

DOT QUALIFICATION TRAINING FOR MEASUREMENT AND CONTROL TECHNICIANS

Class # 8040.1

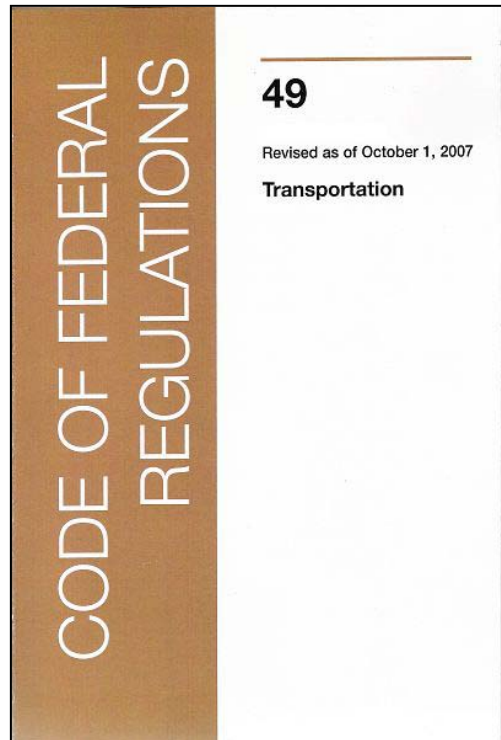
David Wofford[©]

Introduction

Measurement and control technicians must possess certain knowledge and skills in order to effectively and safely perform their required tasks. These knowledge and skill sets are obtained through education and experience. While these requirements are common to all personnel working within these areas of technical discipline, those performing safety sensitive functions on facilities regulated under the jurisdiction of the **United States Department of Transportation (US DOT)** are additionally required to be evaluated for these qualifications as defined within applicable regulation.

History

In 1992, the DOT acted on a congressional mandate to create an Operator Qualification (OQ) program. This is the program by which operators of facilities under the jurisdictional oversight of the **Pipeline and Hazardous**



Materials Safety Administration (PHMSA) and administered by the **Office of Pipeline Safety (OPS)** must ensure that personnel are qualified to perform covered tasks as outlined within the applicable regulations. The intent of the implementation of this requirement was to ensure a qualified workforce for the competent operations of safety sensitive facilities under the jurisdiction of the Department, as well as to reduce the probability and consequence of incidents due to errors caused by operators of such facilities. The individual state regulatory agencies charged with overseeing the safe operation of pipeline facilities under their jurisdiction recognize and enforce the applicability of the Operator Qualification program as well. Since initial inception, the program has evolved to its present state per Department hearings, public comment, industry input, workshops and the continuing development of protocols.

Title 49 of the Code of Federal Regulations, *Part 192 (Transportation of Natural and Other Gas by Pipeline), Subpart N (§192.801-809)* and *Part 195 (Transportation of Hazardous Liquids by Pipeline), Subpart G (§195.501-509)* address the requirements for **Qualification of Pipeline Personnel**. These requirements do not identify the specific training or skill sets that pipeline personnel must possess, but rather provide a descriptive set of criteria by which operators must identify

applicable covered tasks for which operations personnel must be qualified. Additionally, operating personnel must be trained and qualified in the ability to recognize and react to the occurrence of *Abnormal Operating Conditions*.

Operator Qualification Training Criteria

Each facility operator must define all of the *covered tasks* for which individuals are required to be trained and qualified. The criteria an activity must meet to be considered a *covered task*, or the *Four-Part Test*, are that the activity must:

- 1) Be performed on a pipeline facility;

- 2) Be an operations or maintenance activity;
- 3) Be performed as a requirement of either Part 192 or 195 as applicable; and
- 4) Affect the operation or integrity of the pipeline.

Additionally, the individual must be trained and qualified in the recognition of and reaction to *Abnormal Operating Conditions*, defined as a condition identified by the operator that may indicate a malfunction of a component or deviation from the normal operations that may:

- a) Indicate a condition exceeding design limits; or
- b) Result in a hazard(s) to persons, property, or the environment.

The individual's ability to perform a defined *covered task* must be determined by an evaluation process as established and documented by the operator, and may include;

- a) Written examinations;
- b) Oral examinations;
- c) Work performance history review;¹
- d) Observation during;²
 1. Performance on the job,
 2. On the job training, or
 3. Simulations;
- e) Other forms of assessment

An individual is considered *Qualified* when such has been evaluated and can:

- a) Perform assigned covered tasks; and
- b) Recognize and react to *Abnormal Operating Conditions*.

Training for measurement and control technicians that is directed toward the satisfaction of US DOT mandates must be specifically designed and administered mindful of these criteria and qualification requirements.

Determining a "Covered Task" Training Requirement

Now that we know the criteria for determining whether a task is covered under the US DOT regulations for the need to be performed by a *Qualified* individual, we can evaluate tasks and subsequently determine if such requires specific OQ related training and evaluation. Let's take the example of the performance of a typical secondary measurement system inspection and calibration at an orifice metering facility on a jurisdictional gas transmission pipeline.

In and of itself, the primary intent of performing an inspection and subsequent calibration (if necessary) of secondary measurement devices (pressure and temperature transmitters, for example) is to ensure that measurement and sensing elements are performing within specified levels of uncertainty in order that fluid flow rates are calculated within acceptable levels of accuracy.

When the inspection and calibration of the pressure and temperature transmitters for the assurance of flow rate calculation accuracy are applied to the *Four-Part Test*:

¹ Per §192.809(c) and §195.509(c) Work performance history review may be used as a sole evaluation method for individuals who were performing a covered task prior to October 26, 1999, and §192.809(d) and §195.509(d) After October 28, 2002, work performance history may not be used as a sole evaluation method.

² Per §192.809(e) and §195.509(e) After December 16, 2004, observation of on-the-job performance may not be used as the sole method of evaluation.

- 1) Be performed on a pipeline facility;
 - a. *Yes – the activity is performed on a jurisdictional pipeline facility*
- 2) Be an operations or maintenance activity;
 - a. *Yes – the activity is a typical operations and maintenance activity performed on a pipeline facility*
- 3) Be performed as a requirement of either Part 192 or 195 as applicable; and
 - a. *No – flow rate calculation accuracy is not a specified requirement of Part 192; and*
- 4) Affect the operation or integrity of the pipeline.
 - a. *No – the operation or integrity of the pipeline system is not generally dependent upon flow rate calculation accuracy.*

Per the *Four-Part Test* evaluation, this does not meet the criteria for a covered task and therefore does not require a *Qualified* individual to perform such. However, let's look at this task in a different perspective.

Operators must monitor the pressure of pipeline systems to ensure that such do not exceed established maximum allowable limits. This requires that devices be employed to constantly sense the pipeline pressure (pressure transmitters). Additionally, devices must be in place to enable the operator to prevent the occurrence of excess pressure, relieve excess pressure and isolate pipeline segments in order to minimize and control pressure releases.

Measurement and control systems employed today are utilized for many functions other than flow rate calculation. These systems also provide control functionality, communications and interfaces with peripheral devices. Let us assume that the secondary components that we were inspecting and calibrating previously are also sensing devices that overpressure protection control systems rely upon for operational and integrity assurance and control on the pipeline system.



When applied to the *Four-Part Test* with consideration of the auxiliary functions that the pressure transmitters serve:

- 1) Be performed on a pipeline facility;
 - a. *Yes – the activity is performed on a jurisdictional pipeline facility*
- 2) Be an operations or maintenance activity;
 - a. *Yes – the activity is a typical operations and maintenance activity performed on a pipeline facility*
- 3) Be performed as a requirement of either Part 192 or 195 as applicable; and
 - a. *Yes – inspection of pressure sensing and control elements for overpressure protection are a specified requirement of Part 192; and*
- 4) Affect the operation or integrity of the pipeline.
 - a. *Yes – the operation or integrity of the pipeline system is dependent upon the satisfactory performance of the pressure transmitter in this application.*

The same task as previously determined to not be covered under the OQ requirements is now required to have a trained, *Qualified* individual for the performance of such due to the specific integrated application of the devices.

This example indicates that operators must evaluate tasks very thoroughly in order to ensure that such are properly performed by *Qualified* personnel who have been properly trained and evaluated. This is just one example of a routine task that must be closely evaluated when developing a covered task list.

New PHMSA Requirements

Effective February 1, 2010, PHMSA amended the Federal pipeline safety regulations to address issues related to **Control Room Management**. The amendment additions are found within 49 CFR 192 (§192.631) and 49 CFR 195 (§195.446) along with several additional definitions and requirements added to existing subsections relating to procedural manuals and emergency plans. The new rules primarily address requirements for the training,



performance and management of human factors related to individuals functioning as controllers per the use of Supervisory Control and Data Acquisition (SCADA) systems to control all or part of a pipeline facility. Operators must develop specific procedures for Control Room Management by August 1, 2011 and implement the procedures by February 1, 2012.

One may ask, “Why does this new rule have relevance to the regulatory training and qualification requirements of measurement and control technicians?” As indicated in the previous example of determining a *Covered Task*, today’s measurement, control and communications systems are highly integrated. Therefore,

the measurement and control technician that is performing installation, configuration, operations and maintenance activities on devices in the field has direct affect on the ability of the controller to perform reliable pipeline control functions via SCADA. Additionally, 49 CFR §192.631(c)(2) and §195.446(c)(2) stipulate that the operator will;

Conduct a point-to-point verification between SCADA displays and related field equipment when field equipment is added or moved and when other changes that affect pipeline safety are made to field equipment or SCADA displays;

Another stipulation of this new rule is found in 49 CFR §192.631(f)(2) and §195.446(f)(2) relative to change management, operators must;

Require its field personnel to contact the control room when emergency conditions exist and when making field changes that affect control room operations;

These new rules as promulgated by the US DOT will require that measurement and control technicians are included within the training and qualification facets of those areas which their performance of tasks will affect the control management function.

Other Training Requirements

Hazardous Materials Transportation

Measurement and control technicians are often required to collect and transport samples of hazardous gases and liquids for subsequent testing and compositional analysis. The transportation of these materials also is under the jurisdiction of the US DOT. Depending upon the composition and classification of the product under transport, certain requirements must be met regarding containment, labeling, storage, overpressure protection and emergency notification. Title 49 CFR Parts 171 through 178 provide regulations and specifications for the handling, containment and shipment of materials commonly handled by measurement and control technicians. It is important that all personnel charged with the transportation of hazardous materials are properly trained and equipped.



Drug and Alcohol Testing Regulations

All personnel that perform safety sensitive functions on facilities jurisdictional to the US DOT are subject to the Drug and Alcohol testing requirements as defined within Title 49 CFR Part 199 and incorporated by reference into parts 192 and 195. Additionally, state regulatory agencies that oversee pipeline facilities within their jurisdiction also require operators to administer anti drug and alcohol programs. Operators must train personnel in the facets of the program, as well as train supervisory personnel in the recognition of drug and alcohol related behaviors and issues per reasonable suspicion.

Conclusion

Operators of pipeline facilities under the jurisdictional oversight of the US DOT and individual state regulatory agencies are required to ensure that personnel performing safety sensitive functions are trained and qualified. Operator Qualification of personnel is a primary requirement for operating companies to continuously administer in order to ensure a competent and safe workforce, as well remain compliant with regulations. Operators must also administer appropriate hazardous materials and anti drug and alcohol testing programs for safety sensitive personnel.

References

Washington, D.C., National Archives and Records Administration, Title 49, Code of Federal Regulations, Parts 172, 178, 191, 192, 195, 199

[∞] David Wofford Atlas Pipeline Tulsa, Oklahoma woffy3@aol.com