



# The Role Of PI In Adani Ports Information Management System

Presented by

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**Adani Ports and SEZ Limited**



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1	Adani Group
2	PIMS
3	Dynamic Vessel Monitoring System (DVMS)
4	Port Integration

# The Adani Group



Leading Business Conglomerate with interest in diversified sectors...

## Resources

Sourcing hydrocarbons from around the world to fuel India's growth



Resources

- Coal Mining
- Oil & Gas Exploration
- Coal Trading

## Logistics

Owning a large network of ports, railways, ships and operate various facilities around our ports



Logistics

- Multi Modal Logistics
- Ports
- Special Economic Zones

## Energy

Leading player in private sector power generation



Energy

- Gas Distribution
- Power
- Bunkering
- Grain Silos & Fruits
- Edible Oil

# Adani Ports Infrastructure



## Helping India build Port Capacity

- Adani initially started its first port at Mundra location. Later on it has aggressively added new Indian & Overseas ports to its portfolio.
- Adani Ports is targeting to achieve the mammoth figure of 200 million MT per annum Indian cargo handling by 2020
- In the last fin year Adani Ports (India) handled over 90 Million MT of cargo



Indian Ports & Terminals	Location	Year of Operations (expected)	Existing Capacity	Planned Capacity
Adani Mundra Port	Mundra, Gujarat	1998	165	240
Adani Petronet (Dahej) Port Pvt. Ltd.	Dahej, Gujarat	2010	20	20
Adani Abbot Point Terminal Pty Ltd	Australia	2011	50	100
Adani Hazira Port Private Ltd.	Hazira, Gujarat	2012	25	75
Adani Mormugao Coal Terminal Pvt. Ltd.	Goa	(2013)		7
Adani Vizag Coal Terminal Pvt. Ltd.	Vizag, Andhra Pradesh	(2013)		7
Adani Kandla Bulk Terminal Private Ltd.	Kandla, Gujarat	(2014)		20
<b>Total Capacity (Million MT)</b>			<b>260</b>	<b>469</b>



# APSEZ : Unparallel Operational Expertise



## Pilotage & Towage

- 20 tugs & master mariners
- 13 Dredgers for Capital Dredging across ports



## Internal Transportation

- >580 kms of Conveyor Systems
- >120 kms of private roads
- >80 kms Railway Sidings



## Berthing

- 22 Bulk Berths
- 8 Container Berths
- 2 Single Point Moorings



## Storage

- 1 mn sq. mtrs of Warehouses
- 400 mega liters Liquid Tank Farms
- 12.5 Hectares of Back up yard for containers



## Cargo Handling

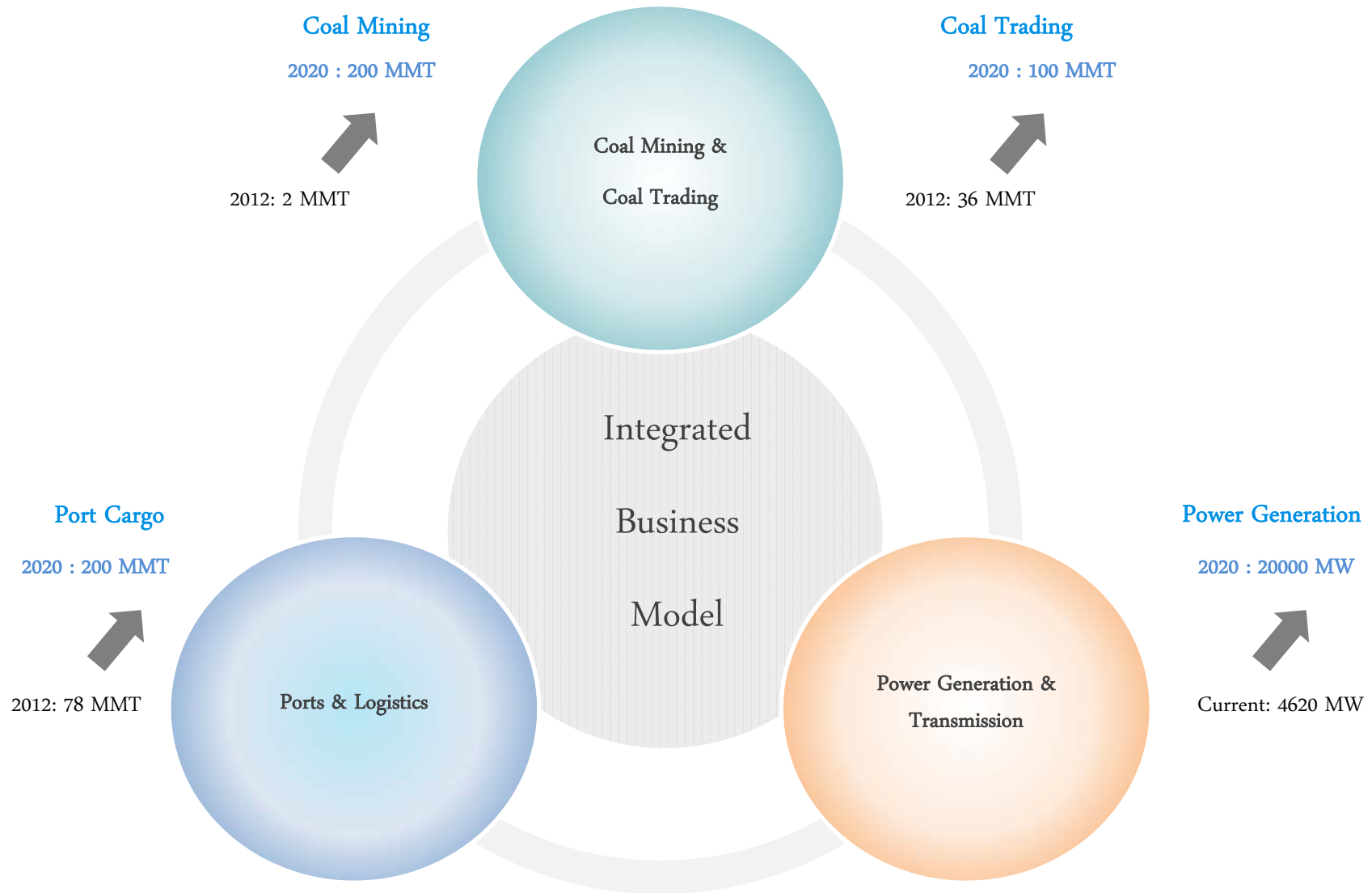
- Bulk Handling: 185 MTPA
- Containers: 5.25 MnTEUs
- Crude Handling: 50 MTPA
- Fully Mechanized Cargo handling terminals



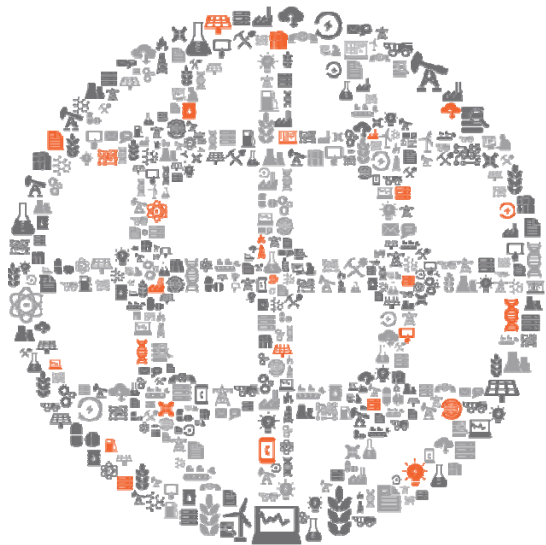
## Evacuation

- 150 kms of private railway line
- Pipelines over >1,000 kms
- 3km airstrip at Mundra

# Today and 2020



# Contents



1 Adani Group

2 Port Information Management System

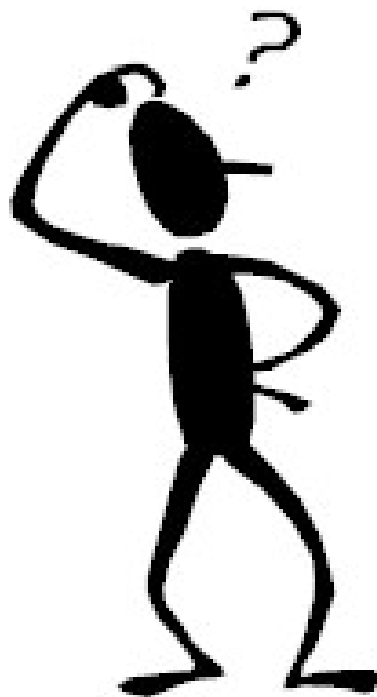
3 Dynamic Vessel Monitoring System (DVMS)

4 Port Integration

# Actual hurdles to overcome pain points

- 1 Missing transparency
- 2 Heterogeneous infrastructure
- 3 Manual data collection
- 4 No real time data
- 5 Manual reporting
- 6 No Benchmarks





How much was the Energy consumption in last year in KWh ?

What was the average production on 23 AUG 2012 compared against 23 AUG 2013 ?

Real time control of multi-cargo port operation

How we can Reduce the port operating cost by usage of optimum resource as per productivity needs ?

# Introduction to PIMS



- PIMS is a tool to achieve 'Operational excellence' by optimizing production in real time
- Integration of applications like Oracle, SQL server based and intelligent automation systems onboard Conveyors & Cranes
- PIMS allows the evaluation of system and operator performance
- Provide client tools for better trending, handling complex calculations
- PIMS will be consisting of two main areas:-
  - ✓ Integration of equipment information
  - ✓ Reports / dashboards

# PI Components used in PIMS

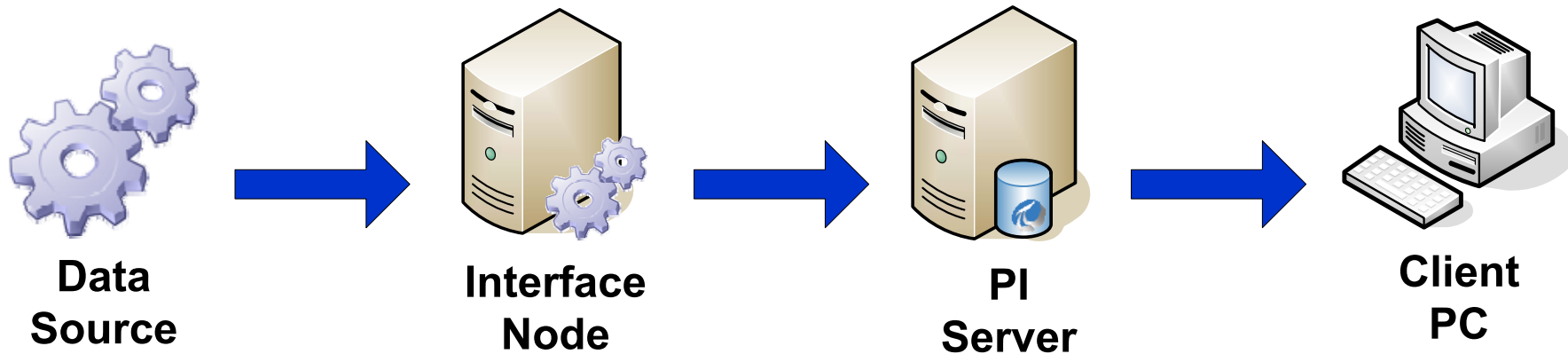


- PI Server 2010 with 10000 tags at Mundra, 2000 tags at Dahej, 2000 tags at Hazira, 2000 tags at Goa and 2000 tags at Vizag ports
- PI Asset Framework
- PI Clients- PI Combo (PI Processbook & PI Datalink)
- PI RDBMS Interface
- PI OPC Interface
- PI Notification
- PI Web Clients
- PI Modbus Serial Interface
- PI ACE
- PI PSA

# Project comprised integration of

- Coal conveyor system
- Hopper system
- Bagging system
- Mobile harbor and yard cranes
- Fuel management system
- GPS
- FMS

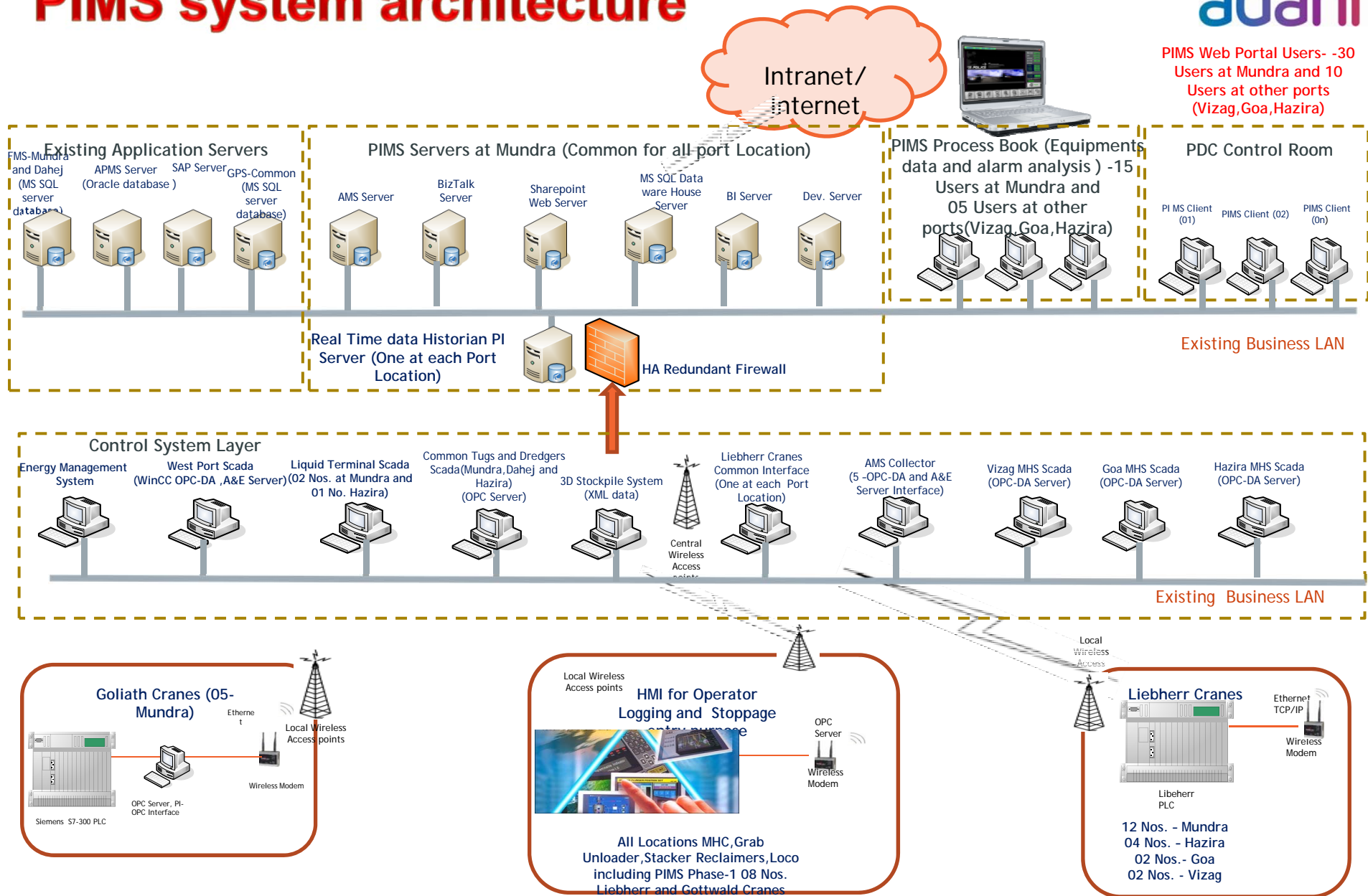
- Liquid terminal automation
- LOCO
- Stacker / reclaimer
- Wagon and truck loading system
- SAP reports integration
- Reports using SSRS
- EMS



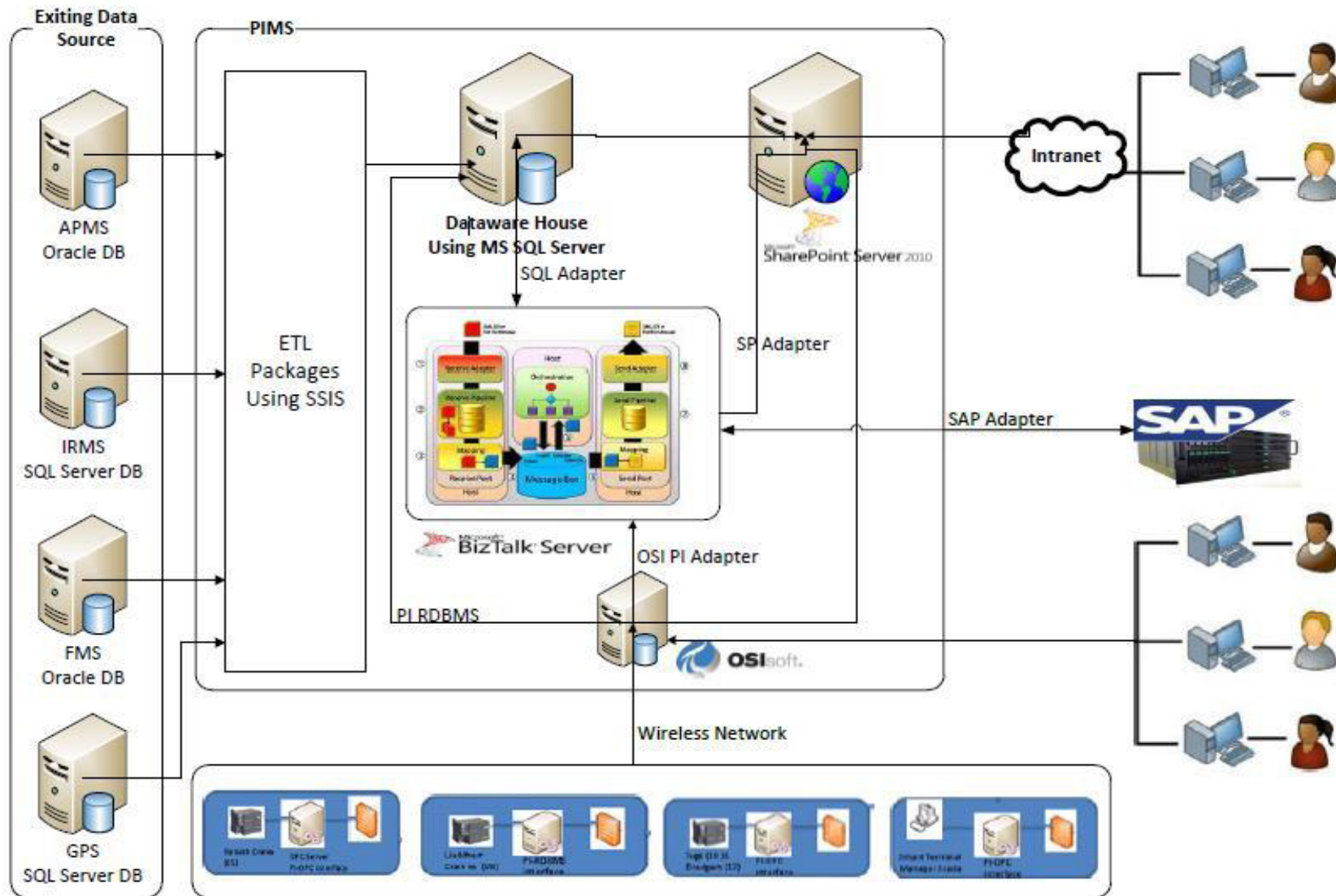
# PIMS system architecture

**adani**

PIMS Web Portal Users- -30  
Users at Mundra and 10  
Users at other ports  
(Vizag,Goa,Hazira)

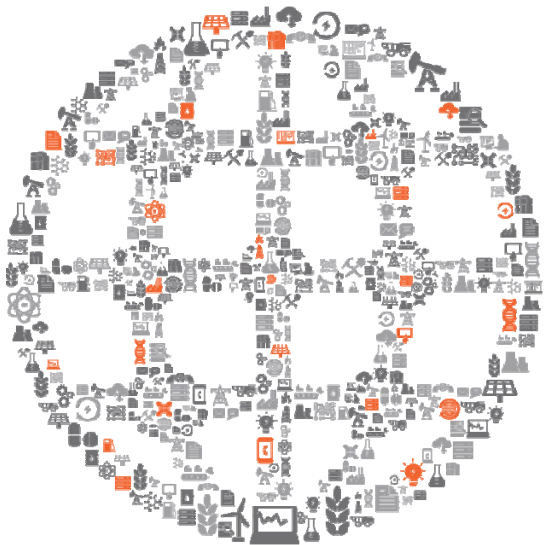


# High level system architecture





# Contents

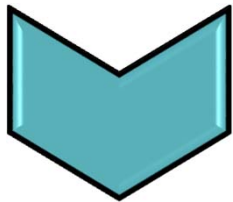


1	Adani Group
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4	Port Integration

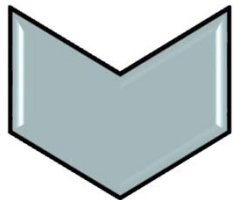
# Need for DVMS



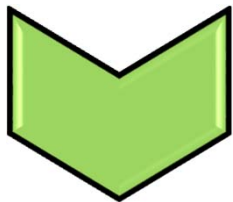
To face lot of challenges in today's market with increase in customer expectations, stiff competition and reduced margins. On top of that, there are some complex operations, which need of a robust Supply Chain Management (SCM) solution which will help Adani Ports to



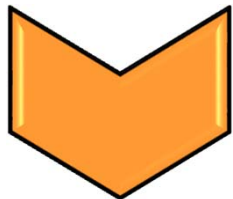
Real time control of multi-cargo port operation



Enhanced visualization: To bring hidden delays on surface in entire supply chain process



Reduce the port operating cost by usage of optimum resource as per productivity needs



Advanced analysis platform for performance comparison

## Objective

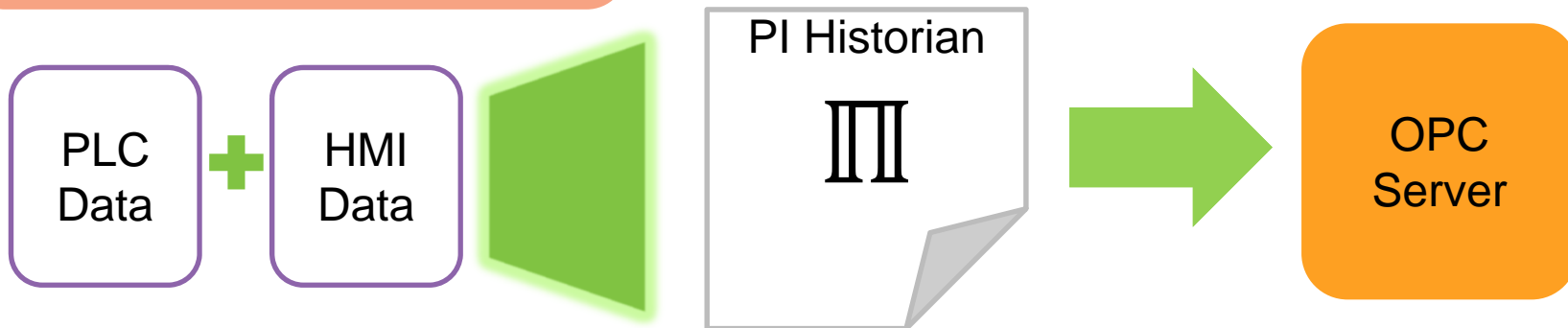
- To provide holistic visualization of the entire supply chain in Dry bulk and break bulk operations, which indicates the overall process, key resources involved and productivity / discharge rate
- Area of weakness in the supply chain can be identified on real time basis
- To reduce resources in the stronger links with an aim to reduce the operating cost
- DVMS system integrated with PI system and other applications like APMS, GPS and FMS system



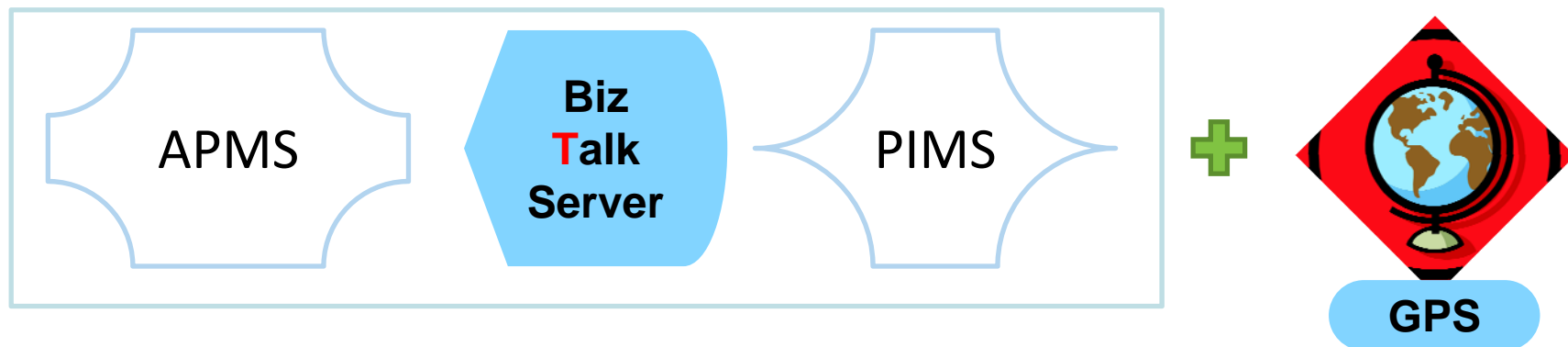
# Dynamic Vessel Monitoring System

Basic Architectural Design of DVMS Operates at 2 Levels

## Control System Layer



## Operational System Layer



# Dynamic Vessel Monitoring System

DVMS is an integrated tool for monitoring the overall vessel and for balancing the line of supply chain. The supply chain in a dry cargo operation comprises of the Shore cranes / vessel cranes, Hopper, Dumpers / Trailers / Conveyors and Back up equipments

## Crane

- It shows active number of system
- Crane data – productivity, reflect



## Hatch

- Hatch number along with
- DVMS will show number of that of a vessel

Hatch-01	Hatch-02
Cargo-DOKING COAL	Cargo-DOKING COAL
Cumens-9450.000	Cumens-9450.000
TRAIL-3450.000	TRAIL-3450.000

**MV CENTRANS LUCKY**

## Resources

- The total number of shown beneath the figure



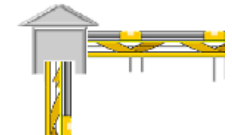
## Dumper

- Number of dumpers and total along with last hour productivity



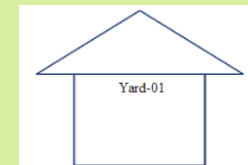
## Conveyor

- In case, supply chain has a conveyor belt will be visible
- Productivity per hour reflect placed on it



## Yard

- As per the allocation the back the system
- Number of available back up



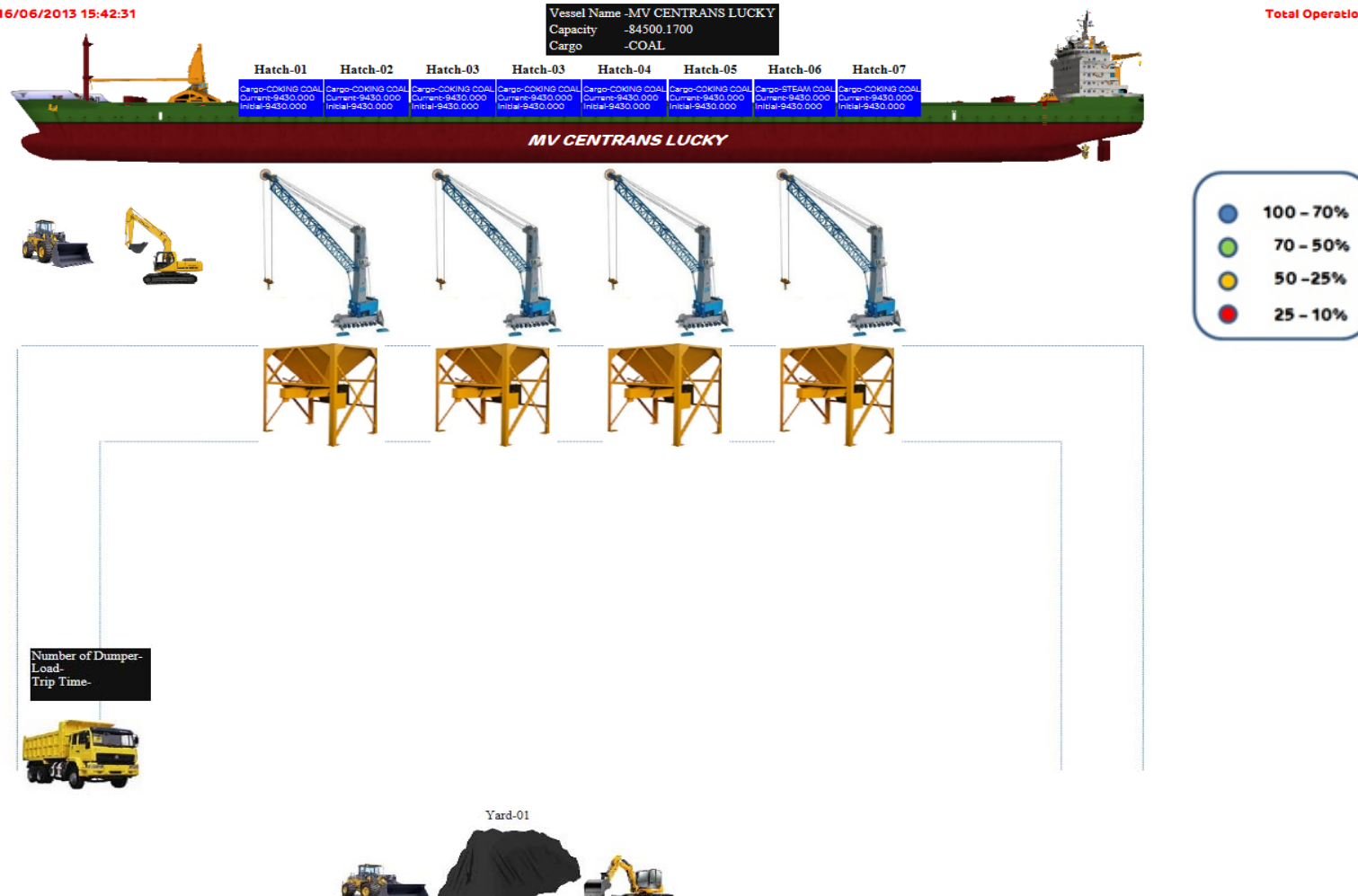
# Dynamic Vessel Monitoring System

Case 1: Vessel -> Shore Crane -> Hopper -> Dumper -> Yard -> Excavators & Loaders

16/06/2013 15:42:31

Vessel Name -MV CENTRANS LUCKY  
Capacity -84500.1700  
Cargo -COAL

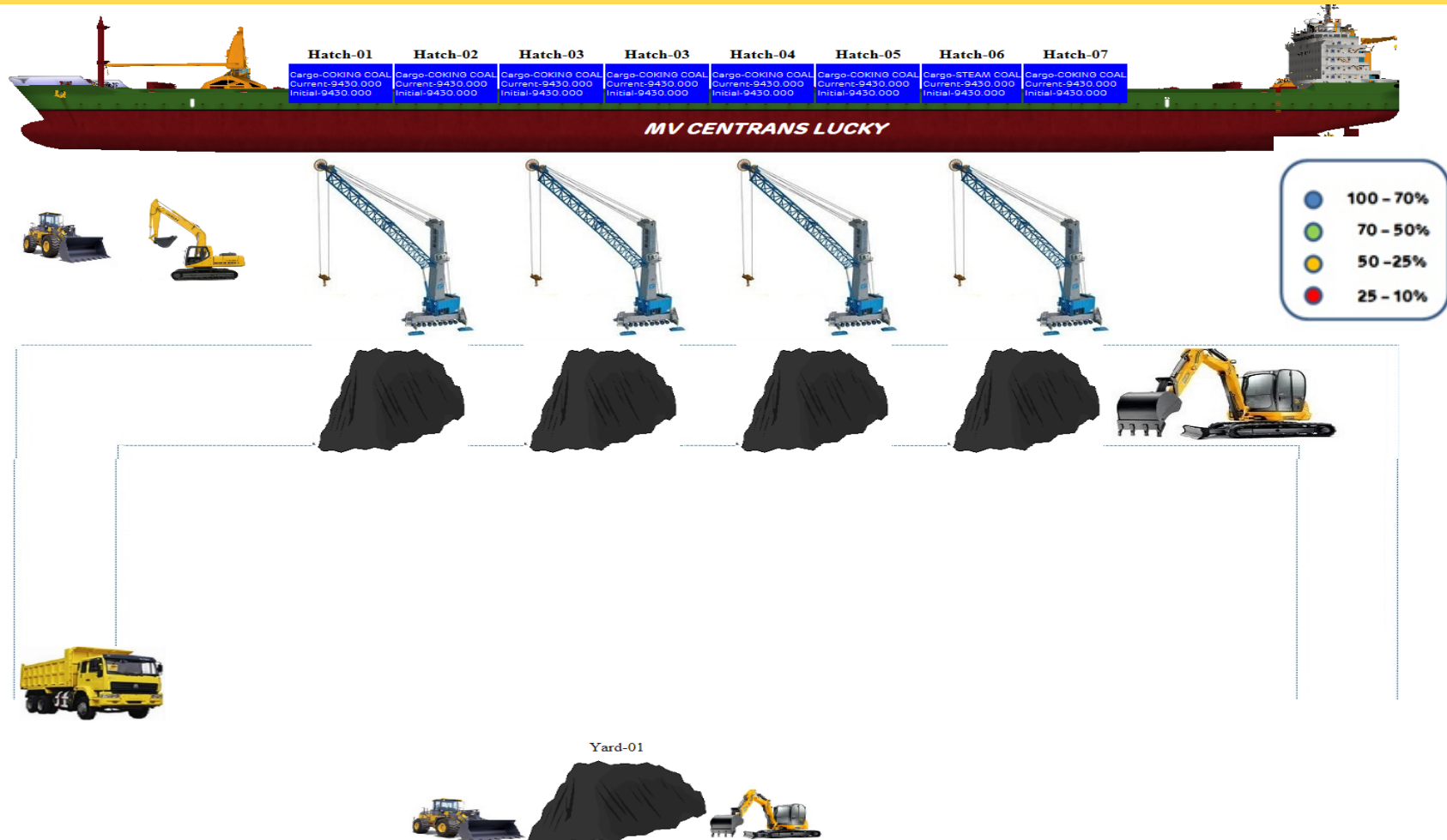
Total Operation Hours: 15





# Dynamic Vessel Monitoring System

Case 2: Vessel -> Shore Crane -> Hopper -> Jetty -> Loader -> Dumper -> Yard -> Excavators & Loaders

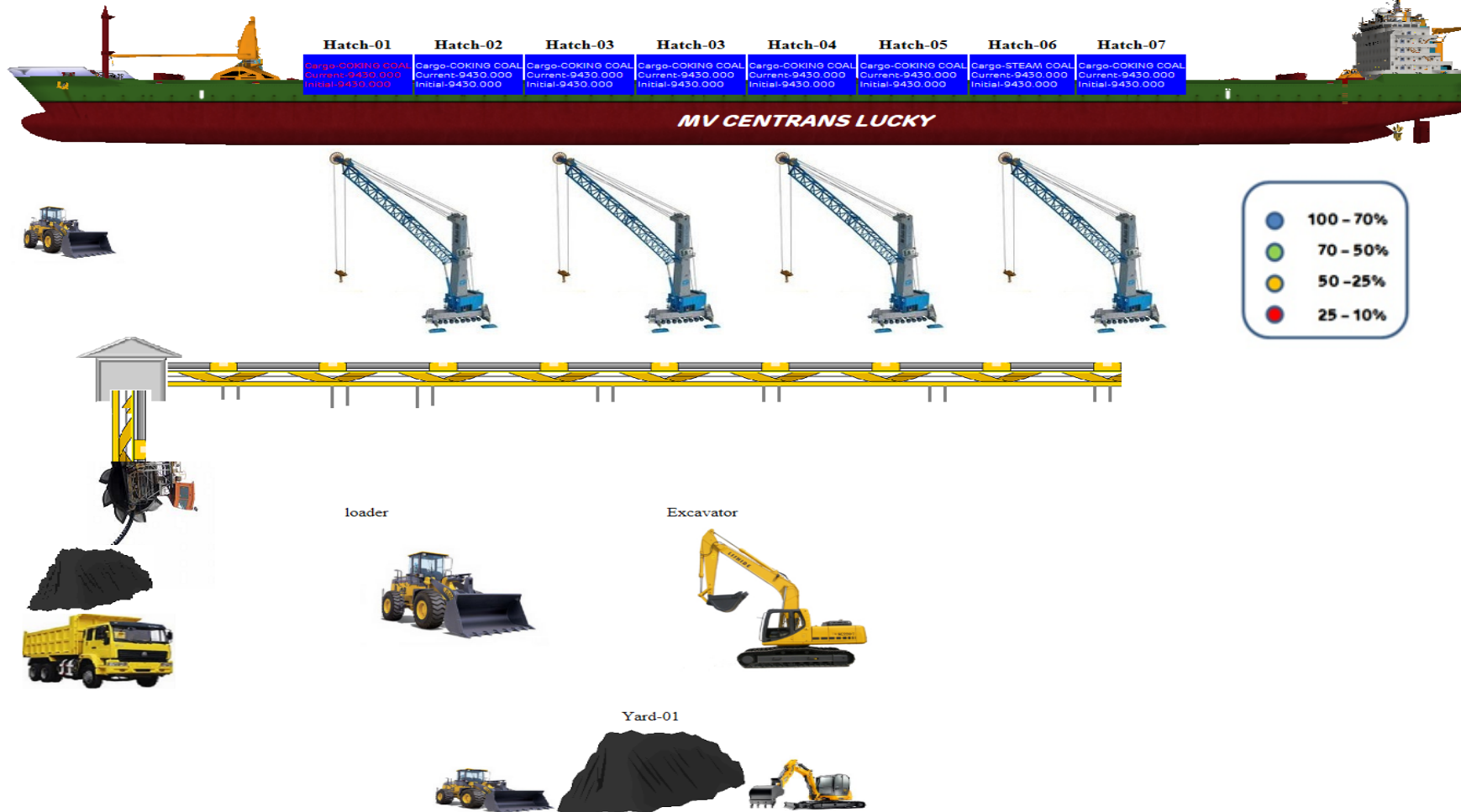


# Dynamic Vessel Monitoring System

Case 3: Vessel -> Shore Crane -> Hopper -> Conveyor -> Dumping Point -> Loaders -> Dumper -> Yard

16/06/2013 15:39:24

Total Operation Hours: 15

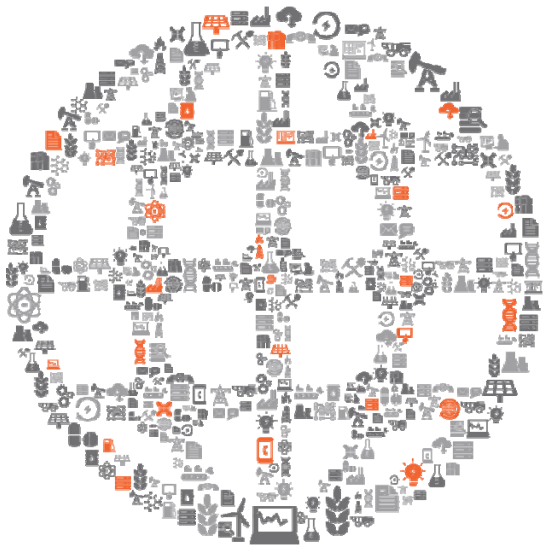


# Benefits : Dynamic Vessel Monitoring System

- Better Vessel Planning, Equipment Allocation as well as Yard Planning to increase in profit margin
- Actual Vs Plan productivity in real time basis to Identification of process bottlenecks
- Optimum equipment deployment based on the per ton handling cost
- Advanced analysis platform and enhanced visualization for decision making
- Consolidated data availability of each vessel in entire port and base for Inter port Knowledge sharing for cost optimization



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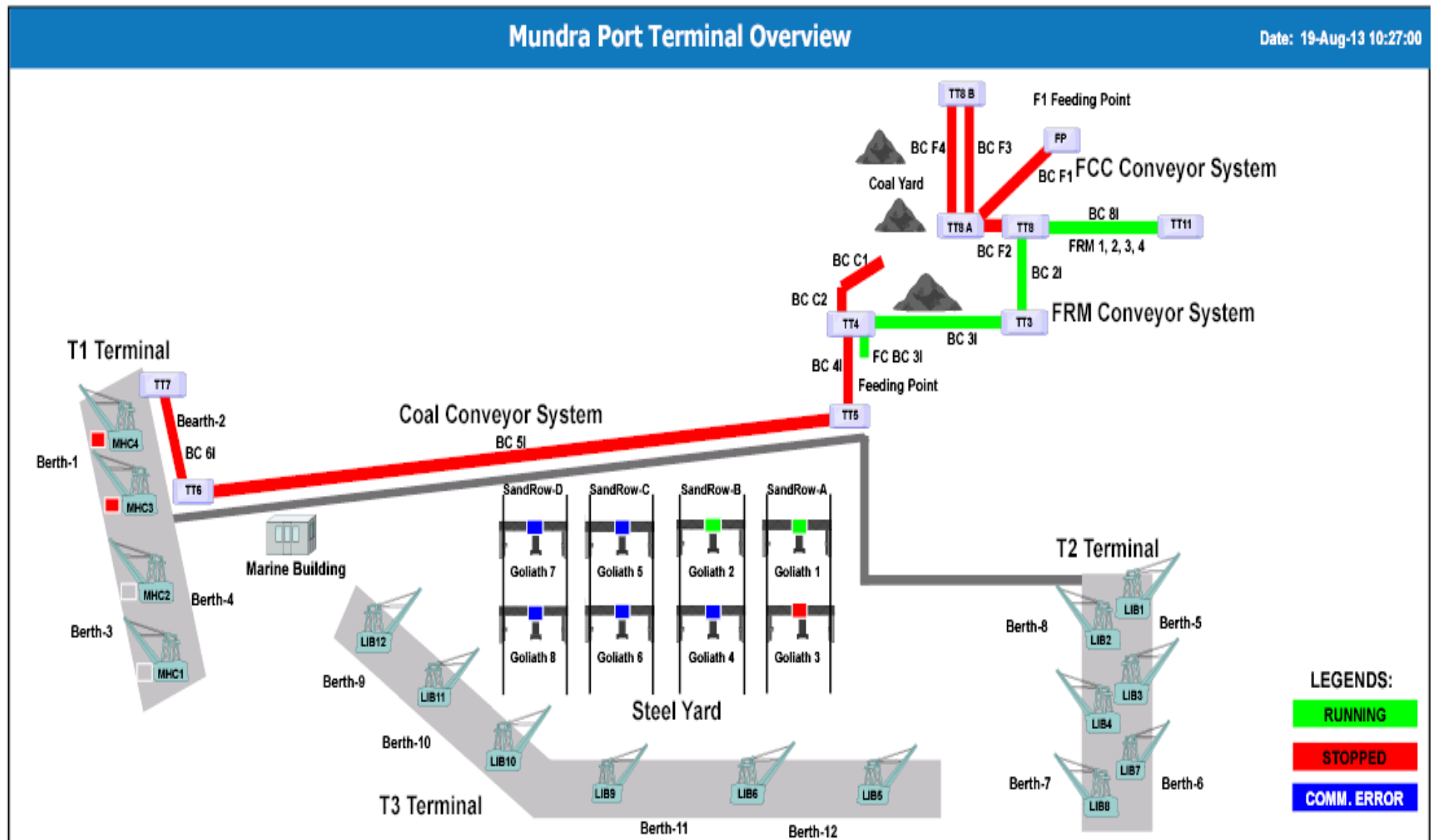
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# Share Point integration

- Microsoft SharePoint is a Web application platform developed for collaboration purpose. SharePoint has historically been associated with intranet content management and document management. **PIMS developed on the Microsoft SharePoint 2010 technology.** The SharePoint 2010 portal are responsible for showing reports and dashboard. PIMS application is also be using SharePoint 2010 out of the box authentication and authorization for the robustness of the application.

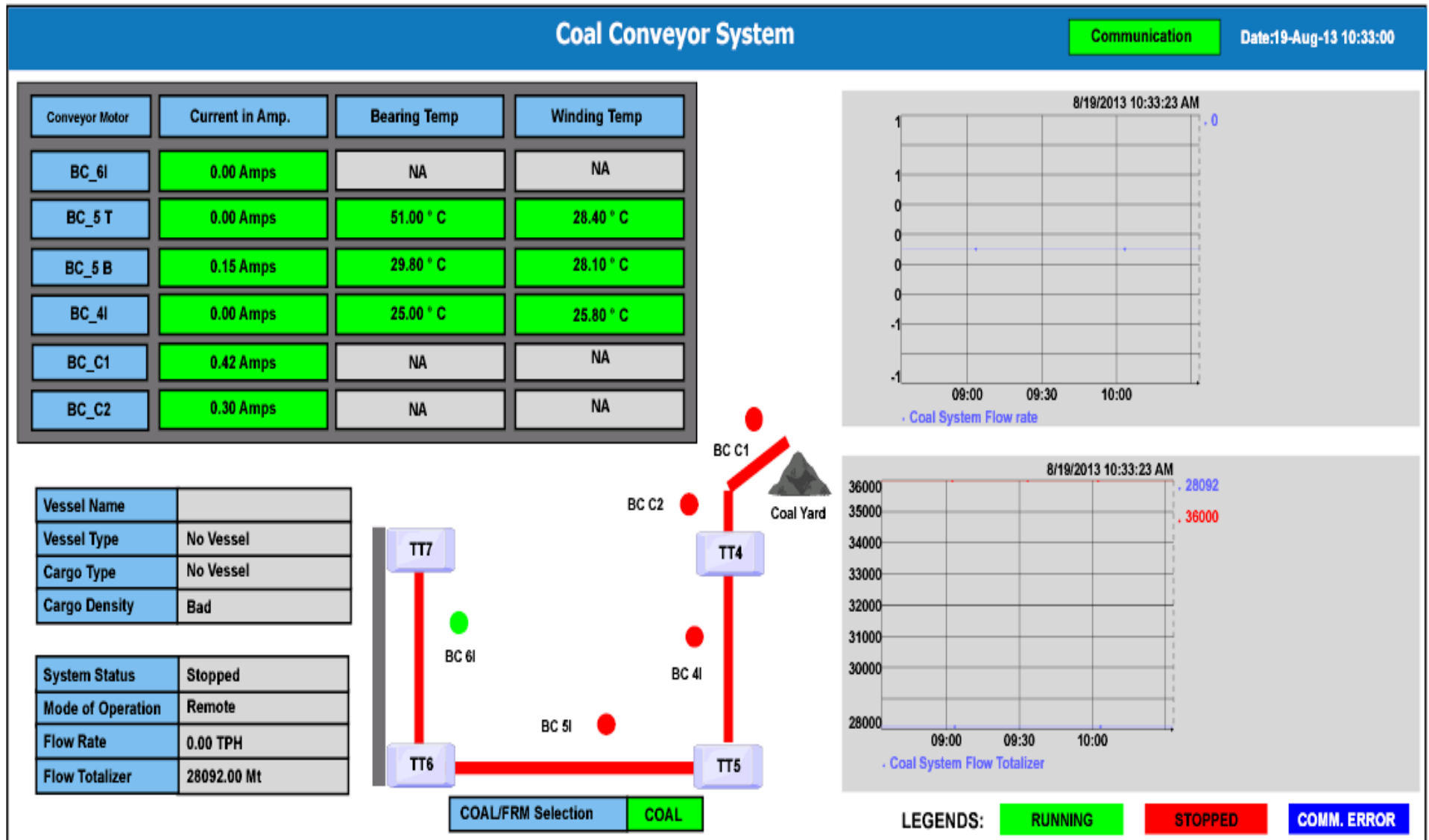


# PIMS Screenshot - Mundra Port Terminal overview





# PIMS Screenshot – Coal Conveyor system



# PIMS Screenshot – Real time Equipment Data Monitoring

PLC Based Calculation Running Hour														Date: 19-Aug-13 10:35:00			
Conveyor System			Crane		MHC-1	MHC-2	Crane		MHC-3	MHC-4	Crane		Goliath-1	Goliath-2			
Conveyor	HH	MM	Crane Equipment	HH	MM	Equipment	HH	MM	HH	MM	Equipment	HH	MM	HH	MM		
BC_F-1	7122	22	Crane Sum of Opr. Hour	Bad	Bad	Hydraulic Pump	9527	43	1624	17	Main Hoist-1	1044	13	867	26		
BC_F-2	5457	5	Engine Devl. Hour Till MNT	Bad	Bad	Diesel_Engine	103	54	42	15	Main Hoist-2	360	36	503	41		
BC_F-3	6673	39	Engine MNT Interval	Bad	Bad	Grab	0	0	0	0	Trolley-1	682	4	754	18		
BC_F-4	6438	55	Engine Opr Hour After MNT	Bad	Bad	Hoist_1_Holding_Gear	5573	30	967	53	Trolley-2	240	59	356	22		
BC_8I	6019	35	Engine Sum of Opr. Hour	Bad	Bad	Hoist_2_Closing_Gear	6148	42	1045	48	Long Travel	158	16	176	12		
BC_2I	6604	26	Grab Sum of Opr. Hour	Bad	Bad	Hook_Swivel_Gear	21	36	1	10	Crane Cntr. ON	4874	57	6036	27		
BC_3I	6573	34	CG Sum of Opr. Hour	Bad	Bad	Luffing_Gear	3208	10	534	25							
FC_BC_3I	6524	38	HG Sum of Opr. Hour	Bad	Bad	Slewing_Gear	4096	43	678	4							
BC_4I	4654	55	LG Sum of Opr. Hour	Bad	Bad	Travel_Gear	42	25	8	47							
BC_5I	4623	26	SG Sum of Opr. Hour	Bad	Bad												
BC_6I	4586	46	TG Sum of Opr. Hour	Bad	Bad												
BC_C1	4682	24	Spdr. Sum of Opr. Hour	Bad	Bad												
BC_C2	4665	31															

LEGENDS:

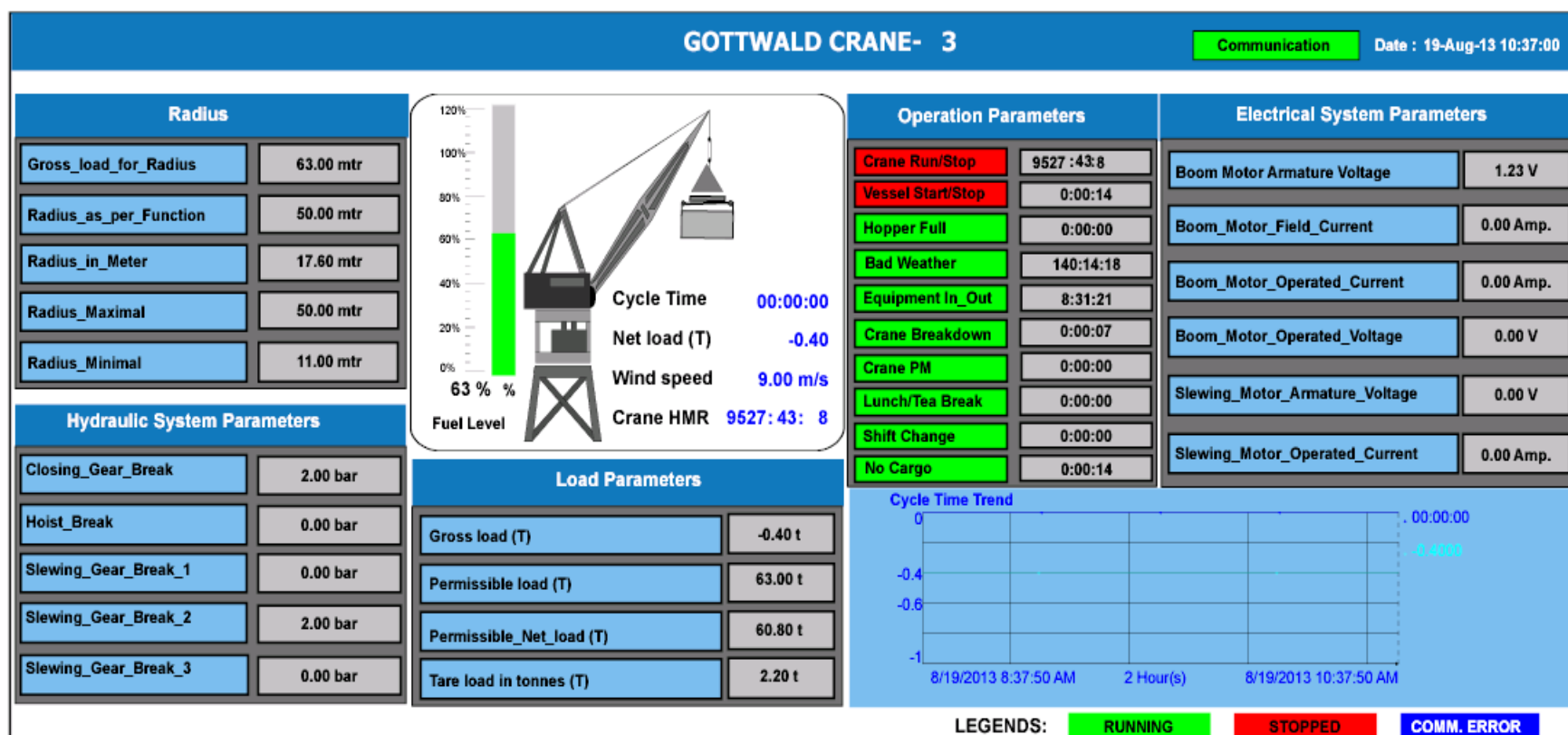
RUNNING

STOPPED

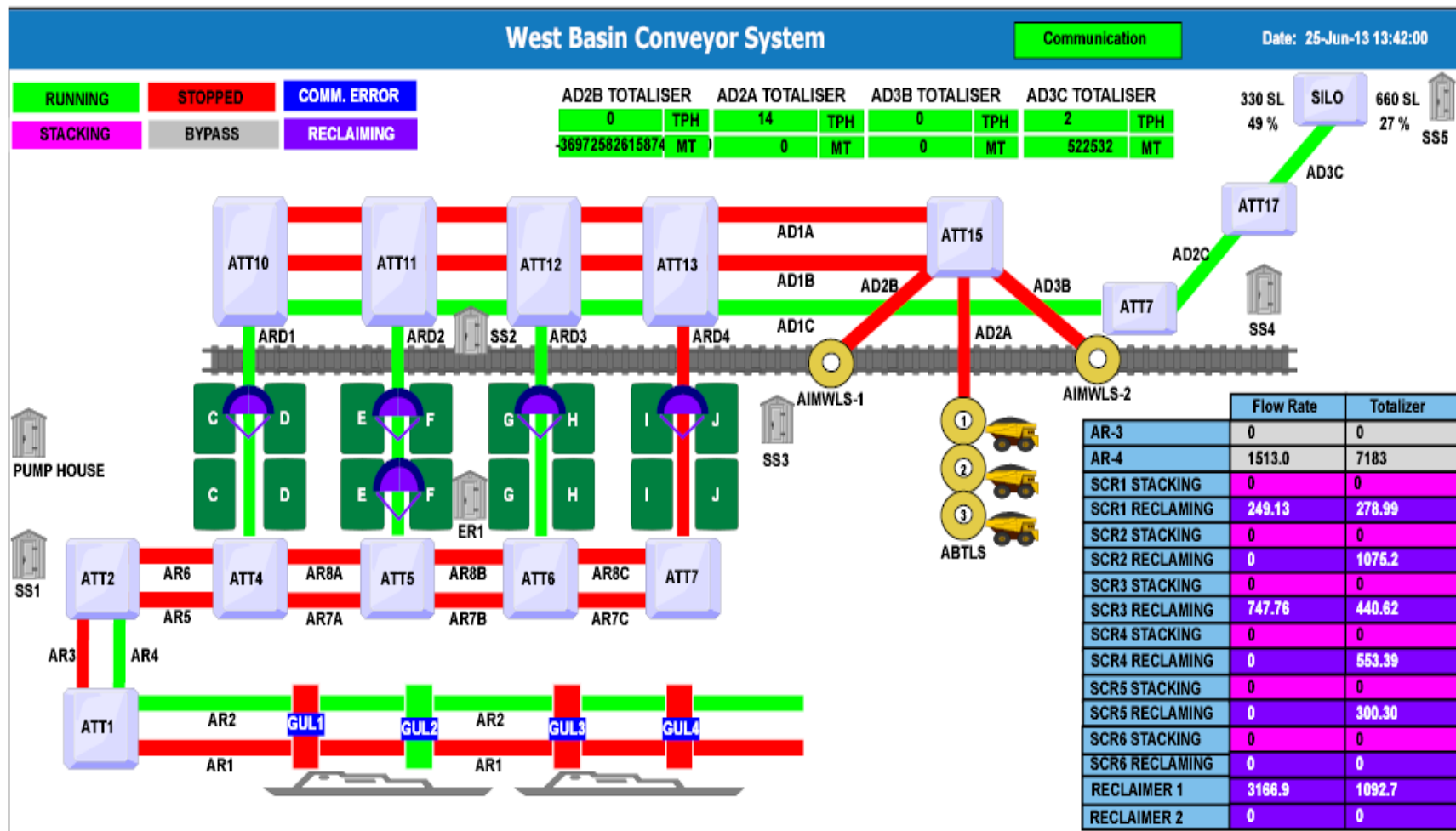
COMM. ERROR

LEGENDS: RUNNING STOPPED COMM. ERROR

# PIMS Screenshot – Real time Crane Monitoring



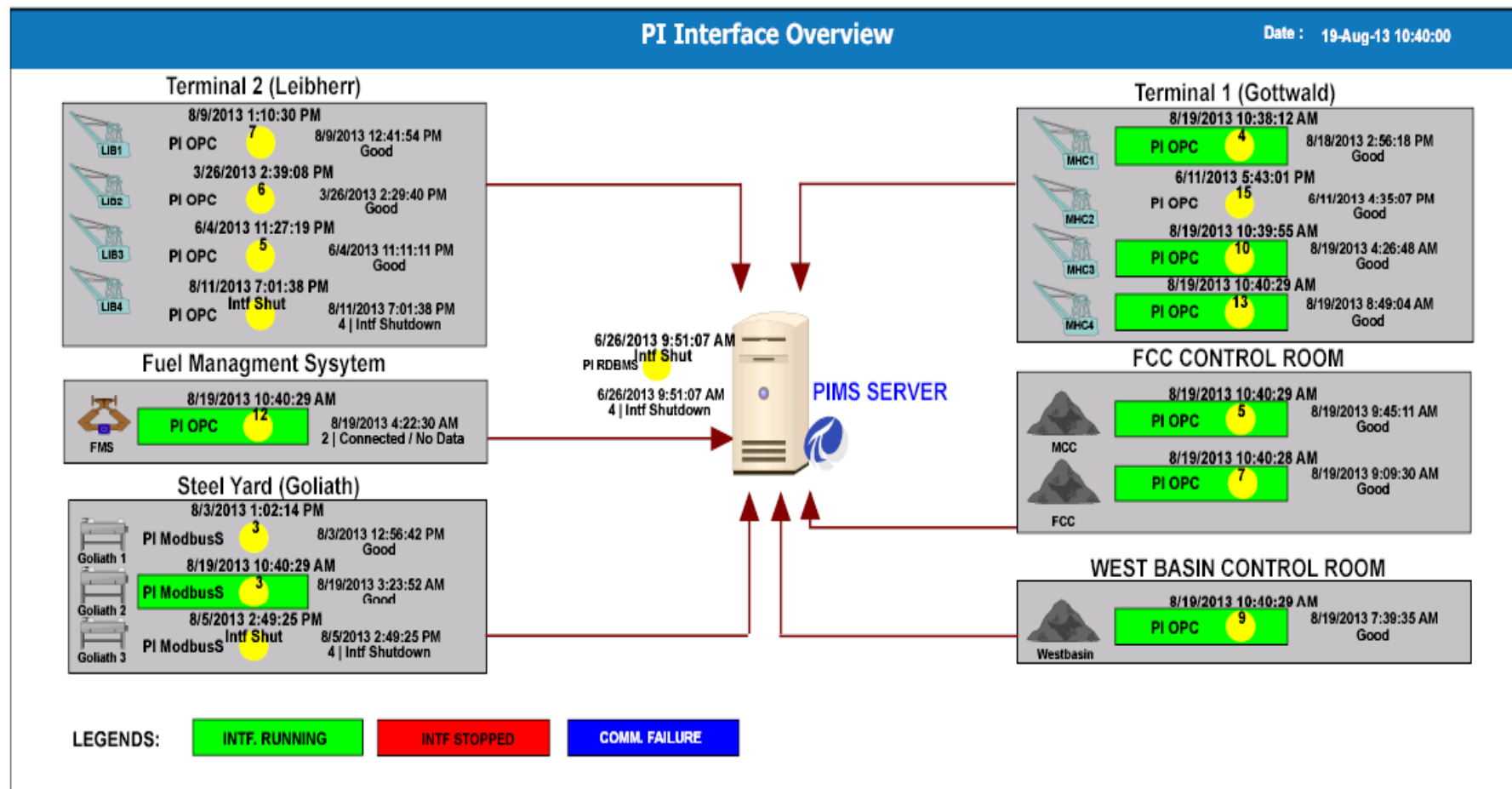
# PIMS Screenshots - West Basin



# PIMS Screenshots - Dahej Port



# PIMS Screenshots – Network Monitoring



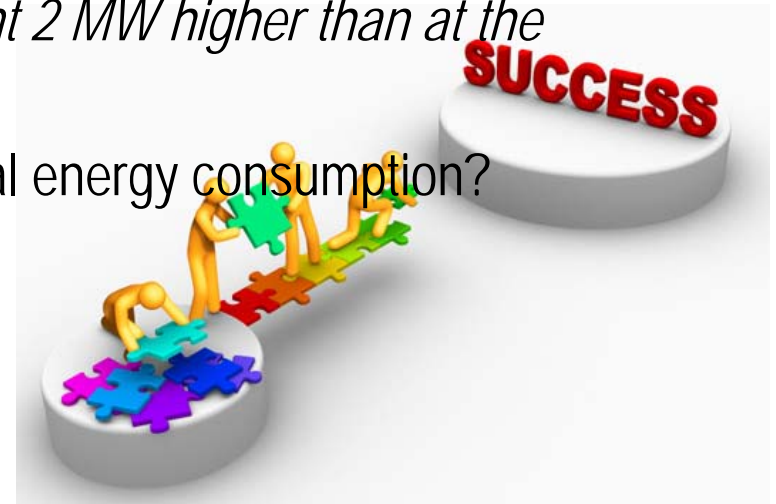


# Energy management System

EM enables companies to determine, improve and analyze systematically and continuously their energy consumption. Within this optimization process economic as well as technical and legal aspects have to be considered.

## Why Energy management System required?

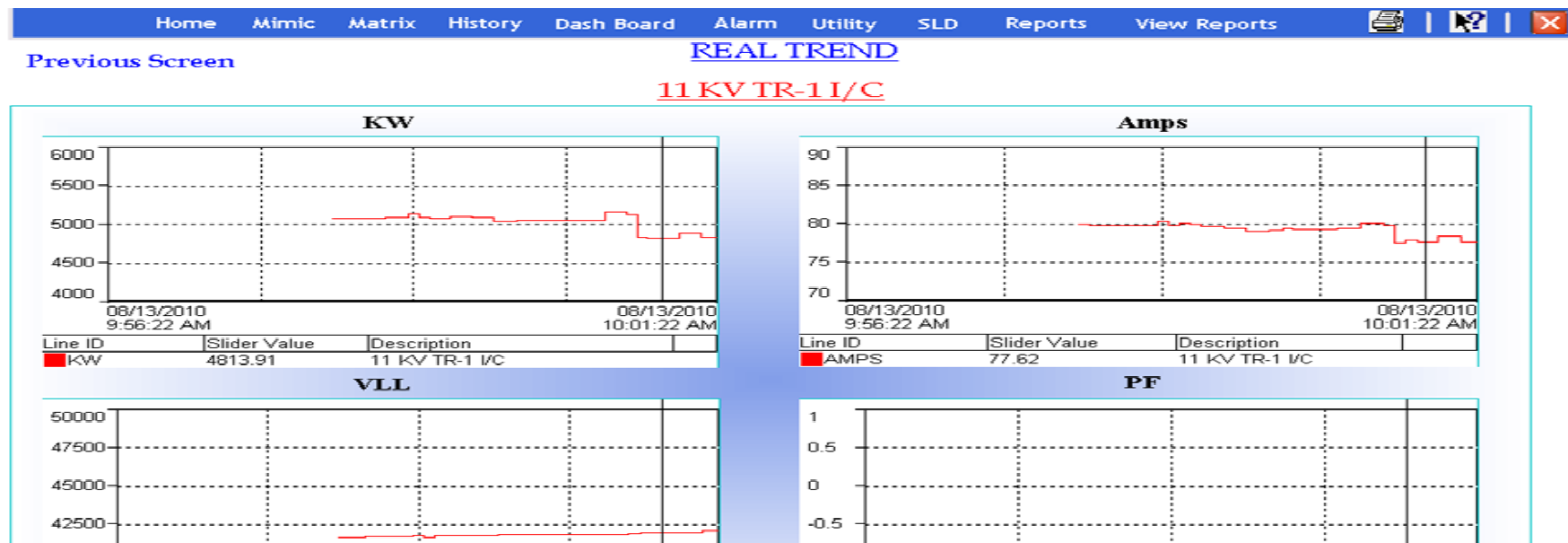
- Where to start with energy management in our organization ?
- *We built two plants in India; one after each other and both on the same standard. Why is the peak load at the one plant 2 MW higher than at the other ?*
- Can we further reduce our in-house operational energy consumption?



# Data Capturing through PIMS from the Plant Electrical system

Previous		Utilities -Group No: 12						Next
FEEDERS	VLL	VLN	A	KW	PF	HZ	KWH	
SSB 14-Utilities	399.3	230.7	40.3	24.5	0.878	49.9	1934	
SSB 15-Pump Room	399.8	231.0	124.1	74.1	0.862	49.9	1372564	
New Pump Room	399.5	231.1	115.0	73.5	0.922	49.9	1832652	
1000 CFM Comp-1	399.6	230.9	292.9	183.4	0.904	49.9	4579404	
1000 CFM Comp-2	417.5	241.4	377.9	245.1	0.896	49.9	28756	
550 CFM Comp-1	409.1	236.4	7.1	3.6	0.717	49.9	2069	
500 CFM Comp-2	407.9	236.2	0.0	0.0	0.000	49.9	6601350	
Sapre	000	000	000	000	0.00	000	0000	

## Real Time Data graph through PIMS

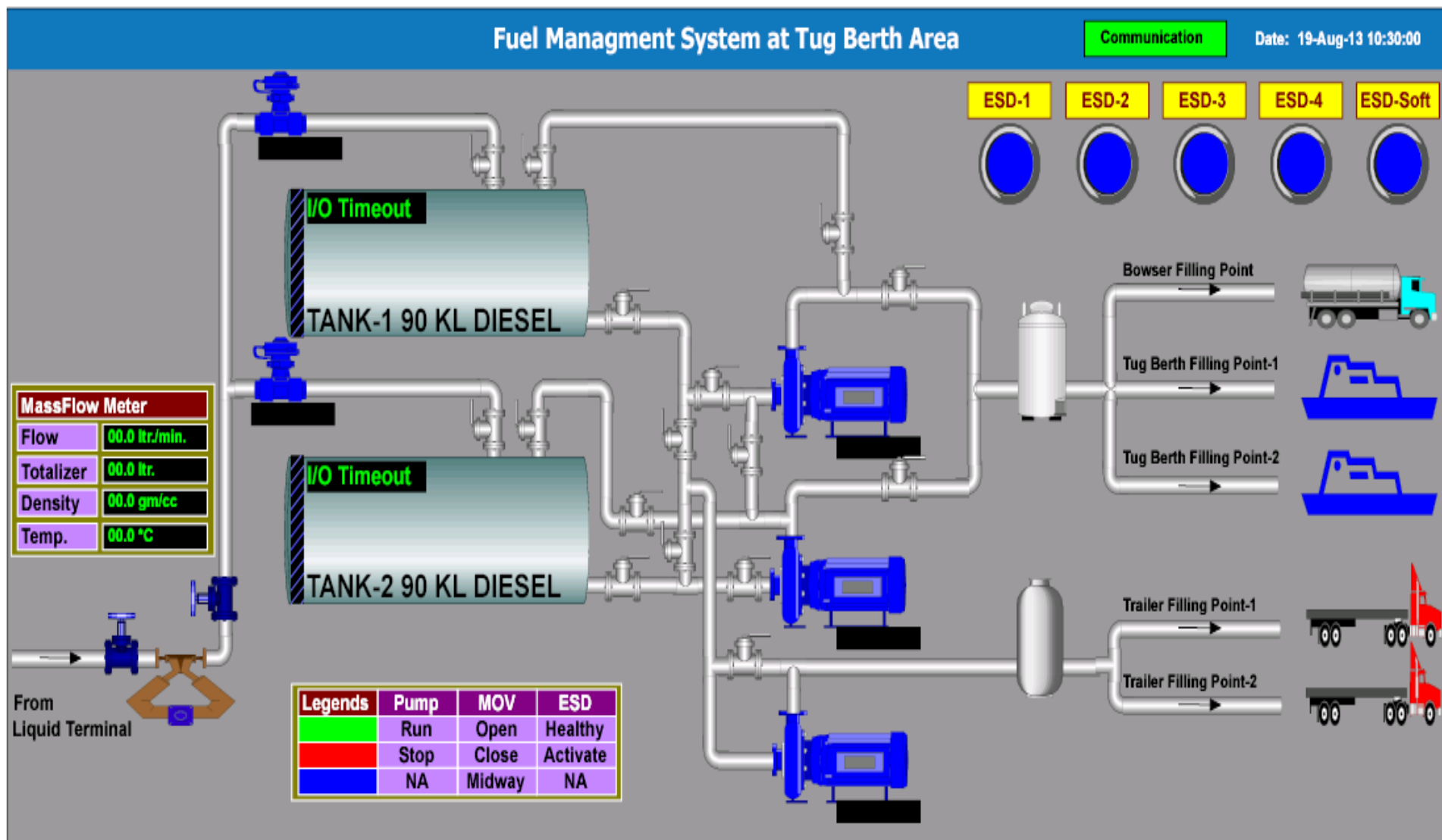


# FMS System – Fuel Management System

- FMS is a Fuel Management System which keeps track of Fuel dispense at Mundra, Hazira, Vizag, Goa sites.
- These Projects sites having equipment such as Liebherr crane, Gottwald Crane, Trailer, Tugs and Dredgers.
- FMS uses Oracle as database for storing fuel dispense information PIMS application will connect to FMS Oracle DB through PI system using PI RDBMS and fetch the data, transform it if required and upload in the PIMS SQL server DB. This data will be further shown as reports on PIMS SharePoint 2010 portal for analysis purpose.



# Real Time Fuel Data Monitoring



# Liquid Terminal System

- Two Liquid terminals at Mundra port namely SEZ and Non SEZ. SEZ has 25 tanks and Non SEZ has 82 tanks. There is a Smart Terminal Manager SCADA system (AST GE) which is a OPC compliant system. The data from this SCADA shall be fetched to OSI PI over OPC communication. The typical data is Level of the tank, Average Temperature, Level rate and so on.



# Liquid Terminal System

Enclosure-01												Date: 16-Aug-13 10:17:00
Parameter	Tank-001	Tank-002	Tank-003	Tank-004	Tank-005	Tank-006	Tank-007	Tank-008	Tank-009	Tank-010	Tank-011	
Product	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout
Book Stock	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout
Level	18.9940	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout
Avg. Temperature	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout
Product Dencity	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout
Gross Volume	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout
Pipe Line Volume	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout
Physical Stock	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout

Parameter	Tank-012	Tank-013	Tank-014	Tank-015	Tank-016	Tank-017	Tank-018				
Product	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout				
Book Stock	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout				
Level	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout				
Avg. Temperature	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout				
Product Dencity	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout				
Gross Volume	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout				
Pipe Line Volume	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout				
Physical Stock	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout	I/O Timeout				





# SAP System

## OLD CONVENTIONAL SYSTEM

Supervisor to collect **D**aily  
**P**rogress **R**eport (DPR)  
manually from the individual  
equipment



On basis of the DPR ,  
Data entry in SAP  
System manually

## PIMS SYSTEM

Data collection based on Real  
time monitoring data of  
individual equipment from  
PIMS



Data automatically feed  
into SAP using BIZTALK



# SAP System report generation

	MANDT	POINT	TRNDATE	TRNTIME	READBY	FILLED_QUAN	UPD_TM	UPD_DT	DOC_...	ZRESULT	DOC_UPD_DT	DOC_UPD_TM
	220	000000024680	23.05.2013	00:00:00	CT-Mundra	16803	20:48:07	31.05.2013				00:00:00
	220	000000025072	23.05.2013	00:00:00	CT-Mundra	45867	20:48:07	31.05.2013				00:00:00
	220	000000025075	23.05.2013	00:00:00	CT-Mundra	280	20:48:09	31.05.2013				00:00:00
	220	000000025076	23.05.2013	00:00:00	CT-Mundra	6952	20:48:10	31.05.2013				00:00:00
	220	000000025078	23.05.2013	00:00:00	CT-Mundra	29460	20:48:15	31.05.2013				00:00:00
	220	000000025081	23.05.2013	00:00:00	CT-Mundra	10	20:48:22	31.05.2013				00:00:00
	220	000000025082	23.05.2013	00:00:00	CT-Mundra	5981	20:48:22	31.05.2013				00:00:00
	220	000000025084	23.05.2013	00:00:00	CT-Mundra	23128	20:48:25	31.05.2013				00:00:00
	220	000000025087	23.05.2013	00:00:00	CT-Mundra	124	20:48:28	31.05.2013				00:00:00
	220	000000025088	23.05.2013	00:00:00	CT-Mundra	1331	20:48:22	31.05.2013				00:00:00
	220	000000025090	23.05.2013	00:00:00	CT-Mundra	1276	20:48:23	31.05.2013				00:00:00
	220	000000025094	23.05.2013	00:00:00	CT-Mundra	1186	20:48:22	31.05.2013				00:00:00
	220	000000025096	23.05.2013	00:00:00	CT-Mundra	2234	20:48:23	31.05.2013				00:00:00
	220	000000025099	23.05.2013	00:00:00	CT-Mundra	133	20:48:28	31.05.2013				00:00:00
	220	000000025120	23.05.2013	00:00:00	CT-Mundra	35986	20:48:34	31.05.2013				00:00:00
	220	000000025123	23.05.2013	00:00:00	CT-Mundra	66095	20:48:44	31.05.2013				00:00:00
	220	000000025124	23.05.2013	00:00:00	CT-Mundra	41760	20:48:36	31.05.2013				00:00:00
	220	000000025125	23.05.2013	00:00:00	CT-Mundra	26889	20:48:39	31.05.2013				00:00:00
	220	000000025126	23.05.2013	00:00:00	CT-Mundra	39464	20:48:39	31.05.2013				00:00:00
	220	000000025127	23.05.2013	00:00:00	CT-Mundra	5674	20:48:41	31.05.2013				00:00:00
	220	000000025128	23.05.2013	00:00:00	CT-Mundra	55701	20:48:55	31.05.2013				00:00:00
	220	000000025129	23.05.2013	00:00:00	CT-Mundra	79873	20:48:50	31.05.2013				00:00:00
	220	000000025130	23.05.2013	00:00:00	CT-Mundra	70000	20:48:54	31.05.2013				00:00:00
	220	000000025131	23.05.2013	00:00:00	CT-Mundra	10782	20:48:59	31.05.2013				00:00:00
	220	000000025132	23.05.2013	00:00:00	CT-Mundra	14216	20:48:58	31.05.2013				00:00:00
	220	000000025133	23.05.2013	00:00:00	CT-Mundra	54297	20:49:00	31.05.2013				00:00:00
	220	000000025134	23.05.2013	00:00:00	CT-Mundra	5213	20:49:00	31.05.2013				00:00:00
	220	000000025137	23.05.2013	00:00:00	CT-Mundra	2977	20:49:03	31.05.2013				00:00:00
	220	000000025138	23.05.2013	00:00:00	CT-Mundra	244	20:49:07	31.05.2013				00:00:00

# Integrated Reports

## Crane and Conveyor Operation Detail

From Date : 01/05/2013 To Date : 22/08/2013

Conveyor,Stacker Operation Details							
Hour Meter Reading				Energy Consumption MWH			
Equip	Vessel Start	Vessel End	Total	Equip	Vessel Start	Vessel END	Total
BF1	95	128	33	BF1			0
BF2	86	120	34	BF2			0
J1AC1	98	132	34	J1AC1	404	408	4
J1C1	97	131	34	J1C1	328	331	3
J2C1_1	87	87	0	J2C1_1	300	300	0
J2C1_2	12	46	34	J2C1_2	1049	1067	18
J3C1	0	0	0	J3C1	0	0	0
J4XC1	48	69	21	J4XC1	268	272	4
J5C1	50	71	21	J5C1	341	341	0
J6C1	92	122	30	J6C1	357	363	6
STK1	52	66	14	STK1			0
STK2	99	134	35	STK2			0
LPS:1				LIB-1			0
LPS:2				LIB -2			0



# Integrated Reports

## Berth-Wise Operation

From Date 01/01/2013 To Date: 22/08/2013  
:

	Vessel Detail	Total Cargo on Vessel	Operation Detail		STOPPAGE SUMMARY IN %								
Vessel Name	MV JAG RAVI				Stoppage Reason	GOT 01		GOT 02		LIB 01		LIB 02	
Vessel Type	DBULK												
Vessel Size	189.95												
Cargo	STEAM COAL												
Grade													
Total cargo on vessel	44102												
Arrival Date& Time	4-25-2013 2:42:00 AM												
Berthing Date & Time	4-28-2013 5:30:00 AM												



# Integrated Reports

Vessel Name : MV GIOVANNI

STOPPAGE DETAILS			
Stoppage Reason	CONVEY	LIB 01	LIB 02
CONVEYOR SCOOP	0:10		
CRANE MAN CAGE			0:19
CRANE DRAFT		0:18	0:48
CRANE EQUIPMENT			0:36
CRANE TRAVELLING		0:17	
<b>Total</b>	0:10	0:35	1:43

## OPERATION STOPPAGE DETAILS

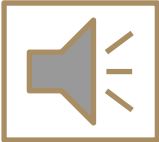
Date	Stop	Start	Effecti	Equippment	Stoppage Reason	Remark
02-15-2013	12:50AM	1:00AM	0:10	LIB 01	CRANE TRAVELLING	HATCH #1 TO #4
02-15-2013	2:04AM	2:52AM	0:48	LIB 02	CRANE DRAFT SURVEY	DRAFT SURVAY
02-15-2013	2:52AM	3:00AM	0:08	LIB 02	CRANE MAN CAGE	
02-15-2013	3:05AM	3:16AM	0:11	LIB 02	CRANE MAN CAGE	
02-15-2013	5:25AM	5:32AM	0:07	LIB 01	CRANE TRAVELLING	HATCH #4 TO #1
02-15-2013	5:45AM	6:03AM	0:18	LIB 01	CRANE DRAFT SURVEY	
02-16-2013	11:28AM	11:34AM	0:06	GONVEYOR	GONVEYOR SCOOP	SCOOP UNHEALTHY
02-16-2013	1:30PM	1:42PM	0:12	LIB 02	CRANE EQUIPMENT	HITACHI SHIFT JETTY TO #7
02-16-2013	4:42PM	4:46PM	0:04	GONVEYOR	GONVEYOR SCOOP	SCOOP UNHEALTHY
02-16-2013	5:03PM	5:27PM	0:24	LIB 02	CRANE EQUIPMENT	LOADER SHIFT JETTY TO #7 & HITACHI SHIFT #7 TO #6



# HMI Panel Shore Crane

**Operation – ON/ OFF**

*Current Status – Highlights either operational activity or Delay – in the ON mode*




IDLE Alarm

Vessel Name  
Cargo  
Hatch Number

VCN

Berth #




Signal Strength

Date      Time

Operator Name

**Operational Activity**



Excavator Shift

Loadr Shift

Crane Shift


Cargo Trim

Hatch Clean

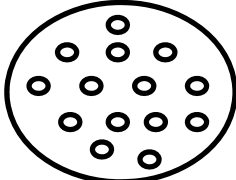
Diesel Shift

Net Shift


Net Clean



No Cargo/ Hopper fill



Speaker



Microphone

VH F

**Delays/ Stoppages**

Ship Related

Vessel Related

Contract or


Break – Tea/ Lunch/ Shift/ operator change

Stev. Instruction

Weather

SAFETY

Breakdown/ Power Cut





# HMI Panel Shore Crane

## Capture Operation and non operation Delays

- Operation (Cargo handling)/ Operational activity/Delays (stoppages)

## Integration with PLC Data

- PLC cycle time data will be recorded for operational hours
- Idle Alarm alert mechanism

## Interactive User interface

- Intuitive data capture
- To keep focus in operation than detailed data capture

## Integration with Card slot and ICCR

- Linking operation activity to resource
- Linking operation performance to ICCR for real-time control



# HMI Panel Shore Crane

## Crane Operator Slot-in Card

Operator slot-in his employee card –  
Start time is recorded



All operations, activities and delays gets  
recorded



Operator takes out his card from the  
slot – End time is recorded

## Information Capture

Crane Operator Detail

Crane Operator Efficiency

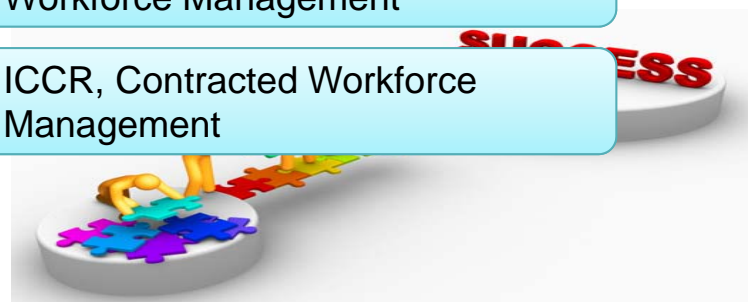
Operator incentive will be based  
on this



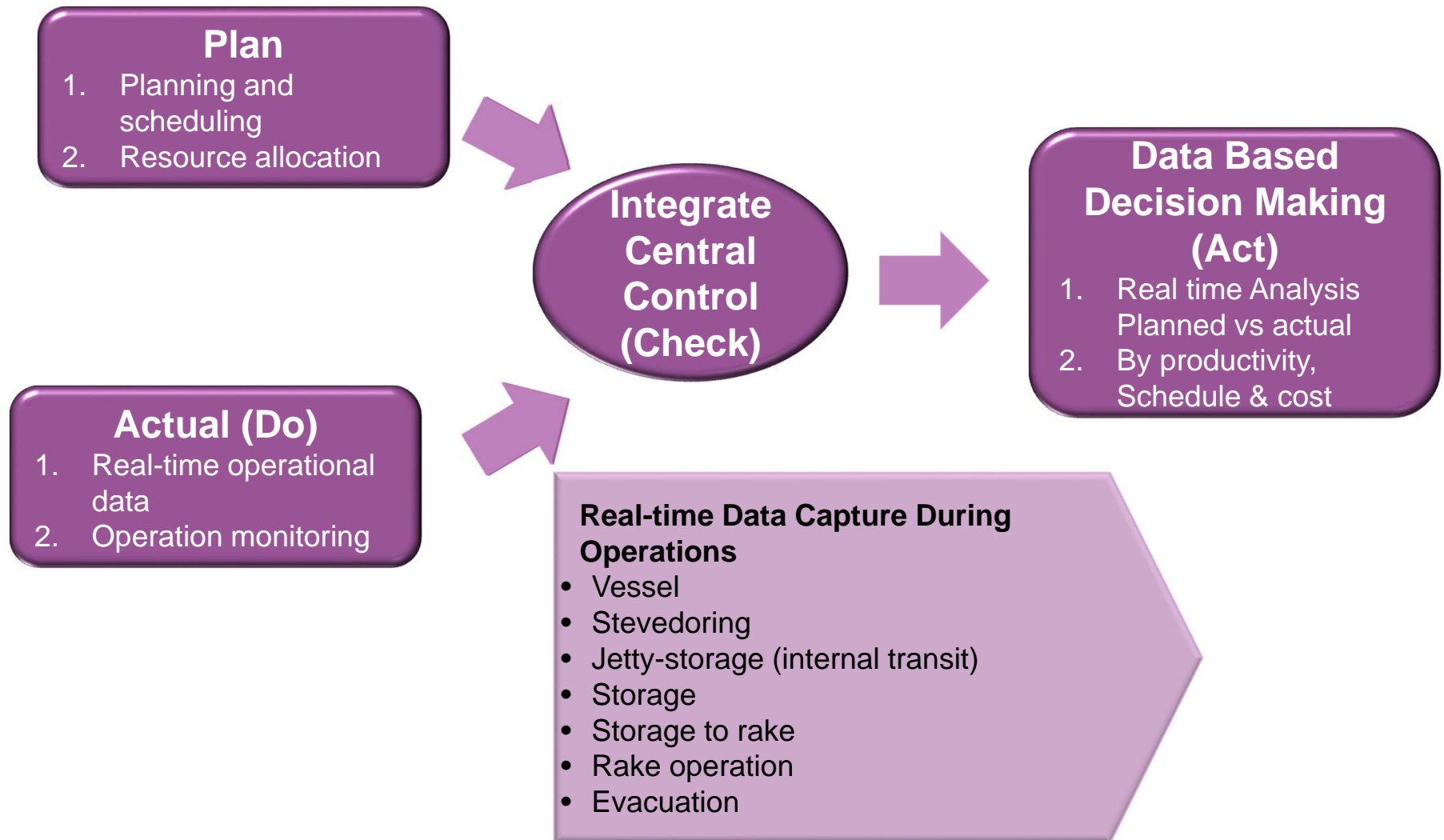
Contracted Workforce  
Management

PLC Data, HMI, ICCR, Contracted  
Workforce Management

ICCR, Contracted Workforce  
Management



# Integrated Central Control Objective



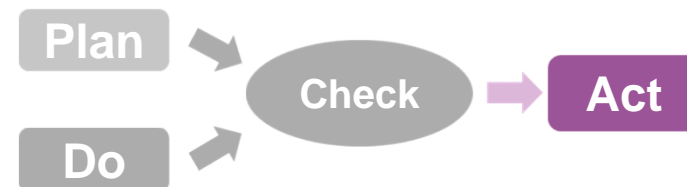
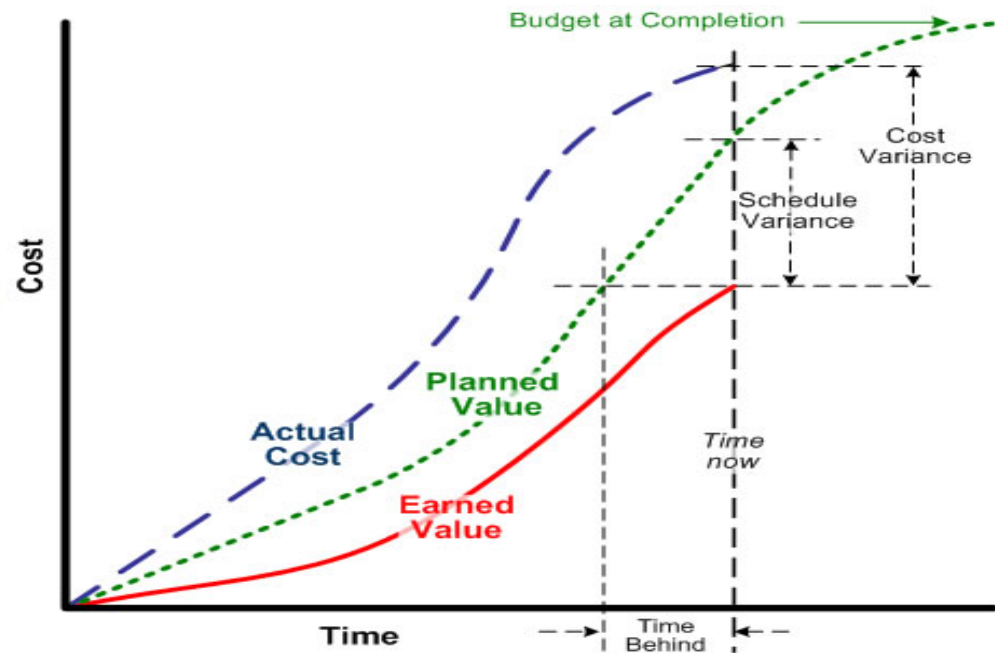
# Integrated Central Control Objective

## Real-time Variance Analysis

- Planned vs. actual
- Estimate future productivity to completion vs. actual trending earned productivity to completion
- Estimate future cost vs actual trending cost to budgeted cost at completion

## Data Based Decision making

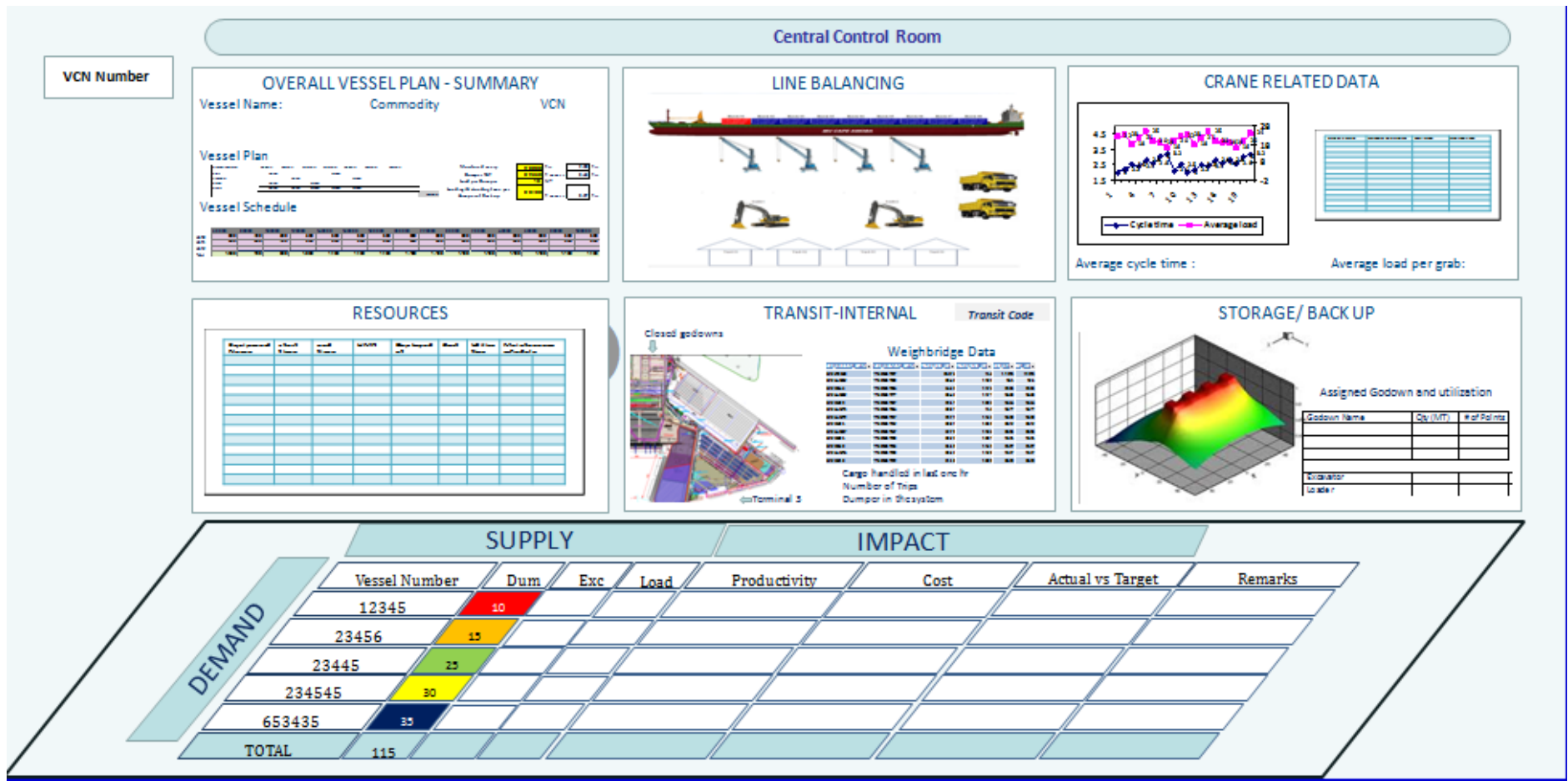
- Rectify actual operation within the planned threshold, by schedule, Productivity & cost
- Perform the role of portfolio management to port vessels operations
- Rebalance vessel supply chain line by allocation of resources ( Equipment + labor)



# Integrated Central Control Objective

## Monitor & Control

- Eyes and ears to sense the heart beat of operations
- Over multi vessel and vessel specific
- Monitor thresholds as per frozen plans
- Initiate balancing action where threshold breaching





**THANK**

**YOU**