

Exceeding the Limit

Industry Violations of New Rule Almost Slid Under State's Radar

Houston-area industrial facilities have regularly violated a key air pollution regulation during the first two months it has been in effect. Their failure to comply with the new rule – which sets an hourly limit on specific emissions – places the region's strategy for reducing ozone smog at risk. Yet the state's environmental agency has only recently begun investigating the incidents.

From April 1 to May 31, 2006, chemical plants and refineries self-reported at least four violations of the limit (see Table 1). Furthermore, an additional 14 violations of the rule may have occurred, but the self-reported data are not descriptive enough to demonstrate whether or not a violation existed.

The new pollution limit, which was established by the Texas Commission on Environmental Quality (TCEQ) in 2004, plays a major role in the state's plan to clean Houston's air. Its goal is to prevent rapid formation of ozone by capping emissions of certain pollutants, known as highly reactive volatile organic compounds (HRVOCs), at 1,200 pounds per hour. The rule came into effect for Harris County in April 2006¹.

However, the TCEQ didn't implement adequate procedures for investigating and enforcing violations of the rule. According to TCEQ investigation staff, all air emission events are investigated to determine if they warrant enforcement for unauthorized emissions. In response to GHASP's inquiries in June 2006, the TCEQ has added review of this rule to its emission event investigation practices.

To prevent rapid formation of ozone smog and to reduce public exposure to toxic air pollution, we are calling on the TCEQ to develop an enforcement plan for the hourly limit that includes:

- Investigations of all 18 actual and potential violations; and
- Revisions of its air emission event reporting database to routinely collect the data needed to identify potential violations of the limit.

We are also submitting this report to the U.S. Environmental Protection Agency for its use in evaluating the potential effectiveness of the hourly limit in controlling ozone smog.

Table 1: Violations of Hourly Limit on HRVOC Emissions

Plant (Tracking number)	Date	Cause	Duration	Emissions
Equistar Chemicals Bayport (74058)	April 5	Compressor overheated.	1 min.	1,279 lbs.
Equistar Chemicals LaPorte (75436)	May 7	Loss of electrical power to plant with no backup power supply. Most emissions directly vented; no pollution control device.	5 mins.	1,529 lbs.
ExxonMobil Chemical Baytown Olefins (75968)	May 17	Process problem during unit shutdown.	1 hr.	1,231 lbs.
Total Petrochemicals LaPorte (75807)	May 14	Storm caused unit shutdown and extinguished flare. Unauthorized emissions for two one-hour periods.	1 ½ hrs.	4,430 lbs.

¹ The rule will come into effect for other Houston-area counties on January 1, 2007. We also noted events during which plants in other counties exceeded the 1,200 pound hourly threshold, which would have resulted in a violation if the rule was in effect.

While the emissions events listed in Table 1 are evidently unauthorized exceedances of the short-term cap, in other cases further information is needed to determine if a violation of the hourly limit occurred. In 14 cases, we determined that the emissions event report had sufficient information to suggest that a violation of the hourly limit may have occurred (see Table 2).

According to TCEQ investigation staff, there are no current procedures to collect the type of information that would be needed to determine compliance in these 14 cases. Such emission events could be investigated during future compliance reviews, but due to resource limitations, not all companies are reviewed for compliance on an annual basis. Furthermore, the procedures for compliance reviews have not been revised to include a specific focus on the new emissions limit.

When the rule was enacted, the TCEQ stated that, “An exceedance of [the hourly] limit is, by rule, unauthorized emissions” (see sidebar). We found that most online reports of unauthorized emissions lack sufficient information to determine if the company may have a valid affirmative defense against enforcement action.

Self-reported incident data alone may not be sufficient to determine if a violation occurred, because:

- The reports list total emissions over the complete duration of the incident, including any emissions associated with startup after a repair is completed. The report does not list the peak hourly emissions rate. For example, if 5,000 pounds of pollution are released over a 5-hour period, the peak hourly emissions rate likely exceeded 1,000 pounds per hour, but it is not certain that the 1,200 pound per hour limit was violated.

About the “Affirmative Defense”

TCEQ policy specifies that an exceedance of the hourly limit on HRVOC emissions is, by rule, unauthorized. Therefore, the violation is subject to enforcement unless the company has a valid affirmative defense, which meets the following criteria:

- The emissions event is not considered “excessive,” which is determined by factors such as the frequency, cause, impact, and duration of the event;
- Recordkeeping and reporting requirements are met;
- The breakdown was beyond the control of the owner or operator;
- The activity or event could not have been foreseen and avoided;
- The pollution control equipment was well-maintained;
- Prompt action was taken to come back into compliance;
- The amount and duration of the unauthorized emissions were minimized;
- Any emissions monitoring equipment was kept in operation if possible;
- Response actions were documented;
- Unauthorized emissions are not part of a frequent or recurring pattern;
- The percentage of a facility’s total operating hours was not high; **and**
- The unauthorized emissions did not cause or contribute to an ozone exceedance or a condition of air pollution.

Source: 30 Texas Administrative Code §101.222.

Table 2: Possible Violations of Hourly Limit on HRVOC Emissions

Plant (Tracking number)	Date	Cause of Possible Violation	Duration	Concerns	Emissions
Basell USA Bayport (74956)	April 25	Loss of steam to plant with no backup source.	114 hrs.	A, B, C	2,413 lbs.
Basell USA Bayport (75401)	May 2	Equipment failure causing flaring.	65 hrs.	A, B, C	1,228 lbs.
Chevron Phillips Chemical Cedar Bayou (74916)	April 25	Material failure causing relief valve to release.	30 mins.	C	683 lbs.
Chevron Phillips Chemical Cedar Bayou (75967)	May 17	Loss of steam to plant with no backup source.	36 hrs.	A, B, C	11,105 lbs.
Chevron Phillips Chemical Cedar Bayou (76324)	May 25	Loss of steam to plant with no backup source.	13 hrs.	A, B, C	2,559 lbs.
Chevron Phillips Chemical Cedar Bayou (76377)	May 28	Startup problems causing flaring; loss of flame at flare.	24 hrs.	A, B, C	17,142 lbs.
Equistar Chemicals Channelview (75392)	May 4	Control system failure causing flaring.	10 mins.	B, C	310 lbs.
ExxonMobil Baytown Refinery (73876)	April 1	Process problems causing flaring.	12 hrs.	A, B, C	1,667 lbs.
ExxonMobil Chemical Baytown Olefins (75998)	May 17	Compressor failure causing flaring.	19 hrs.	A, B, C	1,590 lbs.
Shell Oil Deer Park (74416)	April 1	Flaring caused by operations problem.	9 ½ hrs.	A, B, C	7,935 lbs.
Shell Oil Deer Park (75776)	May 12	Loss of steam to plant with no backup source.	2 hrs.	A, B, C	1,317 lbs.
Sunoco LaPorte (75473)	May 7	Process failure caused flaring.	5 mins.	D	unknown
Total Petrochemicals LaPorte (73830 and 73832)	April 2	Loss of electrical power to plant with no backup power supply.	24 hrs.	A, C, E	5,450 lbs.
Total Petrochemicals LaPorte (75583)	May 9	Process failure causing flaring.	1 ¼ hrs.	C	837 lbs.
Valero Refinery Houston (75159)	May 2	Work accident causing loss of electrical power to plant with no backup power supply.	15 hrs.	B, C, F	858 lbs.

- A. Peak hourly emissions may have exceeded 1,200 pounds.
- B. Flare emissions may have been underestimated.
- C. Other (routine) emissions should be considered.
- D. Possible reporting violation. Although this episode is reported as being monitored for HRVOCs, no HRVOC emissions reported.
- E. The TCEQ has reviewed this incident and determined that it would not issue a notice of violation for an exceedance of a permit limit. The TCEQ did not include the short term HRVOC limit in its review.
- F. The TCEQ has reviewed this incident and issued a notice of enforcement for violation of a permit limit (but not the hourly HRVOC limit). The City of Houston reviewed this incident for compliance with the new hourly limit and does not believe the hourly limit was exceeded.

- The reports list only emissions associated with the incident, and do not include other routine emissions at the facility. Since the hourly limit applies to the entire facility, a violation could be triggered even if the emissions caused by the incident are less than 1,200 pounds per hour. For example, if an incident results in 1,000 pounds of pollution in an hour, and typical emissions across the rest of the plant are 300 pounds per hour, then it is likely that a violation occurred.
- The reports are typically based on calculated emissions, rather than measured emissions, and often omit evidence to demonstrate that the calculations meet TCEQ requirements. For example, TCEQ rules allow companies to assume 98 percent or 99 percent of chemicals sent to a flare are effectively destroyed, as long as flare operations comply with

certain guidelines. If operations are not in compliance, then the companies may only assume 93 percent of the chemicals are destroyed. Some companies are assuming 98 percent or 99 percent destruction without stating that their flares were in compliance with the requisite guidelines (see sidebar). For example, suppose a company sends 20,000 pounds of butadiene to its flare in one hour. Using the 98 percent efficiency, the company would report 400 pounds of butadiene emissions for the hour. However, if the flare wasn't operated in accordance with guidelines, the company would have to report a 93 percent efficiency, which would equal 1,400 pounds for that hour.

Until these issues are addressed through follow-up investigations and revisions to the self-reporting requirements, the TCEQ will not be able to effectively enforce the hourly limit.

Most Industry Reports Lack Adequate Data on Flare Operations

Flare operations must comply with certain guidelines in order for companies to assume the highest efficiencies. In many reports we reviewed, the companies did not include information relevant to flare operations. However, a few companies did describe a correct application of the rules.

For example, Total Petrochemicals reported that "When possible, flaring was done in a controlled manner to minimize smoking and maximize flare efficiency. Flare smoked for approximately 10 minutes. It was assumed the flare destruction efficiency (sic) during

operations with visible emissions was 93%. During periods when smokeless operations of the flare was achieved, it was assumed 99% destruction of VOC was achieved" (Report 75583).

In addition to smokeless operation, flares are required to meet net heating value and exit velocity requirements. We did find one incident (Equistar Bayport, Report 74569) in which a company describes compliance with the net heating value requirement, but we did not find any incidents that mentioned compliance with exit velocity requirements.



The Galveston-Houston Association for Smog Prevention (GHASP) works to persuade government and corporate officials to prevent smog. GHASP seeks to accomplish its mission by being the most credible advocate for clean air in the Houston region; by supporting efforts to educate the public; and by directly engaging government officials, community leaders, the media and industry on regional air pollution issues.

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