VOYAGE2007

Improving Reliability and Saving Money with Condition Based Maintenance

George Muller
IT Manager
Conectiv Energy

Dennis Kilgore
President
DLL Solutions, Inc.

conectiv energy
A New Generation of Energy

DLL SOLUTIONS, INC.
THE PROCESS INFORMATION SPECIALISTS

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About Conectiv Energy

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Introduction

- Conectiv selected DLL Solutions, an OSIsoft ISV and SI Partner, to implement this project
  - Project services include configuring the system for roughly
    - 630 pieces of equipment
    - 450 Measurement position counters
  - Implement Condition Monitor
    - New DLL Solutions product which abstracts the configuration process, and also calculates the data which drives RLink

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Introduction

Sound Check !

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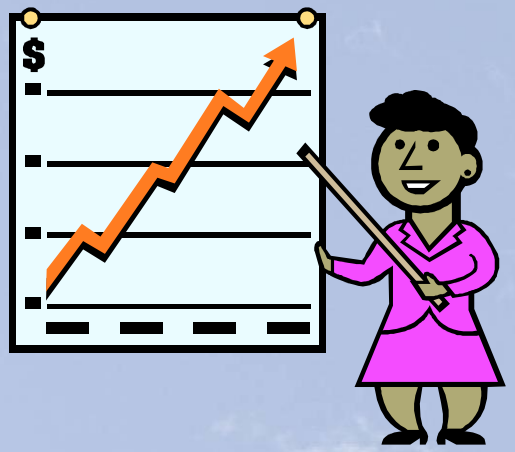
The Business Challenge

- Improving Reliability
- Increasing Availability
- Improving Revenue Stream
- Reducing Costs
- So → What can we control?
  - Engineering / Asset Design
  - Operations
  - Maintenance



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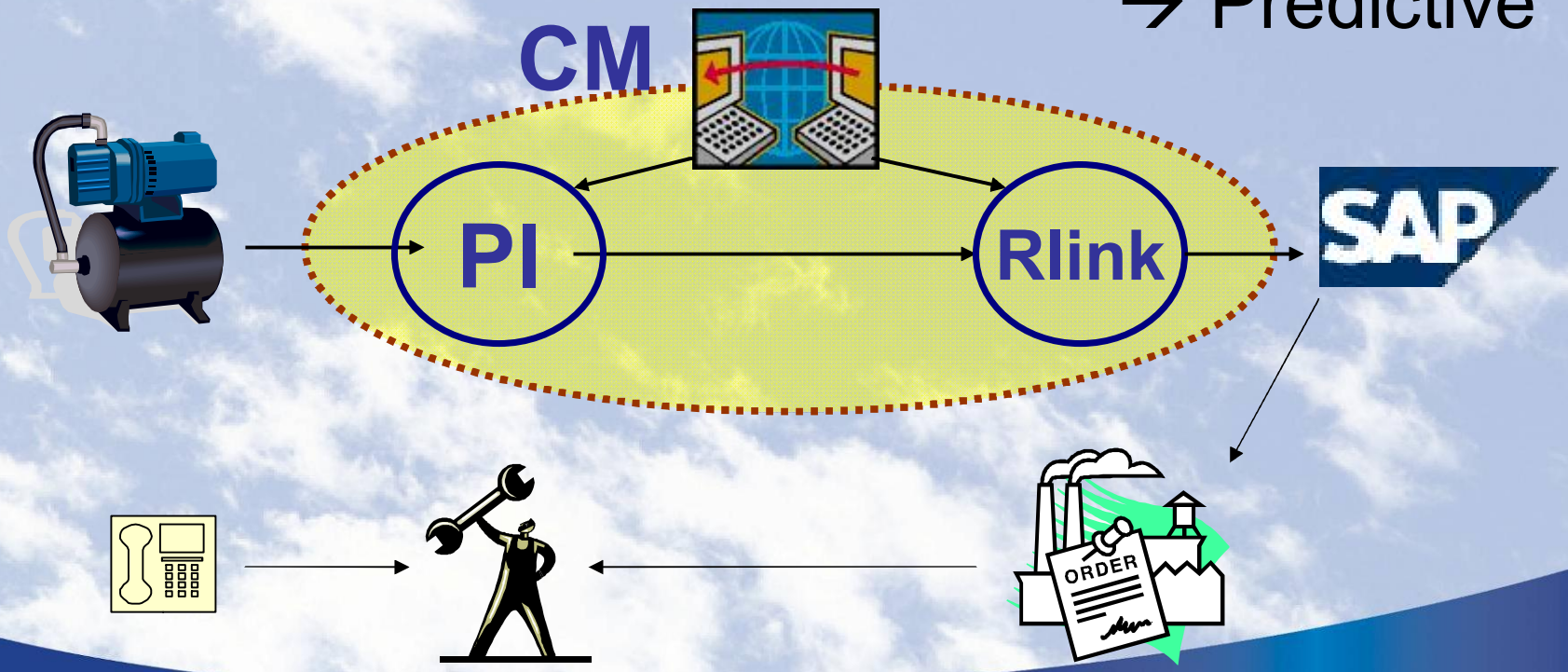
The Solution

- Maintenance Approach- evolution from
  → Corrective
  → Preventative
  → Predictive



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The Solution

- Scope – Implementation at two plants
- Leveraging existing investments
  - OSIsoft PI System and RLINK
  - SAP/PM
- New application from DLL Solutions – CM

  Condition Monitor

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The Solution

- **Why this approach?**
  - **Very user friendly**
  - **Easy configuration of rules**
  - **Leverages existing investments**
  - **Low cost**

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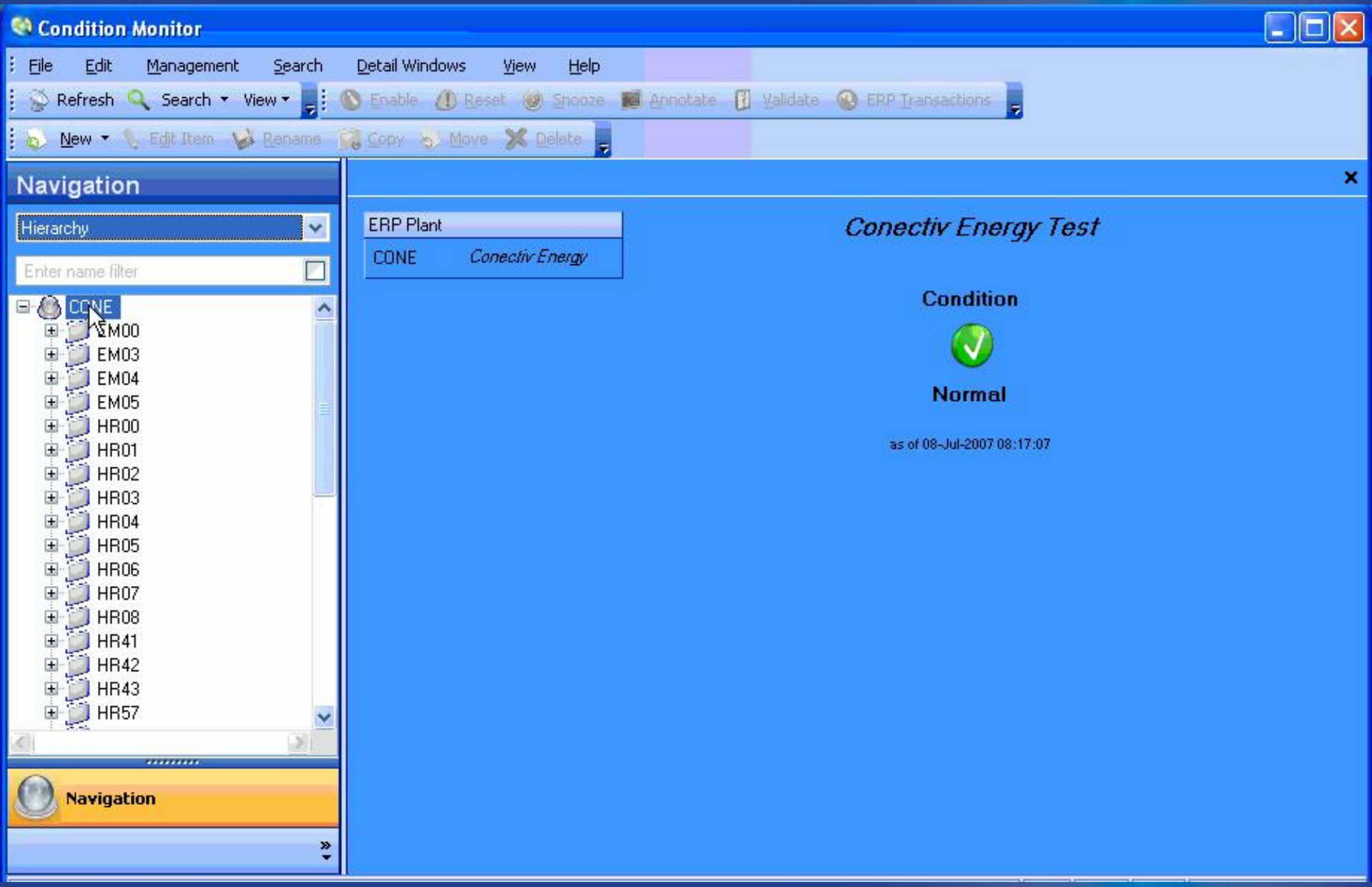
DEMONSTRATION



Benefits

- **Qualitative benefits:**
  - Reduce unnecessary maintenance
    - Lower material and labor costs
  - More effective maintenance program
    - Resources focused on most important items
    - Reduced F.O.R. = increased revenue
- **Quantitative benefits:**
  - IRR = 28.9%
  - Payback in 3rd Year

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What's Next

- Develop additional rules
- Extend scope to other facilities
- Extend functionality

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Cast Change…

George Kilgore

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Key Feature Requirements

- Normalized Inputs
  - Must perform data quality and validity tests
  - Must be capable of inferring condition, i.e. When the 1 minute average of the ‘Motor Amps’ tag is greater than 10, consider the motor “Running”
  - Provide ability to minimize false positives
  - Reusable within system
- Usability
  - Allow less-technical persons to create reliable counters for SAP
- Maintainability
  - Should be adaptable to PI Notifications, AF 2.0 and beyond

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Implementation Goals

- Leverage existing investment in PI and RLink
  - PI contains all of the data
  - RLink does all of the SAP communication
- Fewer steps to a more consistent outcome
  - CM consolidates the various configuration steps required of the underlying systems and orchestrates everything
  - cmServer automatically handles data quality and staleness issues
- Simplification leads to broader use
  - Reducing the amount of effort and information required to make new (and reliable) counters will keep users coming back
- More data driven maintenance reduces costs

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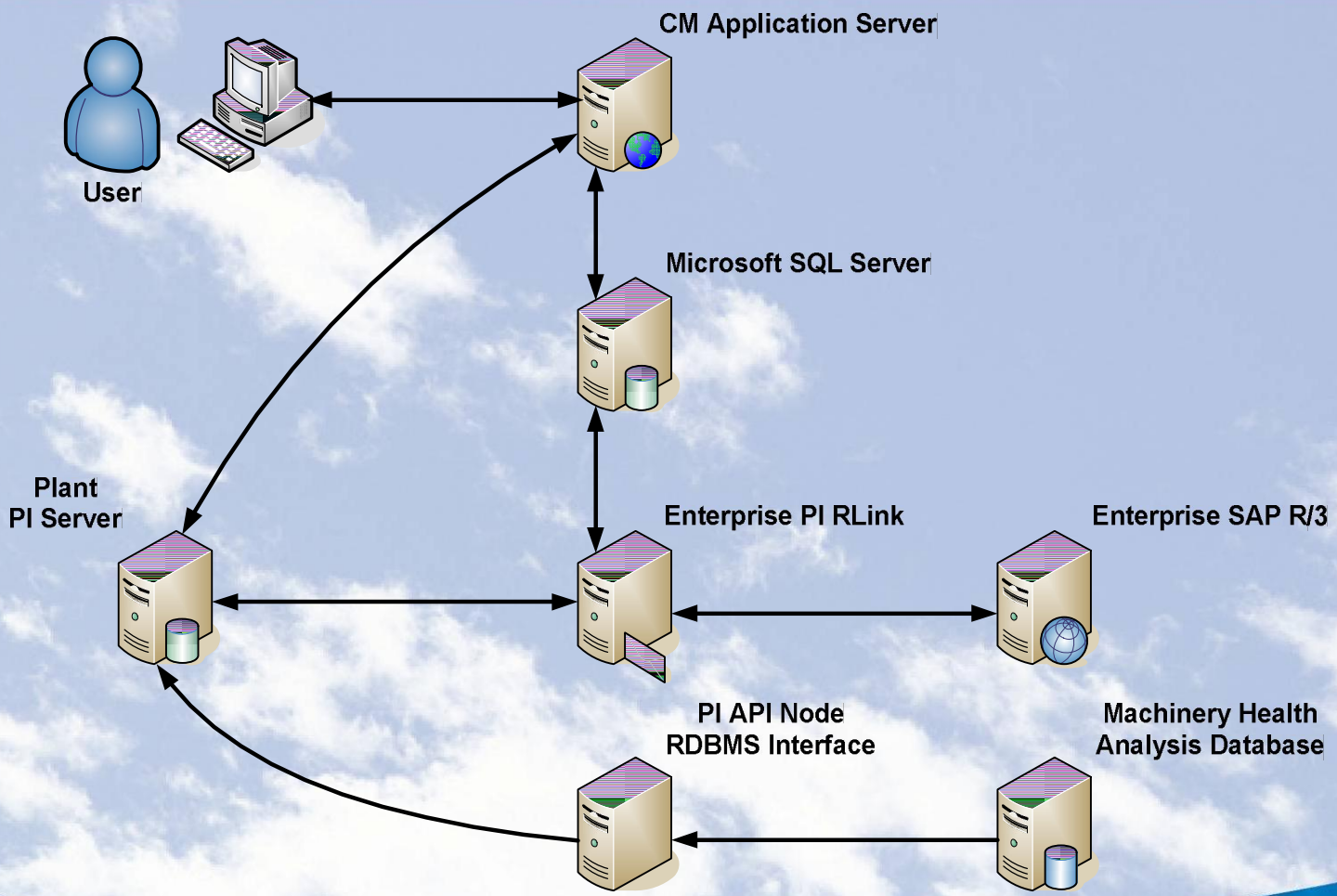
The Big Picture



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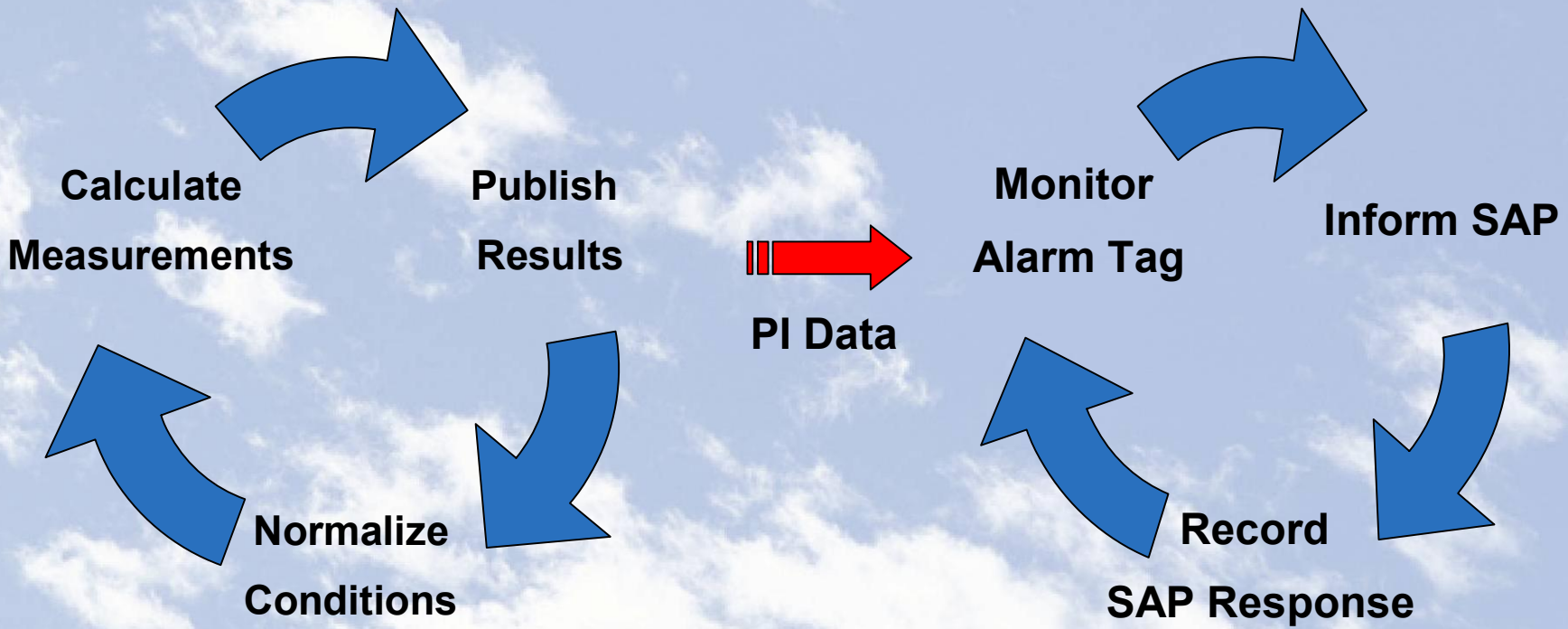
The Circle of Life



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Configuration Items

- Source
  - Encapsulates the definition of equipment specific counters or conditions
    - Condition example: When the 'Motor Amps' one minute average is greater than 10, report the motor as "Running"
    - Counter example: Make a "TotalFlow" counter available for "Pump X" which is based on the "Total" of the 'Pump Flow' tag multiplied by 24.
- Measurement
  - References 1 Condition Source and/or 1 Counter Source
  - When the Condition is TRUE, calculate the Counter
    - E.g. When the pump is "Running" calculate the "TotalFlow"
- Rule
  - The tag level interfacing to RLink and SAP
  - E.g. When my measurements total to 100, send a Measurement Document to SAP

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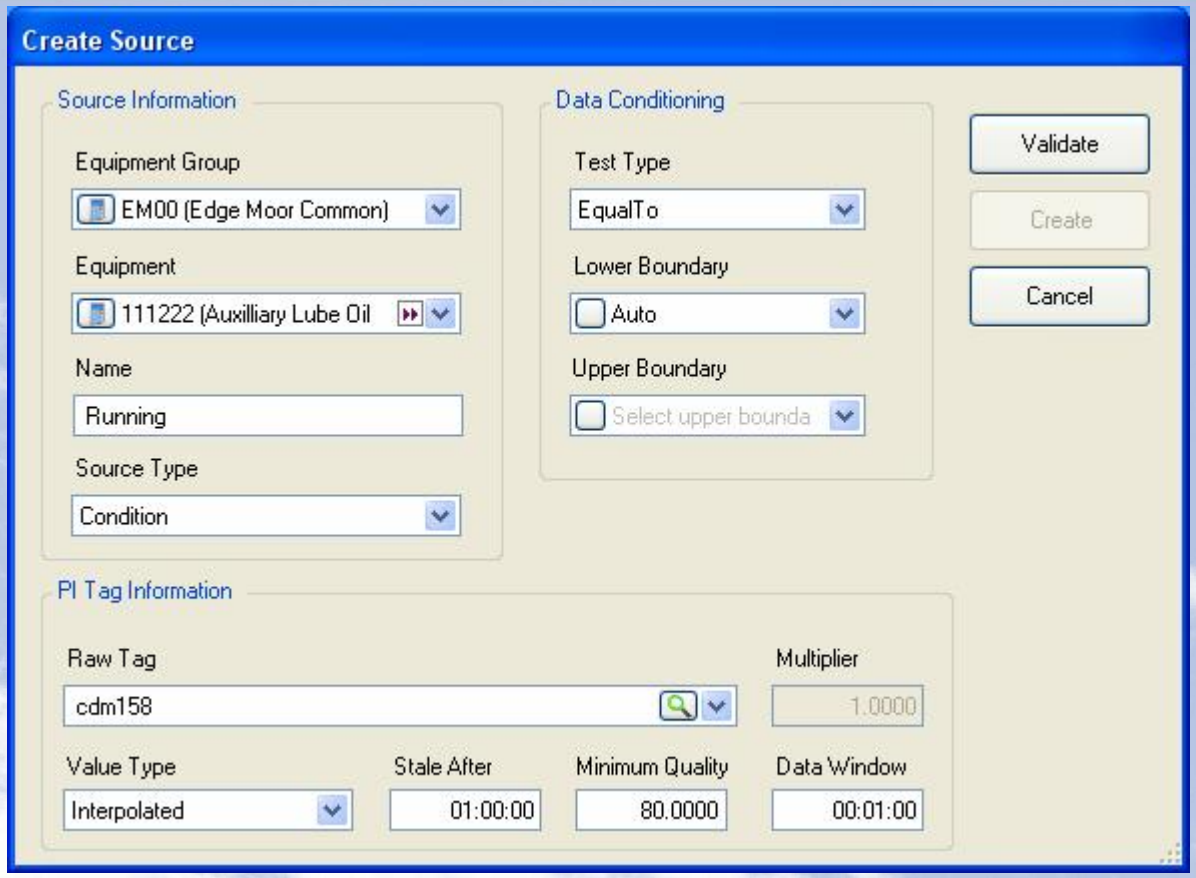
Normalized Sources

- Each source normalizes the data from a known “raw” PI tag based on configured metrics, into either a Condition or a Counter
- Examples:
  - Running
  - LoadedOperation
  - AverageDP
  - TotalFlow



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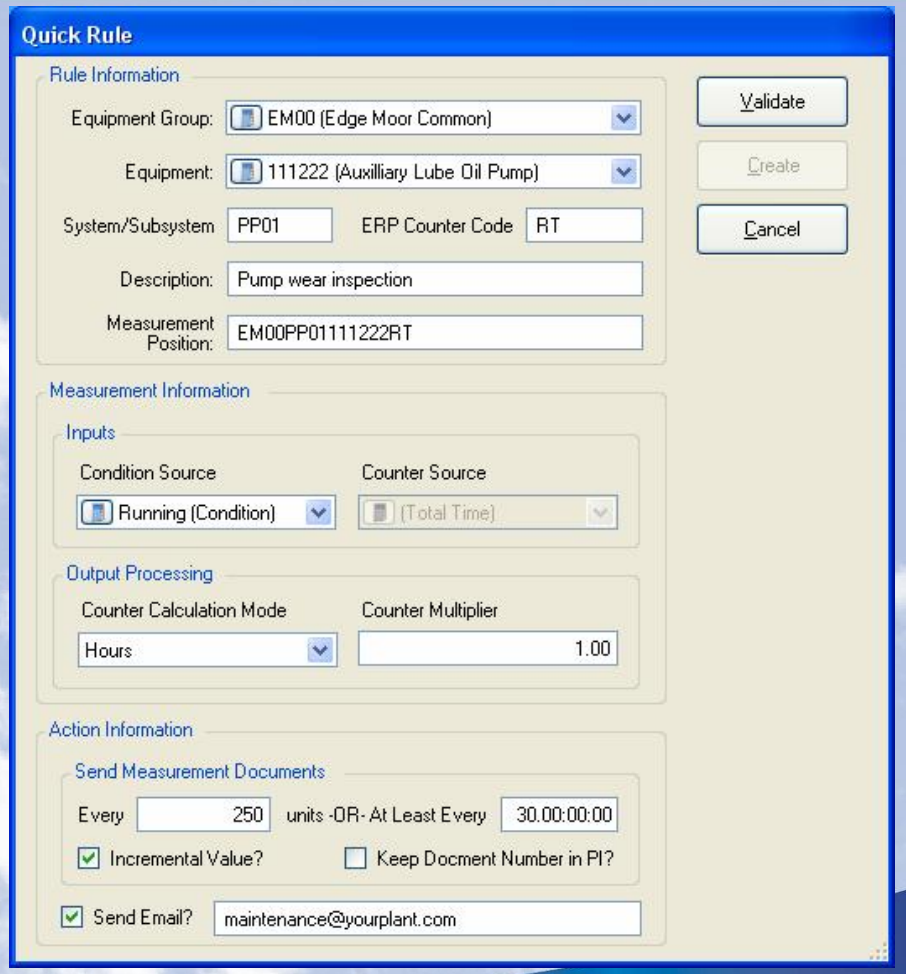
Quick Rules

- Fill in a few blanks to define a new counter for SAP
  - Measurement Position
  - Source Condition and/or Counter
  - Calculation Mode and Multiplier
  - Transaction increments



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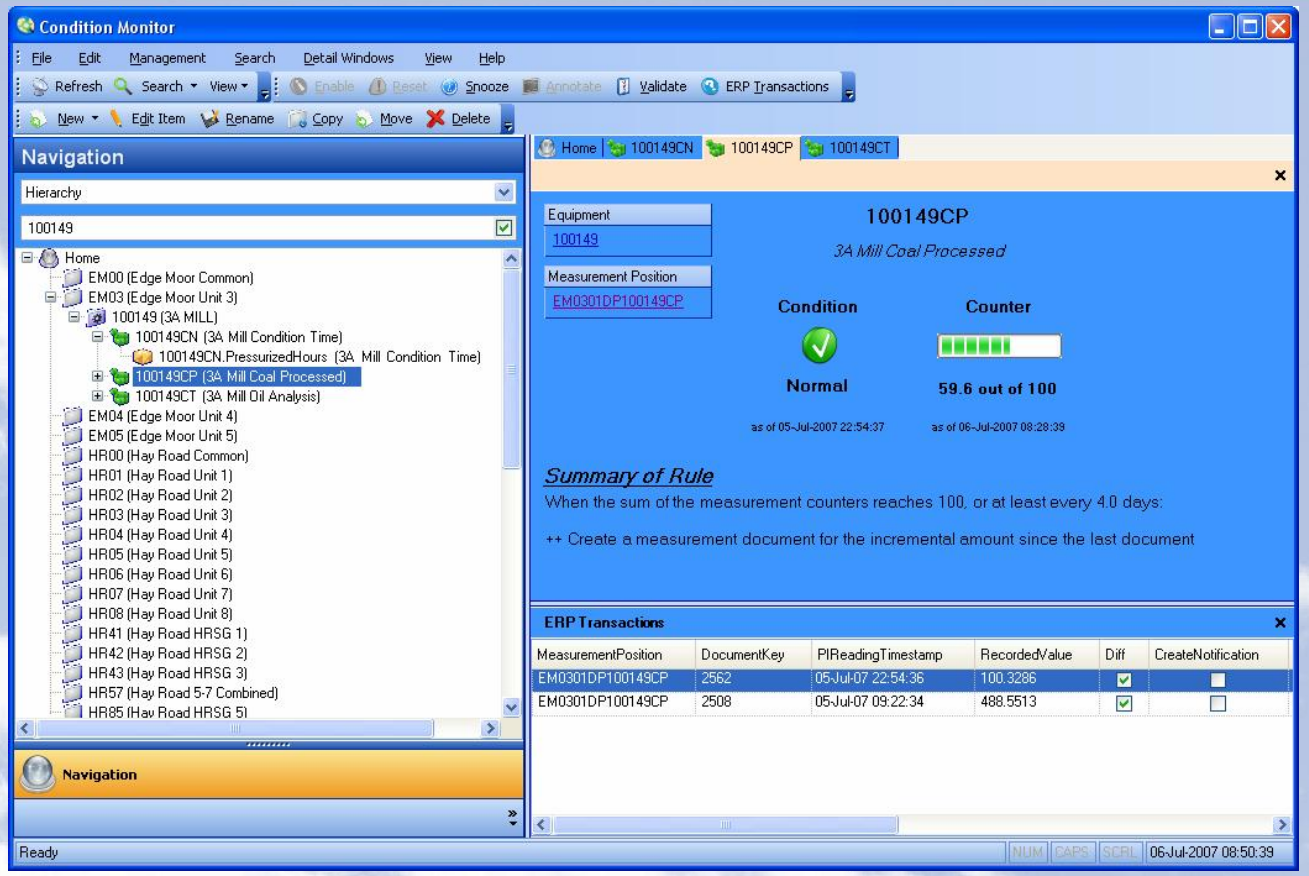
Condition Monitor User Interface

- Automatic software updates
- Gets all required configuration from web services
- Active Directory-based security



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Project Challenges

- Identifying all the desired equipment-specific items to be configured
  - Measuring Points
  - Conditions, Counters, Rules
- Matching raw PI tags to sources
- Finalizing approach to maintenance and counters in SAP

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