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Optimizing Asset Management

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Optimizing Asset Management

- What Is Asset Management?
- Goals
- Requirements
- Life Cycle Work Processes
- Tools
- Recent Industry Activities
- Future Work

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What Is Asset Management?

Activities that provide for Sustainable Managed Risk over the Life Cycle of an Asset.

- **Financial Industry**
- **Software and Cyber Security**
- **Transportation**
- **Power Generation**
- **Mining and Manufacturing (M&M)**
  - Target of This Talk (Includes Oil and Chemical Industries)

Some asset management activities are mandated by government regulation**.**

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Asset Management Goals

- **Reduce Unmanaged Risk**
  - Improve Health, Safety, Environmental, and Operability Performance
  - Manage Complexity
- **Achieve Sustainability**
  - Assure Adequate Human, Financial, and Infrastructure Resources
  - Lower Maintenance Cost
- **Simultaneously**

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Asset Management Requirements

- **A Management System**
  - Accountability, Measurements, Reporting and Auditing Systems
- **Human Resources**
  - Adequate Qualified Personnel
- **Deployed and Integrated Tools**
- **Clearly Defined Work Processes, Roles and Responsibilities**

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M&M Asset Management

- **Model Based Process or Equipment Diagnostics (Hardware Health)**
- **Control Utilization and Performance Monitoring (Software Health)**
- **Safety and Cybersecurity Programs**
- **Dumb Things that Require Manual Tests**
- **Smart Things with Internal Diagnostics**
  - Primary Target of This Talk

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Maintenance Work Processes

- **Run to Failure**
- **Preventive (Scheduled) Maintenance**
- **Predictive Maintenance**
  - Schedule Based on Risk and Failure History
  - May Include Bad Actor / Root Cause Analysis
- **Condition Based Maintenance**
  - Based on Real Time Diagnostic Data
  - Multivariable Model Based (Equipment / Process)
  - Smart Device Based (Instruments / Valves)

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Life Cycle Work Processes

- **FED**
  - Criticality Ranking
  - Vendor Qualification & Templating
- **Design / FAT**
  - Initial Configuration (Build Tools)
  - Training
- **Install, Commission, Loop Check**
  - Initial Use of Diagnostics
- **Pre-Startup Safety Review**
- **Routine Maintenance**
- **Turnaround Management**

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Asset Management Tools

Tools Provide Functionality:

- **Resource Planning, Tracking, Accounting**
  - Example: SAP
- **Design Calculation, Drawing, Documentation**
  - Example: SPI (Intools)
- **Hosts**
  - Integrated Host (Example: DCS)
  - Visitor or Bench Host (Handheld or Laptop)
  - Provide Configuration Management, Troubleshooting, and Human Interface

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Asset Management Tools

- **Each Tool has a Database**
  - Each Tool is Designed to Use its Data as Master
  - The Actual Data Master Changes During the Lifecycle
- **Tools, Devices, and Systems Must Exchange Data**
  - Import, Export, and Reformat are Needed for Exchange
  - Data Comparison and Reconciliation is Necessary
- **History and Change Tracking are Needed**

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Asset Management Tools

- **Tools, Hosts, and Devices Need**
  - Remote Access
  - Multiple Simultaneous Access
  - Role Based Security
  - A Standardized Security Model Would be Nice

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Use of Asset Management Tools

- **Most Diagnostics go Directly to a Black Hole**
- **Diagnostics May Need to go to Engineering, Maintenance, and/or Operations**
- **Use and Priority of Diagnostics are Determined by Application Criticality**
  - Remember Criticality Ranking in FED?
  - Alert Priority Depends on Impact Severity – Not Likelihood
  - Send Alerts to Operator and well as Maintenance if Operator Action is Required

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Use of Asset Management Tools

- **Proper Use of Diagnostics Depends on a Graphical User Interface**
  - Would you give an Operator an Explorer Tree?
  - Navigate from Overview to Detail in 3 Mouse Clicks
  - Cover all System Nodes, Networks, & Modules
- **Free Format Diagnostic Reports are Necessary**
- **Diagnostics must Flag Data Quality**
  - Follow NAMUR NE107
  - Quality Must Propagate to All Applications and Graphics

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Recent Industry Activities

- **Field Experience**
  - **Use of Visitor Hosts (Handhelds)**
  - **Configuration Management (or Configuration Drift)**
    - Template Process for Default Settings
    - Foundation Fieldbus vs. HART
  - **Diagnostics**
    - Foundation Fieldbus vs. HART
    - Good, Bad, and Uncertain
    - NAMUR NE 43

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Recent Industry Activities

- **Field Experience**
  - **Diagnostics**
    - Foundation Fieldbus vs. HART
    - Polling Requirement and Speed
    - Multiple Simultaneous Polling Groups (64 Devices)
  - **Cyber Security**
    - Requirement for Devices and Systems

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Recent Industry Activities

- **User and Vendor Initiatives**
  - Work Process Development
  - Field Pilots
- **Foundation Initiatives**
  - FDI Development (EDDL and FDT/DTM)
  - Improved Specifications and Conformance Tests

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Future Work

- **Standards Development**
  - BSI and ISO Standards
    - Models and Terminology
    - Industry Application
    - Application to Automation Systems
  - ISA Standards??
  - Improved Vendor Tools
  - Wireless??

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Questions?

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