COMMUNICATION BETWEEN THE OFFICE AND FIELD

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Introduction

Organizations, now more than ever, are faced with challenges of doing more with less. Mergers, acquisitions and organic growth increase the measurement departments workload as it relates to ensuring an accurate and complete data set is provided month after month to accounting, marketing and operational departments and systems.

To achieve the monthly goals of complete and accurate field and office data it requires real time communication, effective anomaly detection and robust processes and tools to accommodate the required tasks of reviewing data points that number in the millions. This paper highlights the efficiencies achievable through adopting modern, electronic, and integrated systems in both central offices and the field, ensuring compliance with industry standards, all while reducing prior period adjustments and delivering confidence in your measurement results.

Components from Field to Office

When talking about measurement data, it encompasses a large scale of different devices, methods of data transfer and data sets requiring interrogation for completeness and accuracy. This topic focuses mainly on the benefits of modern integrated systems and how that can help address components of the field activities, related data and central office data sets.

Field Devices

- Meters and Instrumentation
- Recording Devices
- Storage: Tanks, cylinders, and caverns
- Transportation: Pipe, truck, and rail

Field Activities and Related Data

- Samples from laboratories or online gas chromatographs
- Tickets
- Proves
- Calibrations

Central Office Data Sets

- Characteristics
- Volume, Mass, Energy
- Samples: Components, heating values, etc.
- Calibration Data

- Flowing Parameters: Pressure, temperature, etc.
- Proving Data
- Events and Alarms

Data Management Challenges

Beyond the vast sources of measurement data is the scale of the data points requiring validation.

- Hourly level resolution across a few data points such as volume, energy, pressure and temperature for a couple thousand meters quickly grows to over 5 million data points to review a month
- Adding in online gas chromatographs reviewing key components, total mol percentage and heating values for dozens of meters continue to increase the amount of data to validate

Manual processes no longer are feasible when dealing with hourly level information with a focus on reduced error and prior period adjustment elimination.

Error Impact

Unaddressed measurement error as a result of meter instrumentation issues, incorrect configuration or inaccurate meter factors can have a drastic financial impact. This is amplified when all errors trend in the same direction.

Our example of a company with 2000 meters measuring 2,050,000 MCF and 75,000 bbls per day leads to mismeasurement of 54,150 MCF and 1,770 bbls per month resulting in a financial impact of $304,000 per month. This example applies roughly a .09% error across different common challenges related that can be mitigated through calibration, proving and configuration validation.

While not all errors trend the same direction, this case illustrates that small errors in just 20 out of 2000 meters can have significant financial impact.

Eliminating Errors

With the challenges known and the impact of not having processes or tools in place to address common errors, what can be done to identify and correct common these issues? These are some commonly seen approaches and the challenges that remain with each of them.

Measurement Validation Process and Tool Options

1) Manual process implemented to take ticket, proving, calibration and laboratory data and input into the central office system while allowing transactional quantities and qualities to flow in without validation from SCADA.

   Implications

   - Resource Costs: Consolidating disparate manual sources
   - Process Bottlenecks: Slowing down the accounting process
   - Human Error: Data entry and review mistakes
   - Measurement Errors: Lack of timely detection

2) In addition to option 1, consolidate transactional data to a digestible level such as daily and implement manual review for anomaly detection ahead of quantities and qualities entering the central office system

   Implications

   - Resource Costs: Consolidating disparate manual sources

- Additional Costs: Validating daily level data
- Process Bottlenecks: Slowing down the accounting process
- Human Error: Data entry and review mistakes
- Compliance: Challenges meeting industry and/or regulatory expectations on the audit trail

3) Implementing software solutions in the field and central office to automate manual processes and incorporate validation of data at time of entry.

Benefits

- Reduced resource costs
- Near real time flow of information and anomaly detection
- High confidence in accuracy and completeness of data
- Industry and regulatory compliance through use of systems designed for this purpose

Integrated Central Office and Field Systems

Incorporating integrated field and office measurement system will increase operational efficiency that reduces data management complexity through automation. Key functionality offered through systems include:

Central Measurement System Processes

- Validations
- Regulatory Compliance
- Editing
- Quality Management
- System Balancing
- Monthly Close
- Reporting
- Field/Office Integration

Field Application Processes

- Device Management
- Regulatory Compliance
- Scheduling of Field Tasks
- Verification and Calibration
- Proving
- Calculators
- Reporting

- Field/Office Integration

Conclusion

Modern, integrated measurement systems enhance operational efficiency, reduce data management complexity, and ensure compliance with industry standards. By automating validation processes and providing robust audit trails, these systems help organizations achieve accurate and reliable measurement data.