

## **PROGRAM FOR TRAINING A GAS MEASUREMENT TECHNICIAN**

Class # 8140.1

Jimmy Galyean  
Senior Project Specialist  
Atmos Energy Corporation  
1681 Corporate Drive  
McKinney, Texas USA

### **Introduction:**

Although the concept of having a program for training a Gas Measurement Technician is not new, the ever changing contour of the natural gas industry creates challenges for the companies involved, but even more so for the technician's who takes care of the measurement equipment out in the field. Technician's today must be able to retain technical expertise in order to support antiquated equipment while continuously expanding the knowledge required to install, operate and maintain advanced technologies. Since electronic equipment has become more sophisticated, in addition to being the equipment of choice, remaining proficient is an ongoing challenge. Technician's today not only have to install, operate and maintain measurement equipment but may also be responsible for other equipment such as regulation and control, odorization, gas quality, communications and in some cases facility maintenance. Even with these added responsibilities the expectations of having quality measurement, regardless of the equipment being used remains the same. Providing technician's the necessary training they need is extremely imperative.

### **Purpose:**

A comprehensive program for training a Gas Measurement Technician not only adds value to the technician's position but ultimately contributes to a company's bottom line. The time and money invested into a program that promotes and supports quality measurement can have tremendous results. When you think about it the impact of "bad" measurement does not stop at the measuring point. Typically multiple groups within a company may have to get involved to resolve or correct the errors resulting in unproductive use of time, energy and resources. When you include this additional administrative cost along with the potential revenue lost from the original measurement error then this one event compounds the losses. Consequently, earnings are negatively impacted. If measurement errors continue long enough, not only do we need to become concerned with lost profits but also the potential impact this may have with our customer's confidence in our ability to provide them with quality service. This may prove to be more detrimental to a corporation than the actual revenue lost from the measurement error alone.

### **Process:**

To have a successful training program there are several factors that should be considered when developing the structure of the program. To achieve optimum results a process may be required to identify and prioritize the areas that are considered essential. For instance, you may want to know:

- 1) Who needs the training? Should the training be for new employee's only or do you extend the training to seasoned employee's to help refresh their skill sets?
- 2) What areas need the most training? Should the training program focus on the most commonly used equipment, new technology or just problem areas?
- 3) Where will the training take place? Will a classroom setting be sufficient or would on-site training be more productive?
- 4) And finally, who will administer that training? Are there enough resources within the company to provide this training or would the use of an outside vendor be more practical?

Once these variables are determined a plan can be developed to custom fit your organizational needs.

### **Budget:**

Budgeting monies for extensive training programs can be taxing but targeting the areas that are most needed may prove to be more practical and cost effective and would at least be a good start in the right direction. Once we recognize that all training, whether collectively or individually, is an investment for everyone involved we may get to a point one day of having the philosophy that we can no longer afford not to provide training.

**Training Options:**

As mentioned above there are many options when it comes to providing training. Each method provides its own unique contribution and can be very valuable depending on the different learning styles that the students may have. One student may comprehend the information better by reading a manual where as the next one gets a better grasp by having a “hands-on” experience. Classroom training helps provide technician’s a better understanding of the equipment and any associated software while at the same time conveying the importance of company procedures, guidelines and safety regulations. “Hands-on” training provides the students the ability to physically see the function of said equipment. Whether it occurs in a classroom setting with “cut-away” examples or in a flow-lab application the simulation of the “real world” is valuable. When done properly, On-the-job (OJT) training is perhaps the most economical and most practical form of training because while a Technician is being educated their time is being spent accomplishing a task instead of being in the classroom. Although a great deal of knowledge can be gained from classroom activities nothing can replace the experience we receive when working on live equipment out in the elements. However, we must be cautious about depending exclusively on this form of training because the skills that may be being taught are based solely on the instructor’s knowledge, philosophy and techniques. Not all “subject matter experts” are good communicators. While these skills and techniques typically can produce results at the end of the day, they may or may not line up with company procedures and best practices.

**Vendor Training:**

When we find ourselves lacking the resources to effectively provide the desired training within the company, Vendor Training is another option. Vendors typically have their own training programs that can provide training for a specific piece of equipment or for an entire product line. Vendors generally have the facilities to provide this training at or in some cases they can come to the customer’s location. Vendor training can potentially be more costly upfront but usually provides more extensive training than one could get from an in-house training program. Most Vendors also provide different levels of training that may be tailored to fit educational and budgetary needs.

**Training Program Illustration:**

At Atmos Energy, management continues to recognize the necessity and the importance of training their technicians. Not only do they understand that technology continues to change but also recognize the value due to their support of the employee development program within the Measurement Technician organization. This program allows technician’s to promote to different levels through the successful demonstration of the skills and knowledge they have learned. The evaluation process involves a structured program of testing and demonstrating the abilities they have acquired. Several technician positions have been filled in the past years using this development program which validates the need to continue providing this valuable training. In most cases, employee turnover can have a negative impact on operations, but due to the training that was available for the new technicians there was very little concern about the impact on measurement.

Atmos Energy has utilized training facilities for several years but has recently opened a new state-of-the-art training facility in Plano, Texas. This facility contains seven classrooms that allow the students to gain knowledge through classroom activities and lectures, but also contains a 24,000 square foot flow-lab that allows the students to experience real world scenarios while working on various types of measurement and/ or related equipment.

**Training Center Courses:**

The following is a brief description of measurement courses offered to Atmos employees at our training facility:

**Gas Measurement 101**

Learning Objective- Students will gain knowledge in the operation and installation of various types of gas measurement equipment, fundamental gas laws and properties of how natural gas reacts to variations in pressure and temperature. They will gain knowledge in methodologies of odorant measurement, pressure regulation including regulation systems. Included are electrical/electronic fundamentals associated with series and parallel circuitry with emphasis on Ohm's Law and Watts Law. Hands-on exercises will enable the students to better understand regulators and setting up and troubleshooting electrical circuits.

**Gas Measurement 102**

Learning Objective- Students will gain knowledge in the operation, installation and maintenance of various types of gas pressure and/ or flow controllers. Catalytic heaters will be covered including a hands-on demonstration on how to light the heater. Odorization systems will be discussed with emphasis on the Y-Z Systems. Operation and

maintenance of the Y-Z Controllers and associated parts will be covered. Included in the course will be an advanced study of electronics, electrical systems as they apply to the technician's job function.

The following is a list of other training courses offered at our facility in addition to the measurement courses listed above:

Corrosion 101  
Corrosion 102  
Construction/Service 101  
Construction/Service 102  
Meter Reading  
Regulators and Relief Valves  
Flow Computers  
Gas Sampling – Quality Assurance  
Pneumatic/Electronic Controllers  
SCADA – RTU Operations  
Chromatography

#### Class Structure:

Each class is limited to a maximum of between eight and twelve students, depending on the particular course. This size group provides for better class participation and allows all students to operate the hands-on equipment being demonstrated. Classes are informal and students are encouraged to participate in class discussions, ask questions, and share helpful information dealing with problems they may have encountered on the job. This sharing of experience is a valuable training tool and an added benefit of bringing employee's together from different locations.

Occasionally, personnel from Engineering or other resources can be invited as guest instructors particularly when design is a consideration (such as measurement stations, which are governed by company standard drawings). Additionally, vendors are invited to participate in specific blocks of instruction when applicable. In many of the classes, students repair equipment that has failed in the field and analyze failure points.

At the end of each course, the students take a final exam to determine what they have learned. The final course grade is based on an average of the final exam, class participation, and hands-on participation (if applicable). A passing score should be pre-determined and adhered to. If a student does not successfully demonstrate proficiency in the course, the student's supervisor is notified and the employee may be scheduled to retake the course at a later date. The scores are recorded as a Complete/Incomplete and are entered into the company's employee Information System. Each student's records are maintained in the database for future reference and become their transcript.

#### Response to Training:

Feedback is very important to assess the direction of training and to make necessary changes. At the conclusion of each day's instruction, the students evaluate the instructor(s) on such items as communication ability, qualifications, course content and materials. They are encouraged to discuss the training with their supervisor once they return to their field location. The supervisor notifies the training committee if a change is requested. The committee takes all requests under advisement at their next scheduled meeting. A training team should always welcome suggestions and strive for excellence in our overall instructional skill and methodologies.

#### Atmos' guideline for OJT

- 1) Select the mentor/ coach via a defined selection process
- 2) Design an effective training program to:
  - Train this individual to be an effective mentor/ coach
  - Train the mentor/ coach to reinforce and extend job skills of established practices and procedures for error free delivery
- 3) Supervisors play a key pivotal role in the programs success
- 4) Maintain open communications at all times
- 5) Record keeping and status checks to track progress and accomplishments

**Conclusion:**

Even though perfect measurement may not be a reality due to equipment uncertainties, it is more attainable today than ever before due to the advanced technologies that are available. If we indeed want quality gas measurement then we must continually keep our focus on ways to improve it by being proactive. However, before we can expect to achieve quality measurement we must provide our technician's all the tools and resources available to help them achieve maximum performance while at the same time adding value to them personally and professionally. This in return will help support one's company financial goals. One last thought, if we strive for perfection we could potentially obtain quality measurement but if we are content with "good" or "OK" measurement then we may only be getting "mediocre" measurement.