

Note: This monitoring checklist does not include changes from the 12/23/11 final rule 76 FR 80554 (Technical Revisions and Clarifications to subpart A and subpart W), or corrections from the pending proposed rule, "2012 Technical Corrections, Clarifying and Other Amendments to the Greenhouse Gas Reporting Rule, and Proposed Confidentiality Determinations for Certain Data Elements of the Fluorinated Gas Source Category." EPA is working to update these checklists. Additional information on the subpart W rules can be found at <http://www.epa.gov/climatechange/emissions/subpart/w.html>. Reporters should refer to the e-CFR for the final rule ([http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=9415fad5f1c7ea4d940d308e1ea74e11&tpl=/ecfrbrowse/Title40/40cfr98\\_main\\_02.tpl](http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=9415fad5f1c7ea4d940d308e1ea74e11&tpl=/ecfrbrowse/Title40/40cfr98_main_02.tpl)).

# Petroleum and Natural Gas Systems

## Monitoring Checklist for LNG Import and Export



**Final Rule: Mandatory Reporting of Greenhouse Gases (40 CFR Part 98)**

*What must be monitored?*

If emissions are going to flares, need data elements under the source flare stacks (see Monitoring Checklist for Onshore Petroleum and Natural Gas Production).

**Record these parameters on an annual basis, unless specified otherwise.**

### 1. Reciprocating Compressor Rod Packing Venting

**Record emissions at each reciprocating compressor in as-found mode. Each mode must be monitored at least once in any three consecutive calendar years.**

#### Reciprocating Compressor Emissions in Operating Mode:

- |   |   |
|---|---|
| <input type="checkbox"/> Rod packing venting from reciprocating compressor in operational mode (standard cubic feet per hour) | <input type="checkbox"/> Blowdown vent emissions from reciprocating compressor in operational mode (standard cubic feet per hour) |
| <input type="checkbox"/> Total time the compressor is in operating mode (hours)   | <input type="checkbox"/> Annual throughput (million standard cubic feet per day)  |
| <input type="checkbox"/> Mole fraction of GHG in the vent gas   |   |

#### Reciprocating Compressors Emissions in Standby Pressurized Mode:

- |   |  |
|---|--|
| <input type="checkbox"/> Blowdown vent emissions from reciprocating compressor in standby pressurized mode (standard cubic feet per hour) | <input type="checkbox"/> Total time the reciprocating compressor is in standby, pressurized mode (hours) |
|---|--|

feet)

- Mole fraction of GHG in the vent gas

### **Reciprocating Compressors in Shutdown, Depressurized Mode:**

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- Unit isolation valve emissions from reciprocating compressor in shutdown depressurized mode (standard cubic feet)
- Total time the reciprocating compressor is in shutdown, depressurized mode (hours)
- Mole fraction of GHG in the vent gas

### **Record emission factors for reciprocating compressors in each mode.**

- Total annual reciprocating compressor emissions in operating mode (cubic feet)
- Total annual reciprocating compressor emissions in standby, pressurized mode (cubic feet)
- Total annual reciprocating compressor emissions in shut down, depressurized mode (cubic feet)
- Total number of compressors measured in operating mode
- Total number of compressors measured in standby, pressurized mode
- Total number of compressors measured in shutdown, depressurized mode
- Emission factor for rod packing vent emission in operating mode (cubic feet per hour)
- Emission factor for blowdown vent emissions in operating mode (cubic feet per hour)
- Emission factor for blowdown vent emissions in standby pressurized mode (cubic feet per hour)
- Emission factor for isolation valve in shutdown, depressurized mode (cubic feet per hour)

### **Record emissions from each reciprocating compressor in all modes and total annual emissions.**

- Total annual compressor emission from all modes of operation (standard cubic feet)
- Total time the compressor is in operating mode in reporting year (hours)

- |  |   |
|--|---|
| <input type="checkbox"/> Total time the reciprocating compressor is in standby, pressurized mode in reporting year (hours) | <input type="checkbox"/> Total time the reciprocating compressor is in shutdown, depressurized mode in reporting year (hours) |
|--|---|

## **2. Centrifugal Compressor Wet Seal Degassing Venting**

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**Record emissions at each centrifugal compressor in as-found mode. Each mode must be monitored at least once in any three consecutive calendar years.**

### **Centrifugal Compressor Emissions in Operating Mode:**

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| <input type="checkbox"/> Wet seal oil degassing vents emissions from centrifugal compressor in operational mode (standard cubic feet per hour) | <input type="checkbox"/> Blowdown vent emissions centrifugal compressor in operational mode (standard cubic feet per hour) |
| <input type="checkbox"/> Total time the centrifugal compressor is in operating mode (hours)  | <input type="checkbox"/> Number of wet seals connected to the degassing vent   |
| <input type="checkbox"/> Type of meters used for making measurements   | <input type="checkbox"/> Fraction of operating time wet seal degassing vent gas is sent to vapor recovery or fuel gas      |
| <input type="checkbox"/> Mole fraction of GHG in the vent gas  | <input type="checkbox"/> Annual throughput (million standard cubic feet per day)   |

### **Centrifugal Compressors in Not-operating, Depressurized Mode:**

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|--|---|
| <input type="checkbox"/> Unit isolation valve emissions from centrifugal compressor in shutdown depressurized mode (standard cubic feet) | <input type="checkbox"/> Total time the centrifugal compressor is in shutdown, depressurized mode (hours) |
| <input type="checkbox"/> Mole fraction of GHG in the vent gas  |   |

**Record emission factors for centrifugal compressors in each mode.**

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|--|--|
| <input type="checkbox"/> Total annual emissions from all | <input type="checkbox"/> Total annual emissions from all |
|--|--|

- |   |  |
|---|--|
| <p>centrifugal compressor in operating mode (cubic feet)</p> <p><input type="checkbox"/> Total number of centrifugal compressors measured in operating mode</p> <p><input type="checkbox"/> Emission factor for wet seal degassing vent in operating mode (cubic feet per hour)</p> <p><input type="checkbox"/> Emission factor for isolation valve in shutdown, depressurized mode (cubic feet per hour)</p> | <p>centrifugal compressor in shut down, depressurized mode (cubic feet)</p> <p><input type="checkbox"/> Total number of centrifugal compressors measured in shutdown, depressurized mode</p> <p><input type="checkbox"/> Emission factor for blowdown vent emissions in operating mode (cubic feet per hour)</p> |
|---|--|

**Record emissions from each centrifugal compressor in all modes and total annual emissions.**

- |   |  |
|---|--|
| <p><input type="checkbox"/> Total annual centrifugal compressor emission from all modes of operation (standard cubic feet)</p> <p><input type="checkbox"/> Total time the centrifugal compressor is in shutdown, depressurized mode in reporting year (hours)</p> | <p><input type="checkbox"/> Total time the centrifugal compressor is in operating mode in reporting year (hours)</p> |
|---|--|

**3. Blowdown Vents**

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|---|---|
| <p><input type="checkbox"/> Number of repetitive blowdowns for each equipment type of a unique volume</p> <p><input type="checkbox"/> Actual temperature in the blowdown equipment chamber (°F)</p> <p><input type="checkbox"/> Emissions per equipment type (cubic feet)</p> | <p><input type="checkbox"/> Total volume of blowdown equipment chambers (including pipelines, compressors and vessels) between isolation valves (cubic feet)</p> <p><input type="checkbox"/> Actual pressure in the blowdown equipment chamber (psia)</p> |
|---|---|

**4. Valves**

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|---|--|
| <p><input type="checkbox"/> Report CO<sub>2</sub> emissions from all valves (standard cubic feet)</p> <p><input type="checkbox"/> Operating time of leaking</p> | <p><input type="checkbox"/> Report CH<sub>4</sub> emissions from all other valves (standard cubic feet)</p> <p><input type="checkbox"/> Total number of components found leaking</p> |
|---|--|

component (hours)

### 5. Pump Seals

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|---|---|
| <input type="checkbox"/> Report CO <sub>2</sub> emissions from all pump seals (standard cubic feet) | <input type="checkbox"/> Report CH <sub>4</sub> emissions from all pump seals (standard cubic feet) |
| <input type="checkbox"/> Operating time of leaking component (hours)                                | <input type="checkbox"/> Total number of components found leaking                                   |

### 6. Connectors

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|---|---|
| <input type="checkbox"/> Report CO <sub>2</sub> emissions from all connectors (standard cubic feet) | <input type="checkbox"/> Report CH <sub>4</sub> emissions from all other connectors (standard cubic feet) |
| <input type="checkbox"/> Operating time of leaking component (hours)                                | <input type="checkbox"/> Total number of components found leaking   |

### 7. Vapor Recovery Compressors

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|---|---|
| <input type="checkbox"/> Report CO <sub>2</sub> emissions from all vapor recovery compressors (standard cubic feet) | <input type="checkbox"/> Report CH <sub>4</sub> emissions from all vapor recovery compressors (standard cubic feet) |
| <input type="checkbox"/> Operating time of leaking component (hours)  | <input type="checkbox"/> Total number of components found leaking   |

### 8. Other Equipment

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|--|--|
| <input type="checkbox"/> Report CO <sub>2</sub> emissions from all other equipment (standard cubic feet) | <input type="checkbox"/> Report CH <sub>4</sub> emissions from all other equipment (standard cubic feet) |
| <input type="checkbox"/> Operating time of leaking component (hours)                                     | <input type="checkbox"/> Total number of components found leaking  |