



HRVOC Rules Overview

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Background

- TNRCC adopted rules in December 2000 requiring 90% NO_x reductions
- Business Coalition for Clean Air Appeal Group lawsuit
 - 80% vs. 90% NO_x reductions
- Per consent order scientific evaluation was conducted by TCEQ
- Evaluation led to highly-reactive VOCs



Scientific Evaluation

- Based in large part on aircraft data collected by Texas 2000 Air Quality Study
- Results showed that ethylene, propylene, 1,3-butadiene play role in rapid ozone formation
- Study revealed industrial VOC emissions likely significantly understated in earlier inventories
- Analysis to date provides strong support that controlling highly-reactive VOCs is necessary to prevent many of the rapid ozone forming events



Scientific Evaluation

- More detailed analyses indicated that other reactive VOCs, - isoprene, butenes, formaldehyde, acetaldehyde, toluene, pentenes, trimethylbenzenes, xylenes and ethyltoluenes - may also contribute to ozone production in the HGA.
- Other scientists have indicated that large amounts of less reactive VOC emissions may have contributed to ozone production in the HGA.



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HRVOC Defined

§115.10 (17)

- 1,3-butadiene; all isomers of butene (i.e., alpha-butylene (ethylethylene) and beta-butylene (dimethylethylene, including both cis- and trans-isomers)); ethylene; and propylene - Harris County
- ethylene and propylene - Brazoria, Chambers, Fort Bend, Galveston, Liberty, Montgomery, and Waller Counties



Scientific Evaluation

- On-going analysis examined whether reducing emissions of highly-reactive industrial VOCs can replace the last 10% of industrial NO_x controls
- Directional indication that it may be possible to achieve the same level of air quality benefits as would be realized with approximate 90% NO_x reduction requirement if highly-reactive industrial VOCs are limited to approximately 100 tpd



Rule Revisions

- TCEQ adopted rules for four source categories:
 - Flares
 - Cooling Towers
 - Fugitives
 - Process vents
- Emission standards based on 100 tpd threshold



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30 TAC Chapter 115

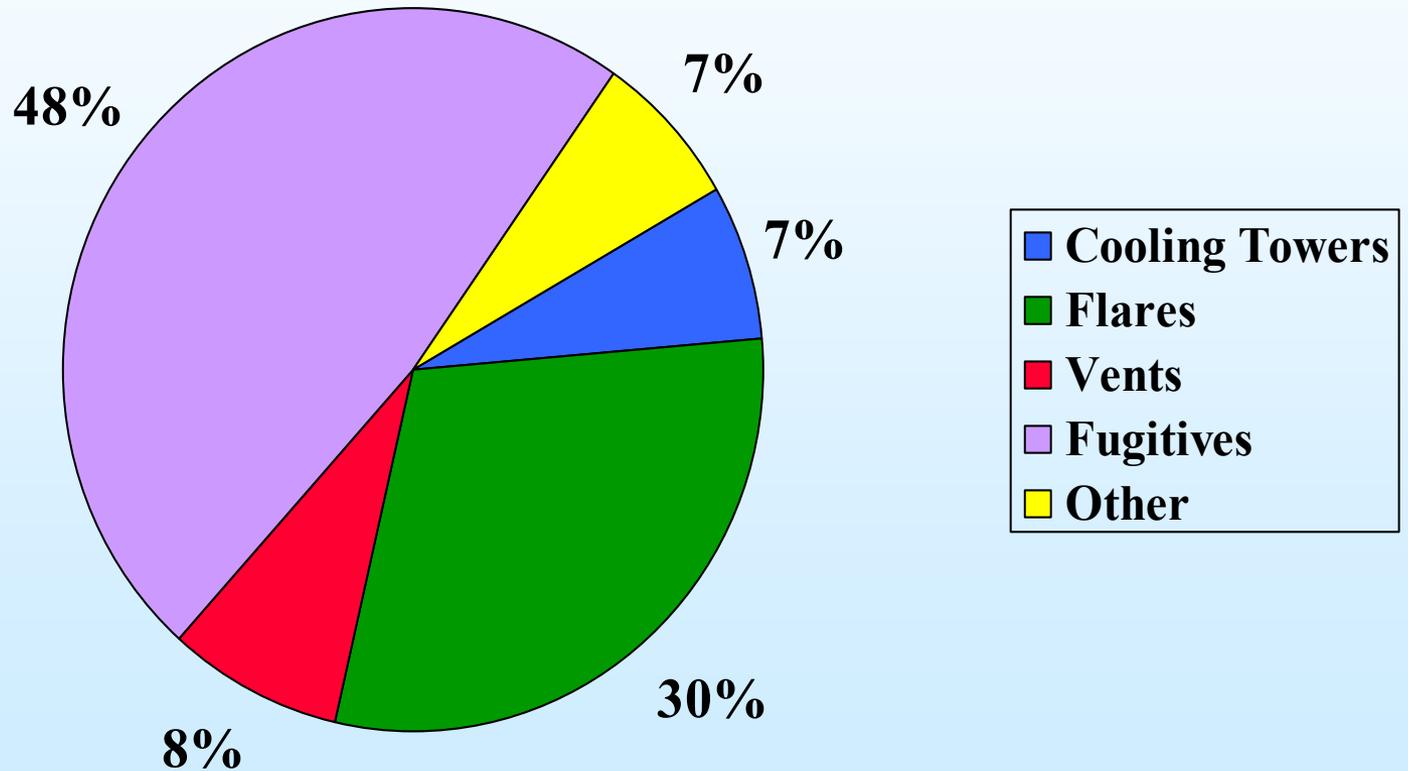
- Flares
 - Subchapter H: Highly-Reactive VOC
 - Subchapter B: General VOC Sources

- Cooling Towers
 - Subchapter H: Highly-Reactive VOC
 - Subchapter B: General VOC Sources



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Highly Reactive VOCs - Routine Emissions





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Overview

- TCEQ has established emission based standards with a very quick response time to correct the cause of the event that resulted in exceeding the standard.
- Based on scientific evidence that releases of highly-reactive industrial VOCs in a short amount of time can result in very rapid ozone formation.
- Relying on companies to develop their own management systems w/appropriate interim trigger thresholds to respond to potential problems before they reach the emission based standard.



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Overview

- Record keeping has been required primarily to demonstrate compliance with emission limits.
- Additional step requires all hourly emissions data associated with the VOC and highly-reactive VOC rules to be submitted to the Technical Analysis Division.
- This info gives TCEQ the ability to more accurately evaluate the most appropriate control strategies for the various source categories.

HRVOC Vent Gas/Flares



- Applies to any vent gas stream in HGA which includes HRVOC
- Applies to any flare in HGA area which emits or has the potential to emit HRVOC



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Exempt from Site-Wide Cap

- Any gas stream routed to a flare: exempt if contains <math><5.0\%</math> by weight HRVOC (in the total stream) at any time. *Still subject to recordkeeping requirements*
- Any gas stream not routed to a flare: exempt if contains ≤ 100 ppmv HRVOC (in the total stream) at any time. *Still subject to recordkeeping requirements*
- Emissions from scheduled maintenance, startups, or shutdowns, if reported in advance and approved by TCEQ regional office.



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Exempt from Monitoring Requirements

- Any flare which at no time receives a gas stream containing $\geq 5.0\%$ by weight HRVOC
- Gas stream is treated as vent gas stream under the site-wide cap
- Applies to flares only. *Still subject to recordkeeping requirements*



Monitoring & Testing

- Each vent gas stream must either be tested or continuously monitored
- For Flares
 - Continuously measure flow rate
 - Measure speciated HRVOC concentrations every 15 minutes
 - Calculate net heating value and actual exit velocity every 15 minutes



Monitoring & Testing (cont'd)

- Assume 98% destruction efficiency
 - Or 93% if flare does not meet 40 CFR §18 (NSPS) heating value and exit velocity requirements
- Calculate the HRVOC hourly emission rate
- Flares used solely for control of transport vessel loading operations are exempt from monitoring requirements



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Recordkeeping & Reporting

- Submit test/quality assurance plan to TCEQ by April 30, 2004 for approval
- Maintain records for 5 years documenting:
 - VOC & HRVOC emission rates
 - Monitoring & testing results
 - Corrective actions
 - Exemption criteria
 - 24-hour rolling average HRVOC emission rate



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Compliance Dates

- Flares
 - Site-wide cap by April 1, 2006
 - All other requirements by December 31, 2004

- Vent Gas
 - Testing by June 30, 2004
 - All other requirements by April 1, 2006

HRVOC Cooling Towers



- Applicable to any cooling tower in HGA that emits or has the potential to emit HRVOC



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Exemptions

- Exempt from Division
 - If minimum pressure on the cooling water side is at least 5 psig greater than the maximum pressure on the process side
 - If no individual heat exchanger has HRVOC in the process side fluid
 - Still subject to recordkeeping requirements



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Exemptions (cont'd)

- Exempt from site-wide cap
 - If any stream directed to a cooling tower heat exchange system contains $\leq 5.0\%$ by weight HRVOC
 - If emissions are from properly reported events
 - Still subject to all other requirements



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Monitoring & Testing

- Submit Test/QA plan to TCEQ by April 30, 2004
- Design circulation capacity $\geq 8,000$ gpm cooling water
 - Continuously measure flow rate at each CT inlet
 - Continuously measure total strippable VOC concentration at each CT inlet
 - Determine concentration of speciated strippable VOC at least once per month



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Monitoring & Testing (cont'd)

- If concentration of total strippable VOC ≥ 50 ppbw, collect a sample at least once per day for strippable VOC analysis from each affected cooling tower inlet
- Continue daily speciated strippable VOC sampling until total strippable VOC concentration < 50 ppbw



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Monitoring & Testing (cont'd)

- Design circulation capacity < 8,000 gpm cooling water:
 - Continuously measure flow rate at each cooling tower inlet
 - Determine concentration of total strippable VOC by collecting samples from each inlet of each cooling tower at least twice per week
 - Determine concentration of speciated strippable VOC at least once per month
 - If concentration of total strippable VOC ≥ 50 ppbw, collect a sample at least once per day for strippable VOC analysis from each affected CT inlet
 - Continue until <50 ppbw



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Monitoring & Testing (cont'd)

- Use air-stripping method given in TCEQ Sampling Procedures Manual, Appendix P
- Use EPA Test Method 18 or TO-14A to analyze samples



Recordkeeping & Reporting

- Establish and maintain process diagram of the cooling tower heat exchange system
- Maintain records for 5 years:
 - VOC & HRVOC emission rates
 - Monitoring and testing results
 - Corrective actions
 - Criteria for exemption status
 - 24-hour rolling average HRVOC emission rate



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Compliance Dates

- Site-wide cap – April 1, 2006
- All other requirements – December 31, 2004



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Leak Detection & Repair (LDAR) Rule Changes

- For all nonattainment areas:
 - Document total cumulative emissions from leaking components to qualify for delay of repair
 - Must repair valves which can be repaired without purging and/or cleaning the line
 - Monitor when components are in contact with process material



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LDAR Recordkeeping for all nonattainment areas

- Calibration gas values and the instrument reading
- Date on which a leaking component is placed on the shutdown list
- Datalogger data must include a time and date stamp, an operator identification, and an instrument identification
- Five year record retention



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LDAR Rule Changes for the Houston/Galveston Area

- First attempt at repair within 24 hours
- Quarterly monitoring for components not previously monitored (e.g., connectors)
- Monitor repaired components within 7 days after startup



Questions???

