Shannon Enterprises Inc.
INSULTECH Thermal Blanket - Energy Survey Proposal

Energy Survey By: Fred Weiler
Represented By: CVA Industrial
Project: **SAMPLE-Steam System**
Location: Anywhere, USA
Site Contact:

Survey Date:
Insulation Thickness: 1.50
Fuel Cost($/mmBTU): **$17.63**
Operating Hours per Year: 8760

Design: **LT450TT (Thermal)**
Amb. Temp: 80
Wind Speed: 0 MPH

Qty.	Description	Area (Ea.) (Sq.ft.)	Surface Temp.	Bare Heat Loss (BTU/Hr/SF	Insulated Heat Loss (BTU/Hr/SF	Bare Heat Loss (BTU/Hr)	Bare Heat Loss ($/Year)	Insulated Heat Loss (BTU/Hr)	Insulated Oper. Cost ($/Year)	Insultech Unit Cost	Insultech Total Cost
	Main Boiler Room										
2	10" 250# Stop Check Valve	18.2	350	864.00	60.28	31,449.60	$4,856.27	2,194.16	$338.81	$643.00	$1,286.00
2	10" 150# Gate Valve	15.9	350	864.00	60.28	27,475.20	$4,242.56	1,916.87	$295.99	$521.00	$1,042.00
4	17 x 20 - Steam Drum	6.4	350	864.00	60.28	22,118.40	$3,415.40	1,543.14	$238.28	$223.00	$892.00
2	17 x 20 - Mud Drum	6.4	350	864.00	60.28	11,059.20	$1,707.70	771.57	$119.14	$223.00	$446.00
	Steam Header										
6	8" 150# Gate Valve	11.8	350	864.00	60.28	61,171.20	$9,445.71	4,267.76	$659.00	$440.00	$2,640.00
4	6" 150# Gate Valve	8.8	350	864.00	60.28	30,412.80	$4,696.17	2,121.82	$327.64	$362.00	$1,448.00
2	12" 150# Flange Cap	5.9	350	864.00	60.28	10,195.20	$1,574.28	711.29	$109.83	$234.00	$468.00
	Steam Tunnel										
6	6" 150# Slip Expansion Joint	13.4	350	864.00	60.28	69,465.60	$10,726.48	4,846.44	$748.36	$536.00	$3,216.00
4	6" 150# Gate Valve	8.8	350	864.00	60.28	30,412.80	$4,696.17	2,121.82	$327.64	$362.00	$1,448.00
3	6" 150# Flange Cap	2.8	350	864.00	60.28	7,257.60	$1,120.68	506.34	$78.19	$123.00	$369.00
	PRV Station tp Deaerator (120 psi to 30 psi)										
1	6" 150# Flanged Strainer	8.8	350	864.00	60.28	7,603.20	$1,174.04	530.46	$81.91	$362.00	$362.00
1	4" 150# Control Valve	6.1	350	864.00	60.28	5,270.40	$813.82	367.70	$56.78	$314.00	$314.00
1	6" 150# Gate Valve	8.8	350	864.00	60.28	7,603.20	$1,174.04	530.46	$81.91	$362.00	$362.00
1	4" 150# Globe Valve	6.1	350	864.00	60.28	5,270.40	$813.82	367.70	$56.78	$263.00	$263.00
1	6" 150# Gate Valve	8.8	275	624.00	43.53	5,491.20	$847.92	383.11	$59.16	$362.00	$362.00
	PRV Station to HW Tank (120 psi to 30 psi)										
1	4" 150# Flanged Strainer	6.1	350	864.00	60.28	5,270.40	$813.82	367.70	$56.78	$263.00	$263.00
1	2.5" 150# Control Valve	4.1	350	864.00	60.28	3,542.40	$547.00	247.14	$38.16	$244.00	$244.00
1	4" 150# Gate Valve	4.1	350	864.00	60.28	3,542.40	$547.00	247.14	$38.16	$263.00	$263.00
1	2.5" 150# Globe Valve	4.1	350	864.00	60.28	3,542.40	$547.00	247.14	$38.16	$211.00	$211.00
1	4" 150# Gate Valve	6.1	275	624.00	43.53	3,806.40	$587.76	265.56	$41.01	$263.00	$263.00
	# 1705 Mechanical Room (30 psi to 15 psi)										
3	3" 150# Flanged Strainer	4.8	275	624.00	43.53	8,985.60	$1,387.50	626.90	$96.80	$230.00	$690.00
3	2" 150# Control Valve	4.1	275	624.00	43.53	7,675.20	$1,185.16	535.48	$82.69	$203.00	$609.00
3	3" 150# Gate Valve	4.8	250	544.00	37.95	7,833.60	$1,209.62	546.53	$84.39	$230.00	$690.00
3	3" 150# Flange Cap	1.5	275	624.00	43.53	2,808.00	$433.60	195.91	$30.25	$97.00	$291.00
	PRV Station to HW Tank (120 psi to 30 psi)										
1	4" 150# Flanged Strainer	6.1	275	624.00	43.53	3,806.40	$587.76	265.56	$41.01	$263.00	$263.00
1	2.5" 150# Control Valve	4.1	275	624.00	43.53	2,558.40	$395.05	178.49	$27.56	$211.00	$211.00
2	4" 150# Gate Valve	6.1	275	624.00	43.53	7,612.80	$1,175.52	531.13	$82.01	$263.00	$526.00
1	2.5" 150# Globe Valve	4.1	275	624.00	43.53	2,558.40	$395.05	178.49	$27.56	$211.00	$211.00

Energy Savings Summary:

Total Heatloss - Bare (BTU/HR):		395,798.40	
Total Heatloss - 1.5" Insulation (BTU/HR):		27,613.84	
Heatloss Savings-W/Insultech (BTU/HR):		368,184.56	
Total Annual Operating Cost - Bare:		$61,116.92	
Total Annual Operating Cost - 1.5" Insulation:		$4,263.97	Per Year
Annual Savings - W/Insultech (BTU/HR):		**$56,852.95**	**Per Year**
Blanket Cost (INSULTECH Blanket System):		$19,653.00	
Installation (All of the Above):	$	2,635.00	
Total Cost (Material & Labor):	**$**	**22,288.00**	
Payback (Months):		**5.21**	**Months**
		62	**Fittings**

Heatloss Calculation

Q = K (Delta T) / L+(K/Ht)
Q = Heatloss (BTU/Hr. / Sq. Ft.)
K = Bare Thermal Conductivity(STL and C.I. = 26.9)
K = Insulated Thermal Conductivity(T.M.=.36)
L = Insultion Thickness
Delta T = Surface Temp - Ambient Temp.
Ht = Combined Coefficients (300 Deg F. = 3.2)
(Radiation, Convection, & Conduction)

Summary:
Highlights to point out regarding this proposal for INSULTECH Thermal Blanket Systems.
A Lifetime of Savings (Year In - Year Out):

Fuel Cost includes: Fuel, Water, Chemicals, Maintenance & Operations Costs to produce 1000 lbs Steam $17.63 per mmBTU or per 1000 lbs Steam

Notes:

***Initial Investment:**	**$22,288.00**
***Lifetime Savings (15 Year Life):**	**$852,794.26**

Added Benefits Beyond Savings:
INSULTECH Thermal Blankets reduce some harmful noise.
Estimates on reduction are: 2-3 DBA Overall (Before Metered Value: 96.2 dba - Estimated After Value: 93.2 DBA).

You will automatically save money by removing and reinstalling the blanket just one time.
This is because the blanket is reused so no added material cost is incurred.

Hot surfaces are treated and covered thereby eliminating the potential for employee burns.
The general work environment is improved by lowering both ambient temperature and ambient noise levels.

INSULTECH Blanket Insulation is easy to install. Blankets are self-contained insulation systems whose wiretwist fasteners are integral to the design of the product. The blanket can be installed and removed within minutes, and there is no need for additional tools or materials.

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(GHG) Greenhouse Gas - Emissions Reductions:

INSULTECH Thermal Blanket Insulation will have a direct impact on emissions reduction.
By reducing annual BTU loss, less energy is expelled, thereby reducing usage.
The above "Energy Survey", shows a calculated Heatloss Savings (BTU/Hr): **368,184.56** BTU/Hr
The Annual Savings (mm BTU) : **3,225.30** mm BTU
The values in the below presentation are derived from Abraxas Energy Consulting.
Emission factors were calculated in 1998 in a federal study done by the Leonardo Academy.
Emission values here are calculated for your information only.

Emissions Savings #1 Natural Gas (mm BTU)	**3,225.30**
CO2 (Tons)	188.85
NOx (lbs)	483.92
N2O (lbs)	7.00
SO2 (lbs)	1.81
PM10 (lbs)	5.96
VOC (lbs)	17.36
CO (lbs)	77.46

Emissions Savings #2 # 6 Fuel Oil (mm BTU)	**3,225.30**
CO2 (Tons)	288.07
NOx (lbs)	1,267.58
N2O (lbs)	*
SO2 (lbs)	3,615.44
PM10 (lbs)	230.30
VOC (lbs)	37.05
CO (lbs)	115.28

(Amount is less than 0.05 lbs)

Emissions Savings #3 Electricity (kWh)	**935,336.05**
CO2 (Tons)	517.60
VOC (lbs)	8.29
NOx (lbs)	2,431.80
CO (lbs)	93.52
Mercury Compounds (tons)	5.70
Cadmium Compounds (lbs)	422.53
Lead Compounds (tons)	8.03

(mm BTU = 290 kWh)

Terms & Definitions:

(GHG) Greenhouse Gases are compounds of the atmosphere that contribute to the greenhouse effect. Greenhouse Gases include water vapor, carbon dioxide, methane, nitrous oxide and ozo
Greenhouse Gases have increased the effect of long wavelength radiant energy downward to the the earth's surface, thereby creating the "Greenhouse Effect".
The absorption of this longwave radiant energy by the earth's atmosphere is what causes the warming of the atmosphere.
(NOx) Nitrogen pollutants generated by boilers are Nitric Oxide (NO) & Nitrogen Dioxide (NO2) commonly referred to as NOx.
NOx in itself is harmful to humans, it initiates reactions that result in the production of ozone (O3) and acid rain.
(VOCs) Volatile Organic Compounds are organic chemical compounds that have high enough vapour pressures under normal conditions to significantly vaporize and enter the atmosphere.
Examples include a wide range of carbon based molecules such as hydrocarbons, aldehydes & ketones.
(PM) Particulates, alternatively referred to as particulate matter (PM), aerosols or fine particles, are tiny particles of solid (smoke) or a liquid (an aerosol) suspended in a gas.
They range in size from 10 nanoemtres to 100 micrometres in diameter, sources include the burning of fossil fuels.
(CO2) Carbon Dioxide or Carbonic Acid Gas, commonly produced from the combustion of carbonaceous fuels.