

TRAINING OF OFFICE MEASUREMENT PERSONNEL

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INTRODUCTION

Effective office training is a crucial part of a company's accuracy and accountability. Volumes are relative to every purchase and sale of gas, directly or indirectly. The money and time spent for accuracy of the primary elements is just the beginning and can all be forgotten if the information in the measurement office is reported inaccurately.

As companies continue to downsize and computer software becomes more efficient, the measurement analysts duties are becoming incorporated into these software applications. Measurement software systems provide tools to validate and process much of the measurement information for them. These systems help decrease the companies overall labor requirements, increase work loads, more consistently detect discrepancies, and decrease human error. However, there is still the need for a comprehensive understanding of the fundamentals of gas measurement.

Entry level personnel usually have little or no understanding of how to calculate, allocate or nominate gas volumes. Experienced personnel will need to learn the nomenclatures of the company. The trainer will need to evaluate each individual and begin training based on their knowledge and individual personality.

REQUIREMENTS OF NEW EMPLOYEES

Learning how to integrate charts, interpret meter service reports, and edit electronic data is unique to measurement and is learned primarily through experience and on the job training. It is imperative that the employee have a basic understanding of math, science, and computers.

Whether training to integrate charts or edit electronic measurement data, basic computer skills are essential. If at all possible it is best that there be a prerequisite for a new employee to have a basic knowledge of computers. Employees that have this understanding will not take up crucial training time learning how to manipulate e-mail, create file folders or simply maneuver from one screen in a program to another.

A new employee must understand that deadlines are serious. Practically all measurement offices are driven by a monthly business cycle. Efficient processes are set in place to help meet these deadlines and must be followed.

No job is too small. In an office measurement department job duties can range from filing and collating paper work, to integrating or editing electronic meter data. As the new employee learns and establishes more job duties they must understand that all processes are important, no matter how monotonous.

EFFECTIVE TRAINING

One of the first jobs for the trainer is to find out as much about the new employee's work history as possible. Training should always be relative to what the trainee already knows and what the expectations will be to accomplish assigned tasks. In the beginning, the trainer will need to be a supervisor employee that fully understands the work flow and is able to explain why a task is relevant. The trainer should be a good communicator, patient, and encourage questions. No question is too small and note taking should be required. Provide instructions, manuals, policies and procedures, and screen prints for assistance.

The goal is for the employee to learn from the beginning to the end. Start with small amounts of work at a time. If at all possible it is best to set up entry levels for training employees. The employee at a beginning entry level is able to learn a portion of measurement at a time and not feel overwhelmed processing a desk from the beginning. Small tasks such as learning chart filing, censoring of meter inspection reports and organizing paper work for other analyst can teach fundamentals of individual fields, well names, station numbers, company names and numbers, and department nomenclature. This lays the grounds for more difficult processes made easier by an understanding of names and numbers.

CHART TRAINING

An excellent place to begin is censoring of orifice meter charts. When censoring charts you learn about on and off dates and times, meter parameters, and the relationship between differential, pressure, temperature, and flow time, clock rotations and the differences between 24 hour, 7 day, 16 day, and 31day clock cycles. The trainee should learn about range springs and temperature elements. The trainee would learn to interpret the notes on the charts that help the operator in the integration process. Acronyms written on charts for integrator operators will actually have a meaning. ZBK no longer

looks like a persons initials but actually mean 'zero between kicks'. Are the recorded variables on the chart accurate, or is there a problem with the meter? Censoring of charts can easily lead into training for chart integration or censoring of test reports.

Learning to integrate can be exciting and challenging. New integrators need to learn by first integrating test patterns with a slow progression to easier flow patterns and then kicks. Trainees need to understand that there is more to this than staying on the lines. The importance of integrator calibration, checking of stops, and maintenance must be learned. Appropriate integrator equipment and configuration must be learned for Barton, Foxboro, and other pen sets, as well as inverted charts, vacuum charts, dual speed clocks, and any other special situations required by the company. The new employee will learn about flow patterns on the charts. They should be taught why a pattern is integrated at the top, bottom or lower third of a band. They must learn and no how to determine if gas is flowing during a plate inspection. Integration is one of the most important functions of a chart department but sometimes treated as one of the mundane and least favorite task to do. The trainer must stress the importance of this task and express appreciation of a good integrator operator and a job well done.

Once the charts have been censored and integrated it is pertinent that the trainee understand how important it is to conduct a final review . The trainer will need to show how to review the statement and the charts to verify the differential, static pressure, temperature, and flow time for accuracy. This is also where they will learn to look for consistency of flow patterns, charts labeled incorrectly, and for high or low zeros that where missed. Plates, tubes, meter ranges, and clock cycles should be checked again. Once the trainee has reviewed the above with the trainer they should be left to try this task on their own, however; the trainer should still double check the work until he or she feels comfortable with the employee's progress.

ELECTRONIC MEASUREMENT

Although there a several programs out on the market to increase efficiencies in validating and editing of electronic measurement data, it is still important for personnel to understand measurement and be able to verify when the application is working correctly and identify when it is not. A program may flag values that it identified as errors to be corrected, but do employees know why and how to fix them?

Trainees need to be taught about the configuration of the meter. When a meter is first configured, why is it setup with the values the technician entered? The trainer will need to teach about atmospheric pressure and pressure base, zero cut-offs and how does this cut-off effect the volumes. Is the tube size the MIC tube size or the size

stamped on the meter? The test report or installation report needs to be compared to the configuration for accuracy. There is a lot of information when the meter is configured and because data entry errors can occur, the trainee needs to have knowledge to be able to identify them.

Audit trails are another important element that should not be ignored and should be utilized when training office personnel. The trainer will need to explain how test reports and audit trail data should match. It should be explained that audit trails indicate everything that has been changed on the meter in the field. A plate change could be indicated on the test report, but not show up in the audit trail? The trainee will need to understand the relationship between the test report, the measurement editing software database, and the meter in the field. The trainee will need to understand how to interpret old and new values as stated in the audit trail that effect electronic measurement volumes.

Alarms are equally important in electronic meters. The trainee must understand what alarms are, how to identify them, and how they might effect measurement. The trainee should learn the significance of low flow cut-offs, low battery alarms, and line segments for example. When viewing the hourly or daily volumetric data, these alarms are significant in detecting errors. The trainer will want to inform the trainee of the significance of the alarms when viewing the daily or hourly data and how to utilize alarms for troubleshooting.

Learning how to decipher the accuracy or inaccuracy of data is another task for the trainee when viewing daily and hourly data. There are many elements that can affect the data, such as meter freeze, false differential, and calibration errors are just a few. Problems with an online gas chromatograph will affect the calculated gas volume, but wouldn't affect the differential, pressure, or temperature. As with charts, the trainer will need to explain how to look for these errors and how to estimate if needed.

Once the trainee has learned to read electronic measurement alarms, audits, configurations and view daily and hourly volumetric data, he will then need to know how to bring all this information together at the end of the month and recalculate as necessary. Once recalculations are done, they will need to review the final volumes. As with chart recorders the trainer should review the final steps with the trainee until he or she feels comfortable reviewing on their own. However, the trainer should continue to monitor the work until a comfort level is achieved.

TEST REPORTS

Test reports or meter inspection reports should be explained in detail. The trainee must learn how to

determine if the meter name and meter number go together, if the test is for an orifice or turbine meter, if the information on the test report matches information in the flow computer or on the chart. These are just a few of the questions that need asking when censoring a test report. The trainer needs to explain the importance of calibrating a meter and what exactly goes into testing the meter. Why the technician puts comments on the bottom and how important it is to pay attention to the comments. If the trainer does not have field experience it is sometimes beneficial to have someone with field experience to go over test reports with new employees to receive a technician's view of how test reports are completed in the field and what information is significant.

Once a test report is censored and a calibration adjustment is found. Trainers need to explain contractual obligations for making corrections. 1% to 3% is typical for corrections made to volumes due to calibration errors.

GAS ANALYSIS

Although gas analyses from spot samples are usually validated at the laboratory, the trainees still will need to know the difference between a spot sample, composite sample, and online gas chromatograph. He or She will need to be trained as to how often a sample should be taken and why. Training to compare the history of a gas samples and understand why a change can be okay if the well has been re-completed or why a new well turned on can change a common point's analysis. In addition, what is the company's policy for applying new analysis?

SYSTEM IMBALANCE

Once an employee learns and becomes confident with censoring and integrating charts, reviewing electronic data, and checking final statements, they may be ready to take on more difficult task. Investigating system imbalances can teach employees much about gas measurement and they're particular business. Typically, this research will involve field operations, accounting, and measurement, and possible legal personnel. Depending on the specific business requirements, the trainee must learn about well head meters, fuel meters, check measurement, compressors, dehydrators, lift gas, and makeup gas and how they are measured and used for accounting purposes. It is good for the trainer to begin with simple examples and gradually introduce more complex systems. As imbalances are found and solved, trouble shooting skills are developed.

AUDITING

As described above with reviewing system imbalances, once an employee learns and becomes confident with chart integration and electronic meter processing, it may be time for the trainee to begin auditing tasks. By conducting a measurement audit, one must verify reported

gas volumes by reintegration of orifice charts, electronic data validation, parameter verification, and recalculation of volumes from the existing original information. These recalculated volumes are compared with the original volumes in order to establish accuracy. All that the employee has learned to process monthly data will be used to perform the measurement audit. This includes comparing meter configuration data, gas analysis, and meter test reports. The trainee will need to understand the difference between an actual check meter and sales check meter. In addition, the trainee will compare gas analysis and meter calibration reports. The trainer will begin showing the trainee new letter writing skills in order to request audit information and request adjustment.

TRAINING RESULTS

The ultimate goal in measurement training is to provide an employee with the necessary knowledge and tools to have a clear and confident understanding of the basic fundamentals of measurement. The measurement office personnel must be ready, capable, and willing to meet monthly closing deadlines, they must work as a team member, must be detailed oriented, and be highly self motivated. Remember that what works for one person does not always work for the next and the trainer will need to constantly take a step back and find creative ways to help the new employee grow. Working with more than one trainer can help as long as everyone's goals and understanding are the same. If possible, provide visuals and even field trips for the trainee to help them on their journey. Well trained employees will be able to adapt quickly to adverse situations, require less management intervention, and will continue to expand as an asset to the company. Poorly trained employees will not be able to handle varying challenges faced in the measurement office.

CONCLUSION

There is nothing more valuable in a measurement department than highly skilled employees that can pass their knowledge on to others. As they are applying these mentoring skills it becomes a refresher course for them. In the end, as said in the introduction, effective office training is a crucial part of a company's accuracy and accountability in reported gas volumes.



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