

HY-BON ENGINEERING COMPANY, INC.

HY-BON[®]

Hy-bon Engineering Company





HY-BON[®]

Methane Leak Detection & Measurement Technologies

**Larry S. Richards
President & CEO
HY-BON Engineering**

Step 1 – Know where to look

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

90 / 10 RULE

Identification of Leak Sources

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





The RMLD is a laser based technology which allows us to identify emission sources on installations and pipelines.

The RMLD is effective up to 100 ft from the emission source.

Spills in the Air – Oil Production

- Identification
GasFinder
Camera



FLIR GasFinder Camera

The FLIR's GF320 & Gas Find IR Cameras allows us to visually identify and document the emission sources.





2006.15.20

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

FLIR™

HI

AUTO

HIST WH



4/ 4/07 1.26.12PM



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

FLIR™ HI

AUTO

HIST WH



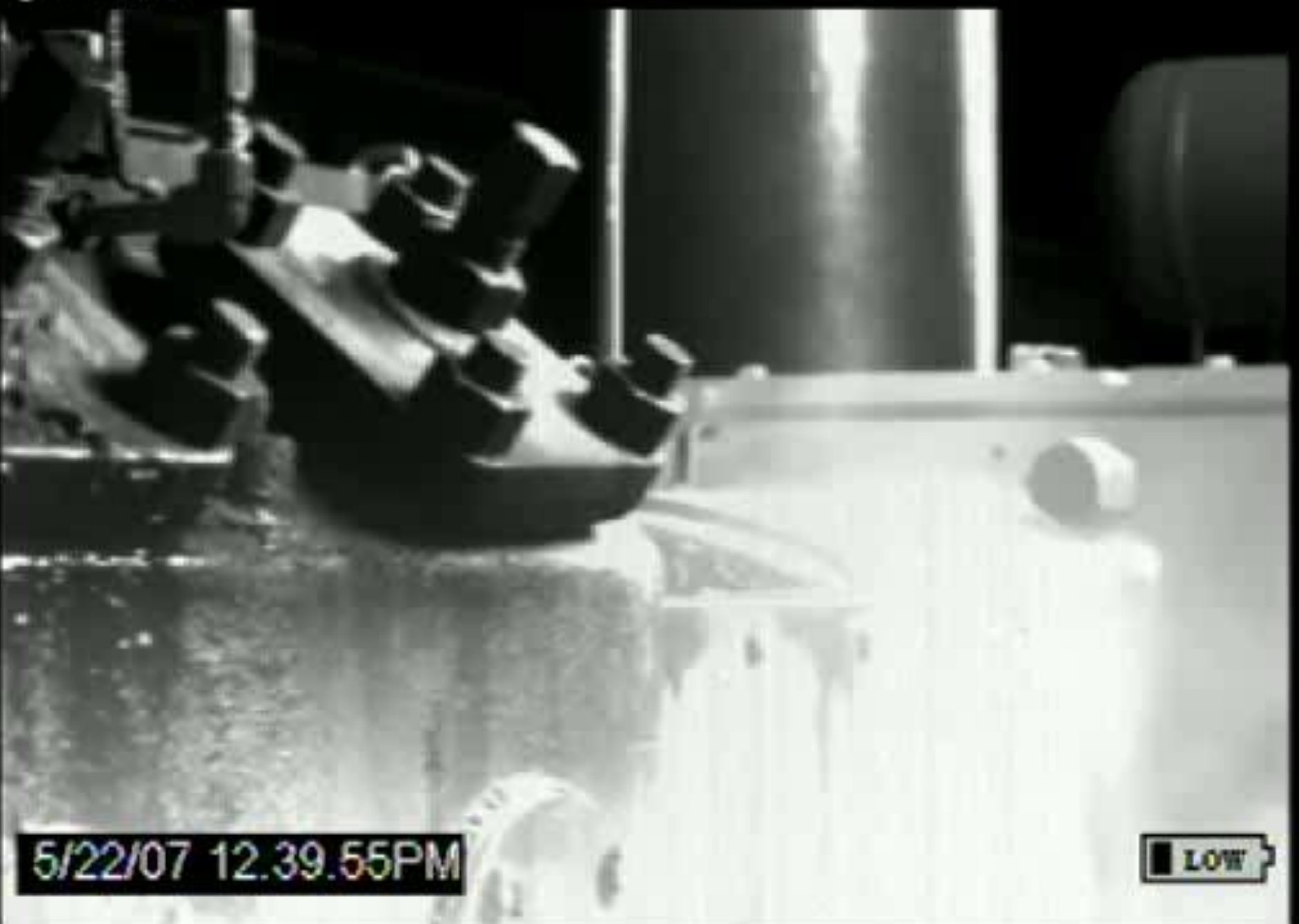
11/30/06 8.06.24AM



FLIR™ HI

AUTO

HIST WH



5/22/07 12.39.55PM

LOW

Spills in the Air – Oil Production

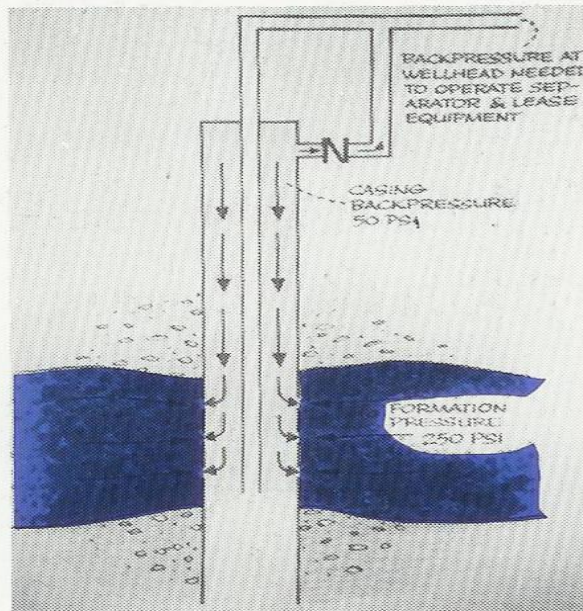
- Four Major Areas of Vent Gas
 - Pneumatic Devices
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 - **Casinghead Gas**
 - Oil & Condensate Storage Tanks

90 / 10 RULE

Spills in the Air – Oil Production

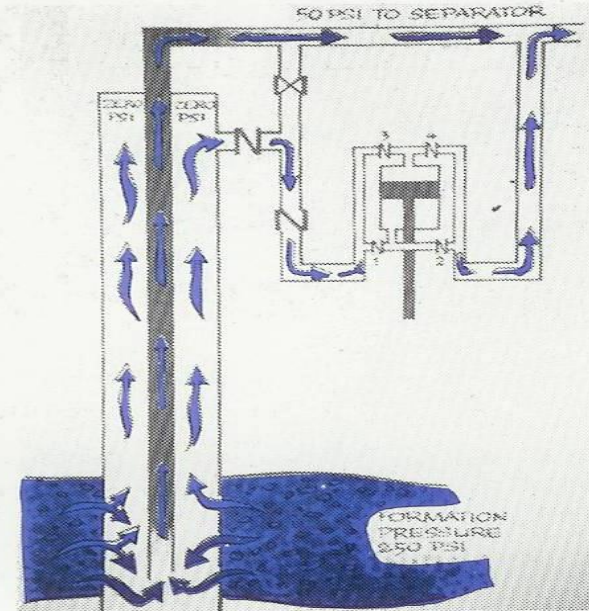
BEFORE COMPRESSION

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.







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



FLIR™ HI

MANUAL

WH



1/18/06 2:42:47PM



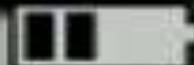
FLIR™ HI

AUTO

HIST WH



12/13/06 7.32.34AM



FLIR™ HI

AUTO

HIST WH



7/31/07 8.06.47AM

LOW

HY-BON[®]



Measurement Technologies

- Minor Leaks
 - **High Flow Sampler**
- Major Emissions
 - **Turbine Meters**
 - Ultrasonic Meters
 - Insertion probes
- Awkward Equipment
 - Calibrated Bags



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BACHARACH[®]

10/07/08 01:22:03
+ Flow(cfm) 7.9
Back(%) 0.24
Leak(%) 0.17
LeakNot Avail
~~SPRINKLER (R) 10/07/08~~
(9991) (R) -1-
Sample Time-> 09:51

NO
↓

▲

V

ESC

Hi Flow[®] Sampler



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





ATTENTION: DOUVER LE COUVERCLE AVANT D'ENLEVER LE COUVERCLE GARDER LE COUVERCLE
UNSCÉLÉBRANT DOIT ÊTRE INSTALLÉ À MOINS
DE 50 CM DU BORD DE LA ZONE DE GROUPE T.

WARNING: TO PREVENT IGNITION OF GAS, ALWAYS
KEEP THE COVER CLOSED. NEVER OPEN THE COVER
UNLESS THE AREA IS PROPERLY VENTILATED AND
FLAMMABLE GASES HAVE BEEN DISPERSED.

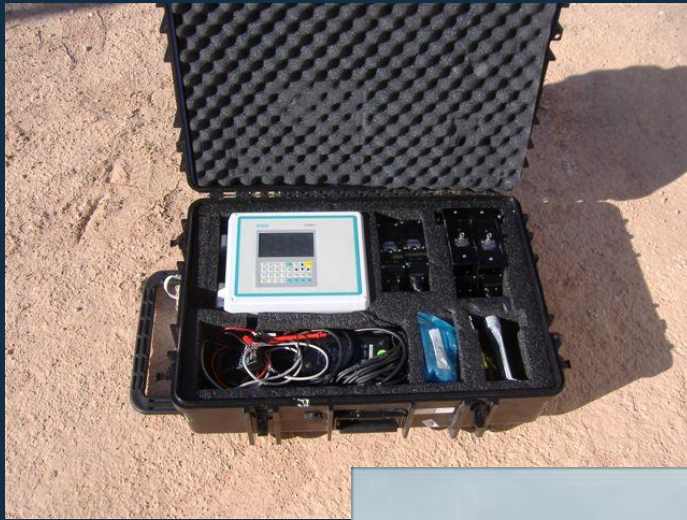
AREA MUST BE FREE OF
FLAMMABLE GASES AND
EXCESSIVE HEAT. KEEP
COVER CLOSED AT ALL
TIMES. NEVER OPEN THE
COVER UNLESS THE AREA
IS PROPERLY VENTILATED
AND FLAMMABLE GASES
HAVE BEEN DISPERSED.

633.1
1978.3



Ultrasonic Meters

Using the Ultrasonic Meter
Ultrasonic meters and insertion probes can be used to accurately measure extremely large volume vent sources. Our company has been able to provide accurate vent gas measurements as high as 1.8 MMCF/D with these instruments.











Gas Analysis

The GAS Kit was developed to capture a vapor samples from the storage tanks in order to obtain a quality sample for analysis using gas chromatograph.

The GAS Kit collects a pressurized vapor sample up to 60 PSI allowing for a proper analysis.

An accurate gas analysis is THE foundation for proper design of any form of recovery or control equipment.



Gas Analysis Sampling Kit
(GAS Kit)