SOLAS Compliance Thermographic Survey

Engine Room Equipment

SAMPLE REPORT

By

Pixel Thermographics Ltd

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Report Details

Customer	
Vessel name	
Contact Person	
Contact Person Address	
Phone Number	
Email Address	
Thermographer	
Thermographer Certification	ITC Level 2 Certified Thermographer
Survey Equipment	Flir Thermacam SC640 Infrared Camera Reporter 9.2 Software
Inspection Date	

INFORMATION

This Thermographic survey was carried out on behalf of *Company Name*, on the *Vessel Name* vessel. This is a report on the findings of this survey.

A FLIR Thermacam SC640, serial number 309000233 was used to capture the thermal data which is recorded within this report. Camera calibration is carried out annually and a copy of the calibration certificate can be obtained by request.

Where items were inspected and no abnormalities were found then no image data is recorded i.e. individual reports are generated by exception. Some areas of particular interest may be included which the Thermographic Engineer feels may be of particular interest to the client.

Descriptions of equipment and locations have been noted as those in common usage within the vessel.

Follow up work including remedial work and investigations into causation etc. or any other factors outside the control of Pixel Thermographics Ltd are not the responsibility of Pixel Thermographics Ltd and are not covered by this contract.

Where Pixel Thermographics Ltd have been unable to inspect equipment or plant which is covered, unexposed or inaccessible, we are therefore unable to report that any such system components are free from defect. Areas un-inspected are highlighted in the scope pages of this report.

To assist the Engineering Management to maintain plant efficiency, it is recommended that the survey is repeated on a two yearly basis.

……..
Mark Pedersen CEng
Certified Level 2 Thermographer
Pixel Thermographics Ltd

Disclaimer

Please note that the report contained herein represents the observed conditions at the time of inspection. Pixel Thermographics Ltd accepts no liability for faults that have occurred during or after the completion of the inspection.

The recommendations given in this report are intended as a guide only. By issuing this report neither Pixel Thermographics Ltd or any of its employees make any warranty, expressed or implied, concerning the contents of this report. Pixel Thermographics cannot accept responsibility for inappropriate actions taken as a result of this report.

SCOPE OF SURVEY

The scope of this survey was to carry out a thermographic inspection of surface temperatures within the engine rooms of the vessel in order to highlight the following anomalies:

- Surface Temperatures >220°C
- Surface Temperatures Between 200°C and 220°C

Statistics show that most engine room fires are caused by a ruptured fuel pipe spraying oil onto a hot surface. Engine room fires are few in number, but are normally very costly for the owners and their insurers and one should not overlook the potential for loss of life or injury to crew and / or passengers.

REGULATIONS

Surveys are carried out to comply with SOLAS regulations relating to protection of high temperature services as detailed below:

SOLAS 2014 - Chapter II-2 - Regulation 4 (Probability of Ignition)

2.2.6 Protection of high-temperature surfaces

2.2.6.1 Surfaces with temperatures above 220'c which may be impinged as a result of a fuel system failure shall be properly insulated.

2.2.6.2 Precautions shall be taken to prevent, any oil that may escape under pressure from any pump, filter or heater from coming into contact with heated surfaces.

REPORT DATA

A summary of all thermographic data is contained in the report pages that follow. The pages in the report have been designed as single page entries, each of which carries its own information so that individual pages can be given to the relevant professions in order that they may carry out any remedial repairs that may be necessary.

INSPECTION POLICY

Our inspection policy for this type of survey has been developed to not only highlight areas which fall outside the regulations for maximum temperatures but we also highlight areas where surface temperatures are approaching the maximum limit. This provides the client with information allowing them to carry out repairs before a real threat occurs.

Anomalies are grouped into 2 categories:

Surface Temperatures Detected >220° C.	**Priority 1**	Urgent Attention Required
Surface Temperatures Detected Between 200°C and 220° C.	**Priority 2**	Investigate Cause of Temperature Rise

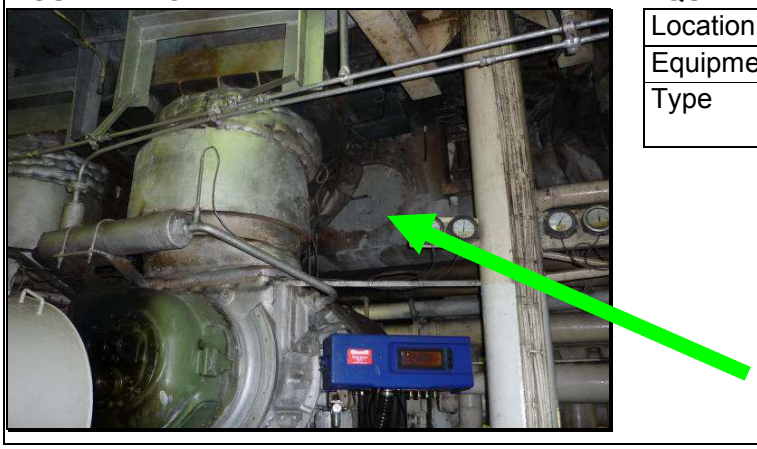
Only areas detected above 200°C have been included in this report. All other surfaces measured at the time of the survey were deemed to be >200°C.

Summary of Issues Found

Location	Equipment	Type	Priority	Page Number
Main Engine Room	Port Engine	Turbo Charger (STBD Side) & Exhaust Duct	1	6
Main Engine Room	Port Engine	Exhaust Duct After Turbo Charger	1	7
Main Engine Room	Central Engine	Exhaust Ductwork	1	8
Main Engine Room	Central Engine	Exhaust From Super Charger (STBD Side)	1	9
Main Engine Room	STBD Engine	Exhaust Duct from Turbo Charger	1	10
Main Engine Room	STBD Engine	Exhaust From Turbo Charger (STBD)	1	11
Generator Room	Port Generator	Top of Generator (Port Side)	1	12
Generator Room	STBD Generator	Top Of Generator	1	13

Surface Temperatures Detected >220° C.	**Priority 1**	Urgent Attention Required
Surface Temperatures Detected Between 200°C and 220° C.	**Priority 2**	Investigate Cause of Temperature Rise

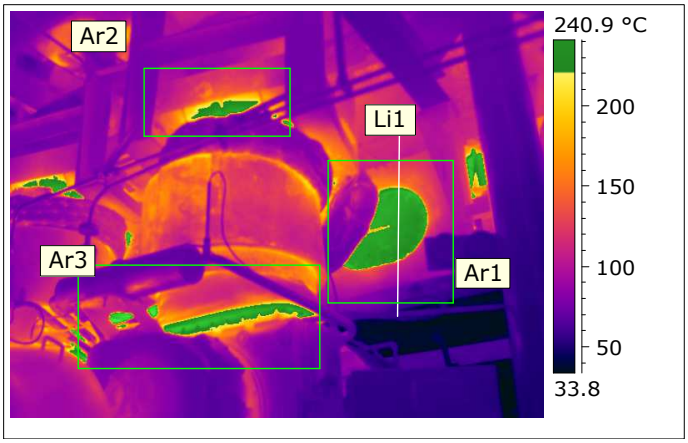
VISUAL IMAGE



EQUIPMENT INFORMATION

Location	Main Engine Room
Equipment	Port Engine
Type	Turbo Charger (STBD Side) & Exhaust Duct

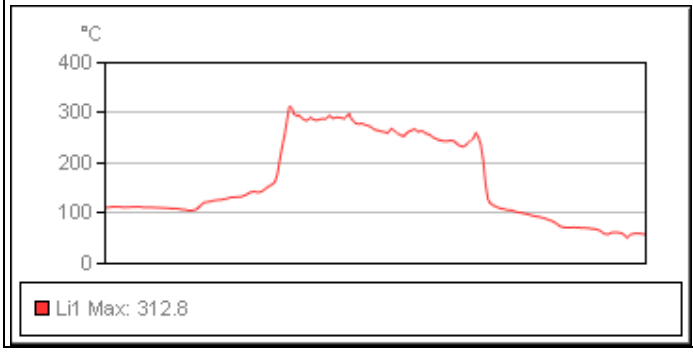
THERMAL IMAGE



RADIOMETRIC DATA

Object Parameters	Value
Date	06/08/2010
Image Time	08:27:14
Atmospheric Temperature	44.0 °C
Ar1 Max. Temperature	342.9 °C
Ar2 Max. Temperature	294.1 °C
Ar3 Max. Temperature	429.3 °C
Emissivity	0.95
Object Distance	4.0 m
Reflected Apparent Temperature	59.6 °C
Image File name	IR_6806.jpg

TEMPERATURE PLOT OF LINE Li1



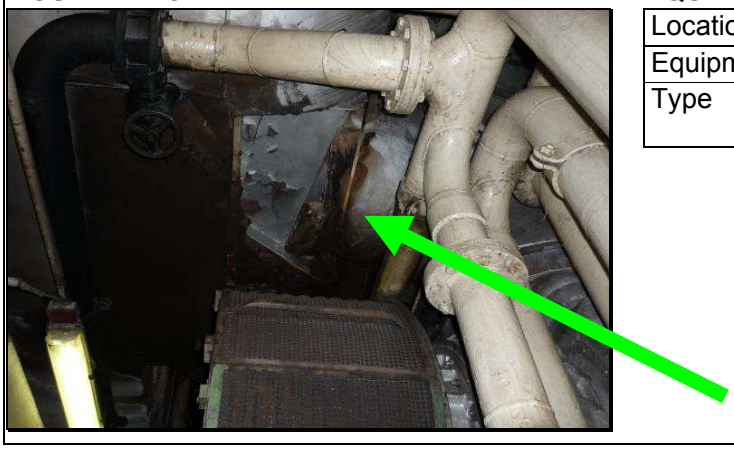
Priority	1

ANALYSIS & OBSERVATIONS

Temperatures in excess of the upper limit of 220°C are highlighted in green.

Missing or damaged / defective insulation appears to be the cause of the high surface temperatures.

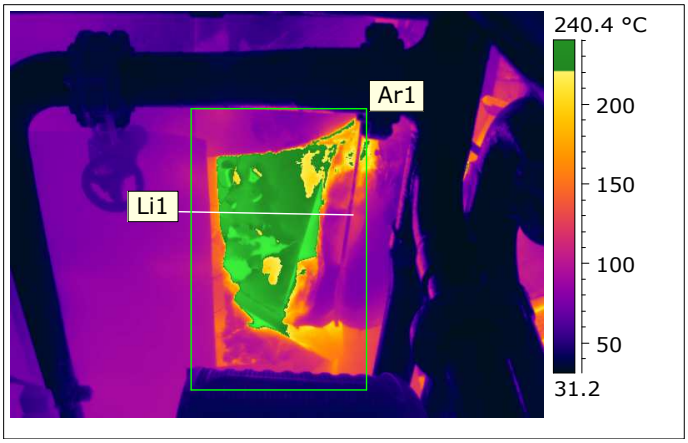
VISUAL IMAGE



EQUIPMENT INFORMATION

Location	Main Engine Room
Equipment	Port Engine
Type	Exhaust Duct After Turbo Charger

THERMAL IMAGE

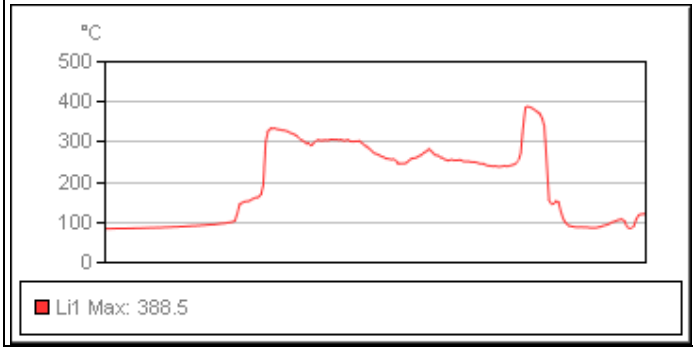


RADIOMETRIC DATA

Object Parameters	Value
Date	06/08/2010
Image Time	08:33:07
Atmospheric Temperature	44.0 °C
Ar1 Max. Temperature	413.9 °C
Emissivity	0.95
Object Distance	4.0 m
Reflected Apparent Temperature	59.6 °C
Image File name	IR_6812.jpg

Priority	**1**

TEMPERATURE PLOT OF LINE Li1

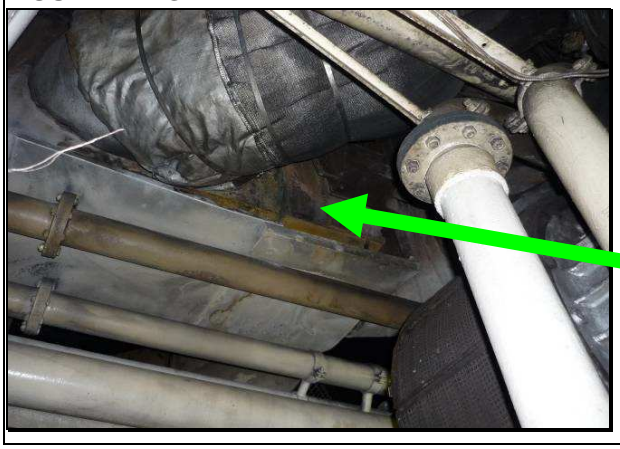


ANALYSIS & OBSERVATIONS

Temperatures in excess of the upper limit of 220°C are highlighted in green.

Damaged / defective insulation appears to be the cause of the high surface temperatures.

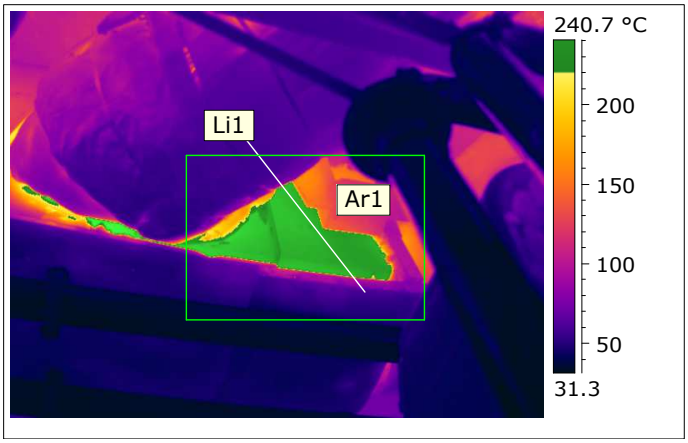
VISUAL IMAGE



EQUIPMENT INFORMATION

Location	Main Engine Room
Equipment	Central Engine
Type	Exhaust Ductwork

THERMAL IMAGE

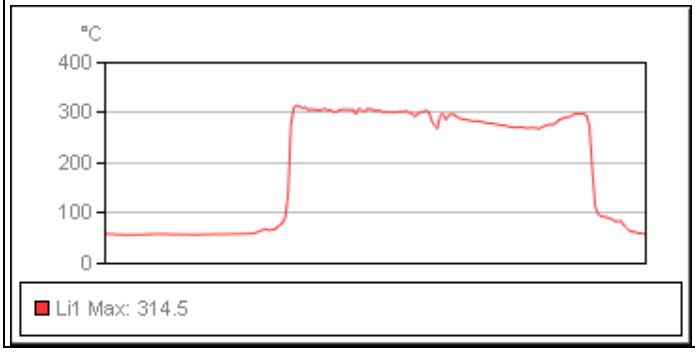


RADIOMETRIC DATA

Object Parameters	Value
Date	06/08/2010
Image Time	08:31:14
Atmospheric Temperature	44.0 °C
Ar1 Max. Temperature	353.7 °C
Emissivity	0.95
Object Distance	4.0 m
Reflected Apparent Temperature	59.6 °C
Image File name	IR_6810.jpg

Priority	1

TEMPERATURE PLOT OF LINE Li1

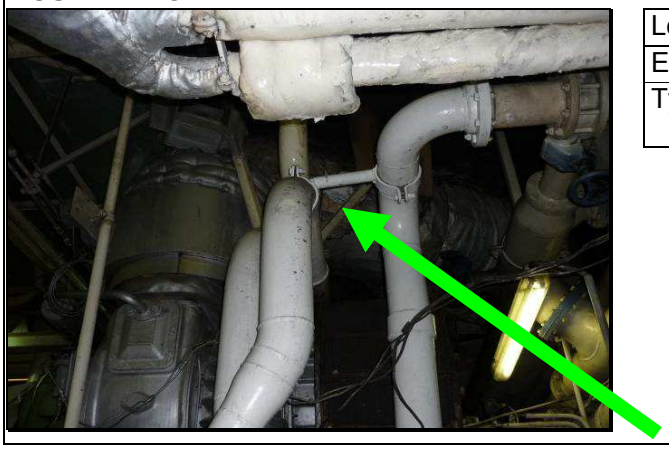


ANALYSIS & OBSERVATIONS

Temperatures in excess of the upper limit of 220°C are highlighted in green.

Missing insulation appears to be the cause of the high surface temperatures.

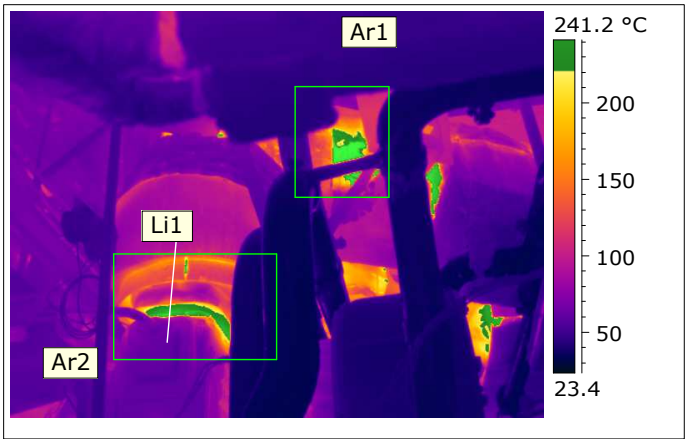
VISUAL IMAGE



EQUIPMENT INFORMATION

Location	Main Engine Room
Equipment	Central Engine
Type	Exhaust From Super Charger (STBD Side)

THERMAL IMAGE

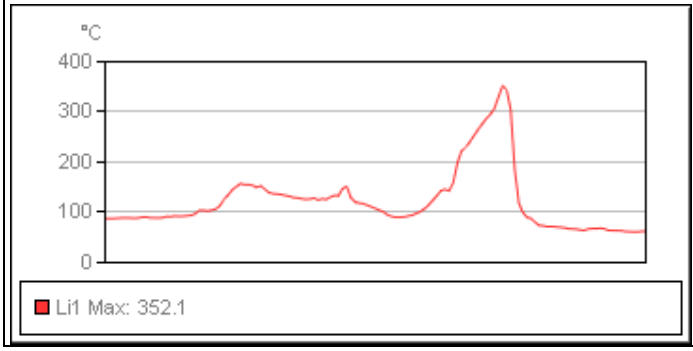


RADIOMETRIC DATA

Object Parameters	Value
Date	06/08/2010
Image Time	08:35:37
Atmospheric Temperature	44.0 °C
Ar1 Max. Temperature	381.6 °C
Ar2 Max. Temperature	361.2 °C
Emissivity	0.95
Object Distance	4.0 m
Reflected Apparent Temperature	59.6 °C
Image File name	IR_6814.jpg

Priority	**1**

TEMPERATURE PLOT OF LINE Li1



ANALYSIS & OBSERVATIONS

Temperatures in excess of the upper limit of 220°C are highlighted in green.

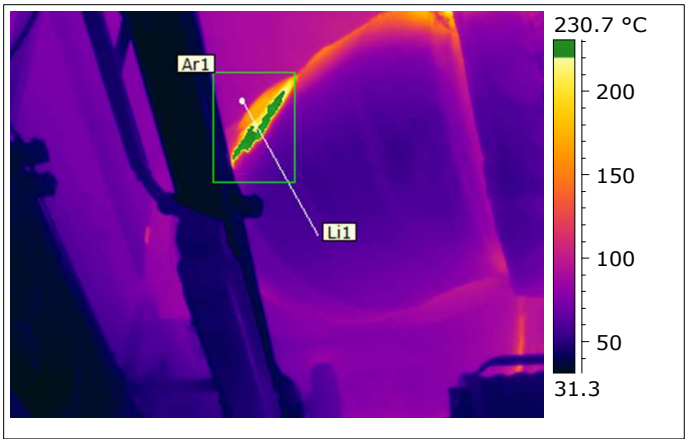
Missing or damaged / defective insulation appears to be the cause of the high surface temperatures.

VISUAL IMAGE

EQUIPMENT INFORMATION

Location	Main Engine Room
Equipment	STBD Engine
Type	Exhaust Duct from Turbo Charger

THERMAL IMAGE

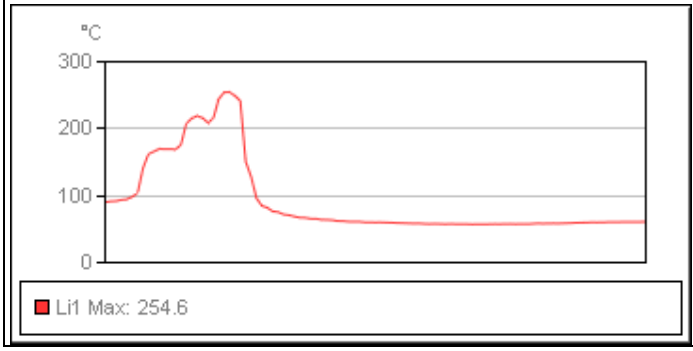


RADIOMETRIC DATA

Object Parameters	Value
Date	06/08/2010
Image Time	08:39:45
Atmospheric Temperature	44.0 °C
Ar1 Max. Temperature	274.5 °C
Emissivity	0.95
Object Distance	4.0 m
Reflected Apparent Temperature	59.6 °C
Image File name	IR_6820.jpg

Priority	1

TEMPERATURE PLOT OF LINE Li1



ANALYSIS & OBSERVATIONS

Temperatures in excess of the upper limit of 220°C are highlighted in green.

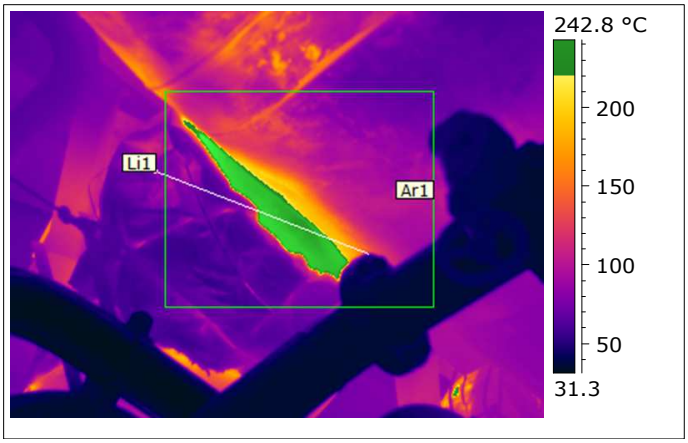
Missing or damaged / defective insulation appears to be the cause of the high surface temperatures.

VISUAL IMAGE

EQUIPMENT INFORMATION

Location	Main Engine Room
Equipment	STBD Engine
Type	Exhaust From Turbo Charger (STBD)

THERMAL IMAGE

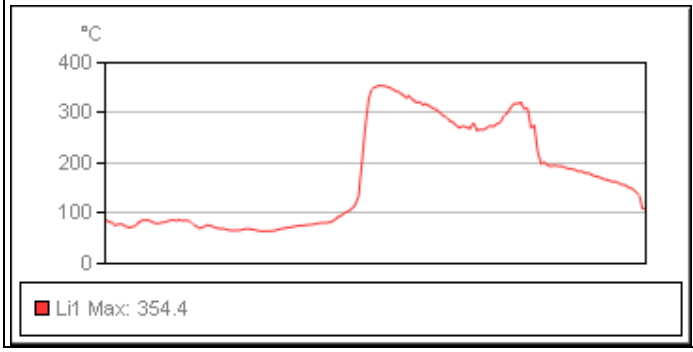


RADIOMETRIC DATA

Object Parameters	Value
Date	06/08/2010
Image Time	08:41:08
Atmospheric Temperature	44.0 °C
Ar1 Max. Temperature	411.3 °C
Emissivity	0.95
Object Distance	4.0 m
Reflected Apparent Temperature	59.6 °C
Image File name	IR_6822.jpg

Priority	**1**

TEMPERATURE PLOT OF LINE Li1

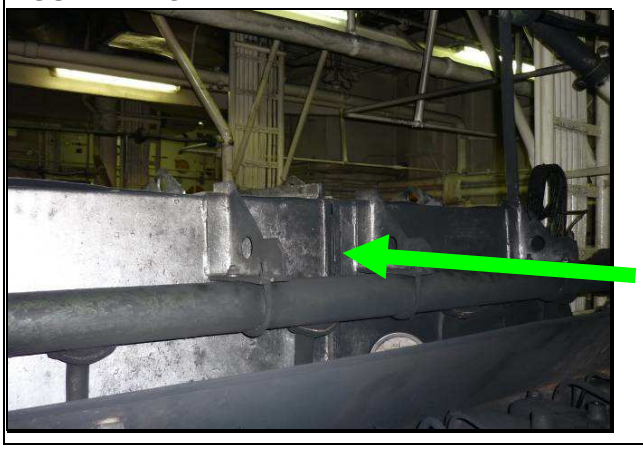


ANALYSIS & OBSERVATIONS

Temperatures in excess of the upper limit of 220°C are highlighted in green.

Missing or damaged / defective insulation appears to be the cause of the high surface temperatures.

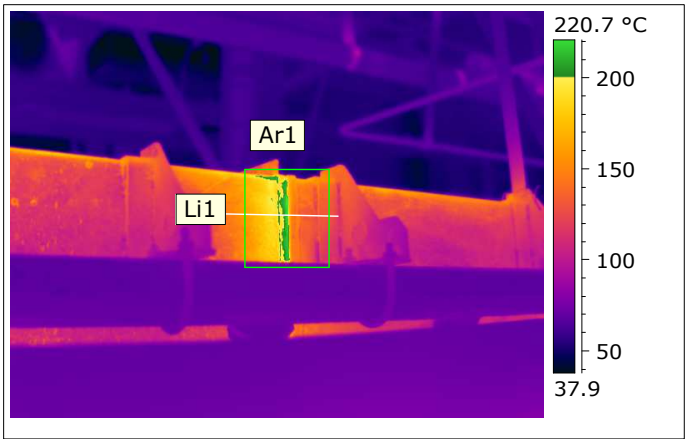
VISUAL IMAGE



EQUIPMENT INFORMATION

Location	Generator Room
Equipment	Port Generator
Type	Top of Generator (Port Side)

THERMAL IMAGE

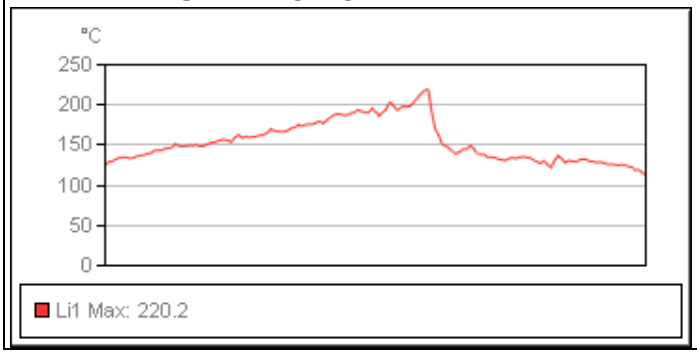


RADIOMETRIC DATA

Object Parameters	Value
Date	06/08/2010
Image Time	08:50:05
Atmospheric Temperature	44.0 °C
Ar1 Max. Temperature	227.2 °C
Emissivity	0.95
Object Distance	4.0 m
Reflected Apparent Temperature	59.6 °C
Image File name	IR_6828.jpg

Priority	**2**

TEMPERATURE PLOT OF LINE Li1



ANALYSIS & OBSERVATIONS

Temperatures approaching the upper limit of 220°C are highlighted in green.

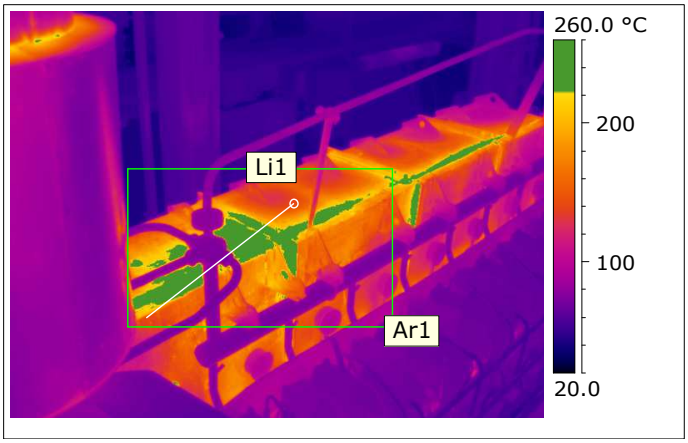
Leakage via a visible gap in the casing appears to be the cause of the high surface temperature.

VISUAL IMAGE

EQUIPMENT INFORMATION

Location	Generator Room
Equipment	STBD Generator
Type	Top Of Generator

THERMAL IMAGE

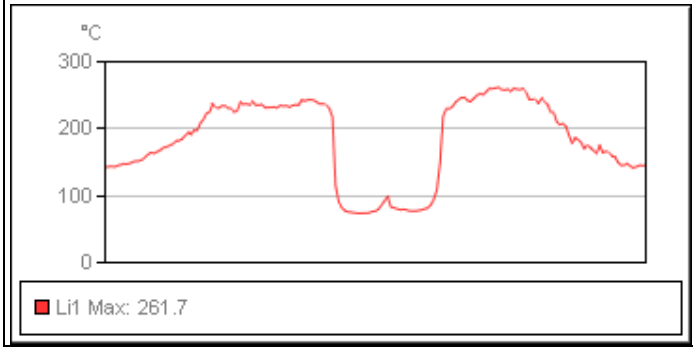


RADIOMETRIC DATA

Object Parameters	Value
Date	06/08/2010
Image Time	08:57:21
Atmospheric Temperature	44.0 °C
Ar1 Max. Temperature	477.3 °C
Emissivity	0.95
Object Distance	4.0 m
Reflected Apparent Temperature	59.6 °C
Image File name	IR_6833.jpg

Priority	**1**

TEMPERATURE PLOT OF LINE Li1



ANALYSIS & OBSERVATIONS

Temperatures in excess of the upper limit of 220°C are highlighted in green.

The hot surfaces appear to be caused by visible gaps in the casing.