Isolation, Blow Down and Purging of Gas Handling Facilities and Equipment

1 SCOPE

To establish a uniform process and outline precautions for the isolation, blow down or purging of natural gas pipeline and related facilities and equipment for construction, maintenance, repair or testing, and the return of the facility to service. The plan is not to be used to de-water pipelines or systems after hydrostatic testing, or remove dirt, scale, or other debris from facilities. While this plan must be carefully followed, it is recognized that some deviations may occur during emergencies.

2 APPLICABILITY

This plan is applicable to all situations in which it is necessary to isolate, blow down or purge facilities and equipment in order to safely perform construction, maintenance, repair or testing activities, and the return of the facility to service. This plan does not apply to operation, maintenance, repair or inspection of storage wells, pressure vessels, or minor routine operations (see Section 6, Definitions).

2.1 Safety

The Company is committed to the safety of the public and its employees. Employees are to perform their work in the safest manner with the utmost regard for the safety of themselves and the public. All Company safety policies and procedures, as well as the appropriate Job Hazard assessments, should be reviewed as necessary.

2.2 Operator Qualification

All persons performing tasks covered by 49 CFR 192, Subpart N, shall be qualified according to the Company Operator Qualification Plan.

3 PLANS

3.1 Facility Isolation

3.1.1 Before a facility is removed from service, a plan for isolation of the facility should be developed by appropriate personnel. Gas Control should be consulted during the planning stage. For more complex piping such as compressor stations, M&R stations, or looped crossovers, a site visit and plan review with the local Operations personnel is recommended.

The isolation plan should consider and/or include, as needed:

A. Identify valve segment and length of segment to be isolated, blown down or purged.

B. The reason for isolation, blow down and/or purge.

C. Drawings or a single line sketch of the facility, including the location of valves to be operated, and location of the work.

D. An evaluation of the impact on facilities and customers (including points of delivery, receipts and farm taps), including both up and down stream. Consideration should be given to minimize outages and service interruptions. Affected customers should also be notified.

E. A review of the Maximum Allowable Operating Pressure (MAOP) of various permanent and temporary facilities and equipment, along with controlling Maximum Operating Pressure (MOP) to ensure overpressure does not occur and contractual obligations are maintained.

F. An inspection of the pressure limiting equipment, relief valves, and other valves or equipment to ensure that they are in proper operating condition.

G. Lockout/Tagout procedure as described in the appropriate Company Plan.

H. Notify Gas Control immediately prior to implementation and upon return to service.

3.2 Facility Blow Down

Prior to blowing down a facility, a written blow down plan shall be developed by appropriate personnel. For more complex piping such as compressor stations, M&R stations, or looped crossovers, a site visit and plan review with the local Operations personnel is recommended.

The written blowdown plan should consider and include, as needed:

A. All information included in Section 3.1- Isolation.

B. A single line sketch and/or drawing or labeled photos showing the sizes and the locations of pertinent valves, fittings, blow-off locations, gauge connections, and other appropriate facility information.

C. Review individual valve operations guide.

D. Written sequence of events such as contacts, pressure control and monitoring, opening and closing valves.

E. Identification and notation of any special operational problems such as potential for pipeline debris, liquids or hydrocarbons to be present in the facility.

F. Identification and notation of any special conditions such as nearby ignition sources such as overhead transmission lines, and precautions that may be necessary for the safety of the public, personnel, or equipment.

G. Notification to the public and emergency response authorities. Note: Individual states may have specific requirement concerning the release of natural gas.

H. Personnel and communication requirements, including contact names and home numbers, needed during the removal and return to service.

I. Estimate of gas loss.

J. Prevention of Accidental Ignition as per Section 3.7 and Plan 220.04.02, Prevention of Accidental Ignition.

K. Any special safety and environmental considerations including proper Personal Protective Equipment, spill containment, etc.

The blow down plan shall be submitted to the appropriate Engineering Services – Pipeline/Compliance a, M&R, Compressor engineer or technician for review and approval.

3.2.1 **Pre-Blow Down Familiarization Review**

All personnel involved in the blow down of the facility will review the written plan with the team or project leader prior to the blow down. It is recommended that the project leader hold a safety meeting for all personnel to review the procedures. Any changes to the plan should be communicated and documented. The final approved plan should be signed by the team or project leader.

3.3 Purging

If air is being purged by gas, the gas flow rate must be moderately rapid and continued until all air is removed from the facility. If gas is being purged by air, air movers are to be used to evacuate the gas and prevent a hazardous gas air mixture. OEP-128 Pipeline Purging Procedures or GRI Pipeline Purging Program shall be used to calculate purge rate and purge time.

Prior to purging a facility, a written purge plan shall be developed by appropriate personnel. For more complex piping such as compressor stations, M&R stations, or looped crossovers, a site visit and plan review with the local Operations personnel is recommended.

The written purge plan should consider and include, as needed:

A. All information included in Section 3.2- Blow Down.
B. Estimate of purge time and/or description of verification of purge completion.

The purge plan shall be submitted to the appropriate Engineering Services – Pipeline, Compliance, M&R, Compressor engineer or technician for review and approval.

3.3.1 **Pre-Purge Familiarization Review**
All personnel involved in the purging of the facility will review the written plan with the team or project leader prior to the purge. Any changes to the plan should be communicated and documented.

3.3.2 **Gas Detection**
Gas detector readings should be monitored through the purge, and readings should be taken at the end of the normal purging period.

3.4 Fabricated Assemblies (M&R Facilities, Compressor Stations, etc.)

Since the length and size of piping involved in a measuring, regulator, or other fabricated assembly may vary from one installation to another, the duration of the purge must be left to the discretion of responsible field personnel. Upon repressuring the facility, and prior to placing it into service, sufficient gas must be exhausted through piping to ensure that all air has been removed, as best can be determined using a gas detector. Refer to the M&R Handbook for procedures on purging meter or regulator runs following routine inspections. Standard purges for compressor stations should be included in the Compressor Operations Supplement.

3.5 Reporting Gas Lost

Refer to Plan 220.01.04, Reporting Unmeasured Gas Lost and Used from Company Operations.

3.6 Additional Precautions

3.6.1 When the facility is being purged of air, the purge should continue until 100% gas is detected at the blow off used for venting. Note that gas detectors are normally calibrated for the "100% gas" reading using pure methane. Due to small but varying amounts of other hydrocarbons and inert components present in all natural gas sources, the detector will not read 100% gas. It is recommended that the gas detector be checked out against a pipeline quality sample of the natural gas used for purging, prior to the actual purging. The maximum reading on the detector for a pipeline quality sample should be noted, and this figure used to represent "100% gas" reading.

3.6.2 When the facility is being purged of gas, a calibrated gas detector shall be used to insure that a combustible mixture is not present. If a combustible mixture is

found, the purging shall be continued until the combustible mixture is removed. Hot Work shall not be performed until the combustible mixture is removed.

3.6.3 Before starting blow down or purging operation, adequate precautions shall be exercised to protect the public, employees, and company facilities. For all blow down or purging operations in populated areas, the local fire and police officials shall be notified of the planned activity.

3.6.4 Other precautions may include, but are not limited to:

- All gas-fired equipment, such as indirect fired heaters, in the vicinity of the gas discharge shall be turned off prior to beginning the purge.
- Other potential sources of ignition, such as automobiles, two-way radios, cell phones, other non-intrinsically safe devices, etc., shall not be permitted in the vicinity of the gas discharge.
- Periodically monitor changes in the atmospheric conditions and wind direction that could affect work activities, and adjust accordingly.
- Personnel should make note of other stationary ignition sources (such as overhead electric transmission lines).
- All personnel working in the area shall be made aware of the gas release in order to prevent accidental ignition.
- Personnel at the gas release point shall wear hearing protection.
- Suitable and adequate fire extinguishing equipment shall be on site and readily available. Fire extinguishing equipment must be properly maintained and inspected.
- During the process of any discharge of gas to the atmosphere, and where enclosed equipment is being vented, care shall be taken to vent the discharge to a point outside of the building and away from any electrical equipment or wiring in the area.

3.6.5 For specific information or unusual situations, contact the appropriate Engineering Services Pipeline, Compliance, M&R, Compressor engineer for additional assistance.

3.7 Prevention of Accidental Ignition

See Plan 220.04.05, Prevention of Accidental Ignition for additional information.

Personnel performing the work shall ensure that proper procedures are followed to minimize the possibility of accidental ignition of gas-air mixtures. These procedures should include, but are not limited to, the following requirements:

A. Extinguish or remove all source of ignition, and ensure that proper fire extinguishing device(s) will be present during blowdown and actual work.

B. Monitor the facility for migrating gas, pipeline debris, or other flammable material.

C. Locate vehicles and powered equipment away from and upwind of locations where gas is being vented.

D. Periodically monitor the wind direction, noting changes, and adjust work activities to ensure the continued safety of personnel and equipment.

E. Check and periodically monitor the work area, including the inside of the piping, with an appropriate gas detector to assure that a hazardous atmosphere is not present before and when using any equipment or instruments that could be a potential source of ignition.

F. Ensure that gas or electric welding is not performed on facilities that contain a combustible mixture of air and gas in the work area.

G. Ground or bond the pipeline or facilities to eliminate potential sparking or arcing associated with AC or DC current on the piping.

H. Shut off, lock, and tag all rectifiers that might be providing cathodic protection current to the facility.

I. Post warning signs where appropriate, advising personnel not directly involved in the work of the temporary potential hazards in the work area.

J. Lock out and tag out of valves or other equipment, according to Plan 110.01.10, Lockout/Tagout.

K. Check with appropriate operations personnel and check records to verify the ability of isolation valves to hold a tight seal or shut-off between pressurized and isolated facilities.

L. If a combustible air-gas mixture is detected in the piping, identify the source and attempt to eliminate by using additional air movers or blowing down additional facilities.

M. If a combustible air-gas mixture is being managed with air movers, verify that the incremental piping changes as work proceeds doesn't inadvertently change the

flow of gas and air to create a combustible mixture.

N. Implement a Hot Work Permit, if required (see Plan 110.01.17, Hot Work Permit).

4 RESPONSIBILITIES

4.1 Operations

Operations will ensure that all personnel performing tasks required under the DOT Operator Qualification Rule will be qualified under the Company Operator Qualification Plan.

4.1.1 Team Member

The personnel performing the facility isolation, blow down or purge, and the return to service will ensure that the plan is followed and all safety and environmental procedures that apply are followed.

4.1.2 Team Leader

The facility team leader or project leader accountable for the facility is responsible to see that isolation, blow down or purge plans are prepared, reviewed and followed. The team leader will also assure the availability of the necessary tools and equipment. The team or project leader should sign the final approved plan. The team leader is responsible for capturing actual blowdown and purge times as well as beginning and ending pressures to be used for actual gas loss calculations.

4.2 Support Staff

4.2.1 Engineering Services

Engineering Services will provide technical support. Engineering Services – Pipeline, Compliance, M&R, or Compressor can assist in the preparation and should provide an independent review and approval of blowdown and purge plan documents.

5 RECORDS

5.1 Company Forms/Database

Written blow down and purge plans should be placed and retained in the appropriate facility file. Work orders issued in the work management system should document implementation of the plan including, but not limited to, valve maintenance, lockout/tagout, blowdown, purge and gas lost.

Gas lost shall be documented as outlined in Plan 220.01.04, Reporting Unmetered Gas Lost and Used from Company Operations.

5.2 Records Retention

The most recent blow down and purge plan for a given facility and appropriate electronic record of plan implementation should be retained for the life of the facility.

6 DEFINITIONS

Minor Routine Operations: The isolation, blow down and purge of a relatively small system, or a facility that is performed on a regular basis for scheduled maintenance and inspections.

Maximum Allowable Operating Pressure (MAOP): The maximum pressure at which a line segment is qualified to operate under CFR 192.

Maximum Operating Pressure (MOP): The lowest MAOP of an element within any protected pipeline segment. The maximum pressure allowed on a piping system between designated control points which will not exceed the design pressure of the weakest link in a piping system, published MAOP's, or the pressure certified by the FERC certificate of any line segment, including all components or adjoining facilities between such points.

7 REFERENCES

7.1 Related Plan Documents

Plan Number:	Title:
110.01.10	Lockout/Tagout
110.01.17	Hot Work Permit
220.01.04	Reporting Unmetered Gas Lost and Used from Company Operations
220.02.01	Pipeline Repair and Realignment
220.04.02	Prevention of Accidental Ignition
	Operator Qualification Plan

7.2 Related Procedure Documents

Procedure Number:	Title:
OEP-102	Use of Air Movers When Cutting and Welding
OEP-128	Pipeline Purging Procedures

7.3 Operator Qualification Tasks

This list of Operator Qualification tasks indicates the tasks that may be associated with this plan.

Task Number:	Title:
PLOQ.0015	Isolate & Purge Compressor Units
PLOQ.0024	Operate Valve
PLOQ.0030	Operate Portable Gas Detectors – Presence of Gas
PLOQ.0031	Operate Portable Gas Detectors – Percent Gas
PLOQ.0034	Purge Gas Facility of Air Using Gas
PLOQ.0035	Blow down Gas Facilities (for Pressure Removal Only)

PLOQ.0036	Evacuate Gas from Facilities (for Construction Activities)

7.4 Other References or Related Specifications

GRI-97/0104, Pipeline Purging Principals and Practices Research
A&E Drawing FA-1202-0128 (Modified 05/12/04)

8 REGULATORY CITATIONS AND EXCEPTIONS

8.1 Federal Requirements

Citation Number:	Title:
49 CFR 192.629	Purging of Pipelines
49 CFR 192.751	Prevention of Accidental Ignition
49 CFR 192, Subpart N	Operator Qualification

8.2 State Requirements

State air quality regulations and permits may impose restrictions and notification requirements when venting gas to atmosphere.