AGA Guidelines for Oversight of Construction for Transmission Pipelines, Distribution Mains and Services

The purpose of this document is to provide information and guidance for operators to consider to further improve construction quality on both new and fully replaced transmission pipelines, distribution mains and services. The document was developed in support of AGA’s Commitment to Enhancing Safety, issued in May 2012. (http://www.aga.org/our-issues/safety/Documents/AGA%20Commit%20Enhance%20Safety_FINAL.pdf) Through that document, AGA member companies committed to reviewing established oversight activities associated with pipeline construction in order to further enhance the quality of construction.

One way to further improve construction quality may be by providing appropriate risk-based oversight of both company and contract personnel performing construction activities. This will help provide confidence that the final installation will be in conformance with applicable state and federal regulations and with the operator’s construction policies, practices and procedures. It may also help utilities meet their goal of providing safe and reliable delivery of natural gas to the communities and customers that they serve.

This document will not provide a prescribed method for operators, but rather a list of considerations to explore when evaluating a construction oversight program.

A) Background

i) Existing regulations
49 CFR, Part 192 prescribes the minimum safety requirements for pipeline facilities and the transportation of gas and generally addresses the design, construction, operations and maintenance of natural gas pipelines and related facilities. §192.13 requires that no person may operate a segment of pipeline unless “(a)(1) The pipeline has been designed, installed, constructed, initially inspected, and initially tested in accordance with this part.” One of the critical elements for quality construction is verifying the pipeline is installed in accordance with pipeline safety regulations and the operator’s own design specifications, policies, and procedures. A pipeline built in this manner increases the probability of it providing safe and reliable service.

Subpart G prescribes the minimum requirements for constructing transmission pipelines and distribution mains.

§192.303 Compliance with specifications or standards requires that:
“Each transmission line or main must be constructed in accordance with comprehensive written specifications or standards that are consistent with this part.”

One example of a code section with associated industry guidelines related to the oversight of construction for new and fully replaced transmission pipelines and distribution mains is:
192.305 Inspection: General

“Each transmission line or main must be inspected to ensure that it is constructed in accordance with this part.”

The guide material contained in the Gas Piping Technology Committee (GPTC) Guide for Gas Transmission and Distribution Piping Systems for §192.305 suggests that operators may consider the following: “(a) Each operator should provide inspection by personnel who are knowledgeable by training or experience. Inspection should ensure that all work conforms to the operator’s specifications and to the applicable federal, state, and local requirements. The inspector should have the authority to order the repair or the removal and replacement of any component that fails to meet the above requirements. (b) The operator should assemble and retain all necessary records.”

Other examples of applicable requirements under federal code include:

- **192.307 Inspection of materials.** “Each length of pipe and each other component must be visually inspected to ensure that it has not sustained any visually determinable damage that could impair its serviceability.”

- **192.319 Installation of pipe in a ditch.** “(b) When a ditch for a transmission line or main is backfilled, it must be backfilled in a manner that:
  1. Provides firm support under the pipe; and
  2. Prevents damage to the pipe and pipe coating from equipment or from the backfill material.”

- **192.325 Underground clearance.** “(a) Each transmission line must be installed with at least 12 inches of clearance from any other underground structure not associated with the transmission line. (b) Each main must be installed with enough clearance from any other underground structure to allow proper maintenance and to protect against damage that might result from proximity to other structures. (c) In addition, each plastic transmission line or main must be installed with sufficient clearance, or must be insulated, from any source of heat so as to prevent the heat from impairing the serviceability of the pipe.”

- **192.327 Cover.** “This section defines the requirements for cover for transmission lines as a function of class location and soil conditions and also dictates the depth of cover for distribution mains.”

In addition, Subpart H includes the minimum requirements for installing distribution service lines. §192.361 Service lines: Installation prescribes the requirements for service line installations relative to “(a) Depth, (b) Support and backfill, (d) Protection against piping strain and external loading” and other issues to ensure a safe installation.
ii) Regulatory Considerations

The Pipeline and Hazardous Materials Safety Administration (PHMSA) and the National Association of Pipeline Safety Representatives (NAPSR) have informally expressed concerns that new transmission pipelines and distribution lines are being installed without an adequate level of oversight. The oversight would provide added confidence that the constructed pipeline complies with the requirements of Part 192, applicable state regulations and the individual operator’s own policies and procedures. The issue has been discussed at workshops in 2009 (Technical Pipeline Safety Steering Committee (TPSSC) meeting December, 2009) and 2010 (PHMSA/ NAPSR Distribution Construction Workshop conducted April 20, 2010).

On November 29, 2011 PHMSA issued a Notice of Proposed Rulemaking (NOPR) “Pipeline Safety: Miscellaneous Changes to Pipeline Safety Regulations”. The rulemaking proposed to make miscellaneous changes to the pipeline safety regulations that were anticipated to be relatively minor in nature. One of the changes proposed in the NPRM was to modify the requirements contained in Section 192.305 Inspection: General to address the concerns expressed by state and federal regulators. NAPSR had proposed that the current regulation should be revised to require a greater degree of independence; specifically, that contractors who install a transmission line or main should be prohibited from inspecting their own work for compliance purposes. Based on the July 11, 2012 TPSSC meeting, the additional language which AGA anticipates seeing in the final rule for §192.305 is underlined below:

192.305 Inspection: General. Each transmission line and main must be inspected to ensure that it is constructed in accordance with this part. No operator shall use an individual to perform a required inspection if that individual performed the construction task requiring inspection. Nothing in this section prohibits the operator from inspecting construction activities with operator personnel who are involved in the construction activities.

iii) AGA’s Commitment to Enhancing Safety - Construction Quality

In AGA’s Commitment to Enhancing Safety, AGA and its members have committed to;

Review established oversight procedures associated with pipeline construction to ensure adequacy and confirm that operator construction practices and procedures are followed.

Specific to the quality of new construction, AGA member companies have committed to the following actions:

“Review and revise as necessary established construction procedures to provide for appropriate (risk based) oversight of contractor installed pipeline facilities.” (Transmission 12/31/12, Distribution 12/31/13)

http://www.phmsa.dot.gov/portal/site/PHMSA/menuitem.ebdc7a8a7e39f2e55cf2031050248a0c/?vgnextoid=7568bd1a04a08310VgnVCM1000001ecb7898RCRD&vgnextchannel=f351d95c4d037110VgnVCM1000009ed07898RCRD&vgnextfmt=print
April 2013

“Extend Operator Qualification Program to include tasks related to new main & service line construction.” (6/30/13)

“Implement applicable portions of AGA’s technical guidance documents re: Oversight of new construction tasks to ensure quality.” (Within one year of AGA Guidance)

B) Key Elements of a Construction Oversight Program

The operator has the ultimate responsibility and accountability for the quality of construction of transmission pipelines, distribution mains and services they install. It is in the best interest of the operator to establish confidence that their completed installation of these facilities meets applicable state and federal codes, the operator’s design specifications, standards, policies and procedures. There are three generally accepted essential elements to a construction oversight program, which may include the following:

(1) **Pre-Installation Oversight**
   - Ensuring trained and qualified utility employees and contractor personnel are performing work. Training of construction personnel is critical to success.
   - Ensuring training and qualification of oversight personnel.
   - Ensuring that updated policies, procedures, maps, project information, etc. are communicated and distributed to appropriate personnel.
   - Determining activity specific sampling requirements. (type of sample, frequency, total sample size, who will perform sampling)

(2) **Installation Oversight**
   - Company crews- Qualified company personnel have responsibility for the successful completion of construction, including oversight of construction quality.
   - Contractor crews- Qualified company personnel or qualified contract personnel not involved in the construction task requiring inspection should have responsibility for the oversight of construction.
   - Conduct appropriate risk-based oversight of issues and tasks as necessary to improve confidence in the quality of construction. (see section D titled “Examples of Issues and Tasks That May Be Reviewed During Construction Oversight”)

(3) **Post-installation Oversight**
   - Post- installation excavations- For work that was not subjected to direct observation during construction, an operator may consider risk-based post installation excavations as another method to improve confidence that the pipeline construction was performed in accordance with appropriate company policies and procedures.
   - For cause investigation- Excavations conducted of post-construction leaks, failures or incidents. This may initiate additional inspections to determine if a construction issue is isolated or more systemic in nature. This may also prompt additional excavations at locations where individuals or crews involved in leaks, failures or incidents previously performed construction. This action may support an operator’s obligation contained in
§192.617 Investigation of Failures regarding “…minimizing the possibility of a recurrence.”

C) Oversight of Construction for Transmission Pipelines, Distribution Mains and Services Using Risk Based, Representative Sampling

There is a considerable range in complexity associated with different types of construction, ranging from transmission pipelines on one end of the spectrum to distribution services at the other end of the spectrum. For example, the construction of a large diameter, long line transmission pipeline may involve the use of one or more contractors, multiple construction crews and locations, a large number of personnel with diverse knowledge, skills and abilities, and a broad range of new construction tasks. Conversely, the installation of a single distribution service line is a less complex construction activity and typically involves a single two or three person crew with fewer tasks. Whether the construction involves a transmission pipeline or a distribution service line, it is important that the final product is constructed with a high level of quality and in accordance with applicable pipeline safety regulations and the operator’s own standards and specifications.

The amount of oversight required for a specific construction project may be risk-based and contingent on a number of factors, including, but not limited to:

- Complexity of project (Transmission main, distribution main or service)
- Size/length of project (diameter and/or miles)
- Number of construction personnel
- Number of construction locations (spreads)
- Complexity of construction tasks
- Is the project new construction or reconstruction?
- Is the work being performed by company or contractor personnel?
- Experience level of personnel
- Are the tasks performed frequently or infrequently (e.g. daily vs. annually)?
- Results of previous oversight evaluations of construction personnel
- Underground clearance from other utilities and structures
- Other factors

Based on an assessment of these factors, an operator may determine an appropriate level of oversight for a given type of construction project and construction personnel involved. For example, the installation of a new distribution service line is a less complex construction activity performed by a crew multiple times each day using a relatively limited number of tasks. Therefore, an appropriate level of oversight for distribution services installed by an experienced company crew might be one random construction visit conducted periodically. By contrast, for more complex construction of a 100 mile long interstate transmission pipeline using multiple contractors, with personnel distributed over multiple locations (spreads), it may be prudent to assign a qualified individual or individuals to oversee each of the construction spreads on a fulltime basis.
D) Examples of Issues and Tasks That May Be Reviewed Under a Construction Oversight Program

- Qualification of personnel performing tasks
- Appropriate construction drawing for project on worksite
- Appropriate, current procedures for tasks being performed available at worksite
- Oversight personnel with appropriate knowledge and / or skills for tasks performed
- Qualified welders with qualified weld procedures for work being performed. Appropriate documentation available on site
- Weld inspection- visual and NDT, as necessary
- Plastic joints made by qualified plastic fusion personnel in accordance with written procedures that are available on site.
- Material quality (steel) - Verify that material meets the specifications for the installation. Verify that material is free from physical defects.
- Adequate coating thickness and quality. Adequacy of jeeping procedure
- Material quality (plastic) – verify that material meets the specifications for the installation, including the date of manufacture. Verify that material is free from physical defects.
- Verify that applicable “call before you dig” requirements are being followed.
- Adequate clearance from other utilities and/ or underground structures
- Ditch preparation and installation- proper ditch depth, bedding and backfill material that is not injurious to the pipe or coating. Adequate support of pipe during backfill process. Adequate depth of cover.
- Post construction pressure testing – Clearly defined procedures for post construction pressure test, appropriate test equipment (calibrated test gages, etc.), dewatering and drying (if appropriate) and purging
- Clearly defined and appropriate tie-in procedures
- Verification of appropriate installation of plastic pipe locating methodologies, per company standards
- As-built records documenting the construction installation and testing of the new facility, completed and submitted to corporate records in a timely manner, as prescribed by the operator’s policy and procedures manual.

E) Conclusion

For natural gas operators, safety involves reviewing the quality of construction for transmission pipelines, distribution mains and service installed to provide natural gas service to their customers. Operators have a number of programs that provide confidence relative to the quality and documentation of the final pipeline installation; including operator qualification (OQ) programs, material and equipment specification and approval programs, and construction oversight programs. These programs integrate quality into the pipeline construction process.

Operators may review their current construction oversight procedures based on the guidance contained in this document and consider the proper use of risk-based sampling programs to
April 2013

provide the appropriate level of oversight for new and fully replaced pipeline construction activities to further improve confidence regarding the quality of the completed pipeline infrastructure.
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