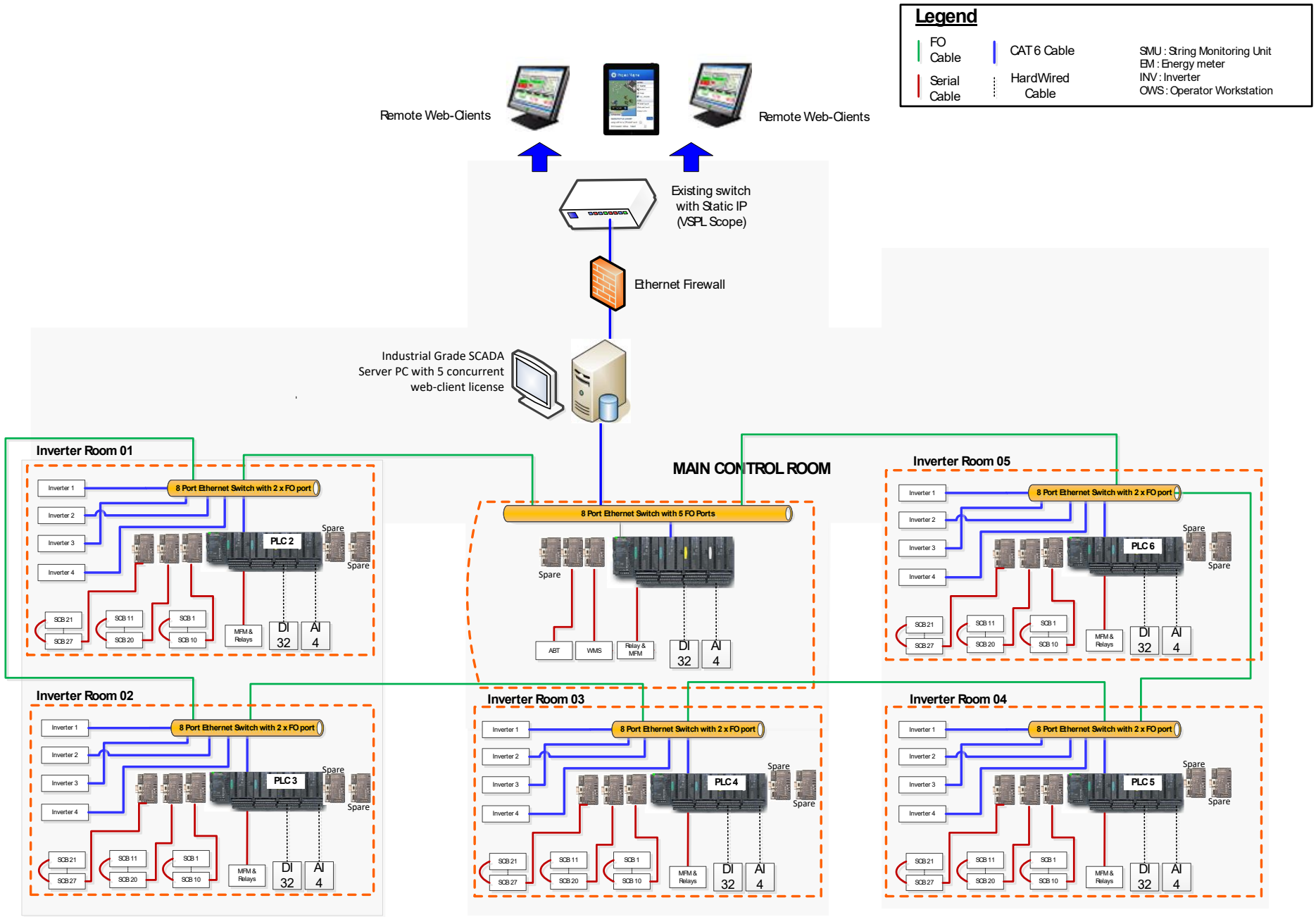
CECPL Management
Solar Solutions

SCADA Solutions

electrifying change

TYPICAL SCADA SOLUTION ARCHITECTURE



TODAY'S/ONLINE ENERGY

59.60 MWh

ENERGY

Y' Day	Week	Monthly	Yearly
51.00 MWh	102.00 MWh	489.00 MWh	1072.80 MWh

WMS

Irradiance 5.00 W/M²

Inst Sol Engy 65384.55 kWh/M2

33.00 °C | 2.00 m/s | 27.00 °C

PLANT DATA

	PR	POA	PLF
Online	91.15	0.0	74.50
Y' day	89.00	0.0	21.25

OVERVIEW | BLOCK1 | BLOCK2 | BLOCK3 | BLOCK-4 | MCR | SLD | SMB | WMS | ALARMS | TRENDS | DIAG | REPORT

17/12/2014 5:43 PM

Online Genration 59.60MWH Online PR 91.15% Solar radiation 5.00 W/m²

Plant Active Power 30.16 kW

Lifetime Export 0.00 MWh

CO2 39932.00 Ton

Diesel Energy Generated 5900.40 KL

Device Statuses

Device	Functional	Total
SMBs	297	1735
Inverters	19	15

Yesterday's / Today's/Online

Block	Yesterday's kWh	Today's/Online kW	Today's/Online kWh	Today's/Online PR
Block - 1	12610.00	7.61	13020.00	93.00
Block - 2	12610.00	6.43	13040.00	93.14
Block - 3	10850.00	5.80	11090.00	85.31
Block - 4	10590.00	8.82	11220.00	89.76

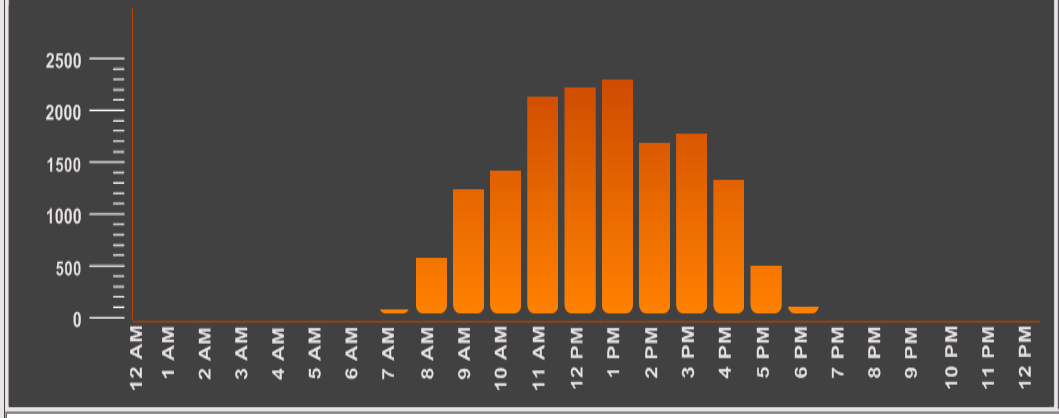
String Status

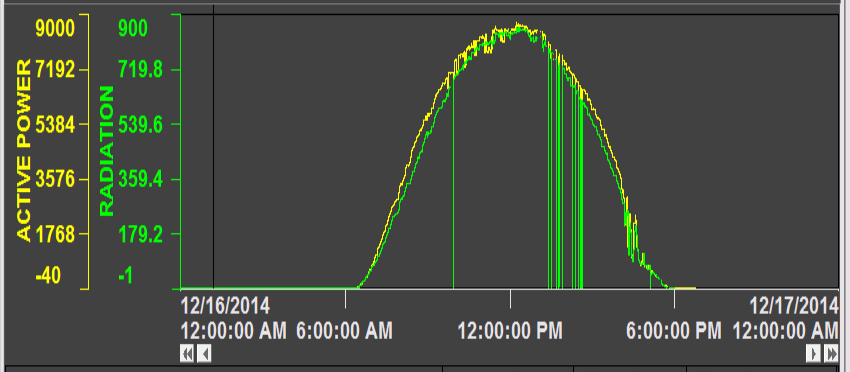
Block ID	Functional	Total
Block - 1	45	460
Block - 2	7	464
Block - 3	140	466
Block - 4	105	345

Today's Data

Aux Consumption	76.5
Grid Availlability	✓
Grid Downtime	0 :0
Operation Hours	8 :30
Today Max Power	2921.48 kW
Today Max Irradiance	244.00 W/M²
Plant Start Time	06:14:37
Plant Stop Time	19:14:37

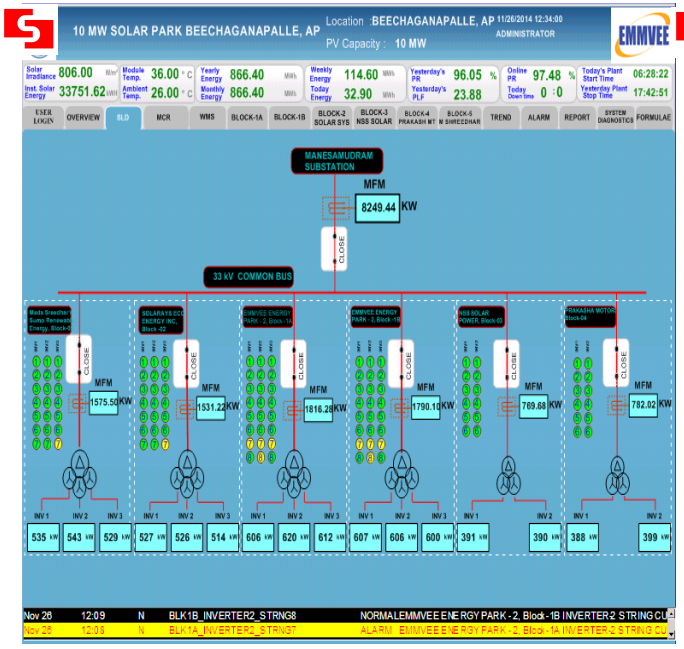
GENERATION - DAY 13.02 MWH | Block 1 | 12/16/2014 | DAY | WEEK | MONTH | YEAR

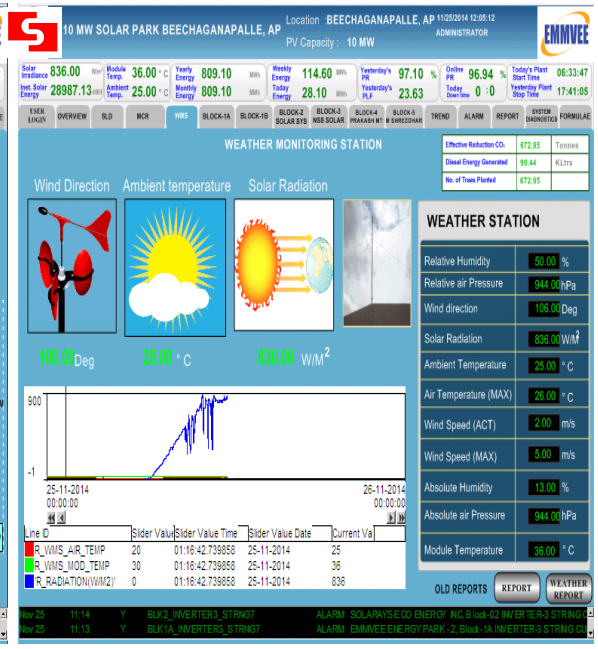


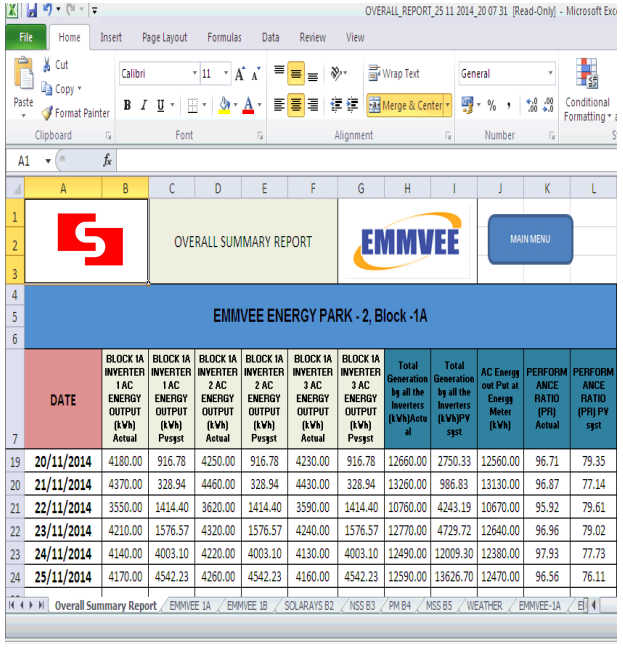


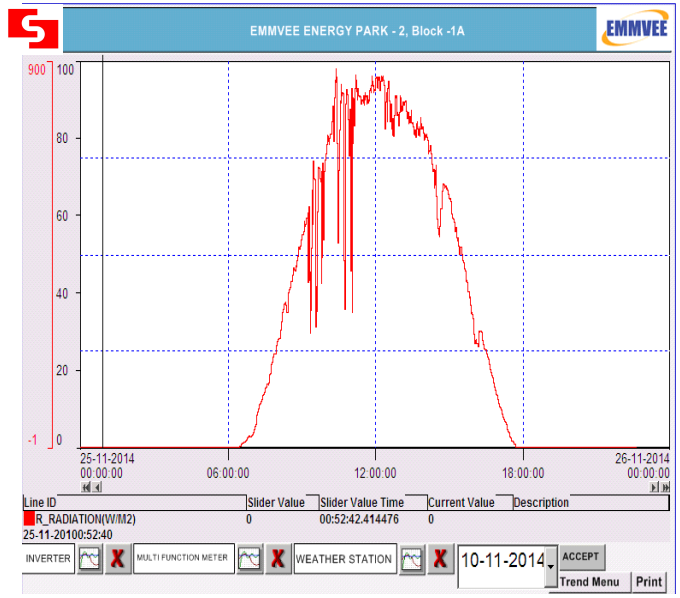
Description	Current Value	Slider Value	Slider Value Time
WEATHER STATION HORIZONTAL GLOBAL RADIATION	5	0	7:58:35.094252 PM
BUS PT TRANSFORMER PROTECTION RELAY ACTIVE POWER	30.16	-19.68	1:13:00.599297 AM

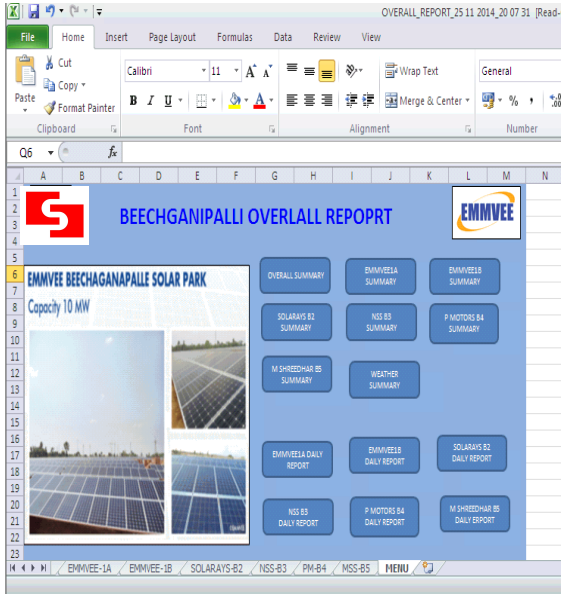
Dec 17	17:39	N	B1 ISO1.VCB ON	ALARM	B1 ISO1 VCB ON
Dec 17	17:39	N	B1 ISO2.VCB ON	ALARM	B1 ISO2 VCB ON
Dec 17	17:10	N	B1 DIAG.PLC	ALARM	PLC Loss of Module

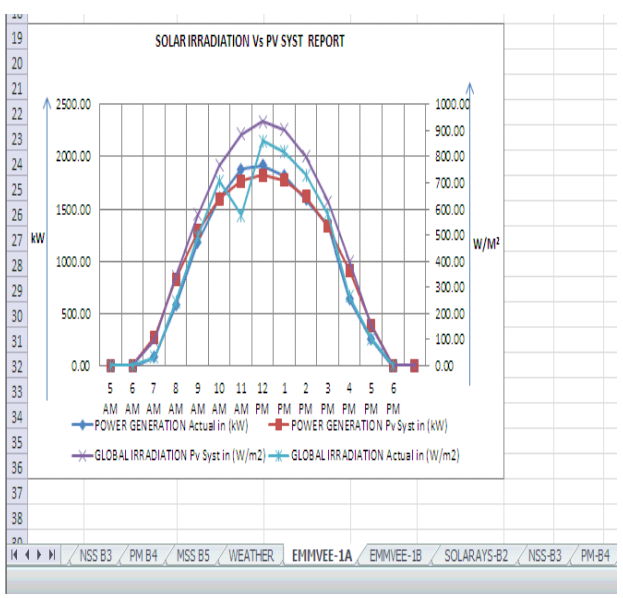

10 MW SOLAR PARK BEECHAGANAPALLE, AP
Location :BEECHAGANAPALLE, AP
PV Capacity : 10 MW
EMMVEE
MANESAMUDRAM SUBSTATION
MFM
8249.44 KW
33 kV COMMON BUS
MFM
1575.50KW
MFM
1531.22KW
MFM
1816.28KW
MFM
1790.10KW
MFM
769.68 KW
MFM
782.02 KW
535 kW
543 kW
529 kW
527 kW
526 kW
514 kW
606 kW
620 kW
612 kW
607 kW
606 kW
600 kW
391 kW
390 kW
388 kW
399 kW


10 MW SOLAR PARK BEECHAGANAPALLE, AP
Location :BEECHAGANAPALLE, AP
PV Capacity : 10 MW
EMMVEE
WEATHER MONITORING STATION
Wind Direction
Ambient temperature
Solar Radiation
106.00Deg
25.00 °C
836.00 W/M2
WEATHER STATION
Relative Humidity 50.00 %
Relative air Pressure 944.00 hPa
Wind direction 106.00 Deg
Solar Radiation 836.00 W/M2
Ambient Temperature 25.00 °C
Air Temperature (MAX) 26.00 °C
Wind Speed (ACT) 2.00 m/s
Wind Speed (MAX) 5.00 m/s
Absolute Humidity 13.00 %
Absolute air Pressure 944.00 hPa
Module Temperature 36.00 °C
OLD REPORTS
REPORT
WEATHER REPORT


OVERALL_REPORT_25 11 2014_20 07 31 [Read-Only] - Microsoft Excel
OVERALL SUMMARY REPORT
EMMVEE
MAIN MENU
EMMVEE ENERGY PARK - 2, Block -1A
DATE
BLOCK 1A INVERTER 1 AC ENERGY OUTPUT (kVh) Actual
BLOCK 1A INVERTER 1 AC ENERGY OUTPUT (kVh) Pvsyst
BLOCK 1A INVERTER 2 AC ENERGY OUTPUT (kVh) Actual
BLOCK 1A INVERTER 2 AC ENERGY OUTPUT (kVh) Pvsyst
BLOCK 1A INVERTER 3 AC ENERGY OUTPUT (kVh) Actual
BLOCK 1A INVERTER 3 AC ENERGY OUTPUT (kVh) Pvsyst
Total Generation by all the Inverters (kVh)Actual
Total Generation by all the Inverters (kVh)PV syst
AC Energy out Put at Energy Meter (kVh)
PERFORMANCE RATIO (PR) Actual
PERFORMANCE RATIO (PR) PV syst
20/11/2014 4180.00 916.78 4250.00 916.78 4230.00 916.78 12660.00 2750.33 12560.00 96.71 79.35
21/11/2014 4370.00 328.94 4460.00 328.94 4430.00 328.94 13260.00 986.83 13130.00 96.87 77.14
22/11/2014 3550.00 1414.40 3620.00 1414.40 3590.00 1414.40 10760.00 4243.19 10670.00 95.92 79.61
23/11/2014 4210.00 1576.57 4320.00 1576.57 4240.00 1576.57 12770.00 4729.72 12640.00 96.96 79.02
24/11/2014 4140.00 4003.10 4220.00 4003.10 4130.00 4003.10 12490.00 12009.30 12380.00 97.93 77.73
25/11/2014 4170.00 4542.23 4260.00 4542.23 4160.00 4542.23 12590.00 13626.70 12470.00 96.56 76.11

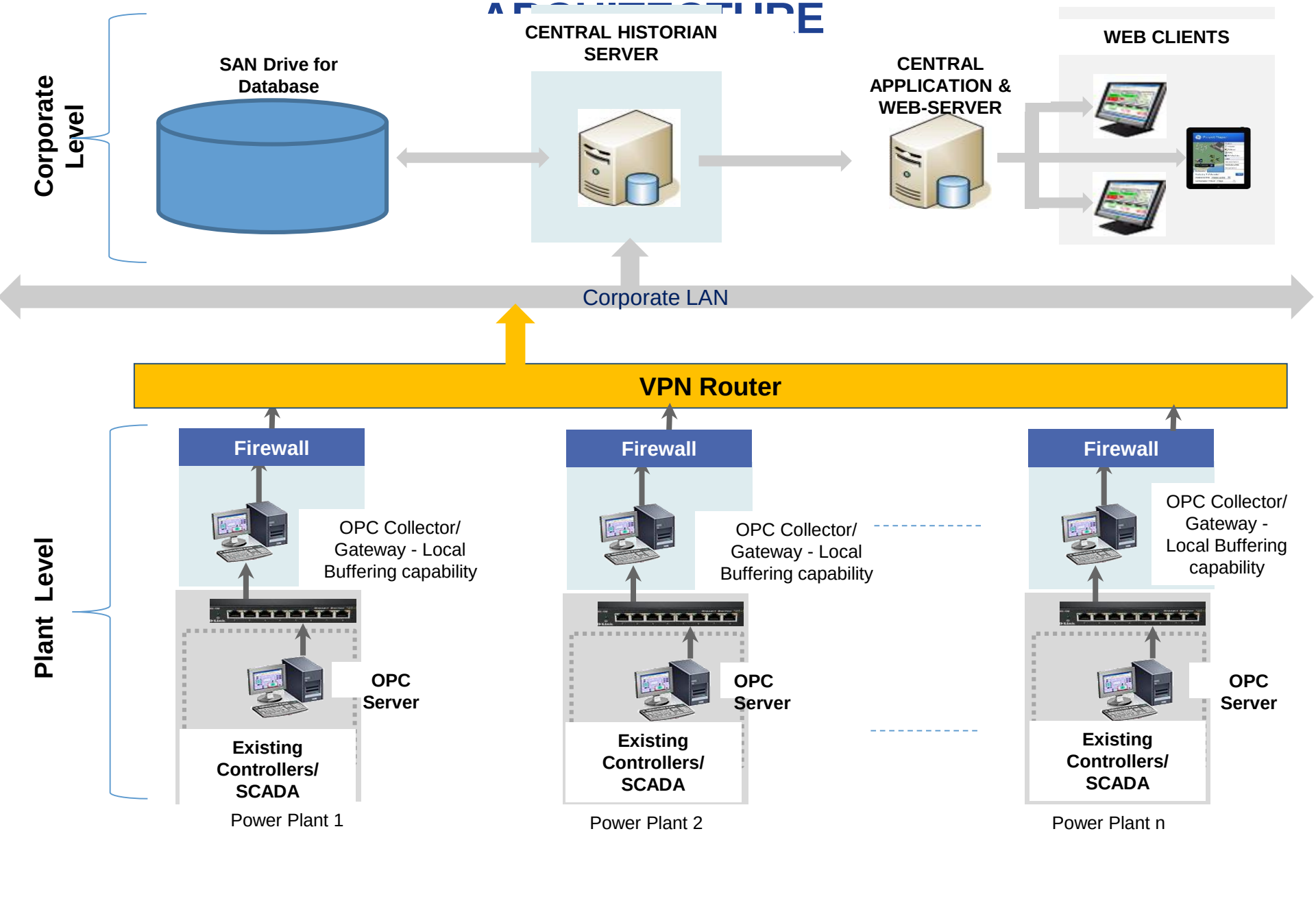

EMMVEE ENERGY PARK - 2, Block -1A
EMMVEE
25-11-2014 00:00:00
06:00:00
12:00:00
18:00:00
26-11-2014 00:00:00
Line ID
Slider Value
Slider Value Time
Current Value
Description
R_RADIATION(W/M2)
0
00:52:42.414476
0
25-11-20100:52:40
INVERTER
MULTI FUNCTION METER
WEATHER STATION
10-11-2014
ACCEPT
Trend Menu
Print


BEECHGANIPALLI OVERLALL REPOPRT
EMMVEE
EMMVEE BEECHAGANAPALLE SOLAR PARK
Capacity 10 MW
OVERALL SUMMARY
EMMVEE1A SUMMARY
EMMVEE1B SUMMARY
SOLARAYS B2 SUMMARY
NSS B3 SUMMARY
P MOTORS B4 SUMMARY
M SHREEDHAR B5 SUMMARY
WEATHER SUMMARY
EMMVEE1A DAILY REPORT
EMMVEE1B DAILY REPORT
SOLARAYS B2 DAILY REPORT
NSS B3 DAILY REPORT
P MOTORS B4 DAILY REPORT
M SHREEDHAR B5 DAILY REPORT


SOLAR IRRADIATION Vs PV SYST REPORT
kW
W/M2
POWER GENERATION Actual in (kW)
POWER GENERATION Pv Syst in (kW)
GLOBAL IRRADIATION Pv Syst in (W/m2)
GLOBAL IRRADIATION Actual in (W/m2)

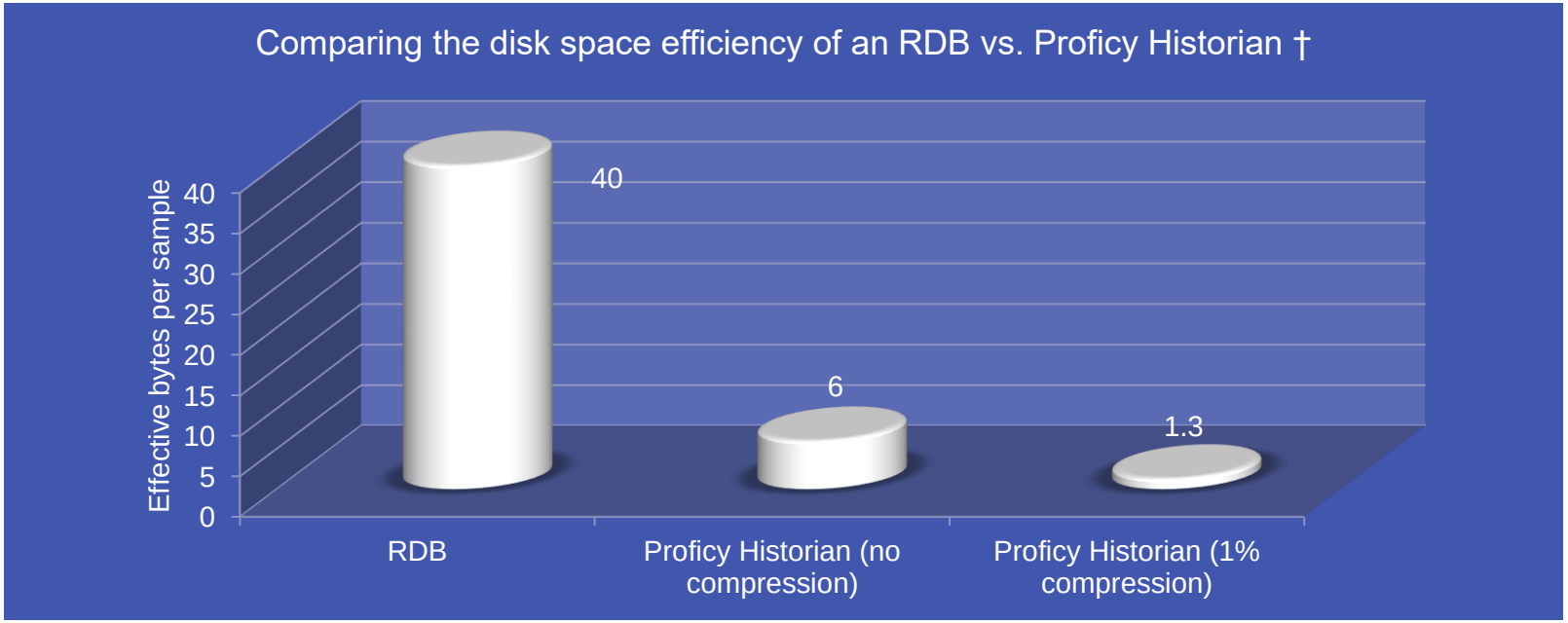
Centralized Performance Monitoring Station for Renewable Power Plants

CENTRAL MONITORING STATION - SOLUTION ARCHITECTURE



The Value Time Series Database

- Hardware agnostic – can layer on anybody's OPC compliant SCADA
- Online Monitoring of Defined KPIs
- Access from anywhere & everywhere….mobility on Android or iOS
- Creates treasure of past & current performance at 1/40th of the disk space as required by a relational database like SQL or Oracle
- Web based reports & dashboards, customizable on the fly…. Ad hoc reporting & trend analyses
- Makes the past data available at finger tips
- Creates a benchmark from the past performance
- Lesser Disk space & Fast retrieval



OVERVIEW DASHBOARD

CENTRAL MONITORING SYSTEM

Home | 22MW Plant Overview | Inverter Summary | Inverter SMB Monitoring | Weather Montoring System

22MWp SOLAR POWER PLANT

Online Generation

14.49 MW

18.6MW

0.0 MW

TVM Online Generation

14,318.90 kW

Today TVM Generation

83,728.52 kWh

Today Plant Start Time

06:29:01

Plant Running Time

8 h 17 m 35 s

Last Plant StopTime

18:54:10

Yesterday Generation

27.76 MWh

Yesterday PR

90.88%

Yesterday PLF

5.41%

Current Performance Ratio

94.73 %

CO2 Footprint Saved

12,816.06 Tonnes

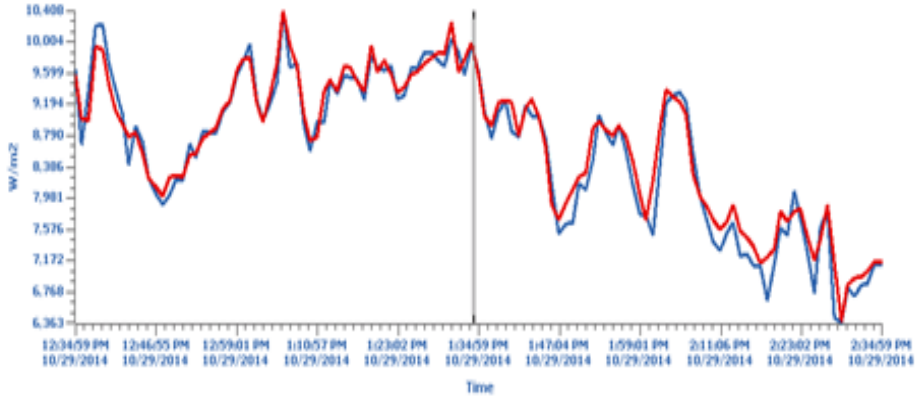
Weather Montoring System

GHI	760.91 w/m2	AMB TEMP	36.21 °C
INCLINED	804.35 w/m2	MODULE TEMP	56.34 °C

Block Wise kwh

CENTRALIZED MONITORING SYSTEM

PLANT PERFORMANCE



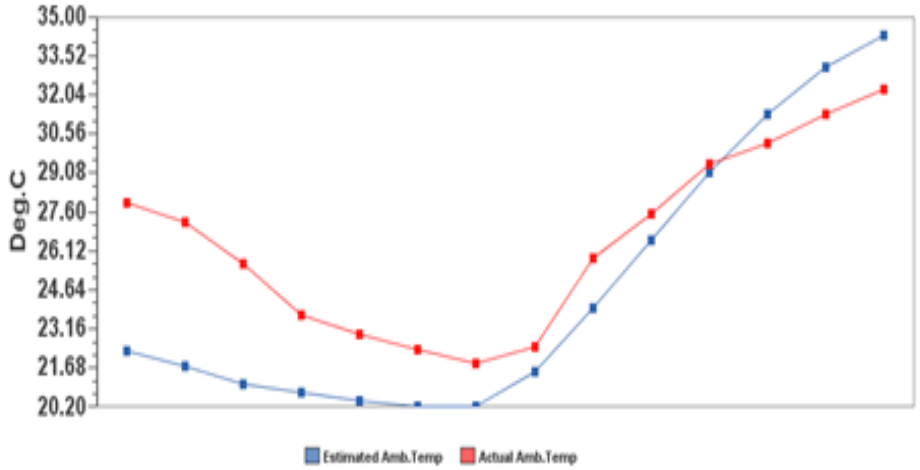
Pen Name	Description	Value
22MW.Overview.TVM_ONLINE_GENERATION	22MW.Overview.TVM_ONLINE_GENERATION	9,871
22MW.Overview.TVM_TREND	22MW.Overview.TVM_TREND	548

Generation

Estimated	106.75	MWh
Actual	55.26	MWh

Revenue

	6.89	lacs.
	3.56	lacs.



PR

73.79 %	83.41%

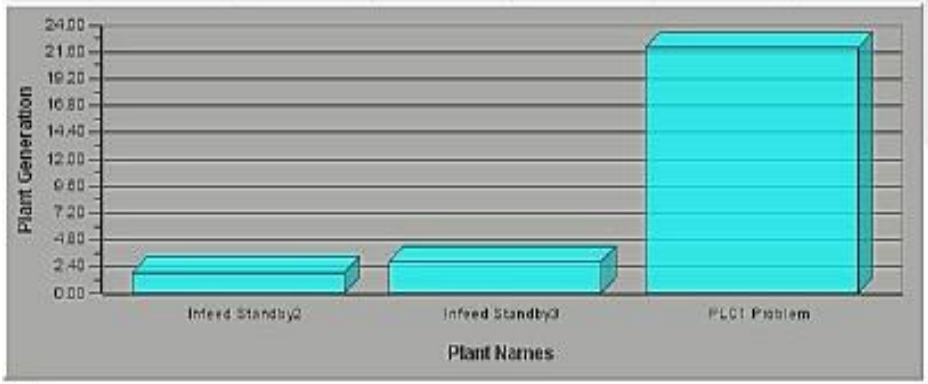
PLF

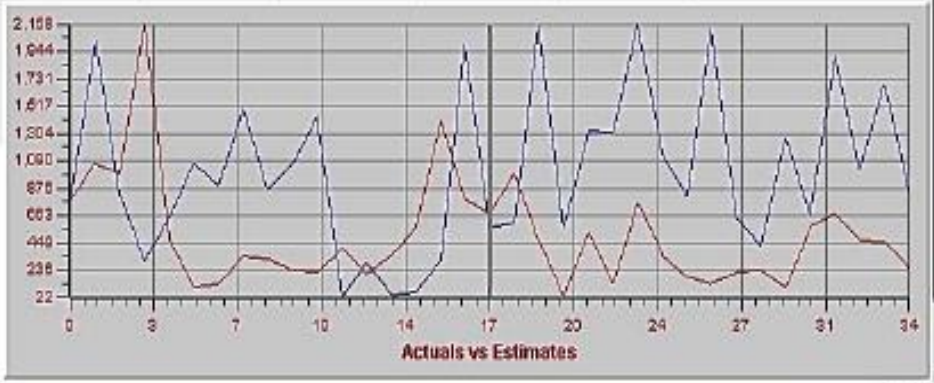
20.72%	10.45%

File | Help

5:24:41 PM | 1 Hour Ago

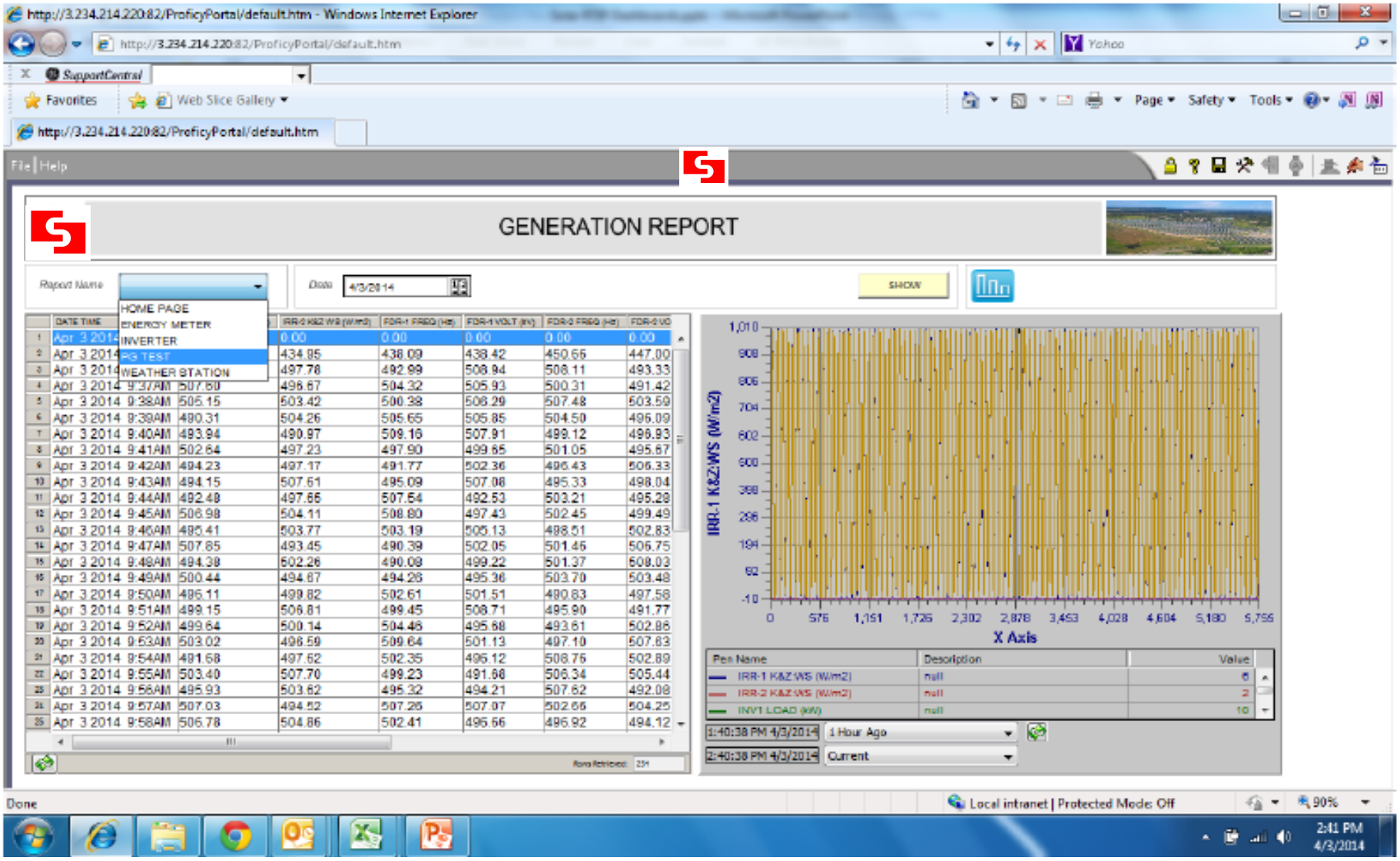
Title		Performance Measurement			From Design	From Site	% Variation Estimated vs Actuals	Guarantees				STATISTICS
Sr.No.	Project	Date	Actual Radiation (kWh/m2)	Actual Temperature (kWh/m2)	Generation in Kwh			Description	As per contract	At actuals	% Variation	
					Estimated	Actual						
1.	22 MW ABG	10/24/2014	6.84	33.47	120147	117350	-2.38	NMGG (kWh)	18736181	20948677	11.81	
								PR (%)	75.00	75.00		
2.	7.5 MW RSSB	10/24/2014	6.32	44.09	25036	24300	-3.03	NMGG (kWh)	4328788	3845057	-11.17	
								PR (%)	00.00	00.00		
3.	20 MW	10/24/2014	6.83	53.58	103057	102312	-0.73	NMGG (kWh)	15667623	17479084	11.56	
								PR (%)	73.5	74.90		
4.	xxxx MW							NMGG (kWh)				
								PR (%)				





Done | Local intranet | Protected Mode: Off | 100%

GENERATION REPORT



ADMINISTRATOR
05/22/2014 13:51:11

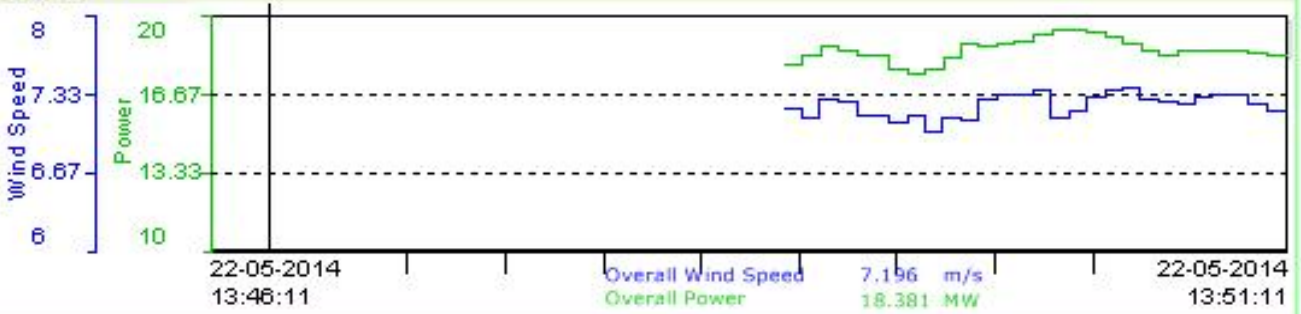
Wind Farm

Home Wind Screen

Key Performance Indicators

Power	18.4	MW
Wind Speed	7.2	m/s
Capacity Factor (MTD)	13.5	%
Availability (MTD)	84.7	%

Trend



ADMINISTRATOR
05/22/2014 13:52:32
Wind Farm

Home | Wind | Screen

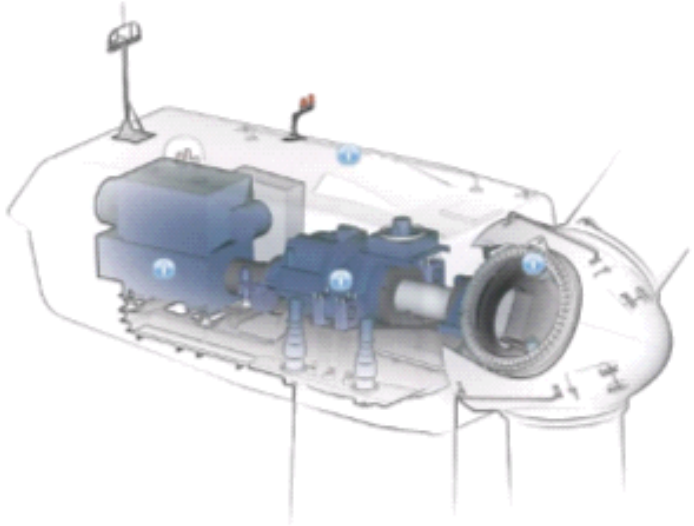
Turbine Status

- Greenko01
- Greenko02
- Greenko03
- Greenko04
- Greenko05
- Greenko06
- Greenko07
- Greenko08
- Greenko09
- Greenko10
- Greenko11
- Greenko12
- Greenko13
- Greenko14

Turbine Details -Greenko15

Online

Power	118	kW
Reactive Power	1	kVAr
Ambient Temperature	28	° C
Wind Speed	5.54	m/s
Generator speed	1071	rpm
Rotor speed	10.0	rpm
Temp Nacelle	33	° C
Availability (MTD)	53	%
Reliability (MTD)	100	%
Cap. Factor	5	%
Production (MTD)	38034	kWh



Key Performance Indicators

Power	17.9	MW
Wind Speed	7.3	m/s
Capacity Factor (MTD)	13.5	%
Availability (MTD)	84.7	%

Alarms

Date	Time	Resource ID	Message	State	Ack
May ...	14:29		Load operation	ALARM	N
May ...	14:29		System OK	ALARM	N
May ...	14:29		No Errors	ALARM	N
May ...	17:58		Low wind speed cut ...	NORM..	N

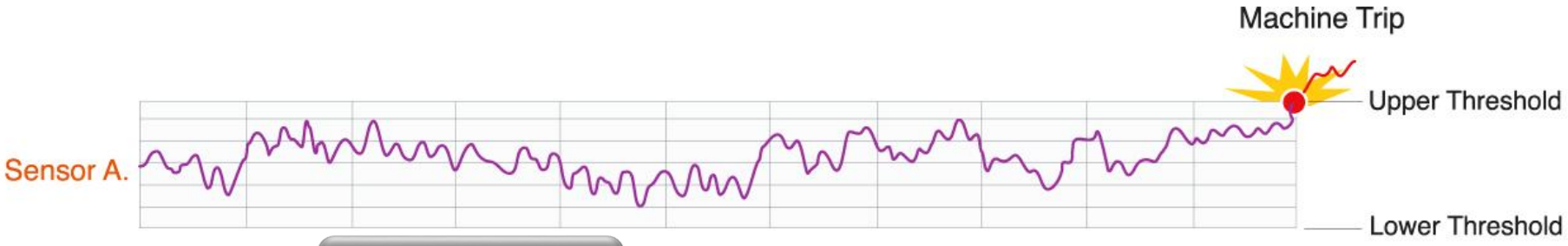
273 May 22 13:43

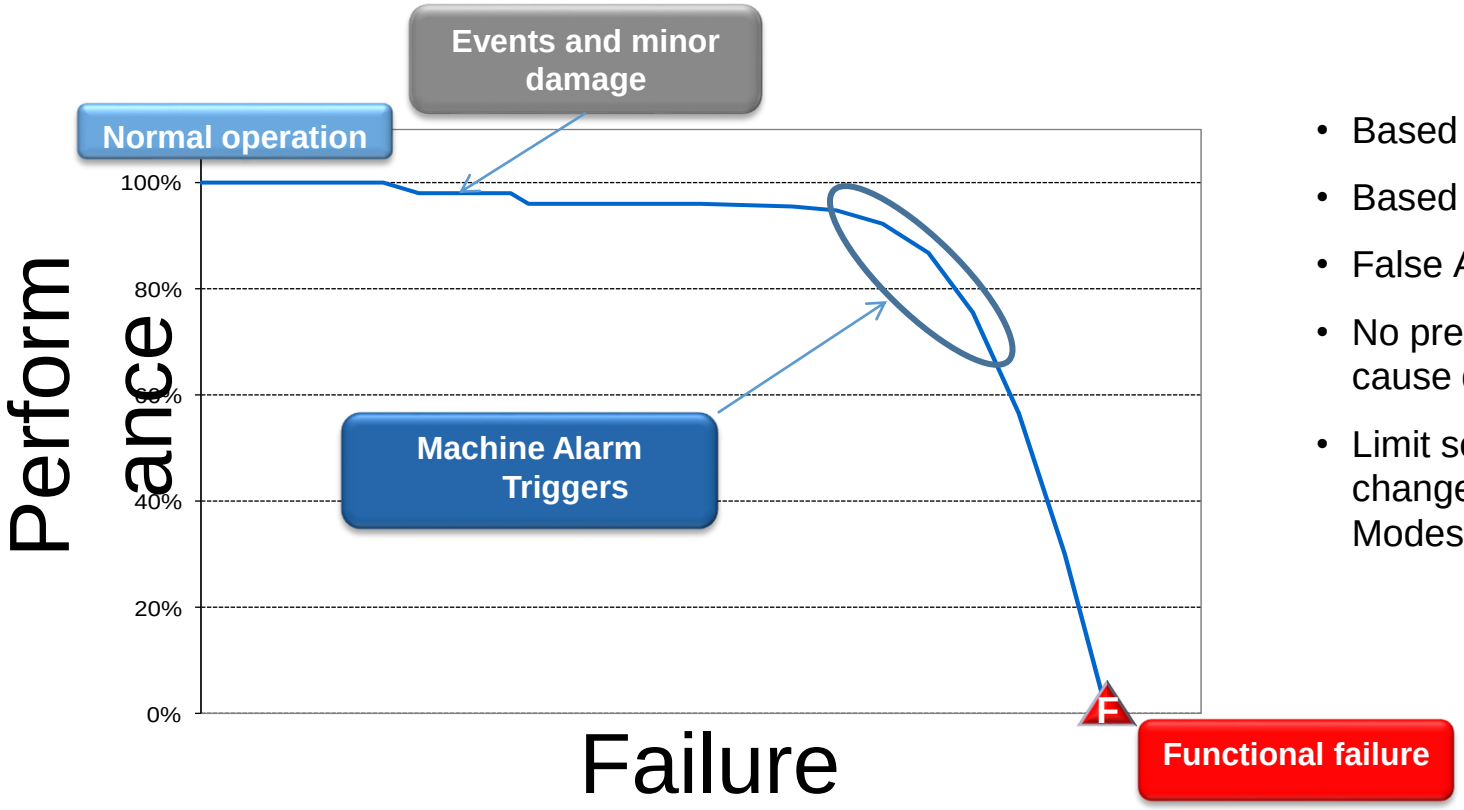
Ack | Reset | Delete | Toggle | Setup | Refresh | Help | View Stack | Comments

Predictive Diagnostics

Conventional Monitoring …

Uses Hard Thresholds… damage already done alerting



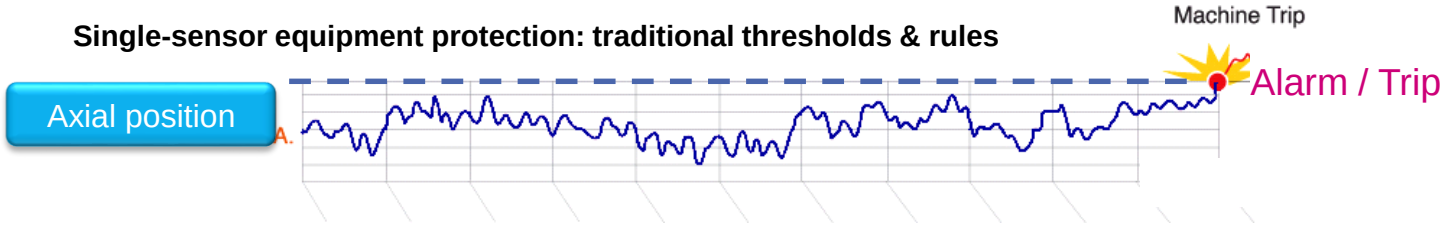


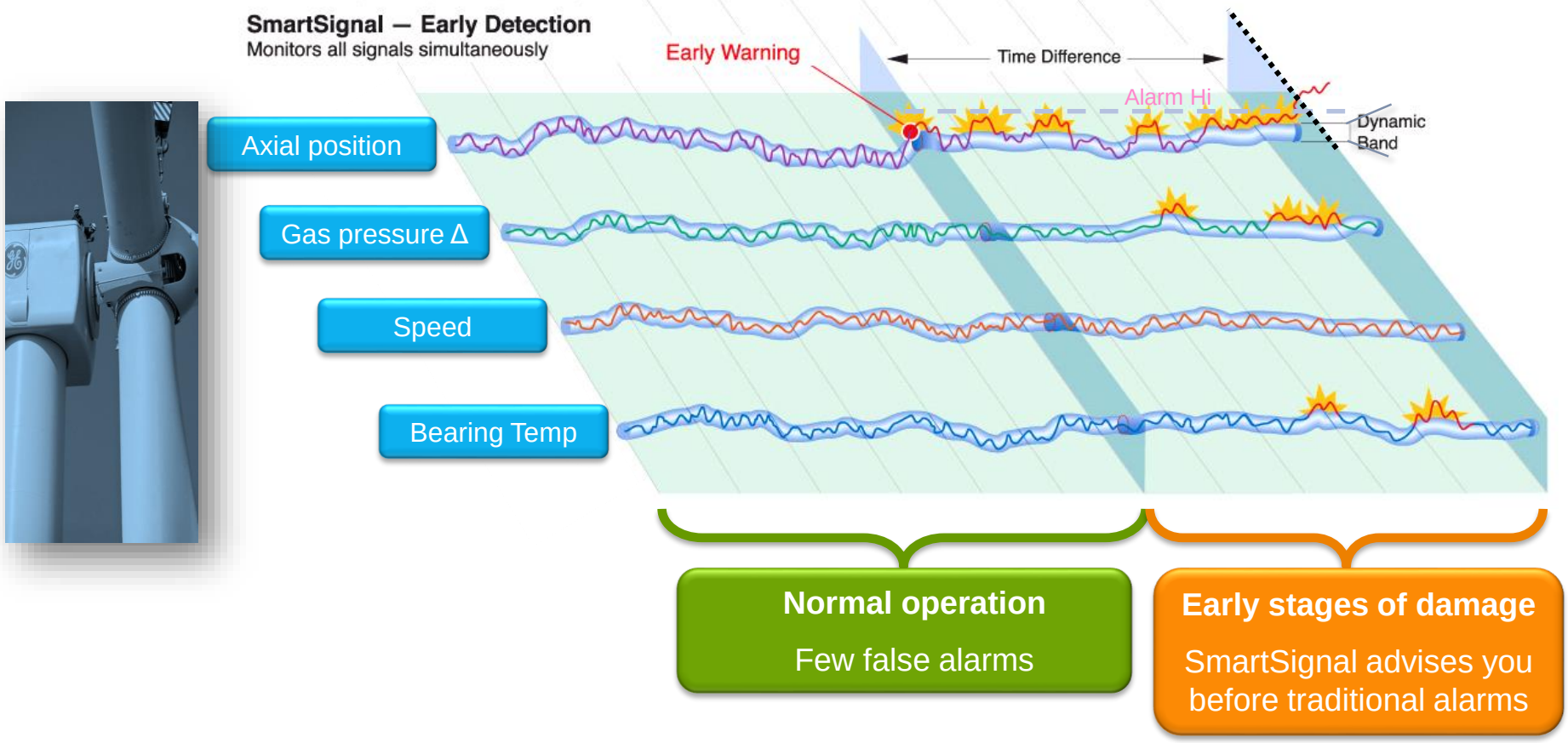
- Based on MFGR Specs
- Based on Plant Experience
- False Alarms
- No prediction or apparent cause diagnostic
- Limit sets need to be changed to encompass all Modes of Operation

SmartSignal Difference: Equipment condition in context

Multiple sensors, thresholds based on residual values

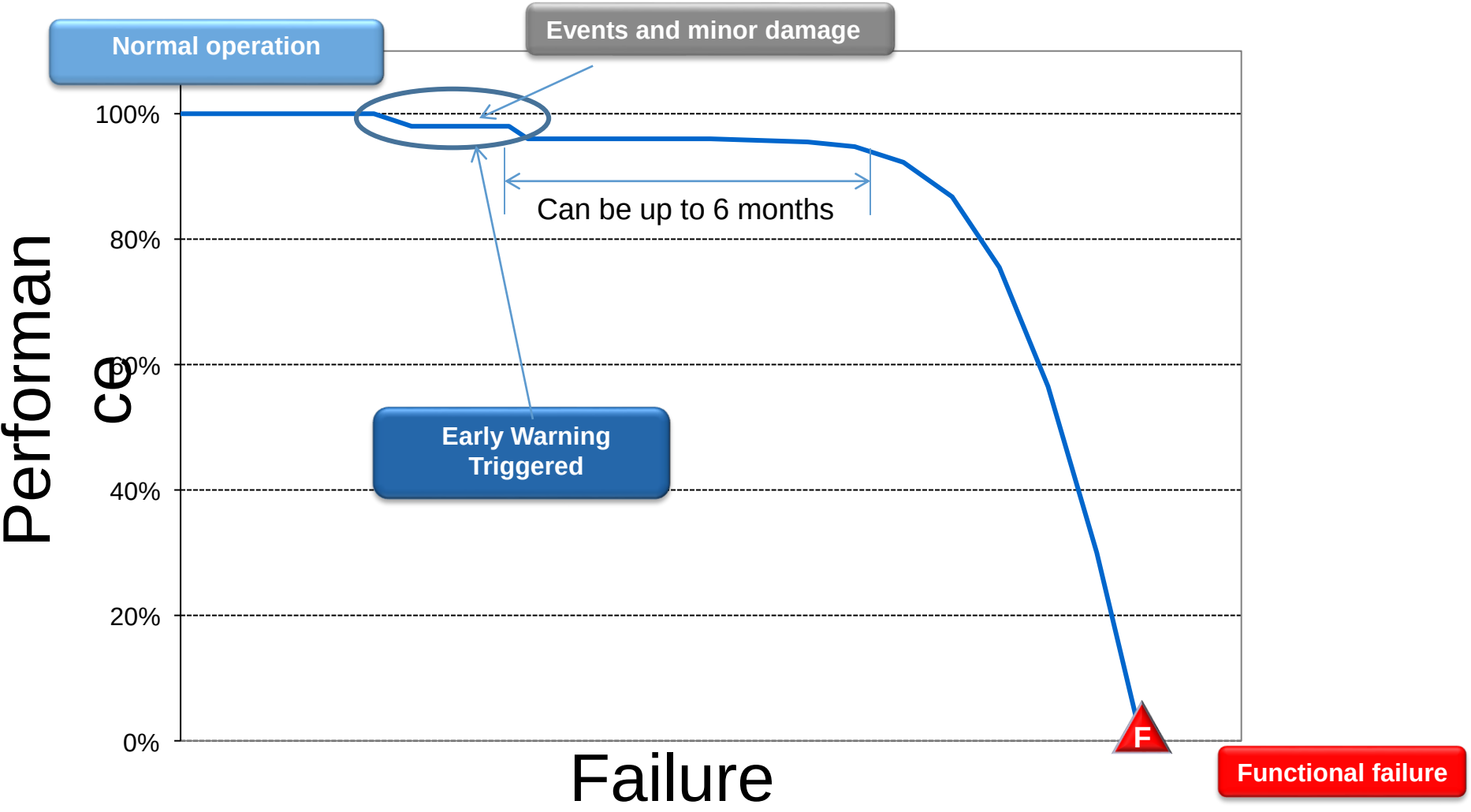
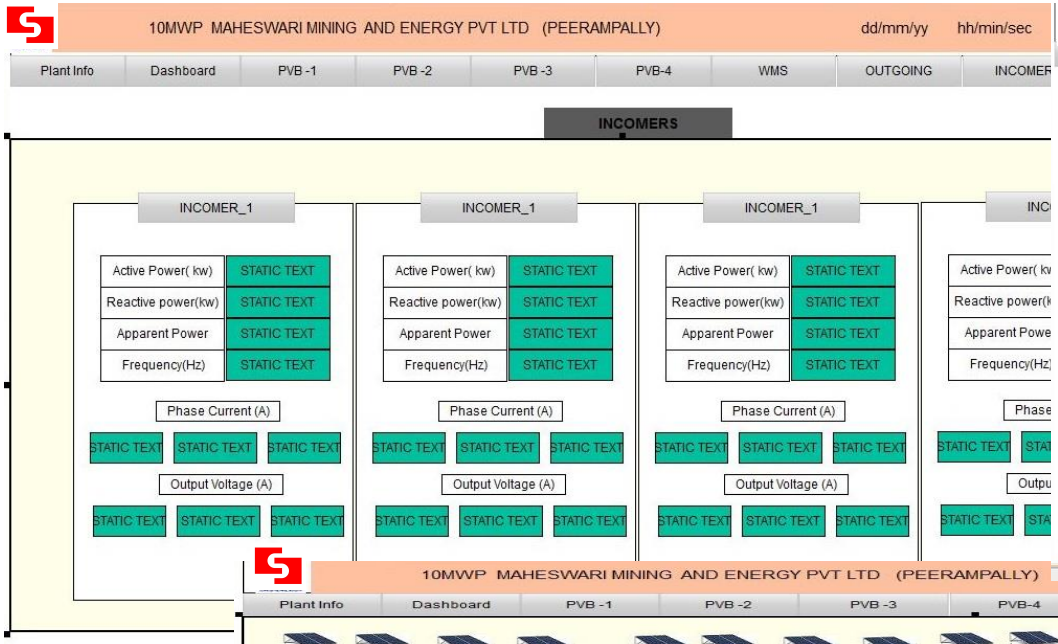
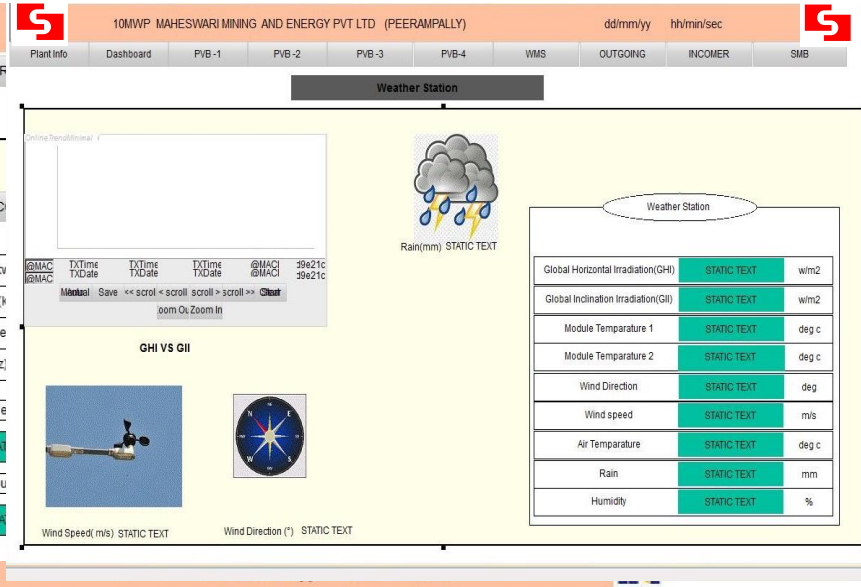
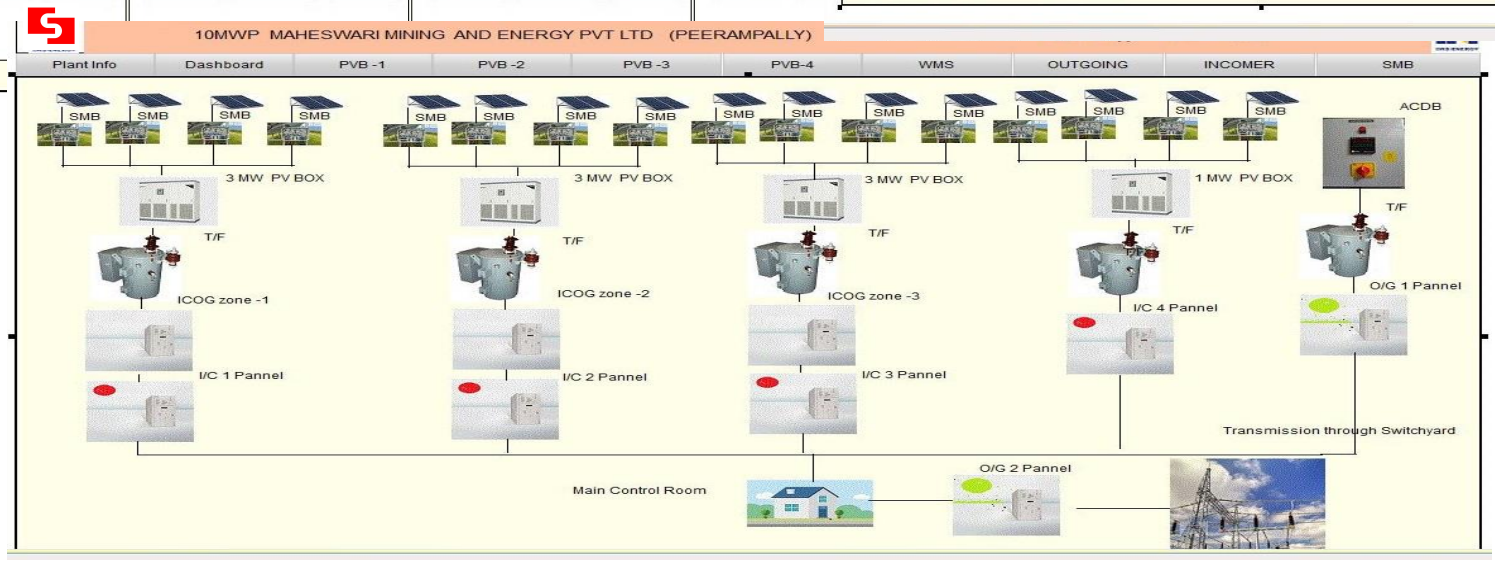
Single-sensor equipment protection: traditional thresholds & rules





Delivers time for decision making

Have the foresight to see issues developing ‘early’



Some Other SCADA Screens References