Regional Seminar Series

Houston, Texas USA

Pertamina's Integrated Downstream Dashboard

Craig Harclerode
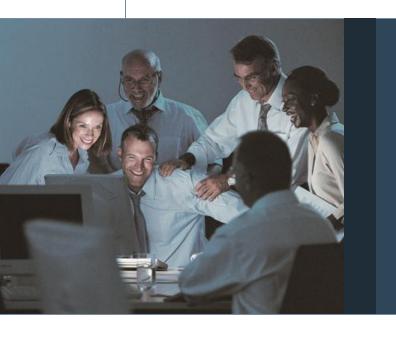O&G Business Development Executive
OSIsoft, LLC

November 16th,2010

- PERTAMINA Overview

- Business Challenges - Deregulation

- Solution – Downstream Transformation

- Enabler – The Real-Time Infrastructure

- Results – The Integrated Downstream Dashboard

- Case Examples- Time Does Matter

- Benefits Achieved- Creating Enduring Business Value

- Next Steps- Building on the Infrastructure

- Conclusion

Empowering Business in Real Time.

About Pertamina

Empowering Business in Real Time.

Pertamina Downstream

Assets

6 Refineries :
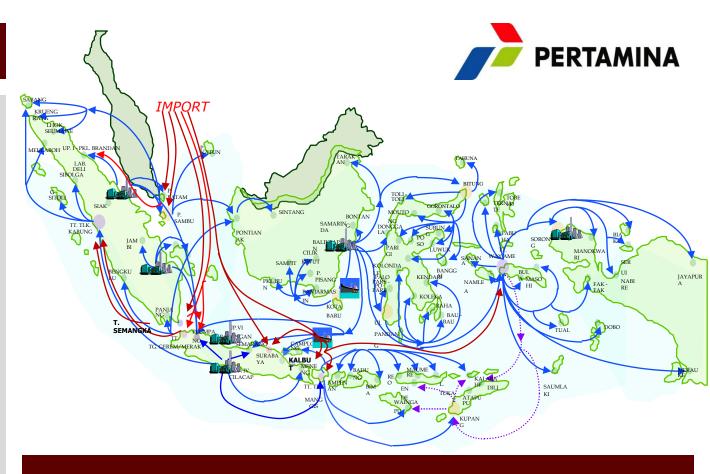1,034 Million bbl/day

120 + Depots

98 Vessels
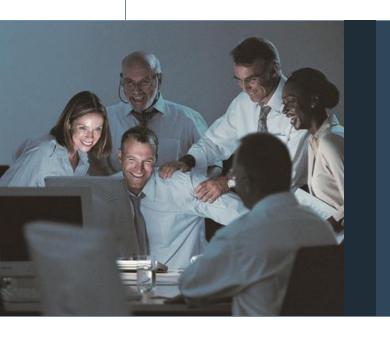
3,400 Fuel Stations

Sales Volume :
1,200 Million bbl/day
(92 % Market Share)

PERTAMINA

IMPORT

One of the most complex Downstream Supply Chains in the world

Deregulation Forced Change

Pertamina – Challenges (early 2007)

Process, People, Structure

- Business process based on functional units, planning based on functional target, **no one is accountable for downstream margin**.

- "Legacy" structure, rigid interfaces between Refining & Marketing, creating silos within the organization.

Systems

- No single point of coordination for Supply operations.

- Lack of integrated system for planning optimization and scheduling

- No coherent single view of downstream timely operational data

- Unable to track Plan vs. Actual

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A Balancing Act " A Balancing Act…"

REGULATED (before 2006)

DEREGULATED (2006 onwards)

Security of Supply

Economics of Supply

Complex geography – 13,000 islands, rivers, mountains

Low Downstream Margin

Supply chain disruptions (shipping, ports, refinery)

Competition from Oil Majors

Variability of Demands

High product import costs

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Enabler – The Real-Time Infrastructure

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Evolution of the Real-Time Infrastructure

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Areas of Focus

Functional Optimization	IT Efficiency	Process Optimization	Advanced Business Integration

100%

Solution Code

Microsoft Infrastructure

Microsoft Office SharePoint Server 2007

Microsoft Office

Microsoft SQL Server 2008

PI System Infrastructure

> 90% of traditional asset situational awareness and traditional **propriety solutions** can now be done as **open, configured applications** in the "real-time IT and automation infrastructure" for significantly less cost and time to value while retaining ownership of intellectual property and knowledge.

"% of "Solution Functionality"

Modular

Microsoft Windows

Data Historian

Data Historian ++

Real Time Data Infrastructure

0%

1980's	1990's	2000's	2008+

Evolution of the Real-Time Infrastructure

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Horizontally ... he Value Chain

Vertically From the Shop Floor to Business Systems

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The Real-Time Infrastructure

Real time applications

- Operations Monitoring
- Energy Management
- Maintenance Management (CBM)
- Asset Optimization

Business Systems

IBM maximo | ORACLE | SAP NetWeaver | MII | Microsoft Silverlight | Microsoft SQL Server Analysis/Reporting Services | TIBCO The Power of Now

Individual/Organizational Analytics & Visualization With Microsoft Tools

Microsoft Office 2010

- Real-Time Data
- Batch Data
- Relational Data
- Quality Data
- Manual Data
- Structure/Asset Data
- Web Data
- Applications Data
- Maintenance Data
- ERP Data

Agnostic Real-Time Infrastructure

- ENTERPRISE
- REGION
- Territory
- PLANT
- UNIT
- MACHINE

Across the Value Chain

Across the Infrastructure

Exploration | Production | Gas & Liquid Pipelines | NGL & LNG | Refining | Chemicals | Distribution & Marketing | Alternative Energy | R&D | Data Centers | IT Infrastructure | Trading

1000's of different real-time data sources and associated interfaces that propagate through the automation space

DeltaX | ROSEMOUNT Analytical | GE FANUC | FISHER | ABB | Rockwell Automation RSView | Honeywell Plantscape | Invensys FOXBORO | SOFTWARE | TECNOMATIX FACTORYLINK 7.5 | EMERSON | Bailey

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Common IT Infrastructure

Forecasting

"Best of Breed" Applications

Planning

Trading

Manufacturing

Scheduling

Unified and Aligned Real-Time Global Value Chain

Transportation

Distribution & Retail

Manufacturing

Planning & Scheduling

Organizational Silos

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Rephrasing & Generalizing

Supply   Refining   Shipping   Marketing

Raw Materials   **Value Add**   **Finished Goods**

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The Integrated Downstream Dashboard

Objectives :

- <u>Consistent single view</u> of entire downstream supply chain.

- <u>Integrated real time data</u> from Crude Purchases to Secondary Distribution.

- Decision making support (normal operations, supply chain disruptions)

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Pertamina - Integrated Downstream Dashboard

Planning

PLANNING & OPTIMIZATION

Monitor Analysis Action

DOWNSTREAM DASHBOARD

Execution

Operations

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Pertamina - HQ Control Room Design
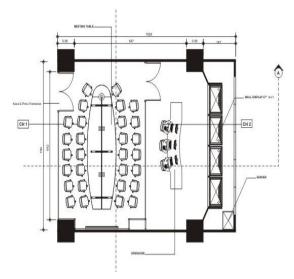
Design Objectives

- **Single operations room for Refining, Supply, Shipping & Marketing.**

- Ergonomic working environment.

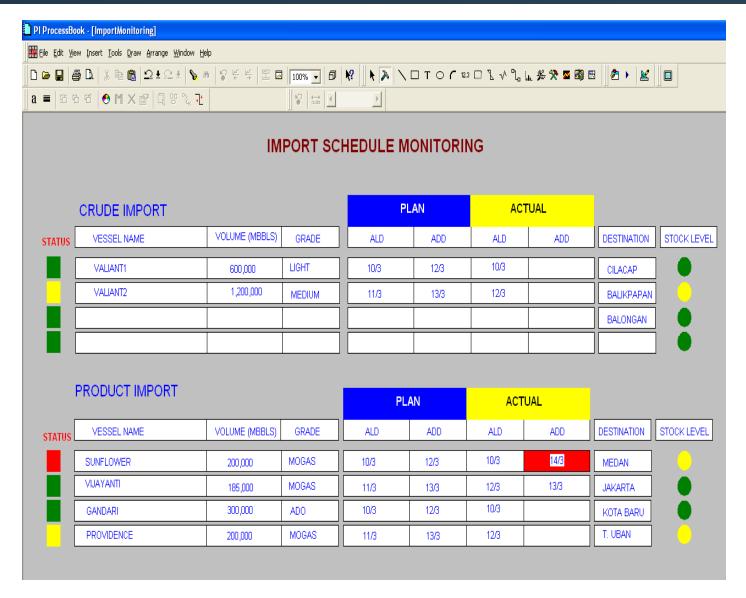- **Direct communication to refineries, vessels and depots.**

- Single wall display

Empowering Business in Real Time.
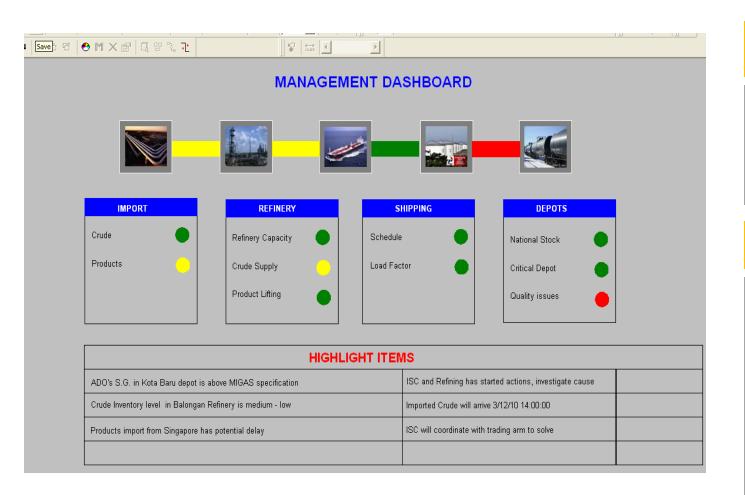
Pertamina - Main Dashboard Display

OSIsoft.

Objective

- **Management View of Entire Supply Chain**

Features

- Easy to understand "traffic lights"
- Highlighted items
- Drill down capabilities

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Crude and Product Imports

IMPORT SCHEDULE MONITORING

CRUDE IMPORT

STATUS	VESSEL NAME	VOLUME (MBBLS)	GRADE	PLAN ALD	PLAN ADD	ACTUAL ALD	ACTUAL ADD	DESTINATION	STOCK LEVEL
🟩	VALIANT1	600,000	LIGHT	10/3	12/3	10/3		CILACAP	🟢
🟨	VALIANT2	1,200,000	MEDIUM	11/3	13/3	12/3		BALIKPAPAN	🟡
🟩								BALONGAN	🟢
🟩									🟢

PRODUCT IMPORT

STATUS	VESSEL NAME	VOLUME (MBBLS)	GRADE	PLAN ALD	PLAN ADD	ACTUAL ALD	ACTUAL ADD	DESTINATION	STOCK LEVEL
🟥	SUNFLOWER	200,000	MOGAS	10/3	12/3	10/3	**14/3**	MEDAN	🟡
🟩	VIJAYANTI	185,000	MOGAS	11/3	13/3	12/3	13/3	JAKARTA	🟢
🟩	GANDARI	300,000	ADO	10/3	12/3	10/3		KOTA BARU	🟢
🟨	PROVIDENCE	200,000	MOGAS	11/3	13/3	12/3		T. UBAN	🟡

Objective

- **Track Crude & Products Imports Schedule**

Features

- **Tracks ETA of incoming shipments**
- **Tankage and Jetty Availability**
- **Summary of committed and pending**

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Crude Supply to Refinery
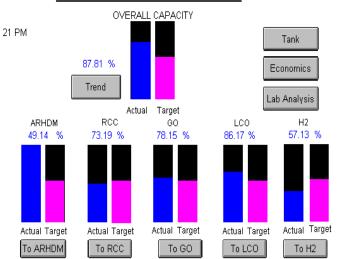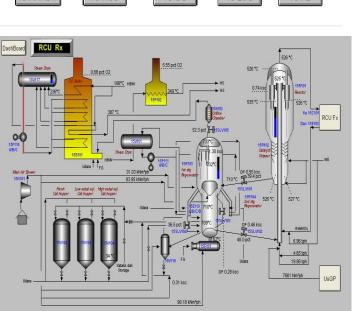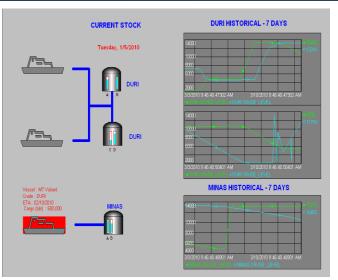
Empowering Business in Real Time.
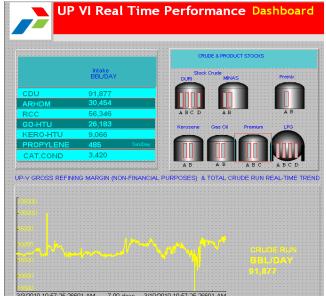
Objective

- **Real time monitoring refinery operations**

Features

- **Plan vs Actual Production**
- **Stock levels of crude and finished products**
- **Detail DCS level view**
- **Refinery Problem EWS**

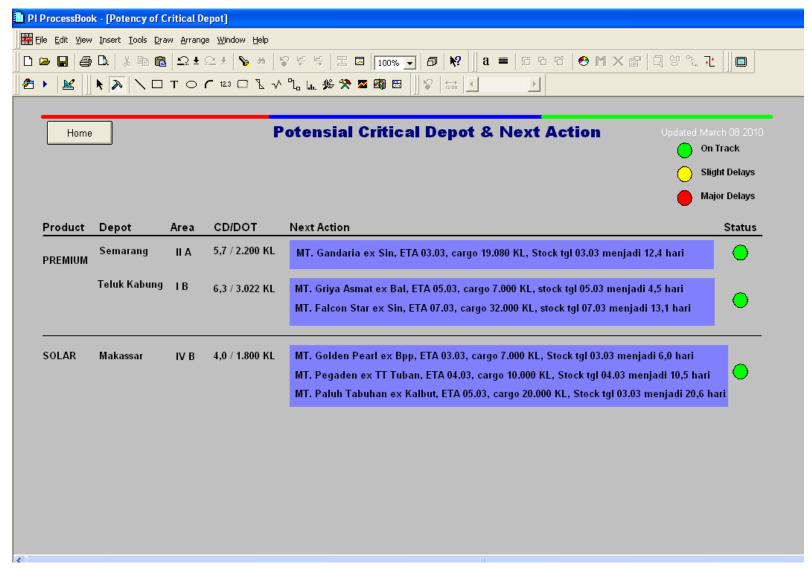Empowering Business in Real Time.

National Stock

National Fuel Stock Monitoring dashboard showing National Fuel Stock Availability (Coverage days) for Refinery, Shipping, Marketing, Total and Status across Premium, Kerosene, Solar, Avtur, Pmax, MFO; and Regional Fuel Stock Availability (Coverage days) across Region I–IV areas.

Objective

- **Maintain National fuel stock levels**
- **Management View**

Features

- **Identify potential critical depots**
- **Actions taken**
- **Deviation highlights**

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Alerting and Guidance
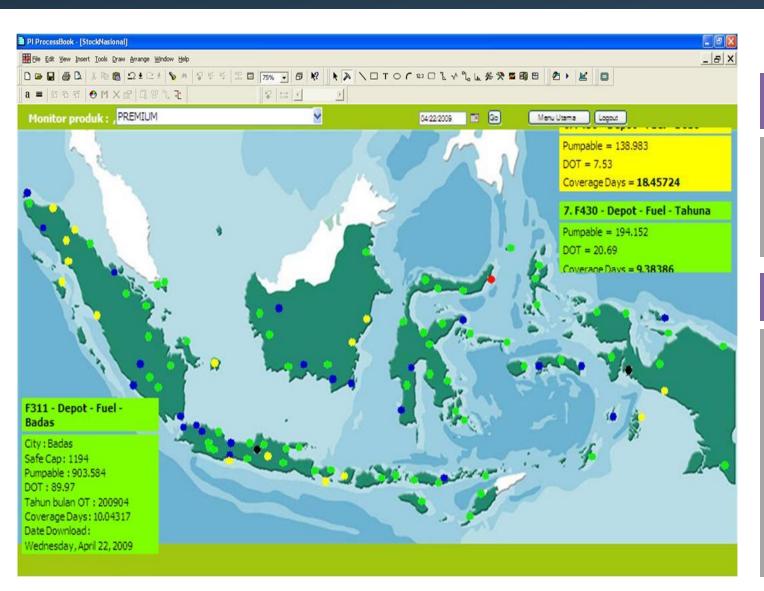
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Supply To Marketing

Objective

- **Maintain National fuel stock levels**

Features
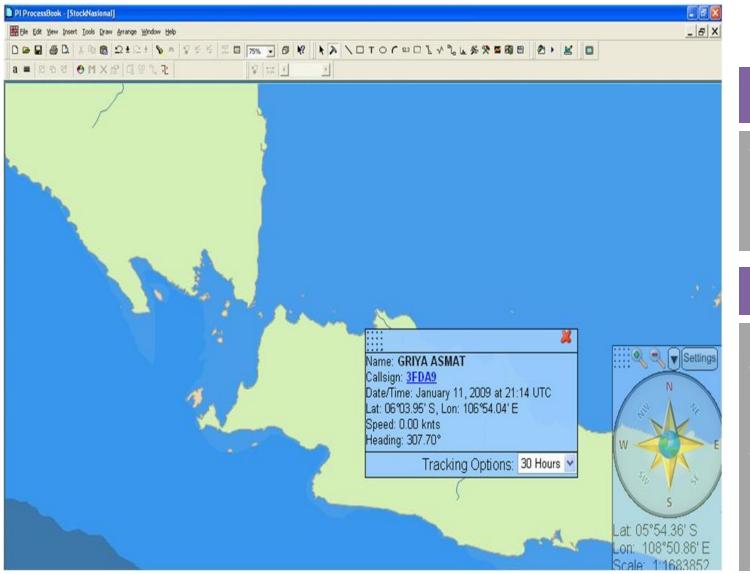
- **Identify potential critical depots**

- **Top 10 critical depots**

- **Single click to access detail depot data**

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Vessel Tracking
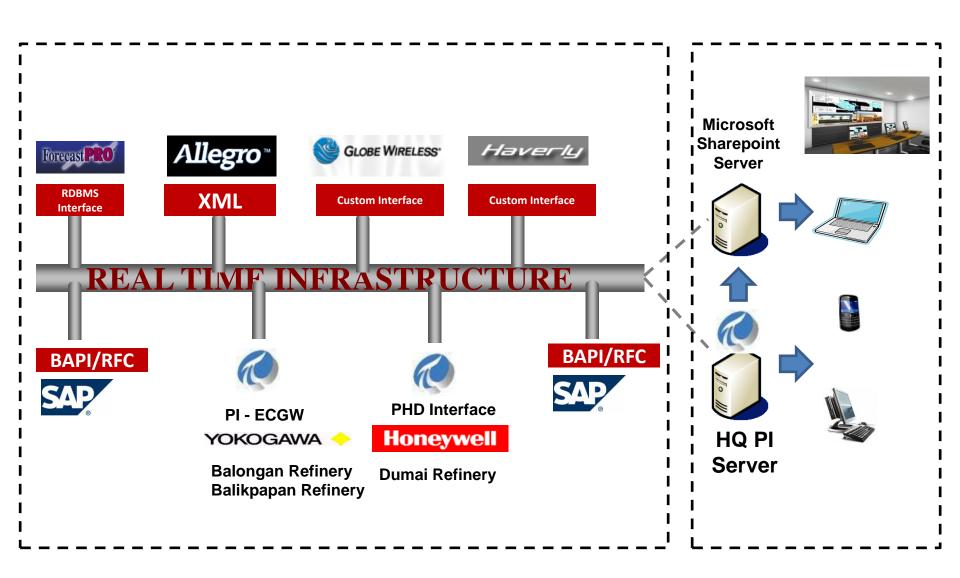
Objective

- **Real time vessel position monitoring**

Features

- **Track Shipments**

- **Real time updates of ETA**

- **Vessel**

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Integration Architecture
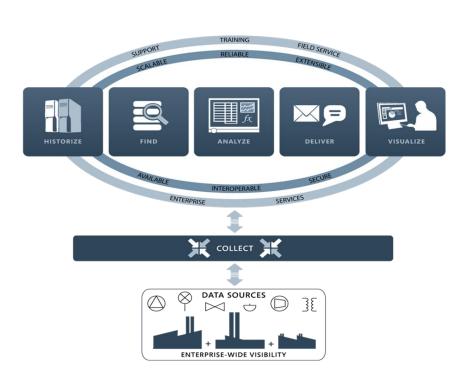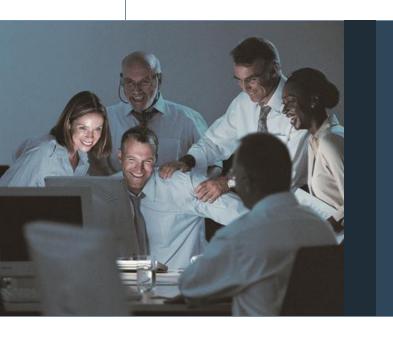
OSIsoft Software and Services Used

- PI Server

- PI ProcessBook

- PI DataLink

- PI WebParts

- PI ACE (Advanced Computing Engine)

- PI Notifications

- PI System Management Tools (PI SMT)

- PI SDK

- PI JDBC Driver

- PI ODBC Client

- PI OLEDB Provider
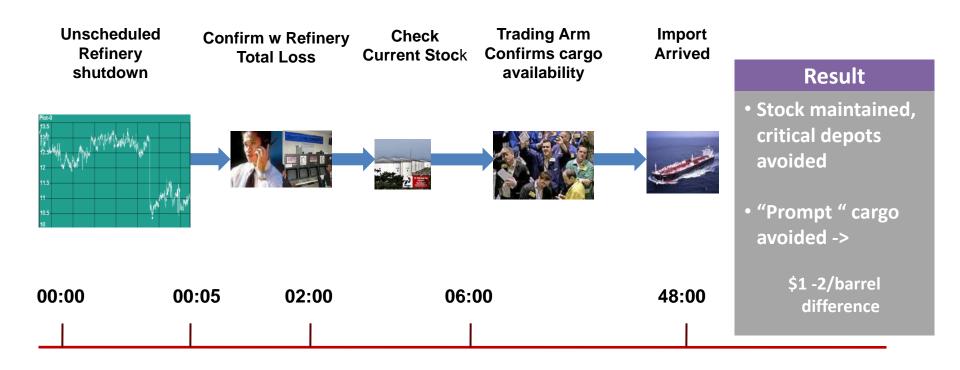
- PI OLEDB Enterprise

- PI to PI Interface

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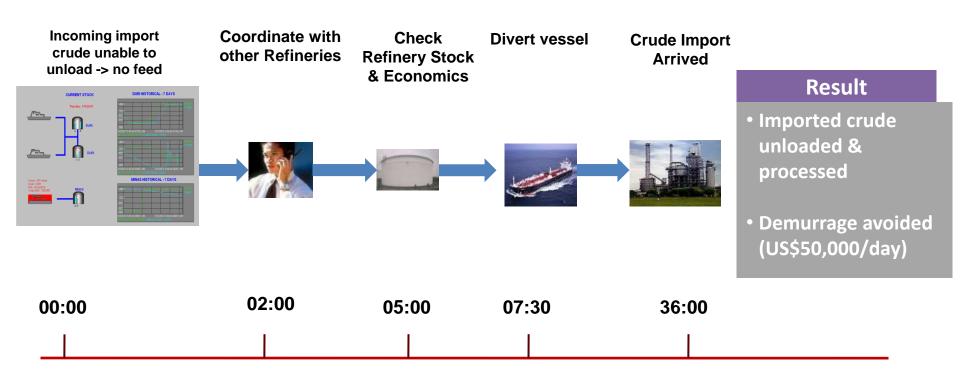
Case Examples – Time Does Matter

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Unscheduled Refinery shutdown	Confirm w Refinery Total Loss	Check Current Stock	Trading Arm Confirms cargo availability	Import Arrived

Result

• Stock maintained, critical depots avoided

• "Prompt " cargo avoided ->

$1 -2/barrel difference

00:00	00:05	02:00	06:00	48:00

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OSIsoft®
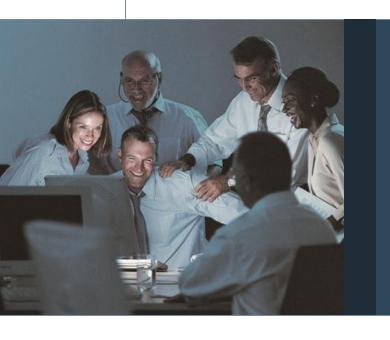
Incoming import crude unable to unload -> no feed

Coordinate with other Refineries

Check Refinery Stock & Economics

Divert vessel

Crude Import Arrived

Result

- **Imported crude unloaded & processed**

- **Demurrage avoided (US$50,000/day)**

00:00	02:00	05:00	07:30	36:00

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Results – Creating Enduring Business Value

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PERTAMINA

	BEFORE - 2007	AFTER - 2009
Working Environment	4 Operating Groups, Separate floors	Single floor, in Control Room
Planning process	Functional Silos	Integrated planning and operations from end to end
Data Timeliness	Outdated, not synchronized data	Real time and near real time data
Data Visibility	Limited view of supply chain data	Single coherent view
Monitoring tools	Manual monitoring - Excel	Track plan vs. actual through ProcessBook, Web

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Pertamina - Benefits

Tangible Benefits

- National stocks maintained at optimal level
- Reduced Critical Depots (stock outs) by 65 %
- Reduced Demurrage by 40 %
- Better loss monitoring & control
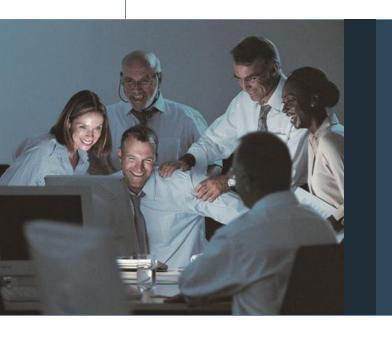
US$ 10s of Million/Year

Intangible Benefits

- Better Team Work & Coordination
- Better Decision Making
- Faster response to supply chain problems
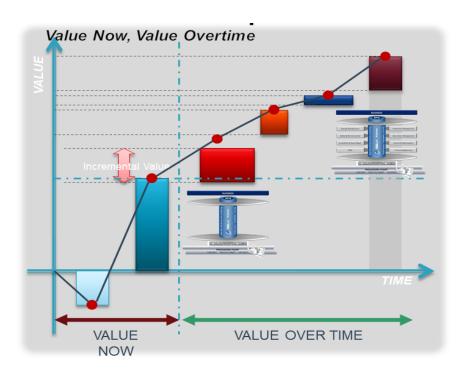- Integrated end to end downstream visibility

"Downstream First" Mindset

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Building on the Infrastructure

- **Enhance Functionality**
  - AF
  - Notifications
  - Excel Services
  - Additional analysis rules

- **Increase Reliability**
  - HA

- **Layer on additional applications**
  - Enterprise Energy Management
  - Asset performance management and benchmarking
  - Asset Portfolio Optimization
  - Advanced Collaboration

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Thank you