Enabling Operational Excellence

Xu Ning

Process Systems & Solutions
Ning.Xu@AP.EmersonProcess.com

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Process Management

Kuala Lumpur
25-Oct-07

Agenda

- **Emerson Introduction**

- PlantWeb Overview

- Advanced Solutions:

  1. APC (Advanced Process Control)

  2. OTS (Operator Training Solution)

  3. Alarm Management

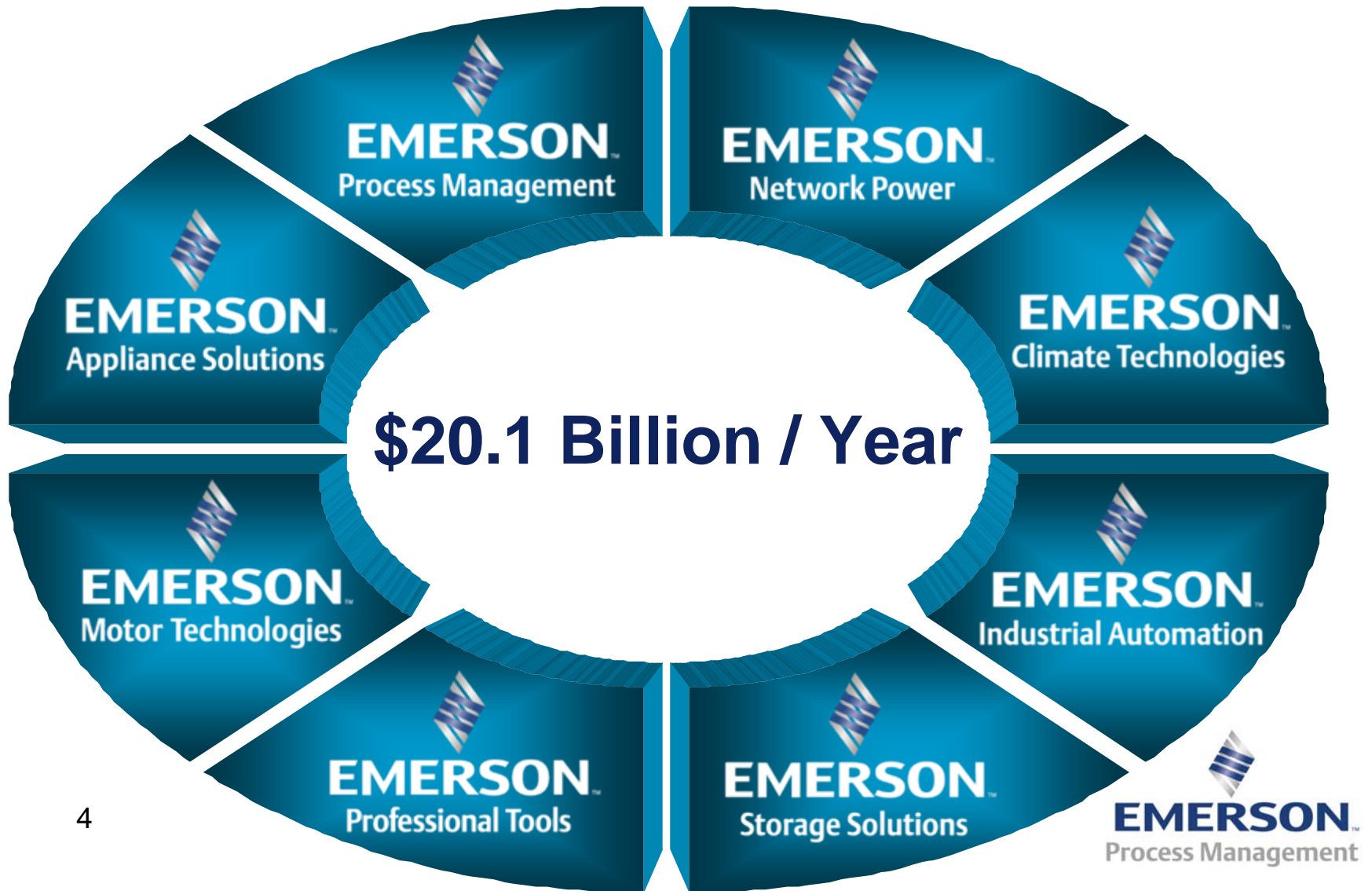 4. PIMS (Plant Information Management System)

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Emerson: Company Profile

Emerson is a diversified global manufacturing and technology company serving industrial, commercial, and consumer markets around the world

2006 Highlights	
Sales	$20.1B
Employees	136k
Locations	
US & Canada	117
Europe	80
Asia	38
ROW	39
Total	274

- Publicly traded (NYSE: EMR)
- Headquarters in St. Louis, MO (USA)
- Recognized for outstanding management process and record of consistent long-term performance
- Manufacturing and/or sales presence in more than 150 countries
- Founded in 1890 – in business for 116 years

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Emerson Business Units

$20.1 Billion / Year

EMERSON Process Management
EMERSON Network Power
EMERSON Climate Technologies
EMERSON Appliance Solutions
EMERSON Motor Technologies
EMERSON Industrial Automation
EMERSON Professional Tools
EMERSON Storage Solutions
EMERSON Process Management

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Systems & Solutions

- **DeltaV**
- **Ovation**
- **Industry Centers**
  - **Chemical**
  - **Oil & Gas**
  - **Refining**
  - **Power & Water**
  - **Life Sciences**
  - **Metals & Mining**
  - **Pulp & Paper**
  - **Food & Beverage**

Asset Optimization

- **AMS Suite**
- **Services and Technologies**
  - **Rotating Equipment**
  - **Electrical Systems**
  - **Process Equipment**
  - **Instruments & Valves**

Measurement

- **Rosemount**
- **Saab Rosemount**
- **Micro Motion**
- **Brooks**
- **Rosemount Analytical**
- **Daniel**

Valves & Regulators

- **Fisher**
- **Bettis**
- **El-O-Matic**
- **Shafer**

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- Advanced Solutions: Enable Operational Excellence

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What Is PlantWeb?

A process automation architecture that uses the **power of field intelligence** *to improve*

plant process and financial performance

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PlantWeb Is a Digital Architecture that Uses the Power of Field Intelligence…

…to improve plant performance by delivering accurate, actionable information to the right person in time to make a difference

SMART ASSET OPTIMIZATION

SMART DIGITAL CONTROL

SMART MEASUREMENT

SMART FINAL CONTROL

SMART SAFETY

SMART ANALYTICAL

SMART MACHINERY HEALTH MANAGEMENT

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Emerson's PlantWeb Value Proposition

PlantWeb Digital Plant Architecture -

Empower your Organization with Predictive Intelligence

- Improves **plant efficiency by ≥ 2%**
    - Improves **plant production**
    - Lowers **conversion costs**

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Emerson Team Areas of Expertise

Production Planning

Operations ... **ance**

Quality

Accounting & Controlling

Sales & Distribution

Connectivity to ERP and Maintenance

Special Applications (Blending, etc.)

Historians (OSI PI)

DCS Migration

Advanced Control/ Optimization

Control Systems

Control Performance (Entech)

Fieldbus Consulting

Field Devices

Tank Farms

Loading Terminals
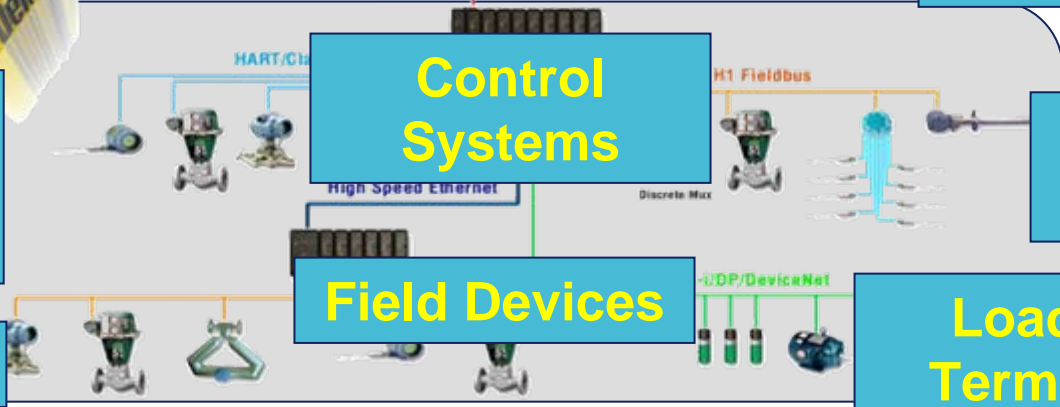
Operational Excellence through Advanced Solutions for Plant- Benefits

- – **Control Performance Improvement (CPI)**

- – **Advanced Process Control (APC)**

- – **Operator Training System (OTS)**

- – **Plant Information Management System (PIMS)**

- – **Asset Management and Optimization**

PlantWeb

4. Validate and Sustain Improvements

3. Define and Execute Performance Improvement Programs

2. Evaluate Options for Improvement

1. Analyze & Benchmark Current Performance
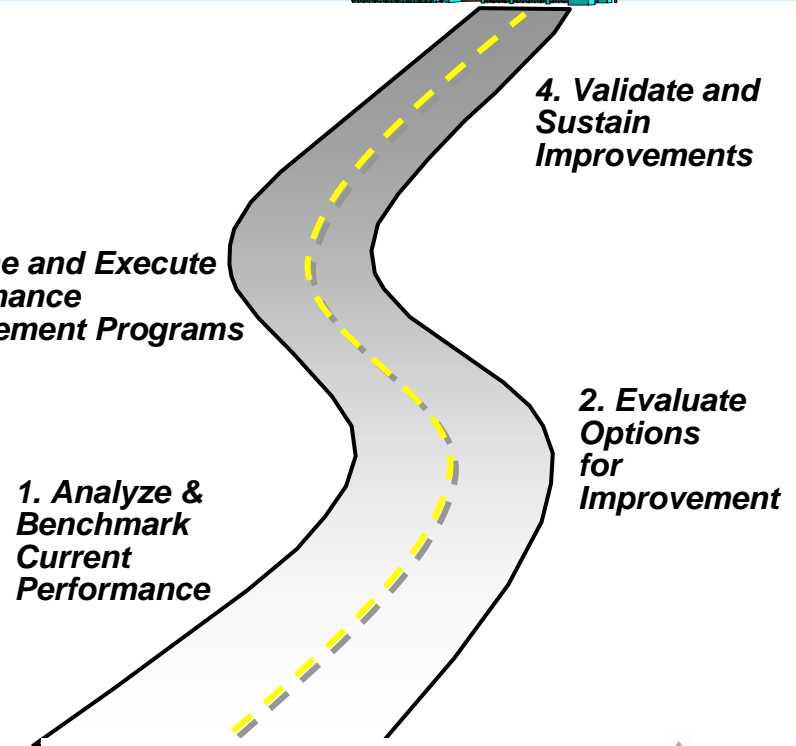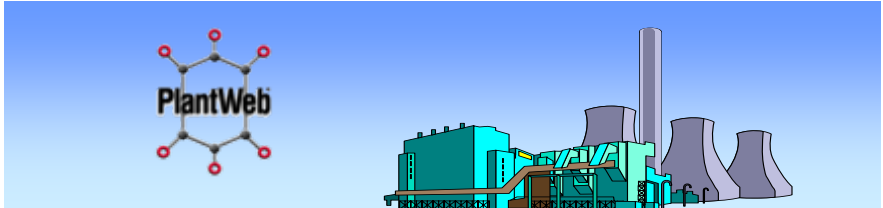
Process Equipment

Mechanical

Electrical / Power

Field Devices

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Embedded APC Tools – What's new?

- *NO extra databases*

- *NO database synchronization issues*

- *NO watchdog timers*

- *NO fail/shed logic design*

- *NO custom DCS programming*

- *NO interface programming*

- *NO operator interface development*

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Traditional Advanced Control

Embedded APC:

- Can run in DCS controllers

- Redundant and fast (1/sec)

- Integrated operator user interface

- Configured in DeltaV environment

- Automated step testing and Model ID

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The Emerson APC Suite

DeltaV Inspect	DeltaV Tune	DeltaV Fuzzy	DeltaV Simulate
Loop Performance Monitoring	*Control Loop Tuning*	*Better way of Loop Control*	*Configuration, Design, Training*
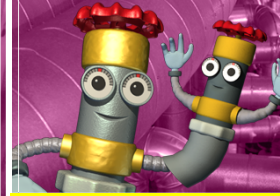
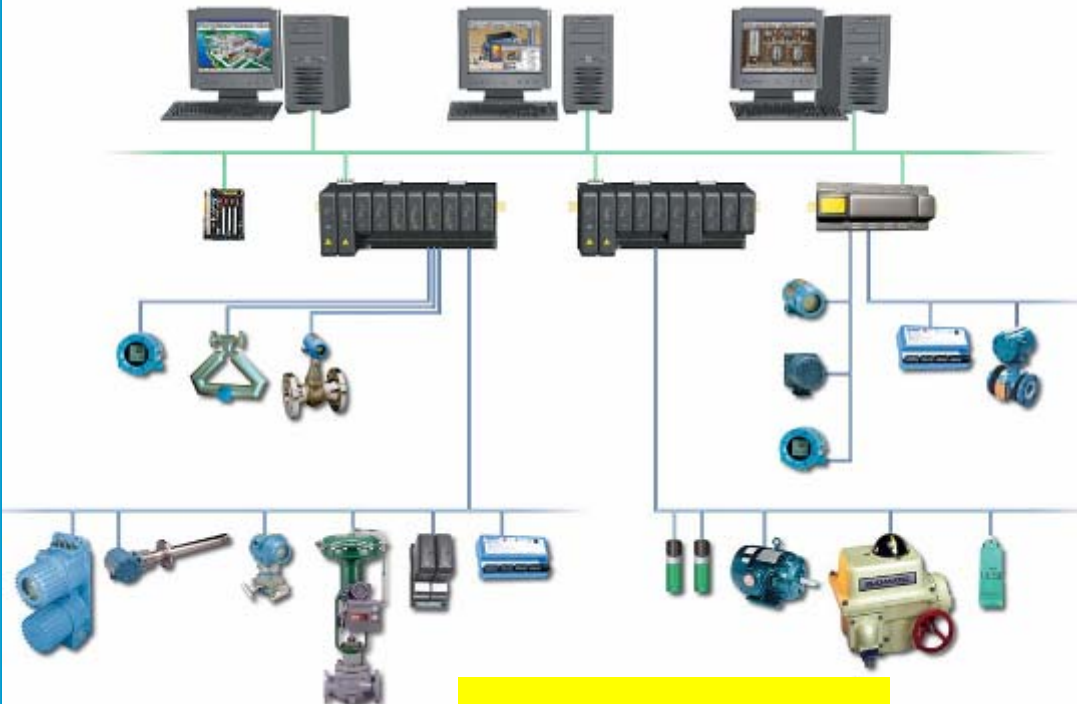| DeltaV SimulatePRO	DeltaV Predict	DeltaV Neural	DeltaV PredictPRO
Configuration, Design, Training	*MPC*	*Soft Sensor*	*MPC with Optimization*
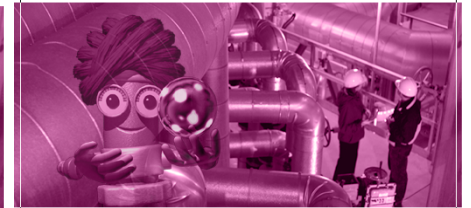
DeltaV Adapt

Adaptive Non-Linear PID Control

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In the drive towards operational excellence, you've made a great investment in leading technology

30% Project Savings by Reducing…

RISK | COST | STARTUP

2% Operational Improvement by Impacting…

OUTPUT: QUALITY | THROUGHPUT | AVAILABILITY

COST: OPERATIONS and MAINTENANCE | SAFETY, HEALTH and ENVIRONMENT | ENERGY and UTILITIES | WASTE and REWORK

PlantWeb™

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Operator Training is an On-going Process

When critical situations occur...

You must be prepared!!

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Operator Training Solution (OTS)

Reduced Operator Error
- **Improved Safety**
- **Reduced Product Loss**
- **Reduced Shutdowns**

Quicker Smoother Start-Ups

Key Benefits

Improved recognition & response to upset conditions

Change Management

Regulatory Compliance Refresher Training

Transfer Knowledge and Best Practices

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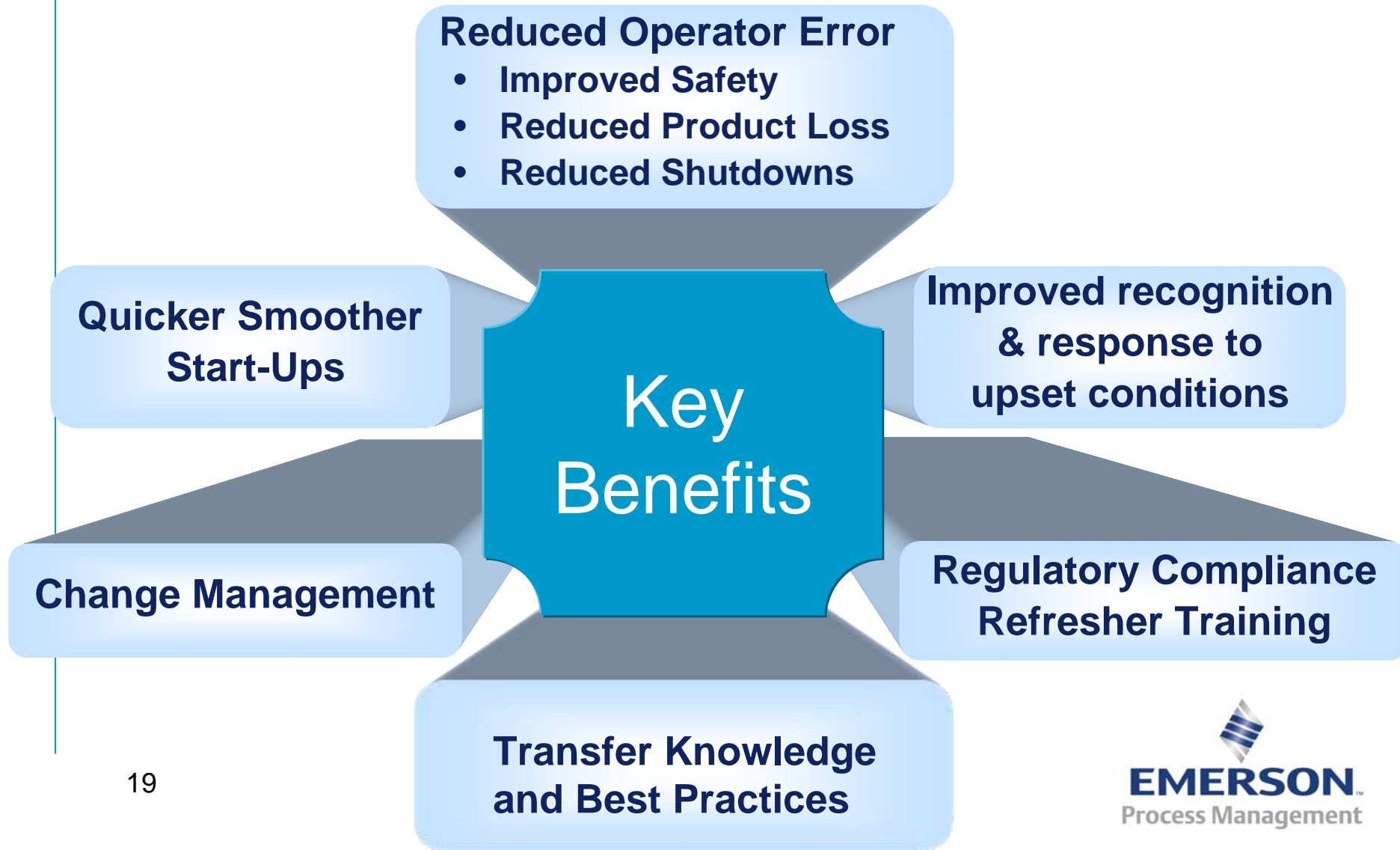
Training Solution Components

Customer's Configuration Database/Graphics **+** DeltaV Simulate **+** Process Simulation Software **+** Custom Courseware

- Utilize your exact live plant system configuration and operator displays

- DeltaV Simulate Suite

- Mimic process simulation software

- Customized curriculum and courseware

Instructor Station

Simulation Server

Operator Training Station

Operator Training Station

DeltaV OTS example architecture

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Operator Training with DeltaV OTS

The solution that delivers skilled operators and operational excellence

Customer's Configuration Database/Graphics **+** DeltaV Simulate **+** Process Simulation Software **+** Custom Courseware

Instructor Station   mimic Server

Operator Training Station   Operator Training Station

Single Workstation with MiMiC

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The Importance Of Alarm Handling

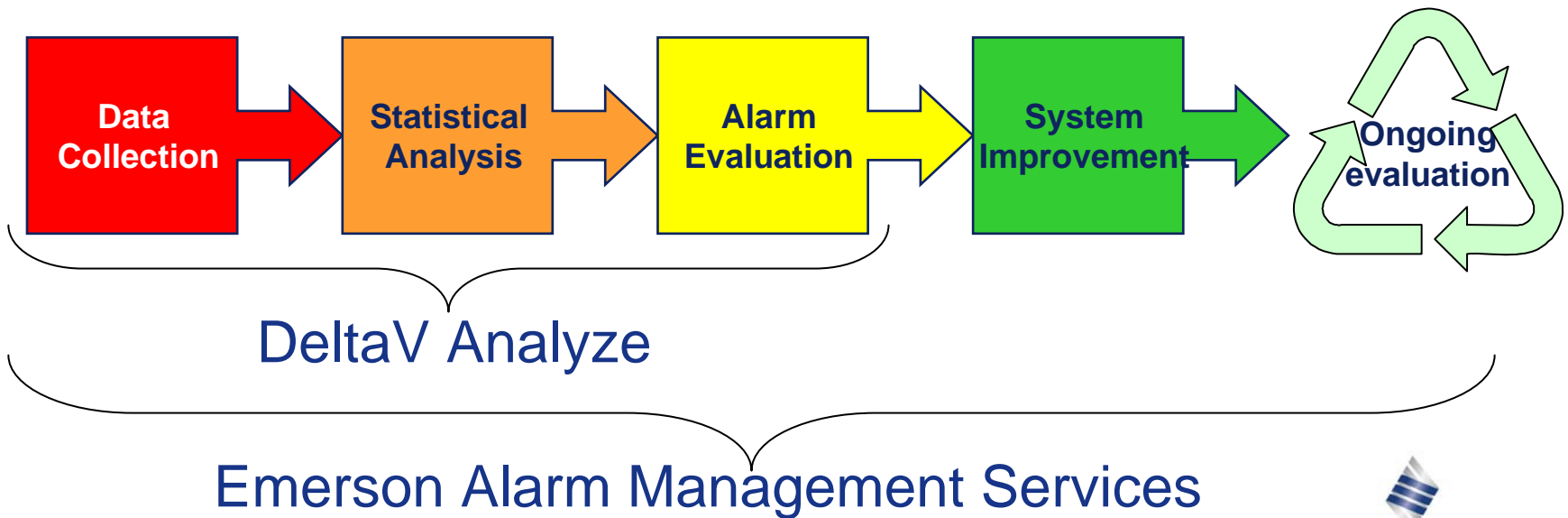In the last 11 minutes before explosion, the operators had to recognize, acknowledge and act on 276 alarms, and these alarms were poorly prioritized

Capital and production losses of £48M ($82 M)

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A Complete Approach to Alarms

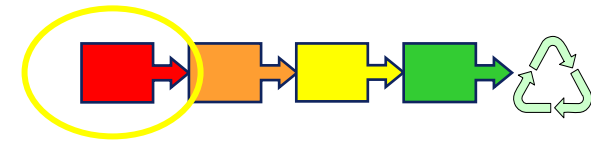## Four steps to an effective and comprehensive alarm analysis and rationalization program for your plant

| Data Collection | → | Statistical Analysis | → | Alarm Evaluation | → | System Improvement | → | Ongoing evaluation |

DeltaV Analyze

Emerson Alarm Management Services

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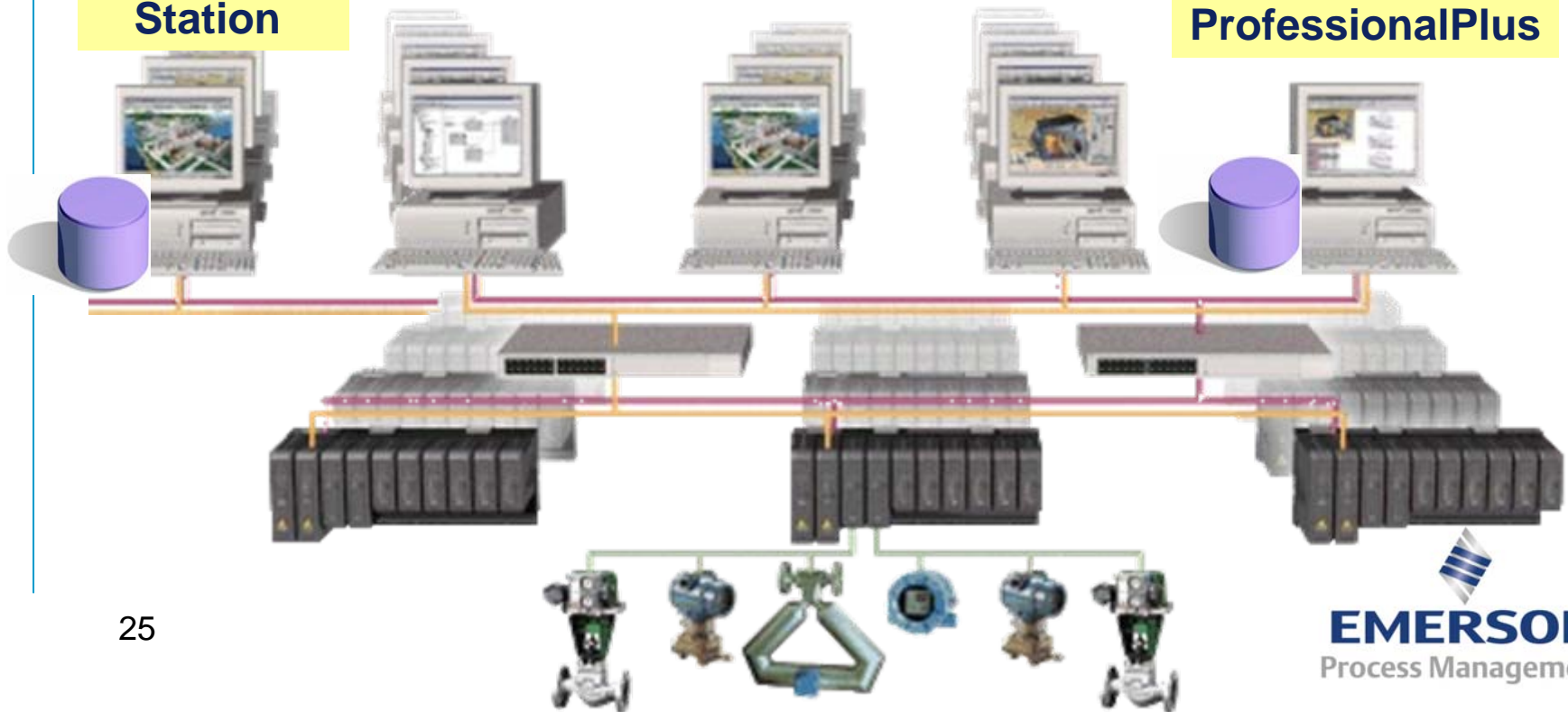
DeltaV Event Chronicle

Electronically record alarms/alerts by Plant Area

- Centralize event recording on ProPlus or Application Station

Application Station

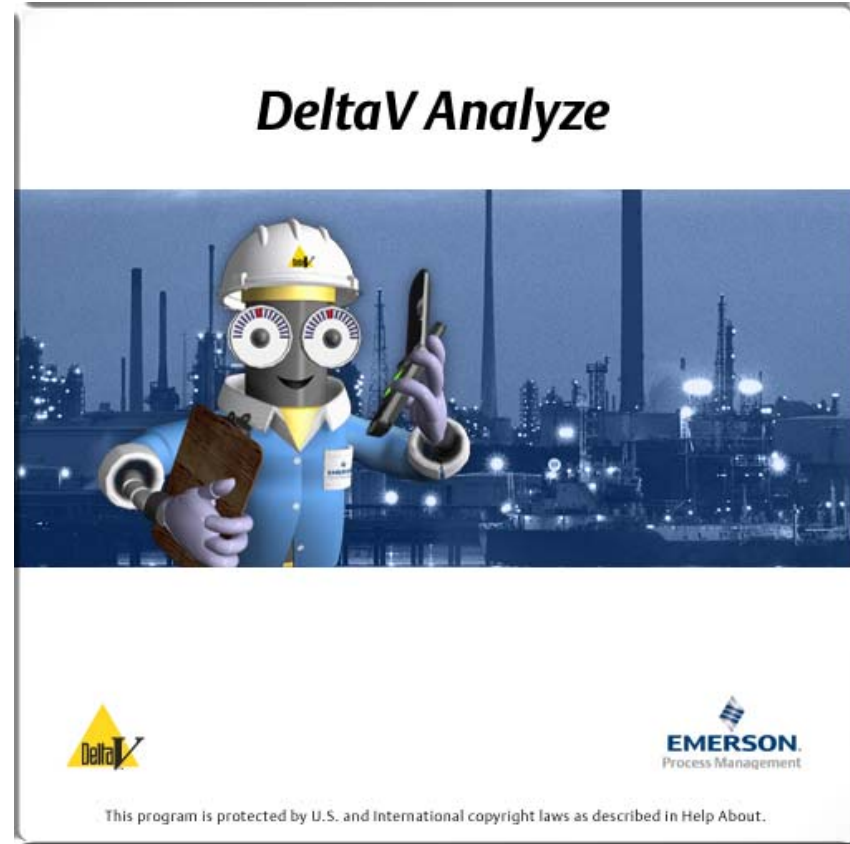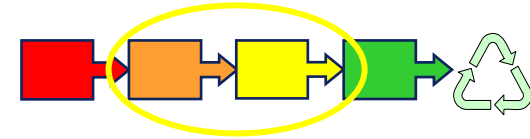ProfessionalPlus

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DeltaV Analyze
New DeltaV Alarm Analysis Product

Why DeltaV Analyze?

- Embedded product
- Knowledge of DeltaV specific alarms and events

DeltaV Analyze

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This program is protected by U.S. and International copyright laws as described in Help About.

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Alarm Management Services

- SureService[SM] has developed Alarm Management Services to help our customers evaluate and improve their alarm systems for:
  - Improved plant safety
  - Reduced downtime
  - Improved operational excellence
  - Improved plant maintenance
- At the core of Alarm Management Services programs:
  - DeltaV Analyze installed on the system for automatic, periodic collection of data
  - Alarm Management Subscription Services from SureService[SM]
- The Alarm Management Services program consists of three areas of alarm system services:
  - Alarm System Management Assessment
  - Alarm System Performance Improvement
  - Alarm System Maintenance Program
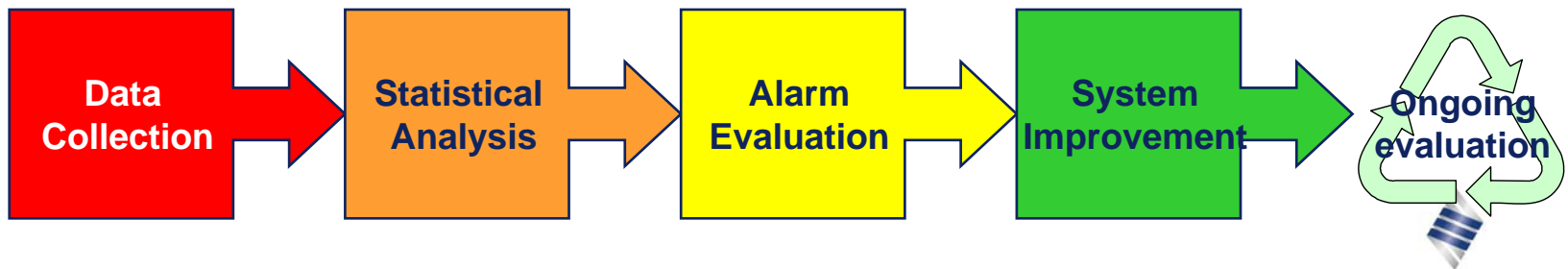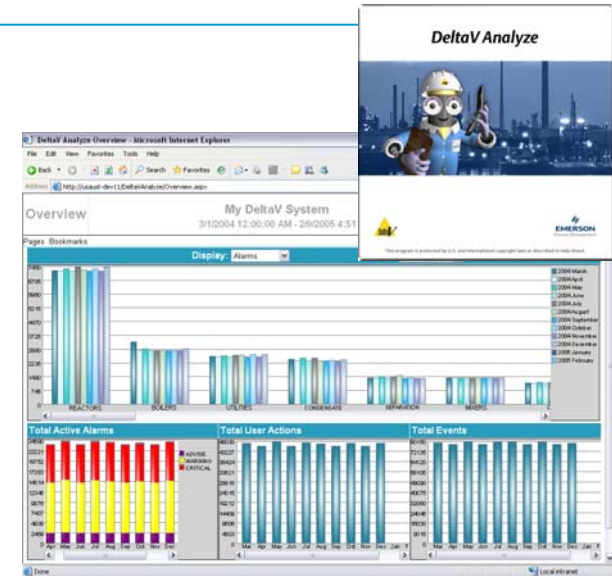
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Partner Announcement

## OSISoft Strategic Partner - Platinum VAR

OSI view Emerson as a member of the highest tier partner

World Wide Best Practice

Each application design, development and implementation is supported by wide experience and in-depth knowledge consultants

DeltaV Continuous Historian Connectivity to PI Client Applications

**OSIsoft PI Applications**
PI DataLink, PI ProcessBook, etc
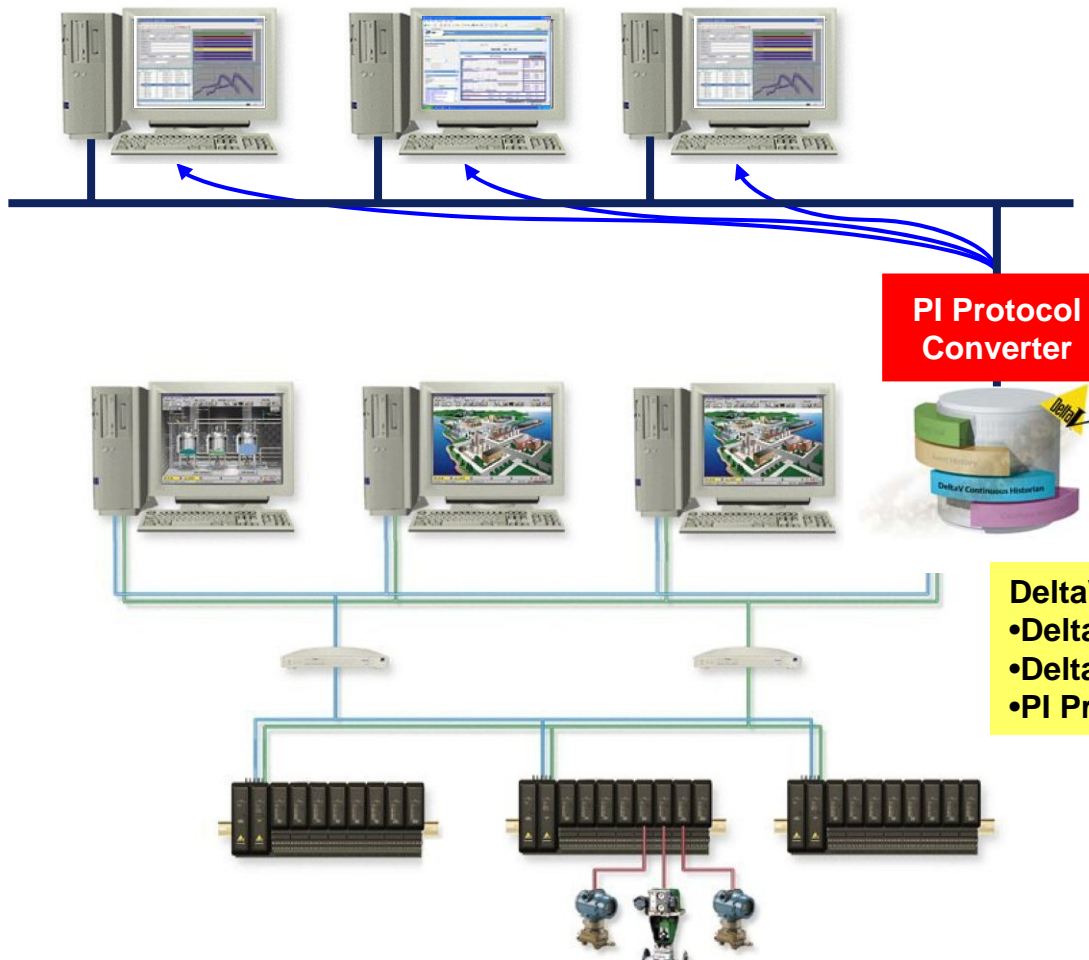
PI Protocol Converter

DeltaV Application Station >=v7.4.1
•**DeltaV Continuous Historian**
•**DeltaV OPC History Server**
•**PI Protocol Converter**

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DeltaV Continuous Historian Connectivity to Enterprise PI

OSIsoft PI Applications
PI DataLink, PI ProcessBook, etc

Enterprise PI

PI to PI Interface

PI Protocol Converter

DeltaV Application Station >=v7.4.1
•**DeltaV Continuous Historian**
•**DeltaV OPC History Server**
•**PI Protocol Converter**

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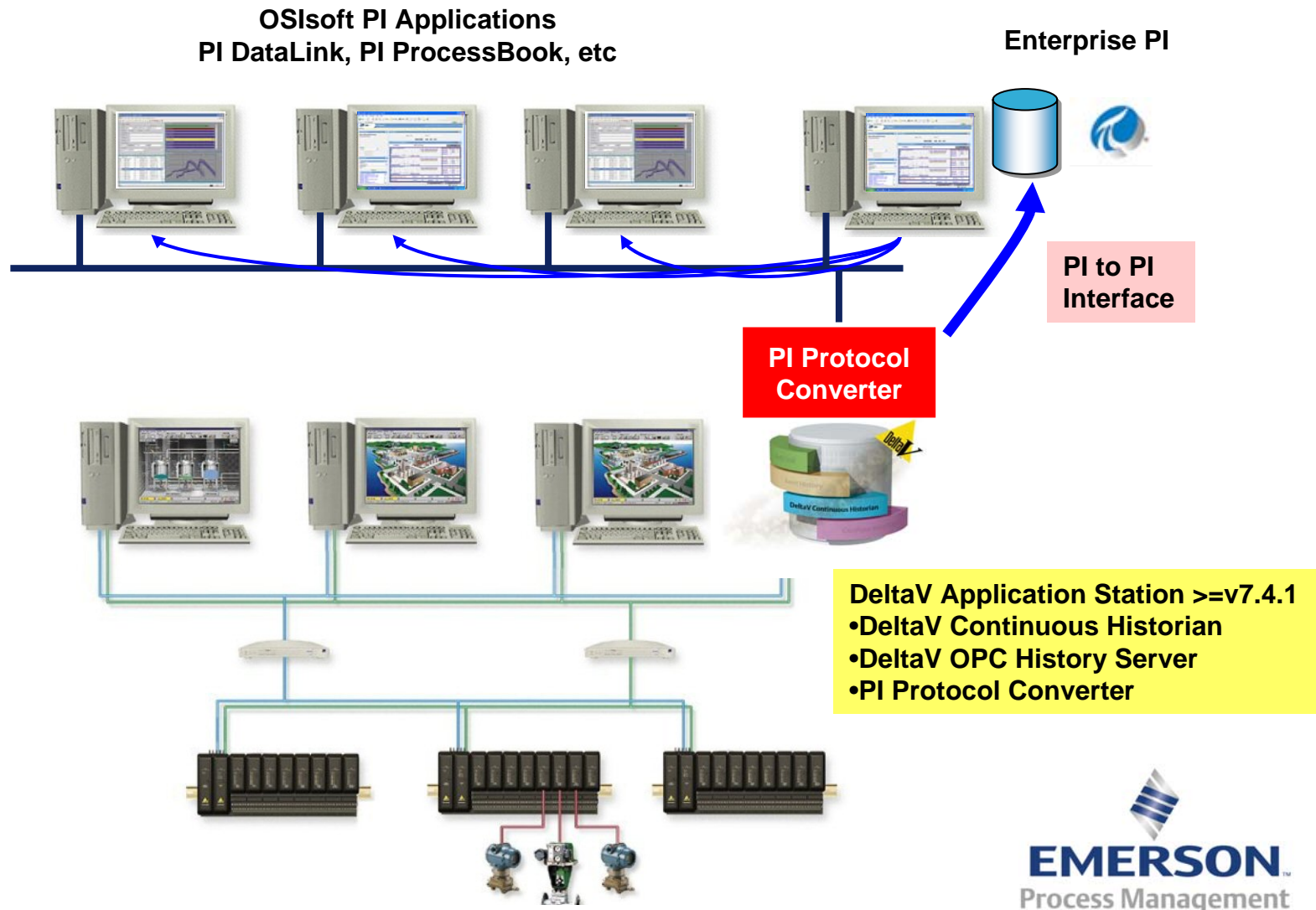
Plant Information Management System (PIMS) – Objectives/Benefits

→ **One Version of the Truth - Anywhere, Anytime –**

- Access real time data and information from anywhere, at anytime

- Analyze, Decisions and Execute Actions

- Improve root cause analysis/ Diagnostics methods

→ **Plant/Business Information Management System**

- Data Management : Seamless integration with plant & business systems

- Business Scenarios Simulation/Analysis

- Dynamic updates – generate alerts in real-time

- Visibility of Key Performance Indicators and Monitoring

- On-line and Web Based reporting

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PlantWeb Powers Operational Excellence

Process Management

Network Power

Climate Technologies

Appliance Solutions

When the stakes are high

Industrial Automation

Motor Technologies

Professional Tools

Storage Solutions

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CONSIDER IT SOLVED.