

Centralized Monitoring of Power Industry Assets

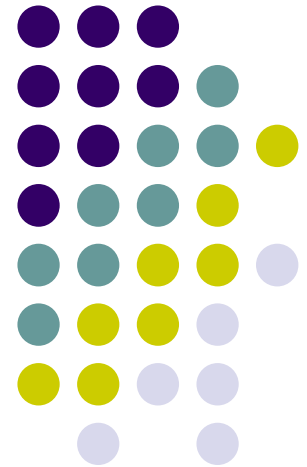


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*Solving Tomorrow’s Energy Problems
Today™*

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Presentation Overview

Fleet-Wide
Monitoring
Applications

- Thermal Performance
- Vibration Analysis
- Equipment Condition Assessment

Industry
Activities

- Implementation
- Experience & Lessons Learned
- Next Steps



Fleet-Wide Monitoring



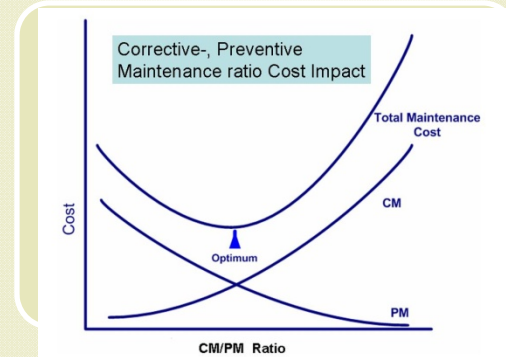
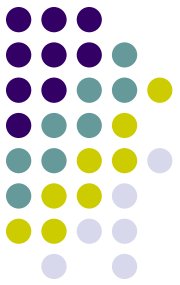
Centralized Resource to
Manage Generating Assets

Early detection of plant
problems

Strategy to continue
reducing O&M costs

New Drivers

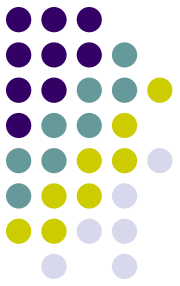
Fleet-Wide Monitoring Applications



Thermal Performance Monitoring solutions are used to monitor plant operational efficiencies, emissions, fuel performance and costs.

Vibration Analysis is applied for condition based monitoring of rotating machinery.

Equipment Condition Assessment technologies based on empirical modeling are being deployed fleet-wide for diagnostics and prognostics



Example Applications

Entergy

- Focus on Preventive Maintenance and Diagnostics as well as Operational Assistance

TXU

- Heat Rate Improvement, Preventive Maintenance and Diagnostics, Operational Assistance

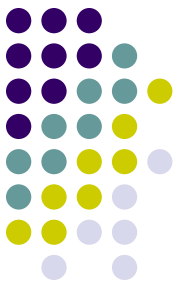
First Energy

- Operational Assistance; All Generation

Iberdrola

- Preventive Maintenance & Diagnostics for their Global Assets (Spain, Mexico, Central America)

Lessons-Learned & Critical Factors



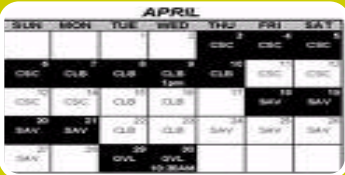
Strong Management Support



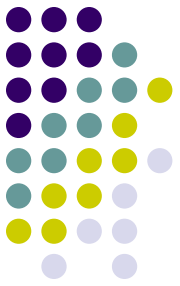
Strong Leadership, Ownership & Teamwork



Managing Expectations



Developing & Adhering to Schedule



Typical Results

Cost Benefit

First year: 2 to 1

Ongoing after first
year 3 to 1

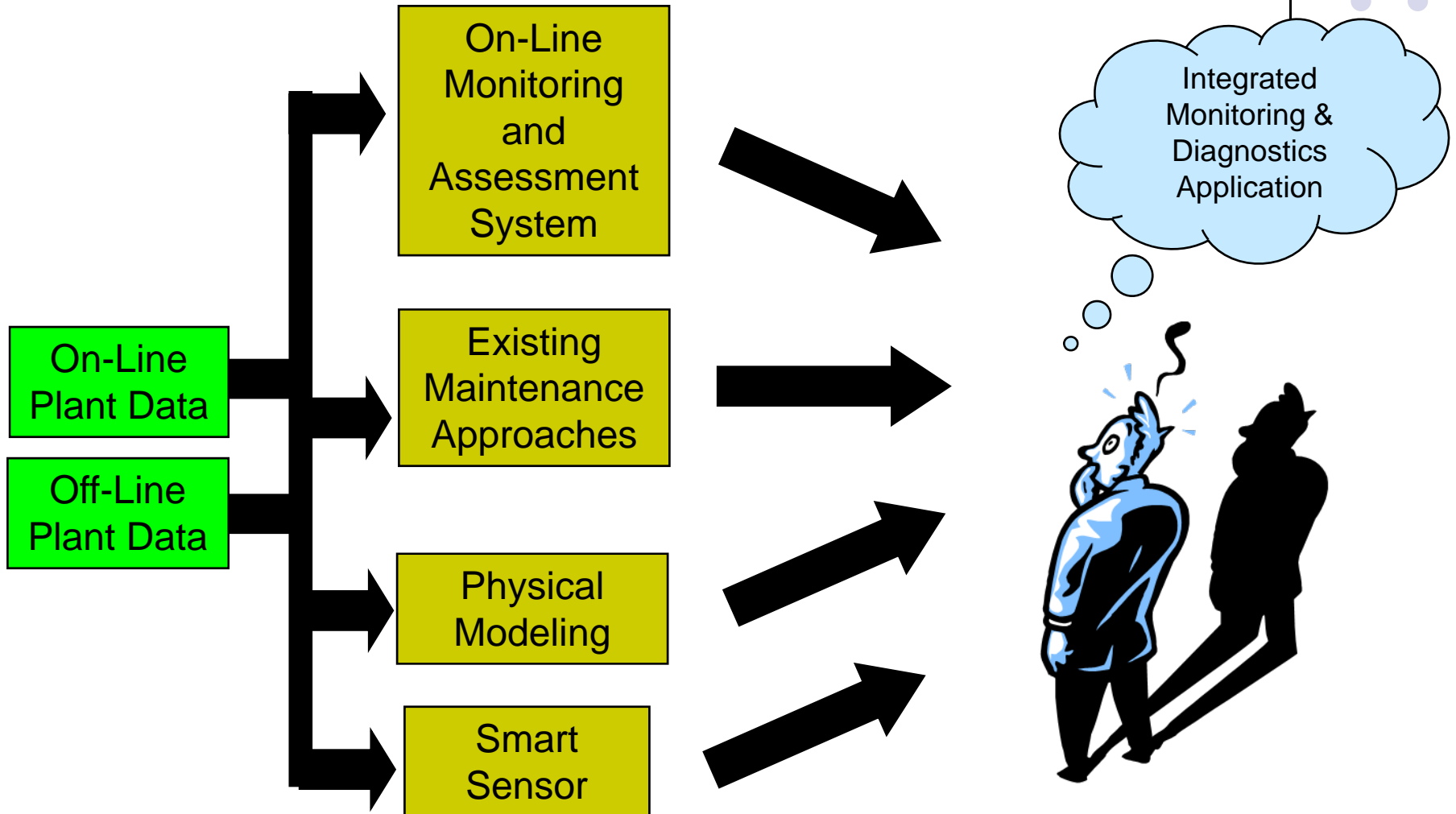
Ongoing after first
year 8 to 1

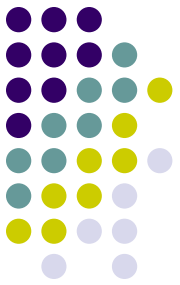
Catches

First year
250

Ongoing
400 to 500 / yr

Current Information Flow





An Integrated Future

Data
Integration



Integrated
Monitoring &
Diagnostics

First Principle Models

Smart Sensors

Existing Maintenance Approaches

On-Line Monitoring & Assessment

Planning & Procedures

Diagnostics

Prognostics