Summary of Flare Issues & EPA Regulatory Plans

As of September, 2011

Prepared by Bruce Davis, 586-2536
For Discussion with DuPont Staff and for Presentation to Local Air & Waste Management Association Meeting Oct 4, 2011

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My Job with AWMA – dealing with E-mail like this

Name : Glenn Canady

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Comment : We will soon be releasing information about a free energy device that can completely power your home off the grid! It\'s called a free energy magnetic motor and just one of these devices can power the average home at no cost! It\'s already being done by others right now! You can see a video on free energy read all about this amazing device on this page. www.project.nsearch.com/profiles/blogs/free-energy-device-to-be-teste One of our members is now running his vehicle on nothing but water and will be sharing this as soon as everything is documented for easy reproduction! If you want to be informed about the free energy device and running your vehicle using water make sure you join the site at www.project.nsearch.com as it\'s the only way we can reach you. Another one of our members cured his skin cancer using our \"hemp oil cures cancer\" secret he learned in our free \"Natural Cures\" area of www.project.nsearch.com Make sure you click on the natural cures menu option and share with others that

Presentation Overview

The results of the TCEQ test work

Summary of TCEQ forward plans to conduct flare training for operators and the public

EPA forthcoming regulations and a summary of what the API/NPRA/ACC group presented to EPA on Aug 30.

Learnings from the American Flame Research Committee (AFRC) Flare Colloquium meeting in Houston from the 18th through the 20th

Key Issues – data applicability to

- Un-assisted flaring,
- Hydrogen-rich flaring
- Small flare systems

Feedback on latest EPA Presentation on Rulemaking

Summary of what is needed to get ready

TCEQ Flare Test Overview

Study conducted at John Zink facilities in Sept, 2010

Test cost ~ $ 2.2 MM

Test was managed by Univ. of Texas

Final Report issued Aug. 2011 is available at:

TCEQ Flare Study - Final Report

Report referenced a number of PFTIR measurements on operating Refining Flares

These are available at:

Tx Flare Stakeholder Web Link

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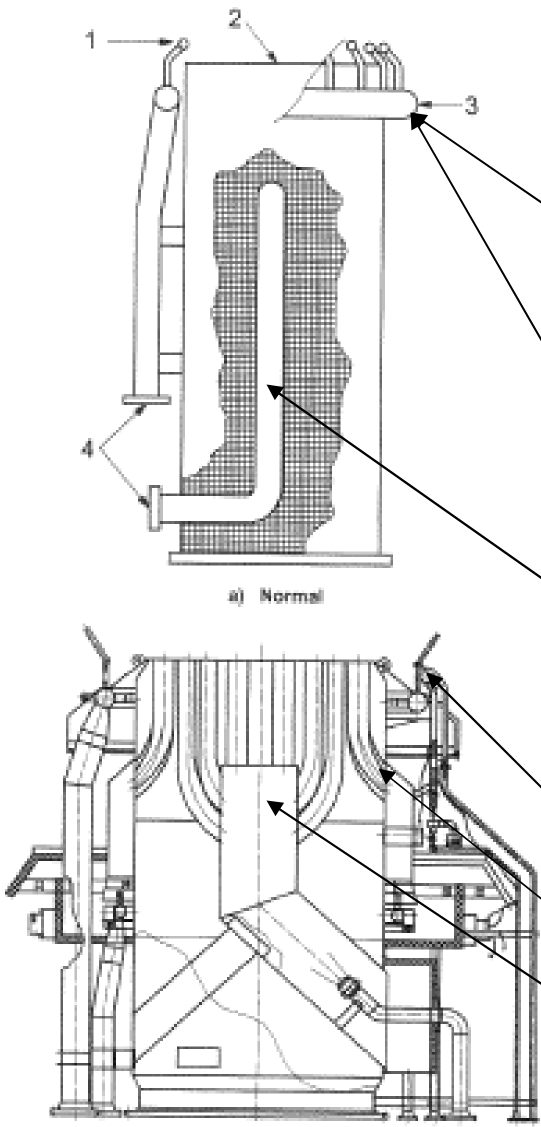
Summary of Flare Tests cited by TCEQ

Marathon Texas City, Texas, USA – a 500k lb/hr elevated steam-assisted flare.

- The tip has three points of steam addition: center steam, a lower steam ring, and an upper steam ring.
- Flare test focused on the turndown operating range (1900 lb/hr, 1100 lb/hr, and 800 lb/hr turndown).
- Flaring gases were saturates, olefins, nitrogen and hydrogen mixtures.
- Test report concluded that the PFTIR instrument appears to identify general flare performance trends.
- Additional research is needed to characterize the instrument's overall precision and bias.
- The combustion reaction products appeared to show variability and scatter in terms of the carbon dioxide component, but less so in terms of combustion efficiency.

Schematics of Center Steam and Rim Steam Flares

API Standard 521 / ISO 23251



b) Low noise

Key
1 steam tips 2 flame holder 3 steam manifold 4 steam connections

Rim Steam only Flares use steam nozzles around the tip of the flare

This is a two point center steam flare using
upper steam and
center steam

This is a three point center steam flare using
upper steam
a lower steam/air ring and
center steam

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Rim steam flare with efficient burning at low flow occurring below the steam addition system.

1. Flare is at the end of it's useful life.
2. Steam addition is via a radial slot off of a steam chest.
3. Steam pattern is good.
4. Smokeless performance is still being achieved at low flaring rates.
5. Flame is below the steam addition and flame is burning efficiently

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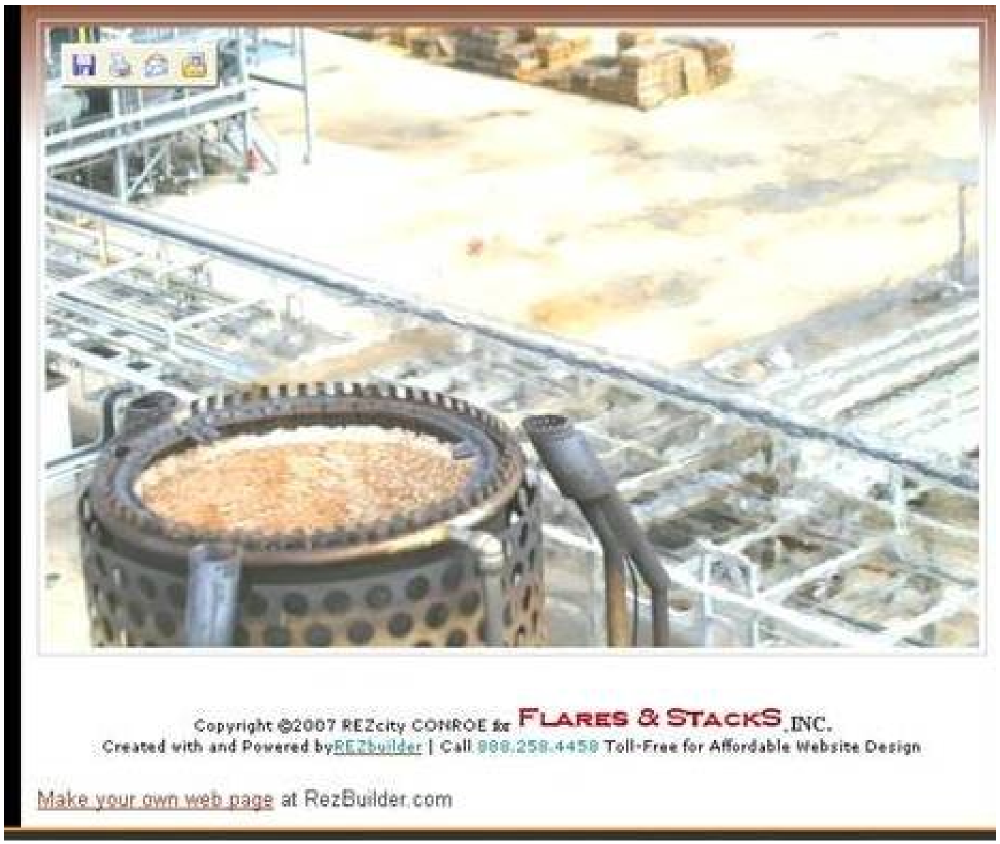
Large Rim Steam Flare at Low Flow



A large rim steam flare operated at low flow where the steam is not influencing the flame which is below the steam nozzles.

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Summary of Flare Tests cited by TCEQ

Marathon Detroit, Michigan, USA - a 241k lb/hr elevated steam-assisted flare.

- The tip has two points of steam addition: center steam and an upper steam ring.
- Flare test focused on the typical base load which is approximately 500 – 600 lb/hr, or less than 0.25% of the hydraulic capacity
- Flaring gases were a base gas mixture, refinery fuel gas, propylene, hydrogen, and nitrogen mixtures.
- The data collected at Detroit shows significant correlation with the Texas City data despite the fact that the flare tips are different sizes, different designs, and from different manufacturers.
- The most consistently high combustion efficiencies appeared to be near the incipient smoke point.

Summary of Flare Tests cited by TCEQ

Shell Deer Park Refining, Deer Park, TX a 806k lb/hr elevated steam assisted flare

- The tip has two points of steam addition: center steam and an upper steam ring.
- Test looked at
  - Test A - the effect of S/VG with H2 < 30 %;
  - Test B – the effect of increasing H2 content (31 - > 60 %) @ S/VG 1 – 5
  - Test C – the effect of increasing S/VG ratio (2.5 – 7.8)
- The flared gas is hydrogen, nitrogen, methane with minor concentrations of low MW paraffins, olefins and aromatics.
- The experimental design assessed flare performance outside the normal range of S/VG ratio.
- High CE values were obtained with CZNHV values > 200 BTU/scf

TCEQ Flare Study Objectives

Assess the impact of high turndown (low flow) rate of vent gas on flare destruction and removal efficiency (DRE) and combustion efficiency (CE)

- DRE is the percent removal of hydrocarbon from flare vent gas.
- CE is the percent of hydrocarbon in vent gas converted to carbon dioxide.

Assess if flares operating within 40 Code of Federal Regulations (CFR) §60.18 achieve the assumed hydrocarbon DRE of at least 98% at high turndown, varying assist ratios, and vent gas heat content

Identify and quantify the hydrocarbon species in flare plumes

TCEQ Flare Test Limitations

Limited vent gas composition: Tulsa natural gas, propylene, and nitrogen

- Propane was used for limited test runs.

Hydrogen was not included in any test run.

Two flare tip sizes and assist configurations were tested.

- 36-inch steam-assisted flare with upper and center steam assist
- 24-inch air-assisted flare

Both flare tip designs are commonly used for routine low-flow vent gas streams

High turndown (low flow) operating conditions were focus of study.

Study was not designed to evaluate:

- Flare operations under upset or emergency conditions
- Hydrogen flares
- Flares specifically designed for routine, low flow applications

TCEQ Test Operating Conditions

Vent gas streams with heat content of 350, 600, and 2,149 British thermal units per standard cubic foot (Btu/scf)

40 CFR §60.18 minimum heating value for an assisted flare is 300 Btu/scf.

Vent gas streams with low flow rate

- 0.1% and 0.25% of rated design capacity
- Steam-assisted flare = 937 lb/hr and 2,342 lb/hr
- Air-assisted flare = 359 lb/hr and 937 lb/hr

TCEQ Test Operating Conditions

Assist rates varied between zero assist to over assist near flameout (snuff point).

Measurements were taken at points between the incipient smoke point and near snuff point.

Four to six points per test series, with up to three repetitions per point

Tip velocity of vent gas, including center steam, was between 0.6 and 2.0 feet per second (fps).

Data Collection

Extractive measurements

- Aerodyne Research: quantum cascade laser, proton transfer reaction mass spectrometer, gas chromatograph (GC), aerosol mass spectrometer, particle analyzers
- TRC: GC

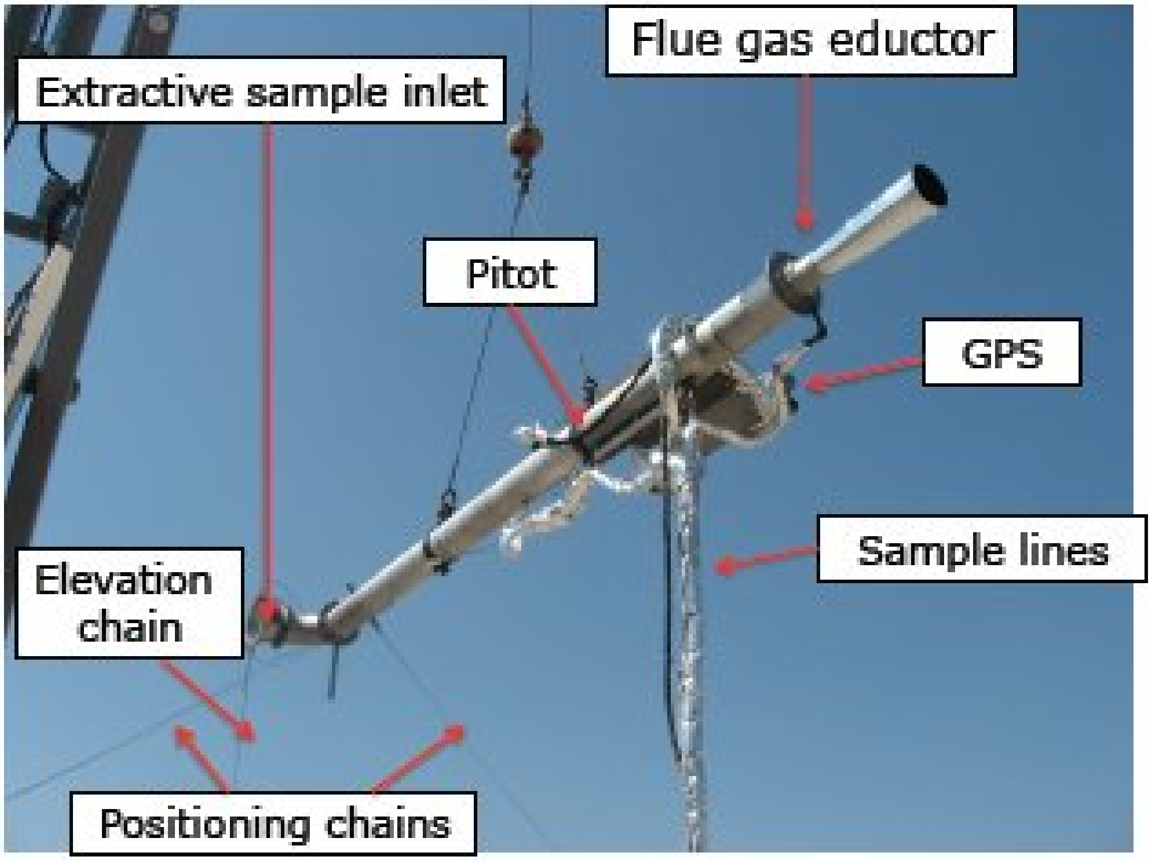
Remote sensing measurements

- Telops: Field portable radiometric spectrometer
- Industrial Monitor and Control Corporation: passive and active Fourier transform infrared (PFTIR and AFTIR) detectors

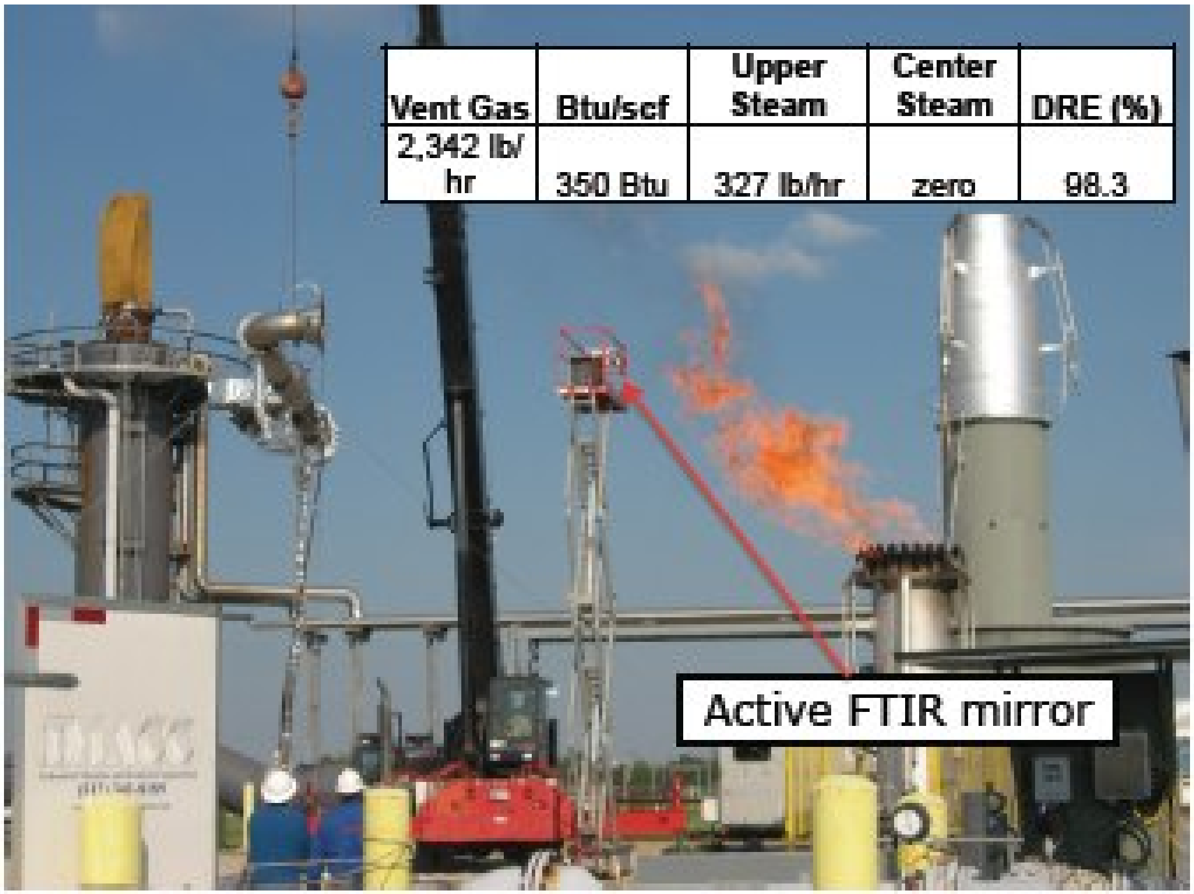
All remote sensing companies performed single blind measurements.

Leak Surveys, Inc: FLIR GasFindIR and standard infrared cameras

Extractive Sampling Probe



Typical Test Run – Test No. S 4.4



Steam to VG ratio – 0.14

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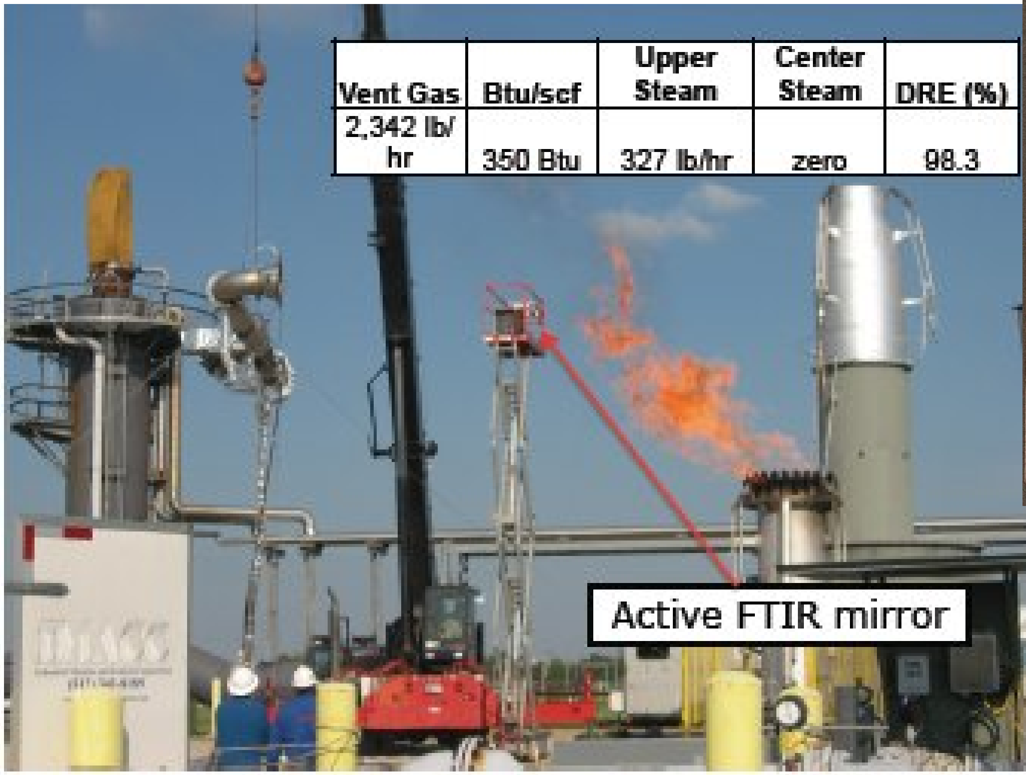
Comparison to TCEQ – Test No. S 4.4



Vent Gas	Btu/scf	Upper Steam	Center Steam	DRE (%)
2,342 lb/hr	350 Btu	327 lb/hr	zero	98.3

Steam to VG ratio – 0.14

Propylene/Propane flow – 305 lb/hr
Steam flow – 256 lb/hr
Nitrogen flow – 1222 lb/hr
Steam/fuel ratio – 0.17
BTU content – 309 BTU/scf
Velocity – 28.9 ft/sec
Flare Diameter – 8“
CE – 98.7 %
% capy – 7.2 %

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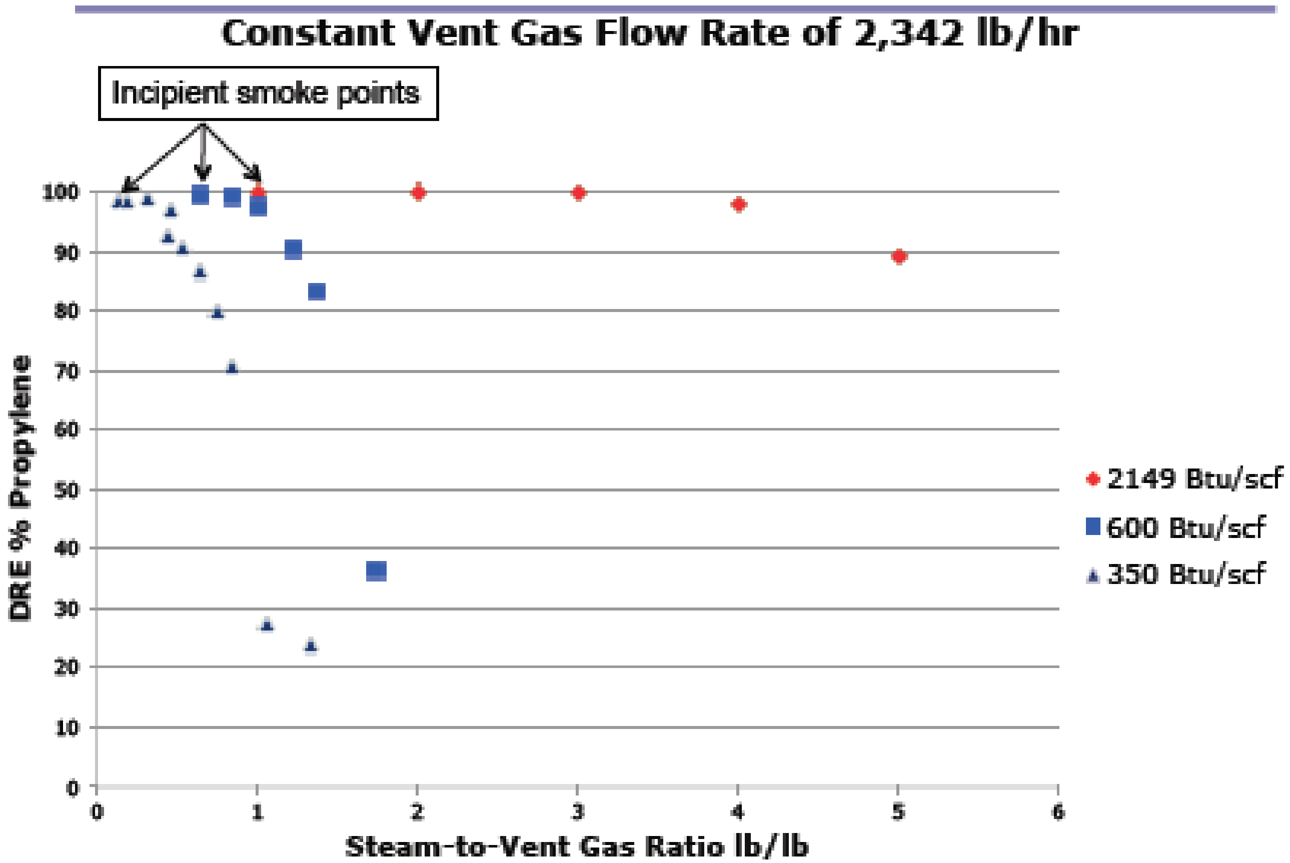
TCEQ Results

High DRE Measured

- The flares tested were able to achieve greater than 99% DRE and CE for vent gas streams with low heating value at low flow rate conditions.

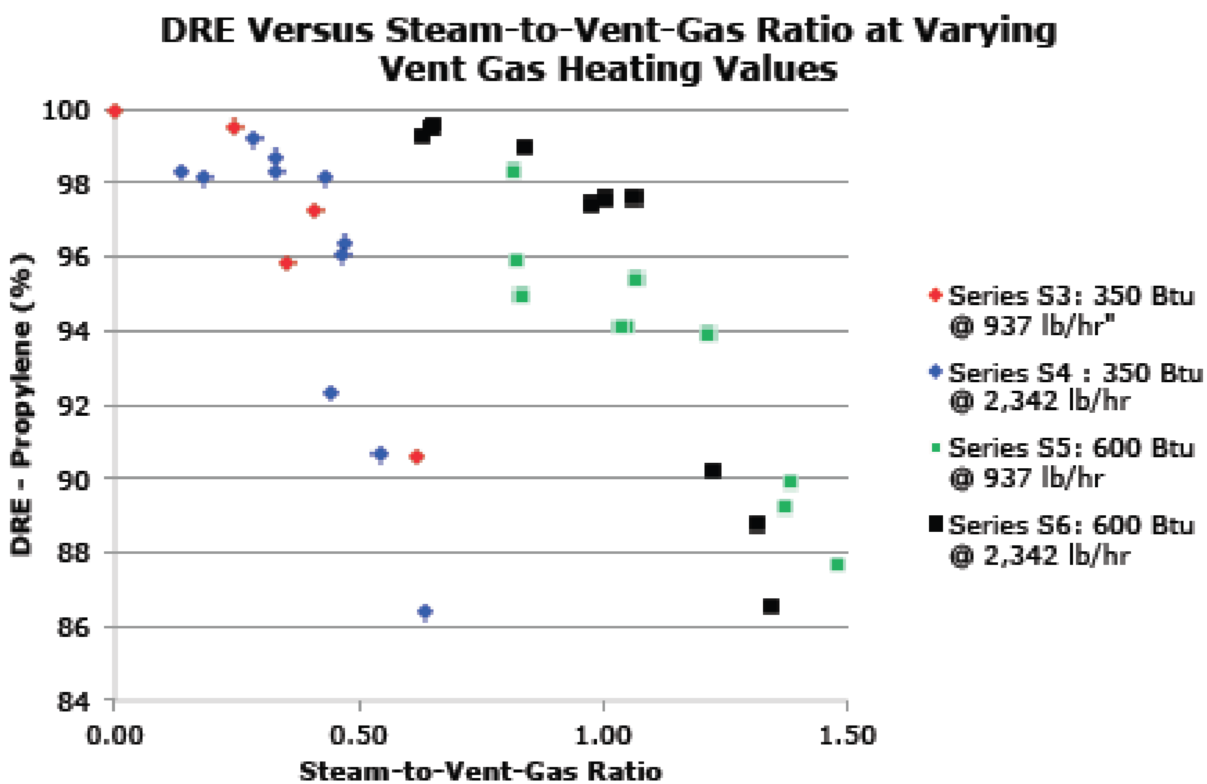
For the conditions tested, the highest DRE and CE was achieved at or near the incipient smoke point.

TCEQ Results



The TCEQ high BTU case performs similarly to the 1982 CMA/EPA high BTU case

TCEQ Results



Vent gas with high heating value (2,149 Btu/scf) has a wider operating range for steam to vent gas ratios.

Vent gas with lower heating values (350 and 600 Btu/scf) has a narrower operating range for steam to vent gas ratios, regardless of tested flow rate.

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TCEQ Results: Center Steam Impacts DRE

At minimum recommended center-steam assist rates, the steam-assisted flare was not able to achieve 99% DRE for the vent gas stream of 350 Btu/scf at 937 lb/hr flow rate.

Manufacturer recommended a minimum center steam operating range of 300-500 lb/hr.

At 937 lb/hr flow rate, a steam-to-vent-gas ratio of less than 0.25 (with zero center steam) was required to achieve 99% DRE.

- This is compatible with the 1982 EPA/CMA results

Steam-assisted flare DRE measured at 98% under limited operating conditions when vent gas stream had low heating value and low flow rates.

- The DRE and CE decrease almost linearly as steam assist rate increases.
- As DRE decreases, flame becomes more “transparent.”

TCEQ Results: Comparison to 1983 EPA/CMA Steam Assisted Tests

TCEQ 2010 test points at 2,149 Btu/scf are similar to EPA 1983 test points at 2,183 Btu/scf.

TCEQ 2010 test points at 350 and 600 Btu/scf are significantly different than EPA 1983 test points.

During the EPA 1983 test at vent gas heating values below 600 Btu/scf, the steam assist was not used and the tip was unassisted. High CE would be expected in this configuration.

- Comment – The 1983 test work did not examine the effect of steam on low BTU gas flaring.
- The two low BTU runs in the 1983 work that used steam were at 0.15 – 0.17 lb steam to VG. These match up with the TCEQ work.

An 8-inch upper steam-assisted tip was used in EPA 1983 tests.

EPA 1983 testing occurred during calm wind conditions.

- Comment – The wind in 1983 was variable – the TCEQ sampling probe is more tolerant of wind variations compared to the CMA/EPA probe

TCEQ testing occurred during variable wind conditions.

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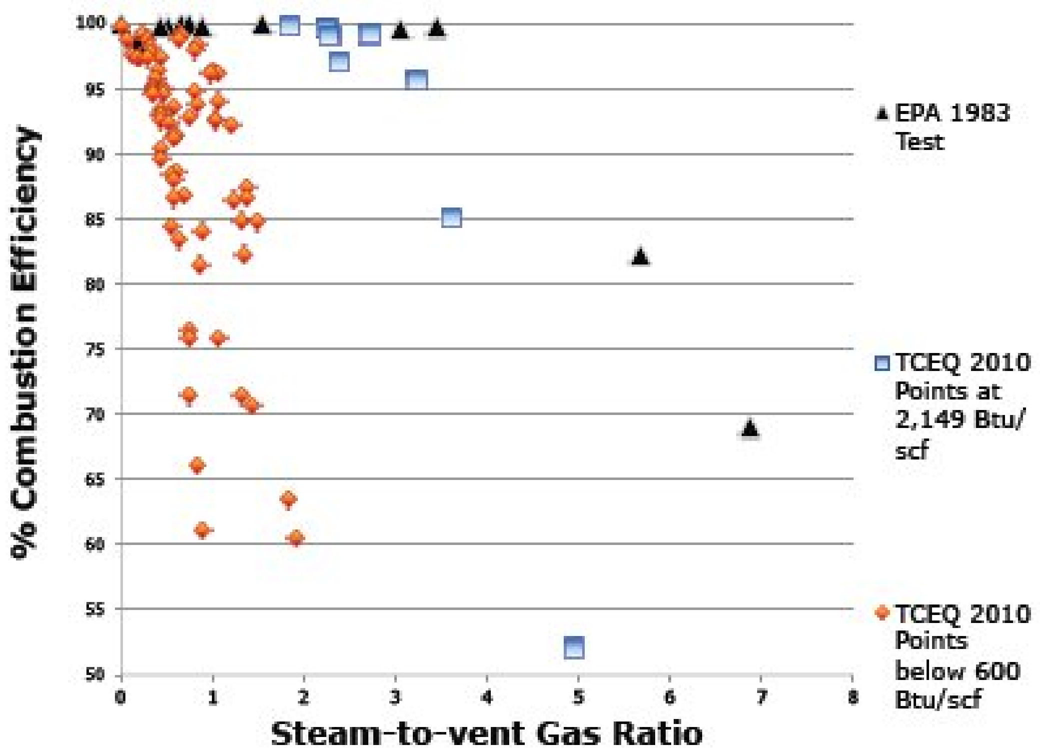
TCEQ 2010 and EPA 1983 Steam Assisted Flare Test Data



The 1983 test work did not examine the effect of steam on low BTU gas flaring.

The two low BTU runs in the 1983 work that used steam were at 0.15 – 0.17 lb steam to VG. These match up with the TCEQ work.

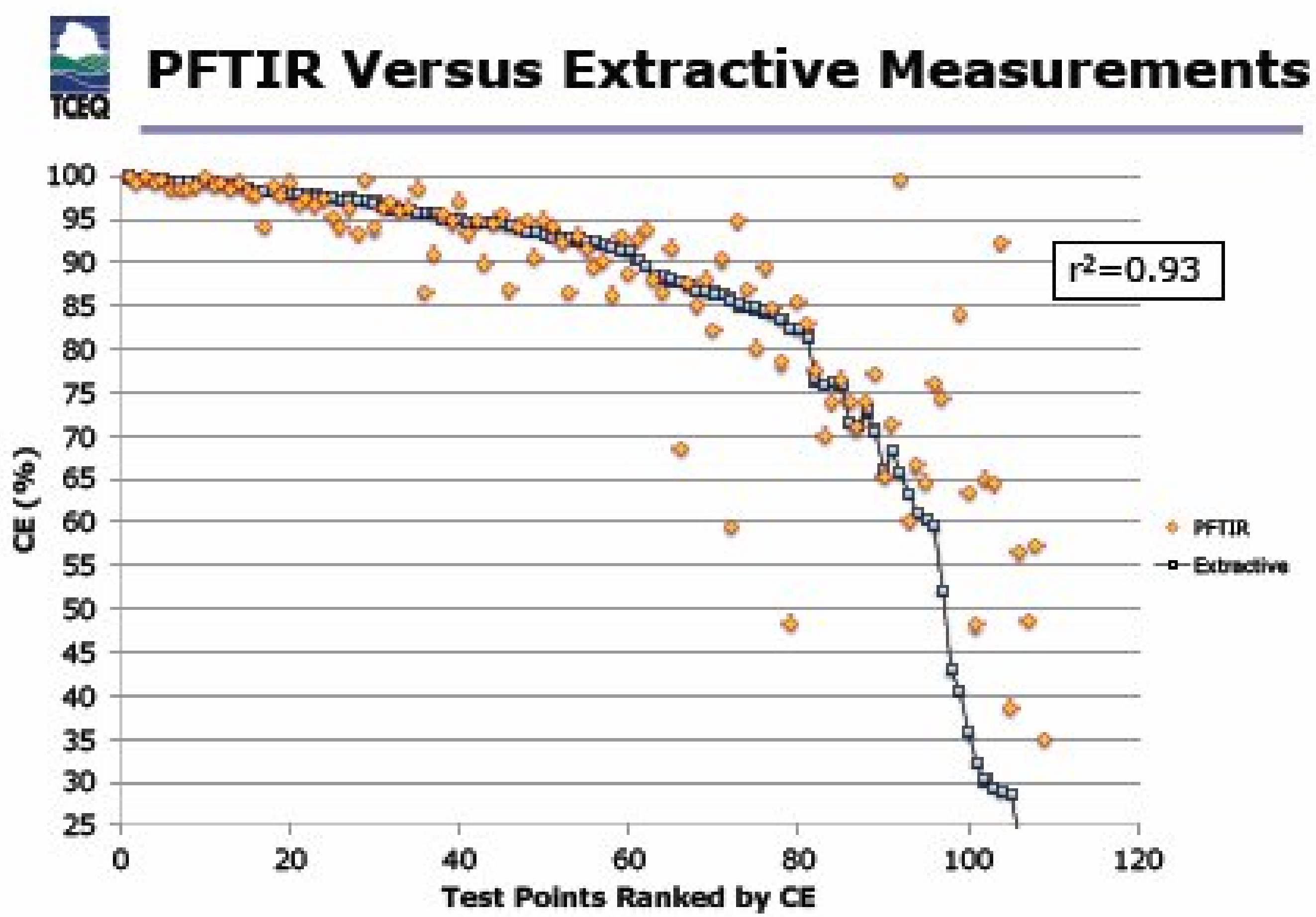
The two study results compare well.

TCEQ Results: How Well Do Passive Techniques Agree with Direct Measurement?

Single-blind CE measurements from the PFTIR were comparable to the Aerodyne extractive CE measurements at higher CE conditions.

Below 87% CE, some instances of poor correlation were observed.

TCEQ PFTIR vs. Extractive Data Comparison



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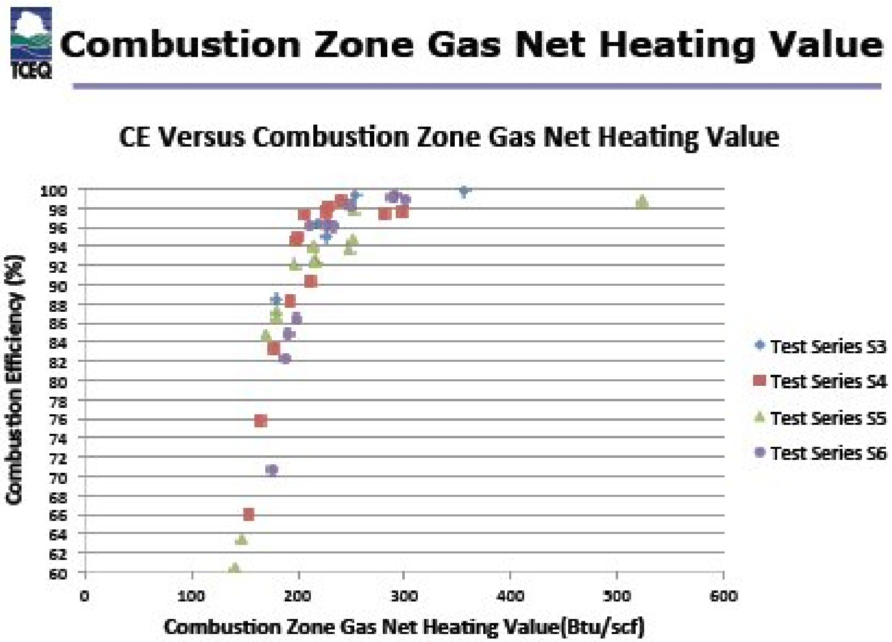
Comparison of TCEQ Data to Other PFTIR Data

Results: Combustion Zone Gas Net Heating Value

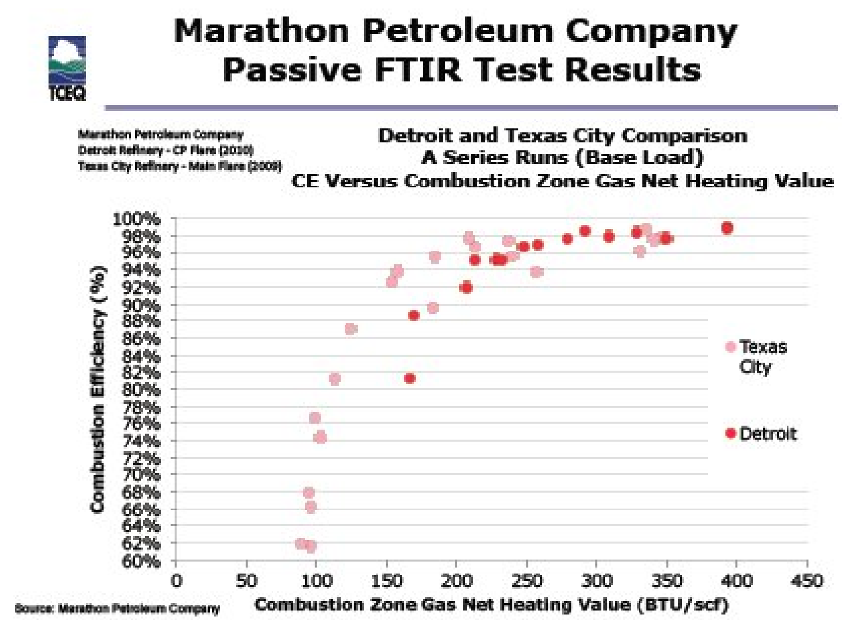
The TCEQ 2010 combustion zone gas net heating value data curve above 200 Btu/scf is very similar to recent Marathon and other EPA consent decree passive FTIR measurements.

- Marathon measurement performed on different flare tip configurations and different vent gas flow conditions.
- Marathon, Texas City, test on 24-inch diameter flare with center, upper, and lower steam and tested under refinery base load conditions at a tip velocity 1 to 3 fps.
- Marathon, Detroit, test on 16-inch diameter flare with center and upper steam and tested under refinery base load conditions at a velocity of 2 fps.

Comparison of TCEQ & Marathon Test Data



TCEQ Data



Marathon Data

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TCEQ Forward Plans

Communication Plan

- TCEQ is developing a cooperative flare training program with stakeholders.
  - Targeted to industry and regulators
  - Goals:
    - Share information from the TCEQ 2010 Flare Study
    - Improve knowledge and efficiency of flare operations
- TCEQ is developing a presentation for local community advisory panels.

  The main objective is to communicate that a luminous and visible flame generally indicates that a flare is combusting hydrocarbons effectively.

Further Details on TCEQ Flare Training

A meeting was held in Austin on 9/26 with TCEQ, TCC & TxOGA.

TCEQ presented an outline/brainstorming document re their training plans. Feedback was given at the meeting.

UT Austin has been given a contract ($150K) to develop the training

The training audience is both the public, regulators, interested stakeholders and industry (plant managers to plant operators).

Seeking input and/or partnership with TCC, TxOGA, API, ACC & NPRA & Flare manufacturers

The brainstorming outline is

- Administrative
- Technical Training
- Important Flare Operating Concepts
- TCEQ and other Test Results
  - A presentation on this alone was shared by TCEQ at the 9/26 mtg
- Indicators of Flare DRE
- Resources
- Ideas to maximize flare efficiency

TCEQ Results Summary

TCEQ

Results Summary

- Air- and steam-assisted flares can efficiently control low Btu vent gas at low flow rates under limited operating conditions.
  - The assist-to-vent gas flow operating range to achieve greater than 98% DRE was limited.
  - A slow rolling, bright orange flame near the incipient smoke point was observed when DRE was measured to be greater than 98%.
- Controlling flare assist rates is critical to achieving high DRE.
  - The assist-to-vent gas ratio operating range increased with increased heating value of vent gas.
  - Increasing vent gas flow rate had a marginal effect on the assist-to-vent gas ratio operating range.

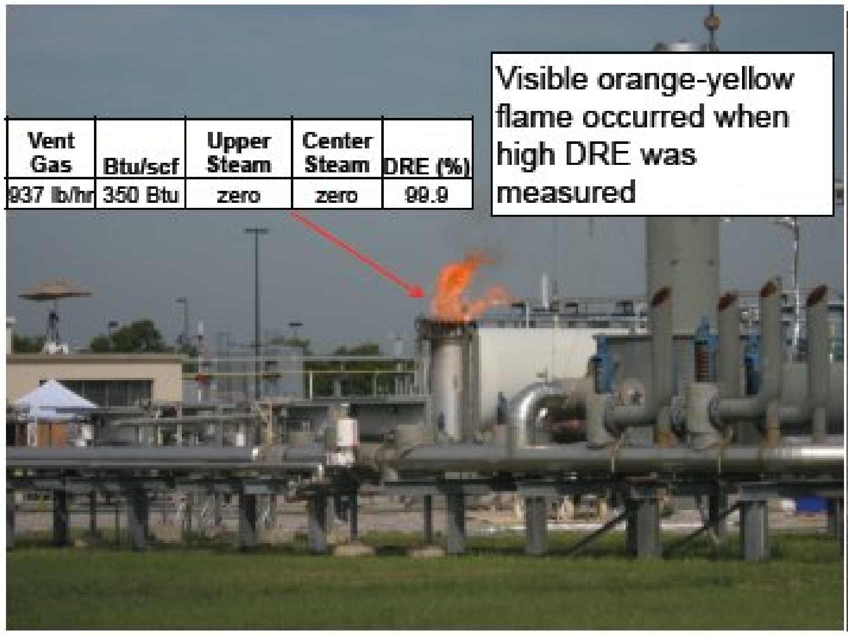
TCEQ Results Summary

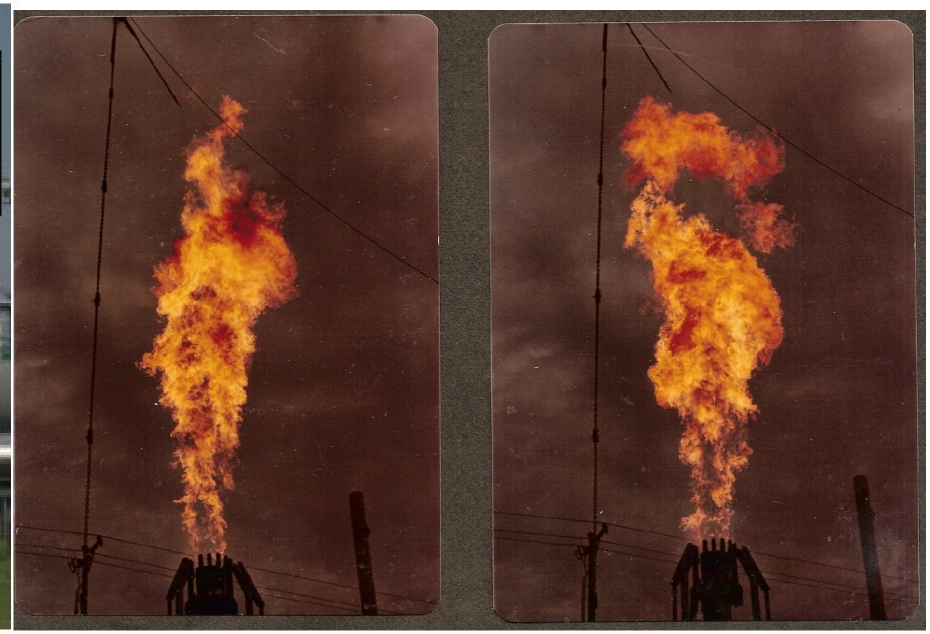
TCEQ

Results Summary

- A flare can be operated under 40 CFR §60.18 criteria and not achieve 98% DRE.
- Flares were easily over-assisted.
  - Air-assisted flare with an excess air factor greater than 10 measured less than assumed 98% DRE.
  - Steam-assisted flare combusting 350 and 600 Btu/scf waste gas required a steam-to-vent gas ratio of less than 1.1:1 to achieve 98% DRE.
  - Steam-assisted flare combusting 2,149 Btu/scf waste gas required a steam-to-vent gas ratio of less than 3.3:1 to achieve 98% DRE.
  - Type of steam assist (center versus upper) impacts flare DRE.

Comparison to TCEQ Work @ 350 BTU/scf @ zero steam





TCEQ Test S 3.6

Steam is not needed for some cases of low BTU flaring

Propylene/Propane flow – 612 lb/hr Steam flow – 0 lb/hr
Nitrogen flow – 2489 lb/hr Steam/fuel ratio – 0
BTU content – 305 BTU/scf
Velocity – 58.7 ft/sec Flare Diameter – 8 “
CE – 99.8% % capy – 14.7 %

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Summary of ACC/NPRA/API Presentation to EPA on Aug 30

Steam-Assisted Flares
Cost-Effectiveness Analysis of Monitoring Controls

Preliminary Results

EPA/Industry Flare Technical Work Group

August 30, 2011

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API/NPRA/ACC Study Approach and Objectives

Collect operating data representative of steam-assisted flares in the Refining/Chemicals industry – Obtained for 35 flares

Collect actual cost data for installing equipment to continuously monitor flare flow, steam flow, and flare gas composition

- Avg Cost - $2.3 MM for full monitoring of flows and composition

Meters, control valves, GC/shelter, infrastructure and cabling

Reflects total installed costs

Estimate current flare emissions and potential reductions

Analyze the cost effectiveness (cost/ton VOC reduced) resulting from installation of monitoring equipment to maintain desirable steam-to-gas ratio by adding natural gas.

Develop an order-of-magnitude perspective on relationships among operating scenarios, emissions, and costs

Key Learning's

Opportunities exist to reduce flare emissions in a cost-effective manner

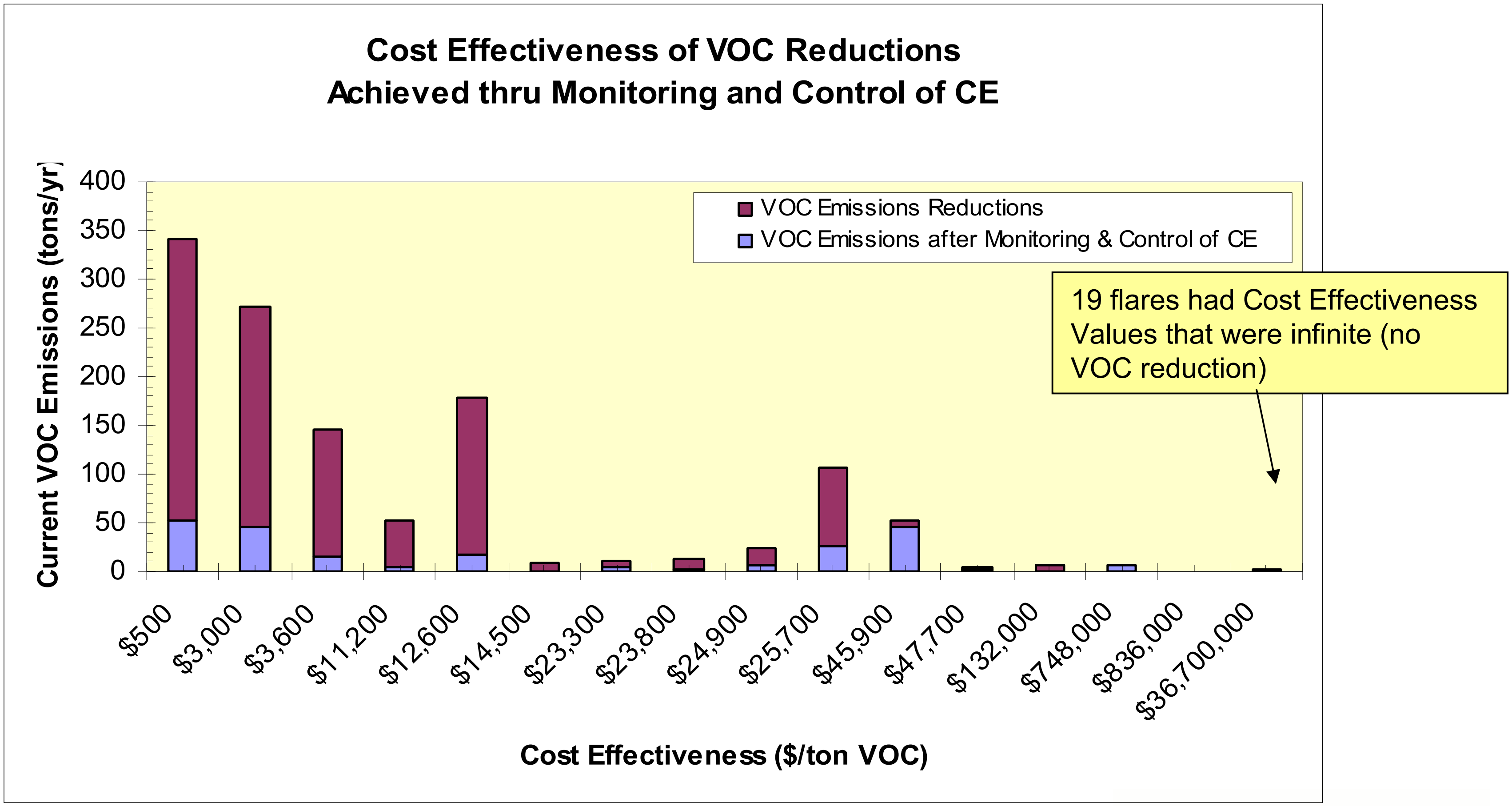
The degree to which emissions can be reduced via an increased focus on steam-assist ratio depends upon a flare’s specific operation

To assure cost-effectiveness, monitoring requirements should be tailored based upon VOC emission rates

Little opportunity to reduce emissions from purge-and-pilot flares

Primary focus should be on flares that may have sufficient potential reduction in VOC by increasing combustion efficiency thru improved operating practices and/or monitoring

VOC Emissions Reductions Achieved thru Monitoring & Control of CE are Cost-Effective ($10k/ton) for a Small Number of Flares



In Summary

Flares operating at reduced combustion efficiency do not necessarily have high VOC emissions

Several variables influence the potential benefit from monitoring steam-assist ratio

- VOC content of the flared gas
- Annual VOC load during routine operations
- Combustion efficiency achievable using current operating practices

The cost-effectiveness for extensive monitoring on flares with low VOC emissions is very poor

- "Purge-and-pilot" flares should be allowed to demonstrate compliance with good combustion operating conditions in a flexible, cost effective manner

Flares with high VOC load have the potential to benefit most from improved monitoring of steam-assist ratio

- Flares with high Operating Hours at high steam to fuel ratios benefit from improved monitoring

Summary of Learning's from AFRC Flare Colloquium

The American Flame Research Committee is an organization of flame researchers.

The members are from academia, industry and combustion equipment vendors.

The AFRC is affiliated with the International Flame Research Foundation

The meeting was held in Houston from Sept 18 through Sept 20

Key points made by the various speakers are summarized in the following slides

Summary of Key Speaker's Talks

Jim Seebold, Chevron, retired – Colloquium Organizer

Compliance with 40 CFR 60.18 does not guarantee high efficiency operation of flares

BTU/scf is not a good performance indicator

Flare flame plumes are not homogeneous leading to problems with PFTIR

PFTIR is not accurate enough to predict performance and is not fully validated

Need to combine testing with flame simulation modeling

High efficiency occurs at or near the smoke point

Flames form and destroy numerous compounds at ppb/ppt levels and more at ppq levels

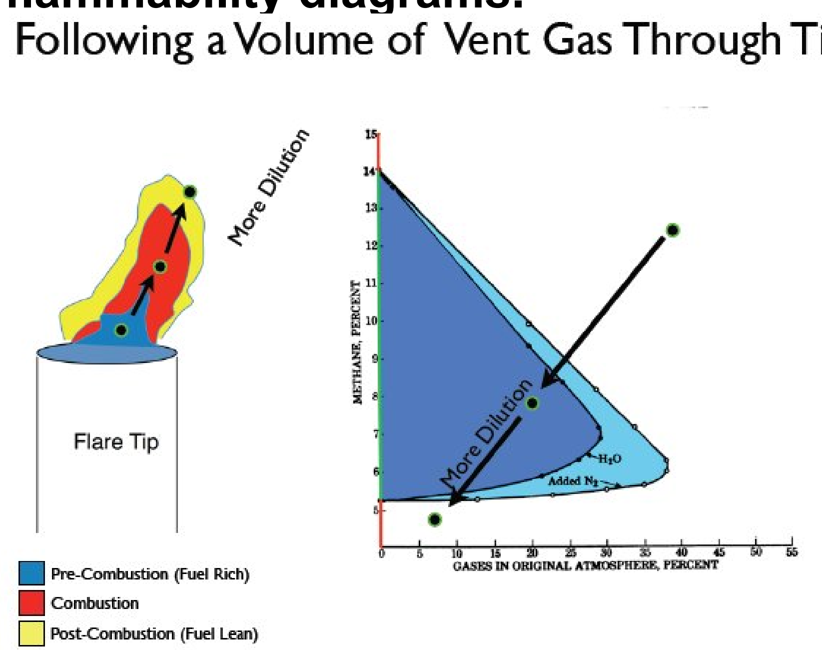
Reference: Seebold, James. "Combustion Efficiency of Industrial Flares Revisited – The Current status of this multivariate, multiphysics, multichemistry morass and what to do about it" 2011 AFRC Flare Colloquium, Houston TX, September 19, 2011.

Scott Evans – Clean Air Engineering

Scott has served as the study manager and testing coordinator for many of the refinery settlement agreement flare tests at Shell and Marathon.

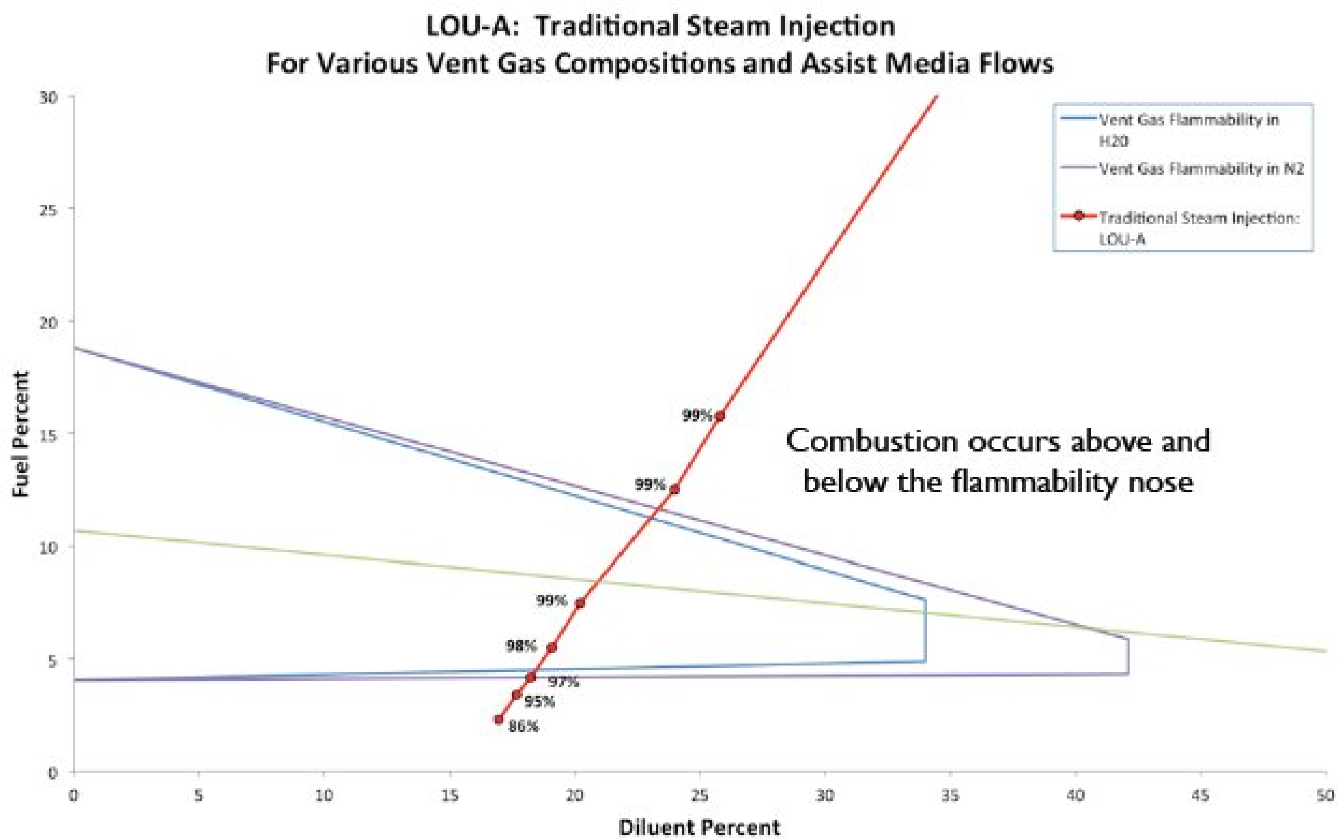
His talk dealt with Marathon results

Flare flame test data can be analyzed using Zabatakis Diagrams also known as flammability diagrams.

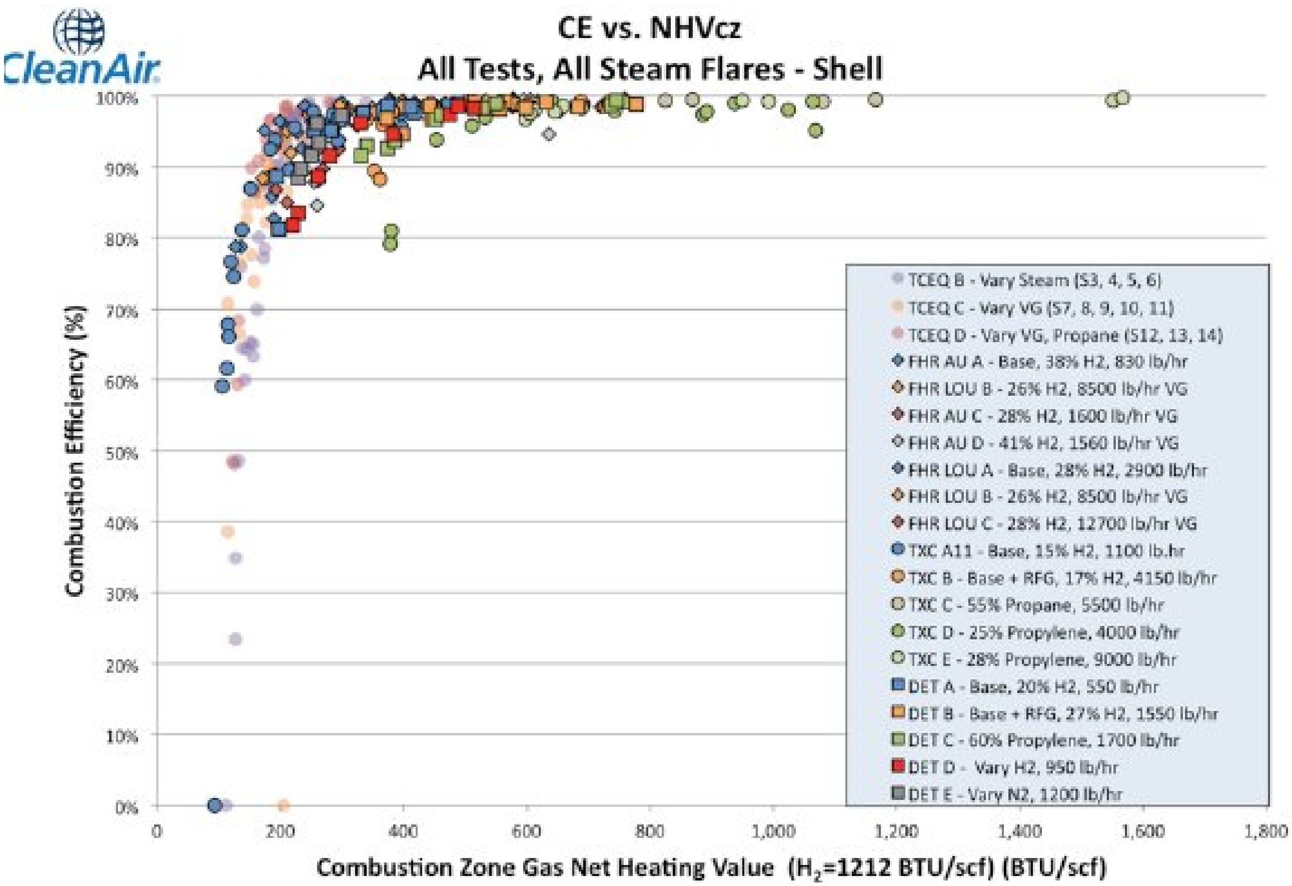


Reference: Evans, Scott. "Insights from Passive FTIR Flare Performance Tests" 2011 AFRC Flare Colloquium, Houston TX, September 19, 2011.

Test Data on Nose Plot or Flammability Diagram



Most Recent Flare Data Collapsed on one plot



This is most of the recent PFTIR test results which indicate the choice of a CZNV of ~ 300 as a cutoff for efficient operation

This includes a correction factor for Hydrogen

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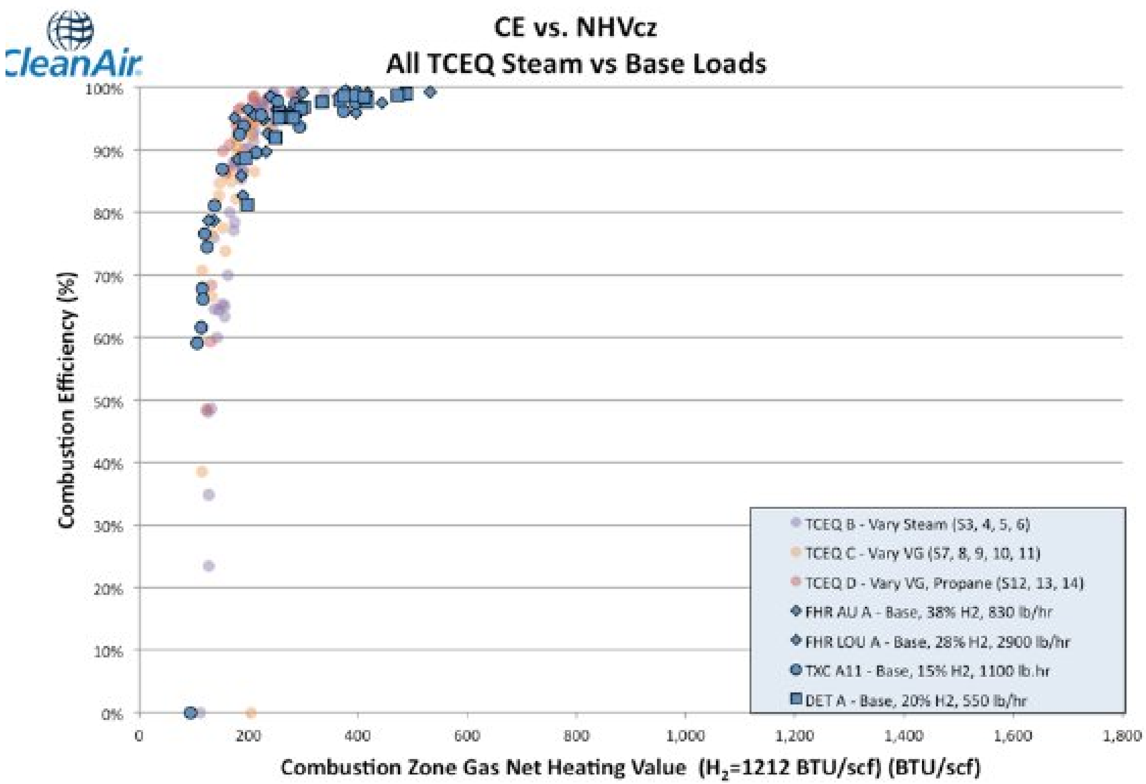
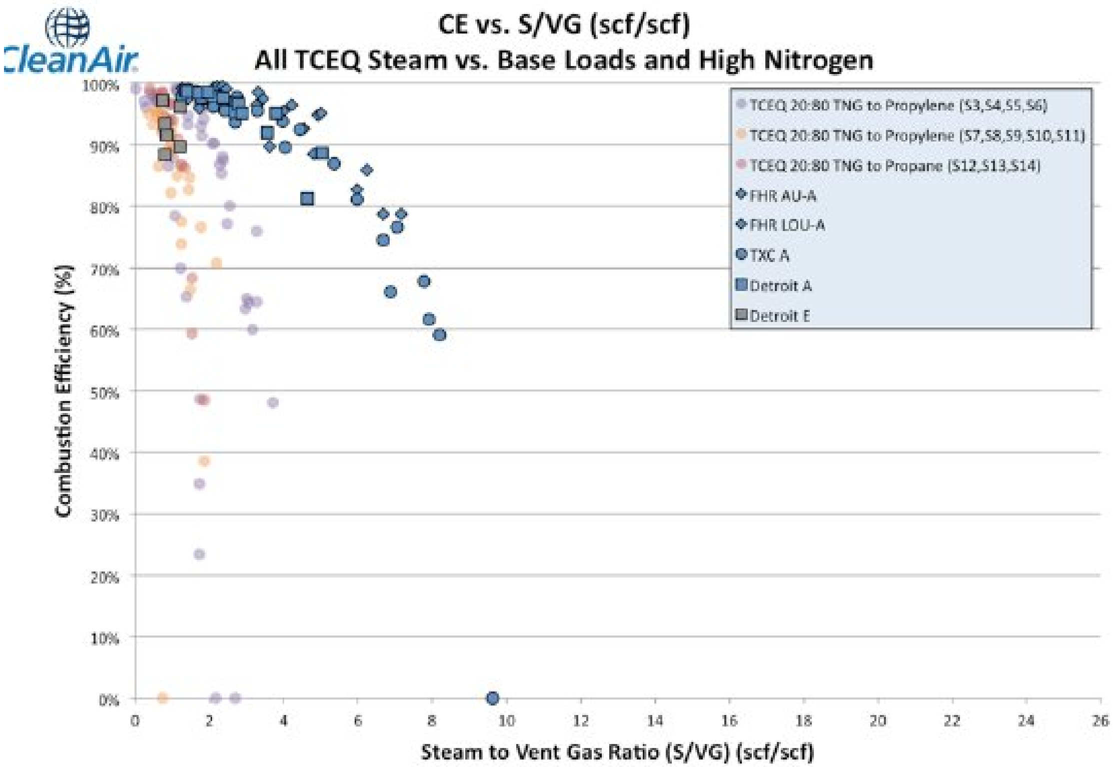
TCEQ Data and Base load Flare Test Data



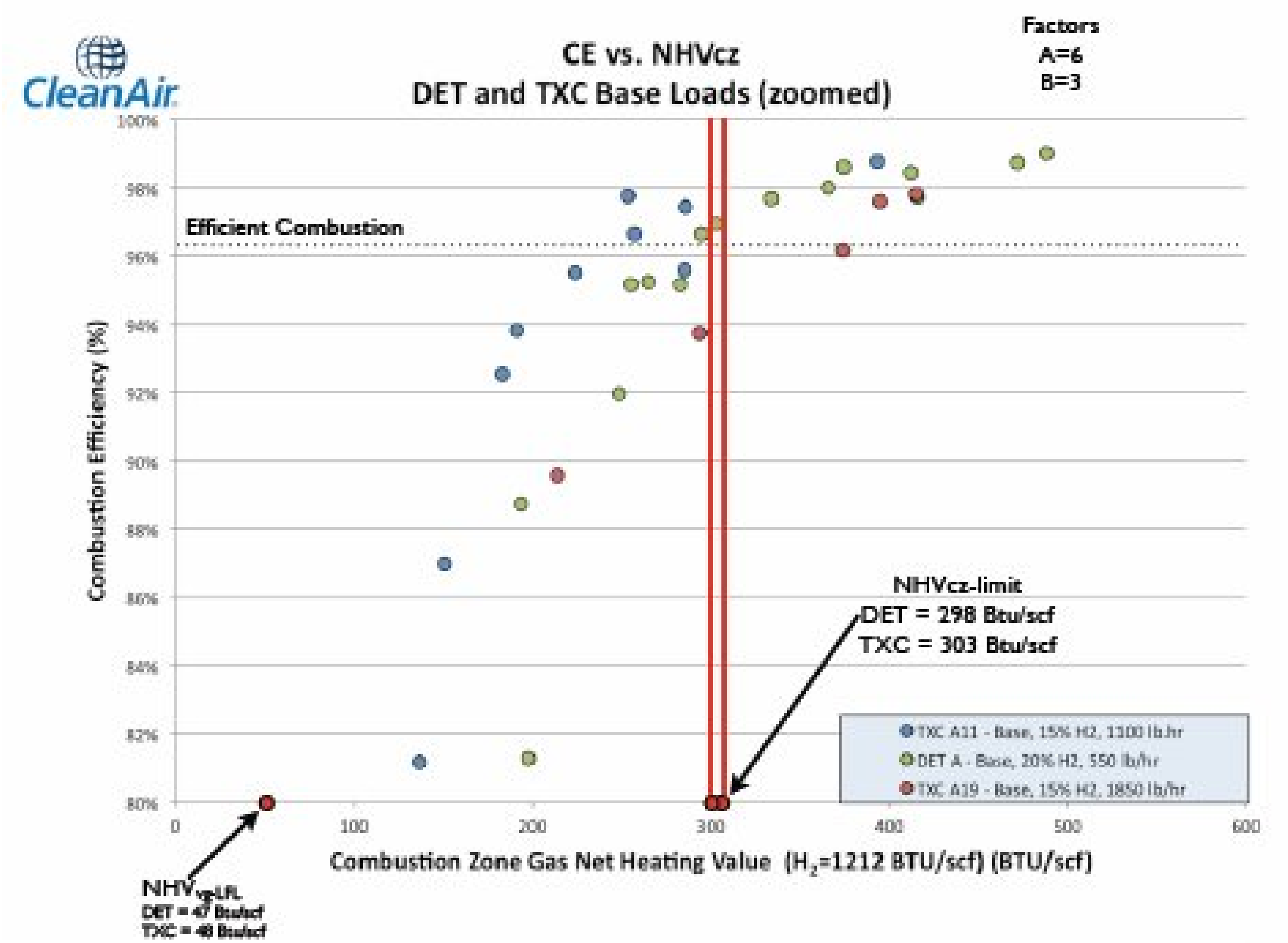
These TCEQ and Base load Refinery data indicate the choice of a CZNV of ~ 300 as a cutoff for efficient operation

TCEQ Steam runs, Base Load data with high Nitrogen



The TCEQ data agrees with the field test data

Base load Flare Data with a Hydrogen Correction Factor



These TCEQ and Base load Refinery data indicate the choice of a CZNV of ~ 300 as a cutoff for efficient operation

This data uses a pseudo correction for hydrogen

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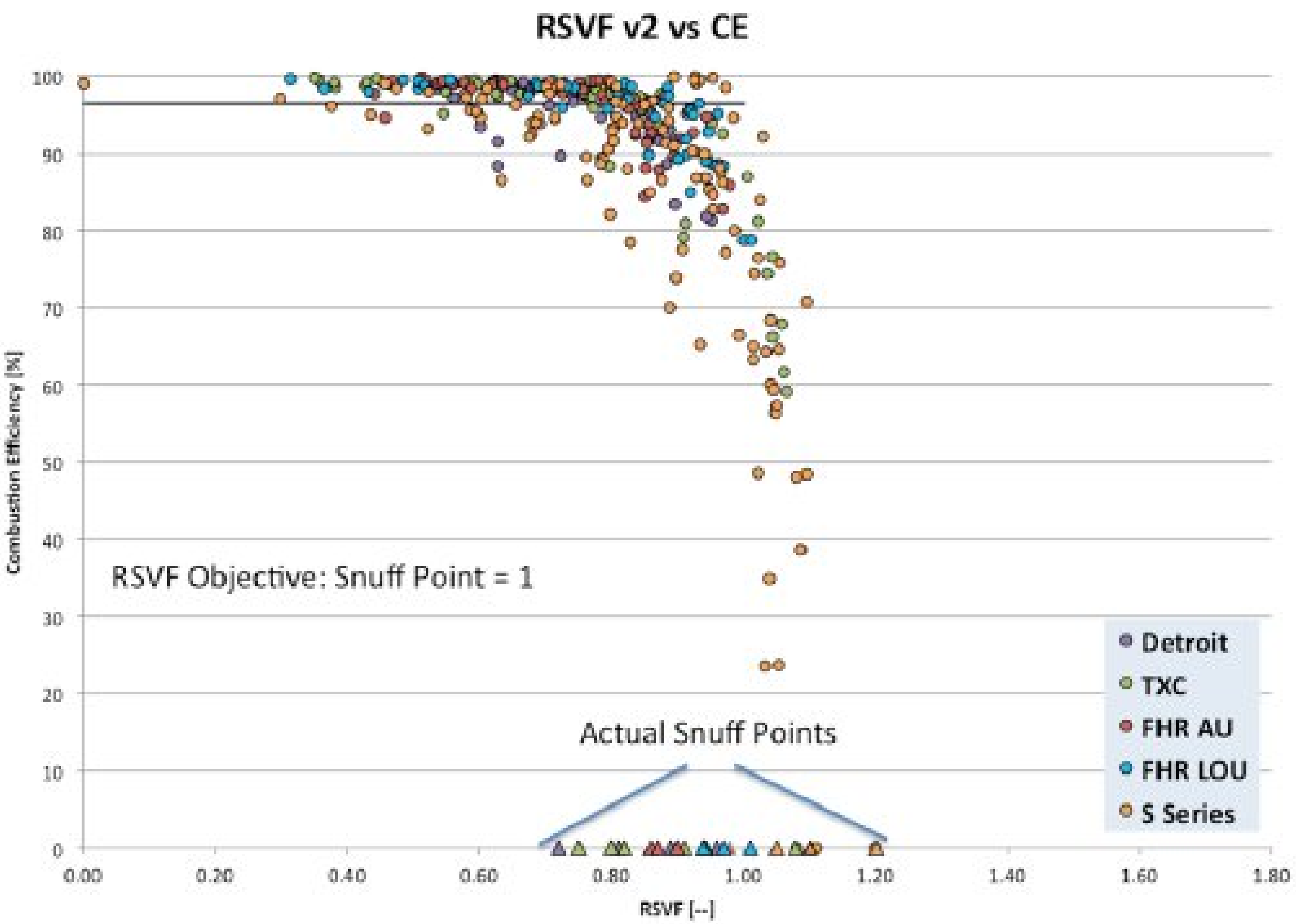
Reduced Steam Volume Fraction as a Function of CE for Refinery PFTIR Testing



Reduced steam volume fraction is the ratio of actual steam volume fraction to the snuff point steam volume fraction

Gary Mueller et al., Shell Global Systems

Gary and his group have analyzed IFC Flare test data and have used the IFC Literature search to modify the use of flammability diagrams.

The results of his work have honed the concept of reduced steam volume fraction and alternate flare monitoring parameters.

Reference: Mueller, Gary. “Combustion of Mixtures: A Modified IFC Approach” 2011 AFRC Flare Colloquium, Houston TX, September 19, 2011.

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Flammability Diagrams for Mixtures

UFL & LFL @ Stoichiometric

Flammability of CH4 in nitrogen

Cst – Stoichiometric fuel composition in inert mixture

Inert composition @ Stoichiometric (I*)

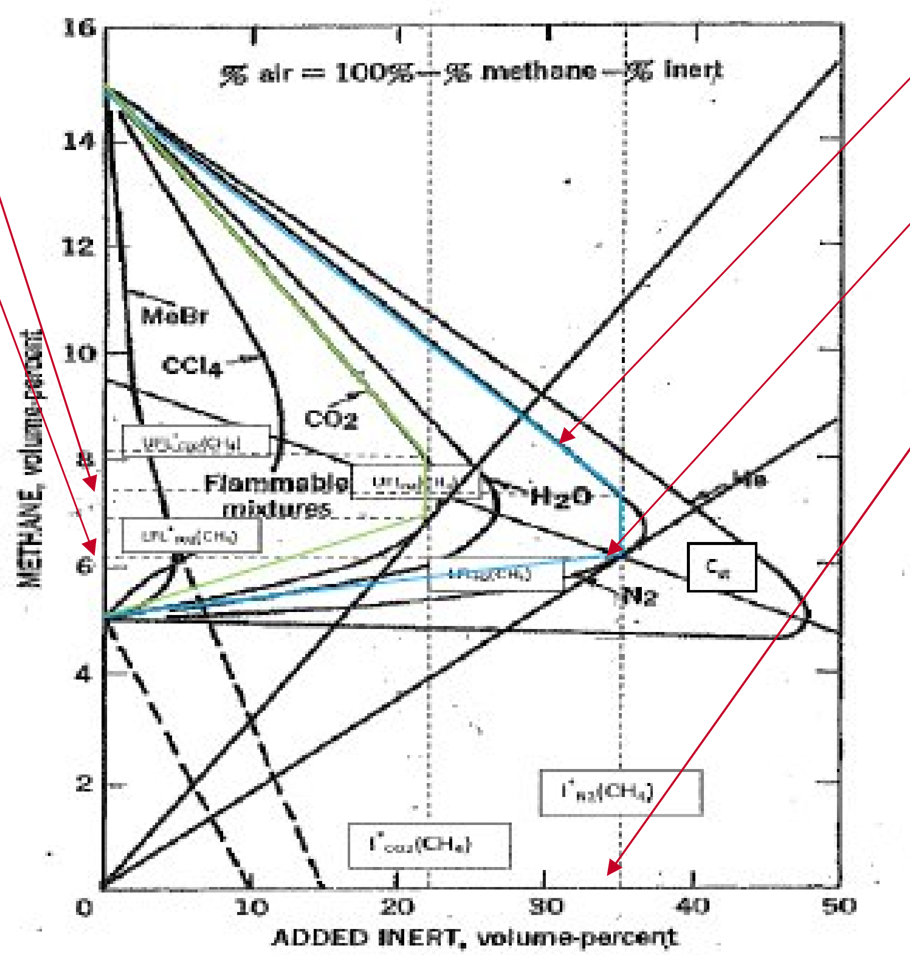

Figure 1. Estimated Flammability Diagram for Methane with Nitrogen and Carbon Dioxide[1]

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Mixture Flammability Properties proposed for Flare Flame Combustion Optimization

Table 1. Values of I*, LFL*, and UFL* estimated from Zabetakis[2]

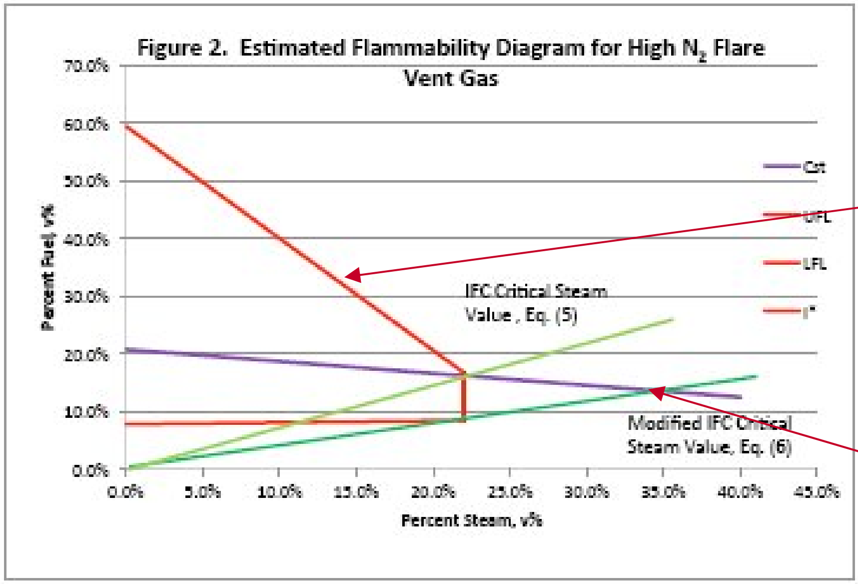
Component	I^*_{N2}	I^*_{CO2}	Est. I^*_{H2O}	LFL^*_{N2}	LFL^*_{CO2}	Est. LFL^*_{H2O}	UFL^*_{N2}	UFL^*_{CO2}	Est. UFL^*_{H2O}
Hydrogen	69.5	52.8	57.8	4.1	5.1	4.8	7.3	12.5	11.0
Carbon monoxide	55.0	36.9	42.4	13.4	17.6	16.3	18.1	28.3	25.2
Methane	35.0	22.0	25.9	6.2	6.7	6.6	7.6	8.2	8.0
Ethane	42.1	30.1	33.7	3.3	4.1	3.9	4.1	4.6	4.5
Propane	39.4	26.7	30.5	2.7	3.5	3.3	3.5	4.4	4.1
Butanes	36.5	25.7	28.9	2.2	2.7	2.6	3.4	3.9	3.7
Pentanes	40.5	24.8	29.5	1.9	2.1	2.1	2.7	4.0	3.6
Hexanes	40.0	26.4	30.5	1.6	1.9	1.8	2.7	2.9	2.8
Hexane+	36.8	25.7	29.0	0.7	0.8	0.8	1.3	1.4	1.3
Ethylene	46.9	31.0	35.8	3.4	2.8	3.0	5.9	8.4	7.7
Propylene	39.6	26.0	30.1	2.5	3.3	3.1	3.9	4.7	4.5
Butenes	41.0	28.4	32.1	2.2	2.6	2.5	3.5	4.0	3.8
Pentenes	42.4	28.7	32.8	2.0	2.3	2.2	2.9	3.3	3.1
Acetylene	64.7	48.9	53.6	2.6	2.6	2.6	4.0	14.7	11.4
Benzene	39.1	24.6	29.0	1.5	2.0	1.9	3.1	4.0	3.8
Hydrogen sulfide		25.3	28.9		5.3	5.1		12.9	12.0

The values at stiochiometric composition for various inerts can be calculated using various mixture rules – modified based on IFC Flare Test work and the IFC literature search

I^*, LFL^*, & UFL^* are the composition in inert & UFL and LFL all at stoichiometric composition for the mixture

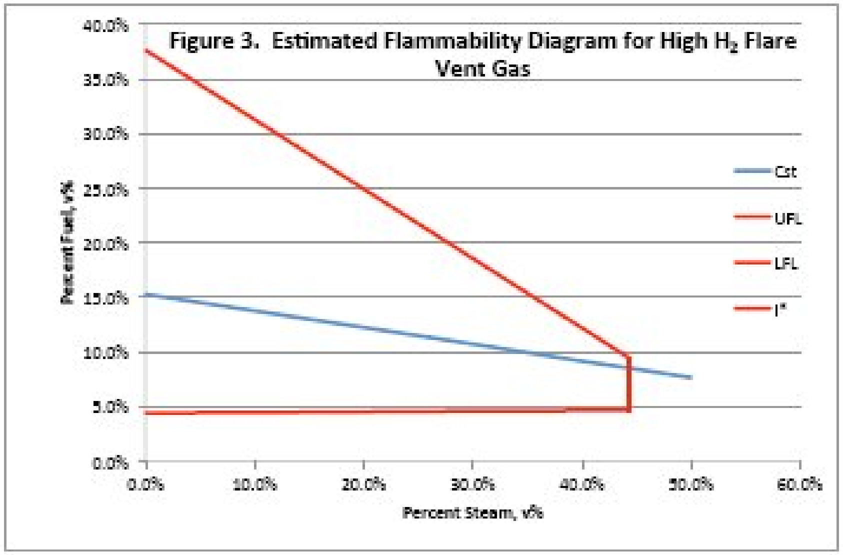
The miracles of science™

Flammability Diagram in action for a flared gas inert mixture using steam assist



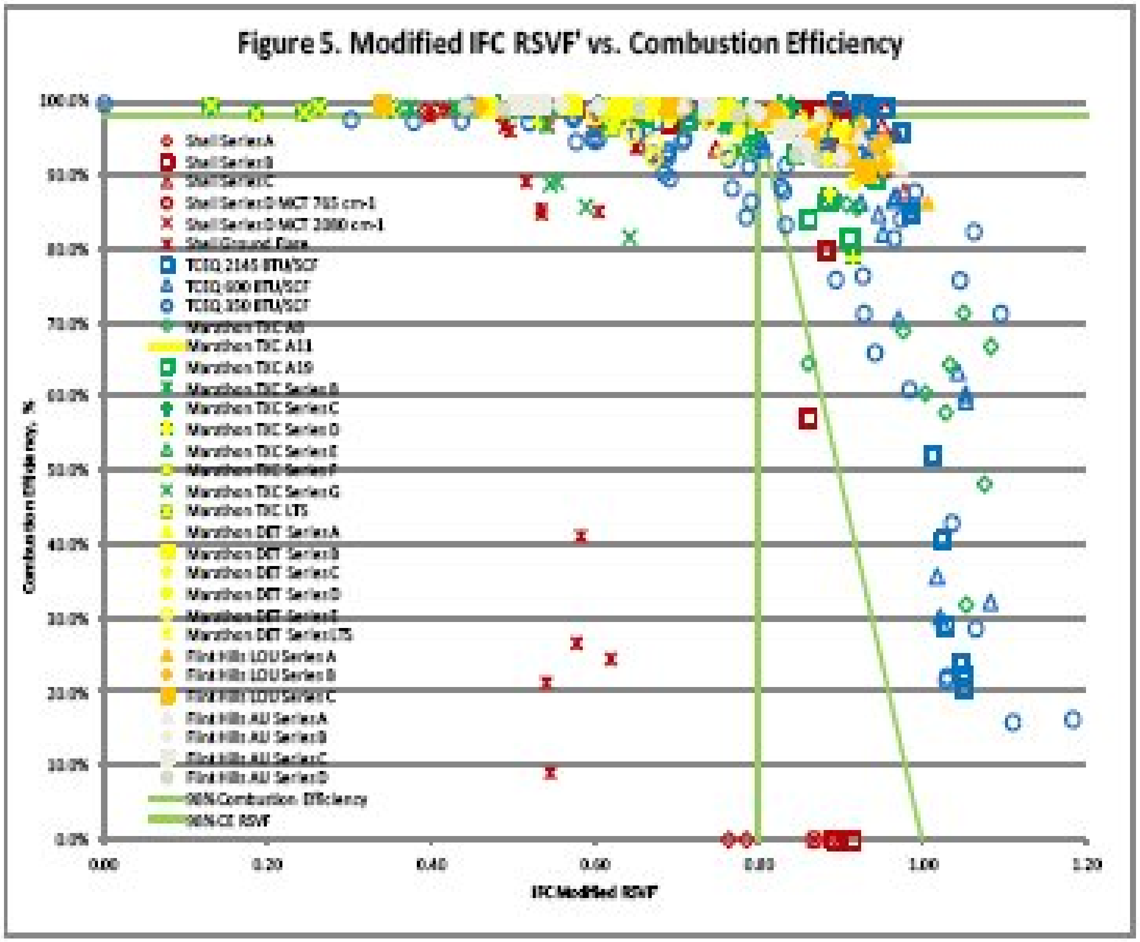
Flammability of Mixture in nitrogen calculated from I* , LFL* , & UFL* - the composition in inert & UFL and LFL all at stoichiometric

Critical Snuffing Steam value



Hydrogen Mixtures are a different animal

Reduced Steam Volume Fraction as a Prediction of Flare Performance



An advantage of this approach is that a hydrogen correction factor is not needed.

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EPA – an Overview of Forthcoming Rules

EPA's data collection effort has been via settlement agreement coerced flare studies in refineries and one chemical plant.

- The scope, planning and study objectives have been dictated by EPA OECA with minor input from OAQPS.
- Minimal or no participation by external industry or trade associations or independent experts has occurred
- The studies were performed in 2009, 2010 and 2011 with all reports not publicly available until April, 2011

EPA has been very private and first met with API/NPRA/ACC in May of 2011 despite efforts to arrange meetings starting in the 4th quarter of 2010

The proposed flare performance parameters were only fully discussed/presented to the technical community at the AFRC Flare Colloquium meeting in Sept, 2011

The flare rules are already written and were drafted in the first/second quarter of 2011with no premeetings with the regulated community.

In the past, data gathering to support rules was been done cooperatively with industry, EPA and the public.

- Fugitive mission rules, tank rules, 1st generation flare rules, Ethylene MACT, HON, MON, SOCMI CAR and other rules.

EPA Regulatory Forecast

The current flare standards are termed “narrative standards.”

Violations of these standards have been determined using 60.18 criteria or using “good air pollution control practice.”

EPA wants to convert the flare standards to numeric standards with bright lines to determine compliance.

Operation to confirm compliance with the numeric bright lines needs to be determined using measurement and monitoring data to the maximum extent possible.

EPA will propose the rules in late Oct/Nov and will allow only a 60-day comment period.

EPA Regulatory Forecast

EPA will propose and request comments on three regulatory parameters

- Combustion Zone net heating value
- Reduced Steam Volume Fraction
- An LFL concept based on a ratio of LFL to combustible volume fraction

EPA will propose three groups of regulations for large, medium and small flare systems

- Large systems will have a full suite of monitoring (steam, assist fuel, flare gas composition and flow and control requirements.) This is projected to cost > $2mm/flare
- Medium and smaller flares will have a less severe set of requirements

Right now flare narrative regulations are grouped and include air-assisted, steam-assisted, non-assisted and non-assisted hydrogen-rich flaring.

While the current round of data collection only applies to steam-assisted flaring, EPA intends to redo the whole regulatory regime dealing with all types of flare categories.

Summary: What to do to once the new rules are proposed

Determine your flare operating parameters (steam, air, flow, composition and assist gas) for each operating scenario (startup, shutdown, maintenance operations, loading, equipment emission control, etc.)

Determine how your flare is operated against the various proposed flare operating parameters.

Determine how much compliance with these rules will cost.

Do this in 60 days and comment on the proposal.

As soon as the proposal is issued, petition the EPA for a comment period extension based on the lack of communication with the regulated community during the technical data collection and analysis period of the rule-making process.