Best Practices to Reduce Venting and Flaring with Economic Benefit

Jeff Voorhis PE, EMS-LA
HY-BON/ED Engineering

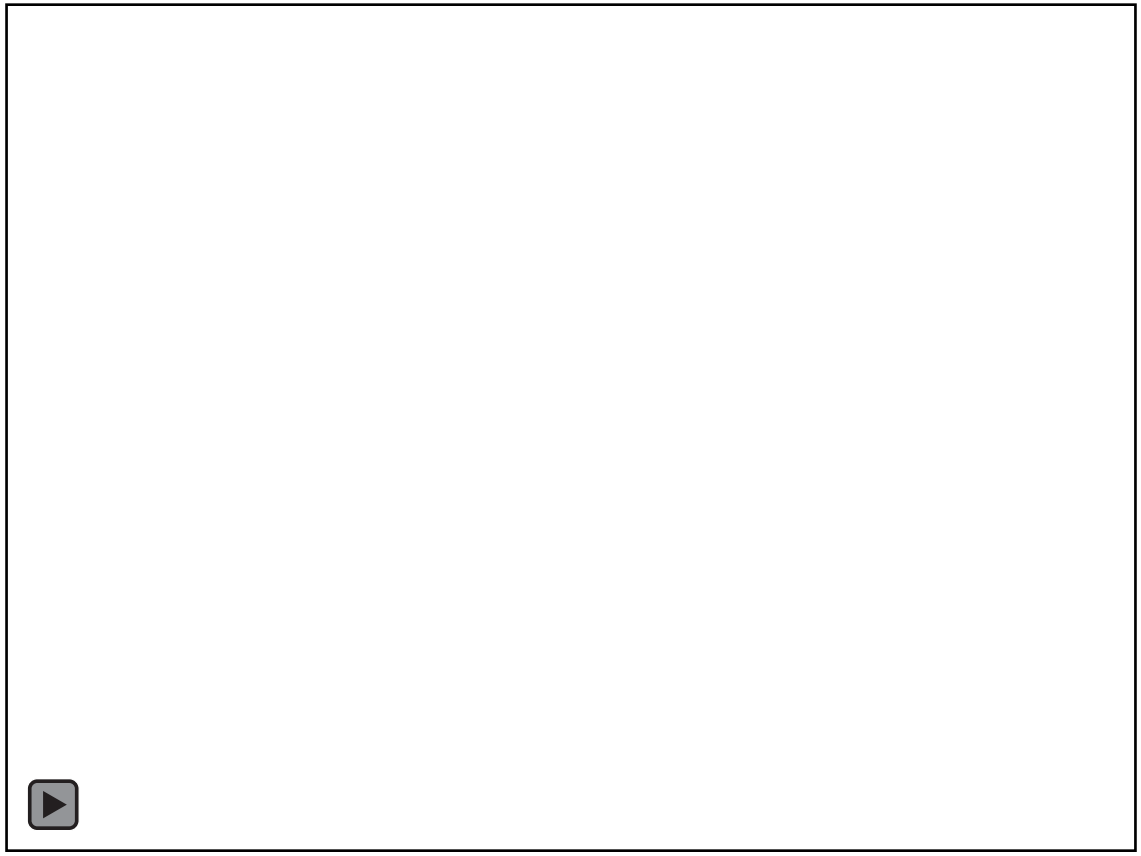
October 30, 2017

What does HY-BON/EDI do?

We take waste gas emissions and convert them into revenue, while keeping you safe and in compliance.

HY-BON EDI
Vent Gas Management

Wasting resources and, most importantly, revenue!



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Actual Measurement

- 530 tons per year of VOC Emissions
- $55\ \text{MSCFD} \times \frac{\$4}{\text{MSCF}} \times 2000\ \text{BTU} = \frac{\$132{,}000\ \text{Revenue}}{\text{Year}}$
- Project Cost: $100,000 (VRU, VRT, VCU and Install Estimate)
- Payout: 9 Months!

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Why the current focus on tank battery emissions?

- Technology advancements to see and analyze these gas streams
- Realization that industry and nationwide inventories are understated
- Dramatically higher volumes of VOC's & other contaminants
- Focus on reduction of greenhouse gases (CO2 & CH4)
- All resulting in heightened regulations & enforcement

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EPA Amends Definition of Storage Vessel Affected Facility

A single storage vessel located in the oil and natural gas production segment, natural gas processing segment or natural gas transmission and storage segment and has the potential for VOC emissions equal to or greater than 6 tpy MUST reduce the emissions by 95% taking into account requirements under a legally and practically enforceable limit in an operating permit or by other mechanism.

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6 tons per year sounds like a lot, but…

- Threshold based on potential to emit VOC's – 6 tons per year or more

- Daily equivalents could be as low as:
  - 33 pounds emission
  - About 1 MCF Emission
  - 1 Barrel of Condensate Produced
  - 20 Barrels of Oil Produced
  - 2000 Barrels of Water with 1% Oil Carryover Processed

Emissions Limitations

The 6 tpy limit is on a per tank basis. Even if the tanks are manifold together in a series the PTE needs to be looked at on a per tank basis. So if all of the flash is occurring in the first tank of the series, and as a result it's PTE is 10 tpy and the remaining tanks are only 1 tpy each, then the first tank is an affected source under OOOO and the others are not. Since the flash is occurring in that first tank, those emissions must be accounted for that tank's PTE and cannot be averaged out to the other tanks in the series.

Oklahoma

Kendal Cody Stegmann

Sr. Environmental Manager

Compliance and Enforcement Group

Air Quality Division

(405) 702-4150

Texas

Joe Shine

Team Leader, Rule Registrations Section

Air Permits Division

joe.shine@tceq.texas.gov

(512) 239-6595

What is the Survey Timeline?

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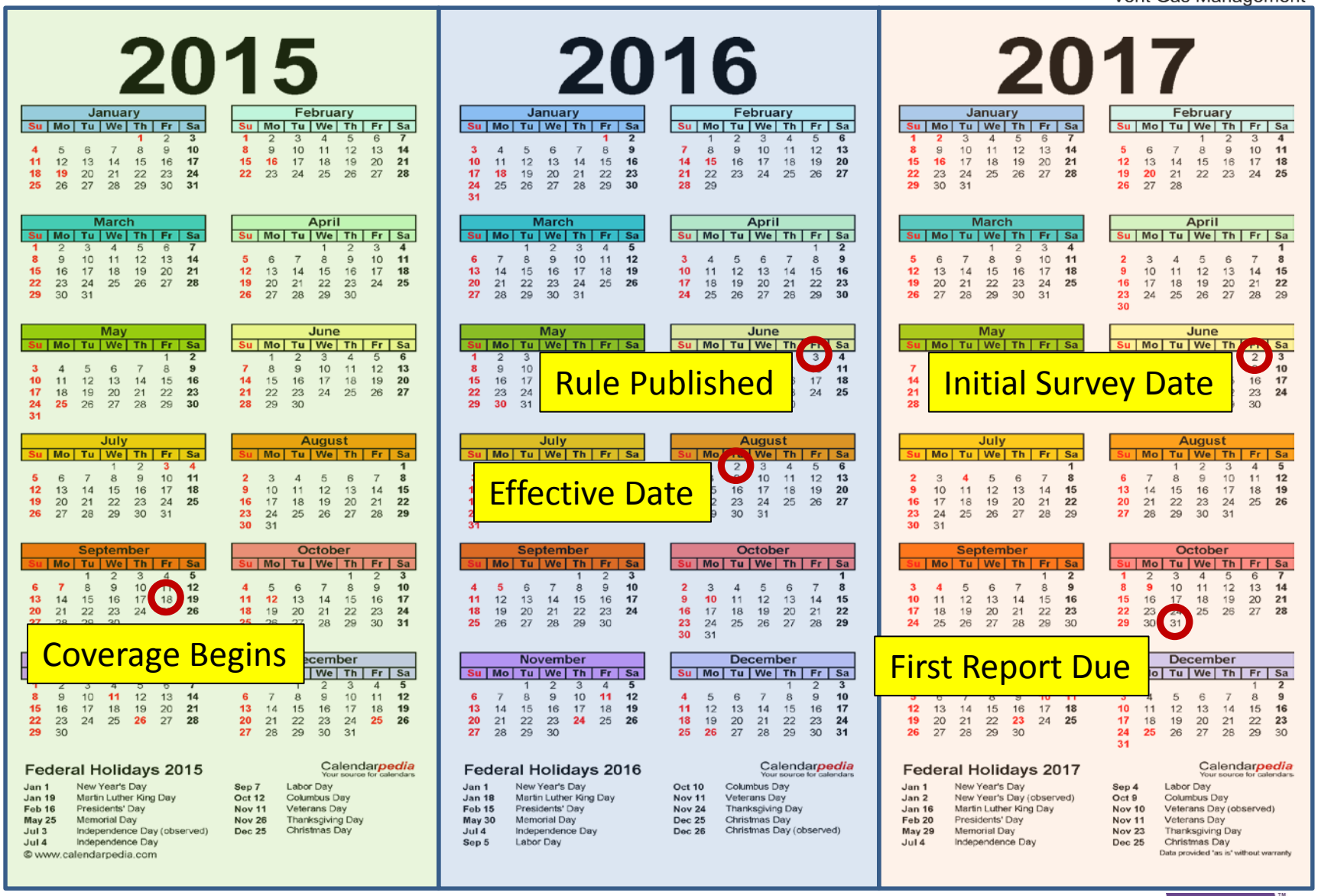

40 CFR PART 60 SUBPART OOOOa - LEAK DETECTION AND REPAIR (LDAR) REPORT SUBMISSION PROCESS

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DEADLINE FOR SUBMISSION - OCT 31, 2017

- TCEQ has enforcement authority over OOOOa
- LDAR reports should be submitted to the EPA and TCEQ
- LDAR reports to the TCEQ should be submitted in hard copy form until STEERS is updated to receive them online
- From the OOOOa rule listed below – if EPA's electronic report submission website CEDRI is not set up to accept electronic reports by the deadline then hard copies should be sent to the EPA's Regional Office as well.

40CFR Part 60 Subpart OOOOa :

- §60.5420a " (11) You must submit reports to the EPA via the CEDRI. (CEDRI can be accessed through the EPA's CDX (https://cdx.epa.gov/).) You must use the appropriate electronic report in CEDRI for this subpart or an alternate electronic file format consistent with the extensible markup language (XML) schema listed on the CEDRI Web site (https://www3.epa.gov/ttn/chief/cedri/). If the reporting form specific to this subpart is not available in CEDRI at the time that the report is due, you must submit the report to the Administrator at the appropriate address listed in § 60.4. Once the form has been available in CEDRI for at least 90 calendar days, you must begin submitting all subsequent reports via CEDRI. The reports must be submitted by the deadlines specified in this subpart, regardless of the method in which the reports are submitted."

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EPA United States Environmental Protection Agency

Office of Enforcement and Compliance Assurance

Compliance Alert

September 2015

EPA Observes Air Emissions from Controlled Storage Vessels at Onshore Oil and Natural Gas Production Facilities

Purpose

The U.S. Environmental Protection Agency (EPA) is publishing this Compliance Alert because EPA and state investigations have identified Clean Air Act compliance concerns regarding significant emissions from storage vessels, such as tanks or containers, at onshore oil and natural gas production facilities. The Alert discusses certain engineering and maintenance practices causing the compliance concerns and potential emissions-reducing solutions. While this Alert provides information intended to help operators and state regulators identify and address compliance concerns, the Alert's engineering and maintenance practices do not equate to or guarantee compliance with federal and state regulations.

Compliance Concerns

This Alert aims to help operators assess whether their vapor control systems are properly designed, sized, operated, and maintained such that emissions from storage vessels may be controlled in compliance with applicable federal and state regulations. For purposes of this Alert, a "vapor control system" includes a closed-top storage vessel, all vent lines leading from the storage vessel, fittings and connectors in the vent lines, any liquid knock-out vessels in the vent lines, any pressure relief devices (PRDs) on the vessel or vent lines, and the control device used to combust gas or route gas into the sales line.

EPA and state inspectors have observed emissions from storage vessel PRDs, such as closed thief hatches and pressure relief valves. Inadequately designed, sized, operated, and/or maintained vapor control systems may not effectively capture and control emissions.

and natural gas is extracted from sub-surface formations through a wellhead and then flows into a separator at varying pressures. The separator divides material from the wellhead into various constituents, such as oil, water, hydrocarbon liquids and natural gas or comingled

Storage vessels at an oil and gas production facility.

liquids and natural gas, depending on the characteristics of the well. The separator has a valve that opens to "dump" the pressurized liquid into a storage vessel. While some storage vessels are designed to operate at pressures greater than atmospheric pressure, most storage vessels currently used for oil and natural gas production are atmospheric storage vessels, which are only designed to operate at or below atmospheric pressure.

Storage vessel emissions at onshore oil and natural gas production facilities are regulated because they contain: (1) large quantities of volatile organic compounds

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Some Engineering Solutions and Maintenance Considerations for Storage Tanks in the Alert

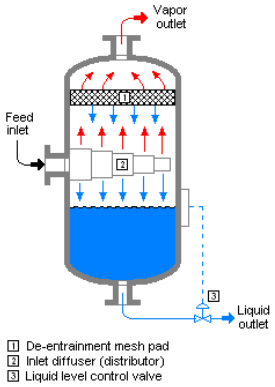
- Reduce Liquid Pressure Prior to Transferring the Liquid to Atmospheric Storage Vessels
- Adequate Diameter of Piping Used for Vent Lines to Control Device
- Prevent Liquid Collection in Vent Lines
- Eliminate Unintentional Natural Gas Carry-Through
- Ensure Proper Maintenance and Set Points for Pressure Relief Valves
- Minimize Venting from Thief Hatches
- Adequate Sizing of Emission Control Devices

1. Crude Oil/Condensate/Produced Water Pressure Drop

To reduce flash gas volumes and peak flowrates of vent gas during separator dumps of oil/produced water to storage tanks, use multiple stages of separation. This allows the system to operate with a smaller pressure drop between the last stage of separation (low pressure separator/heater treater) and an atmospheric storage vessel.

Of course, to reduce air emissions, the gas liberated by the intermediate stages of separation must be collected and sent to the system (fuel, sales pipeline) and not vented to the atmosphere.

High Differential Pressure Equals High Flash Potential

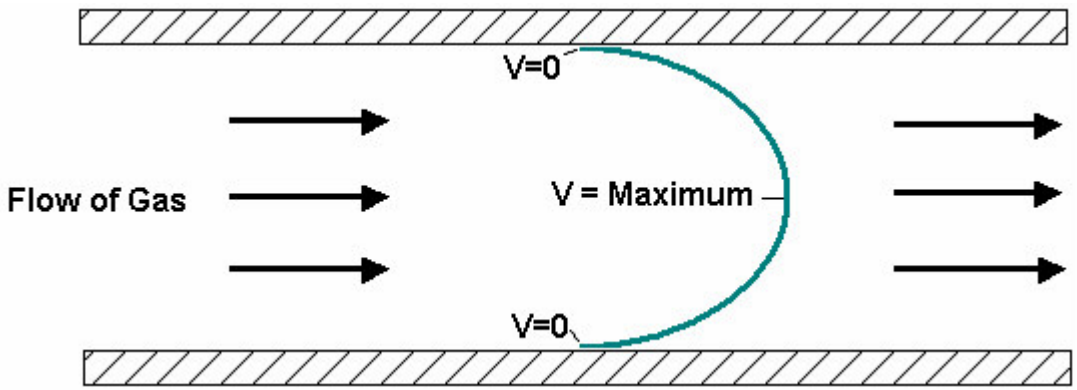


HY-BON/EDI's IQR Emission Survey includes an optional assessment of an oil and gas process to optimize pressure drops to atmospheric storage tanks and reduce flash emissions.

2. Adequate Diameter of Piping Used for Vent Lines to Control Device

Use vent piping between storage tanks and emission control devices that has a diameter designed to handle the potential instantaneous peak flow of vent gas increase flash gas during separator dumps. If the piping is inadequate, then a portion of the will not be collected by the VRU and/or combustor. This will increase the chance of creating back pressure on the storage tank and result in venting to the atmosphere at the thief hatches and/or pressure relief valves (PRV).

Internal Gas Flow Pipe Friction Causes Problems: Oversize It



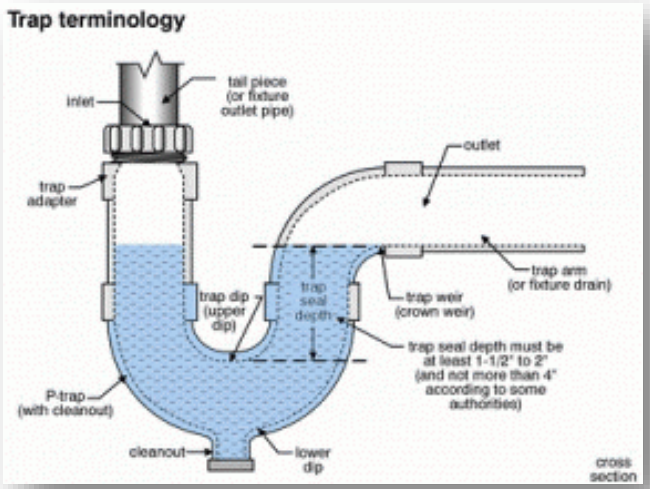
$$C_d = 0.5961 + 0.0261\beta^2 - 0.216\beta^8 + 0.000521\left(\frac{10^6\beta}{\mathrm{Re}_D}\right)^{0.7} +$$
$$+\left(0.0188 + 0.0063\left(\frac{19000\beta}{\mathrm{Re}_D}\right)^{0.8}\right)\left(\frac{10^6}{\mathrm{Re}_D}\right)^{0.3}\beta^{3.5} +$$
$$+\left(0.043 + 0.08e^{-10L_1} - 0.123e^{-7L_1}\right)\left(1 - 0.11\left(\frac{19000\beta}{\mathrm{Re}_D}\right)^{0.8}\right)\frac{\beta^4}{1-\beta^4} -$$
$$-0.031\left(\frac{2L_2}{1-\beta} - 0.8\left(\frac{2L_2}{1-\beta}\right)^{1.1}\right)\beta^{1.3} + 0.011(0.75-\beta)\left(2.8 - \frac{d_1}{0.0254}\right)$$

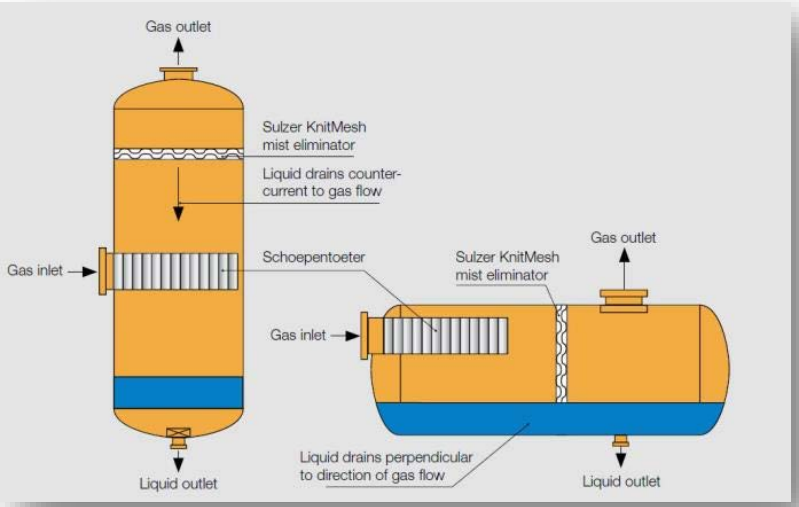
HY-BON/EDI includes this as a standard design criteria when sizing VRUs and combustors for a facility.

3. Prevent Liquid Collection in Vent Lines

The collection efficiency of vent gas control systems will be reduced if rich gas in to vent line between the storage tank and emission control device condenses and collects in vent lines – especially in low spots along the path.

No Liquid Traps to Gas Control Devices





In HY-BON/EDI's VRU and combustor lines, we recommend using a sloping piping of adequate inner diameter from the storage tank that is routed to a drip pot (i.e., scrubber) to ensure that liquids do not collect in the line creating a blockage. Also, the scrubber can remove liquids that can harm vapor recovery compressors and cause smoking conditions in enclosed combustors/flares.

4. Eliminate Unintentional Natural Gas Carry-Through

- When storage tank pressure relief devices (PRD) are opening and venting gas on a regular basis due to pressure increase in storage vessel and this caused by unintentional natural gas carry-through, take corrective action to reduce/stop venting.
- This can be due to pressure increase during normal separator dump events and can also occur from separator dump valves stuck in open position (i.e., valve failed to reseat) and leaking gas into storage tanks.
- If repeated PRD venting is not from unintentional natural gas carry-through, the following corrective actions are offered:
- Increase the PRD pressure set points if there is sufficient margin between the set point and the rated pressure of the storage vessel to do so while continuing to safeguard storage vessel integrity-
- Take steps to decrease the liquid's pressure drop experienced at the storage vessel
- Replace the storage vessel with a storage vessel that is rated to a higher pressure and use higher pressure set points.

Find Them, Document Them and Fix Them

HY-BON/EDI's design services will take into account production rates, operating pressures in sizing VRUs and combustors. Our IQR services include onsite inspections for carry-through of vent gas due to stuck dump valves.

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5. Ensure Proper Maintenance and Set Points for Pressure Relief Valves

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- By design, pressure relief valves (PRVs) are safety devices that protect vessels from over-pressurization and should remain closed during normal operations. They are not process vents that should discharge during normal operations.
- The EPA alert states that PRVs should have a pressure setting that is low enough to protect vessel structural integrity and avoid over-pressurization. Also, the pressure setting should be high enough to exceed storage vessel operating pressures during normal operation.
- When a PRV is found to be venting to the atmosphere actions should be taken to verify proper valve reseating after opening.

Critical to All Operations of VRU and Control Devices. Check, Monitor and Maintain to Stay in Compliance

Division Now Issuing Immediate Notice of Violation for Visible Emissions from a Flare and/or Open Thief Hatch

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"The Division has determined that improperly secured thief hatches, visible emissions from a flare, and audible emissions from a thief hatch or PRV are violations of Regulation No. 7. The Division has determined that the minimum fine for an open thief hatch, visible emissions from a flare or audible emissions from a thief hatch or PRV will be $15,000 per day. The duration of each such violation will be at least one day, unless evidence gathered by the Division and/or provided by the source proves otherwise." (emphasis in original).

DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
Air Quality Control Commission; REGULATION NUMBER 7 ; CONTROL OF OZONE VIA OZONE PRECURSORS

6. Minimize Venting from Thief Hatches

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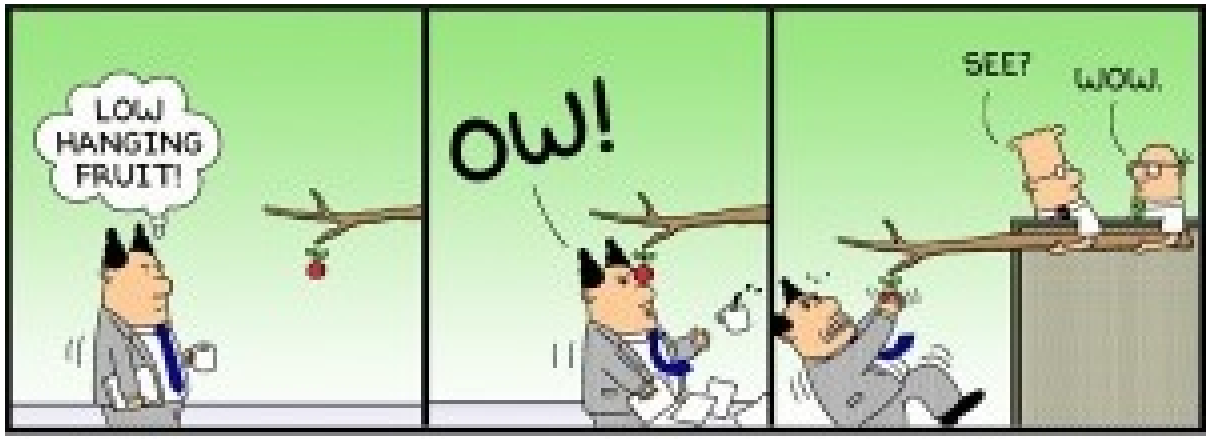
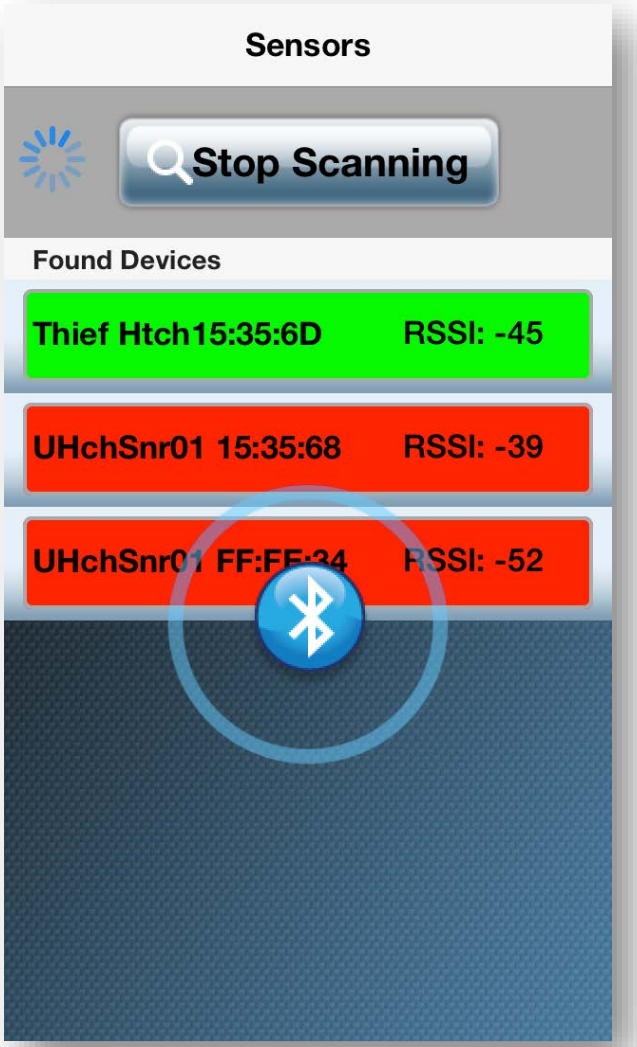
Inspect gauging/thief hatches and pressure relief devices regularly to ensure good seals. Install quality gaskets on thief hatches and regularly inspect those gaskets to ensure a tight seal. Implement procedures to ensure thief hatches are properly closed after vessel gauging, sampling and unloading.

Inspectors Go After Low Hanging Fruit. Always Pick and Fix It First.



HY-BON/EDI routinely inspects and replaces gaskets for thief hatches and leaking pressure relief devices as a part of our IQR services.

Hatch Sense



Problem

The Oil & Gas Market is Working to Meet EPA's "Quad-O" Requirements

- The EPA and all States require operators to control emissions by keeping the vent safety devices in the working closed position.
- When an EPA permit violation or noncompliance issue leads to enforcement proceedings, corrective action is required and fines up to $15,000 per day per occurrence may be assessed.

If a Tank Hatch is open, the tank will not build the necessary pressure to allow Vapor Recovery Units or Combustors to operate properly.

- Operators or Truckers may not verify that tank hatches are closed before leaving site.
- Many Producers cannot remotely monitor their equipment.

Environmental Health and Safety

- Improve overall health and safety by reducing employee exposure to VOCs.
- Protect the environment including adjacent communities.

Solution

The Simplest Solution

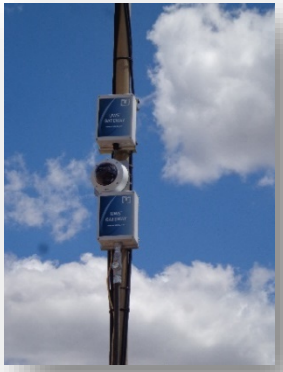
- UWS™ Hatch Sense Kits with the free iOS Application
  - One sensor per tank hatch or valve
  - One customer supplied iPad per Operator
- Before operator leaves site the iOS App is used to verify the state of all of the hatches in the vicinity

A Better Solution

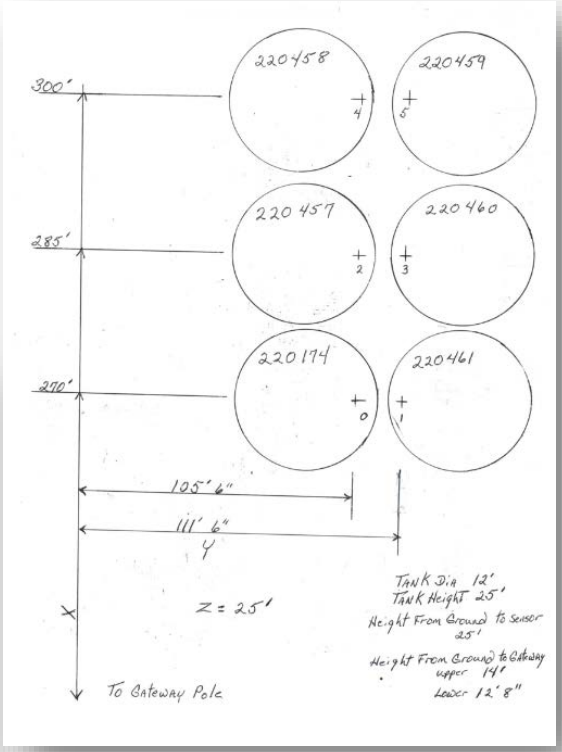
- UWS™ Hatch Sense Kits with the free iOS Application
  - One sensor per tank hatch or valve
  - One customer supplied iPad per Operator
- UWS™ Gateway with the free iOS Application
  - One gateway per site
- SCADA Monitoring
  - Data is automatically stored in the database
  - Data can be compiled for EPA compliance reporting
  - Email and Text messaging subscription services will alert when a hatch lid or valve is open
  - Optional video surveillance

Configuration, User Interface and Alerts

Pilot Installation at a Denver Based Producer



The pilot installation has six tanks, each equipped with one UWS™ Hatch Sense. There are two UWS™ Gateways installed approximately 300 feet away from the tanks and outside the hazardous area. Both gateways are solar powered during the daytime. One gateway is powered by backup batteries for over-night operation.



		Hatch Closed Count	Hatch Open Count		Data Count	State Change Count		
		4920	45		4965	10		
GMT Time	Name	Value	MDT Time	ΔT	Data Notes	State Change	Work Ticket	Time Open
5/18/16 23:24	S05 Hatch State	0	5/18/16 17:24	0:05		1	RR1090988	< 5 min
5/18/16 23:29	S05 Hatch State	1	5/18/16 17:29	0:05		1		
5/19/16 0:13	S05 Hatch State	0	5/18/16 18:13	0:05		1	RR1090988	< 5 min
5/19/16 0:19	S05 Hatch State	1	5/18/16 18:19	0:06		1		
5/23/16 13:42	S05 Hatch State	0	5/23/16 7:42	0:06		1	RR0040963	~ 1hr 22 min
5/23/16 15:24	S05 Hatch State	1	5/23/16 9:24	0:06		1		
5/24/16 8:22	S05 Hatch State	0	5/24/16 2:22	0:05		1	RR0040964	~ 12 min
5/24/16 8:34	S05 Hatch State	1	5/24/16 2:34	0:06		1		
6/1/16 18:34	S05 Hatch State	0	6/1/16 12:34	0:17		1	RR0300825	~43 min
6/1/16 19:17	S05 Hatch State	1	6/1/16 13:17	0:22		1		
6/1/16 20:48	S05 Hatch State	0	6/1/16 14:48	0:11		1	RR0300825	~ 6 min
6/1/16 20:56	S05 Hatch State	1	6/1/16 14:56	0:07		1		
6/4/16 20:11	S05 Hatch State	0	6/4/16 14:11	0:05		1	RR0040983	~ 10 min
6/4/16 20:21	S05 Hatch State	1	6/4/16 14:21	0:05		1		
6/6/16 16:26	S05 Hatch State	0	6/6/16 10:26	0:05		1		~ 34 min
6/6/16 17:05	S05 Hatch State	1	6/6/16 11:05	0:07		1		
6/9/16 19:50	S05 Hatch State	0	6/9/16 13:50	0:04		1	RR1091009	< 5 min
6/9/16 19:55	S05 Hatch State	1	6/9/16 13:55	0:04		1		
6/16/16 17:00	S05 Hatch State	0	6/16/16 11:00	0:05		1		~ 1hr 8 min
6/16/16 18:08	S05 Hatch State	1	6/16/16 12:08	0:06		1		

Producer "found the devices to be successful."
The feedback from all levels, Operations, Automation, and Facilities is very strong .

7. Proper Sizing of Emission Controls

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Vent Gas Management

- Ensure that vent gas control devices are properly designed/sized for the specific facility's operations. The design should be sized and operated to control for the full range of gas flowrates that are expected.
- Key to ensuring proper sizing of emission controls is appropriate sampling, measurement and/or modeling to estimate potential maximum flow of vent gas from storage tanks.

You Don't Know What You Don't Know. Get Good Data. Allows for Management Decisions Based On Fact

HY-BON/EDI's engineers can run process simulation calculations to estimate the potential range of flowrates of vent gas for various operating scenarios. The assessment will take into account production rates, storage tanks used and operating pressures in sizing VRUs and combustors.

Low Bid Cost More

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After flyover of an oil and gas production site by the TCEQ using FLIR Camera, an O&G Operator observed visible vent gas emissions. TCEQ gave the operator the opportunity to correct the emissions without monetary penalty.

Low Bid Cost More

The operator contacted HY-BON/EDI for an IQR measurement and bid for a vapor recovery unit (VRU). HY-BON/EDI engineered a system for the application and quoted a wet, flooded screw VRU and vapor recovery tower (VRT).

PAYBACK for HY-BON/EDI system estimated at 9 MONTHS.

Low Bid Cost More

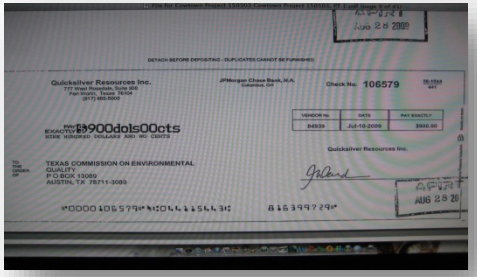
The operator decided to go with another vendor based on cost/low bid for a reciprocating compressor VRU (which was NOT designed the wet gas service it would encounter.)

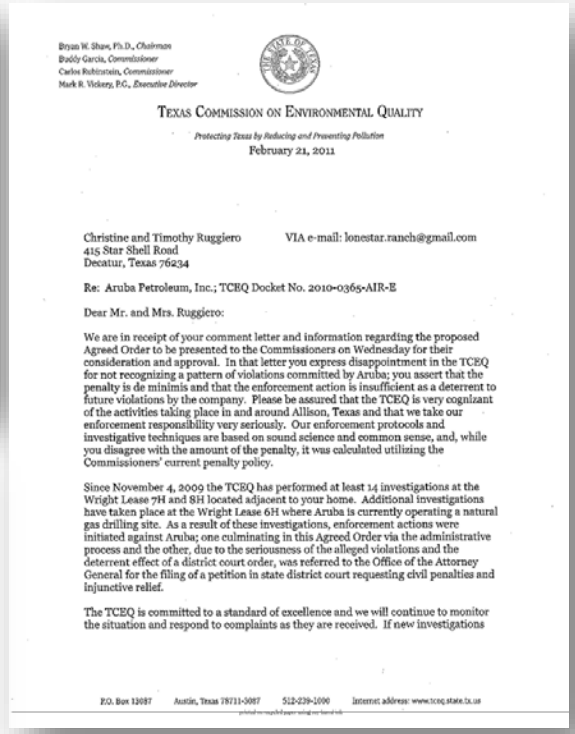
HY-BON/EDI gave a “HEADS UP” of possible failure using reciprocating compressors in wet gas service.

Low Bid Cost More

TCEQ inspectors conducted a follow-up inspection for the production facility and found the site venting natural gas due to failure of the reciprocating VRU compressor.

TCEQ issued a notice of violation and the company was fined $300,000.





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Carlos Rubinstein, *Commissioner*
Mark R. Vickery, P.G., *Executive Director*

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

February 21, 2011

Christine and Timothy Ruggiero VIA e-mail: lonestar.ranch@gmail.com
415 Star Shell Road
Decatur, Texas 76234

Re: Aruba Petroleum, Inc.; TCEQ Docket No. 2010-0365-AIR-E

Dear Mr. and Mrs. Ruggiero:

We are in receipt of your comment letter and information regarding the proposed Agreed Order to be presented to the Commissioners on Wednesday for their consideration and approval. In that letter you express disappointment in the TCEQ for not recognizing a pattern of violations committed by Aruba; you assert that the penalty is de minimis and that the enforcement action is insufficient as a deterrent to future violations by the company. Please be assured that the TCEQ is very cognizant of the activities taking place in and around Allison, Texas and that we take our enforcement responsibility very seriously. Our enforcement protocols and investigative techniques are based on sound science and common sense, and, while you disagree with the amount of the penalty, it was calculated utilizing the Commissioners' current penalty policy.

Since November 4, 2009 the TCEQ has performed at least 14 investigations at the Wright Lease 7H and 8H located adjacent to your home. Additional investigations have taken place at the Wright Lease 6H where Aruba is currently operating a natural gas drilling site. As a result of these investigations, enforcement actions were initiated against Aruba; one culminating in this Agreed Order via the administrative process and the other, due to the seriousness of the alleged violations and the deterrent effect of a district court order, was referred to the Office of the Attorney General for the filing of a petition in state district court requesting civil penalties and injunctive relief.

The TCEQ is committed to a standard of excellence and we will continue to monitor the situation and respond to complaints as they are received. If new investigations

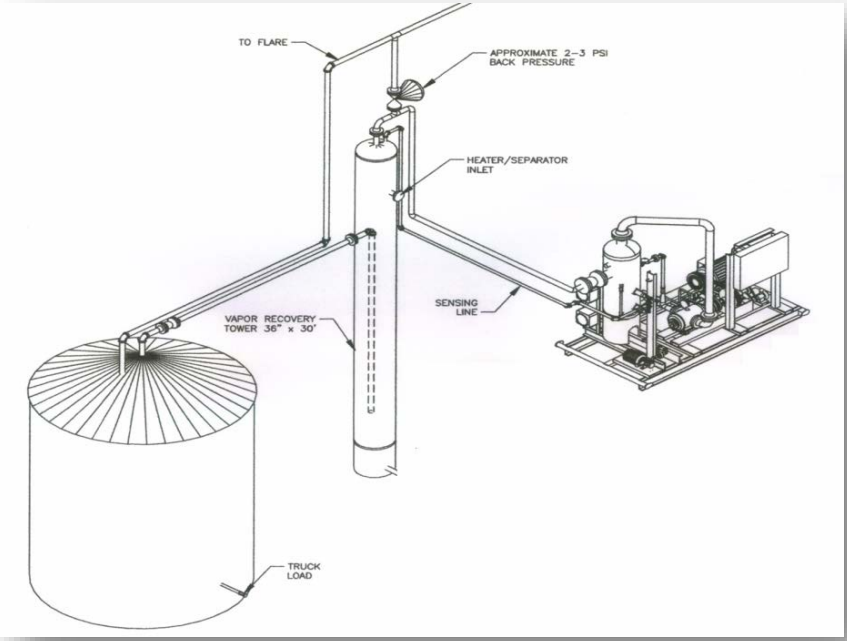
P.O. Box 13087 Austin, Texas 78711-3087 512-239-1000 Internet address: www.tceq.state.tx.us

Low Bid Cost More

The operator contacted HY-BON/EDI to correct the low bid system that did not function properly.

HY-BON/EDI supplied the proper VRU design for the application.

The production site is NOW producing and operating in compliance with TCEQ air quality regulations.



Low Bid Cost More

HY-BON/EDI's engineered designs have the lowest downtime and operating costs in the oil and gas industry.

Doing It Right The First Time Will Make Your Company Money and Keep You In Compliance.

YOU DON’T KNOW WHAT YOU DON’T KNOW

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Vent Gas Management

WHAT GETS SEEN, GETS MEASURED

WHAT GETS MEASURED, GETS CONTROLLED

WHAT GETS CONTROLLED, CAN MAKE YOU MONEY

REGAL™

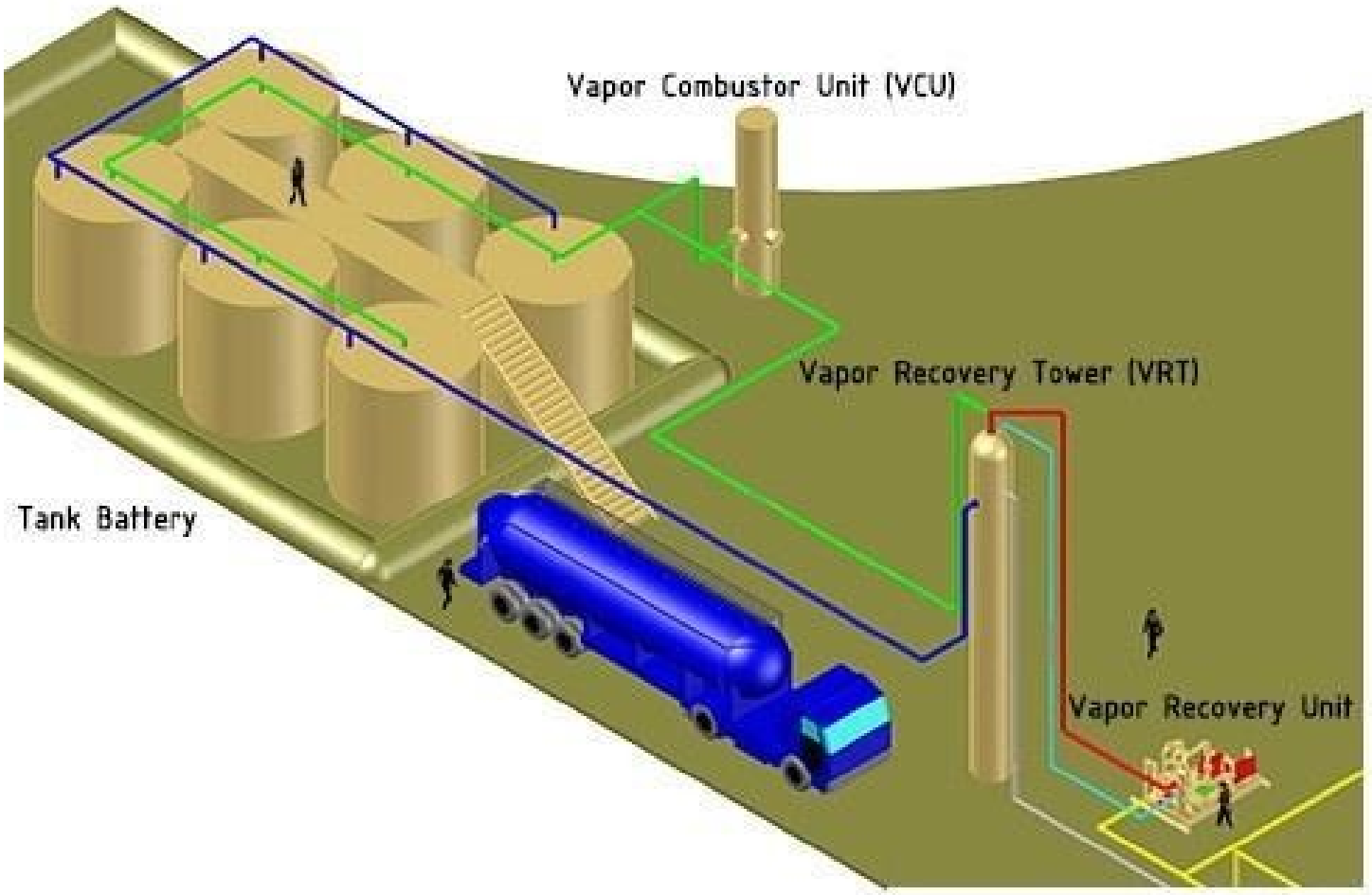
HY-BON EDI
Vent Gas Management

Solutions

Inayat Virani
President/CEO

REGAL™

VRU Installation



HY-BON/EDI Vent Gas Revenue Share – A Success Story

A TOTAL SOLUTIONS APPROACH

Overview

- This program is intended to allow Oil and Gas Companies to place the emission control equipment required by State and Federal Government regulations applicable to oil and gas production facilities location at the least possible initial cost.
- The cost of program-related testing, equipment and maintenance and repair, is to be paid by the additional revenue generated by the sale of the gas that is currently being vented or burned.

Some Specifics

- HY-BON/EDI will perform tests to determine the amount and quality of gas that is available to be captured by our equipment.
- The cost of the testing and the equipment will be paid to HY-BON/EDI based on an agreed upon percentage of the new revenue stream related to the gas being captured.

Some Specifics

- HY-BON/EDI will provide commissioning services once the equipment is installed.
- HY-BON/EDI will provide maintenance of the equipment during the payoff period. The cost of monthly maintenance will be deducted from HY-BON/EDI's portion of the monthly gas revenue.
- Once the equipment is paid in full, HY-BON/EDI will recondition the equipment to "zero -hour" status and will offer an optional maintenance agreement for an agreed upon monthly fee.

Monthly Preventative Maintenance

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Vent Gas Management

Field Service Monthly Service Scope

Services Performed during Monthly Preventative Maintenance

1. Complete Oil Change - as needed
2. Oil Filter Change – Monthly
3. Coalescent Oil Filter Change – Quarterly
4. Remove Guards
5. Inspect Belts, Coupling Alignment, and Condition (Replace if Required)
6. Inspect, Evaluate and Clean Scavenge Lines and Screens (Replace if Required)
7. Check Setscrews and Hub Bolts (Tighten/Torque, replace if Required)
8. Grease Pillar Block Bearings (If applicable)
9. Check Foot Bolts on Compressor and Motor (tighten/torque, replace if necessary)
10. Reinstall Guards
11. Inspect, Quantify and Evaluate Y Strainer (Clean, replace if Required)
12. Inspect, Clean and Lubricate Bi-Pass Valves-Norriseal parts kits not included
13. Inspect O-Ring Discharge Check Valve
14. Inspection and Visual Assessment of (LTP) Liquid Transfer Pump Operation
15. Purge Air from Unit
16. Restart Unit
17. Check "Start Up" Amperage
18. Test By-Pass Operation
19. Put Interface (PLC) Unit in "Test Mode"
20. Check All Digital and Analog Kills
21. Allow Unit to reach Optimal Operation Temperature
22. Check Discharge Temperature with Temperature Gun
23. Verify thermostat operation with temperature gun
24. Visual Assessment of Fan Operation and Amperage Draw
25. Degrease and Wash Unit (if Required)

Zero Hour at end of contract:

1. Replace/Rebuild compressor
2. Full oil and filter change.
3. Inspect all couplings, belts, and valve kits – replace as necessary
4. Grease pack LTP

Best in Class Monitoring

HY-BON/EDI
Vent Gas Management

Quarterly IQR Scope of Work: OGI Survey

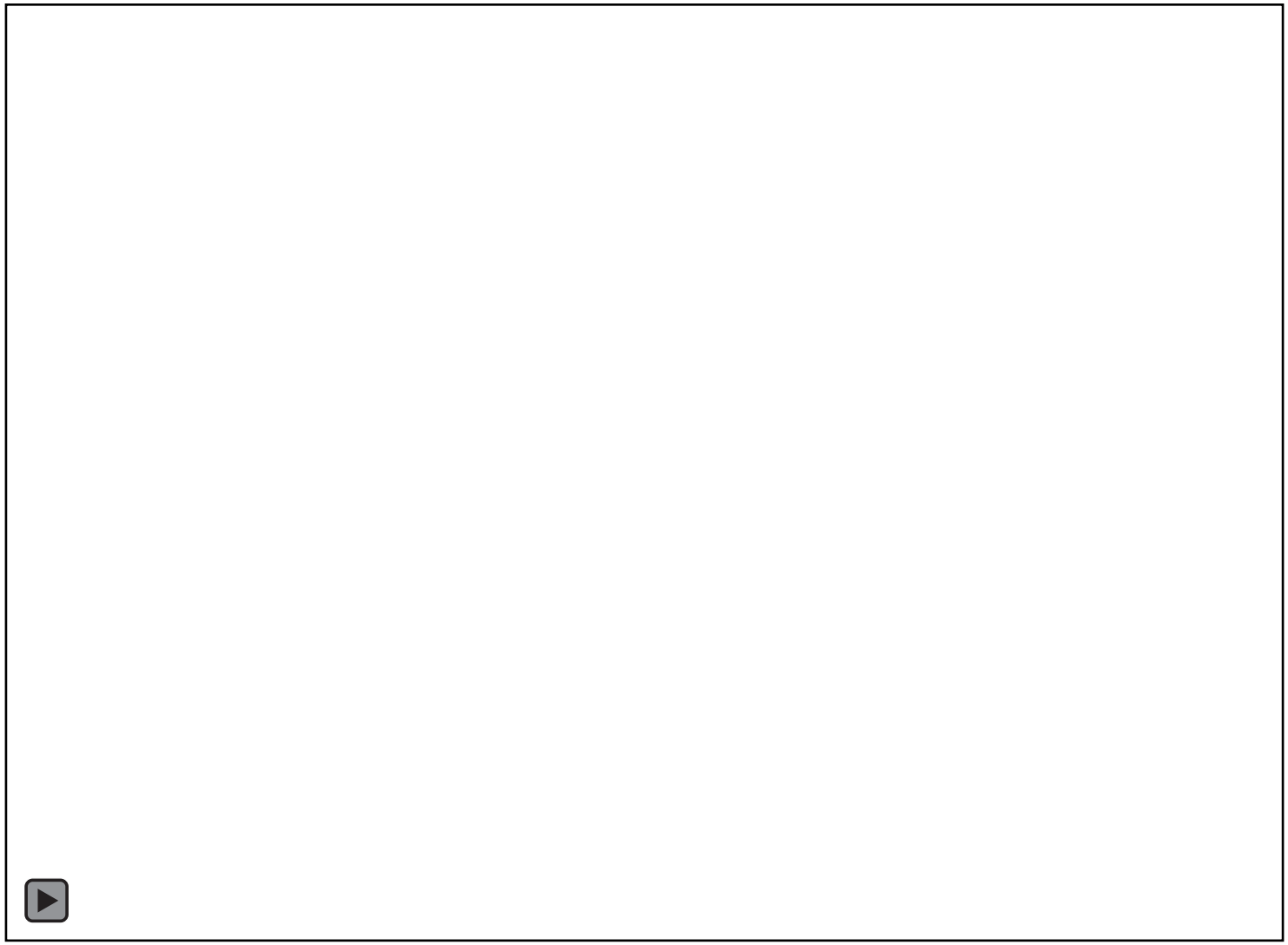
HY-BON/EDI will conduct a quarterly Optical Gas Imaging (OGI) survey of the location in order to ensure all equipment is operating efficiently. The survey includes identifying and documenting component leaks as well as making recommendations for repairs. Also included is a comprehensive inspection of thief hatches and vent valves identifying any maintenance opportunities that can be addressed in order to prevent leaks from occurring.

Components that will be surveyed and inspected include:

- Thief hatches
- Vent valves
- Tank roof tops
- Tank vent gas piping
- VRT and associated piping
- VRU and associated piping

The complete findings will be delivered in a full report via the HY-BON/EDI secure web portal that captures all the details of the survey along with the recommendations for any needed repairs. All leaking components will also be video documented using the OGI camera and the videos will be included in the report.

1500 TPY → 125 MSCFD



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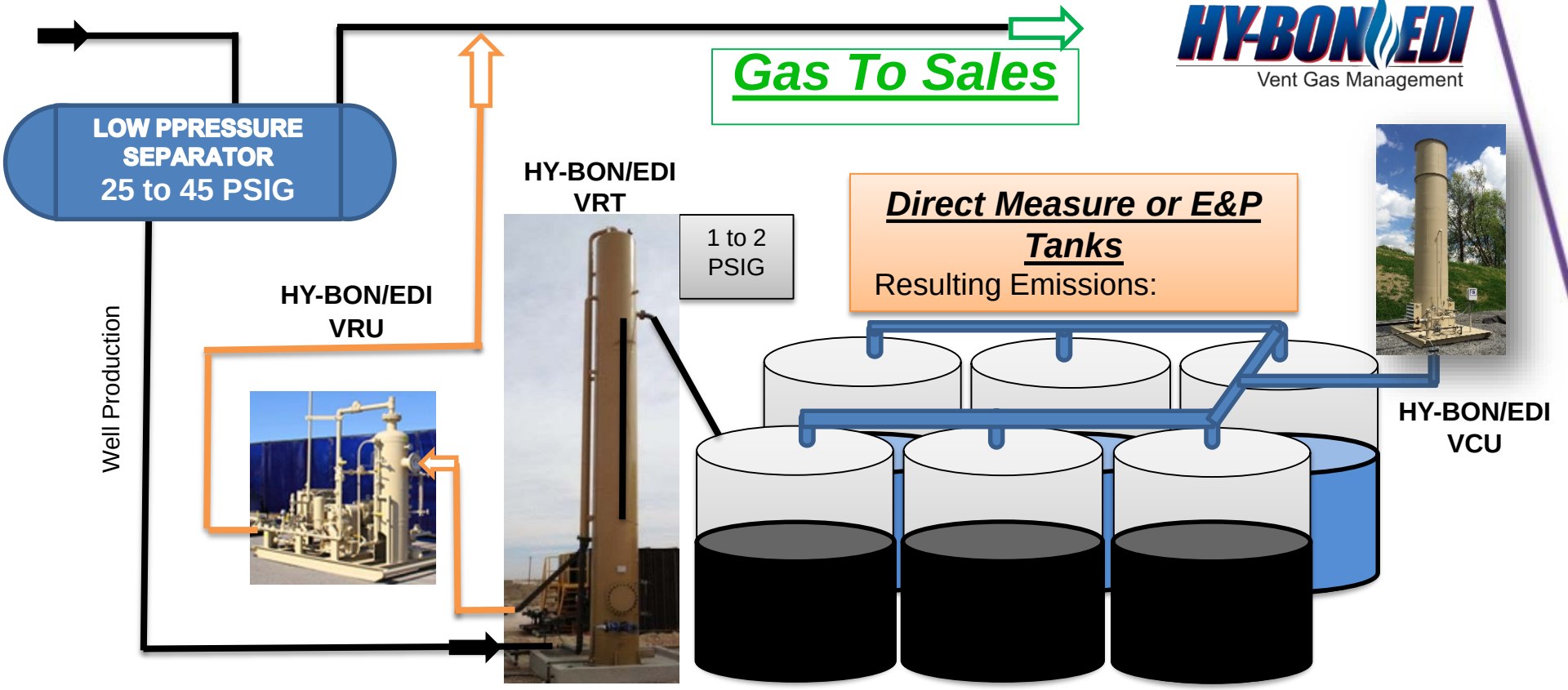

Economic Payback

6.65 Months

Operational Data		Qty	Project Installed Cost			$145,400.00
Flow Volume MSCFD	100		IQR Field Survey Cost			$1,600
Operating Days	350		***UNIT SELECTION***	***Op Range***	***PSI***	
BTU of GAS	2100	1	HB-NK100-40-36D	60-120	200	41,900
Gas Price	$3.57	1	HY-BON(VRT)	5 - 75	1 - 2	20,500
		1	HY-BON Combustor (SM)	.7MTF	4 oz	9,500
Annualized Revenue	**$262,395.00**	0	NONE	0	0	0
		Install Cost %	100%	Installation Cost		71,900

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Vent Gas Management

WHAT GETS SEEN, GETS MEASURED

WHAT GETS MEASURED, GETS CONTROLLED

WHAT GETS CONTROLLED, CAN MAKE YOU MONEY

REGAL™

Not Always the answer!

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KEYS TO SUCCESS

“TOTAL SOLUTIONS APPROACH”

Using Standardized VRU Designs Engineered to cost effectively capture the gas analysis from your field or basin with maximum run times

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HY-BON Engineering Company

2404 Commerce Drive
Midland, TX 79703

Phone: (432) 697-2292
Fax: (432) 697-2310

www.hy-bon.com

Electronic Design for Industry

100 Ayers Blvd.
Belpre, OH 45714

Phone: (740) 401-4000
Fax: (740) 401-4005

www.ediplungerlift.com

QUESTIONS?