Appendix E

Subpart A-General Provisions

40 CFR 60.18 General control device requirements. (Flares)

Introduction. This section contains requirements for control devices used to comply with applicable subparts of parts 40 CFR 60 and 40 CFR 61. The requirements are placed here for administrative convenience and only apply to facilities covered by subparts referring to this section.

1. Flares shall be designed for and operated with no visible emissions as determined by the methods specified in 40 CFR 60.18(f), except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.
[Rule 62-296.800, F.A.C.; 40 CFR 60.18(c)(1)].

2. Flares shall be operated with a flame present at all times, as determined by the methods specified in 40 CFR 60.18(f).
[Rule 62-296.800, F.A.C.; 40 CFR 60.18(c)(2)].

3. Flares shall be used only with the net heating value of the gas being combusted being 11.2 MJ/scm (300 Btu/scf) or greater if the flare is steam-assisted or air-assisted; or with the net heating value of the gas being combusted being 7.45 MJ/scm (200 Btu/scf) or greater if the flare is non assisted. The net heating value of the gas being combusted shall be determined by the methods specified in 40 CFR 60.18(f).
[Rule 62-296.800, F.A.C.; 40 CFR 60.18(c)(3)].

4. (i) Steam-assisted and non assisted flares shall be designed for and operated with an exit velocity, as determined by the methods specified in 40 CFR 60.18(f)(4), less than 18.3 m/sec (60 ft/sec), except as provided in 40 CFR 60.18(c)(4)(ii) and 40 CFR 60.18(c)(4)(iii).

(ii) Steam-assisted and non assisted flares designed for and operated with an exit velocity, as determined by the methods specified in 40 CFR 60.18(f)(4), equal to or greater than 18.3 m/sec (60 ft/sec) but less than 122 m/sec (400 ft/sec) are allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).

(iii) Steam-assisted and non assisted flares designed for and operated with an exit velocity, as determined by the methods specified in 40 CFR 60.18(f)(4), less than the velocity, Vmax, as determined by the method specified in 40 CFR 60.18(f)(5), and less than 122 m/sec (400 ft/sec) are allowed.

[Rule 62-296.800, F.A.C.; 40 CFR 60.18(c)(4)].

5. Air-assisted flares shall be designed and operated with an exit velocity less than the velocity, Vmax, as determined by the method specified in 40 CFR 60.18(f)(6).
[Rule 62-296.800, F.A.C.; 40 CFR 60.18(c)(5)].

6. Flares used to comply with this section shall be steam-assisted, air-assisted, or non assisted.
[Rule 62-296.800, F.A.C.; 40 CFR 60.18(c)(6)].

7. Owners or operators of flares used to comply with the provisions of this subpart shall monitor these control devices to ensure that they are operated and maintained in conformance with their designs. Applicable subparts will provide provisions stating how owners or operators of flares shall monitor these control devices.
[Rule 62-296.800, F.A.C.; 40 CFR 60.18(d)].

8. Flares used to comply with provisions of this subpart shall be operated at all times when emissions may be vented to them.
[Rule 62-296.800, F.A.C.; 40 CFR 60.18(e)].

9. (1) Reference Method 22 shall be used to determine the compliance of flares with the visible emission provisions of this subpart. The observation period is 2 hours and shall be used according to Method 22.
(2) The presence of a flare pilot flame shall be monitored using a thermocouple or any other equivalent device to detect the presence of a flame.
(3) The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_T = K \sum_{i=1}^{n} C_i H_i$$

where:
HT=Net heating value of the sample, MJ/scm; where the net enthalpy per mole of offgas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20 °C;

K = Constant, 1.740×10^{-7} (1/ppm) (g mole/scm) (MJ/kcal)
where the standard temperature for (g mole/scm) is 20°C;

Ci=Concentration of sample component i in ppm on a wet basis, as measured for organics by Reference Method 18 and measured for hydrogen and carbon monoxide by ASTM D1946-77 (Incorporated by reference as specified in 40 CFR 60.17); and
Hi=Net heat of combustion of sample component i, kcal/g mole at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D2382-76 (incorporated by reference as specified in 40 CFR 60.17) if published values are not available or cannot be calculated.

(4) The actual exit velocity of a flare shall be determined by dividing the volumetric flowrate (in units of standard temperature and pressure), as determined by Reference Methods 2, 2A, 2C, or 2D as appropriate; by the unobstructed (free) cross sectional area of the flare tip.

(5) The maximum permitted velocity, Vmax, for flares complying with 40 CFR 60.18(c)(4)(iii) shall be determined by the following equation.

$$\text{Log10 (Vmax)}=(HT+28.8)/31.7$$

Vmax=Maximum permitted velocity, M/sec
28.8=Constant
31.7=Constant
HT=The net heating value as determined in 40 CFR 60.18(f)(3).

(6) The maximum permitted velocity, Vmax, for air-assisted flares shall be determined by the following equation.

$$Vmax=8.706+0.7084\ (HT)$$

Vmax=Maximum permitted velocity, m/sec
8.706=Constant
0.7084=Constant
HT=The net heating value as determined in 40 CFR 60.18(f)(3).

[Rule 62-296.800, F.A.C.; 40 CFR 60.18(f)].

a1.con
/ss
06/15/94
/clp
07/01/96