Slab : March

566

Below 10%

188

(10-15%)

605

(15-30%)

958

(30-50%)

1799

Above > 50 %

920

Abnormal

AT & C Slab : March

413

Below 10%

128

(10-15%)

453

(15-30%)

815

(30-50%)

2619

Above > 50 %

608

Abnormal

Collection Efficiency Slab : March

248

Below 10%

169

10-30%

888

30-60%

1271

60-80%

2460

Above 80%

Thru Rate Slab : March

1527

Below 1.5

476

1.5-2

788

2-3

540

3-4

416

4-5

316

5-6

Turnup Slab : March

239

6-7

734

Above 7

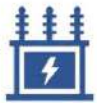
0

Abnormal

COMMERCIAL DATA ANALYSIS

(AT&C, Through Rate, Line Loss, Exceptions)

1.



Substation wise

2.



Feeder wise

3.



AI Analytics
On DT/Consumer Data



Data Source

Through API



Data Entry

Through API



Captured Data

Theft & Other
Anomaly Detection



Updation

Periodic Data



ACTIONABLE INPUTS

1

Suspected Energy Theft

2

Abnormal Consumer Usage

3

Priority Field Verification

4

Commercial Loss Hotspots

5

High-Risk DTs

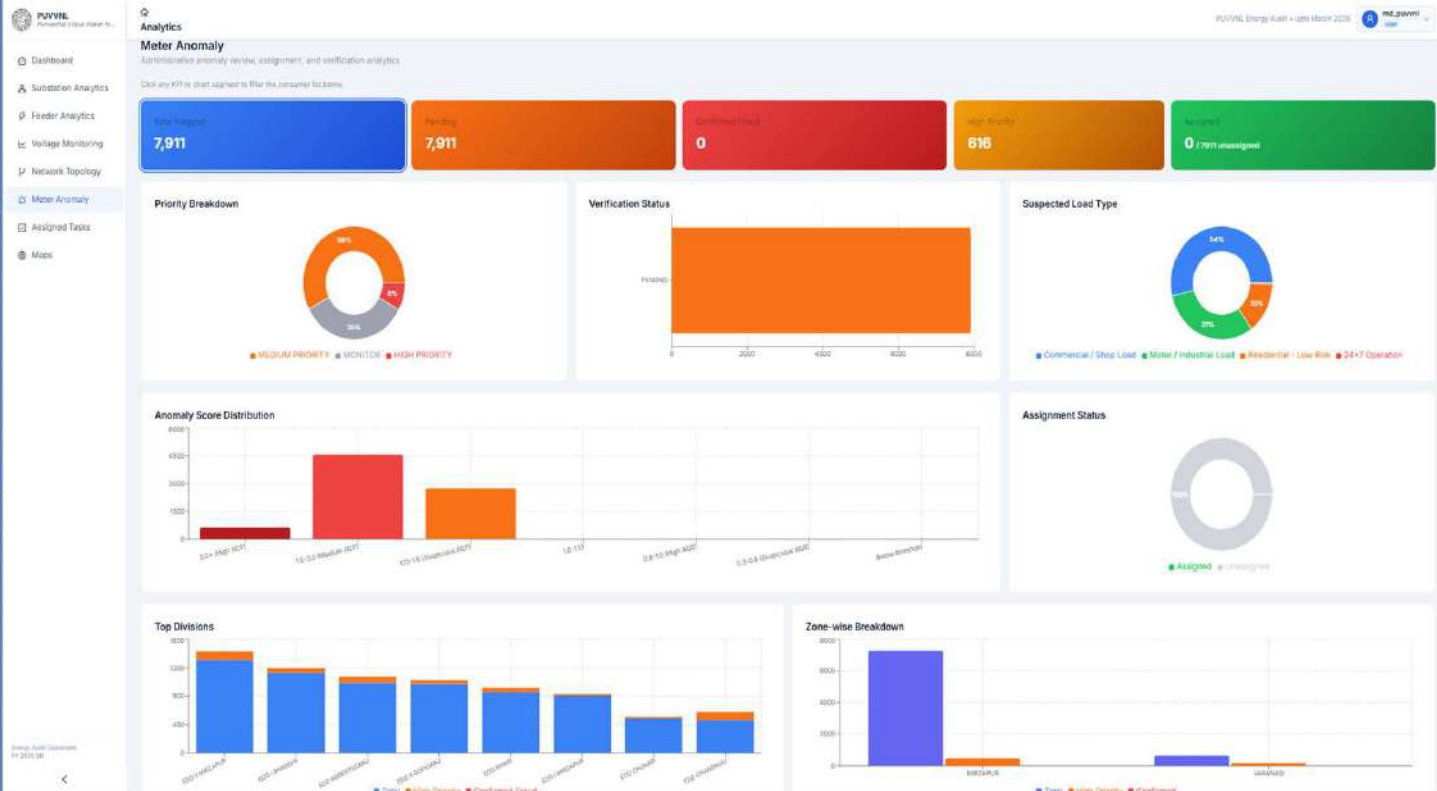
3.1 AI Analytics



AI/ML analytics on DT and smart meter data identify anomalies and exceptions, enabling predictive insights, loss reduction, reliability improvement, and proactive operational decision-making.

Dashboard

Generated through AI/ML Analysis



Reliable Supply



Digital Workforce



Data-Driven Decisions

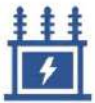


24x7 Consumer

COMMERCIAL DATA ANALYSIS

(AT&C, Through Rate, Line Loss, Exceptions)

1.



Substation wise

2.



Feeder wise

3.



AI Analytics
On DT/Consumer Data



Data Source

Through API



Data Entry

Through API



Captured Data

Theft & Other
Anomaly Detection



Updation

Periodic Data



ACTIONABLE INPUTS

1

Suspected Energy Theft

2

Abnormal Consumer Usage

3

Priority Field Verification

4

Commercial Loss Hotspots

5

High-Risk DTs

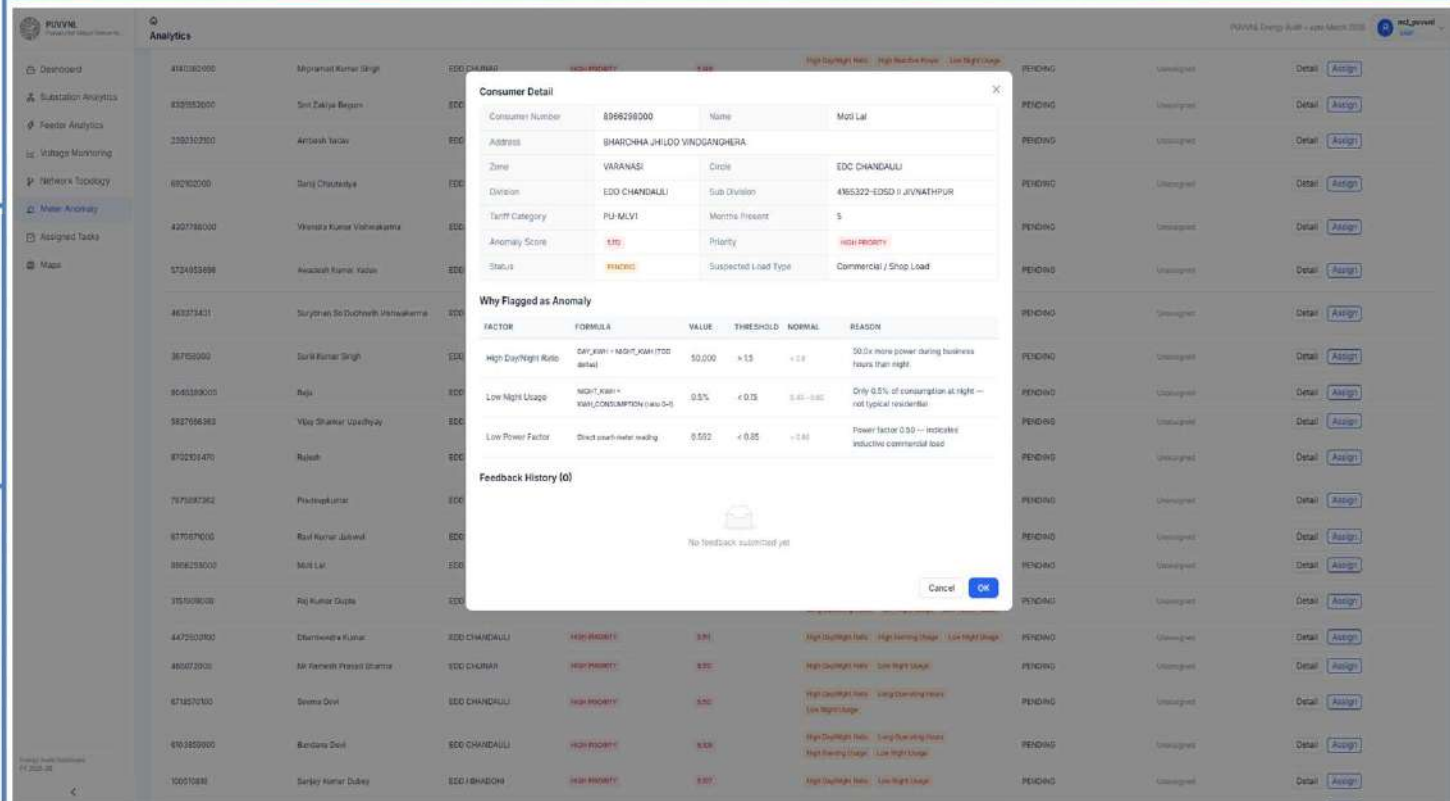
3.2 AI Analytics



AI/ML analytics on DT and smart meter data identify anomalies and exceptions, enabling predictive insights, loss reduction, reliability improvement, and proactive operational decision-making.

Dashboard

Generated through AI/ML Analysis



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Data-Driven Decisions



24x7 Consumer



4. CAPEX PLANNING & EXECUTION

CAPEX PLANNING & EXECUTION

Capex Planning & Execution



	Data Source	SIS Data
	Data Entry	JE / AE / EE / SE
	Captured Data	Various Details of Substation
	Updation	Periodic

ACTIONABLE INPUTS

- 1 Power Source Reliability
- 2 Capacitor Banks Status
- 3 Validate Network Topology
- 4 Monitor Commercial Performance
- 5 Support Data-Driven Planning

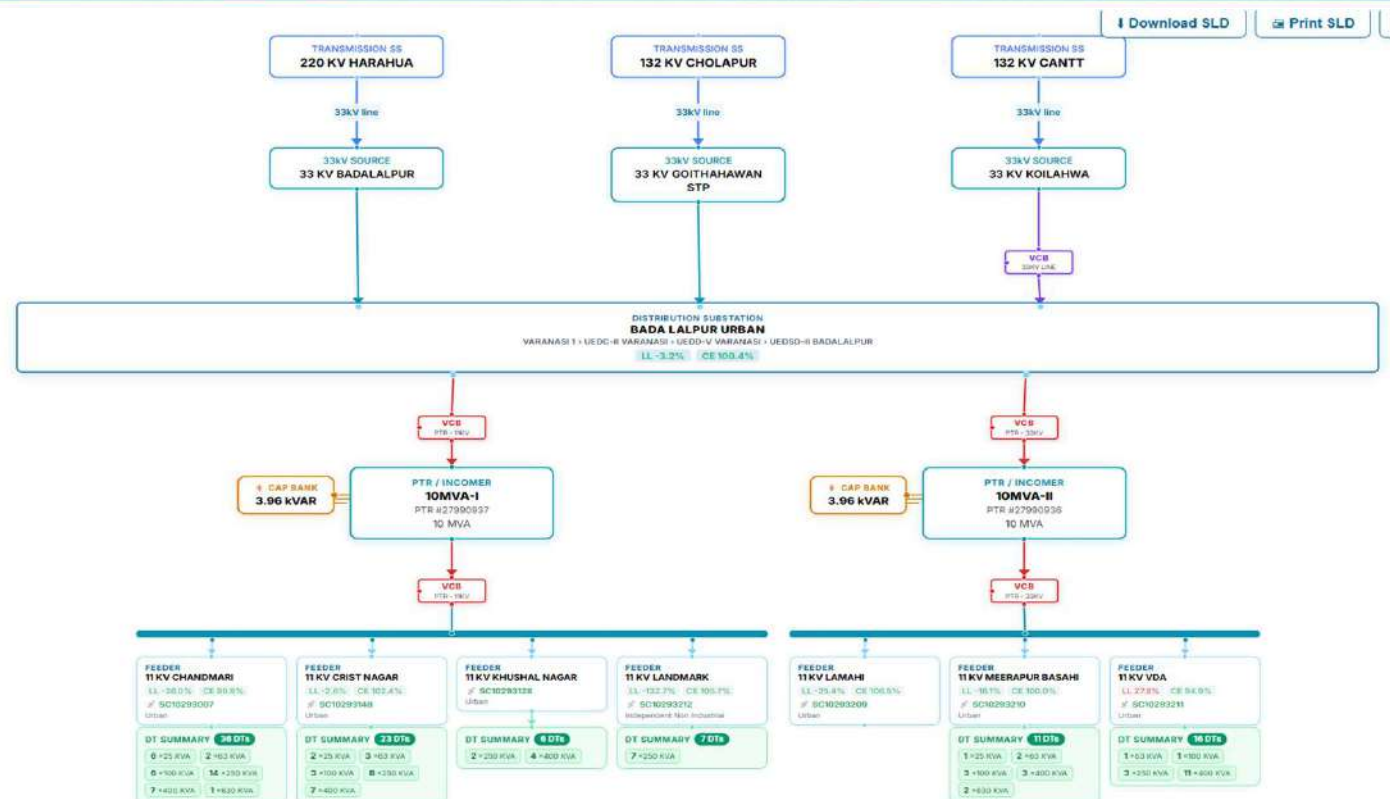
1. Topology



Data Convergence to build up Substation SLD indicating each Asset Parameter including 33 kV & 11 kV lines details , Feeder meter number, numbers of DT, Commercial Parameters, Capacitor Banks etc.

Dashboard

Generated from SIS Data



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Digital Workforce



Data-Driven Decisions



24x7 Consumer

CAPEX PLANNING & EXECUTION

Capex Planning & Execution



	Data Source	SIS Data
	Data Entry	JE / AE
	Captured Data	Various images
	Updation	Periodic

ACTIONABLE INPUTS

- 1 Verify Asset Location
- 2 Identify Network Gaps
- 3 Improve Maintenance Planning
- 4 Monitor Network Expansion
- 5 Enable Data-Driven CAPEX Planning

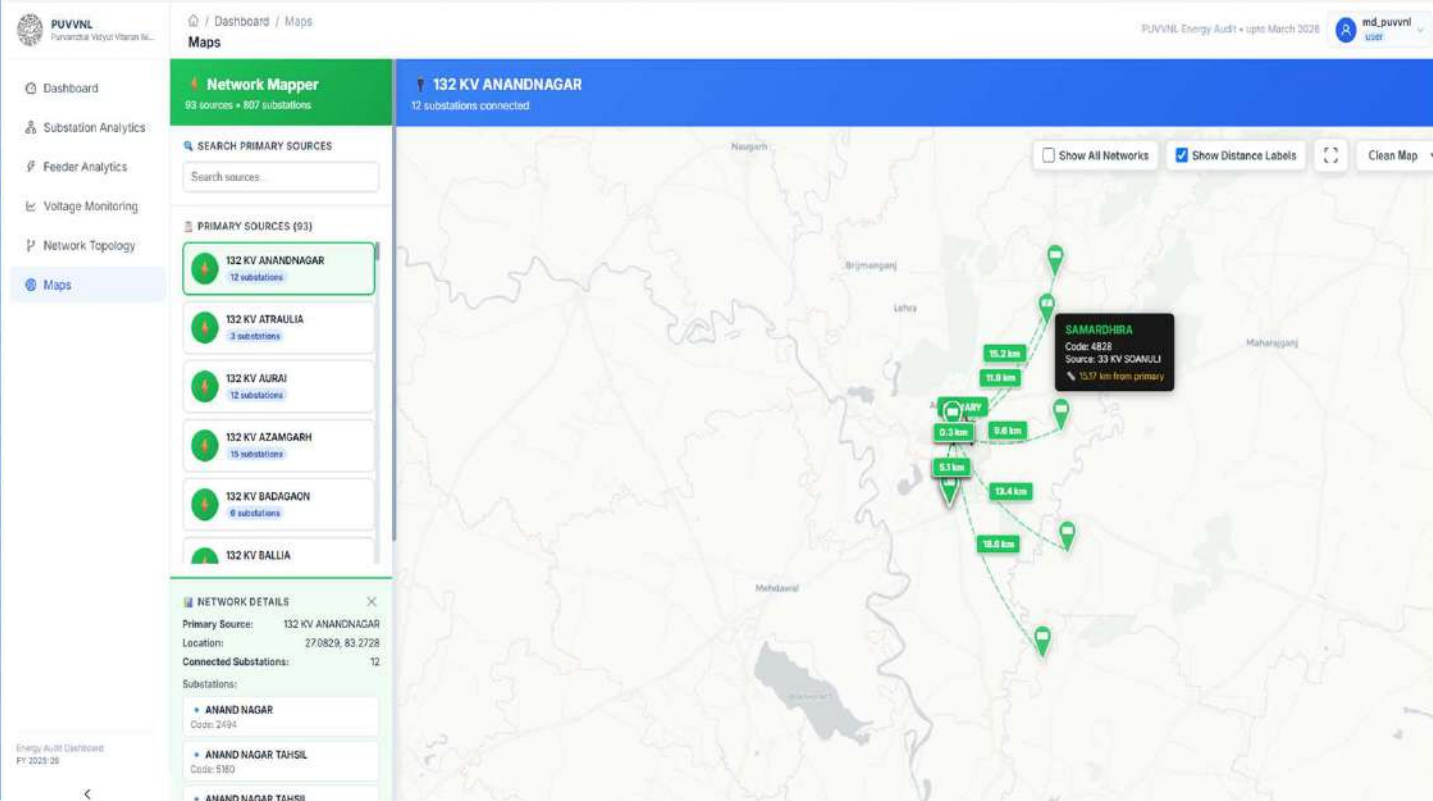
2. Assets Geo Tagging



Geo Tagging is based on Geo Tag of primary and Secondary Sub Station along with mapping

Dashboard

Generated from SIS Data



Reliable Supply



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Data-Driven Decisions



24x7 Consumer

CAPEX PLANNING & EXECUTION

Capex Planning & Execution



	Data Source	SIS Data
	Data Entry	JE
	Captured Data	Peak Load of PTR & Feeders
	Updation	Periodic

ACTIONABLE INPUTS

- 1 Identify Peak Load Hours
- 2 Detect Underutilized Assets
- 3 Prevent Transformer Overloading
- 4 Prioritize CAPEX Planning
- 5 Enable Data-Driven Operational Decisions

3. Load Pattern



Data Convergence to build up Substation Peak Loading parameters against each PTR and 11 KV Feeders

Dashboard

Generated from SIS Data



PUVVNL
Punjab Urban Vidyut Nigam Ltd.

Dashboard

Substation Analytics

Feeder Analytics

Voltage Monitoring

Network Topology

Maps

Dashboard / Voltage & Load Monitoring
Voltage & Load Monitoring

PUVVNL Energy Audit

Zone VARANASI-1	Circle UEDC-1 VARANASI	Division UEDC-1 VARANASI	Sub-Division UEDC-1 BHELUPUR
Substation BHELUPUR	PTR 10MVA-1	Feeder All feeders	
Date Range (optional — leave blank for all data) Start date: End date:			

Total Days Data
38

Peak Load (in Ampere) PTR
252.00 A

Minimum Voltage (in KV)
124.00 KV

Peak Current (in Ampere) Feeder
220.00 A

Comparative Daily Trends



Reliable Supply



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Data-Driven Decisions



24x7 Consumer

CAPEX PLANNING & EXECUTION

Capex Planning & Execution



	Data Source	SIS Entry Form
	Data Entry	JE / AE / EE
	Captured Data	Various Exceptions
	Updation	Periodic

ACTIONABLE INPUTS

- 1 Prioritize Critical Exceptions
- 2 Track Pending Exceptions
- 3 Improve Asset Health
- 4 Plan Preventive Maintenance
- 5 Prioritize CAPEX Investments

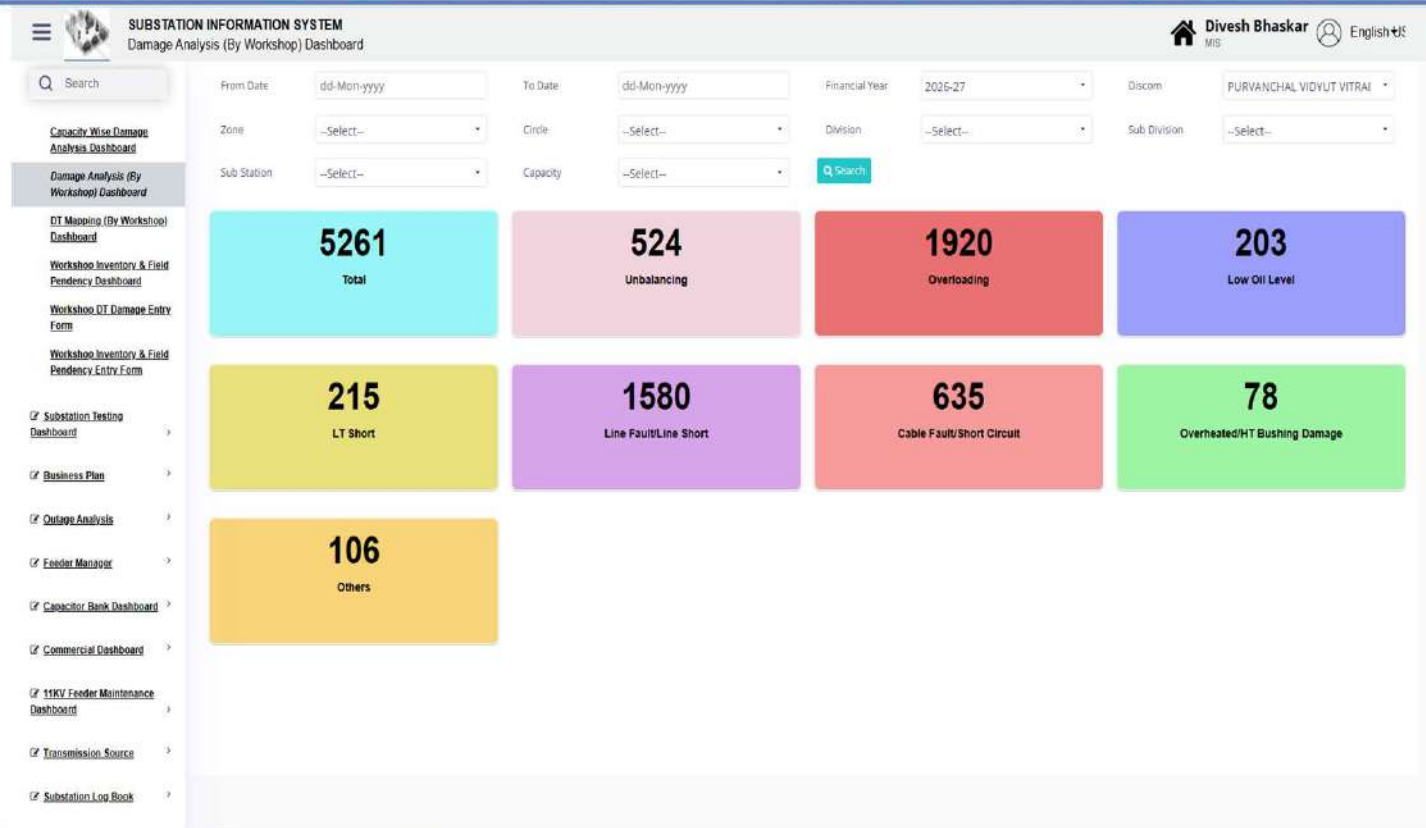
4.1 Exceptions



The dashboard captures and categorizes field-level exceptions identified during the survey and inspection of electrical assets by field officers, enabling timely monitoring, analysis, and corrective action.

Dashboard

Generated from SIS Entry Form



CAPEX PLANNING & EXECUTION

Capex Planning & Execution



	Data Source	SIS Entry Form
	Data Entry	JE / AE / EE
	Captured Data	Various Exceptions
	Updation	Periodic

ACTIONABLE INPUTS

- 1 Prioritize Critical Exceptions
- 2 Track Pending Exceptions
- 3 Improve Asset Health
- 4 Plan Preventive Maintenance
- 5 Prioritize CAPEX Investments

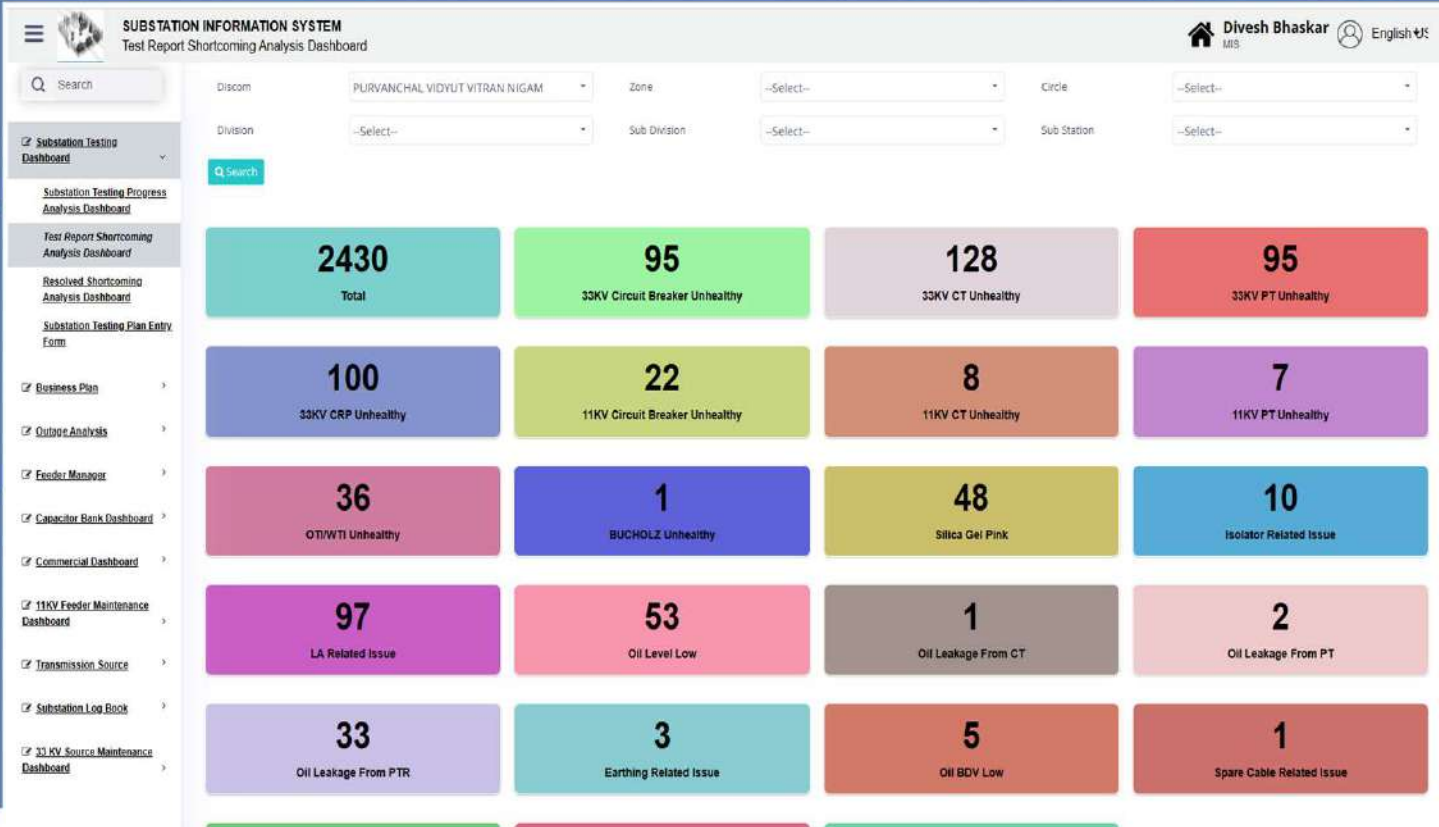
4.2 Exceptions



The dashboard captures and categorizes field-level exceptions identified during the survey and inspection of electrical assets by field officers, enabling timely monitoring, analysis, and corrective action.

Dashboard

Generated from SIS Entry Form



CAPEX PLANNING & EXECUTION

Capex Planning & Execution



	Data Source	Entry form on SIS.
	Data Entry	SE / JE
	Captured Data	Capex Scope & Execution
	Updation	Periodic

ACTIONABLE INPUTS

- Projects Under Execution
- Tender Status Monitoring
- Delayed Projects
- Work Completion Status
- Resource & Material Requirement

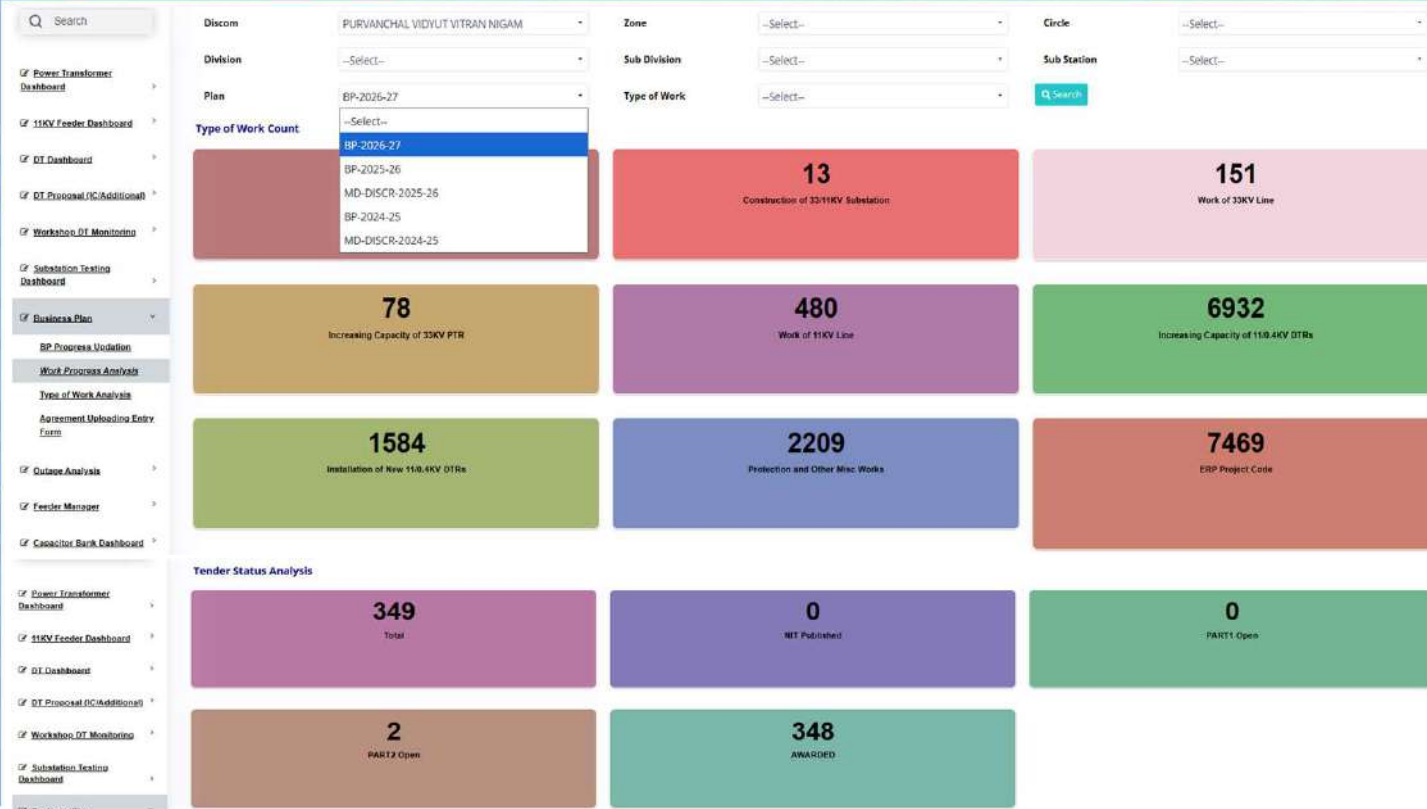
5. Capex Planning & Execution

Dashboard

Generated from SIS Entry Form



Data indicates various Project/Business Plan/CAPEX work for various type of work. This helps to maintain stemless flow of project work & insure effective/timely completion of work.



Reliable Supply



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Data-Driven Decisions



24x7 Consumer



PREDICTIVE ANALYTICS THROUGH SIS DATA



Predictive Analytics

- As on sample testing, prediction analytical tool was run in April to predict one area outages based on old outage data of same duration, old weather pattern and future weather prediction
- The predictive output was then compared with actual data in June and found the there as hit rate of 83% which is encouraging

ASSET PREDICTIVE FORESIGHT VS. ACTUAL OUTAGE CORRELATION REPORT

Performance Validation and Risk Analytics for May – June 2026 Window

Prepared For: Grid Resilience Division & Circle Operations Engineers
Date of Issue: June 9, 2026
Data Sources: April Loop Stress Analytics & May-June 2026 Interventions Log
Operational Zone: Prayagraj Operational Zone (EDC Prayagraj Pratapgarh, Kaushambi, Fatehpur)

Executive Summary: This engineering report presents a formal validation of the *May-June 2026 Asset Predictive Hotpoint Matrix* by cross-correlating forecasted risks against actual empirical breakdown shutdown logs from the field. Predictive modeling based on April's 6,582 trippings flagged 6 High-Voltage Feeder corridors and 6 Low-Tension Aerial Bundled (LT-AB) cable sections as highly vulnerable to the Peak Summer Heat Dome (\$45^{\circ}\text{C}\$ ext(C)-48^{\circ}\text{C}\$ ext(C)\$) and thunderstorm squall lines. The empirical correlation reveals an exceptional model accuracy rate, validating targeted preventative hardening and exposing fields where deferred maintenance led to multi-hour grid sags.

1. Macro Performance Analytics Dashboard

83.3%	14 Major	16.0 Hrs	100%
HV FEEDER PREDICTION HIT RATE	CORRELATED ACTUAL TRIPS	MAX OUTAGE DURATION (PIDI)	MITIGATION SUCCESS (BHAGHRAJ)

The predictive engineering framework successfully isolated high-stress asset corridors before structural failure occurred. 5 out of the 6 key distribution sections logged severe structural or thermal tripping loops matching the predicted environmental drivers, enabling operational control rooms to localize grid stress profiles effectively.

2. Comprehensive Predictive vs. Empirical Outage Matrix

The following structured matrix correlates each high-probability predictive asset risk profile from the May-June Asset Brief directly with the empirical breakdown logs collected up to June 9, 2026.

Asset / Corridor Name	Circle Location	Predicted Failure Mode & Risk Index	Critical Forecast Window	Empirical Actual Outages Logged (May-June 2026)	Correlation Status & Validation Notes
PIDI - SEHARA Feeder (HV Distribution)	EDC Prayagraj	Wind-Induced Whipping Conductor Snaps CRITICAL (96%)	June 15-30 Squall Fronts	04-06-2026: 1H 30M (Pidi-Pidi) 30-05-2026: 0H 0M (Pidi-Pidi) 29-05-2026: 16H 0M (Pidi-Benipur) 29-05-2026: 6H 0M (Pidi-Benipur) 05-05-2026: 2H 20M (Pidi-Benipur)	HIGHLY VALIDATED Severe early failures; 16-hour catastrophic outage logged on May 29 due to cascading line drops.
PATTI-GRAMIN NORTH (HV Distribution)	EDC Pratapgarh	Insulator Flashover / Tree Contact Tripping CRITICAL (92%)	Late June Monsoon Arrival	06-05-2026: 0H 25M (Patti Tehsil Substation Feeder)	VALIDATED Early micro-tripping recorded; corridor is highly vulnerable as moisture block increases.
DHANUH - REWA ROAD 2 (HV Distribution)	EDC Prayagraj	Thermal Overload Sagging & Overcurrent Melts HIGH (86%)	May 15-June 10 Heat Dome	06-05-2026: 0H 45M (Dhanuha-Rewa Road 2) 21-05-2026: 0H 30M (Dhanuha-Dhanuhan) 02-06-2026: 0H 55M (Dhanuha-Madauka 2)	VALIDATED Perfect temporal match with Peak Summer Heat Dome. Heavy agricultural loads triggered cyclic sagging.
BHAGHRAJ - BARO Feeder (HV Distribution)	EDC Pratapgarh	Cross-Arm Structural Twisting / Earth Fault HIGH (84%)	May Sudden Dust Storms	No empirical outages logged during this window.	MITIGATED 100% Success: Target of preemptive structural reinforcement and pole guy-wire tightening prevented failure.



Predictive Analytics

- Similar prediction tool is applied for other area based on improved logics (inclusion of three sources weather data etc) and inclusion of possible Distribution Transformer failure.
- Engine has given output for date wise possible outages on feeders present in old data set. Further validation will be done accordingly

ENGINEERING ASSET MANAGEMENT & RELIABILITY OPERATIONS

Date-Wise Outage Pattern Projections & Distribution Transformer Mortality Forecast Models

Predictive Operational Window: July 1, 2026 – October 31, 2026

Technical Asset Performance Architecture: This engineering report presents a date-wise predictive analysis model mapping network vulnerabilities to seasonal atmospheric changes. By processing 6,902 historical system logs from mid-2026, 2025 seasonal baseline logs, and a master registry of 5,601 verified Distribution Transformer (DT) failure events, this study applies power distribution reliability engineering principles and data science time-series methodologies. The resulting predictive schedules and technical

frameworks identify risk areas to guide maintenance schedules, line hardening, and grid stabilization across the Eastern Distribution Circle (EDC) without any reference to financial indices or cost structures.

Document Purpose: Operational Reliability Strategy & Outage Prevention Engineering Plan
Technical Authors: Principal Reliability Engineer & Power Systems Data Scientist

Data Scope Parsed: 6,902 Active Outage Entry Rows & 5,601 Historical DT Mortalities

Date of Compilation: June 14, 2026

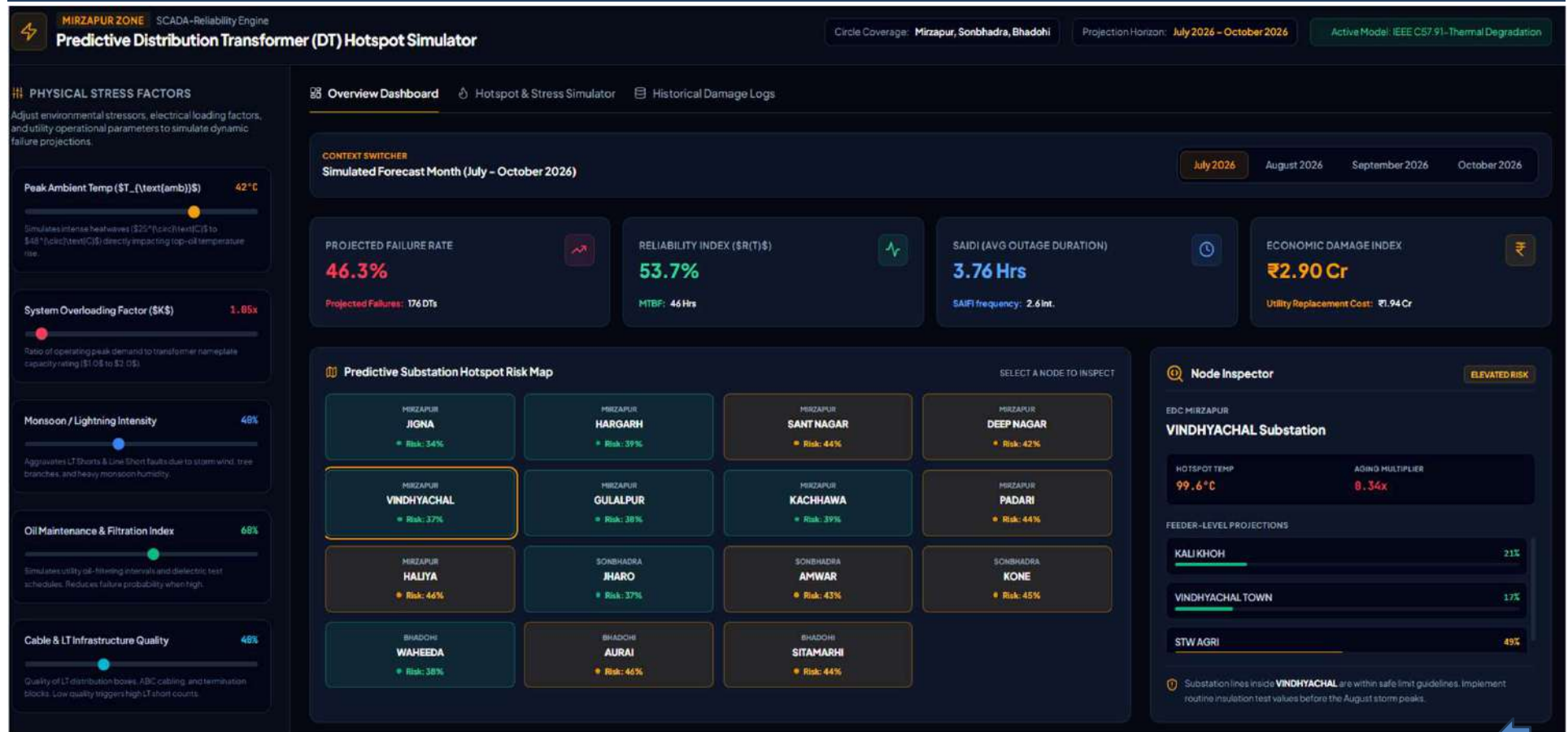
Classification: Internal Technical Distribution Standard — Operational Performance Group

TARGET FORECAST DATE	PROJECTED METEOROLOGICAL HAZARD	PREDICTED 11KV/33KV OUTAGES	PREDICTED DT FAILURES	HIGHEST-RISK SUBSTATION & FEEDER LOCATION	ENGINEERING PRIORITY INDEX
July 03, 2026	Monsoon Front Wind Shear (55–65 km/h)	42	18	Madihan (Hasara Feeder)	CRITICAL SCOPE
July 04, 2026	Initial Torrential Rain / Earth Softening	51	22	Deep Nagar (Sant Nagar Feeder)	CRITICAL SCOPE
July 12, 2026	Continuous Sub-Surface Wet Precipitation	33	14	Jigna (Udaypur Feeder)	HIGH URGENCY
July 25, 2026	Sustained Ambient Saturation (90% RH)	29	11	Hargarh (Pali Feeder)	MEDIUM MONITOR
August 11, 2026	Convective Lightning Discharge Waves	58	19	Akasauli (Patiya Feeder)	CRITICAL SCOPE
August 12, 2026	Severe Electrical Storm Fronts	64	25	Devahi (Devahi Feeder)	CRITICAL SCOPE
August 22, 2026	Peak Monsoonal Volume / Localized Floods	37	15	Kachhawa (Kachwa Town Feeder)	HIGH URGENCY
Sept 04, 2026	Post-Rain Vapor Trapping / Thermal Rise	22	28	Madihan (Sirsi Feeder)	HIGH URGENCY



Predictive Analytics

- Based on above, Model has suggested a simulator for prediction based on weather parameter like temperature, monsoon, storm etc and technical parameters like %age loading, maintenance etc.
- Simulator predicts month wise criticalness of feeders and substation so that field team can take predictive actions.





Effective Changes Brought in the Organization

01		Strengthened Data Integrity & Transparency	→	- All Substation-related data — Technical, Commercial, Outage, Testing—Shifted from Scattered/Manual Sources to a Single Digital System. - Eliminated Data Manipulation and Improved Trust in Reports.	
02		Real-Time Visibility for Leadership	→	- MD/Director/CE/SE now get instant, real-time Dashboards on Outages, DT Failures, Load, Testing & Business Plan Progress. - Improved Responsiveness to Field issues.	
03		Accountability Deeply Embedded	→	- Geo-Tagged, Time Stamped entries created a Transparent Audit Trail, Ensuring Responsibility for Outages, Inspections & Delays. - Reduced Negligence and Improved Field Discipline.	
04		Faster Decision Making	→	- Instead of waiting for Weekly/Monthly Combined Reports, Decisions are now Data-Driven using Live SIS Analytics. - Enabled Proactive Planning instead of Reactive Management.	
05		Improved Reliability of Substations	→	- Continuous Monitoring of PT/DT Failure Reasons and Testing Trends improved Preventive Maintenance. - Reduction in repeat failures and Outage Durations.	
06		Streamlined Monitoring of Business Plan Works	→	- Stage-Wise Digital tracking eliminate guesswork and delays. - Better Coordination among field, HQ and vendors.	
07		Enhanced Citizen Service Quality	→	Accurate and consistent Scheduled Supply Hours led to better compliance with Regulatory Norms and improved Customer satisfaction.	
08		Organization-Wide Standardization	→	- Uniform formats for Testing, Outage Logging, Inspections and reporting. - Improved Discipline and removed variability between Divisions/Zones.	
09		Higher Efficiency of Field Staff	→	- Reduced paperwork, WhatsApp reporting, and redundant communication. - Clear Task Assignments and faster issue resolution.	
10		Evolution Toward a Data-Driven Organization	→	- Trend analysis of Outages, Transformer Failures, Load Patterns, and Supply Hours supports predictive maintenance and long-term planning. - Culture shift from Intuition-based Decisions to Analytics-based Governance.	



PuVVNL Digitalisation Implementation

Challenges → Field-ready Strategies

 Build with field teams |  Govern with data |  Make digital the default



IMPLEMENTATION CHALLENGE

1



CO-CREATE

Coordination gap between Technical & IT teams

Field constraints and engineering priorities are not converted into clear product requirements.



Joint digital product squad

Technical + IT + field officers jointly design use cases and pilot before scale-up.



2



ADOPT

Low interest among field staff

Apps feel like extra reporting work when they do not reduce daily operational pain points.



Field-first adoption model

Simple mobile workflows, local champions, handholding & training operational pain points.



3



DATA CULTURE

Weak data culture in decision-making

Reviews may still rely on verbal updates and manual reports instead of live operational KPIs.



Data-led leadership reviews

Use dashboards in every review; link decisions to AT&C, reliability, collection and complaint KPIs.



4



DIGITAL DEFAULT

Tendency to fall back to manual processes

Parallel registers, Excel sheets and WhatsApp reporting dilute accountability and data quality.



Digital-first SOPs and audit trail

Stop duplicate formats; inspections and exceptions through the platform.



5



IMPROVE

Limited feedback after rollout

Systems become static when field bugs, usability issues and improvement ideas are not captured.



Continuous improvement loop

Capture field feedback, prioritise fixes, release monthly improvements and communicate changes.



Success formula: product thinking + field adoption + leadership data culture + digital-first SOPs + feedback-led improvement



PuVVNL

(A Distribution Company (DISCOM) under UPPCL)

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