



Martherm

Marine Thermographic Services

enquiries@martherm.co.uk

T: 087000 562 48 ~ F: 087000 562 49

Engine Room Hot Surfaces Thermographic Survey Report

M/V NO SUCH VESSEL



ACCME Shipping

01/01/2001

Introduction

Infra-red thermography is a widely accepted PPM technology that can be applied to electrical and mechanical systems found in the Marine Industry.

In addition to saving money and increasing uptime, thermography can play a crucial function in maintaining the safety and reliability of marine facilities where system failure could lead to catastrophic loss of vessel or its crew.

Oil leakage hitting hot spots on engines is the major cause of engine-room fires onboard ship. According to casualty statistics more than 60% of all engine room fires have been initiated by a hot spot.

Most lubrication, hydraulic and fuel oils have an autoignition point above 250o C. If a liquid hits a surface hotter than its autoignition temperature the liquid may ignite spontaneously. Any such hot spot is an immediate hazard in case of oil leakage.

Variables

There are many variables that can affect the accuracy of thermographic imaging; distance from object, ambient temperature, relative humidity and most importantly the materials emissivity.

Emissivity is a modifying factor used in colour thermometry to achieve a correct temperature reading. Emissivity, or radiated efficiency, of most materials is a function of surface condition, temperature and wavelength of measurement

The camera operates in the longer wavelengths of the IR spectrum - (7µm - 14µm)

Ambient temperature and relative humidity are measured at the survey point and corrected for in the camera's set up.

Emissivity values are extrapolated with reference to the 'Table of Emissivity of Various Surfaces' produced by Mikron Instruments which can be found at the end of this report

Advisory Note & Disclaimer

An in depth Thermographic Survey was carried out as instructed using the NEC San-ei Thermo Tracer TH7102 system. The survey covered areas of the Plant as detailed in the following report, with any observations specified on the attached individual thermographic Shot Sheets.

This report highlights and identifies "Hot or Cold Spots" found on the day of the survey which are pin pointed very clearly in the thermal image report sheet. These detailed thermal images are supported with a standard digital photo image for ease of identification around your plant.

It is recommended that this report be analysed by a qualified member of your staff, in order for your company to undertake any necessary remedial action. This report is for advisory purposes only and Marine Thermographic Services will not assume any liability for any decisions or actions taken by you as a result of this report.

This report does not purport to set forth all hazards, impending failures or existent problems nor to indicate that other such hazards, impending failures or existent problems do not exist. By issuing this report, neither Marine Thermographic Services nor any of its employees make any warranty, expressed or implied, concerning the contents of this report. Furthermore, neither Marine Thermographic Services nor any of its employees shall be liable in any manner for personal injury or property damage or loss of any kind arising from or connected with this thermal imaging survey or failure to inspect.



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General

It is noted that all surveyed machinery must be running at normal load in order to achieve the conditions necessary to produce a meaningful Thermographic Survey Report.

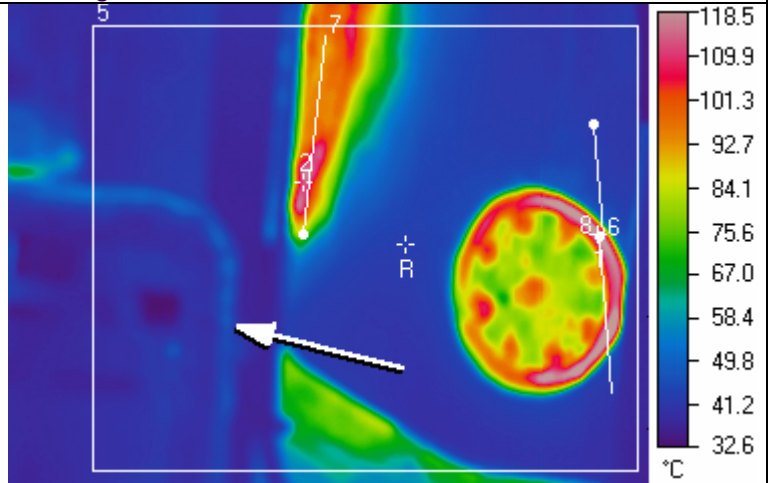
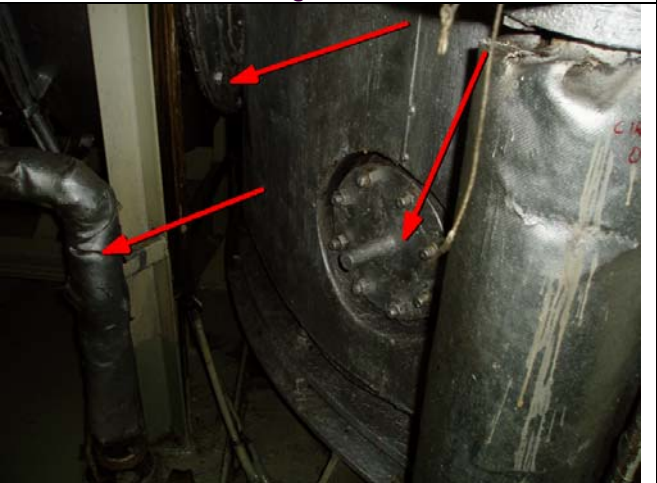
Whilst under survey the loading on each engine was as follows: -

Item Description	Running Load / Condition
Auxiliary Boiler	Half Load

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Report Date: - 01/01/2001

Machinery ID	Auxiliary Boiler Scum Door and Boiler Insulation
Type	Sunrod
Machinery Location	Engine Room 2nd Level
Running Load / Condition	Half Load

<p>IR Image : TH710003.SIT 01/01/2001</p> 	<p>Identification Image :</p> 
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	Point1	Point2	Ref.	Rect5	Line6	Line7	Line8
Emiss.	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Avg				51.8 °C	50.9 °C	99.1 °C	85.3 °C
Min				32.8 °C	41.5 °C	82.6 °C	41.0 °C
Max	121.1 °C	111.9 °C	42.5 °C	126.6 °C	119.9 °C	116.4 °C	123.8 °C
Delta	78.6 °C	69.4 °C		84.1 °C	77.4 °C	73.9 °C	81.3 °C

Comments & Recommendations:

This door requires to be lagged and the insulation indicated by arrow needs repairing, as can be seen the arrow on left indicates the fuel line which if it leaks on to hot surface could cause a problem

Thermographer: - Jim Scott

Repair Date:	Repaired By:
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Image	Image Date • Time	Machinery ID	Machinery Location	Page
TH710003.SIT	01/01/01 8:20 AM	Turbo Charger Lagging	On main engine Aft	3