

What is Required of a Reliable Oil Mist Detection System

Presented By

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AIMarEST, MIDGTE

Definition of Oil Mist as Defined by Dr Malcolm Holness late of Ministry of Defence (Navy) Fuel Laboratories and other Academics

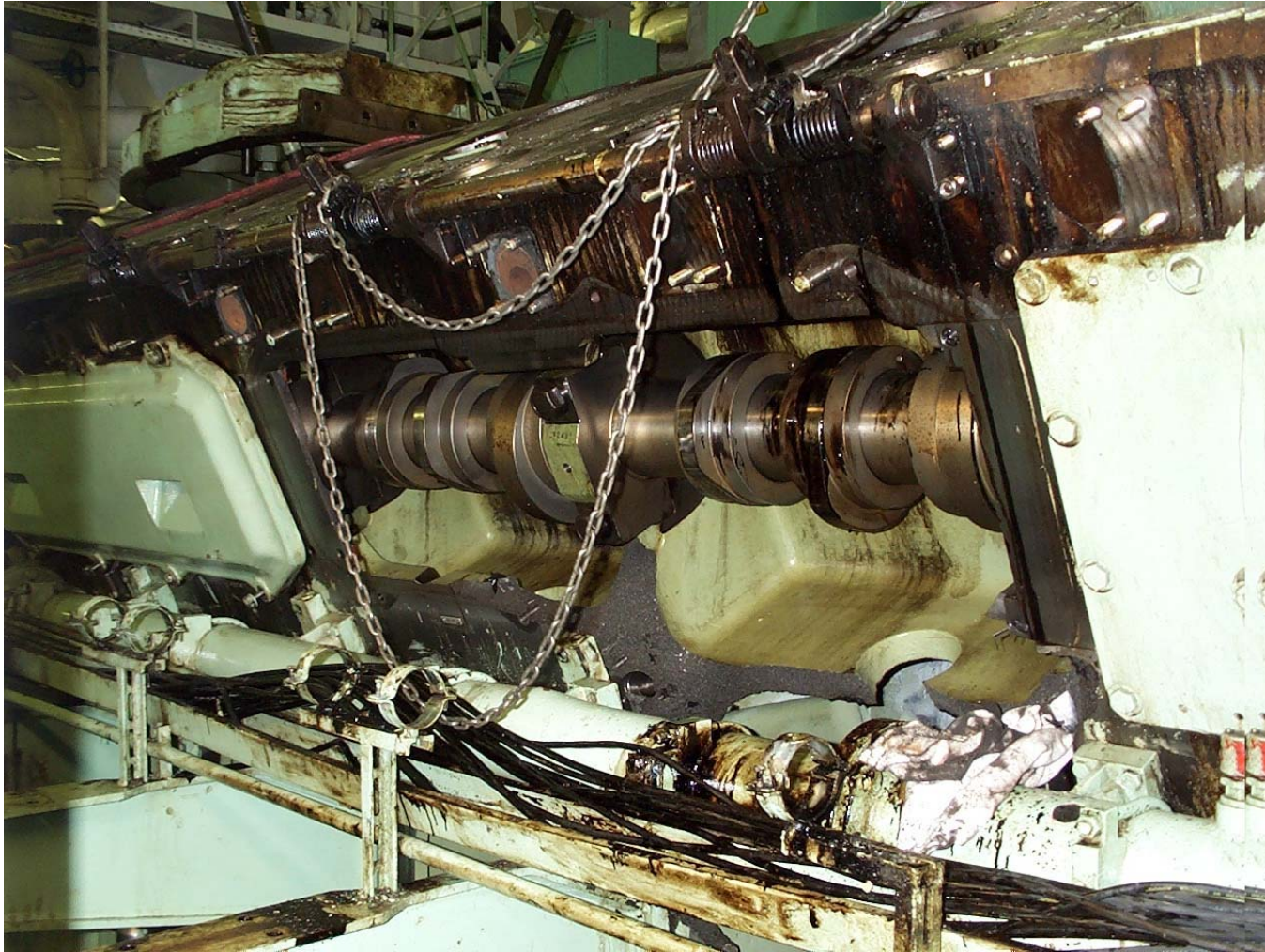
- Droplet size in the range 1-10 micron are described as mist and are produced between 200°C and 600°C.

- Other causes of mist is by aerosol and this depends on pressure and size of leaks in structures.



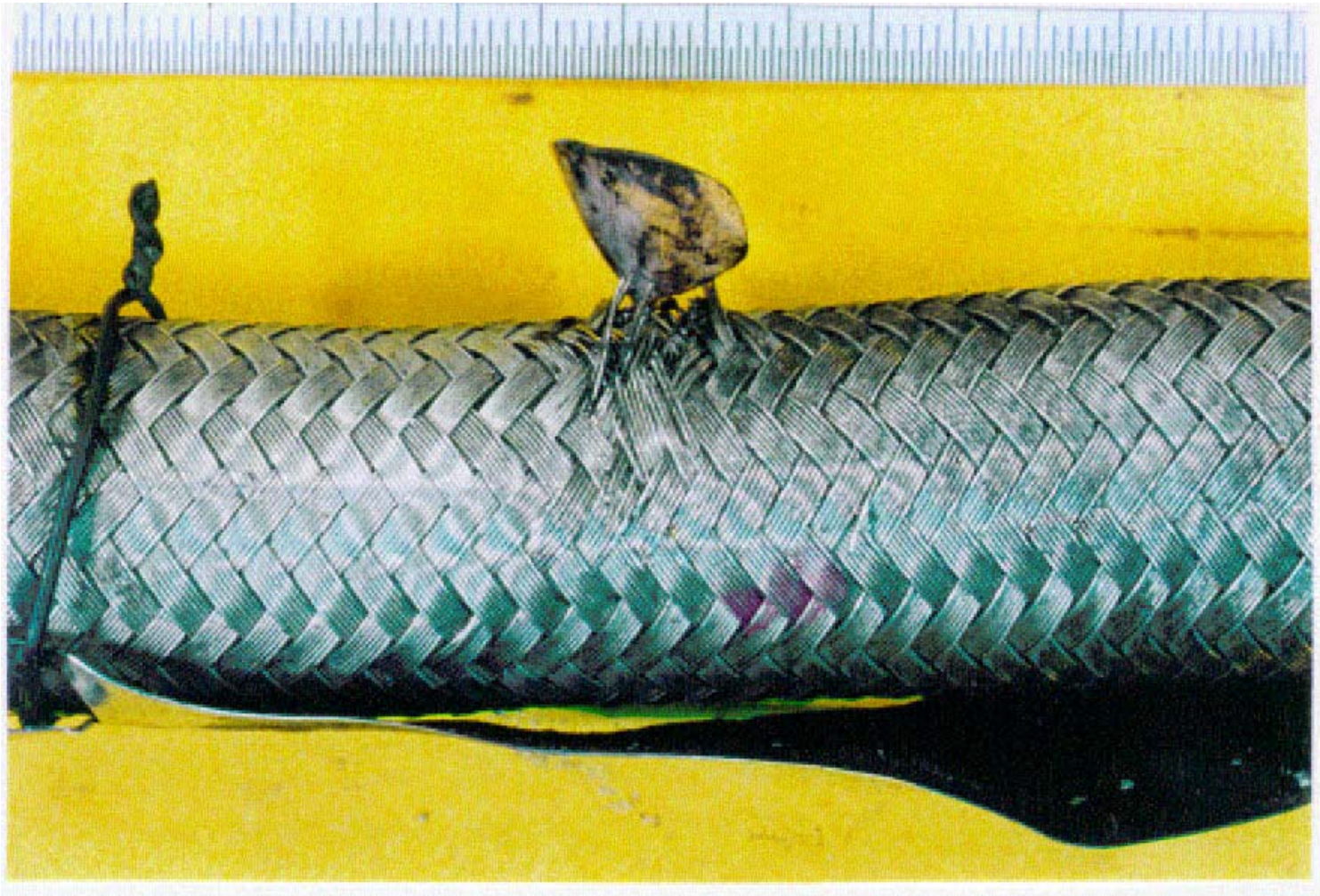
The Worst Type of Oil Mist Explosion

The Most Common Type of Oil Mist Explosion



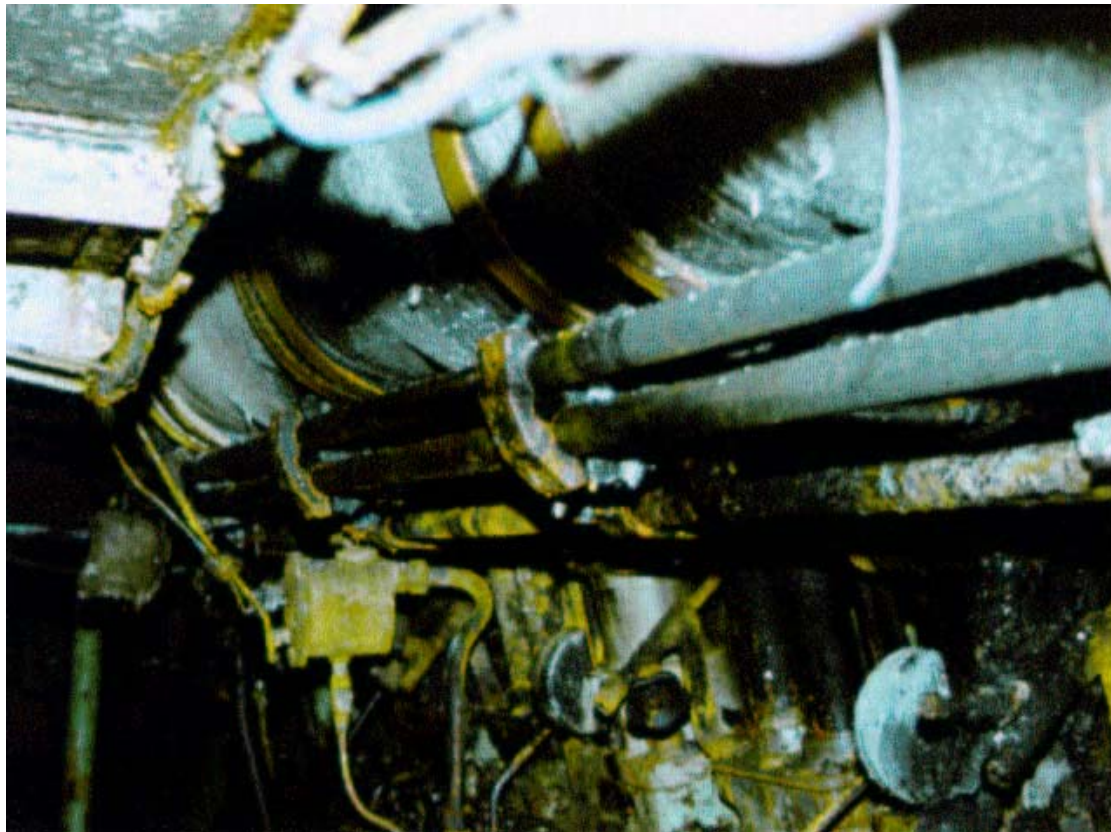
A Minor Crank Case Explosion on a Diesel Locomotive





Typical Cause of Oil Mist Fires

The Result of a Fire Caused by a Small Leak from a Flexible Hose, was this Damage and 4 Young Seamen Dead



Why wait for a fire when it may be prevented before it starts. Remember there is no smoke without a fire.

LLOYD'S LIST

FOUNDED 1734

TUESDAY OCTOBER 31 1995

MAIB report into Channel blaze on 'Sally Star' calls for series of actions to tighten emergency procedures

Failed joint led to fire on ferry

"... consider whether vapour detectors should be part of fire detection systems in category A machine spaces."



Flashback to August 1994: a tug sprays the hull of the stricken Sally Star in the Channel as a Belgian Air Force helicopter hovers above the engine room ventilation system. The report urges the Marine Safety Agency to consider further research to ensure fuel supply pipes

Sally Line was asked to amplify emergency valve-closing instructions, solve the issue of distinguishing between passengers and crew in an emergency, and hold more exercises to improve the performance of breathing apparatus teams.

It was also asked to reconsider the practice of allowing the watchkeeping engineer to perform maintenance tasks which require him to be away from the machinery control room for long periods, and consider pressure-testing the main engine room to assess its gas-retaining ability.

The report recommended that HM Coastguard and Kent fire brigade enhance communications systems available to the brigade officer at Dover marine rescue and co-ordination centre.

The brigade was asked to look at maintaining a reliable running total for the number of its staff on board during a vessel incident, and the coastguard urged to strengthen continuing efforts to involve ferry operators in regular exercises with the emergency services. *HMSO, ISBN 0-11-551777-4. Price £15.

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venting the fire from spreading. It has added more halon flaps to

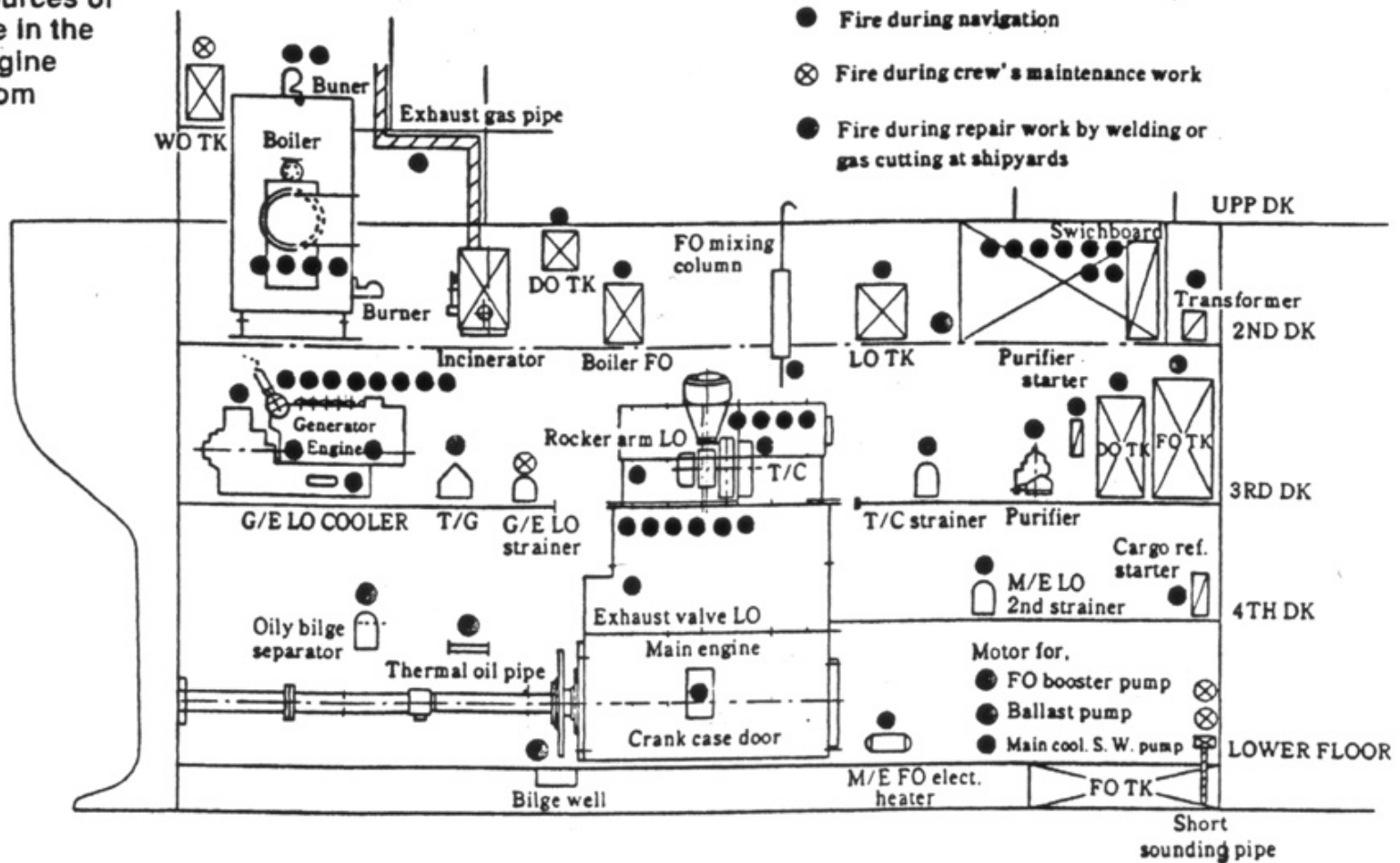
This Fleet had an Oil Mist Detection System Installed after a Fire.



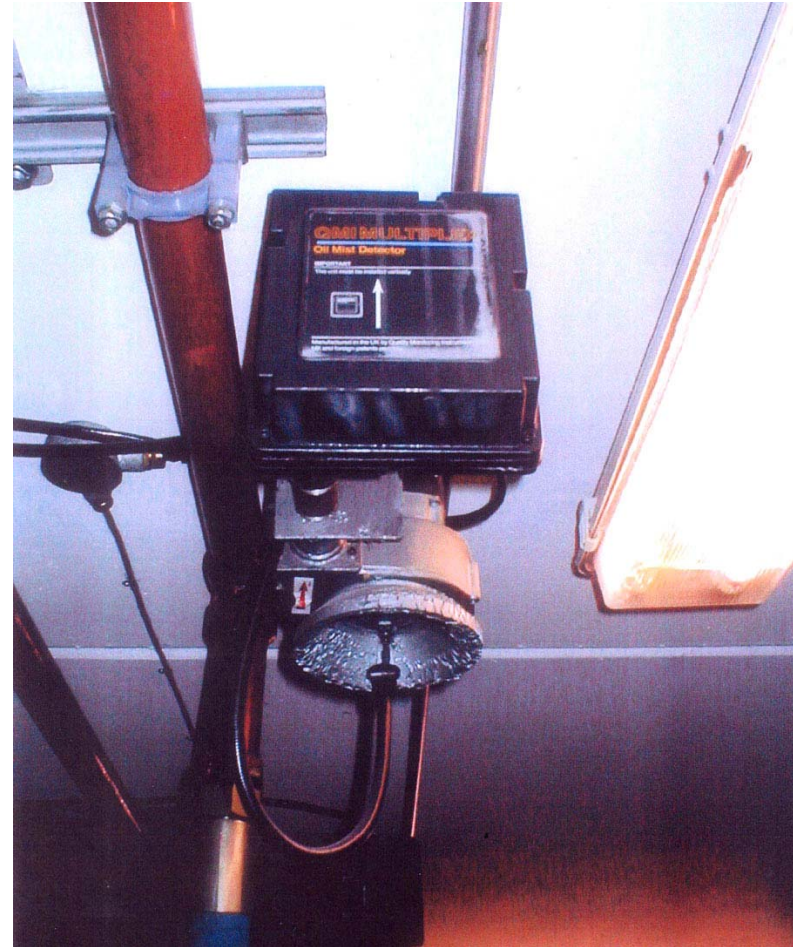
Shortly after the Installation,
Another Leak was Detected.

Location of Leaks as Described by the Japanese

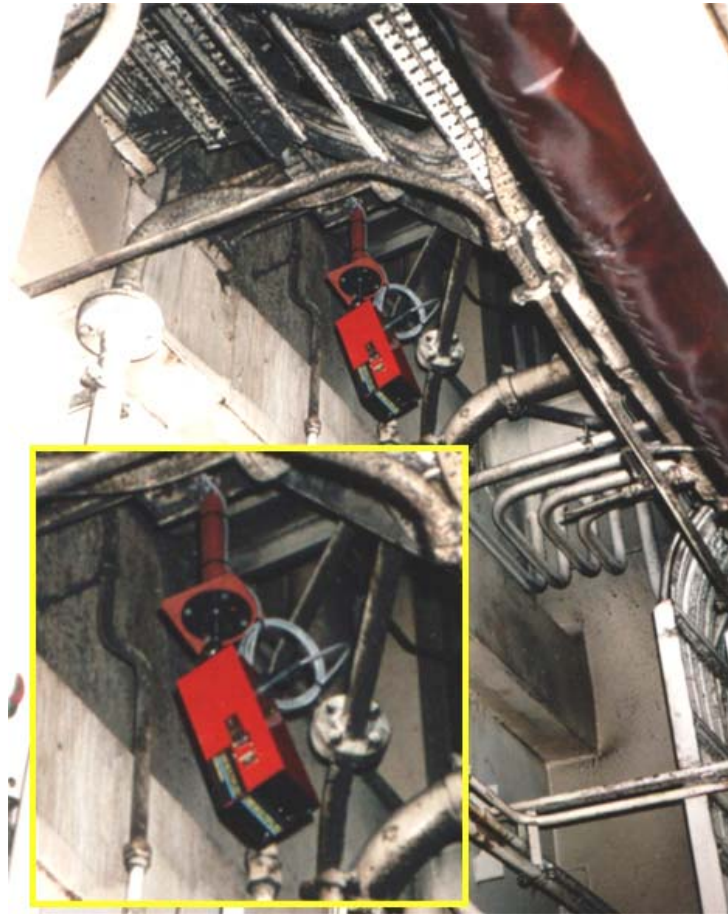
Sources of fire in the engine room



Our First Attempt at Detecting Oil Mist in the Atmosphere



First Production Line Dedicated Sensor (MK1)



Latest Type of Detector



Causes of Fire by Oil Mist

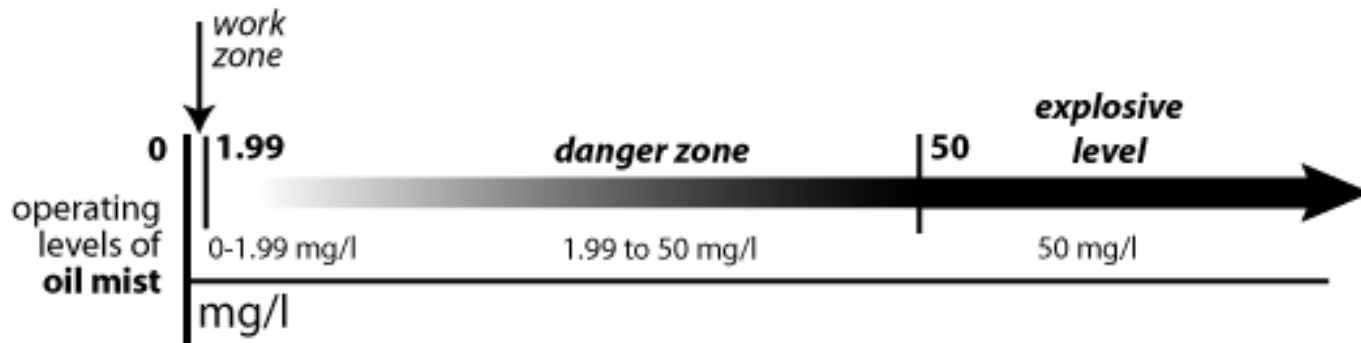
SOURCES OF THE MIST:

- Leaking injectors
- Fractured flexible hoses
- Loose or incorrectly fitted pipe fittings
- Broken welds
- Poor maintenance of machinery and pipe work

CAUSES OF IGNITION:

- Exhaust pipes
- Turbochargers
- Non-flameproof motor
- Electrical contacts
- Static electricity
- Faulty wiring

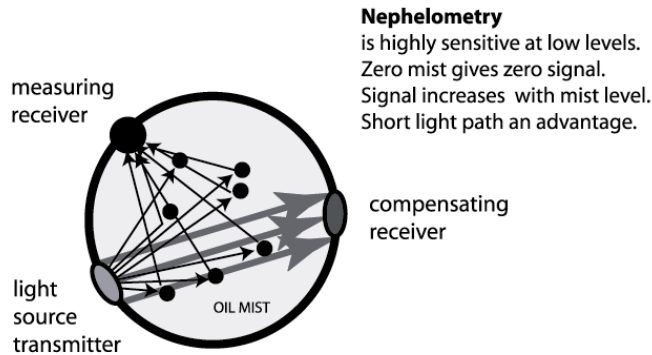
What Amount of Oil Mist is Needed to Start a Fire or Ultimately an Explosion



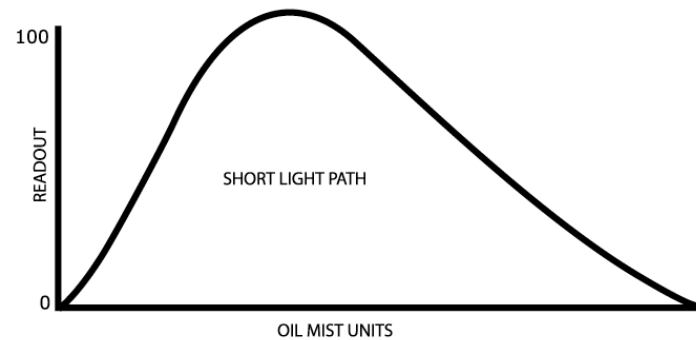
Operating Levels of Oil Mist

Different Types of Oil Mist Sensors Most Favoured

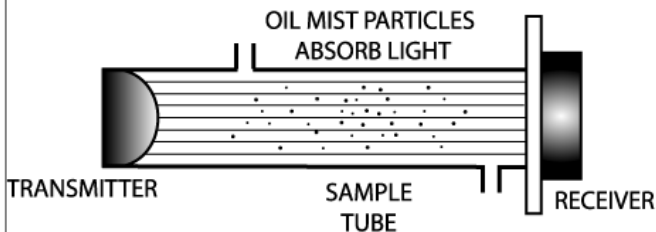
Schematic diagram showing principle of nephelometry



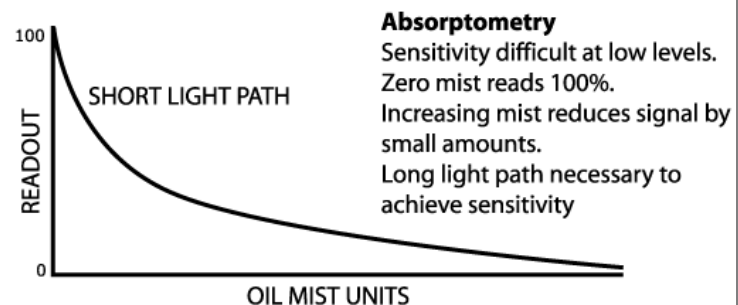
Typical graph produced by nephelometer



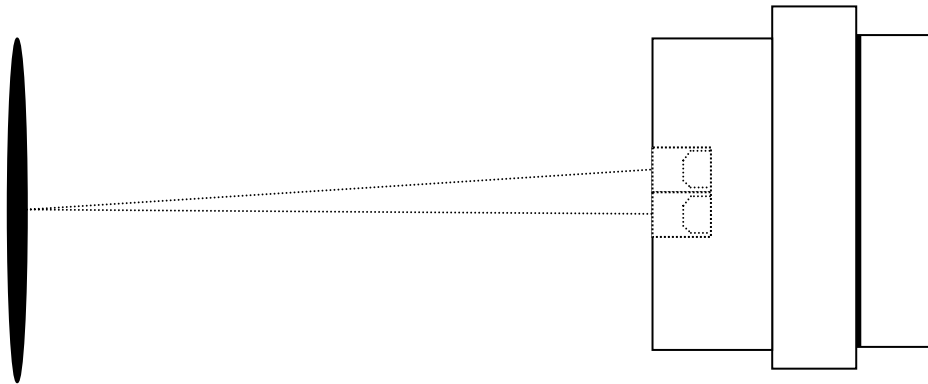
Schematic diagram showing principle of absorptometry



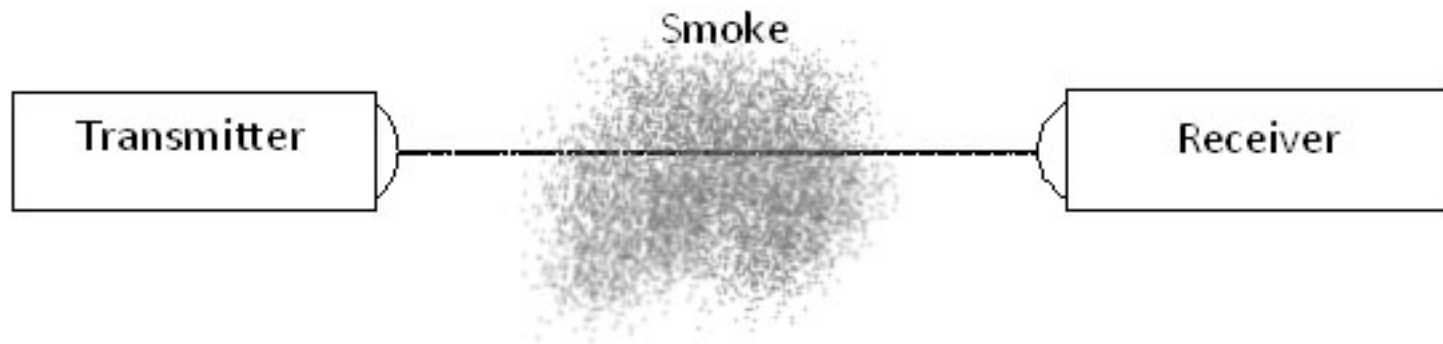
Typical graph produced by absorptometer



Type that Authorities are not happy with due to the fact that they have to many False Alarms

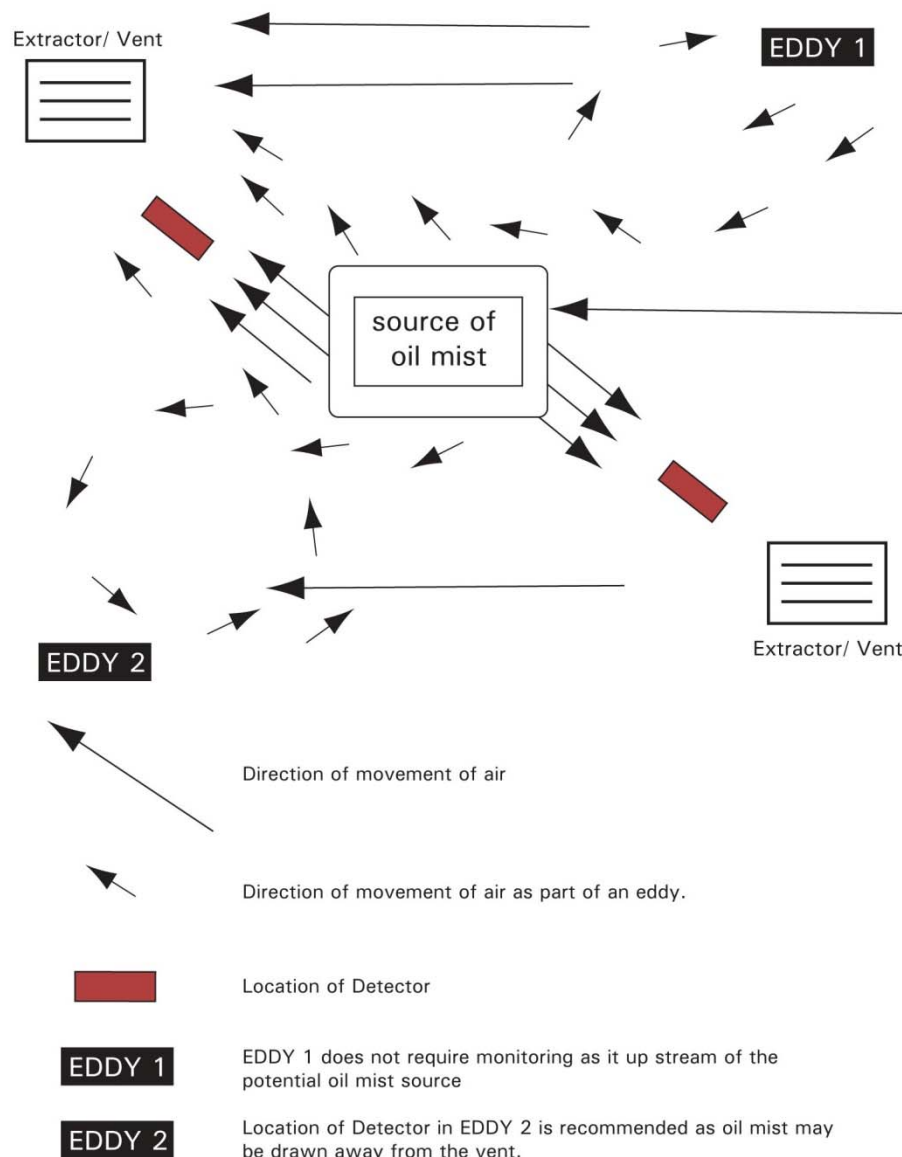


Beam detection over large distances



A line of sight instrument for chimney smoke on vessels

Location of Detectors is the Most Important Factor when Installing them



Power Stations on Land are now Beginning to Install Systems Following in the Foot Steps of the Marine Industry



Equipment used
to Monitor for Oil
Mist in Acoustic
Chambers of
Diesel or Turbine
Engines by
Placing Detectors
in the Air
Exhaust Ducts



Detector Draws the Oil Mist from the Duct, Passes in Through the Detector by the use of a Small Fan and Returning the Air Back into the Duct



QMI's Latest Enquiry
is to Monitor Wind
Turbines which have
Many Fires. Just
Look it up in Google
– 'Wind Turbine
Fires'

Smoke pours from the top and
bottom of one of the wind turbines.

27 March 2008, Worthington Daily Globe



Wind Turbine Fires

- Fire is the second most common accident cause in incidents found.
- A total of 131 fire incidents reported:

By Year:

Year	70s	80s	90-94	95	96	97	98	99	00	01	02	03	04	05	06	07	08	09*
No.			1	1		1	1	2	3	1	24	16	15	14	12	20	16	4

**09 to 30 June 2009 only*

- The biggest problem with turbine fires is that, because of the turbine height, the fire brigade can do little but watch it burn itself out.

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