Operations and Maintenance Procedures for Natural Gas Systems

The Arizona Administrative Code

- **Title 14** - Public Service Corporations; Corporations and Associations; Securities Regulation
- **Chapter 5** - Arizona Corporation Commission – Transportation, Supplement 16-4
- **Sections** - Parts, Exhibits, Tables or Appendices modified **R14-5-202 through R14-5-205, R14-5-207**

Part 192 General Requirements

- §192.1 Scope
  - This part prescribes minimum safety requirements for pipeline facilities and the transportation of gas including facilities within the limits of the outer continental shelf.
  - This part **does not** apply to:
    - Offshore gathering of gas in State waters.
    - Pipelines on the Outer Continental Shelf (OCS) that are producer-operated and cross into State waters.

Part 192 General Requirements

- §192.11 Petroleum gas systems.
  - Each plant that supplies petroleum gas by pipeline to a natural gas distribution system must meet the requirements of this part and ANSI/NFPA 58 and 59.
  - Each pipeline system subject to this part that transports petroleum gas or petroleum gas/air mixtures must meet the requirements of this part and of ANSI/NFPA 58 and 59.
  - In the event of a conflict between this part and ANSI/NFPA 58 and 59, ANSI/NFPA 58 and 59 prevail.

Part 192 General Requirements

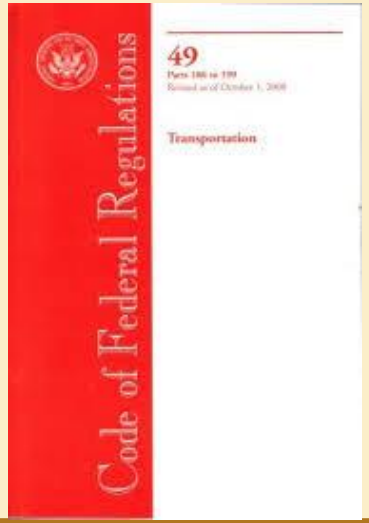
- §192.1 Scope (Cont.)
  - This part **does not** apply to onshore gathering of gas:
    - Through a pipeline that operates at less than 0 psig.
    - Through a pipeline that is not a regulated onshore gathering line (as determined in §192.8).
    - Within inlets of the Gulf of Mexico, except for the requirements in § 192.612.

Part 192 General Requirements

- §192.1 Scope (Cont.)
  - Any pipeline system that transports only petroleum gas or petroleum gas/air mixtures to:
    - Fewer than 10 customers, if no portion of the system is located in a public place.
    - A single customer, if the system is located entirely on the customer's premises (no matter if a portion of the system is located in a public place).

Part 192 General Requirements

- §192.13 (c) General Requirements:
  - Each operator shall maintain, modify as appropriate, and follow the plans, procedures, and programs they are required to establish under this part.



Part 192 General Requirements

- §192.603 General provisions:
  - Pipelines must be operated in accordance with this subpart.
  - Operators shall keep records necessary to administer the procedures established under §192.605.
  - The Administrator of PHMSA or the State Agency with a current certification under the pipeline safety laws, may require the operator to amend its plans and procedures as necessary to provide a reasonable level of safety.

§192.605 O&M Procedures

- §192.605 Procedural manual for operations, maintenance, and emergencies.
- Each operator shall prepare and follow for each pipeline:
  - A manual of written procedures for conducting operations and maintenance activities and for emergency response.
  - Transmission line operators must also include procedures for handling abnormal operations.

§192.605 O&M Procedures

- The manual must be reviewed and updated by the operator at intervals not exceeding 15 months, but at least one each calendar year.
- The manual must be prepared **before** operations of a pipeline system commence.
- Appropriate parts of the manual must be kept at locations where operations and maintenance activities are conducted.

Operations and Maintenance

- The manual must include procedures for the following, if applicable, to provide safety during maintenance and operations:
  - Operating, maintaining, and repairing the pipeline in accordance with each of the requirements of this subpart and Subpart M.
  - Controlling corrosion in accordance with the O&M requirements of Subpart I.

Operations and Maintenance

- Making construction records, maps, and operating history available to appropriate operating personnel.
- Gathering of data needed for reporting incidents under Part 191 in a timely and effective manner.
- Starting up and shutting down any part of the pipeline in a manner designed to assure operation within the MAOP limits, plus the build-up allowed for operation of pressure-limiting and control devices.

Operations and Maintenance

- Maintaining compressor stations, including provisions for isolating units or sections of pipe and for purging before returning to service.
- Starting, operating, and shutting down gas compressor units.
- Periodically reviewing the work done by operator personnel to determine the effectiveness and adequacy of the procedures, and modifying the procedure when deficiencies are found.

Operations and Maintenance

- Taking adequate precautions in excavated trenches to protect personnel from unsafe accumulations of vapor or gas, and when needed, emergency rescue equipment, breathing apparatus, and a rescue harness and line.
- Systematic and routine testing and inspection of pipe-type or bottle-type holders.
- Responding promptly to a report of a gas odor inside or near a building, unless the operator's emergency procedures under §192.615(a)(3) specifically apply to these reports.

Operations and Maintenance

- **R14-5-202. Construction and Safety Standards for Gas, LNG, and Hazardous Liquid Pipeline Systems**

D. An operator of an intrastate pipeline shall file with the Commission an Operation and Maintenance Plan, including an emergency plan, at least 30 days before placing a pipeline system into operation. Any changes in an existing Operation and Maintenance Plan shall be filed within 30 days after the effective date of the change.

Abnormal Operations

- For **transmission lines**, the manual must include procedures for the following to provide safety when operating design limits have been exceeded:
  - Responding to, investigating, and correcting the cause of unintended closure of valves or shutdowns.
  - Increase or decrease in pressure or flow rate outside normal operating limits.
  - Loss of communications.

Abnormal Operations

- Operation of any safety device.
- Any other foreseeable malfunction of a component, deviation from normal operation, or personnel error which may result in a hazard to persons or property.

Abnormal Operations

- Checking variations from normal operation after abnormal operation has ended at sufficient critical locations in the system to determine continued integrity and safe operation.
- Notifying responsible operator personnel when notice of an abnormal operation is received.
- Periodically reviewing the response of operator personnel to determine the effectiveness of the procedures controlling abnormal operation and taking corrective action where deficiencies are found.

Abnormal Operations

- The requirements of this paragraph **do not** apply to natural gas distribution operators that are operating transmission lines in connection with their distribution system.

Safety Related Conditions

- The manual must include instructions enabling personnel who perform operation and maintenance activities to recognize conditions that potentially may be safety-related conditions subject to the reporting requirements of §191.23.

Surveillance, Emergency Response, Accident Investigation

- The procedures required by §§192.613(a), 192.615, and 192.617 must be included in the manual.

Continuing Surveillance

- §192.613 Continuing Surveillance.
- Each operator shall have a procedure for continuing surveillance of its facilities to determine and take appropriate action concerning changes in class location, failures, leakage history, corrosion, substantial changes in cathodic protection requirements, and other unusual operating and maintenance conditions.

Continuing Surveillance

- If a segment of pipeline is in unsatisfactory condition but no immediate hazard exists, the operator shall initiate a program to recondition or phase out the segment involved, or if the segment cannot be reconditioned or phased out, reduce the maximum allowable operating pressure in accordance with §192.619.

O&M Procedures

- Types of O&M Manuals
  - The Operator Built manual.
  - The “Canned” or purchased manual.
  - The Contractor Built manual.

O&M Procedures

- Types of O&M Manuals
  - The Operator Built manual.
  - Advantages:
    - Designed specifically for your system.
    - In-house development.
    - Cost of development may be lower.

O&M Procedures

- Types of O&M Manuals
  - The Operator Built manual.
    - Disadvantages:
      - Time consuming to develop.
      - Operator staff time spent on manual may take time from regular duties.
      - Must be in place prior to system operation.

O&M Procedures

- Types of O&M Manuals
  - The “Canned” or purchased manual.
    - Advantages:
      - Can be adopted quickly.
      - May be more cost effective.
      - Most of the major development work has already been done.

O&M Procedures

- Types of O&M Manuals
  - The “Canned” or purchased manual.
    - Disadvantages:
      - Most likely will require modification to fit your system.
      - Additional time and costs may be involved before implementation.
      - May not be detailed enough for larger or more complex systems.

O&M Procedures

- Types of O&M Manuals
  - The Contractor Developed manual.
    - Advantages:
      - May be custom designed for your system.
      - Usually a combination of canned and custom developed plan.
      - Usually quicker than building it yourself.

O&M Procedures

- Types of O&M Manuals
  - The Contractor Developed plan.
    - Disadvantages:
      - May still require modification for system specific procedures.
      - May have additional costs involved for procedure updates and reviews.
      - May require more time to develop procedures for new or updated O&M tasks.

O&M Procedures

Let’s look at some examples.

Operation and Maintenance Plan
Master Meter
Natural gas System

The Operation and maintenance Plan provides a guide for complying with Federal and State requirements, assuring safety for the public and maintaining facilities in a satisfactory operating condition. Revision –

FACILITY NAME: _____

ADDRESS: _____ **O&M Master Meters**

Operating Procedure

The personnel responsible for the operation and maintenance of the gas system must be trained in the use of the procedures contained in this Operation and Maintenance Plan. The plan will be reviewed annually by all applicable personnel. A record of review and training will be maintained.

Pressure Limitations (maximum allowable operating pressure)

The maximum allowable operating pressure(s) (MAOP) for the existing gas pipelines system is **15** psi.

*NOTE: All gas piping installed after the above-mentioned date, shall be based on a pressure test as described in, PRESURE TEST REQUIREMENTS, in this plan.

DISTRIBUTION SYSTEM

The Distribution System consists of the following:

DIAMETER OF PIPE	TYPE MATERIAL	FT ABOVE GROUND	FT BELOW GROUND	TOTAL FEET	DATE INSTALL

WELDING

Welding will be performed by a third party qualified welder utilizing procedures that meet the requirements of the federal code, PART 192. Copies of the third party's qualifications and qualified welding procedures will be kept on file for all welds performed on the system.

JOINING

Joining will be performed by a third party contractor. Copies of the contractor's qualifications and procedures that meet the requirements of the Federal Code, Part 192, will be kept on file. Records will be kept on file for all.

ODORANT

Gas odorant will be quarterly and annually. All Quarterly testing will be conducted by a "sniff test", the use of two persons is recommended. The annual test will be conducted by a qualified gas utility employee using an odorometer to determine that the gas contains odorant at a concentration in air of one-fifth of the lower explosive limit. Written verification that the gas meets the above criteria will be kept on file. The State Pipeline Safety Office shall be notified at 405-555-1234 when the odorant is not detected.

DAMAGE PREVENTION

No person or company shall begin any excavation on the operators' property before being notified. When notified of an excavation the operator will locate their natural gas lines as promptly as practical but in no event later than two working days after a request. All marks for gas lines will be marked yellow in color. Location requests will be documented. ONE CALL MEMBERSHIP DATE: _____.

PURGING OF PIPELINES AND MAINS

(a) When a pipeline or main full of air is placed in service, the air in it can be safely displaced with gas provided that a moderately rapid and continuous flow of gas is introduced at one end of the line and the air is vented out of the other end. The gas flow should be continued without interruption until the vented gas is free from air. The vent should then be closed.

(b) In cases where gas in a pipeline or main is to be displaced with air and the rate at which air can be supplied to the line is too small to make a procedure similar to, but the reverse of that described in (a) feasible, a slug of inert gas should be introduced to prevent the formation of explosive mixture at the interface between gas and air. Nitrogen or carbon dioxide can be used for this purpose.

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Subject:	Steel Pipelines Arc Burns	Issued:	10-01-96
		Revised:	

PURPOSE To state minimum requirements for the repair of arc burns.

REFERENCE CFR 49: Part 192.309

SUMMARY Following are requirements for the repair of arc burns.

Responsibility	**Action**
Superintendent, Foreman, Welder	Repair all arc burns either by: • Grinding; or by • Removal of the section of pipe from the pipeline. Grinding-- When grinding arc burns ensure that the remaining wall thickness is greater than the amount required for the design pressure of the pipeline. If major grinding is required, then use an ultra-sonic thickness gage to determine remaining wall thickness. After removing visible evidence of the arc burn, swab the ground area with 20 percent solution of ammonium persulfate. A blackened spot is evidence of metallurgical notch and indicates that additional grinding in necessary.

O&M Procedures

- Other Issues:
  - Which procedures to use when companies merge or are sold.
  - Training operator personnel when procedures are changed or updated.
  - Documentation of O&M and code required tasks for compliance.

O&M Procedures

- What to look for in an O&M.
  - Procedures included for all O&M tasks.
  - Procedures are understandable and could be followed by someone without system knowledge (New Employee).
  - Operator has a plan in place to review procedures and track changes when required, and more frequently if needed due to system changes or additions.

O&M Procedures

- What to look for in an O&M.
  - Procedures are arranged, indexed, and easy to find.
  - Any standards or supplemental procedures referenced by the O&M are located with it.
  - Operator staff are trained and familiar with O&M procedures, and know where they are located.
  - Procedures are not more stringent than the regulations, or the operator is aware that they are.

Websites

ACC Pipeline Safety

http://www.azcc.gov/divisions/safety/pipeline.asp

PHMSA Pipeline Safety Regulations

https://www.phmsa.dot.gov/standards-rulemaking/pipeline/standards-and-rulemaking-overview