October, 12, 2009

Ms. Lindley Anderson
MC 206
Air Quality Division
Chief Engineer's Office
Texas Commission on Environmental Quality
PO Box 13087
Austin, Texas 78711-3087

RE: **TCEQ's Flare Taskforce Draft Report: Recommendations**

Dear Ms. Anderson:

LyondellBasell Industries (LyondellBasell) appreciates the opportunity to provide comments on recommendations presented in the agency's draft "Flare Taskforce Report". LyondellBasell operates 13 facilities in Texas with more than 40 flares. Therefore, the work of the agency's flare task force is of significant interest.

If you have any questions on these comments, please contact: me at 281.862.5048.

Sincerely,

Steve Smith
Environmental Issues
LyondellBasell Industries

The LyondellBasell comments are limited to the recommendations in the draft report and do not include a review of the documents cited in the Appendixes.

TCEQ's Draft Recommendation concerning Flare Monitoring

Require additional monitoring of flare operational parameters will help ensure proper flare operation and allow for a more accurate accounting of flare emissions in the state's emissions inventory and permit authorizations by providing reliable data for emission calculations. Require continuous air/steam assist rate flow monitoring of flares that receive routine process waste gas streams.

LyondellBasell Response:

(a) Monitoring flare gas flow rate

LyondellBasell agrees with TCEQ's assessment that flare flow monitoring will provide more reliable estimates of the amount of material being sent to the flare.

However, based on experience in the HRVOC flare monitoring program, there needs to be flexibility in the flow monitoring requirements. TCEQ needs to recognize that when dealing with flares that handle both routine flows and emergency releases it is potentially a very wide span between the normal routine flow rate and the design maximum emergency release flow rate.

LyondellBasell supports TCEQ's differentiation between routine process (non-emergency) flares and emergency flares; however, a definition for "routine" is necessary to differentiate between flows that may require monitoring and those that do not. In addition, the technical challenges of monitoring flow to these two types of flares are inherently much different. LyondellBasell agrees that continuously monitoring the presence of a physical seal on emergency flares using a pressure or level indicator, for example, is a reasonable alternative to continuous flow monitoring since it is difficult to find a flow meter designed to accommodate the full range of flow conditions, including the very high flow rates often experienced during emergency flaring. Any rule or guidance needs to recognize the limitations of flow meters and the need for time for calibration and replacement.

For those flares that may be required to continuously monitor flow, the type and choice of flow meter should be left to the site. For new installations, because process configuration and waste gas characteristics will play important roles in flow meter selection and placement, TCEQ should avoid prescriptive requirements on flow metering technology.

Since the accuracy of continuous flow meters can vary depending on design and stream characteristics, specific criteria for accuracy should not be required. In addition, although the reliability of continuous flow meters is typically very good, some consideration should be given for a service factor. An on-stream factor of 95% should be sufficient to allow for temporary outages associated with flow meter malfunctions, calibration, and required maintenance.

(b) Monitoring flare gas composition

The agency suggests that continuous monitoring of flare waste gas stream composition for flares receiving routine process waste gas streams may be appropriate.

LyondellBasell agrees with TCEQ's assessment that flare gas composition monitoring will provide more reliable estimates of the material being sent to the flare. However, there needs to be flexibility as discussed below.

Flares in the Houston Galveston Brazoria (HGB) nonattainment area subject to TCEQ's Highly Reactive Volatile Organic Compound (HRVOC) rules already monitor for approximately 20 constituents. To meet continuous, as currently defined, data requirements, additional gas chromatographs (GC) and/or new analyzers would be necessary to expand the list of monitored components.

When more compounds are added and compound resolution is needed, analysis time increases. This limits the analyzer's ability to meet cycle time requirements. If the additional monitoring time for the newly monitored compounds exceeds the instrument's ability to meet the 15 minute cycle time requirement, a new analyzer is required. .

Column selectivity also determines whether or not new compounds can be analyzed on an existing system. Sulfur compounds (H2S) and hydrocarbons are generally on separate GCs for this reason. Furthermore, certain existing HRVOC GC columns are not designed to analyze for aromatics, for example.

Therefore, TCEQ should consider an alternative sampling plan based on the complexity and variability of the stream. This could be a sample each shift, or daily or weekly that is analyzed in the lab as opposed to online. If using an online analyzer, additional flexibility should be available to increase the minimum cycle time from a data point every 15 minutes to one data point every two hours.

(c) Monitoring Flare Gas Assist Rates

LyondellBasell does not support the recommendation to require continuous monitoring of flow rates for air or steam assist gas flow rates.

Assist gas aids in mixing air into the base of the flame to support complete combustion and smoke suppression. Assist gas also serves the purpose of cooling the flare tip metal to minimize damage from overheating.

Individual flare assist gas quantity requirements vary with several variables including:

1. Type of assist gas delivery system
2. Flare tip diameter
3. Waste gas composition and flow rate
4. Inert gas (often used to sweep the flare gas header for safety reasons) composition and concentration

Steam to fuel ratio charts for pure compounds have been published by API. The published ratios are reported in ranges. Generally, however, the actual flared gases are mixtures and not simple pure compounds. Therefore, the applicability of the ratios from the charts to the mixtures that are actually flared is limited at best.

Attempting to regulate the assist gas rate as a function of waste gas rate would be impractical from a compliance standpoint for the following reasons:

- Determining the target assist gas rate would be case-by-case for each individual flare. Such case-by-case tests would only be valid for waste gas compositions used during the test and would not be valid for the wide range of waste gas compositions that most flares see. It would be difficult or impossible to test each flare on the range of waste gases that are actually routed to the flare for control.
- Even if the flare could be tested over that wide range, writing an algorithm for controlling the assist gas rate based on the various variables including waste gas composition and flow rate and inert gas composition and concentration would be a very complex or even impossible task.
- Further, measurement systems for composition or heat content of the waste gases have a lag time that would inevitably result in changes to the assist gas flow rate being too slow and too late. Typical composition analyzers have a 15 minute (minimum) lag time from sample to result. Typical plant flare flow rates and compositions are highly dynamic, and impossible to tie to the assist gas rate in any accurate manner. Since flares often serve multiple plant units, the dynamic nature of flow rates and compositions is further exaggerated and flows and compositions may vary over wide ranges.

Thus, any attempt to control assist gas based on waste gas would inevitably result in the assist gas “chasing” the waste gas but never catching up. Therefore, if the assist gas flow data cannot be reasonably used in determining the assist gas to waste gas ratio, then LyondellBasell sees no purpose in collecting the assist gas flow. Current assist gas management practices are centered on achieving smokeless operation. For operations that occur where changes can be predicted, management practices are provided in operating procedures. Each flare system and each set of flared gases is different.

TCEQ's Draft Recommendation concerning Flare Minimization Plans

Requiring the development of flare minimization plans will reduce emission from routine flaring events through the implementation of appropriate control strategies.

LyondellBasell Response

A number of LyondellBasell plants already have flare minimization plans in place as a best management practice. Some plans have been in place for a number of years. Any TCEQ action must recognize these past actions. A typical plan might include:

- A discussion of planned and unplanned flaring events
- Procedures to minimize hydrocarbon flaring including, for example, mechanical reliability programs and/or event management programs
- Procedures to minimize emissions during planned shutdown of process units or equipment
- Procedures to minimize emissions during startup of process units or equipment

Development of such a plan benefits a plant by providing a review of flaring causes and a subsequent analysis of potential measures to reduce emissions from planned events.

Other considerations for flare minimization plans include:

- Maintain records on-site, available to the agency on-request.
- These plans can be best completed in-house where personnel have a full understanding of operational complexities that may impact the plan. Use of third party contractors to review/design such plans is an unnecessary expense.
- The agency could maintain a clearing house of flare minimization options gleaned from reviewing minimization plans at various facilities, as a means to encourage the use of as many minimization techniques as possible in developing plans.
- Requiring inclusion of a flare minimization plan at permit renewal may unnecessarily slow the permitting process. Again, the plans should be held on-site, subject to agency inspection.

TCEQ must recognize that there is a significant difference between flare minimization plans and flare gas recovery. Flare minimization plans have a potentially large number of applicable processes. The population of potentially applicable processes for flare gas recovery is much smaller. Flare gas recovery is not economical or technically feasible in all cases and this must be a consideration. For example, it may not be technically feasible to recover some VOC streams and adequately purify them for introduction back into a chemical or polymerization process.

TCEQ's Draft Recommendation concerning Public Outreach

Continuing to promote stakeholder involvement in agency flare issues will help improve our collective understanding of how flares factor into Texas air quality issues.

LyondellBasell Response

LyondellBasell supports the Task Force's goal of continuing to promote stakeholder involvement in agency flare issues. Such dialogue on flare design, operation, maintenance, and testing, as well as the potential impacts of flare emissions on air quality, is critical to our collective understanding of the opportunities and practical constraints associated with these necessary process control devices.

> As was stated in the Introduction portion of the TCEQ Flare Task Force Draft Report, "Flares are imperative for safe plant operations and must be continuously available, highly reliable, and capable of the stable combustion of unwanted gas streams over the entire range of operating conditions including: emergency releases from site-wide general power failure; episodic releases during maintenance, startup, and shutdown operations; and continuous releases associated with routine process venting."

LyondellBasell concurs with the Task Force's recommendation of continuing to utilize the TCEQ-sponsored Flare Task Force as a vehicle to gather and validate pertinent technical information on all aspects of flare operation from all stakeholders and to provide the public with such educational information. This effort will increase public awareness and provide a solid foundation for potential future policy and regulatory actions, if needed.

The Task Force can also serve the need to explain and understand the observations and data acquired by remote sensing tools on operating flares. These data and observations need to be explained to the public so owners, operators, the public and TCEQ have a common understanding of what the information means and what it does not mean.