
Permitted MSS Emissions Tracking, Recordkeeping, and Reporting

Presented by

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Agenda

- **Introductions**
- **Overview of Current MSS Permitting Program Status**
- **Discussion of Model MSS Permit Requirements**
- **MSS Calculation System**
- **Discussion**

Overview of MSS Permitting Program Status

- Refineries submitted permit applications by January 5, 2007
 - ❖ Permits have not yet been issued
 - ❖ Affirmative defense has officially expired
 - ❖ Most permits are undergoing health effects review
 - ❖ TCEQ has published a “model permit” for discussion
- Chemical plants submitted applications in January 2008
 - ❖ Many more chemical plants than refineries
 - ❖ Most permits are in public notice
 - ❖ Affirmative defense expires in January 2010
- The refinery permits will establish Tier 1 BACT
- TCC is actively negotiating “model permit” provisions



Overview of Model MSS Permit

- **Model permit published by TCEQ with first-draft conditions for refinery compliance**
- **TCC is actively negotiating conditions**
- **Monitoring, recordkeeping and compliance requirements in model permit are very detailed**
- **Expect specific details to change, but general principles to remain in final permits and Tier I BACT**
 - ❖ **Identify all MSS activities**
 - ❖ **Quantify all MSS emissions**
 - ❖ **Demonstrate compliance with permit emission limits**



General MSS Activities in Model Permit

- **Model permit puts most MSS activities into three categories**
 - ❖ **Small activities that require annual review but not ongoing records**
 - ◆ **Instrument calibrations and maintenance**
 - ◆ **Sampling**
 - ◆ **Gauge glass cleaning**
 - ❖ **Medium activities that require general recordkeeping using a work order system and detailed emission calculations**
 - ◆ **Valve and piping maintenance**
 - ◆ **Pump maintenance**
 - ❖ **Large activities that require detailed recordkeeping and emission calculations**

Process Units and Facilities

- **Specific clearing procedures – including time limits, control requirements and vapor pressure thresholds – are provided in the model permit**
- **Atmospheric venting is prohibited unless it meets specific criteria**
- **VOC concentration sampling requirements are provided**
 - ❖ **Frequency, concentration limits, and sample locations**
 - ❖ **Instrument type, calibration methods, and accuracy limits are specified**
 - ❖ **Response factor limits are specified**

Storage Tanks

- **Specific clearing procedures – including time limits, control requirements and vapor pressure thresholds – are provided in the model permit**
- **VOC concentration sampling requirements are provided**
 - ❖ **Frequency, concentration limits, and sample locations**
 - ❖ **Instrument type, calibration methods, and accuracy limits are specified**
 - ❖ **Response factor limits are specified**
- **Roof landings require very detailed records**
- **Control requirements for venting fixed-roof tanks are provided**

Other Sources

- **Vacuum truck usage is subject to many new requirements**
 - ❖ **Operational limits and equipment requirements**
 - ❖ **Extremely detailed recordkeeping and emission calculations**
 - ❖ **Control requirements**
- **Frac tanks are subject to detailed recordkeeping, calculation, control and color requirements**
- **Planned unit turnarounds are subject to notification and recordkeeping requirements**
- **Paint is subject to recordkeeping requirements as well as limits on application methods and usage rates**
- **Abrasive blasting limitations are provided**

Control Devices

- **Control devices are subject to detailed operating and recordkeeping requirements**
- **Flare systems must be monitored in some way to demonstrate Btu value**
- **Carbon systems require 2 canisters and are subject to hourly monitoring and detailed recordkeeping**
- **Thermal oxidizers are subject to temperature and residence time limits with associated temperature monitoring**
- **Internal combustion engines used to control emissions are subject to stack exhaust monitoring and recordkeeping**
- **Flare header systems are subject to leak monitoring and bypass line monitoring**

New Compliance Approach Required

- **New requirements will impose operational changes**
 - ❖ **New clearing procedures to address monitoring and controls**
 - ❖ **May require physical modifications for monitoring points**
 - ❖ **Extensive new records of maintenance activities**
- **Compliance records will require new emission estimates**
 - ❖ **Significant sources require calculations for every activity**
 - ❖ **Minor sources (pumps) require one-time calculation and frequency**
 - ❖ **Insignificant sources (instrument clearing) require annual evaluations**
- **A standardized calculation approach is essential to demonstrating compliance**

Equipment Clearing Emissions

- Most significant source of emissions
- ACES' standard methodology uses engineering estimates
 - ❖ Two-stage mass balance based on amount of process material remaining in equipment prior to venting to control device (if applicable) and amount remaining prior to opening to atmosphere
 - ❖ Equipment-specific method of clearing (e.g., drain to process, steam to flare, open to atmosphere)
 - ❖ Uses actual equipment data (dimensions, packing)
- Apply engineering estimates to determine amount of process material remaining based on method of clearing
 - ❖ Liquid film thickness on all interior surfaces
 - ❖ Amount of saturated vapor in volume of equipment

Other MSS Emissions

- Vacuum trucks
 - ❖ Material usage and quantities
 - ❖ Modified loading calculation
- Frac tanks or other temporary vessels use modified storage tank calculation
- Simplified or equipment-specific pump and heat exchanger calculations
- Instrument clearing
 - ❖ Can assume standard dimensions
 - ❖ Rough estimate of number in plant or by unit, broken down by vapor or liquid service
 - ❖ Need some assumptions for speciation
- Balance simplicity and accuracy

MSS Activities Tracking Strategies

- **Vessel clearing activities emission calculation spreadsheets**
 - ❖ **Insert number of actual clearings per equipment**
 - ❖ **Change clearing method, if necessary, using drop-down**
 - ❖ **Can link to other systems**
- **Need equipment-specific clearing records**
 - ❖ **Use existing systems where available**
 - ❖ **Can create a new system if necessary**
 - ❖ **Need to identify each significant piece of equipment cleared**
 - ◆ **Reactors**
 - ◆ **Columns**
 - ◆ **Receivers**

Systemic Approach to Calculations

- **ACES' calculation approach is simplified, systemic, and proven**
 - ❖ **Implemented in over 100 process units**
 - ❖ **Uses actual process and equipment information**
 - ❖ **Uses simplifying assumptions to minimize time and cost**
 - ❖ **Based on engineering principles**
- **Process for creating system is standardized**
 - ❖ **Clearing procedures largely dictated by permit limits**
 - ❖ **Use mechanical drawings for equipment details**
 - ❖ **Use mass balances or other records for speciation**
- **Focus system on significant equipment items**
 - ❖ **Limited equipment list**
 - ❖ **Largest emitters**



Discussion