Save Energy. Save Money.

A Division of Andrew Consulting Engineers, PC

Thermography Inspection at

New Hanover County Courthouse
316 Princess Street
Wilmington, NC 28402
5th Floor Mechanical Room

7/16/08
By:
Tommy Webster

ACE Thermal Imaging
3811 Peachtree Avenue
Wilmington, NC 28403
910-202-5555 o - 910-202-5558 f
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Inspection Site Information	
Customer	New Hanover County Property Management
Address	316 Princess Street, Wilmington, NC 28402
Contact person	
Phone	
E-mail address	
Thermographer	Tommy Webster - tommy@andrewengineers.com

General Information

To whom it may concern,
This was a visual and thermographic observation of the 5th floor mechanical room of the New Hanover County Courthouse. This report's purpose is to alert you of some identified failing components and possible anomalies that may need further action or attention. On the following pages you will see visual as well as thermal images of components within the mechanical room. You will also note information tables with temperature and atmospheric data. This data assists us in determining how critical the anomalies may be.
Below is a fault key that will correspond to the fault code listed on the table beside the digital photo. This code will be based on the "Delta Value", or Temperature Rise in the thermal image. At the bottom of each page is our analysis and recommendation for each component.
As always, if there are any questions or concerns please feel free to contact us.

Thank You,

Tommy Webster

Overview of Fault Rating Key:

0: Normal	Temp rise 0-8 °F	No action needed
1: Low grade	Temp rise 10-18 °F	To be monitored – Plan new Thermal Scan
2: Medium grade	Temp rise 18-65 °F	Repair at scheduled shut down
3: Severe	Temp rise >65 °F	Repair immediately

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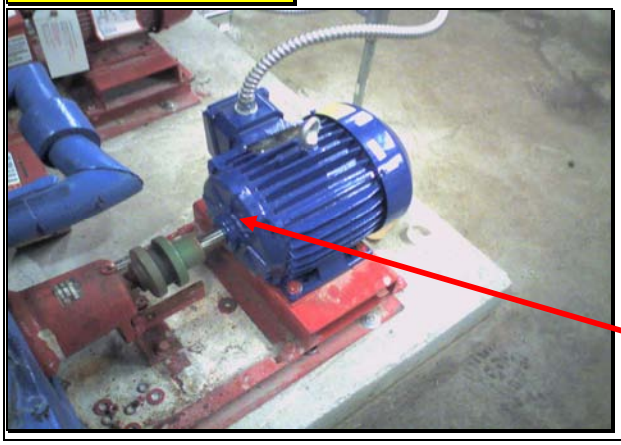
Photo and Identification



Location	5th Floor Mechanical Room
Equipment	Chilled Water Pump
Fault	(1)
Recommendation	Monitor

"Hot Spot"/Possible Anomaly

Thermogram 7/16/2008

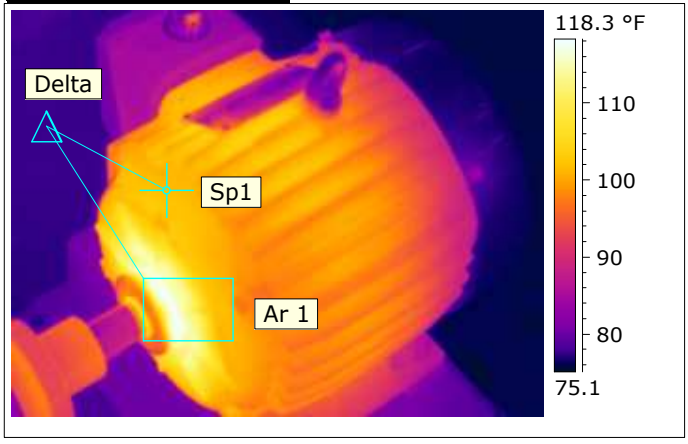


Image Date	7/16/2008
Image Time	9:25:46 AM
Emissivity	0.95
Object Distance	10.0 ft
Relative Humidity	57.0 %
Atmospheric Temperature	74.3 °F
Reflected Temperature	73.8 °F
Ar 1 Max. Temperature	118.3 °F
Sp1 Temperature	101.8 °F
Delta Value	16.5

Analysis & Recommended action:

We were informed that this was a fairly recently replaced pump. The uniform gradient thermal pattern in this motor housing suggests normal operation. The Delta Value is derived from the temperature rise between the high temp inside the Area 1 box and the average temp of the motor housing identified by the Spot 1. The only possible cause for concern is the Delta value of 16.5º F in the area where a bearing is located. Although this is not critical at this time, it may be necessary to monitor this bearing and inspect it during normal shutdown and /or scheduled maintenance.

Thermographer : **Tommy Webster** Signature:……..…….…… Date: **7/16/08**

Repaired by: ...…… date:

Comment:……..

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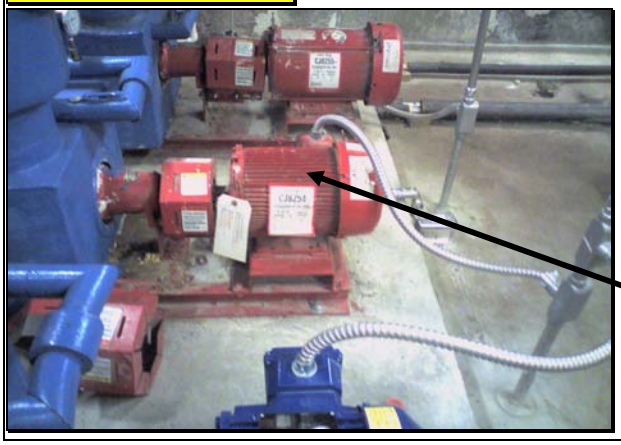
Photo and Identification



Location	5th Floor Mechanical Room
Equipment	Chilled Water Pump
Fault	(0)
Recommendation	None Required

Identifies hottest area of the motor housing

Thermogram 7/16/2008

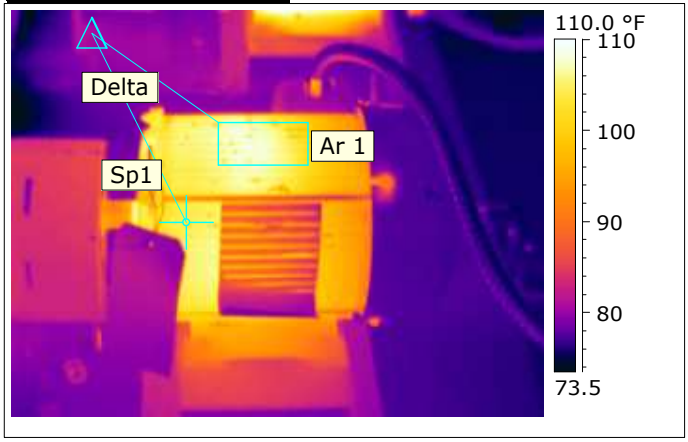


Image Date	7/16/2008
Image Time	9:25:24 AM
Image Description	-
Emissivity	0.95
Object Distance	10.0 ft
Reflected Temperature	73.8 °F
Relative Humidity	57.0 %
Ar 1 Max. Temperature	108.5 °F
Sp1 Temperature	103.8 °F
Delta Value	4.7

Analysis & Recommended action:

This motor appears to be operating in a normal fashion under normal temperatures. Note that there is only a 4.7º F rise in temperature in the average surface area and the hottest surface area.

Thermographer : **Tommy Webster** Signature:……..…… Date: **7/16/08**

Repaired by: ...…… date:

Comment:……..

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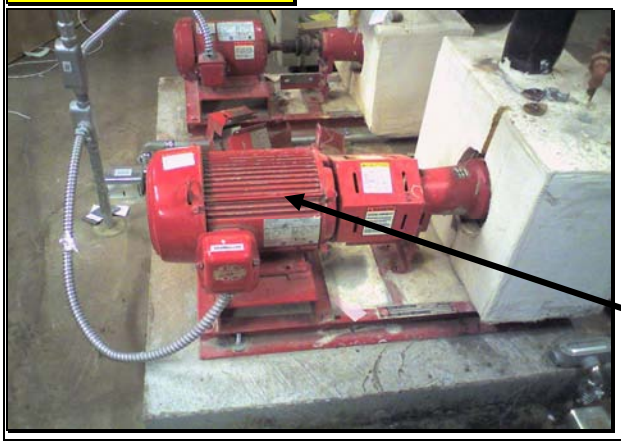

Location	5th Floor Mechanical Room
Equipment	Hot Water Pump
Fault	(1)
Recommendation	Monitor

Hot Spot in Motor Housing

Thermogram 7/16/2008

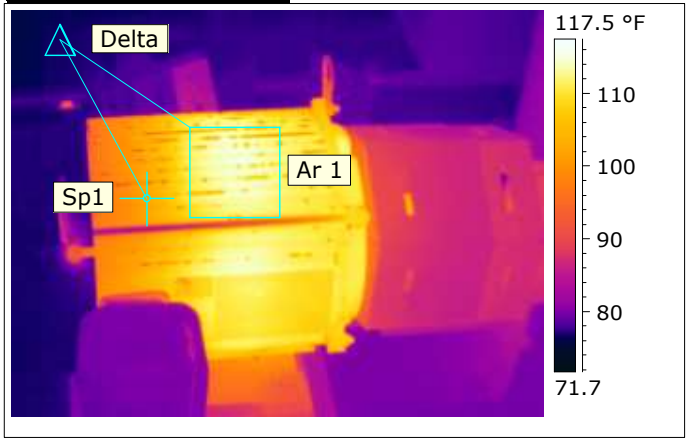

Image Date	7/16/2008
Image Time	9:26:08 AM
Image Description	-
Emissivity	0.95
Object Distance	10.0 ft
Reflected Temperature	73.8 °F
Relative Humidity	57.0 %
Ar 1 Max. Temperature	115.0 °F
Sp1 Temperature	102.4 °F
Delta Value	12.6

Analysis & Recommended action:

Although the overall temperature of this motor housing is not alarming; the Delta temp in the casing is high enough to merit monitoring. There is a possibility of winding wear that could eventually cause a failure. Our recommendation is to schedule a future Thermal Scan to better monitor the integrity of this particular pump.

Thermographer : **Tommy Webster** Signature:……..…….…… Date: **7/16/08**

Repaired by: ...…… date:

Comment:……..

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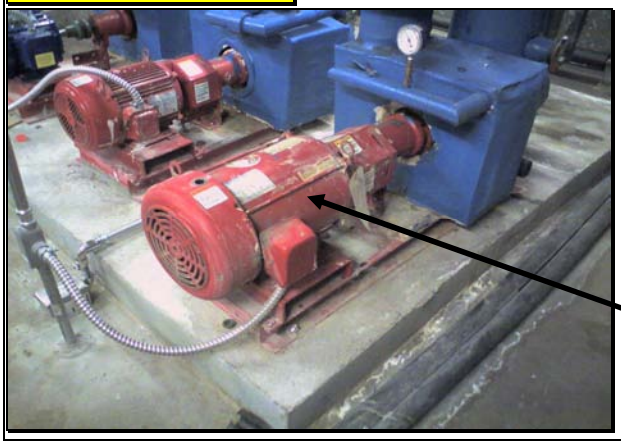
Photo and Identification



Location	5th Floor Mechanical Room
Equipment	Chilled Water Pump
Fault	(2)
Recommendation	Schedule Repair

Severe Hot Spot in Motor Housing

Thermogram 7/16/2008

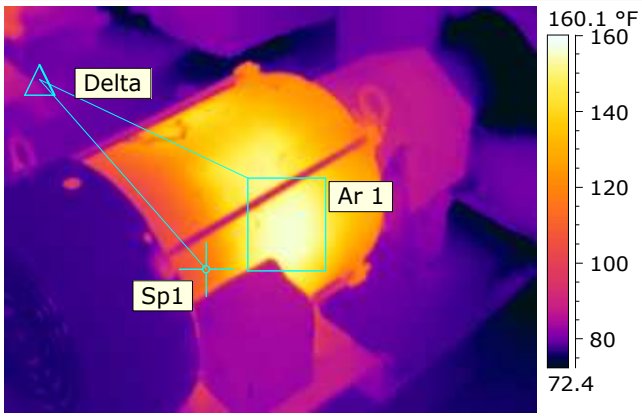


Image Date	7/16/2008
Image Time	9:40:49 AM
Image Description	-
Emissivity	0.95
Object Distance	10.0 ft
Reflected Temperature	73.8 °F
Relative Humidity	57.0 %
Ar 1 Max. Temperature	155.8 °F
Sp1 Temperature	114.3 °F
Delta Value	41.6

Analysis & Recommended action:

This motor housing shows potentially severe wear in the windings of this component.
The Delta temp of 41.6 degrees in this housing identifies a high potential for failure. It is significant enough to immediately inspect and schedule a repair for this unit.

**Note that the Max temp for this particular pump is 47ºF higher than the adjacent pump.*

Thermographer : **Tommy Webster** Signature:……..…… Date: **7/16/08**

Repaired by: ...…… date:

Comment:……..

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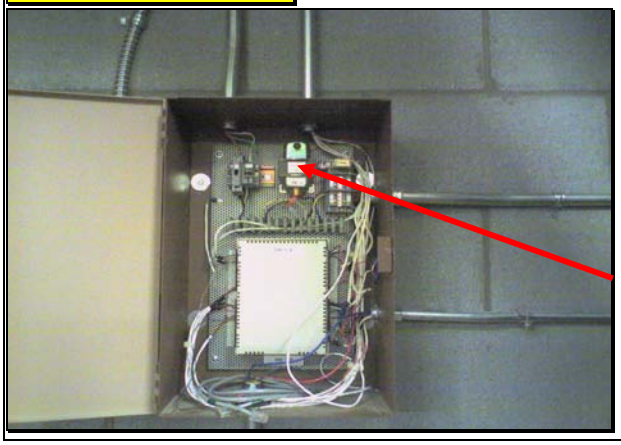

Location	5th Floor Mechanical Room
Equipment	Transformer
Fault	(?)
Recommendation	Contact Manufacturer

Possible Overloaded Transformer

Thermogram 7/16/2008

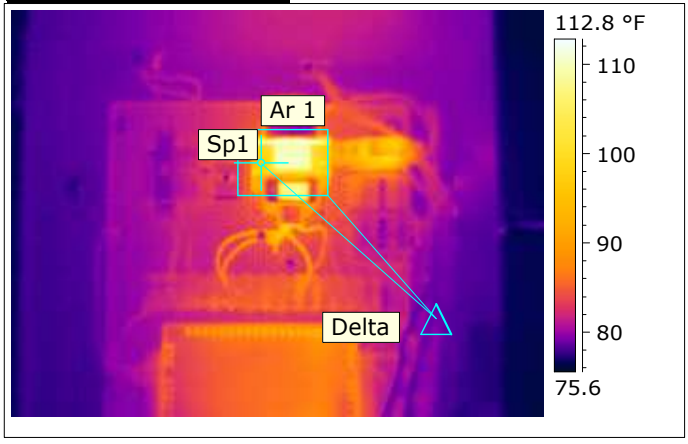

Image Date	7/16/2008
Image Time	9:39:55 AM
Image Description	-
Emissivity	0.85
Object Distance	10.0 ft
Reflected Temperature	73.8 °F
Relative Humidity	57.0 %
Ar 1 Max. Temperature	112.9 °F
Sp1 Temperature	97.1 °F
Delta Value	15.8

Analysis & Recommended action:

This transformer *appears* to be functioning properly.
The manufacturer if this transformer needs to be contacted to determine what the normal operating load should be for this particular component. Some loads and temperatures of this type are completely normal if the component is rated for such a load. Only the manufacturer will be able to satisfy this information. Even though this seems to be a normal operating temp, we can compare the current temperature information to future scan results to create temperature trending and more accurately identify potential failures.

Thermographer : **Tommy Webster** Signature:……..…….…… Date: **7/16/08**

Repaired by: ...…… date:

Comment:……..

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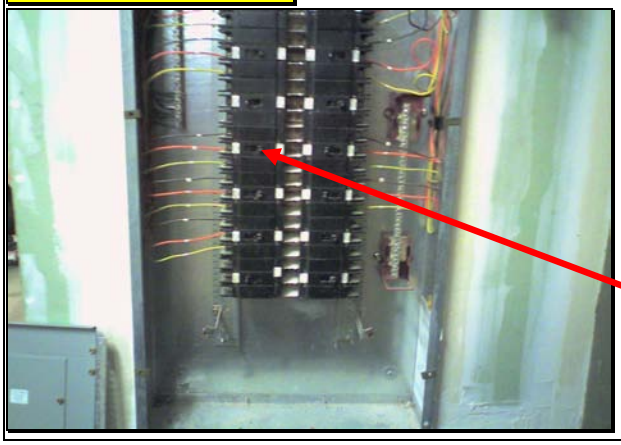

Location	5th Floor Mechanical Room
Equipment	Electrical Panel
Fault	(0)
Recommendation	None Required

Circuit Break shows normal loading

Thermogram 7/16/2008

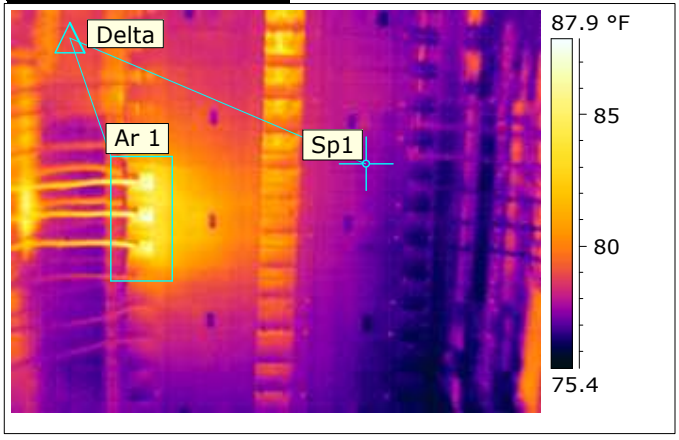

Image Date	7/16/2008
Image Time	9:36:23 AM
Image Description	-
Emissivity	0.95
Object Distance	10.0 ft
Reflected Temperature	73.8 °F
Relative Humidity	57.0 %
Ar 1 Max. Temperature	87.9 °F
Sp1 Temperature	77.5 °F
Delta Value	10.4

Analysis & Recommended action:

Electrical Panel exhibits normal load distribution and connectivity. Temperature rises of this nature under normal conditions are typical.

Thermographer : **Tommy Webster** Signature:……..…….…… Date: **7/16/08**

Repaired by: ...…… date:

Comment:……..

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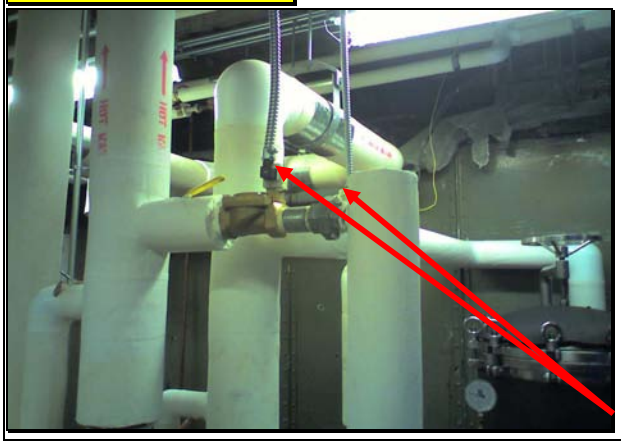

Location	5th Floor Mechanical Room
Equipment	Hot Water Valve
Fault	(0)
Recommendation	None

Valve Locations

Thermogram 7/16/2008

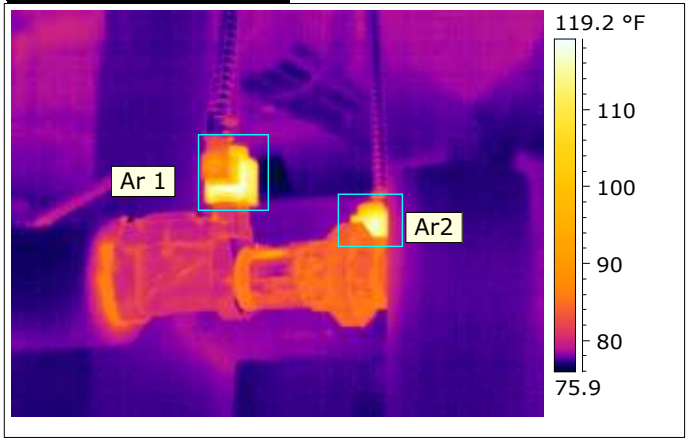

Image Date	7/16/2008
Image Time	9:33:15 AM
Image Description	-
Emissivity	0.95
Object Distance	10.0 ft
Reflected Temperature	73.8 °F
Relative Humidity	57.0 %
Ar 1 Max. Temperature	119.1 °F
Ar2 Max. Temperature	117.9 °F

Analysis & Recommended action:

Area boxes show average temperatures for these hot water valves. They appear to be functioning properly.

Thermographer : **Tommy Webster** Signature:……..…….…… Date: **7/16/08**

Repaired by: ...…… date:

Comment:……..

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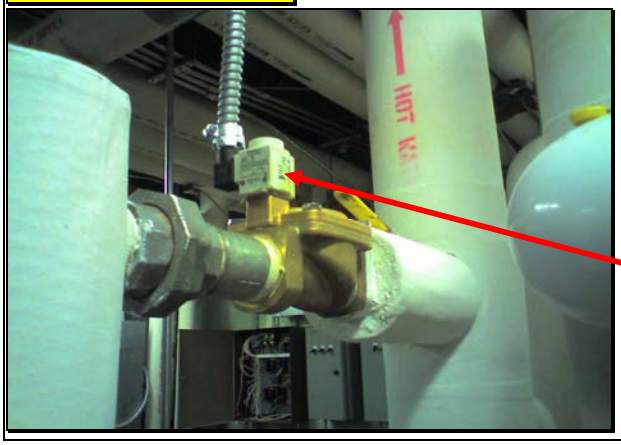

Location	5th Floor Mechanical
Equipment	Hot Water Valve?
Fault	(1)
Recommendation	Monitor

Possible compromised water valve

Thermogram 7/16/2008

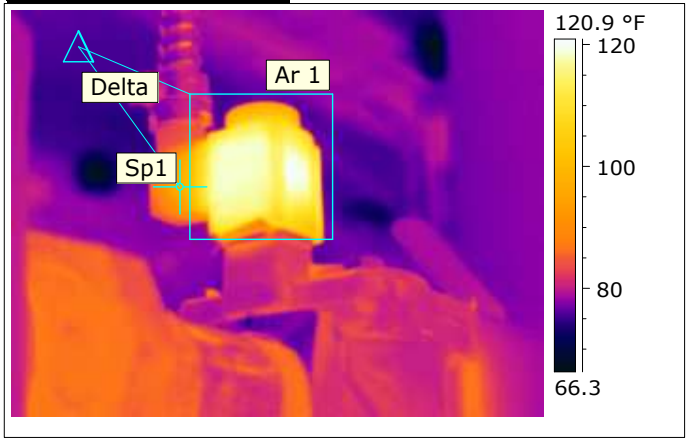

Image Date	7/16/2008
Image Time	9:33:38 AM
Image Description	-
Emissivity	0.95
Object Distance	10.0 ft
Reflected Temperature	73.8 °F
Relative Humidity	57.0 %
Atmospheric Temperature	74.3 °F
Ar 1 Max. Temperature	120.8 °F
Sp1 Temperature	97.4 °F
Delta Value	23.4

Analysis & Recommended action:

This water valve appears to be operating a bit warmer than expected. We recommend scheduling a future Thermal Scan to monitor temperature and avoid a potential failure.

Thermographer : **Tommy Webster** Signature:……..…… Date: **7/16/08**

Repaired by: ...…… date:

Comment:……..

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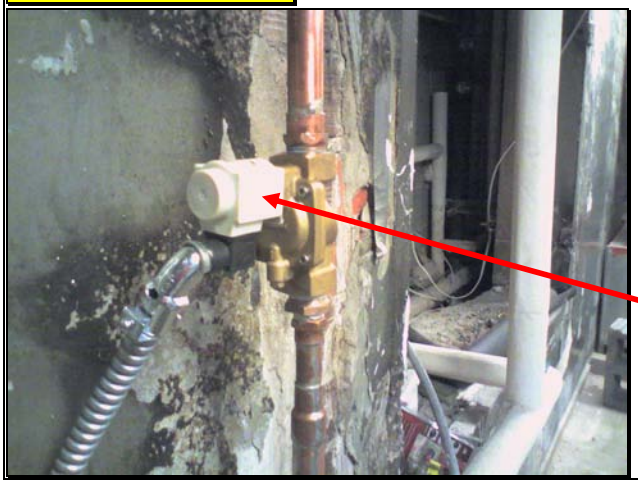

Location	5th Floor Mechanical Room
Equipment	Hot Water Valve
Fault	(1)
Recommendation	Monitor

Hot Spot in Valve

Thermogram 7/16/2008

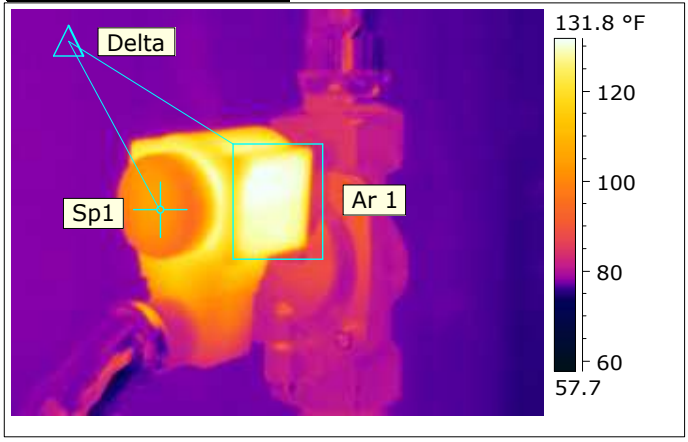

Image Date	7/16/2008
Image Time	9:41:45 AM
Image Description	-
Emissivity	0.95
Object Distance	10.0 ft
Reflected Temperature	74.8 °F
Relative Humidity	57.0 %
Atmospheric Temperature	74.3 °F
Ar 1 Max. Temperature	131.6 °F
Sp1 Temperature	104.1 °F
Delta Value	27.5

Analysis & Recommended action:

Overall temp is 11.6° F hotter than the average of the other valves. Again we recommend monitoring this valve to see if its operating max temperature is within the expected range.

Thermographer : **Tommy Webster** Signature:……..…… Date: **7/16/08**

Repaired by: ...…… date:

Comment:……..

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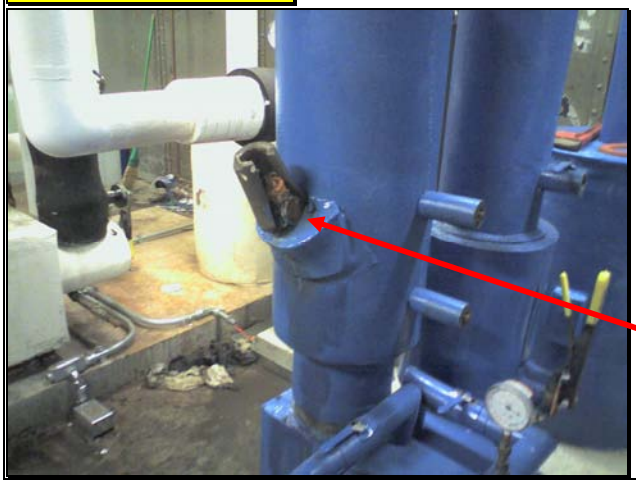

Location	5th Floor Mechanical Room
Equipment	Chilled Water Line Valve
Fault	(2)
Recommendation	Repair Immediately

Thermogram 7/16/2008

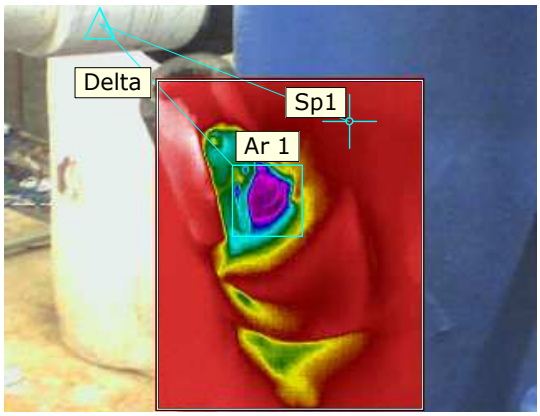

Image Date	7/16/2008
Image Time	9:43:50 AM
Image Description	-
Emissivity	0.90
Object Distance	10.0 ft
Reflected Temperature	73.8 °F
Relative Humidity	57.0 %
Sp1 Temperature	75.1 °F
Delta Value	-23.8
Ar 1 Min. Temperature	51.2 °F

Analysis & Recommended action:

This is the first valve in a line of three. Behind the foam insulation there was a visible water leak in this valve. The thermal image shows a Delta value of -23.8. This leak will eventually destroy the pipe insulation if not repaired. This is an active leak and needs immediate attention.

Thermographer : **Tommy Webster** Signature:……..…… Date: **7/16/08**

Repaired by: ...…… date:

Comment:……..

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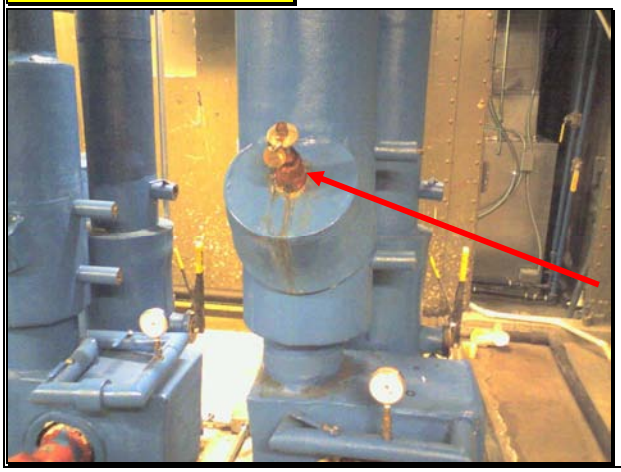

Location	5th Floor Mechanical Room
Equipment	Water Valve
Fault	(2)
Recommendation	Repair Immediately

Defective Water Valve

Thermogram 7/16/2008

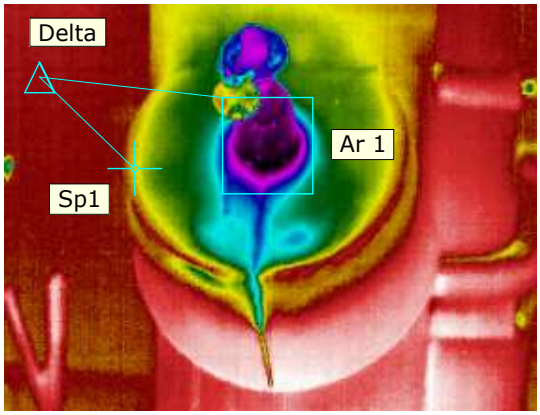

Image Date	7/16/2008
Image Time	9:44:18 AM
Image Description	-
Emissivity	0.90
Object Distance	10.0 ft
Reflected Temperature	73.8 °F
Relative Humidity	57.0 %
Sp1 Temperature	74.8 °F
Delta Value	-28.5
Ar 1 Min. Temperature	46.3 °F

Analysis & Recommended action:

This is #3 in a line of three valves for the Chilled water lines; each one has its own leak. This particular valve is the most critical. Note the stream of water coming from the connection point of the valve. This is an active leak and is critical need of replacement. Once again the insulation will be destroyed if not repaired.

Thermographer : **Tommy Webster** Signature:……..…… Date: **7/16/08**

Repaired by: ...…… date:

Comment:……..

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Photo and Identification

Location	5th Floor Mechanical Room
Equipment	Chilled Water Tank
Fault	(2)
Recommendation	Insulate

Chilled Water Holding Tank

Thermogram 7/16/2008

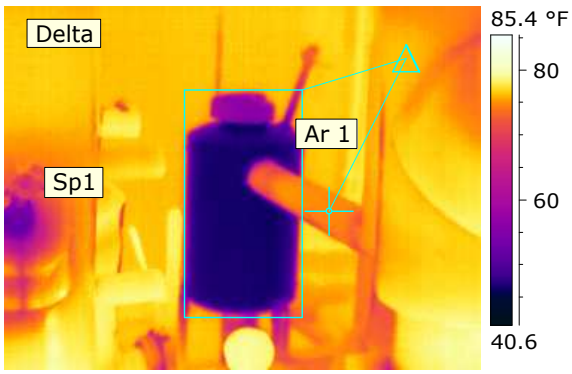

Image Date	7/16/2008
Image Time	9:27:56 AM
Image Description	-
Emissivity	0.95
Object Distance	10.0 ft
Reflected Temperature	73.8 °F
Relative Humidity	57.0 %
Sp1 Temperature	74.5 °F
Delta Value	-28.7
Ar 1 Min. Temperature	45.8 °F

Analysis & Recommended action:

This Chilled Water Tank has a surface temp of 45.8ºF and is almost 29ºF colder than the insulation around the chilled water lines. We recommend insulating the outside of the tank to increase the tank's efficiency.

Thermographer : **Tommy Webster** Signature:……..…… Date: **7/16/08**

Repaired by: ...…… date:

Comment:……..