



G L O B A L F O R U M

On Flaring and Venting Reduction
and Natural Gas Utilisation

Oil Production:

Spills in the Air—Latest Technology to Identify, Measure and Recover Tank and Facility Emissions

Larry S. Richards

President & CEO

Hy-bon Engineering Company

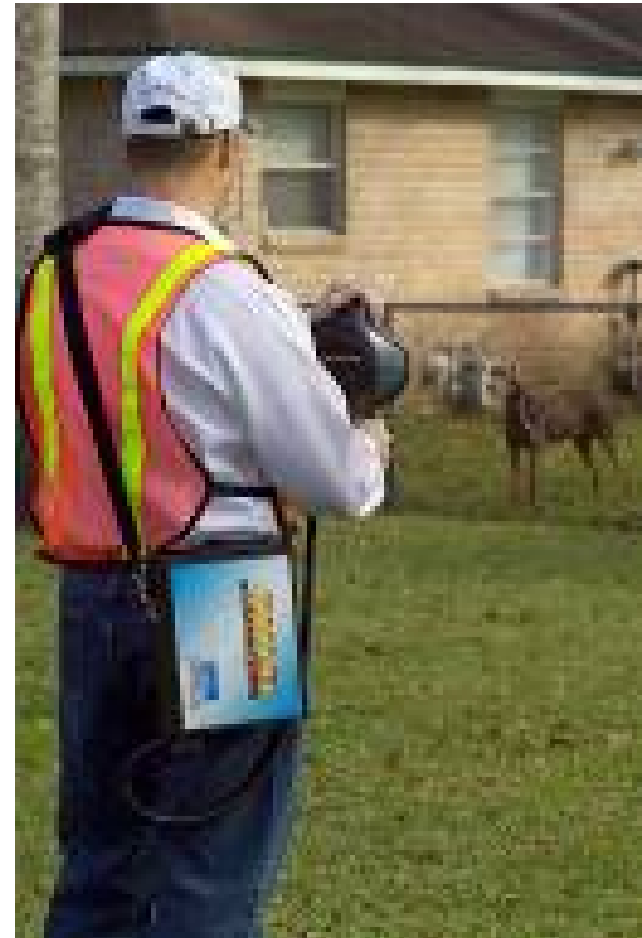
Spills in the Air – Oil Production

- Four Major Areas of Vent Gas
 - Pneumatic Devices
 - Compressor Stations
 - Casinghead Gas
 - Oil & Condensate Storage Tanks

90 / 10 RULE

Spills in the Air – Oil Production

- Identification
 - Acoustic Detectors
 - RMLD (Infrared Detection)
 - FLIR GasFinder Camera



Spills in the Air – Oil Production

- Identification

GasFinder
Camera





Spills in the Air – Oil Production

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90 / 10 RULE

FLIR™

HI

AUTO

HIST

WH



4/ 4/07 1.26.12PM



Spills in the Air – Oil Production

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90 / 10 RULE

FLIR™ HI

AUTO

HIST WH



11/30/06 8.06.24AM



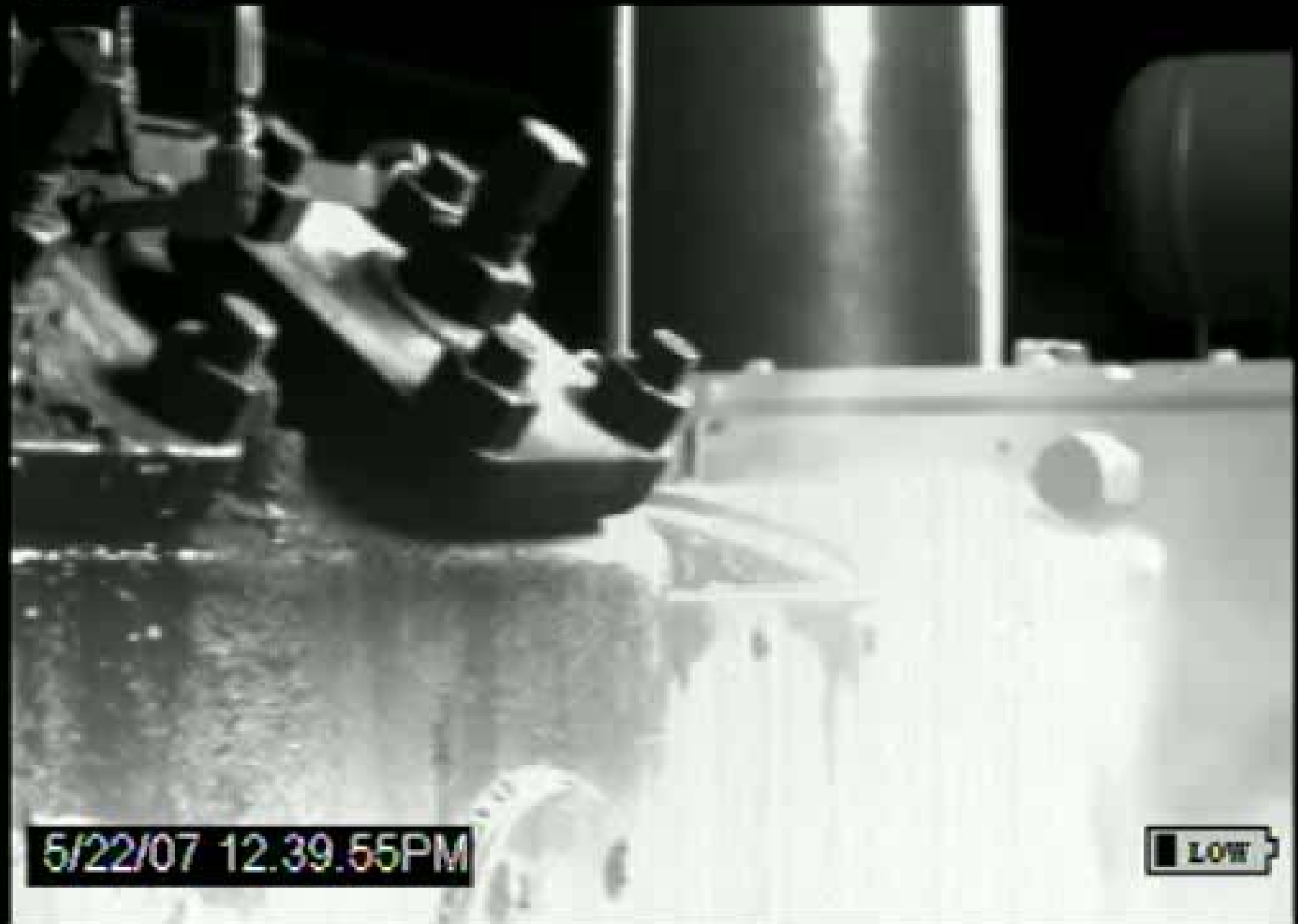
FLIR™

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5/22/07 12.39.55PM

LOW

Spills in the Air – Oil Production

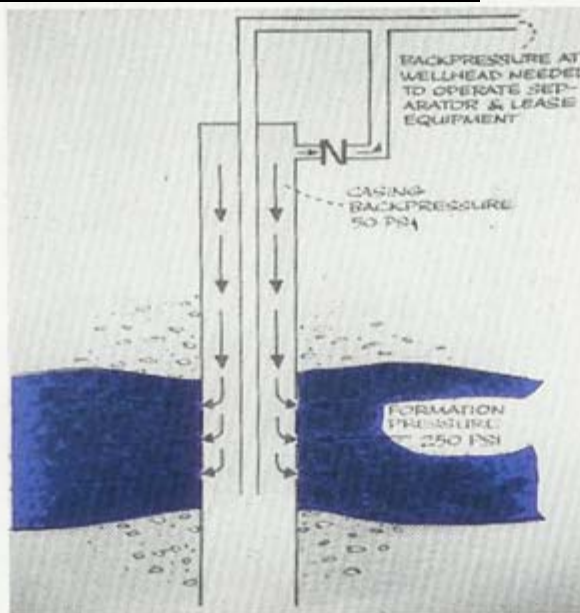
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90 / 10 RULE

Spills in the Air – Oil Production

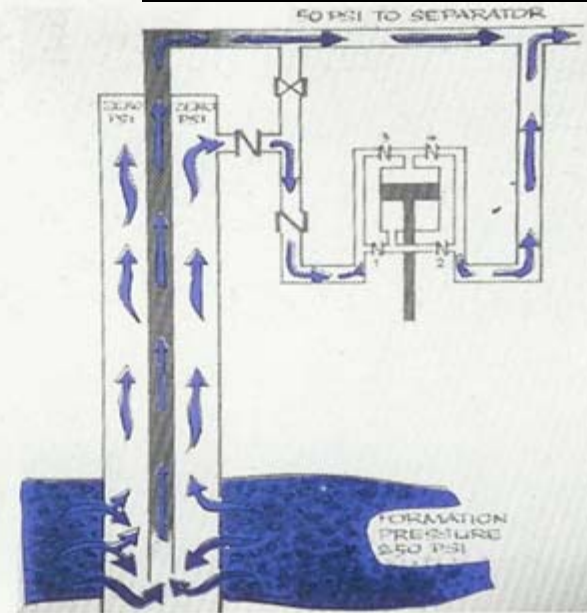
BEFORE COMPRESSION

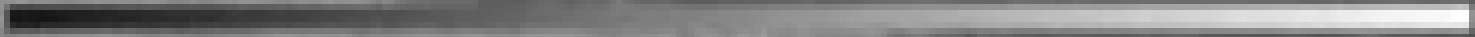
Restricting Back pressure holds back the flow of Hydrocarbons into the well bore.



AFTER COMPRESSION

Back pressure is relieved from the face of the formation allowing more hydrocarbons to flow into the well bore.





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Spills in the Air – Oil Production

- Four Major Areas of Vent Gas
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 - **Oil & Condensate Storage Tanks**

90 / 10 RULE



FLIR™ HI

MANUAL

WH



1/18/08 2:42:47PM



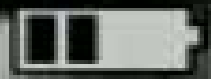
FLIR™ HI

AUTO

HIST WH



12/13/06 7.32.34AM



FLIR™ HI

AUTO

HIST WH



7/31/07 8.06.47AM

LOW

Spills in the Air – Oil Production

- Measurement
 - Minor Leaks
 - **High Flow Sampler**
 - Major Emmissions
 - **Turbine Meters**
 - Ultrasound Meters
 - Recording Manometers
 - Awkward Equipment
 - Calibrated Bags







BACHARACH®

10/07/08	01:22:03
+ Flow (cfm)	7.0
Back (%)	0.24
Leak (%)	0.17
Leak Not Avail	?
SPG (10)	10
[9001] (H)	-1-
Sample Time ->	09:51

VOI

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V

ESC

Hi Flow® Sampler



Oil Storage Tank – 24 hour
emission test utilizing a
turbine meter capable of
downloading data to a PC





ATTENTION: DURING LE CIRCUIT ARIANT, S'IL Y A UN PROBLEME DE CONNEXION, LE CONVERTEUR NE FONCTIONNERA PAS. VEUILLEZ VÉRIFIER LES CONNEXIONS DES CÂBLES ET DES CONTACTS. AREA MUST BE FREE OF OIL, GREASE, AND ALIEN PARTICLES. CONTACTS MUST BE CLEAN AND PROPERLY MOUNTED TO IN. (1.5 CM.) (1.5 CM.) (1.5 CM.)

WARNING: TO PREVENT FLAMMABLE GASES FROM ACCUMULATING IN THE AREA OF THE METER, THE METER MUST BE INSTALLED IN A WELL-VENTILATED AREA. TO PREVENT FLAMMABLE GASES FROM ACCUMULATING IN THE AREA OF THE METER, THE METER MUST BE INSTALLED IN A WELL-VENTILATED AREA.

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1978.3

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Spills in the Air – Oil Production

- Gas Capture
 - Associated gas is a technical challenge
 - Typically wet
 - Very low pressure
 - Often contains contaminants such as H₂S
 - Vapor Recovery Units
 - Can capture 95% of these gas streams
 - Sized from 5 mcf/d to 25 MMcf/d
 - Improved automation technology
 - Improved transmitter technology
 - Improved compressor styles for wet, low pressure gas





SAFETY
NO OPEN FLAMES
NO SMOKING

CAUTION
SEE SERVICE TAG
FOR OPERATING
INSTRUCTIONS

CAUTION
HOT SURFACE

DANGER
ELECTRICAL EQUIPMENT
AUTHORIZED
PERSONNEL ONLY

VEREY JAYBEE





FERRUM

HECHO EN VENEZUELA
AÑO 1997 N. 7597
10 t.

HY-BON

HY-BON
Engineering S. de R.L.
CALLE 100 N. 100
CAROLINA, P.R.

HY-BON

CEITE
LIENTE

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LIENTE

Spills in the Air – Oil Production

- *In Conclusion ...*

