

Cybertech Automation helps industry engineer, build, configure, and commission instrumentation, electrical, and control system technologies.

# ASSET MANAGEMENT SYSTEMS

## HOW TO REALLY USE THEM

*Asset Management Systems (AMS) can do many things. Why do plants only do initial instrument AMS configuration/commissioning and then not use it again until an instrument fails?*

### WHAT IS AN AMS?

Standalone or integrated into a vendor's control system, an **Asset Management System (AMS)** can be:

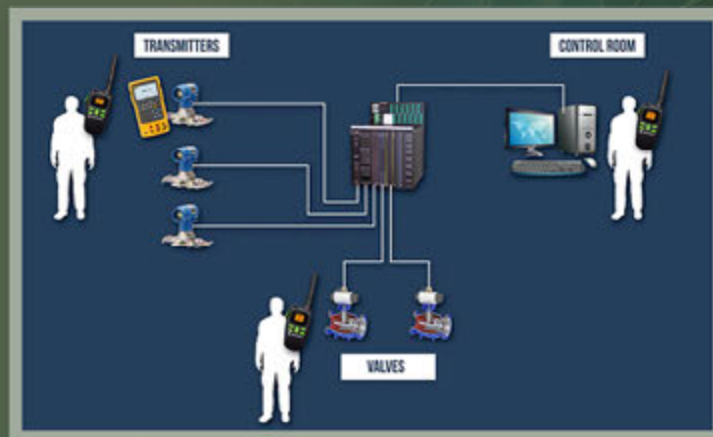
- Software that communicates with smart instruments (i.e. HART, FOUNDATION Fieldbus)
- A data logger
- An instrument configuration/testing tool
- A troubleshooting and predictive maintenance tool

Multiple vendors offer AMS products (including Emerson, Schneider, ABB, Honeywell, Rockwell and GE), and many companies have invested in such systems. However, in many plants, these systems are only used to configure instruments when they fail or are being set up for the first time. There is the potential to leverage these systems to actually save time/money, easily do rigorous testing and ultimately monitor/maintain the performance of a plant.

A major requirement in most plants is regular safety systems testing. The maintenance department typically does manual calibration and logs the results. AMS systems can be used along with automatic calibration equipment to automate/document this activity, but this is only the start. By looking at the data available in all of the control systems (DCS, SIS and PLC), it's possible to integrate all of this information into the AMS. This creates new opportunities for:

- Automated safety system testing
- Trip credit tools
- Trip validation tools
- Preventive maintenance
- Digital documentation of tests/trips/validation

### TYPICAL INSTRUMENT TRIP TESTING



- Two technicians – One in the control room and one or more in the field
- Field – Simulates signals and records valve close/open times
- Control Room – Records values, watches alarms and directs the test
- Test results manually recorded

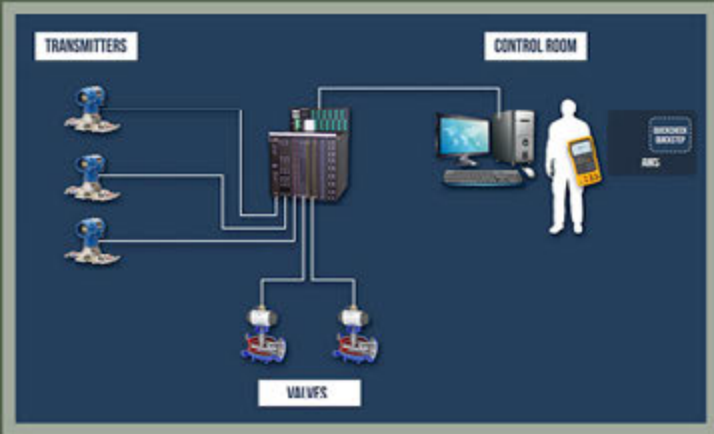
#### Typical Testing Challenges

- Radio communication confusion/misinterpretation
- Timing of valve closures can be inconsistent/inaccurate
- Majority of testing has to be done during an outage
- Paper test results are difficult to store/find when an audit is performed
- Tracking test intervals can prove difficult
- The process relies on people to ensure quality of testing
- Coordination of resources (coffee breaks, cost, timing, etc.)

### Contact

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## AMS AUTOMATED TRIP TESTING



### Transmitter Field Test

- A technician loads transmitter calibration routes onto a field calibrator
- A technician goes to the field transmitter and does the automatic transmitter calibration
- Calibration route test data is stored in the AMS for the life of the instrument
- Data is transferred by manually uploading the calibrator data to the AMS

### Transmitter Simulation Test

- A technician using the AMS puts a transmitter into simulate mode (appropriate environments/passwords are required)
- The AMS with a custom SNAP-ON (QuickCheck) performs the automatic trip setpoint test (QuickStep) – this can also be done manually
- Test data is stored in the AMS for the life of the instrument

### Final Element Test

- Feedback is required from valves, pumps and other final elements to automate the test
- Data can be pulled from a DCS historian, AMS, safety system sequence of events or PI (time stamp resolution is an issue)

## BENEFITS

- Three times more instruments tested daily
- Reduced instrument tests (credit for a better live test of the instrument)
- Proof that the entire trip worked as designed
- Increased accuracy, consistency and repeatability of the trip testing
- Searchable digital documentation database
- Early detection of failed/failing trip instruments/valves

## AMS TEST ADVANTAGES

- One technician can do the test
- Reduced technician testing/calibration time spent in the field (reduced HSSE risk)
- Instruments can be monitored from a safe and controlled environment
- A digital time-stamped record of the transmitter initiating a trip and feedback confirming the trip (potential for millisecond accuracy)
- A test report can be generated automatically from the data
- An audit trail of the calibration/trip data exists

### A Plant Trip Is Actually a Benefit

- Plant trips can be used to claim credit for required initiator/final element trip tests
- To do this, the plant requires a method to cross-reference the process data against the trip setpoints and required trip actions
- The AMS and other process data sources do not have the built-in trip logical relationships to perform this cross-referencing
- The trip credit, if done, is typically done manually (time consuming, complex, multiple data sources, time stamp/resolution issues, cascaded trips, etc.)
- Using a trip credit tool or a database, custom queries can automate a trip credit to prove the trip occurred when it should and the proper actions resulted
- Test reports can be generated from the data exactly like doing the test itself
- The tool can be run immediately after a trip to confirm the cause of the trip and proper trip actions

### Automatic Trip Validation

- Can be used either on plant trip data or manually initiated trip tests
- All trip logical relationships (cause and effects) can be validated
- Valve failures can be identified before an outage to allow for proper planning for replacement equipment and hours
- Leading indications of potential valve failures
- Final element trip times can be analyzed to see if they meet process safety times
- While the plant is going into a planned shutdown, live data can be tracked to record final element trip times
- Issues can be identified prior to outage to allow proper planning for replacing/fixing issues
- The tool can be run immediately after a trip to ensure the performance of the plant/instrumentation

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### AMS Digital Documentation

- Test results are automatically recorded and digitally stored for audit trail
- Tool can be used to generate required upcoming tests
- Tests will be automatically documented with accurate times down to the millisecond
- Historical trip test data can be stored in a database for the life of the instrument
- Test documents can be restored, test intervals verified and test deficiencies documented