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Availability Based Tariff & Deviation Settlement Mechanism

using

inSis suite

Implementations at various locations

Client Name	Completion date
Meenakshi Energy Limited (MEL)	20-Jun-17
Nabha Power Limited (NPL, L&T)	8-Jan-20
OPG Power Generation Private Limited	19-Dec-20
Sai Wardha Power Generation Ltd (SWPGL)- ABT	26-Dec-20
Sai Wardha Power Generation Ltd (SWPGL)- EMS	17-Jan-22
Adhunik Power & Natural Resources Ltd (APNRL)	9-Feb-21
SV Power Plant Limited	10-May-19
Anjani Cements	10-Dec-21
BVPL	1-Dec-19
RattanIndia	Dec 22
Sembcorp Energy India Limited (Plant 2)	21-Dec-21
NTPC Limited (Simhadri)	15-Feb-22
Sembcorp Energy India Limited(Plant 1)	30-Aug-22
JPVL - ABT	Under-Imp
NAES, Mexico, EMS	26-Sep-22
SJRR, USA	Under-Imp
NTPC, Jhanor	29-Apr-23
NSL Power, (Koppa, Aland, Krishnaveni & Tungabhadra) - (4 sites)	12-Dec-23
Sravanti Group, Uttarakhand	22-Dec-23
RPSG (Gummadipoondi & Mundra)	Under-Imp
Anpara D Thermal Power Plant	Under-Imp
NTPC, Solapur	Under-Imp

Our solution is deployed at multiple client locations and successfully delivering value through improved visibility, analytics and faster time to respond

- Our project duration: 3 to 6 months
- Time to get back your money: 12 to 18 months
- We support meters of different make and model and can communicate through Modbus / TCP IP / Ethernet
- We can integrate with your MES systems and provide comprehensive Performance Management System for the power plant

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Challenges

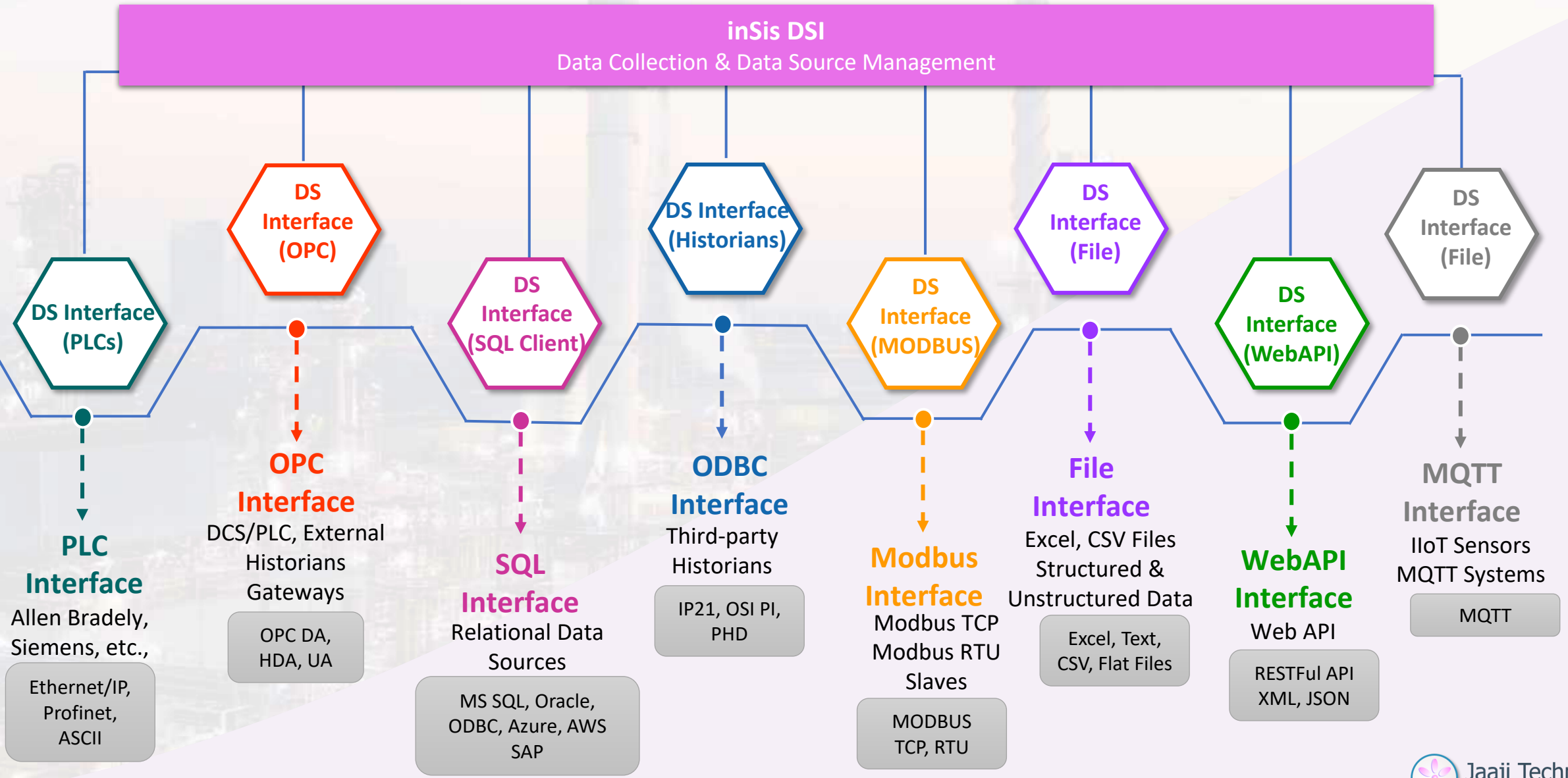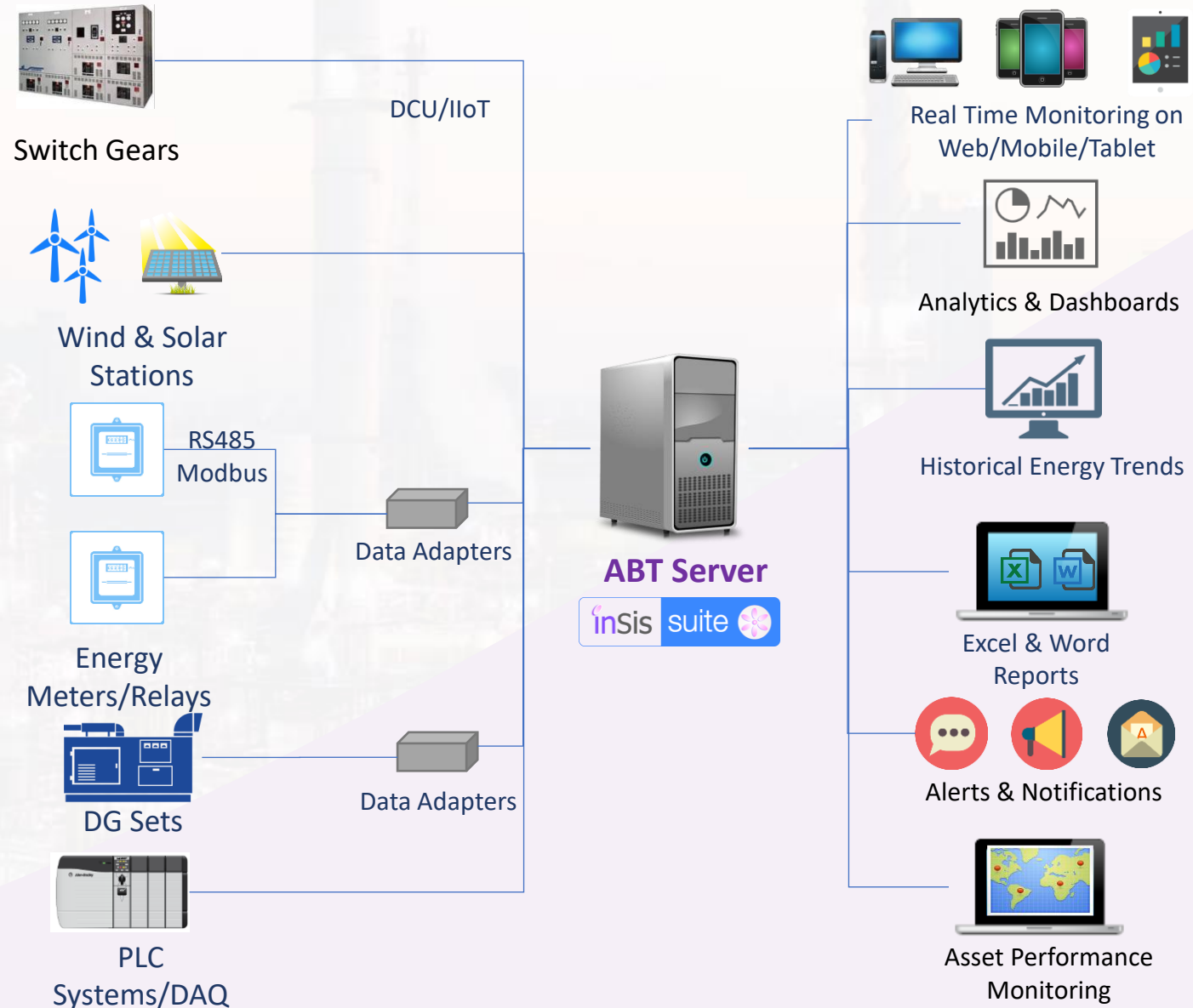| UI deviations and penalties | Loss of incentives | Manual Data Entry Efforts | No ABT info on mobiles | Lack of real-time visibility | Laborious Calc & Reporting |

inSis ABT/DSM Solution Helps Minimize Penalties – Key Features

Gen, Export, APC, UI etc., Dashboards, Trends, SLDs, Views

Real-time ABT/DSM Data

ABT Calculations (UI Rate, Profit/Loss etc.), Reports, Energy KPIs, Performance Calculations

IEX, RTM & RLDC Integration

UI Deviations, Penalties, Shutdown, Idle Times, Notifications

Email & SMS

Identify & notify Events & Abnormal conditions

KPI Management

Data Analytics - Deviation Analysis, Violations, Troubleshooting, SPC

Self-Service

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Data Integration Capabilities

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Data Collection & Data Source Management

DS Interface (PLCs)

DS Interface (OPC)

DS Interface (SQL Client)

DS Interface (Historians)

DS Interface (MODBUS)

DS Interface (File)

DS Interface (WebAPI)

DS Interface (File)

PLC Interface
Allen Bradely, Siemens, etc.,

Ethernet/IP, Profinet, ASCII

OPC Interface
DCS/PLC, External Historians Gateways

OPC DA, HDA, UA

SQL Interface
Relational Data Sources

MS SQL, Oracle, ODBC, Azure, AWS SAP

ODBC Interface
Third-party Historians

IP21, OSI PI, PHD

Modbus Interface
Modbus TCP Modbus RTU Slaves

MODBUS TCP, RTU

File Interface
Excel, CSV Files Structured & Unstructured Data

Excel, Text, CSV, Flat Files

WebAPI Interface
Web API

RESTFul API XML, JSON

MQTT Interface
IIoT Sensors MQTT Systems

MQTT

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Typical System Architecture for ABT & Energy Management System

Switch Gears

DCU/IIoT

Wind & Solar Stations

RS485 Modbus

Energy Meters/Relays

Data Adapters

DG Sets

Data Adapters

PLC Systems/DAQ

ABT Server

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Real Time Monitoring on Web/Mobile/Tablet

Analytics & Dashboards

Historical Energy Trends

Excel & Word Reports

Alerts & Notifications

Asset Performance Monitoring

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Dashboard: ABT System Block wise Data

Dashboard: ABT System Block wise Data

inSis suite	Oneview	Builder	inSis suite	⚙	❓	Administrator Jaajitech

ABT DASHBOARD(1)

BLOCK DATA (12:45 - 13:00)

BLK NO	52	GEN	1100.00	FREQ	54.25	EXP/SG %	89.17
TIME ELAPSED	1 :7	NET EXP	927.41	UI RATE	3.03	TARG 100%	927.41
TIME REMAINS	13 :53	SCH GEN	1040.00	DEVIATION	-112.59	UI GAIN/LOSS	-85289

PREVIOUS BLOCKS

BLOCK	50	49	48	47	46	45
SG (MW)	1040.00	1040.00	1040.00	1040.00	1040.00	1040.00
EXPORT (MW)	697.89	592.35	825.84	685.51	802.72	637.78
DEV. (MW)	-342.11	-447.65	-214.16	-354.49	-237.28	-402.22
BLOCK SIGN	-NA-	-NA-	-NA-	-NA-	-NA-	-NA-
FREQ.(Hz)	49.35	51.75	50.17	51.25	50.92	49.77
UI GAIN/LOSS (INR)	94536	0	0	0	0	94536

NEXT BLOCKS

BLOCK	53	54	55	56	57	58
SCH GENERAT(MW)	1040.00	1040.00	1040.00	1040.00	1040.00	1040.00

CURRENT DATA

U1 GENERATION	560	STATION GENERATION	1080
U2 GENERATION	520	STATION EXPORT	917
STATION APC MW	162.52	STATION APC %	15.05

DAY ABT REPORT

GEN. (MU)	0.000	ACP (₹)	0.000
EXPORT (MU)	0.000	SRMC(₹)	0.000
SG (MU)	13.260	EXP/SG %	0.000
DC (MU)	14.025	DSM CORRE. %	6.000
DEV.(MU)	-13.260	BACK Down (MU)	0.765
UI GAIN/LOSS			0.000

Dashboard: ABT/DSM Overall Dashboard

ABC DSM Dashboard

ABC Power Ltd

15-09-2022
12:27:12

Block No	50	Time Remain	2 : 48	Inst.Ex-Bus (MW)	2229.57	Inst.Frq (Hz)	51.78	ACP Rate (Rs)	0.0000
Block Time	12:15 - 12:30	Time Elapsed	12 : 12	Avg.Ex-Bus (MW)	1854.41	Avg.Frq (Hz)	50.68	BEF (Hz)	50.00

Gross Generation (MW)			Station APC MW	Station APC %	Line Wise Export (MW)	
	UNIT-1	UNIT-2			Line-1	Line-2
MW	1492.92	1470.09	-2963.01	0.00	143.69	184.86
MVar	16107.67	10833.72			9253.10	1873.16

Block wise Parameters	Previous Block	Current Block
Block No.	49	50
Block Time	12:00 - 12:15	12:15 - 12:30
Declared Capacity, MW	0	0
Scheduled Export(SE), MW	0.00	0.00
Average Gen. Ex-Bus, MW	2467.55	2571.89
Average Frequency, Hz	0.00	50.68
Average Gen. -Ex-Bus/DC %	0.00	0.00
Average Gen. -Ex-Bus/S.E %	0.00	0.00
Deviation, MW	2467.55	2571.89
Deviation Rate, Rs	0.000	0.000

Next Block Data

Blk	DC (MW)	SG(MW)
51	1100	1040.00
52	1100	1040.00
53	1100	1040.00
54	1100	1040.00
55	1100	1040.00
56	1100	1040.00
57	1100	1040.00

Transformer (HV) Side Data

GT / ST	MW	MVAr
GT-1	1068.27	9774.35
GT-2	1161.30	8234.86
ST-1	424.65	6333.32
ST-2	308.80	2598.86
Net Export	2963.01	26941.39

Decision Aspects Current Block

Decision Aspects Current Block, MW	Target (Limit)	Asking Rate Current Block
For 100 % SE	1040.00	1496.12
For 88% SE	915.20	1496.12
For 112% SE	1164.80	1496.12
For (SE -50MW)	990.00	1496.12

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Performance Management with KPIs – Key Features
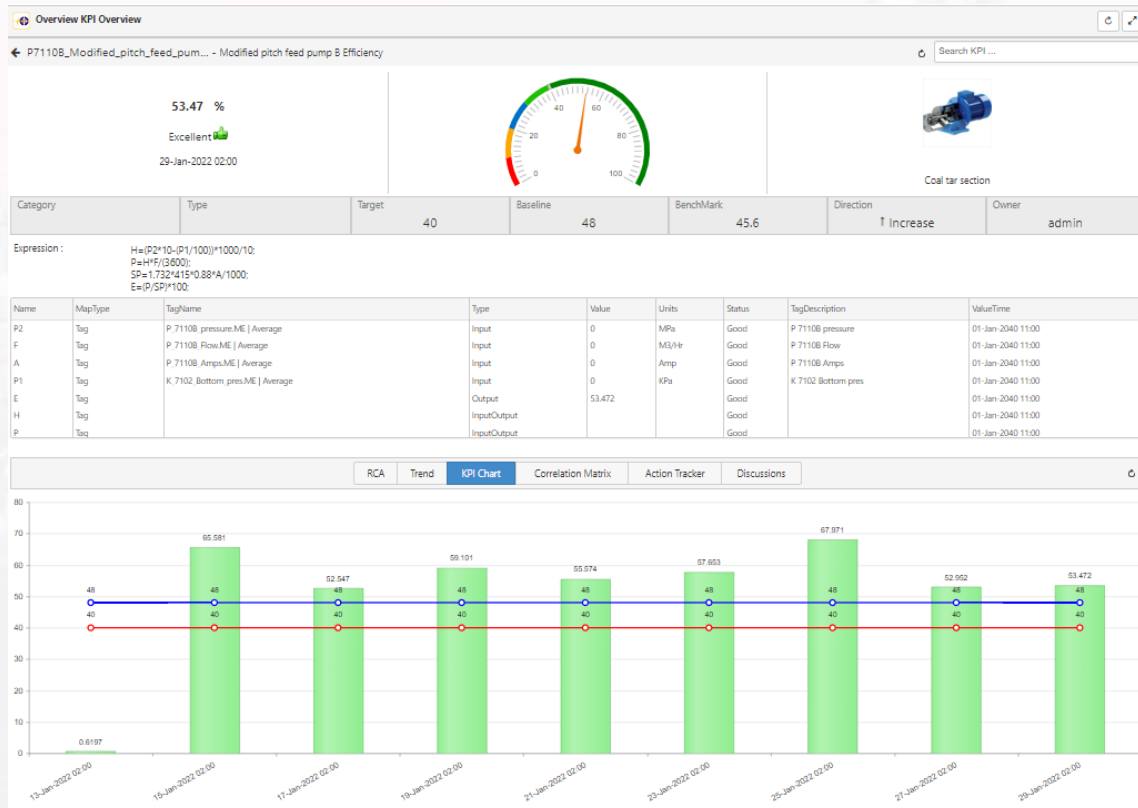
Easy to configure and manage KPIs

- KPI drill down helps in easy identification of anomalies

- Update of formulae is easy through user-friendly interface

- Simplified Root Cause Analysis

- Limits management (Low Low / Low / High / Hi Hi)

- Discussion thread in case of out-of-range values

- Alerts and notifications

- Multiple analytics options

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Alerts & Notifications – Key Features

- **Automated Alert System:**
  - Real-Time Detection of Abnormal Conditions
  - Configurable Notifications via Email & SMS
  - Escalation Protocol for Critical Situations

Dear Administrator,

The following conditions met 515.47>0, please check the system. C>0.

Note: This is an automatically generated alert by inSis ProSense System.

inSis Suite - Process Data Analytics, Dashboards, Notifications & Asset Performance System

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↩ Reply   ↪ Forward

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inSis suite   ProSense   Events   Summary   ABC

← EventSummary   ★ ⊙ ⊞   ⟳ ⟲ ⊗ Go   🔍 ▲

FCC Unit Condition - Shutdown   ⚠ Activated 13-Jan-2023 10:08   ⓘ ✎ 💬
Notify To   : Operations Managers,...   👤 OFF   Message : Unit is Shutdown   IsEnabled : ON   Show Related
Escalate To   :   👤 ON   Criteria : A<=40   Show Similar

FCC Unit Condition - Low Capacity Utilisation   ⚠ Activated 13-Jan-2023 10:08   ⓘ ✎ 💬
Notify To   : Operations Managers,...   👤 OFF   Message : Low Capacity Utilisation IsEnabled : ON   Show Related
Escalate To   : Administrators   👤 ON   Criteria : A<=85   Show Similar

CDU Unit Condition - Low Capacity Utilisation   ⚠ Activated 13-Nov-2021 11:02   ⓘ ✎ 💬
Notify To   : Operations Managers,...   👤 OFF   Message : Low Capacity Utilisation - Current Value is - 49.551   IsEnabled : ON   Show Related
Escalate To   : Administrators,Proce...   👤 ON   Criteria : Cap<=85   Show Similar

HP to LP Letdown - Open High   ⚠ Activated 23-Mar-2023 15:38   ⓘ ✎ 💬
Notify To   : ProcessEngineer   👤 ON   Message : HP to LP Letdown is open high   IsEnabled : ON   Show Related
Escalate To   : OperationManager,Adm...   👤 ON   Criteria : Letdown>10   Show Similar

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inSis Report Automation

- inSis Reports collects and stores the real-time data from,
  - ✓ DCS, Historians
  - ✓ LIMS
  - ✓ SAP Etc.
- Web-based, self-service reports configuration, generation & distribution
- Comprehensive management of Reports central with role-based access
- Customizable Manual Data Forms to collect manual data from users
- Can handle typical Calculations required for report
- Integration between Dashboards, Reports for better data visibility and understanding
- Report can be scheduled and shared for collaboration
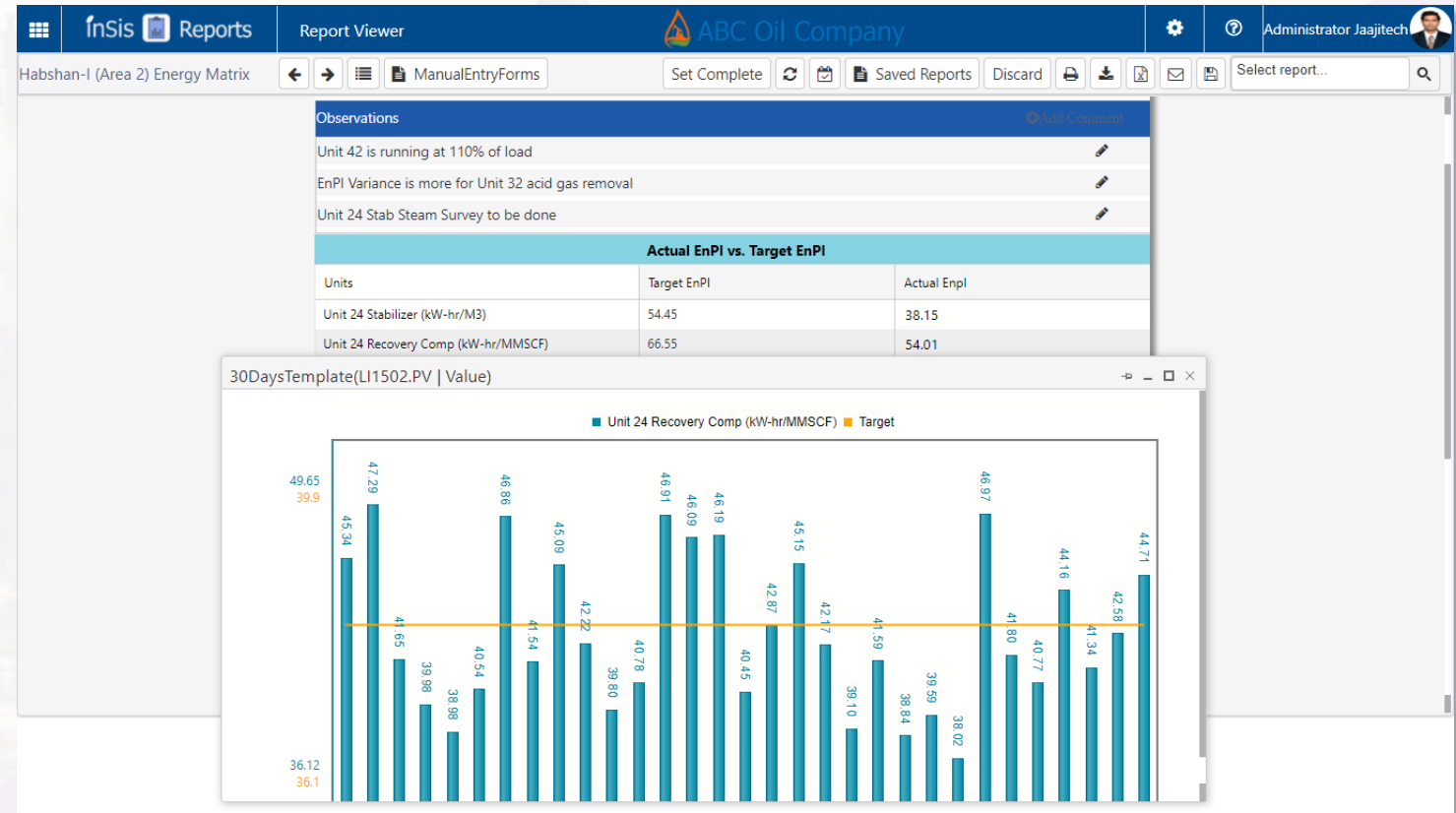
Web Based Reports
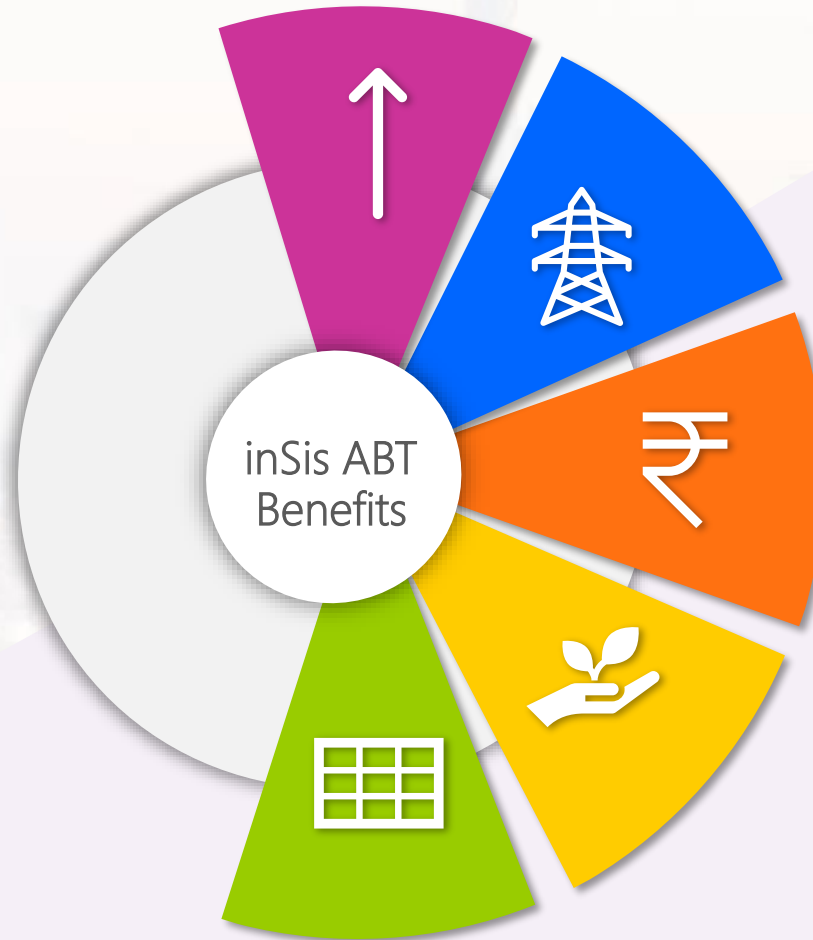
Report Monitoring

Reports Sharing

Email Report

Report Scheduler

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Benefits

1. **Improved Operational Efficiency**

2. **Load Management & Grid Integration**

3. **Reduced Penalties & Imbalances**

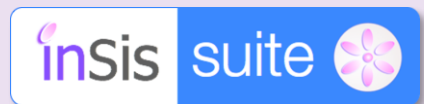4. **Improved Reliability**

5. **Enhanced Grid Stability**

inSis ABT Benefits

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Thank You

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