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Columbia Pipeline Group
Columbia Gas Transmission, LLC

**Perry Michael Hoffman**
Manager – System Integrity

October 20, 2015

Mr. Byron E. Coy, PE
Director, Eastern Region
United States Department of Transportation
Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety
Eastern Region – New Jersey District Office
820 Bear Tavern Road, Suite 103
West Trenton, NJ 08628

**RE: CPF 1-2015-1020M**

Dear Mr. Coy:

This letter is provided on behalf of Columbia Gas Transmission, LLC (Columbia Gas) in response to the Notice of Amendment (NOA) CPF 1-2015-1020M, dated August 31, 2015 and received on September 1, 2015. The NOA was issued following inspections conducted by the PHMSA Eastern Region from December 8th through 12th, 2014, of the Columbia Gas liquefied natural gas (LNG) plant in Chesapeake, VA. On September 12, 2015, Columbia Gas requested additional time to respond to the NOA. On September 28, 2015, PHMSA granted an extension to October 30, 2015. Columbia Gas appreciates the additional time to respond.

In accordance with Section II (a) of the Response Options for Pipeline Operators in Compliance Proceedings provided with the NOA, Columbia Gas submits this letter to notify you that it has revised its plans and procedures to address the items in the NOA.

The language from the NOA is provided in bold, followed by Columbia Gas's response to each item.

1. **§193.2017 Plans and procedures.**

   **(a) Each operator shall maintain at each LNG plant the plans and procedures required for that plant by this part. The plans and procedures must be available upon request for review and inspection by the Administrator or any State Agency that has submitted a current certification or agreement with respect to the plant under the pipeline safety laws (49 U.S.C. 60101 et seq.). In addition, each change to the plans or procedures must be available at the LNG plant for review and inspection within 20 days after the change is made.**

**CGT's written plan, 220.05.01 "DOT Incidents – Reporting and Investigating Requirements" effective 10/3/2014, is inadequate in that it fails to provide guidance for reporting LNG facility incidents in accordance with §193.2011.**

**§193.2011 states that "Incidents, safety-related conditions, and annual pipeline summary data for LNG plants or facilities must be reported in accordance with the requirements of Part 191 of this subchapter."**

**§191.15 "Transmission systems, gathering systems, and liquefied natural gas facilities. Incident report" paragraph (b) states in part that "LNG. Each operator of a liquefied natural gas plant or facility must submit DOT Form PHMSA F 7100.3 as soon as practicable . . . "**

**Section 3.2, Incident Report, of CGT's written plan states in part that: "An electronic DOT PHMSA Form RSPA F 7100.2 shall be submitted by System Integrity as soon as practical, but not more than 30 days after an Incident. Such reports are not required for LNG facilities. . . The Incident report e-form must be submitted electronically to DOT through the Pipeline and Hazardous Materials Safety Administration (PHMSA) OPS Online Data Entry and Operator Registration System."**

**The procedure does not provide guidance related to the use of DOT Form PHMSA F 7100.3.**

Columbia Gas Response

Columbia Gas has updated its Operations and Maintenance Plan 220.05.01 entitled DOT Incidents/Accidents – Reporting and Investigating Requirements Plan to address the recommendations in the NOA. Specifically, Section 2.2 of Plan 220.05.01 includes guidance for reporting incidents at LNG facilities and specific reference to DOT Form PHMSA F 7100.3. Section 2.2 also includes the PHMSA website address where instructions for the use of the form are available. A copy of the revised procedures is included in Attachment A.

**2. §193.2513 Transfer procedures.**
**(a) Each transfer of LNG or other hazardous fluid must be conducted in accordance with one or more manuals of written procedures to provide for safe transfers.**

**CGT's LNG Truck Loading Procedure – SOP 1 Procedure No. 310.008.450, effective 4/11/2014, is inadequate in that it fails to require documentation of the date the truck loading was performed, and the person that performed the truck loading.**

**Section 2.3 Records states: "Utilize the "Truck Loading Checklist" in Exhibit 1 during LNG truck loading operations. The Company's work management system is used to record truck loading operations. A scan of "Truck Loading Checklist" should be attached to the Maximo work order. Paper copies should be stored at the LNG Plant. Records should be maintained for five (5) years plus the current year."**

**There is no requirement for dating or signing the checklist.**

Columbia Gas Response

Columbia Gas has updated Procedure 310.008.450 entitled LNG Truck Loading Procedure – SOP 1 and the related LNG Truck Loading Checklist to specifically require the collection of the truck loading date and the names and signatures of the company employees involved with LNG truck loading operations. A copy of the revised procedure (which includes the revised LNG Truck Loading Checklist) is included in Attachment B.

**3. §193.2503 Operating procedures.**

**Each operator shall follow one or more manuals of written procedures to provide safety in normal operation and in responding to an abnormal operation that would affect safety. The procedures must include provisions for:**

**(d) Purging and inerting components according to the requirements of §193.2517.**

**CGT's written purging procedures, Procedure 310 – Purge LNG Pumps, dated 10/1/2014, and Procedure SPP-Rev 0 – Purge Adsorber D-101 C, issued 6/15/2009, are inadequate in that they fail to provide details on how to document the steps taken when purging LNG pumps and / or absorbers, such as the form that should be used, the date the purging was performed, the name of the person that performed the purging, and, where the completed form should be filed.**

Columbia Gas Response

Columbia Gas has revised Procedure 310.018.001 entitled Purge Truck Loading Pump and Station (SPP-1) as well as Procedure 310.018.005 entitled Adsorber Skid Purge Procedure to clarify the steps to be taken when purging. The revised procedures detail the correct valve positions during purging operations, the work management documentation requirements including requirements for recording the date purging was performed, the name of the person(s) performing the purging operations, and how the documentation should be entered into the system. A copy of the revised procedures are included in Attachment C.

**4. §193.2605 Maintenance procedures**

**(b) Each operator shall follow one or more manuals of written procedures for the maintenance of each component, including any required corrosion control. The procedure must include:**

**(1) The details of the inspections or tests determined under paragraph (a) of this section and their frequency of performance; and**

**CGT's written procedure, 310.26.01 – Support Systems, effective date 11/21/2014, is inadequate in that it fails to include the details of the inspections or tests determined under paragraph (a) of section 193.2605.**

**§193.2605 states that: "Each operator shall determine and perform, consistent with generally accepted engineering practice, the periodic inspections or tests needed to meet the applicability requirements of this subpart and to verify the components meet the maintenance standards prescribed by this subpart."**

**§193.2609 states that: "Each support system or foundation of each component must be inspected for any detrimental change that could impair support."**

**CGT procedure 310.26.01 paragraphs 3.1 and 3.2 state that this inspection must be conducted once each year, not to exceed 18 months. The procedure lacks criteria for evaluating the inspection findings and determining if or when remediation of the support system is required.**

Columbia Gas Response

Columbia Gas has updated Plan 310.26.01 entitled Support Systems Plan and Procedure 310.026.001 entitled Support System Inspections Procedure to clarify the as found conditions requiring further evaluation and/or remedial actions. Specifically, Procedure 310.026.001 clarifies the as found conditions requiring engineering review and Section 8 of the document direct the additional actions necessary to either further evaluate or remediate any actionable condition found. A copy of the revised plan and procedure is included in Attachment D.

**5. §193.2605 Maintenance procedures.**

**(b) Each operator shall follow one or more manuals of written procedures for the maintenance of each component, including any required corrosion control. The procedure must include:**

**(1) The details of the inspections or tests determined under paragraph (a) of this section and their frequency of performance; and**

**CGT's procedure, 310.001.025 – Refrigerant Hose Maintenance, effective date 12/01/2013, is inadequate in that it references the 2009 edition of NFPA 59A instead of the 2001 edition that is currently incorporated by reference under §193.2013.**

**Specifically, paragraph 2.3.2.4, states that: "Pressure test each refrigerant hose to a pressure of 300 psig on the propane/ iso-butane/ iso-pentane loading station and a pressure of 1,000 psig on the ethylene loading station (This is the set pressure of the relief valve and per *NFPA59A Section 11.8.6-2009 version* [emphasis added] that is the required test pressure)."**

Columbia Gas Response

Columbia Gas has updated Procedure 310.001.025, Refrigerant Hose Maintenance Procedure. The reference to NFPA 59A has been removed. A copy of the revised procedure is included in Attachment E.

Columbia believes that the above plan and procedure revisions fully address the issues raised in the NOA.

If you have any questions or would like additional information, please do not hesitate to contact me.

Sincerely,

Perry M. Hoffman
Manager – System Integrity
Columbia Pipeline Group

# Attachment A

Columbia Gas Transmission, LLC

Operations and Maintenance Plan 220.05.01
DOT Incidents/Accidents – Reporting and Investigating Requirements

# DOT Incidents/Accidents – Reporting and Investigating Requirements Plan

## Scope

This Plan provides requirements for notifying, reporting, investigating, and responding to accident or incident involving a:

- jurisdictional natural gas facilities, or
- LNG, liquefied natural gas facility (Chesapeake LNG Plant), or
- natural gas liquid (NGL) facility.

The Plan is applicable to all companies operated by Columbia Pipeline Group (CPG) including its employees, contractors, and third party personnel.

This Plan complies with various requirements in parts 49 CFR 191, 192, 193, 195 and 199. Additional requirements may be found in the appropriate Company Operations Manual. Internal reporting and notification requirements can be found in 100.01.02 Incident Management Plan.

## Safety

The Company is committed to public and employee safety. Employees are to perform their duties with the utmost regard for safety at all times. Review Company safety Plans, Procedures, and applicable Job Hazard Assessments.

### Operator Qualification

All persons performing covered tasks shall be qualified according to the Company Operator Qualification Plan. All persons performing tasks covered by 49 CFR 193 Subpart F shall have successfully completed the LNG Facility Training Plan.

## Plans

## 1.0 Incident or Accident Determination

### 1.1 Natural Gas or LNG Facility

Any event that involves the release of natural gas or LNG from a jurisdictional natural gas or LNG facility is reportable per Parts 191 to the National Response Center (NRC) as an Incident if it results in any of the following:

- Death

- Personal injury necessitating in-patient (overnight) hospitalization
- The estimated total property damage (to the Company and/or others) is $50,000 or more (excluding the cost of lost gas)
- The unintentional loss of three million cubic feet or more (3,000 MCF) of natural gas

In addition, the following are also reportable to the National Response Center as an incident:

- An event that results in an emergency shutdown of an LNG facility. However, activation of an emergency shutdown system for reasons other than an actual emergency would not be reportable.
- An event that is significant in the judgment of the Company, even though it does not meet any of the above criteria.

## 1.2 Liquids Pipeline (NGL)

Per 49 CFR 195.50, an accident report is required for each failure in a jurisdictional pipeline system that involves the release of hazardous liquid or carbon dioxide from a jurisdictional pipeline and/or pipeline facility if it results in any of the following:

(a) Explosion or fire not intentionally set by the operator.

(b) Release of 5 gallons or more of hazardous liquid or carbon dioxide, except that no report is required for a release of less than 5 barrels resulting from a pipeline maintenance activity if the release is:

(1) Not otherwise reportable under 49 CFR 195 Subpart B;

(2) Does not *Result in pollution of any stream, river, lake, reservoir, or other similar body of water that violated applicable water quality standards, caused a discoloration of the surface of the water or adjoining shoreline, or deposited a sludge or emulsion beneath the surface of the water or upon adjoining shorelines;*

(3) Confined to company property or pipeline right-of-way; and

(4) Cleaned-up promptly;

(c) Death of any person;

(d) Personal injury necessitating hospitalization;

(e) Estimated property damage, including cost of clean up and recovery, value of lost product, and damage to the property of the operator or others, or both, exceeding $50,000.

Per 49 CFR 195.52, at the earliest practicable moment following discovery of a release of the hazardous liquid or carbon dioxide transported resulting in an event described above (pre49 CFR 195.50), notice must be given, in accordance with the "Monitoring Center Notice" requirements of this section (below), of any failure that:

(1) Caused a death or a personal injury requiring hospitalization;

(2) Resulted in either a fire or explosion not intentionally set by the operator;

(3) Caused estimated property damage, including cost of cleanup and recovery, value of lost product, and damage to the property of the operator or others, or both, exceeding $50,000;

(4) Resulted in pollution of any stream, river, lake, reservoir, or other similar body of water that violated applicable water quality standards, caused a discoloration of the surface of the water or adjoining shoreline, or deposited a sludge or emulsion beneath the surface of the water or upon adjoining shorelines; or

(5) In the judgment of the operator was significant even though it did not meet the criteria of any other paragraph of this section.

**NOTE**

Per Plan 100.01.02 - Incident Management Plan items to be considered when determining if an event may be significant include the following.

(1) Rupture or explosion

(2) Fire

(3) Loss of service

(4) Evacuation of people in the area

(5) Involvement of local emergency response personnel

(6) Degree of media involvement

Investigated and documented the circumstances surrounding an accident or incident. This may include, but is not limited to,

1. a determination of the extent of property damage and personal injury,
2. a review of the operating history and conditions of the facilities that failed, obtaining and analyzing samples of the material or item of equipment that failed as needed,
3. obtaining photographs and/or other pertinent information.

Record an accident or incident in the Company's work management system using Job Plan 220.005.001 – *DOT Incident/Accident Reporting*.

# 2.0 Reporting Incidents/Accidents

## 2.1 Monitoring Center Notification

All Incidents/accidents shall be reported to the Monitoring Center by telephone at 1-800-835-7191 (Columbia Gas), 1-866-485-3427 (Columbia Gulf), or 1-855-511-4942 (Columbia Midstream Group) at the earliest practical moment (typically within one hour). Gas Control may need to be contacted for operational issues. The Monitoring Center will notify Engineering Services, System Integrity immediately. The Monitoring Center shall notify representatives from the appropriate departments following the guidelines in *100.01.02 - Incident Management Plan* document.

A notice shall be given to the National Response Center (NRC) at 1-800-424-8802 by System Integrity at the earliest practical moment, with a goal not to exceed one (1) hour following the discovery of an accident or incident.

## 2.2 PHMSA Notifications

System Integrity shall submit one of the following Accident/Incident Reports electronically via the Online Data Entry System (ODES) as soon as practical, but not more than 30 days after an accident or incident. The Incident report e-form must be submitted electronically to DOT through the Pipeline and Hazardous Materials Safety Administration (PHMSA) Office of Pipeline Safety Online Data Entry and Operator Registration System.

Natural Gas – PHMSA F 7100.2 (Incident Report Form)

NGL – PHMSA F 7000-1 (Accident Report Form)

LNG - PHMSA F 7100.3 (Incident Report Form)

Instructions on the use of these forms is available under "References –Other References or Related Specifications (http://phmsa.dot.gov/pipeline/library/forms).

If new data is received within thirty days from the date the incident/accident and reported to the NRC verifying that the event did not meet the definition of an incident/accident then System Integrity will submit a letter to the PHMSA Information Resources Manager that the Company will not submit a 30-day Initial Incident/Accident Report. The letter may be submitted via e-mail, facsimile, or both methods. The e-mail address is InformationResourcesManager@dot.gov and the facsimile number is (202) 366-7178.

## 2.3 PHMSA Supplemental Report

After an initial Incident report has been filed electronically via ODES as described in the Accident/Incident Report section, supplemental report(s) must be submitted to PHMSA by System Integrity as soon as practical after additional pertinent information is obtained. When a report is submitted in writing, the supplemental report must clearly reference the date and report number of the

original Incident report. Supplemental report(s) should be filed electronically. For Accidents, a Supplemental Report must be filed no later than 30 days.

### 2.4 PHMSA Final Report

When all investigations and repairs are complete, submit a final report. The final report will be filed electronically similar to the Initial (and Supplemental if applicable) Reports via ODES. A copy of the final report shall also be provided to the Program Administrator for the CPG Anti-Drug Plan and Alcohol Misuse Prevention Program Manual.

## 3.0 Incident Investigation

Each accident or incident shall be investigated by the appropriate Engineering Services group to determine the cause. The investigating group will determine the need to preserve the incident site, sample preservation and failure analysis. A root cause analysis may be performed to identify the chain of events that led to the accident/incident and to prevent future re-occurrence (see Procedure *220.004.002 - Incident Near Miss Investigation and Root Cause Analysis Process*).

### 3.1 Requirements for LNG Investigations

Each event that involves explosion, fire, or LNG spill or leak, which results in: (1) Death or injury requiring hospitalization; or (2) Property damage exceeding $10,000 shall be investigated. Because of the investigation, appropriate action must be taken to minimize recurrence of the event. If the DOT-PHMSA Administrator or relevant state agency under the pipeline safety laws (49 U.S.C. 60101 *et seq.*) investigates an event, the Company shall make available all relevant information and provide reasonable assistance in conducting the investigation. Component(s) involved with the event shall not be removed from its location or otherwise altered unless they are necessary to restore or maintain service, or for safety, until the investigation is completed or the investigating agency otherwise provides. If a component is removed, it must be maintained on-site and intact to the extent practicable, unless determined otherwise by the investigating agency.

### 3.2 Drug and Alcohol

The Company will conduct both a drug test and an alcohol test after an accident, or incident on each employee whose performance either contributed to the accident or cannot be completely discounted as a contributing factor to the accident. The decision whether to test or not to test any employee shall be based on the Company's determination, using the best available information immediately following the accident, that the covered employee's performance could or could not have contributed to the accident. The Company will explain to each employee to be tested there is reason to believe their performance either contributed to the accident or cannot be completely discounted as a contributing factor to the

accident. Post-accident testing is documented using the PHMSA Post Accident Validation Form.

Supervisors should be aware that testing must be done within the following prescribed time frames:

- An employee or contractor being tested for drugs should be tested as soon as possible but no later than 32 hours after the accident/incident.
- An employee or contractor being tested for alcohol shall be tested within two (2) hours but no longer than eight (8) hours following the accident/incident.

The Supervisory Written Record must be submitted when:

- An employee or contractor is tested, or
- Information immediately available after the incident determines the employee's or contractor's performance could not have contributed to the accident, or
- Because the time between that performance and the incident, it is determined that testing would not reveal if performance was affected by drug use, or
- Drug or alcohol testing was not performed following an incident.

The PHMSA Post Accident Validation Form and Supervisory Written Record must be provided to DER/Substance Abuse Program Administrator within 48 hours. The Program Administrators for CPG is Linda Bisca (lbisca@cpg.com, 1-614-855-5650).

Refer to the *CPG Drug and Alcohol Plan* for additional testing and reporting requirements. For more information during an emergency, contact the Monitoring Center 1-800-835-7191.

### 3.3 Contract Employees

The requirements in this Section apply to any Contractor who is performing work at a Company facility. The Company's site representative is ultimately responsible for following the requirements of this Section.

## 4.0 FERC Outages

### 4.1 FERC Notice

The Monitoring Center shall notify the CPG Manager of Rates and Regulatory Affairs by telephone in a time frame that enables then to issue a report to the FERC at the earliest feasible time.

## 4.2 FERC Incident Report

A. Service interruptions and damage to jurisdictional natural gas facilities, as defined in Item C below, shall be reported by Certificates to the FERC at the earliest feasible time. The report should include the following:

1. The location and cause of the service interruption or damage to natural gas pipeline or storage facilities;
2. The nature of any damage to pipeline or storage operations;
3. Specific identification of any facilities damaged;
4. The time the service interruption or damage to facilities occurred;
5. The customers affected by the interruption of service or damage to facilities;
6. Emergency actions taken to maintain service; and
7. Company contact and telephone number.

B. Certificates will furnish the report by email to: pipelineoutage@ferc.gov or facsimile transmission to the Director, Division of Pipeline Certificates, Office of Energy Projects, Federal Energy Regulatory Commission at (202) 208-2853.

C. Service interruptions and/or damage to pipeline facilities that are reportable to FERC include:

1. Damage to any jurisdictional natural gas facilities caused by hurricane, earthquake or other natural disaster or terrorist activity resulting in loss of or reduction in pipeline throughput or storage deliverability
2. Serious interruptions (three hours or more in duration) of service to shippers involving jurisdictional natural gas facilities. Such serious interruptions of service shall include:
   a. Communities (50 or more consumers) served directly by shippers (including Company affiliates) and/or mainline service.
   b. Major government installations.
   c. Large industrial plants outside communities.
   d. Any other interruption judged significant by the Company.

   Interruptible service interrupted in accordance with provisions of filed tariffs, interruptions resulting from planned maintenance or construction, and interruptions of service less than three hours duration will not be reported.
3. Damage to jurisdictional natural gas facilities not caused by hurricane, earthquake or other natural disaster if, in the Company's judgment

such damage creates potential for serious delivery problems on its own system or the pipeline grid.

D. Whenever a PHMSA Incident Report is required, System Integrity will provide a copy of the report to Certificates, and Certificates will furnish the report to FERC within 30 days of the reportable Incident.

E. Certificates shall furnish a copy of the report to each State Commission in those States where the reported service interruption or damage occurred.

Refer to *310.08.02 - Abnormal Operating Conditions* for reporting service interruptions and/or damages related to LNG facilities.

# 5.0 Responsibilities

## 5.1 Team Member

Operations personnel are responsible for making the area safe in order to ensure protection of life and property in accordance with the Incident Management Plan and site-specific Emergency Plan as the situation requires.

During the immediate response, the Company personnel in charge will coordinate operations with Gas Control, the CMG Control Room, the Monitoring Center, team leader, or their designee, and other appropriate Operations personnel, per 100.01.02 - Incident Management Plan document. Response and notification responsibilities are outlined in the 'site specific' Emergency Plan Manual and the Incident Management Plan.

The employee's supervisor, Contractor or Company site representative is responsible for complying with the post-accident testing procedures and requirements in the CPG Drug and Alcohol Plan.

Employee(s), Contractor, and/or third-party employee(s), who may have contributed to or cannot be completely discounted as a contributing factor to an accident or incident may be subject to an Operator Qualification review per the Company's Operator Qualification Plan.

## 5.2 Team Leader

When appropriate, the team leader or designee is responsible for preserving samples for failure analysis.

Operations will provide assistance in documenting information in the Company's work management system as required.

## 5.3 Monitoring Center

The Monitoring Center will contact the necessary Operations, System Integrity and Certificates personnel in order to respond, notify, and coordinate efforts

involving an accident or incident in accordance with 100.01.02 - Incident Management Plan document.

The Monitoring Center may also need to contact Gas Control or the CMG Control Room for operational issues.

### 5.4 Engineering Services

Engineering Services personnel will provide support as necessary.

Depending on the nature of the event, an investigation team may be appointed to conduct an investigation. The investigation team may recommend additional investigations to be conducted by outside experts. If appropriate, the team will determine the need for sample preservation and failure analysis and provide a written report of the investigation.

The responsible Engineering Services supervisor is responsible for substantiating post-accident drug and/or alcohol testing, and Operator Qualification review of employee(s) and/or third-party employee(s).

System Integrity will support the investigation team, generate all PHMSA required reports, and is responsible for completing the information required by Job Plan 220.005.001 – *DOT-PHMSA Incident Reporting*.

System Integrity is responsible for updating this plan to reflect changes in regulatory requirements through periodic review and evaluation.

### 5.5 Rates and Regulatory Affairs

The FERC Certificates Manager in the Rates and Regulatory Affairs department will communicate with and process reports required by FERC.

## 6.0 Documentation Requirements:

| Record/Form Name | Storage Location | Retention Requirement (years) |
|---|---|---|
| All Incidents or Accidents | CPG Work Management System – Per Job Plan 220.005.001 – DOT (PHMSA) Incident Reporting | Life of Facility |
| Natural Gas – PHMSA F 7100.2 (Incident Report Form) | System Integrity | Life of Facility |
| NGL – PHMSA F7000-1 (Accident Report Form) | System Integrity | Life of Facility |
| LNG – PHMSA F7100.3 (Incident Report Form | System Integrity | Life of Facility |

| Record/Form Name | Storage Location | Retention Requirement (years) |
|---|---|---|
| Original PHMSA accident or incident investigation information and other applicable forms | System Integrity | Life of Facility |

A copy of the electronic records should be stored with the Company's work management system where applicable.

Forms, associated with the CPG Anti-Drug and Alcohol Misuse Plan, are maintained by the Program Administrator.

Certificates will retain, for the life of the facility, all applicable reports, and forms that were submitted to the FERC.

# 7.0 References

**Related Plan Documents**

| Plan Number | Title |
|---|---|
| 100.01.01 | *Emergency Plan (Gas)* |
| 100.01.02 | *Incident Management Plan* |
| 400.017.422 | *Emergency Plan (Liquid)* |
| 120.02.01 | *Spill and Release Reporting* |
| 220.05.02 | *Safety Related Conditions - Reporting and Investigating Requirements(Gas)* |
| 400.017.103 | *Safety Related Conditions - Reporting and Investigating Requirements(Liquid)* |
| 220.05.03 | *Abnormal Operations (Gas)* |
| 400.017.434 | *Abnormal Operations (Liquid)* |
| 310.08.02 | *Abnormal Operating Conditions (LNG)* |
| 100.01.02 | *Incident Management Plan* |
| | *CPG Drug and Alcohol Plan* |
| 80.01.01 | *Operator Qualification Plan(Gas)* |
| 400.017.501A | *Operator Qualification Plan(Liquid)* |

**Related Procedure Documents**

| Procedure Number | Title |
|---|---|
| 100.001.005 | *Post Incident Review* |
| 220.004.002 | *Incident Near Miss Investigation and Root Cause Analysis Process* |
| 220.005.001 | *DOT(PHMSA) Incident Reporting* |
| 220.005.002 | *Safety Related Condition Reporting* |
| 310.014.001 | *Chesapeake LNG Plant Emergency Plan* |
| NA | Site-Specific Emergency Plans |

**Other References or Related Specifications**

| Reference | Title |
|---|---|
| ADB–2010–01 | Pipeline Safety: Updates to Pipeline and Liquefied Natural Gas Reporting Requirements; Final Rule |
| ALN-91-01 | Accident Report |
| ADB-02-04 | Telephonic Notification to NRC |
| ADB-03-01 | Updates of Digital Mapping Data for Hazardous Liquid Pipeline High Consequence Areas (HCA) |
| ADB-2012-02 | Post-Accident Drug and Alcohol Testing |
| ADB-2013-01 | Telephonic Notification Time Limit to NRC |
| PHMSA F 7100.2 | Natural Gas -Instructions for Completing Form |
| PHMSA F 7000-1 | NGL - Instructions for Completing Form |
| PHMSA F 7100.3 | LNG - Instructions for Completing Form |

# 8.0 Regulatory Citations and Exceptions

## 8.1 Federal Requirements

| Citation | Title |
|---|---|
| 49 CFR 191.3 | Definitions |
| 49 CFR 191.5 | Telephonic Notice of Certain Incidents |
| 49 CFR 191.7 | Addressees for Written Reports |
| 49 CFR 191.15 | Transmission and Gathering System: Incident Report |
| 49 CFR 191.19 | Report Forms |

| Citation | Title |
|---|---|
| 49 CFR 192.605 | Procedural Manual for Operations, Maintenance, and Emergencies |
| 49 CFR 192.615 | Emergency Plans |
| 49 CFR 192.617 | Investigation of Failures |
| 49 CFR 193.2011 | Reporting |
| 49 CFR 193.2515 | Investigation of failures |
| 49 CFR 195.3 | Definitions |
| 49 CFR195.50 | Reporting accidents |
| 49 CFR 195.52 | Immediate notice of certain accidents |
| 49 CFR 195.54 | Accident reports |
| 49 CFR 195.402 | Procedural Manual for Operations, Maintenance, and Emergencies |
| 49 CFR 195.403 | Training |
| 18 CFR 260-260.9 | FERC Statements and Reports |
| 49 CFR 192 Subpart N | Qualification of Pipeline Personnel |
| 49 CFR 193 Subpart H | Personnel Qualifications and Training |
| 49 CFR 195 Subpart G | Qualification of Pipeline Personnel |
| 49 CFR 199 | Drug and Alcohol Testing |

### 8.2 State Requirements

State air quality regulations and permits may impose restrictions and notification requirements when venting gas to atmosphere. The Monitoring Center should be notified when gas is vented to the atmosphere so appropriate notifications can be made.

The Louisiana State Police must be notified within one (1) hour of any release of natural gas, either intentional or not intentional.

## 9.0 Definitions

**Columbia Pipeline Group (CPG)**: CPG companies include Columbia Gas Transmission, LLC; Columbia Gulf Transmission, LLC; Columbia Midstream Group, LLC; and Crossroads Pipeline Company, LLC as well as other pipeline facilities operated by CPG, including Millennium Pipeline Company, LLC, and Hardy Storage Company, LLC.

**Jurisdictional Pipeline:**

1. A transmission or storage pipeline, or,

2. An onshore gathering pipeline that meets the Type A or Type B line and location characteristics below:

| Gathering Line Classification | Line Characteristics | Location Characteristics |
|---|---|---|
| Type A | • Metallic lines with a hoop stress of 20% or more of SMYS based on MAOP<br>• Non-metallic lines with an MAOP more than 125 psig. | Located in Class 2, 3 or 4 location |
| Type B | • Metallic lines with a hoop stress of less than 20% of SMYS based on MAOP<br>• Non-metallic lines with an MAOP of 125 psig or less. | - Located in a Class 3 or 4 location or<br>- Located in an areas within a Class 2 location as determined by any of the following methods:<br>1) Class 2 location (as applicable to transmission lines);<br>2) 300 foot corridor (150 feet each side of line) with more than 10 but less than 46 dwellings within any one continuous mile**;**<br>3) 300 foot corridor (150 feet each side of line) with five or more dwellings within any continuous 1000 feet. |
| **Note:** The definition of an onshore gathering line is set out in Procedure 220.001.038. | | |

## 10.0 Change Log

| Date | Change Location | Change By | Brief Description of Change |
|---|---|---|---|
| 06/22/2015 | | Dave Anderson | Added more 195 references. Fixed several typos and editorial issues. |
| 6/24/2015 | Section 1 & Section 3.2.1 | Greg Lago | Changed wording in Section 1 to clarify that accidents and incidents are reported to the NRC. Updated wording in Section 3.2.1 regarding instances when events do not meet the definition of an incident/accident. |
| 7/7/2015 | Throughout | Juanita Scaggs | Updated to new template, accepted changes, removed reference to NiSource and added hyperlinks. Updated name of the new Alcohol and Drug Plan Administrator. Procedure 220.004.001 Safety Related and Incident Reporting replaced with 220.005.002 Safety Related Conditions Reporting |

| Date | Change Location | Change By | Brief Description of Change |
|---|---|---|---|
| 7/8/2015 | Plan | Mark Newman | Add 195.52 requirement and information on what is a significant event. |
| 7/8/2015 | References | Mark Newman | Added Plan 100.01.02 |
| 7/8/2015 | Throughout | Mark Newman | Format edits |
| 7/14/2015 | Throughout | George Hamaty | Editorial changes throughout the document |
| 8/18/2015 | Section – Telephonic Notice – Numeral 1 | Dennis Cofer | Created hyperlink to Incident Management Plan |
| 9/3/2015 | Throughout | Mark Newman | Formatting and editorial edits. Added hyperlinks to CPG documents and Intranet sites where applicable. |
| 9/3/2015 | References | Mark Newman | Add LNG reference and CPG D&A Plan |
| 9/8/2015 | Section 1 | Greg Lago | Minor clarifications relative to incident reporting wording. |
| 9/16/2015 | Section 7 | Mark Newman | Updated information for D&A post testing as required by CPG D&A Plan. Remove out dated references and posted hyperlink to Corporate D&A site. |
| 9/17/2015 | Scope | Mark Newman | Edits to improve document readability. Review complete. |
| 9/28/15 | | | Edits |

# 11 Review Log

| Review Level (1 or 2) | Review Date |
|---|---|
| 2 | October 1, 2015 |

# Attachment B

Columbia Gas Transmission, LLC

Procedure 310.008.450
LNG Truck Loading Procedure – SOP 1

**PROCEDURE NUMBER: 310.008.450** **RELATED PLAN: 310.16.01**

**MAXIMO JOB PLAN: 310.008.450** **PROCESS OWNER: Compressor**

# LNG Truck Loading Procedure – SOP 1

## Scope:

This Procedure provides instruction on how to load a LNG tanker truck at the Chesapeake LNG Plant.

## Preparation:

**Specialty Tools/Equipment:**

- ☐ Spark proof hammer
- ☐ Portable Gas Detector
- ☐ Personal Gas Monitor

**Prerequisites:**

**The following items MUST be completed or reviewed before beginning this Procedure.**

- ☐ Use portable gas detector to make sure truck loading area is free of flammable fluids before starting truck loading operation.
- ☐ Use personal gas monitors during truck loading operations.
- ☐ Suspend any maintenance activities or vehicular traffic within 25 feet of the truck loading station. Mark off area with orange safety cones after truck is in place and before loading operations begin. Remove orange safety cones prior to allowing the truck leave the Plant.
- ☐ Trucks are prohibited from backing into the Plant at the truck loading area.
- ☐ Do not start the truck's engine during loading operations as it can ignite flammable vapors that may be present during loading operations.
- ☐ Static electricity can be created when LNG is flowing through the hose, which can ignite flammable vapors that may be present during loading operations.
- ☐ Truck loading operations generate pressure that is directed to the LNG tank boiloff line. LNG tank over pressurization can occur if boiloff compressor loading is not correct.
- ☐ Do not exceed design limits for the loading station or the trailer being filled.
- ☐ LNG can create a dangerous spray when disconnecting incompletely drained hoses from the trailer. Completely drain hoses from the trailer before disconnecting.

- ☐ LNG trapped in the truck loading line between the tank and the truck loading station can generate dangerous pressure if not relieved. Relieve pressure between truck loading line and truck loading station.

**Alarms/Set Points**

- ☐ Alarm PSHH-1002 - High pressure shutdown – 60 psig
- ☐ Alarm LSH-1005 - D-105 high level shutdown - 16 inches
- ☐ Maximum Tanker Pressure – 60 psig

## Safety:

Prior to beginning work, review the entire procedure, identify any associated safety hazards, and take appropriate steps to mitigate those hazards.

Review any applicable Safety Data Sheet (SDS, formerly MSDS).

**Special Personal Protective Equipment (PPE):** In addition to a hardhat, safety glasses, hearing protection, gloves, and hard-toe shoes, this Procedure requires the following Special PPE:

- ☐ Coveralls or long sleeved shirt or leather apron
- ☐ Leather sleeves if arms are uncovered
- ☐ Face shield
- ☐ Cold gloves

**Applicable Life Saving Rules**

- ☐ Fall Prevention and Protection
- ☐ Work in Hazardous Atmosphere

**WARNING**

Flammable gases are contained during the normal operation of this plant. Employees must be vigilant in identifying areas where these gases can be found and use measures to prevent a source of ignition in the presence of these gases.

**CAUTION**

LNG can create a dangerous spray when disconnecting incompletely drained hoses from the trailer.

## Procedure Steps:

1. **Fill in date, signature, and initials on "LNG Truck Loading Checklist".**

   1.1 Plant employee(s) who assist with LNG truck loading operations are required to complete the "Date and Signature" section on the LNG Truck Loading Checklist (Exhibit 1).

   1.2 The Lead employee or as assigned by the Plant Supervisor is responsible for obtaining signatures and completion of Maximo related work orders.

2. **Verify Truck Loading Operations.**

   2.1 Confirm with Shift Operator in Control Room or Team Leader that truck loading has been scheduled.

   2.2 Verify with truck driver that tanker loading was scheduled.

3. **Verify Driver Identity.**

   3.1 Request driver to display Commercial Driver License (CDL).

   3.2 Verify the driver's CDL matches the copy provided before truck loading.

4. **Position truck and trailer at LNG Truck Station.**

   4.1 Open and close entrance gate after truck enters the compound.

| **CAUTION** |
| --- |
| Trucks backing in to the loading area is prohibited. |

   4.2 Driver must pull through truck loading station, through the turn around and pull into the truck loading station facing the main gate.

| **CAUTION** |
| --- |
| Starting the truck's engine during loading operations can ignite flammable vapors that may be present during loading operations. |

   4.3 Instruct driver to shut down engine. Remove keys from ignition. Place keys in the custody of the Plant Operator, or designated employee.

**5. Secure and ground trailer for loading operations.**

5.1 Chock wheels on LNG trailer.

| CAUTION |
| --- |
| Static electricity created by the LNG flowing through the hose can ignite flammable vapors that may be present before loading operations. |

5.2 Install ground cable to trailer.

**6. Verify trailer is suitable for LNG service.**

6.1 Verify that the trailer is suitable for, or is in exclusive LNG service, and has a positive pressure.

6.2 Request the driver for documentation that the trailer is suitable for or used exclusively for LNG service and the product that was transported in the trailer before arriving at the facility. If the product was not LNG, ask the driver for documentation that the trailer was emptied of all its contents and purged with nitrogen to less than 2% oxygen.

6.3 Check the pressure gauge on the trailer and verify the pressure is greater than zero.

| NOTE |
| --- |
| Trailers that are not suitable for, or not in exclusive LNG service, and do not have a positive pressure will not be filled. |

6.4 Verify the trailer complies with applicable regulations governing its use. Request documentation from Driver that specifies the plate, certification plate or nameplate provided on the trailer.

| NOTE |
| --- |
| Tank vehicles under the jurisdiction of the U.S. Department of transportation shall comply with the regulations and specifications of that federal agency governing its use |

**7. Verify trailer capacity and monitoring requirements**

7.1 Request documentation from the Driver on the maximum filling volume of the trailer in inches of water and percent full to ensure that expansion of incoming fluid due to warming will not result in overfilling/over pressuring.

7.2 Request the Driver to indicate the amount of inches of water gauge that the trailer will be filled to for road transport. Compare it to the maximum normal filling volume and percent full of the trailer.

**NOTE**

Only trailers equipped with ≤90% tri-cock valve can be loaded. A statement from the trucking company is required listing the trailer's normal maximum filling volume for transport in percent and inches of water, the location of the tri-cock valve, tri-cock valve percent of trailer volume, and the last calibration date for the level gauge.

7.3 Limit the trailer volume to less than 100% of its total volume by monitoring the tri-cock valve and manually terminating the transfer when the trailer reaches the level for road transport.

**NOTE**

The normal maximum filling volume for road transport shall be less than or equal to the tri-cock volume.

7.4 A liquid level (inches of water) gauge on the trailer may be used to determine when the trailer is loaded. A conversion chart provided from the trucking company is used to convert inches of water to trailer volume to determine when the truck is loaded, see Attachment 1. The truck company specifies the liquid level at which the truck is considered normally full for road transport. It is the responsibility of the trucking company to calibrate the Liquid Level Gauge used on the trailer to determine when it is full. It is recommended that gauge calibration occur at intervals not to exceed once per calendar year.

**8. <u>Verify the truck loading system ready for transfer.</u>**

8.1 Purge truck-loading system following procedure 310.018.001 - Purge Truck Loading Pump and Station -SPP-1, if necessary. Verify driver and non-essential personnel are not in the area while this task is performed.

8.2 Verify truck-loading system is ready for operation.

**NOTE**

Purging is necessary if the truck loading station or associated piping have been open to the atmosphere for maintenance.

8.3 Verify the following initial conditions (pre-truck loading pump cool down) before truck loading operations begin:

| Valve | Position | Verify Position | | |
|---|---|---|---|---|
| | | Open | Closed | As Required |
| GLV-114 | CLOSED | | | |
| BFV-1O1 | OPEN | | | |
| RSV-8102 | OPEN | | | |
| BFV-102 | AS REQUIRED | | | |
| BFV-103 | AS REQUIRED | | | |
| BFV-104 | AS REQUIRED | | | |
| BU-7:1201 | AS REQUIRED | | | |
| PI-8l33 IBV | OPEN | | | |
| BFV-1O5 | CLOSED | | | |
| GAV-104 | CLOSED | | | |
| BFV-109 | CLOSED | | | |
| BFV-111 | CLOSED | | | |
| BFV-112 | CLOSED | | | |
| BU-7:1806 | CLOSED | | | |
| BU-7:1808 | CLOSED | | | |
| BU-7:1819 | CLOSED | | | |
| BU-7:1820 | CLOSED | | | |
| IB-24:1802 | OPEN | | | |
| IB-24:1805 | OPEN | | | |
| IB-24:1815 | OPEN | | | |
| IB-24:1818 | OPEN | | | |
| GA-29:1804 | CLOSED | | | |

| Valve | Position | Verify Position | | |
|---|---|---|---|---|
| | | Open | Closed | As Required |
| GA-29:1807 | CLOSED | | | |
| GA-29:1809 | CLOSED | | | |
| BA-98:1825 | CLOSED | | | |
| BA-98:1824 | CLOSED | | | |
| GA-29:1810 | CLOSED | | | |
| GA-29:1813 | CLOSED | | | |
| GA-29:1814 | CLOSED | | | |
| BU-7:1817 | OPEN | | | |
| 1-4 SHUT DOWN "OFF" | CS-19 | | | |
| 1-4 SHUT DOWN "OFF" | CS-20 | | | |
| NO TRUCK LOADING HAZARD | CS-19 | | | |
| NO TRUCK LOADING HAZARD | CS-20 | | | |
| BA-98: 1295 | POSITION AS NEEDED | | | |
| GA-29: 1811 | CLOSED | | | |
| FV-1002 | CLOSED | | | |
| FV-1009 | CLOSED | | | |
| BU-25:1298 | POSITION AS NEEDED | | | |
| LCV-3130 | POSITION AS NEEDED | | | |
| BA-204:12113 | POSITION AS NEEDED | | | |
| BA-204:12116 | POSITION AS NEEDED | | | |
| BA-204:12117 | POSITION AS NEEDED | | | |
| BA-204:12118 | CLOSED | | | |
| PI-8134 IBV | OPEN | | | |

| NOTE |
| --- |
| A record of valve positions before truck loading operations is not considered a maintenance record and retention of the above information is not required. The above table is provided to assist an employee during LNG truck loading operations. |

**9. Cool down the truck loading pump, piping and station.**

9.1 Verify driver and non-essential personnel are not in the area while these tasks are performed.

9.2 Cool down the truck-loading pump following Procedure 310.008.451 LNG Truck Loading Pump Cool Down – SOP 2.

9.3 Cool down the truck-loading pipe and station following Procedure 310.008.452 LNG Truck Loading Station Cool Down – SOP 3.

**10. Pre-Transfer of LNG Operations.**

10.1 Verify the LNG trailer will be filled according to the filling volume percent specified by the truck driver when verifying the trailer capacity.

| NOTE |
| --- |
| Partially filled trailers (except for the heel) shall not be filled. |

10.2 Verify the heel on the trailer, if applicable, contains LNG.

10.3 Verify there is capacity available to receive the transfer. Observe the inches of water on the trailer. Verify the gauge reads between 0-3 inches of water.

10.4 Position Operator and truck driver to inspect the trailer for damage; leaks, cold spots, etc. while LNG transfer operations occur.

10.5 Visually inspect the trailer for large dents.

10.6 Verify the location and accessibility of the trailer's emergency shutdown system.

10.7 Verify that liquid is not leaking from the pressure building coil or any valves or piping on the trailer.

10.8 Verify that the trailer does not have any frost spots.

10.9 Visually inspect the transfer hoses for damage and defects. If the hose contains dents, cuts or deformed fittings that cause you to question the integrity of the hose, replace it with a hose that has been pressure tested, before truck-loading operations begin.

10.10 Suspend vehicular traffic within 25 feet of the truck loading station.

10.11 Notify Operations, Maintenance and any Contractors on site that vehicular traffic is prohibited within 25 feet of the loading station during loading operations.

## 11. Trailer Loading Procedure.

| NOTE |
| --- |
| Operator/Driver shall be in constant attendance during truck loading operations. |

11.1 Verify ESD 1-4 is reset on the HMI screen.

11.2 Operator/driver connects flex hose from BU-7:1806/1808 to liquid fill connection on trailer and driver will open appropriate valves on trailer.

11.3 Operator/driver connects flex hose from BU-7:1819/l820 to vapor vent connection on trailer and driver will open appropriate valves on trailer.

| NOTE |
| --- |
| Not all trailers have crossover valves for trailer cool down. It may be necessary to reverse hose connection on trailer for cool down. |

11.4 Open FV-1009 truck loading vapor block valve at CS-19 and latch.

11.5 Open FV-1002 truck loading liquid block valve at CS-19 and latch.

11.6 Verify GA-29:1804 on truck loading station is closed.

11.7 Open BU-7:1819/1820 and BU-7:1806/1808.

| CAUTION |
| --- |
| Truck loading operations generate pressure that is directed to the LNG tank boiloff line. LNG tank over pressurization can occur if boiloff compressor loading is not correct. |

11.8 Increase capacity of boiloff compressor sufficiently to maintain a maximum LNG storage tank pressure of .85 PSI (23.5”WC) or less.

| CAUTION |
| --- |
| Do not exceed design limits for the loading station or the trailer being filled. Monitor PT-1002 remotely, PI- 1003 and PI-1008 locally for signs of over pressurizing. Be prepared to manually stop loading operations by stopping P-105 and closing FV-1002 before an over |

**CAUTION**

pressuring condition occurs.

11.9 Open BFV-109 and close BFV-112.

11.10 Gravity flow LNG to the trailer until driver indicates that trailer is cooled down.

11.11 Visually inspect the transfer hoses for damage, defects and leaks. Immediately suspend loading operations, if the hose integrity is suspected.

**NOTE**

**If hose connections were reversed for trailer cool down:**

a. Ask driver to close liquid and vapor valves on trailer

b. Close BU-7:1806/1808 (liquid hose)

c. CloseBU-7:18l9/l820 (vapor hose)

d. Close FV-1002 and FV-1009

e. Open GA-29:1807/1809 and BA-98:1824/1825 to drain hoses

f. After hoses have been drained, close GA-29:1807/1809 and BA-98:1824/1825

g. Remove hoses from trailer valves and attach hoses to trailer in accordance with steps in this procedure.

h. Open FV-1009 truck loading vapor block valve at CS-19 and latch.

i. Open FV-10O2 truck loading

j. Open BU-7:1819/1820 and BU-7:1806/1808.

k. Proceed to next step.

11.12 Start P-105.

11.13 Monitor liquid level gauge to determine when trailer has been filled to requested level and the ≤90% tri-cock for overfilling. .

11.14 Only trailers equipped with ≤90% tri-cock valve can be loaded. The normal maximum filling volume shall be less than or equal to the tri-cock volume. The trailer shall be limited to less than 100% of its total volume by monitoring the tri-

cock valve and manually terminating the transfer should the trailer reach that level.

11.15 When trailer has reached the requested level, or the tri-cock indicates the presence of LNG, stop P-105 then close BU-7:1806/1808 (liquid hose),Ask driver to close liquid and vapor valves on trailer

11.16 Open GA-29:1807/1809 and BA-98:1824/1825 to drain hoses.

11.17 Close GA-29:1807/1809 after hose is completely drained of liquid.

| WARNING |
| --- |
| LNG can create a dangerous spray when disconnecting incompletely drained hoses from the trailer. |

11.18 Driver and Plant Operator disconnect hoses from trailer and secure on hose rack.

| WARNING |
| --- |
| LNG trapped in the truck loading line between the tank and the truck loading station can generate dangerous pressure if not relieved |

11.19 Close BFV-109 and open BFV-112 to vent liquid transfer line from P-105 back to S -101 via sparger ring. Leave GAV-104 open to vent P-105.

| WARNING |
| --- |
| LNG trapped in the truck loading line between FV-1002 and BU-7:1806/BU-7:1808 can generate dangerous pressure if not relieved. |

11.20 Open GA-29:l804 to D-105 and leave open until all residual liquid between FV-1002 and BU-7:1806/1808 has vaporized.

**12. <u>Prepare truck for departure from Plant.</u>**

12.1 Disconnect grounding cable and remove chocks.

12.2 Verify that all vapors have dispersed before returning keys to driver and allowing driver to start engine. Use portable gas detector to verify that no flammable vapors are present.

12.3 Close and lock gate after truck has exited the facility.

**13. Secure truck-loading facility.**

13.1 Close FV-1009 after all LNG has vaporized from D-105.

**14. Record in Maximo whether this Procedure is effective, adequate, and fit for the purpose intended. (Yes/No)** *(Required)*

## Documentation Requirements:

- ☐ "LNG Truck Loading Checklist" in Exhibit 1 is used during LNG truck loading operations. Paper copies should be stored at the LNG Plant. Records should be maintained for five (5) years plus the current year.
- ☐ The Company's work management system is used to record truck loading operations. A work order is created be the Lead Employee or as assigned by the Plant Supervisor to document the work. A scan of "Truck Loading Checklist" should be attached to the Maximo work order as a back-up to the Plant copy.

| NOTE |
| --- |
| Avoid using the "Long description" in the Maximo work order. |

## Reference Documents:

**Related Plans**

| Document Number | Document Title |
| --- | --- |
| 310.16.01 | *Transfer of LNG Plan* |

**Related Procedures**

| Document Number | Document Title |
| --- | --- |
| 310.018.001 | *Purge Truck Loading Pump and Station - SPP-1* |
| 310.008.451 | *LNG Truck Loading Pump Cool Down - SOP 2* |
| 310.008.452 | *LNG Truck Loading Station Cool Down - SOP 3* |

**Related Forms**

| Document Number | Document Title |
| --- | --- |
| FRM.310.001 | *Truck Loading Checklist* |

**Other Reference Documents**

49 CFR 193.2505
49 CFR 193.2513
Drawing - 1-12
Drawing - 1-18

## Change Log:

| Date | Change Location | Changed By | Brief Description of Change |
|---|---|---|---|
| 4/2/2014 | Throughout | Mark Newman | Editorial and format changes made to original procedure. |
| 4/2/2014 | Throughout | Randy Shively & Mark Newman | Revised procedure to include steps for filling LNG trailer and means to determine when a trailer is full for transport and to prevent overfilling. |
| 4/4/2014 | Throughout | Juanita Scaggs | Corrected formatting and made minor editorial changes. |
| 4/10/2014 | Sections 1, and 2.3 | Juanita Scaggs | Per legal review, removed CPG from Section 1. Grammatical changes to Sections 2.3 and 2.1 (3rd bullet) |
| 4/11/2014 | Section 2.3 | Mark Newman | Added section for records and how the checklist should be stored with Maximo. (Section 2.3) |
| 4/11/2014 | Section 2.3 | Juanita Scaggs | Accepted changes. |
| 9/12/2015 | Throughout | Troy Harlow | Asked for Valve chart confirmation |
| 9/17/2015 | Valving Chart | T.Harlow | Changed valves and added valves to list |
| 9/22/2015 | Throughout | R. Shivley | Changed <90% to ≤ 90%. Added trailer trucks comply with DOT Regs. Added PT-1002 |
| 9/25/2015 | Reviewed | T.Harlow | No Changes made. |

Exhibit 1

# LNG TRUCK LOADING CHECKLIST

| | | | | | |
|---|---|---|---|---|---|
| **Driver's Name (Print)** | | | **Truck Company** | | **Date of LNG Loading:** |
| **Employee's Name (Print)** | | | **Employee's Signature** | | **Employee's Initials** |
| **Employee's Name (Print)** | | | **Employee's Signature** | | **Employee's Initials** |
| **Employee's Name (Print)** | | | **Employee's Signature** | | **Employee's Initials** |

**Post Loading Verifications**

| Employee's Initials | Step | Description | Comments |
|---|---|---|---|
| | 1 | Verify identity of driver and that truck loading has been scheduled. | |
| | 2 | Open and reclose main entrance gate after truck enters compound. | |
| | 3 | Open secondary gate and instruct driver to pull through truck loading station, through the turn around,and pull back into the truck loading station facing the gate. | |
| | 4 | Instruct driver the shut down engine, remove keys from ignition, and give them to Operator (employee) to secure until loading operations are complete. | |
| | 5 | Chock wheels and connect ground cable to LNG trailer. | |
| | 6 | Verify trailer is equipped with a <90% tri-cock valve. Record tri-cock valve %_____. | **Record Value:** |
| | 7 | Collect copy of statement from the trucking company listing the trailer's normal maximum filling volume in gallons, the location of the tri-cock valve, and tri-cock valve percent of trailer volume. | |
| | 8 | Verify a conversion chart is available from the trucking company that reads or is capable of reading inches of water, gallons, weight in pounds, MSCF. | |
| | 9 | Record last calibration date of inches of water gauge (less than a year). | **Record Date:** |
| | 10 | Verify the trailer is suitable for, or is in exclusive LNG service, and has a positive pressure. | |
| | 11 | Verify the trailer complies with applicable regulations governing its use. | |
| | 12 | Verify maximum filling volume to ensure that expansion of incoming fluid due to warming will not result in overfilling/over pressuring. Record volume provided by Driver. | **Record Volume:** |
| | 13 | Verify thetruck loading system has been checked out, and purged if necessary, in accordance with Procedure 310.008.452 LNG Truck Loading Station Cool Down - SOP 3 and is ready for operation. | |
| | 14 | Suspend vehicle traffic within 25 feet of the truck loading station. | |
| | 15 | Verify LNG Loading Operations can begin. | |

**Pre-Transfer**

| Employee's Initials | Step | Description | Comments |
|---|---|---|---|
| | 15 | Cool down truck loading pump using Procedure Procedure 310.008.451 LNG Truck Loading Pump Cool Down – SOP 2. | |
| | 16 | Cool down truck loading piping and station using 310.008.452 LNG Truck Loading Station Cool Down – SOP 3. | |
| | 17 | Verify that the heel, if applicable, is LNG. | |
| | 18 | Verify that there is available capacity to receive the transfer. | |
| | 19 | Verify the Plant Operator and driver inspected the trailer for damage; leaks, cold spots. etc. | |
| | 20 | Verify Plant Operator visually inspect the transfer hoses for damage and defects. | |

**Trailer Loading Procedure**

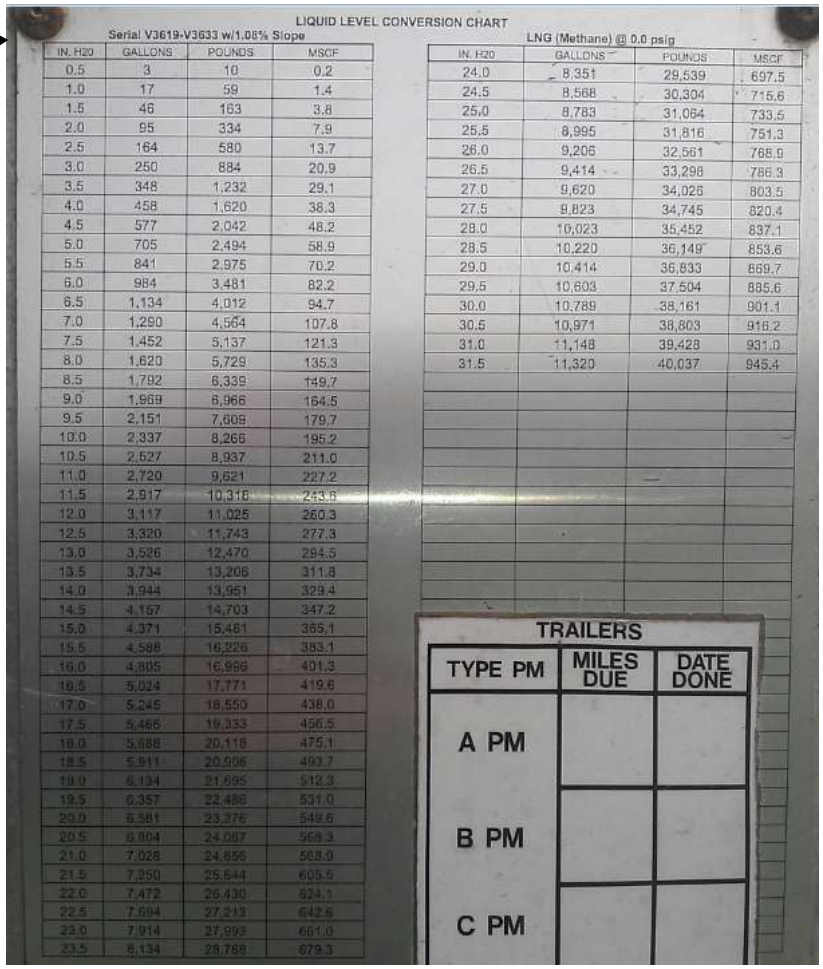
| Employee's Initials | Step | Description | Comments |
|---|---|---|---|
| | 21 | Verify 1-4 is reset on the "SAFE" HMI screen. | |
| | 22 | Assist driver in connecting flex hose from BU-7:1806/1808 to liquid fill connection on trailer and driver will open appropriate valves on trailer. | |
| | 23 | Assist driver in connecting flex hose from BU-7:1819/l820 to vapor vent connection on trailer and driver will open appropriate valves on trailer. | |
| | | **NOTE** | |
| | | **Not all trailers have crossover valves for trailer cool down. It may be necessary to reverse hose connection on trailer for cool down.** | |
| | 24 | Open FV-1009 truck loading vapor block valve at CS-19 and latch. | |
| | 25 | Open FV-10O2 truck loading liquid block valve at CS-19 and latch. | |
| | 26 | Verify GA-29:1804 on truck loading station is closed | |
| | 27 | Open BU-7:1819/1820 and BU-7:1806/1808. | |
| | 28 | Increase capacity of boiloff compressor sufficiently to maintain a maximum LNG storage tank pressure of .85 PSI (23.5"WC) or less. | |
| | 29 | Open BFV-109 and close BFV-112. | |
| | 30 | Gravity flow LNG to the trailer until driver indicates that trailer is cooled down. | |
| | 31 | Visually inspect the transfer hoses for damage, defects and leaks. Immediately suspend loading operations if the hose integrity is suspected. | |
| | | **NOTE** | |
| | | **If hose connections were reversed for trailer cool down:**<br><br>a. Ask driver to close liquid and vapor valves on trailer<br>b. Close BU–7:1806/1808 (liquid hose)<br>c. CloseBU-7:18l9/l820 (vapor hose)<br>d. Close FV-1002 and FV-1009<br>e. Open GA-29:1807/1809 and BA-98:1824/1825 to drain hoses<br>f. After hoses have been drained, close GA-29:1807/1809 and BA-98:1824/1825<br>g. Remove hoses from trailer valves and attach hoses to trailer.<br>h. Open FV-1009 truck loading vapor block valve at CS-19 and latch.<br>i. Open FV-10O2 truck loading liquid block valve at CS-19 and latch. | |
| | 32 | Start P-105 | |
| | 33 | Monitor liquid level gauge to determine when trailer has been filled to requested level and the tri-cock for over filling. . The trailer shall be limited to less than 100% of its total volume by monitoring a tri-cock valve that is less than 90% of trailer volume and manually terminating the transfer should the trailer reach that level. | |
| | 34 | When trailer has reached the requested level, or the tri-cock indicates the presence of LNG, stop P-105 then close BU-7:1806/1808 (liquid hose), BU-7:18l9/l820 (vapor hose), and FV-1002. Leave FV-1009 latched open. Have driver to close | |
| | 35 | Open GA-29:1807/1809 to drain liquid hose into D-105. | |
| | 36 | Close GA-29:1807/1809 after hose is completely drained of liquid. | |
| | 37 | Driver and Plant Operator disconnects hoses from trailer and secure on hose rack. | |
| | 38 | Close BFV-109 and open BFV-112 to vent liquid transfer line from P-105 back to S -101 via sparger ring. Leave GAV-104 open to vent P-105. | |
| | 39 | Open GA-29:l804 to D-105 and leave open until all residual liquid between FV-1002 and BU-7:1806/1808 has vaporized. | |

**Truck Exiting Procedure**

| Employee's Initials | Step | Description | Comments |
|---|---|---|---|
| | 40 | Disconnect grounding cable and remove chocks. | |
| | 41 | Verify flammable vapors have dispersed before returning keys to driver. | |
| | 42 | Clear and verify truck safe exit route out of the plant. Close and lock gate after truck has exited the facility. | |

## Attachment 1

### Example of LNG Trailer Liquid Level Conversion Chart



LIQUID LEVEL CONVERSION CHART

Serial V3619-V3633 w/1.08% Slope

| IN. H20 | GALLONS | POUNDS | MSCF |
|---|---|---|---|
| 0.5 | 3 | 10 | 0.2 |
| 1.0 | 17 | 59 | 1.4 |
| 1.5 | 46 | 163 | 3.8 |
| 2.0 | 95 | 334 | 7.9 |
| 2.5 | 164 | 580 | 13.7 |
| 3.0 | 250 | 884 | 20.9 |
| 3.5 | 348 | 1,232 | 29.1 |
| 4.0 | 458 | 1,620 | 38.3 |
| 4.5 | 577 | 2,042 | 48.2 |
| 5.0 | 705 | 2,494 | 58.9 |
| 5.5 | 841 | 2,975 | 70.2 |
| 6.0 | 984 | 3,481 | 82.2 |
| 6.5 | 1,134 | 4,012 | 94.7 |
| 7.0 | 1,290 | 4,564 | 107.8 |
| 7.5 | 1,452 | 5,137 | 121.3 |
| 8.0 | 1,620 | 5,729 | 135.3 |
| 8.5 | 1,792 | 6,339 | 149.7 |
| 9.0 | 1,969 | 6,966 | 164.5 |
| 9.5 | 2,151 | 7,609 | 179.7 |
| 10.0 | 2,337 | 8,266 | 195.2 |
| 10.5 | 2,527 | 8,937 | 211.0 |
| 11.0 | 2,720 | 9,621 | 227.2 |
| 11.5 | 2,917 | 10,316 | 243.6 |
| 12.0 | 3,117 | 11,025 | 260.3 |
| 12.5 | 3,320 | 11,743 | 277.3 |
| 13.0 | 3,526 | 12,470 | 294.5 |
| 13.5 | 3,734 | 13,206 | 311.8 |
| 14.0 | 3,944 | 13,951 | 329.4 |
| 14.5 | 4,157 | 14,703 | 347.2 |
| 15.0 | 4,371 | 15,461 | 365.1 |
| 15.5 | 4,588 | 16,226 | 383.1 |
| 16.0 | 4,805 | 16,996 | 401.3 |
| 16.5 | 5,024 | 17,771 | 419.6 |
| 17.0 | 5,245 | 18,550 | 438.0 |
| 17.5 | 5,465 | 19,333 | 456.5 |
| 18.0 | 5,688 | 20,118 | 475.1 |
| 18.5 | 5,911 | 20,906 | 493.7 |
| 19.0 | 6,134 | 21,695 | 512.3 |
| 19.5 | 6,357 | 22,486 | 531.0 |
| 20.0 | 6,581 | 23,276 | 549.6 |
| 20.5 | 6,804 | 24,067 | 568.3 |
| 21.0 | 7,028 | 24,856 | 586.9 |
| 21.5 | 7,250 | 25,644 | 605.5 |
| 22.0 | 7,472 | 26,430 | 624.1 |
| 22.5 | 7,694 | 27,213 | 642.6 |
| 23.0 | 7,914 | 27,993 | 661.0 |
| 23.5 | 8,134 | 28,768 | 679.3 |

LNG (Methane) @ 0.0 psig

| IN. H20 | GALLONS | POUNDS | MSCF |
|---|---|---|---|
| 24.0 | 8,351 | 29,539 | 697.5 |
| 24.5 | 8,568 | 30,304 | 715.6 |
| 25.0 | 8,783 | 31,064 | 733.5 |
| 25.5 | 8,995 | 31,816 | 751.3 |
| 26.0 | 9,206 | 32,561 | 768.9 |
| 26.5 | 9,414 | 33,298 | 786.3 |
| 27.0 | 9,620 | 34,026 | 803.5 |
| 27.5 | 9,823 | 34,745 | 820.4 |
| 28.0 | 10,023 | 35,452 | 837.1 |
| 28.5 | 10,220 | 36,149 | 853.6 |
| 29.0 | 10,414 | 36,833 | 869.7 |
| 29.5 | 10,603 | 37,504 | 885.6 |
| 30.0 | 10,789 | 38,161 | 901.1 |
| 30.5 | 10,971 | 38,803 | 916.2 |
| 31.0 | 11,148 | 39,428 | 931.0 |
| 31.5 | 11,320 | 40,037 | 945.4 |

TRAILERS

| TYPE PM | MILES DUE | DATE DONE |
|---|---|---|
| A PM | | |
| B PM | | |
| C PM | | |

Top of Chart


LIQUID LEVEL CONVERSION CHART

Serial V3619-V3633 w/1.08% Slope

| IN. H20 | GALLONS | POUNDS | MSCF |
|---|---|---|---|
| 0.5 | 3 | 10 | 0.2 |
| 1.0 | 17 | 59 | 1.4 |
| 1.5 | 46 | 163 | 3.8 |
| 2.0 | 95 | 334 | 7.9 |
| 2.5 | 164 | 580 | 13.7 |
| 3.0 | 250 | 884 | 20.9 |
| 3.5 | 348 | 1,232 | 29.1 |
| 4.0 | 458 | 1,620 | 38.3 |
| 4.5 | 577 | 2,042 | 48.2 |
| 5.0 | 705 | 2,494 | 58.9 |
| 5.5 | 841 | 2,975 | 70.2 |

LNG (Methane) @ 0.0 psig

| IN. H20 | GALLONS | POUNDS | MSCF |
|---|---|---|---|
| 24.0 | 8,351 | 29,539 | 697.5 |
| 24.5 | 8,568 | 30,304 | 715.6 |
| 25.0 | 8,783 | 31,064 | 733.5 |
| 25.5 | 8,995 | 31,816 | 751.3 |
| 26.0 | 9,206 | 32,561 | 768.9 |
| 26.5 | 9,414 | 33,298 | 786.3 |
| 27.0 | 9,620 | 34,026 | 803.5 |
| 27.5 | 9,823 | 34,745 | 820.4 |
| 28.0 | 10,023 | 35,452 | 837.1 |
| 28.5 | 10,220 | 36,149 | 853.6 |
| 29.0 | 10,414 | 36,833 | 869.7 |

# Attachment C

Columbia Gas Transmission, LLC

Procedure 310.018.001
Purge Truck Loading Pump and Station (SPP-1)

&

Procedure 310.018.005
Absorber Skid Purge Procedure

**PROCEDURE NUMBER: 310.018.001** **RELATED PLAN: 310.18.01**

**MAXIMO JOB PLAN: 310.018.001** **PROCESS OWNER: LNG**

# Purge Truck Loading Pump and Station (SPP-1)

## Scope:

This Procedure provides steps to purge the truck-loading pump and station.

## Preparation:

**Specialty Tools/Equipment:**

- ☐ Portable gas detector
- ☐ Portable oxygen monitor
- ☐ Personal Gas Monitor

**Prerequisites:**

The following items MUST be verified or reviewed before beginning this Procedure.

- ☐ All personal are equipped with personal gas monitors.
- ☐ Eliminate all sources of ignition before the start of purging operations.
- ☐ When required, only steel standpipes shall be used as necessary to vent purge gas above the operational area.
- ☐ Verify the following valve or component positions as part of LOTO plan:

| Valve | Position | Verify Position | |
|---|---|---|---|
| | | Open | Closed |
| LNG tank outlet valve BFV-101 | Closed | | |
| LNG tank ESD valve RSV-8102 | Closed | | |
| LNG tank outlet nozzle vent valve BA98:1295 | Open | | |
| LNG pump inlet header free of LNG | Verify | | |
| LNG pumps P-101/102/103/104/110 free of LNG | Verify | | |
| LNG pump P-105 free of LNG | Verify | | |
| LNG pump Cool down valve BA987:1270 | Closed | | |

| Valve | Position | Verify Position | |
|---|---|---|---|
| | | Open | Closed |
| D-108 inlet valve BA98:1276 | Closed | | |
| BFV-111 | Closed | | |
| BFV-112 | Closed | | |
| P-103 low point drain GLV-103 | Closed | | |
| LOTO P-105 motor starter | Install LOTO Tag | | |
| GLV-114 on tank outlet line | Open | | |
| Remove PI-8134 on tank outlet line and open IBV | Open | | |
| GA69:1272 | Closed | | |
| BA204:12115 | Closed | | |
| BA204:12123 | Open | | |

**NOTE**

Maintain a record of valve positions in the Lockout Tagout Checklist.

☐ Use the appropriate drawings (see References) to highlight the system/identify components to be purged. Indicate where nitrogen (purge medium) will be introduced into the system and the sample points where the purged gas will be vented out. Indicate purge inlets/outlets (endpoints).

☐ Identify the gas being purged and is applicable to this purge procedure.

**Alarms/Set points:**

| Alarm | Set Point % of gas |
|---|---|
| Oxygen concentration for purging into service | 9.7% |
| Flammable gas concentration for purging out of service | 5% |
| Flammable gas concentration for hot work | <0.5% |

## Safety:

Prior to beginning work, review the entire procedure, identify any associated safety hazards, and take appropriate steps to mitigate those hazards.

**Special Personal Protective Equipment (PPE):** In addition to a hardhat, eye protection, gloves, and hard-toe shoes, this Procedure requires the following Special PPE):

☐ "No additional PPE is required."

**Applicable Life Saving Rules**

☐ Authorized Employees Lockout/Tagout

☐ Work in Hazardous Atmosphere

## Procedure:

1. **Purging Out of Service**

1.1 Suspend all operations and maintenance in the purge area

1.2 Verify the following valve positions:

| Valve | Position | Verify Position | |
|---|---|---|---|
| | | Open | Closed |
| P-105 inlet valve BFV-105 | Closed | | |
| P-105 cool down valve GAV-104 | Closed | | |
| P-105 outlet valve BFV-109 | Closed | | |
| D-105 outlet valve BU-7:1817 | Closed | | |
| Station ESD valve FV-1002 | Closed | | |
| BU-1:1806 | Closed | | |
| BU-7 1808 | Closed | | |
| GA29:1807 | Closed | | |
| GA29:1809 | Closed | | |
| GA29:1810 | Closed | | |
| GA29:1811 | Closed | | |
| GA29:1804 | Open | | |

| Valve | Position | Verify Position | |
|---|---|---|---|
| | | Open | Closed |
| GA29:1813 | Closed | | |
| GA29:1814 | Closed | | |
| Station ESD valve FV-1009 | Closed | | |
| IB-24:1805 | Open | | |
| BU-7:1819 | Closed | | |
| BU-7:1820 | Closed | | |
| GLV-114 on tank outlet line | Open | | |
| Remove PI-8134 on tank outlet line and open IBV | Open | | |
| GA69:1272 | Closed | | |
| BA204:12115 | Closed | | |
| BA204:12123 | Open | | |
| P-105 outlet valve BFV-109 | Open | | |
| ESD valve FV-1002 | Open | | |

**NOTE**

Maintain a record of valve positions in the Lockout Tagout Checklist.

1.3 Remove PI-1006 from D-105 outlet line

1.4 Slightly open PI-1006 gauge valve IB-24:1805 and vent pressure from truck loading station (should be less than 1 psi).

1.5 Remove PI-1006 gauge valve IB-24:1805 and install a full port ball valve in its place and close valve.

1.6 Attach a 3’ standpipe with a sample port to the ball valve.

1.7 Open GA29-1804 to D-105

1.8 Attach a nitrogen line to P-103 low point drain GLV-103.

1.9 Slightly open GLV-103 to allow nitrogen to pressurize P-105 discharge line and the truck loading station. Monitor the nitrogen pressure on PI-1003 at the truck loading station.

1.10 When the nitrogen pressure on PI-1003 reaches 30 psi at gauge valve IB-24:1805 open the valve. When pressure on PI-1003 drops to 5 psi, close the valve.

1.11 Repeat nitrogen purge from the truck loading station through the stand pipe sample port. Purge is complete when gas concentration drops to 5%.

1.12 Close valve IB-24:1818 and remove gauge PI-108. Slightly open valve IB-24:1818 and monitor nitrogen venting from valve. Purge is complete when gas concentration drops to 5% of gas.

| NOTE |
| --- |
| A Hot Work Permit is required when flammable gas concentration is <0.5% of gas. |

1.13 Record the gas concentration at endpoint.

2. **Purge into Service.**

2.1. Follow procedure for Purging out of Service outlined in Step 1. Purge is complete when the oxygen content drops to 9.7% of gas or less.

2.2. Record oxygen concentration at endpoint.

3. **Record the following information in the Maximo work order.**

- ☐ Record gas concentration at endpoint.
- ☐ Record oxygen concentration at endpoint.
- ☐ Record the date purging was performed
- ☐ Record the name of the person(s) who performed the purging
- ☐ Record comments or additional records.

3.1. Complete Maximo work order. The actual finished date is the date the purging actually occurred. The Lead Person is the employee responsible for conducting the purge operations.

If just purging into service, only record the oxygen concentration at endpoint.

4. **Record in Maximo whether this Procedure is effective, adequate, and fit for the purpose intended. (Yes/No)** (Required)

## Documentation Requirements:

- ☐ Maintain records in Maximo for a period of not less than five (5) years.
- ☐ Scan Lockout Tagout Checklist and store as part of the Maintenance Record. Maintain original hard copy Lockout Tagout Checklists at the Plant for the calendar year until January 1st of the following year, and then discard.

## Reference Documents:

**Related Plans**

| Document Number | Document Title |
|---|---|
| 110.01.10 | Lockout-Tagout |
| 310.18.01 | Purging LNG Facility Plan |

**Other Reference Documents**

Lockout Tagout Checklist
193.2513 Transfer procedures.
193.2517 Purging.
193.2615 Isolating and purging.
AGA *Purging Principals and Practice*
Drawing 1-12A
Drawing 1-12B
Drawing 1-18

## Change Log:

| Date | Change Location | Changed By | Brief Description of Change |
|---|---|---|---|
| 11/14/2014 | | | Initial upload |
| 9/10/2015 | Throughout | M. Newman | Updated to new procedure template. Added step for fit for purpose and step for Maximo records. |
| 9/10/2015 | References | M. Newman | Added Plan 310.18.01. |
| 9/13/2015 | N/A | T. Harlow | Needs validation of Valves with Team |
| 9/23/2015 | Throughout | M. Newman | Verified procedure follow plan requirements. Added clarity to steps where needed. |
| 9/25/2015 | Prerequisites, Procedure, Step 1 | R. Shivley | Added last 4 valves to list. Revised drawing list. |

| Date | Change Location | Changed By | Brief Description of Change |
|---|---|---|---|
| 10/1/2015 | Procedure, Step 3 | G. Lago | Added date purging was performed and name of person(s) who performed the purging as items to record in Maximo per NOA. |
| 10/1/2015 | Procedure, Step 3 | M. Newman | Added additional Maximo related record information. |

**PROCEDURE NUMBER: 310.018.005** **RELATED PLAN: 310.18.01**

**MAXIMO JOB PLAN: 310.018.005** **PROCESS OWNER: LNG**

# Adsorber Skid Purge Procedure

## Scope:

This Procedure provides the steps for purging operations at the Adsorber Skid.

## Preparation:

**Specialty Tools/Equipment:**

- ☐ Portable Gas Detector
- ☐ Portable Oxygen Monitor
- ☐ Personal Gas Monitor

**Prerequisites:**

**The following items MUST be verified or reviewed before beginning this Procedure.**

- ☐ Feed gas pretreatment system shut down and depressurized.
- ☐ Applicable personal are equipped with personal gas monitors.
- ☐ Eliminate all sources of ignition before the start of purging operations.
- ☐ When required, only steel standpipes shall be used as necessary to vent purge gas above the operational area.
- ☐ Use the appropriate drawings (see References) to highlight the system/identify components to be purged. Indicate where nitrogen (purge medium) will be introduced into the system and the sample points where the purged gas will be vented out. Indicate purge inlets/outlets (endpoints).
- ☐ Identify the gas being purged and is applicable to the purge procedure.

**Alarms/Set points:**

| Alarm | Set Point<br>% of gas |
|---|---|
| Oxygen concentration for purging into service | 9.7% |
| Flammable gas concentration for purging out of service | 5% |
| Flammable gas concentration for hot work | <0.5% |

## Safety:

Prior to beginning work, review the entire procedure, identify any associated safety hazards, and take appropriate steps to mitigate those hazards.

**Special Personal Protective Equipment (PPE):** In addition to a hardhat, eye protection, gloves, and hard-toe shoes, this Procedure requires the following Special PPE):

☐ "No additional PPE is required."

**Applicable Life Saving Rules**

☐ Authorized Employees Lockout/Tagout

☐ Work in Hazardous Atmosphere

# Procedure:

1. **Purge out of service**.

1.1. Position the following valves and "lock and tag out" :

| Valve | Position | Verify Position | |
|---|---|---|---|
| | | Open | Closed |
| BA18-005, inlet to FIL-101 | Closed | | |
| FV-101, inlet to FIUL-101 | Closed | | |
| HV:0003, FIL-101 vent | Open | | |
| HV-0004, FIL-101 vent valve | Open | | |
| BA1-006, nitrogen to FIL-101 | Closed | | |
| BA18-013, outlet of FIL-101 | Closed | | |
| BA18-014, outlet of FIL-101 | Closed | | |
| BA191:0231, inlet of FIL-102 | Closed | | |
| GL15-116, hot gas to D-102 | Closed | | |
| GA8-146, heavy liquids into D-102 | Closed | | |
| BA190:0118, regen gas from D-102 | Closed | | |
| BA180:0152, regen gas from D-102 | Closed | | |
| BA182:0122, D-102 vent | Open | | |
| BV1-128, Regen line vent valve | Open | | |
| BV1-121, D-102 vent valve | Open | | |
| FCV-103, regen flow control valve | Closed | | |

| Valve | Position | Verify Position | |
|---|---|---|---|
| | | Open | Closed |
| BA18-309, feed gas to cold box | Closed | | |
| GA14-339, cold box vent | Closed | | |
| GA14-314, cold box vent | Closed | | |
| GA14-317, cold box vent | Open | | |
| BA18-125, start-up gas | Closed | | |
| BA1-303, NG to refrigerant loading | Closed | | |
| BA18-305, Derime to C-201 | Closed | | |
| BA18-304, vent | Open | | |

**NOTE**

Maintain a record of valve positions in the Lockout Tagout Checklist.

1.2. Close BA190:0218 and remove PSV 103C on top of adsorber vessel D-101 C

1.3. Close BA190:0219 and remove PSV-103B on top of adsorber vessel D-101 B

1.4. Close BA190:0220 and remove PSV-103A on top of adsorber vessel D-101 A

**NOTE**

If vent pipe does not provide sufficient length to provide 6 feet between the platform and the tip of the pipe, A stand pipe will be necessary

1.5. Position the following valves in the "Open" position:

- ☐ BA190:0218 on top of adsorber vessel D-101 C.
- ☐ BA190:0219 on top of adsorber vessel D-101 B.
- ☐ BA190:0220 on top of adsorber vessel D-101 A.

1.6. Cycle the adsorber skid to ensure that there is no gas trapped in other sections of the regeneration gas piping, and then close ¼ turn ball valves on top of D-101 A, D-101 B, and D-101 C.

1.7. Insert a skillet blind in between the flanges at:

- ☐ Lines 0214 and 0215 at the bottom of D-101 A
- ☐ Lines 0216 and 0244 at the bottom of D-101
- ☐ Lines 0217 and 0218 at the bottom of D-101 C

- ☐ Line 0206 and FV-105 on D-101 A
- ☐ Line 0205 and FV-104 on D-101 A
- ☐ Line 0201 and FV-103 on D-101 A
- ☐ Lines 0208 and FV-108 on D-101 B
- ☐ Lines 0207 and FV-107 on D-101 B
- ☐ Lines 0203 and FV-106 on D-101 B
- ☐ Line 0210 and FV-111 on D-101 C
- ☐ Line 0209 and FV-1111 on D-101 C
- ☐ Line 0204 and FV-109 on D-101 C

**2. Purge D-101 A out of service.**

2.1. Install a nitrogen hose on BA183:0248 on the bottom of D-101 A

2.2. Open BA183:0248 and pressure D-101 A until the pressure gauge PI-109 on top of D-101 A reaches 45 psig.

2.3. Close GA22-205 and open BA190:0220 on top of the adsorber and allow the pressure to fall to approximately 5 psig. Repeat this operation 6 times. At the end of the 6th blow down, use a flammable gas detector to sample the nitrogen venting from the stand pipe. Repeat until the flammable gas concentration in the nitrogen purge is less than 5% of gas. Purge is complete when gas concentration below 5%.

| NOTE |
| --- |
| A Hot Work Permit is required when flammable gas concentration is <0.5% of gas. |

**3. Purge D-101 B out of service.**

3.1. Install a nitrogen hose on BA183:0206 at the bottom of D-101 B

3.2. Open BA183:0206 and pressure D-101 B until the pressure gauge PI-109 on top of D-101 B reaches 45 psig.

3.3. Close BA183:0206 and open BA190:0219 on top of the adsorber and allow the pressure to fall to approximately 5 psig. Repeat this operation 6 times. At the end of the 6th blow down, use a flammable gas detector to sample the nitrogen venting from the stand pipe. Repeat until the flammable gas concentration in the nitrogen purge is less than 5% of gas. Purge is complete when gas concentration is below 5%.

| NOTE |
| --- |
| A Hot Work Permit is required when flammable gas concentration is <0.5% of gas. |

4. **Purge D-101 C out of service.**

4.1. Install a nitrogen hose on BA183:0250 at the bottom of D-101 C

4.2. Open BA183:0250 and pressure D-101 C until the pressure gauge PI-109 on top of D-101 C reaches 45 psig.

4.3. Close BA183:0250 and open BA190:0220 on top of the adsorber and allow the pressure to fall to approximately 5 psig. Repeat this operation 6 times. At the end of the 6th blow down, use a flammable gas detector to sample the nitrogen venting from the stand pipe. Repeat until the flammable gas concentration in the nitrogen purge is less than 5% of gas. Purge is complete when gas concentration is below 5%.

| NOTE |
| --- |
| A Hot Work Permit is required when flammable gas concentration is <0.5% of gas. |

| NOTE |
| --- |
| Because the desiccant is slow to release gas trapped within, it will take longer to purge a vessel full of desiccant than an empty vessel. |

5. **Record the gas concentration at end point.**

5.1. D-101 A

5.2. D-101 B

5.3. D-101 C

6. **Purge into Service.**

6.1. Follow procedure for Purging out of Service in steps in 2, 3, and 4. Purge is complete when Oxygen content drops to 9.7% of gas or less.

7. **Record oxygen concentrations at end points.**

7.1. D-101 A.

7.2. D-101 B.

7.3. D-101 C.

8. **Record the following information in the Maximo work order.**

- ☐ Record D-101 A gas concentration at endpoint.
- ☐ Record D-101 B gas concentration at endpoint.
- ☐ Record D-101 C gas concentration at endpoint.
- ☐ Record D-101 A oxygen concentration at endpoint.
- ☐ Record D-101 B oxygen concentration at endpoint.

- ☐ Record D-101 C oxygen concentration at endpoint.
- ☐ Record the date purging was performed
- ☐ Record the name of the person(s) who performed the purging
- ☐ Record comments or additional records.

8.1. Complete Maximo work order. The actual finished date is the date the purging actually occurred. The Lead Person is the employee responsible for conducting the purge operations.

If just purging into service, only record the oxygen concentration at endpoint.

9. **Record in Maximo whether this Procedure is effective, adequate, and fit for the purpose intended. (Yes/No)** (*Required*)

## Documentation Requirements:

- ☐ Maintenance records are stored in Maximo for a period of not less than five (5) years
- ☐ Scan Lockout Tagout Checklists are stored as part of the Maintenance Record. Original hard copy Lockout Tagout Checklists should be maintained for the calendar year until January 1 of the following year, and then discarded.

## Reference Documents:

### Related Plans

| Document Number | Document Title |
|---|---|
| 110.01.10 | Lockout-Tagout |
| 310.18.01 | Purging LNG Facility Plan |

### Other Reference Documents

Lockout Tagout Checklist
193.2517 Purging.
193.2615 Isolating and purging.
AGA *Purging Principals and Practice*
Drawing 1-0
Drawing 1-1
Drawing 1-2
Drawing 1-3

## Change Log:

| Date | Change Location | Changed By | Brief Description of Change |
|---|---|---|---|
| 9/21/2015 | Throughout | R. Shivley | Changes due to valve numbering changes. |
| 9/28/2015 | Procedure Steps 1,2,3,4,6, and 8 | M. Newman | Provide table for valve position used for lockout Tagout checklist, and additional edits. |
| 9/28/2015 | Documentation | M. Newman | Edits made by Greg Lago were accepted. |
| 10/1/2015 | Procedure Step 8 | G. Lago | Added date purging was performed and name of person(s) who performed the purging as items to record in Maximo per NOA. |
| 10/1/2015 | Procedure, Step 8 | M. Newman | Added additional Maximo related record information. |

# Attachment D

Columbia Gas Transmission, LLC

Operations and Maintenance Plan 310.26.01
Support Systems Plan

&

Procedure 310.026.001
Support System Inspection Procedure

**PLAN NUMBER:** 310.26.01

**RELATED POLICY:**
**PROCESS OWNER:** Compressor

# Support Systems Plan

## Scope

This Plan sets forth the requirements for performing inspection on support systems at the Chesapeake LNG Plant. Support components or systems that are subject to atmospheric corrosion receive inspections in accordance with Plan 310.42.01 and Procedure 310.042.001 and are not covered in this Plan.

## Safety

The Company is committed to public and employee safety. Employees are to perform their duties with the utmost regard for safety at all times. Review Company safety policies and procedures, as well as any applicable Job Hazard Assessments as necessary.

### Operator Qualification

All persons performing tasks covered by 49 CFR 192, Subpart N shall be qualified according to the Company Operator Qualification Plan. All persons performing tasks covered by 49 CFR 193 Subpart F shall have successfully completed the LNG Facility Training Plan.

## Plan

1. Foundations and pipe supports of each component in the facility shall be inspected for detrimental change that could impair the support of the component.
2. Foundation and pipe support inspections shall be conducted once each year, not to exceed 18 months
3. LNG storage tank pilings, pile cap and other concrete support systems shall be inspected for:
   - ☐ Cracking
   - ☐ Spalling
   - ☐ Delamination
   - ☐ Pattern cracking
   - ☐ Surface deterioration
4. Each steel support system will be examined for:
   - ☐ Any crack in any weld or connection.

- ☐ Deflection of any beam
- ☐ Broken anchor bolts in base
- ☐ Missing or deteriorated grout
- ☐ Cold transfer from cryogenic lines, as applicable

5. Wooden support systems will be inspected for:
   - ☐ Cracking
   - ☐ Checking
   - ☐ Beam Deflection
   - ☐ Bolted Connections
   - ☐ Deterioration
   - ☐ Infestation
6. Record inspections following *Procedure 310.026.001 - Support System Inspection*. Any re-inspections should be recorded using the same procedure.
7. Any crack or other material defect that impairs the structural integrity or reliability of an LNG facility must be reported to the Monitoring Center.

| NOTE |
| --- |
| These conditions may be considered a Safety Related Condition and may be required to be reported in accordance with *Plan 220.05.02 - Safety Related Conditions-Reporting and Investigating Requirements*. |

8. Detrimental conditions or detrimental changes to the condition of foundations and support systems found as the result of the inspection will be reported to Engineering Services. Engineering Services will determine the significance of the conditions and, where necessary, will determine further actions and the timeframe(s) for further actions.

## Responsibilities

### Team Leader

Team Leader is responsible for the implementation of this plan. Team Leader is responsible for assuring identified repairs are corrected.

### Team Member

Assigned employees are responsible for completing and documenting the inspection. Employees are responsible for reporting any repairs that may be necessary from the inspection.

### Support Staff

Engineering Services will provide support in the implementation of this plan, as necessary, including assistance with repairs and providing guidance in determining if anomalies found on support systems constitute a safety related condition. In the event of a safety related condition, engineering support will provide support as necessary.

Monitoring Center will make the necessary contacts to Company Representatives for a Safety Related Condition as per *Plan 220.05.02 - Safety Related Conditions-Reporting and Investigating Requirements*.

## Documentation Requirements:

| Record/Form Name | Storage Location | Retention Requirement (years) |
|---|---|---|
| Maximo Job Plan 310.001.007 and 310.026.001 | Maximo | Operations monitoring records, inspections, tests and investigations required by 49 CFR Part 193 Subpart G, shall be maintained for a period of not less than 5 years. |

## References

### Related Plan Documents

| Plan Number | Title |
|---|---|
| 220.05.02 | Safety Related Conditions-Reporting and Investigating Requirements |
| 310.44.02 | Training Plan |

### Related Procedure Documents

| Procedure Number | Title |
|---|---|
| 220.005.002 | Safety Related Conditions Reporting |
| 310.026.001 | Support System Inspection |

## Regulatory Citations and Exceptions

### Federal Requirements

| Citation | Title |
|---|---|
| 49 CFR 191.23 | Reporting Safety-Related Conditions |
| 49 CFR 193.2605 | Maintenance Procedures |
| 49 CFR 193.2609 | Support Systems |
| 49 CFR 193.2639 | Maintenance Records |

## Definitions:

**LNG Facility**: A pipeline facility used for liquefying natural gas or synthetic gas or transferring, storing, or vaporizing liquefied natural gas
Safety Related Condition:

1. Unintended movement or abnormal loading by environmental causes, such as an earth quake, landslide, or flood, that impairs the structural integrity or reliability of an LNG facility that contains, controls, or processes gas or LNG.
2. Any crack or other material defect that impairs the structural integrity or reliability of an LNG facility that contains, controls, or processes gas or LNG
3. Any malfunction or operating error that causes the pressure of an LNG facility that contains or processes gas or LNG to rise above its maximum working pressure plus the build-up allowed for operation of pressure limiting or control devices.
4. A leak in an LNG facility that contains or processes gas or LNG that constitutes an emergency.
5. Inner tank leakage, ineffective insulation or frost heave that impairs the structural integrity of an LNG storage tank
6. Any safety related condition that could lead to an imminent hazard and causes (either directly or indirectly by remedial action or the operator) a shutdown of an LNG facility that contains or processes gas or LNG

## Change Log:

| Date | Change Location | Changed By | Brief Description of Change |
|---|---|---|---|
| 2/26/2015 | Throughout | M. Newman | Put in new Plan template. |
| 2/26/2015 | Plans | M. Newman | Add step #6 |
| 2/26/2015 | References | M. Newman | Procedure 310.001.007 renumbered to 310.026.001. |
| 3/13/2015 | OQ | Paul Shaffer | Minor wording addition |
| 4/16/2015 | Scope | R. Shivley | Added reference to atmospheric corrosion |
| 4/22/2015 | Throughout | M. Newman | Accepted edits and finalize review. Send to Technical Writer for final prep and approval. |
| 5/19/2015 | Throughout | J. Scaggs | Prepared for approval. |
| 9/12/2015 | Throughout | T.Harlow | Minor Editorial changes |
| 9/28/2015 | Plan Section | G. Lago | Added information regarding Engineering Services review of inspection results. |

**PROCEDURE NUMBER:310.026.001** **RELATED PLAN: 310.26.01**

**MAXIMO JOB PLAN: 310.026.001** **PROCESS OWNER: Compressor**

# Support System Inspection Procedure

## Scope:

This procedure provides the steps to inspect the support system or foundation of components at the Chesapeake LNG facility for detrimental change that could impair support. Support components or systems subject to atmospheric corrosion inspections are covered in Plan 310.42.01 - Chesapeake LNG Facility Corrosion Control and Procedure 310.042.001 - LNG Non Gas Bearing Inspection – Atmospheric Corrosion and are not covered in this Procedure.

| NOTE |
| --- |
| Notice of the presence of unintended movement or abnormal loading, cracks or material defects, or corrosion, on any component may be considered a safety related condition and reported under Procedure 220.005.002 - *Safety Related Condition Reporting*. |

## Preparation:

**Operator Qualification(s) Required:**

- ☐ All persons performing tasks covered by 49 CFR 193 shall have successfully completed the LNG Facility Training Plan.

**Specialty Tools/Equipment:**

- ☐ Feeler Gauge

## Safety:

Prior to beginning work, review the entire procedure, identify any associated safety hazards, review any applicable Safety Data Sheet (SDS, formerly MSDS), and take appropriate steps to mitigate those hazards.

**Special Personal Protective Equipment (PPE):** In addition to a hardhat, safety glasses, hearing protection, gloves, and hard-toe shoes, this Procedure requires the following Special PPE:

- ☐ "No additional PPE is required"

**Applicable Life Saving Rules**

- ☐ Work in Hazardous Atmosphere
- ☐ Fall Prevention and Protection

## Procedure Steps:

**1. Inspect each LNG Storage Tank pile.**

1.1. Inspect each pile looking for cracks, spalling, delamination, pattern cracking, pop-outs, and surface deterioration.

1.2. Report cracks greater than 0.004" width and 5/16" in length to Engineering Services.

1.3. Report spalling of greater than 10% of the surface area, or a single area that exposes reinforcement steel to Engineering Services.

1.4. Report any delamination found to Engineering Services.

1.5. Report pattern cracking covering an area greater than 36 square inches in any one spot on any piling to Engineering Services.

1.6. Pop-outs should be barely noticeable. Report pop-outs greater than two square inches, or that expose reinforcement steel to Engineering Services.

1.7. Observe the surface for indications that the cement is starting to powder and become disbonded from the aggregate. Look for signs of erosion of the concrete surface. Look for signs of rust stain that may indicate that water has infiltrated to concrete causing the reinforcement steel to corrode. Report loss of surface material greater than 1/8" in depth to Engineering Services.

**2. Inspect each pile cap.**

2.1. Inspect pile cap for cracks, spalling, delamination, pattern cracking, Pop-Outs, and surface deterioration.

2.2. Report cracks greater than 0.004" width and 5/16" in length to Engineering Services.

2.3. Report spalling of greater than 10% of the surface area, or a single area that exposes reinforcement steel to Engineering Services.

2.4. Report any delamination found to Engineering Services.

2.5. Report pattern cracking covering an area greater than 36 square inches in any one spot on any piling to Engineering Services.

2.6. Pop-outs should be barely noticeable. Report pop-outs greater than six square inches, or that expose reinforcement steel to the Engineering Services.

2.7. Check the surface for indications that the cement is:

- ☐ Starting to powder and becoming disbonded from the aggregate,
- ☐ Signs of erosion on the concrete surface

- ☐ Signs of rust stain that may indicate that water has infiltrated to concrete causing the reinforcement steel to corrode.
- ☐ Lost surface material

2.7.1. Report findings to Engineering Services.

2.7.2. Loss of surface material greater than 1/4" in depth must be reported Engineering Services.

2.8. Check the top of the pile cap where the hold-down straps go through the pile cap. Look for signs of missing or deteriorated grout. Replace missing or deteriorated grout provided there are no signs of corrosion on the strap. If corrosion is found, report findings to Engineering Services.

2.9. The pile cap was poured in four (4) separate sections. Check "keyed" areas at the interface of each section and look for signs of separation. Report any signs of separation to Engineering Services.

**3. <u>Inspect each concrete support.</u>**

3.1. Inspect concrete supports for cracks, spalling, delamination, pattern cracking, pop-outs, and surface deterioration.

3.2. Report cracks greater than 0.004" width and 5/16" in length to Engineering Services.

3.3. Report spalling of greater than 10% of the surface area, or a single area that exposes reinforcement steel to Engineering Services.

3.4. Report any delamination found to Engineering Services.

3.5. Report pattern cracking covering an area greater than 36 square inches in any one spot on any piling to Engineering Services.

3.6. Pop-outs should be barely noticeable. Report pop-outs greater than six square inches, or that expose reinforcement steel to the Engineering Services.

3.7. Check the surface for indications that the cement is:

- ☐ Starting to powder and becoming disbonded from the aggregate,
- ☐ Signs of erosion on the concrete surface
- ☐ Signs of rust stain that may indicate that water has infiltrated to concrete causing the reinforcement steel to corrode.
- ☐ Note any honeycombing that may be present.
- ☐ Lost surface material

3.8. Report loss of surface material greater than 1/2" in depth or the presence of rust staining to Engineering Services.

**4. Inspect each steel support.**

4.1. Inspect steel supports for cracks in welds or connections, deflection, broken anchor bolts, and missing or deteriorated grout.

4.2. Check for cracks in welds or connections. Report cracks in welds or connections to Engineering Services.

4.3. Deflection of any beam should be barely noticeable. Report to Engineering Services any deflections in beams that are readily apparent.

4.4. Check the base for broken anchor bolts. Report broken anchor bolts to Engineering Services.

4.5. Grout under the support system or foundation may have a decorative edge formed at a 45° angle. Missing pieces of the decorative edge is not detrimental to the effectiveness of the grout. Should the grout under the support system or foundation be missing or deteriorate it must be replaced.

| NOTE |
| --- |
| Following the requirements in Procedure 310.042.001 - LNG Non Gas Bearing Inspection – Atmospheric Corrosion to conduct atmospheric corrosion inspections. |

**5. Inspect wooden pilings.**

5.1. Inspect wooden pilings for cracks, longitudinal cracks, beam deflection, bolt connection, deterioration, or infestation.

5.2. Check piling for circumferential cracks. Report cracks to Engineering Services.

5.3. Check for longitudinal cracks greater than 1/4” width and greater than 6” in length. Report cracks found to Engineering Services.

5.4. Deflection of any beam should be barely noticeable. Report to Engineering Services any deflections in beams that are readily apparent.

5.5. Verify that all bolts are in place and bolted connections are tight. Replace and tighten broken, missing or loose connections.

5.6. Report deterioration of any one area greater than nine square inches or 10% of the beam must be reported to Engineering Services.

5.7. Report any infestation by boring organisms to Engineering Services.

**6. Report findings discovered during the inspection.**

6.1. Create a Maximo follow-up work order for each corrective action discovered by this inspection.

7. **Record (Yes/No) for the following Support System Inspections (310.026.001) in Maximo work order.** (*All Steps in this section are Required*)

    7.1. LNG Storage Tank pile: Were any reportable cracks, spalling, delamination, pattern cracking, pop-outs, or surface deterioration of discovered?

    7.2. Pile cap: Were any reportable cracks, spalling, delamination, pattern cracking, Pop-Outs, or surface deterioration discovered?

    7.3. Concrete support: Were any reportable cracks, spalling, delamination, pattern cracking, pop-outs, or surface deterioration discovered?

    7.4. Steel support: Were any cracks in welds or connections, deflection, broken anchor bolts, and missing or deteriorated grout discovered?

    7.5. Wooden Pilings: Were any reportable cracks, longitudinal cracks, beam deflection, bolt connection, deterioration, or infestation discovered?

8. **Support System inspection follow-up action.**

    8.1. If the inspection results is a "Yes" response to any of the questions to Support System inspection in questions 7.1 to 7.5, setup meeting with the appropriate Engineering Services to conduct a field visit and inspect the Support Systems within 45 days.

    8.2. Engineering Services will determine if any follow-up or remedial actions are necessary. Engineering Services will assign timeframes for each additional action required.

    8.3. Enter the date of the meeting.

    8.4. Describe any additional actions required and timeframes for completion.

9. **Record in Maximo whether this Procedure is effective, adequate, and fit for the purpose intended. (Yes/No)** (*Required*)

## Reference Documents:

### Related Plans

| Document Number | Document Title |
|---|---|
| 310.26.01 | Support Systems |
| 220.05.02 | Safety Related Conditions-Reporting and Investigating Requirements |
| 310.42.01 | Chesapeake LNG Facility Corrosion Control |

### Related Procedures

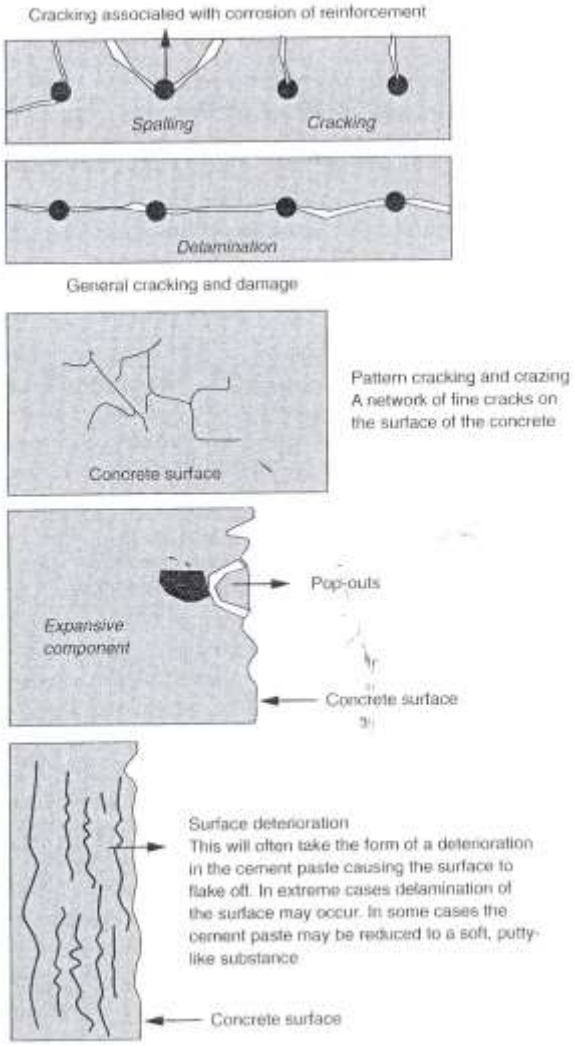
| Document Number | Document Title |
|---|---|
| 220.005.002 | Safety Related Condition Reporting |
| 310.042.001 | LNG Non Gas Bearing Inspection – Atmospheric Corrosion |

**Other Reference Documents**

49 CFR Part 191.23

49 CFR Part 193 Subpart G 193.2605

American Concrete Institute Guide for Concrete Inspection




## Change Log:

| Date | Change Location | Changed By | Brief Description of Change |
|---|---|---|---|
| 10/26/2013 | Section 1, 5, 7, 10 | M. Newman | Editorial and format changes. |
| 10/29/2013 | Throughout | J. Scaggs | Corrected formatting. |

| Date | Change Location | Changed By | Brief Description of Change |
|---|---|---|---|
| 2/27/2015 | Throughout | M. Newman | Renumber document to 310.026.001. Restructured to new procedure template. |
| 3-31-2015 | Scope, Plans, Procedures | R. Shivley | Addressed atmospheric corrosion and added corrosion plan and procedure numbers |
| 3/31/2015 | Throughout | M.Newman | Final edits to procedure to format to new template. |
| 5/6/2015 | Throughout | J. Scaggs | Accepted changes and made minor corrections to template and created links to documents in SharePoint. |
| 9/9/2015 | Steps 7 & 8 | M. Newman | Steps 7 is new. Updated Step 9 – fit for purpose according to new procedure template. |
| 9/13/2015 | Throughout | T.Harlow | Added “reportable” as a qualifier to criteria to notify Engineering Services in section 7. Changed reference to 8.1 thru 8.5 to 7.1 and 7.5 to reflect changes previously made. |
| 9/22/2015 | Section 7 | R. Shivley | Added exception for atmospheric corrosion. |
| 9/28/2014 | Section 8 | G. Lago | Proposed language regarding Engineering Services review of findings and timeframes for required actions. |

# Attachment E

Columbia Gas Transmission, LLC

Procedure 310.001.025
Refrigerant Hose Maintenance Procedure

**PROCEDURE NUMBER: 310.001.025** **RELATED PLAN: 310.01.01**
**MAXIMO JOB PLAN: 310.001.025** **PROCESS OWNER: LNG**

# Refrigerant Hose Maintenance Procedure

## Scope:

This Procedure is used to conduct maintenance on refrigerant hoses.

## Preparation:

**Specialty Tools/Equipment:**

- ☐ Pressure Test Chart
- ☐ Pressure Test Gauge
- ☐ Temperature Gauge

**Materials Needed:**

- ☐ High pressure nitrogen cylinder
- ☐ High pressure regulator
- ☐ Pressure test stand

## Safety:

Prior to beginning work, review the entire procedure, identify any associated safety hazards, review any applicable Safety Data Sheet (SDS, formerly MSDS), and take appropriate steps to mitigate those hazards.

**Special Personal Protective Equipment (PPE):** In addition to a hardhat, safety glasses, hearing protection, gloves, and hard-toe shoes, this Procedure requires the following Special PPE):

- ☐ No additional PPE is required

**Applicable Life Saving Rules:**

- ☐ Authorized Employees Lockout/Tagout

**WARNING**

Flammable gases are contained during the normal operation of this plant. Employees must be vigilant in identifying areas where these gases can be found and use measures to prevent a source of ignition in the presence of these gases.

## Procedure Steps:

| NOTE |
| --- |
| Refrigerant hose is a flexible pipe member connected between a product container (in this case a refrigerant container) and fixed piping. Refrigerant hoses are generally rated for cryogenic temperature where applicable, made of flexible accordion type (corrugated type) inner hose (fluid carrying), and made with a braided stainless steel mesh outer jacket that protects the inner hose and provides a degree of strength to the overall hose design.<br><br>Refrigerant hoses can deteriorate from a number of causes including abrading damage due to wear, thread damage after repeated use, or kink damage due to misuse. |

1. **Routine Hose Inspection**

    1.1. Visually inspect refrigerant hose before every use to assure, they are free of any damage or defect.

    1.2. A Maximo work order is not required for routine hose inspection unless repairs or replacements are required.

    1.3. Create a Maximo work order to document any repairs or replacements.

| CAUTION |
| --- |
| Hose repair may require the use of sharp edged tools (file for removing burrs off end fittings). |

2. **Annual Hose Inspection**

    2.1. Verify hoses are marked for the specific refrigerant service.

    2.2. Verify hoses are rated for applicable refrigerant temperature and pressure.

    2.3. Verify hoses are free of defect and damage.

    2.4. Create a follow-up work order to document any repairs or replacements.

    2.5. Pressure test each refrigerant hose used at the propane/ iso-butane/ iso-pentane loading station to a pressure of 300 psig.

    2.6. Pressure test refrigerant hoses used at the ethylene loading station to 1000 psig.

    2.7. Pressure test hoses in accordance with Plan 310.34.02 - Pressure Testing LNG Process Piping.

3. **Required records for "Annual Inspection"**

   3.1. Create a Maximo work order with the description "Refrigerant Hose Maintenance Inspection" using Job Plan 310.001.025 Refrigerant Hose Maintenance Procedure.

   3.2. Enter the following required data in the actuals tab of the Maximo work order:

   1. Final test pressure for refrigerant hose used at the propane/ iso-butane/ iso-pentane loading station (psig). (XXX)
   2. Final test pressure for refrigerant hoses used at the ethylene loading station (psig). (XXXX)

4. **Record in Maximo whether this Procedure is effective, adequate, and fit for the purpose intended. (Yes/No) (Required)**

# Reference Documents:

## Related Plans

| Document Number | Document Title |
|---|---|
| 310.01.01 | Maintenance Procedures |
| 310.42.01 | Pressure Testing LNG Process Piping |

## Regulatory Citations and Exceptions

### Federal requirements

| | |
|---|---|
| 49 CFR 193.2621 | Testing Transfer Hoses |

# Change Log:

| Date | Change Location | Changed By | Brief Description of Change |
|---|---|---|---|
| 10/29/2013 | Throughout | M. Newman | Format and editorial changes to the document. |
| 10/29/2013 | Throughout | T. Harlow | Editorial Changes |
| 12/16/2013 | Throughout | M. Newman | Minor edits |
| 12/19/2013 | Throughout | J. Scaggs | Corrected formatting and made editorial changes. |
| 2/26/2015 | Throughout | M. Newman | Put procedure into new template and added step for Maximo verification. Update NFPA reference. |

| Date | Change Location | Changed By | Brief Description of Change |
|---|---|---|---|
| 2-27-2015 | Through | R. Shivley | Removed content related to refrigerant hoses intended for truck transfer |
| 3/25/2015 | Throughout | M. Newman | Final edits to new template requirements and procedure for pressure testing following Plan 310.42.01. |
| 4/24/2015 | Throughout | Juanita Scaggs | Accepted changes and updated template |
| 9/9/2015 | Step 1, 3 &4 | Mark Newman | Added clarity for Maximo in Step 1, added required entry fields in Maximo as part of the annual hose inspection. Update fit for purpose step. |
| 9/13/2015 | Maximo Job Plan | T. Harlow | Made data entry reference to Maximo Job Plan |
| 9/17/2015 | Regulatory Citations | R. Shivley | Added regulatory citations |
| 9/22/2015 | Scope, Preparation, Procedure | M. Newman | Editorial edits to scope and preparation. Removed OQ qualifications, as LNG does not have OQ requirements. Modified required steps for Maximo records. Review complete |