Texas Commission on Environmental Quality (TCEQ) Comments on   
Receipt of Approval Requests for the Operation of Pressure-Assisted Multi-Point Ground Flare Technology; Request for Comments

Docket ID Number EPA-HQ–OAR–2014–0738

# Background

The U.S. Environmental Protection Agency (EPA) published a request for comments in the February 13, 2015, issue of the *Federal Register* (FR) entitled: “Receipt of Approval Requests for the Operation of Pressure-Assisted Multi-Point Ground Flare Technology.” The request referenced above solicited comment on a request from the Dow Chemical Company (Dow) for an Alternative Means of Emission Limitation (AMEL) under the Clean Air Act (CAA) in order to operate pressure-assisted multi-point ground flares at the Propane Dehydrogenation Plant and the Light Hydrocarbons Plant at Dow’s Texas Operations site located in Freeport, Texas. The notice also solicited comment on a request from ExxonMobil Chemical Company (EM) for an AMEL under the CAA for pressure-assisted multi-point ground flares at the ExxonMobil Olefins Plant in Baytown, Texas, and the Plastics Plant in Mont Belvieu, Texas. Following are comments from the TCEQ on these requests for an AMEL.

# Comments on Proposed AMEL

*I. General Comments/Overview.*

The TCEQ supports the EPA’s proposed AMELs for Dow and EM, and believes it is reasonable to expand and simplify the approval of additional pressure-assisted flares, also known as “sonic” flares. The TCEQ suggests that the EPA expand the AMEL requirements to have sufficient flexibility to allow for enhanced testing, monitoring, and recordkeeping requirements or approaches.

## II. Comments on pressure-assisted multi-point flare or “sonic” flare design and categorization.

A. The TCEQ concurs with the EPA’s analysis that tests of pressure-assisted ground flare burners have measured high combustion efficiencies, mostly over 99%, during stable flame operation (i.e., the flare flame is lit and not extinguished). No testing data available measured lower efficiencies from pressure-assisted flare testing with a stable flame; however, the data also indicates the potential for flameout and the need to ensure a sufficiently combustible combustion zone gas that has a higher heating value or a lower flammability limit than would currently be acceptable for compliant flare control. With appropriate flame stability test data and enhanced monitoring, a simplified AMEL procedure for pressure-assisted flare designs should be approved.

B. Currently, the EPA recognizes three flare types: non-assisted, steam-assisted, and air-assisted. The EPA’s Footnote 2 in the Statutory and Regulatory Background section of the notice (80 FR 8027) suggests that the company-described “pressure-assisted” flares would qualify as “non-assisted” flares. The TCEQ believes that the EPA should recognize pressure-assisted flares as a separate or unique category of flares, rather than grouping or categorizing these devices under the current system. Pressure-assisted flares appear to require a different set of standards to assure proper function. Future EPA regulations should create and address a new flare type specifically for pressure-assisted flares.

C. The TCEQ is not certain that the specific limits on the combustion zone gas being established in this AMEL (i.e. 800 Btu/scf or 6.5 percent combustion zone lower flammability limit (LFLcz)) should be applicable to all future pressure-assisted or sonic flare determinations. Detailed engineering goes into each burner design and system to address the potential variability in waste gas composition, flammability, and flow. The TCEQ requests that the EPA address or explain what the EPA would consider a “similar design” of individual burners and systems (e.g. number of burners, pressure differentials or flow per row, cross-lighting and non-smoking capability). The TCEQ suggests that each burner manufacturer and system designer show through qualitative testing what minimal operating parameters (i.e. net heating value or LFLcz) are necessary to achieve stable flame operation for the waste gas compositions which are expected. This qualitative evaluation should include cross-light testing to ensure that proper ignition of all burner stages is achieved at the lowest pressure engagement of each stage. The required operational parameters of BTU or LFLcz should be based upon the results of this testing. Despite the limited number of tests which have been performed, TCEQ is reasonably comfortable with the idea that when a stable flame is present the destruction efficiency meets the expected regulatory requirements, and therefore the TCEQ does not perceive that a direct measurement of combustion efficiency needs to be part of the qualitative testing.

## III. Flare parameters, monitoring, and testing requirements.

A. The most critical operational parameter appears to be heat content or flammability of the combustion zone gas as necessary to assure flame stability. The TCEQ supports the EPA’s proposed requirements to measure as continuously as is feasible the parameters (flow and composition in this case) that assure a stable flame on the burners and burner system as designed. The TCEQ supports the EPA’s efforts to allow additional flexibility through the allowance of a maximum percent LFLcz as an alternative to consideration of only the heating value. However, the TCEQ believes the EPA should consider and address if a direct waste gas heating value measurement or alternate waste gas composition detection technique (e.g. Fourier Transform Infrared or FTIR), that could plausibly give faster indication of compliant heat content or flammability, could be substituted for the proposed chromatographic analysis. The TCEQ would support a direct heating value measurement where the expected waste gases do not pose an immediate health threat if the flare flames out under high load. Specific to this and future AMELs, the TCEQ recommends that the EPA include language in the AMEL that would allow companies to adjust monitoring techniques to a proven monitoring approach that enhances the rate determination or assurance of flame stability without a full notice and hearing (i.e. the allowance in rules for administrator-approved minor and moderate monitoring and recordkeeping requirements).

B. The TCEQ objects to the EPA’s stated requirement in the AMEL that owners or operators calculate certain variables and parameters by referencing a *proposed* federal regulation (specifically 40 CFR § 63.670(l)-(m), proposed at 79 FR 36980).  It is inappropriate for the EPA to require owners or operators to commit to a method in a proposed rule, due to the uncertainty of the final promulgated requirements.  In addition, a delegated agency such as the TCEQ has equal uncertainty for practical and realistic certainty of enforcement if the requirements referenced by the EPA change upon consideration of comments and final adoption of the regulation. Instead, the TCEQ recommends that the applicant and the EPA agree to an AMEL Plan Appendix which details a specific variable calculation methodology, and may be based on the underlying research (or equivalent to) that used in the proposal of the referenced federal regulations.

C. The TCEQ supports the EPA’s specific requirement that continues the practice of assuring continuous pilot flame presence with monitoring and recordkeeping. The TCEQ also supports the EPA’s proposal to have a camera to ensure that the flare causes no visible emissions. The TCEQ notes that the language in this AMEL, in 40 CFR § 60.18, and in 40 CFR § 63.11 on these elements is all slightly different, and TCEQ requests that the EPA clarify the reason or intent for the differences. Specifically, the EPA states in the AMEL, “The flare system must be operated with a flame present at all times when in use,” and TCEQ requests that EPA confirm that this means combustion and a flame in each active tip when flow is present. The TCEQ recommends that the EPA allow a thermocouple or other effective and continuous monitor (e.g. IR or UV) to assure the continuous pilot flame.

D. The EPA solicited comment on whether additional ambient monitoring is warranted to provide for notification to emergency planning officials and the community during significant events and malfunctions of the system. TCEQ suggests that the flow and composition monitoring, in concert with monitoring for flame presence, would provide substantially more valuable information for evaluating the downwind effect of a flameout as compared to ambient monitoring. The TCEQ offers that lower explosive limit (LEL) monitors around a ground flare could provide an indication of a malfunction or slow unburned leak that the direct waste gas and flare monitor might miss. This could be valuable in averting a disaster.

E. The TCEQ supports the EPA-proposed AMEL requirement to monitor flow to the flare system and pressure or flow to the pressure assist stages. The TCEQ recommends that the monitoring and records be specified rather than referenced, as noted above, and recommends that the AMEL provide allowance for enhanced alteration or adjustment through an Administrator letter approval process (as noted above for other monitoring). The TCEQ would like to better understand the EPA’s views on accurate measurement of low flow conditions and the ability of the operator to detect minor leakage through the valves that isolate each stage.

F. In the discussion of EM’s proposed AMEL, the EPA states that EM did not provide any additional test data, but rather is relying on a series of publicly available tests by Dow and Marathon. While the TCEQ doesn’t believe republishing another AMEL notice would be appropriate or necessary, the TCEQ believes EM should provide qualitative testing on flame stability and cross-lighting capability for the specific burners from John Zink and Zeeco used in their proposed flare systems.

## IV. Approval of future AMEL requests involving similar flare technology.

A. The EPA solicited comment on using the proposed AMEL requirements for future facilities requesting to operate pressure-assisted multi-point ground flares. The TCEQ supports the idea of using the elements (i.e. tested parameters and limits associated with flame stability, assurance of ignition and continued combustion, waste gas monitoring and records) with the TCEQ’s suggested enhancements as noted above as a reasonable pattern for future approvals. The TCEQ further suggests that the EPA move to modify the underlying rules at 40 CFR § 60.18 and § 63.11 to be consistent and specifically address a “pressure-assisted” or “sonic flare” type that would not require individual AMEL approval of this nature.

Unless the facilities are combusting vent gas that has a very similar composition to previous tests, the EPA should require the facilities to perform a flame stability test using the expected composition of the vent gas to ensure 800 Btu/scf is adequate to maintain a stable flame. The EPA should be willing to lower or raise the specified heat content of the vent gas appropriately based upon the flame stability test results.

In addition, because flare vent gas characteristics and burner tip design are critical to ensuring a stable flame and smokeless operation, the EPA should require a qualitative testing requirement for simple testing of flame stability and spacing (cross-lighting) of the tip burners for each vent gas and burner tip combination, unless nearly identical combinations have been tested before. Most major flare manufacturers are likely already testing flame stability, cross-lighting, and smokeless operation before the pressure-assisted flare is fabricated and constructed. This testing requirement would likely have a minimal cost compared to the total project costs and would ensure a stable flame and high efficiency for the flare design.

B. The TCEQ would also suggest that the EPA evaluate the possibility of the AMEL extending to elevated single point, pressure-assisted or “sonic” flares, considering they have some of the same regulatory issues as pressure-assisted multi-point ground flares.

C. For facilities which have demonstrated to the EPA that they are similar to the examples being considered in this action, the TCEQ supports the ability of any entity which complies with the requirements approved for these or substantially similar AMELs to also receive approval of other individual AMELs without the necessity of protracted review and *Federal Register* publication. As noted above, the TCEQ requests that EPA provide clarification as to what EPA considers a “similar” operational scenario and system design.

D. In addressing AMEL requests, the TCEQ encourages the EPA to allow for flexibility and advances in technology. For example, remote sensing products to determine post-combustion flare efficiency are being currently developed by industry. New methods for monitoring the composition of the vent stream, such as FTIR analyzers, are also in development or becoming available. EPA should be open to considering such emerging technologies as a means of demonstrating compliance. When possible, the EPA should write AMELs in such a manner that allows the owner or operator the flexibility to employ improved monitoring technology with the least possible administrative burden.