

STEAM STUDY



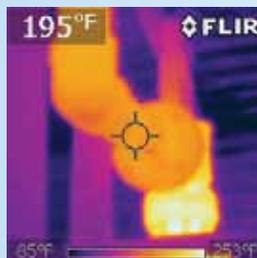
The Valve Shop, a division of WARE is unique in the industry in its approach to helping customers solve steam system issues with a Steam Study. The Steam Study focuses on resolving problems encountered in a facility's process areas, where steam is being used. The Valve Shop reviews the steam distribution system at each point of steam use and the condensate return system to pinpoint the problems and cost effective solutions.



ENERGY ASSESSMENT

A comprehensive report is provided based on our testing and observations of the system and includes recommendations for improvements to the system and components. Steam Studies routinely include the following.

- Prioritized list of Safety related improvements.
- Prioritized list of Process related improvements.
- A description of the system which include typical pipe sizes, pressure zones, uses of steam in the system.
- A description of the condensate return system.
- Observations and recommendations for improvement to the system for each point of steam use.
- Review of the types of traps employed.
- Assessment of the size and number of drip legs in the main steam headers
- Assessment of the size and number of end of line drip legs in the main steam headers.
- Estimate of the steam velocity in the main steam headers.
- A complete trap report listing size, manufacturer, type, model number and indication of trap failure (leaking, backing condensate or plugged)
- Estimate of the cost of leaking traps.
- Estimate of the cost of other system steam leaks
- Investigation of water hammer in the steam system during startup and operation.
- Investigation of condensate induced water hammer.
- Review of condensate temperatures.
- Review of type, size and suitability of installed condensate pumps.
- Examination of debris levels in uninsulated drip legs using digital infrared camera.
- Review of condensate tank venting.
- Review of Deaerator Tank Venting.
- Analysis of other steam process problems as described by the customer.
- Reference Section based on Department of Energy recommendations



ESTIMATED TOTAL LOSS/YEAR = \$248,298.00

Priority	Issue	Concern	Fix	Annual Capital Loss	Notes
1	West Plant Re-boiler Inlet	Excess Costs	Move Superheater condensate drain to the exit piping of Re-boiler steam	\$115,000	Based on 5% steam quality loss at 68,000 PPH due to added condensate
2	DA Overflow Trap	Safety	Inspect and repair bad DA overflow trap	Safety	DA can overflow and water hammer to the point of catastrophic failure
3	South Line Heat Exchanger Condensate Removal	Excess Costs, Process Control, and Equipment Life	Remove orifice trap and install pump trap	\$5,000	Based on 2% Heat Exchanger Surface Area Loss due to stalling in line
4	DA PRV Sensing Line	Excess Costs, Process Control, and Equipment Life	Modify sensing line to have proper intake location and proper fall to drain condensate to process pipe	\$12,000	Based on 7 - 10 PSI difference in DA for 3000 hours per year
5	Main Steam Header Drips	Excess Costs and Equipment Life	Install check valve on existing drip leg and install new drip on opposite end	\$31,500	Based on .5% Quality loss for total system rate of 110,000 PPH
6	New Plant Distribution Header Drips	Excess Cost and Equipment Life	Modify existing drip leg size and install new drip at superheater supply	\$18,000	Based on .5% Quality loss for Plant steam usage of 100,000 PPH
7	Basement Condensate Pumps	Excess Cost and Equipment Life	Design and modify system based on incoming flows, critical back pressures and loads	\$21,835	Based on 15 % steam quality loss since the line is flooded for 1/4 of the year
8	Boiler Feedwater Pump Controls	Excess Cost	Install modulating feed	\$8,500	Based on 1% efficiency increase
9	Replace Bad Traps	Excess Costs	Replace Failed Traps	\$4,251	
10	East Plant Supply Drips	Excess Costs and Equipment Life	Install drip leg before control valve	\$15,300	Based on .5% Quality loss at a rate of 68,000 PPH
11	Economizer Recirculation Line	Equipment Life	Shut off all recirc. lines from Economizer and remove P-Trap	N/A	Hammering can cause piping and equipment failure
12	Feed Room Heat exchanger Stalled	Excess Cost and Product quality	Install Pump trap to remove condensate	\$17,212	Product quality will improve due to consistent temperatures

STEAM LOSS ANALYSIS

Manufacturer	Model	Orifice Diameter	Differential Pressure	Steam			Usage (hr/yr)	Annual	Steam	Annual Cost (per trap)	Quantity Failed	Total \$ Loss
				Flow Rate (lb/hr)*	Resistance Factor**	Loss (in 1000 lb)		Cost (\$/1000 lb)				
Armstrong	811	0.125	80	59	0.2	7500	89	7.50	\$664	1	\$664	
Armstrong	812	0.156	80	92	0.2	7500	138	7.50	\$1,038	3	\$3,115	
Armstrong	813	0.250	80	236	0.2	7500	354	7.50	\$2,658	1	\$2,658	
Armstrong	AB-2000	0.160	80	97	0.2	7500	145	7.50	\$1,089	1	\$1,089	
Armstrong	15B-5	0.344	15	139	0.2	7500	209	7.50	\$1,569	2	\$3,137	
Hoffman	FT030-3	0.236	30	99	0.2	7500	149	7.50	\$1,115	5	\$5,577	
Hoffman	FT15-4	0.253	15	76	0.2	7500	113	7.50	\$850	1	\$850	
Illinois	Series G	0.250	80	236	0.2	7500	354	7.50	\$2,658	1	\$2,658	
Nicholson	A43	0.250	30	111	0.2	7500	167	7.50	\$1,252	1	\$1,252	
Nicholson	AHV52	0.375	30	250	0.2	7500	375	7.50	\$2,816	3	\$8,448	
Nicholson	TA-503	0.250	80	236	0.2	7500	354	7.50	\$2,658	1	\$2,658	
Yarway	711	0.145	80	79	0.2	7500	119	7.50	\$894	4	\$3,576	
Spirax Sarco	B1H	0.125	80	59	0.2	7500	89	7.50	\$664	2	\$1,329	
Spirax Sarco	FT-125	0.125	80	59	0.2	7500	89	7.50	\$664	1	\$664	
Spirax Sarco	FTB-30	0.218	30	85	0.2	7500	127	7.50	\$952	1	\$952	
Spirax Sarco	B2-15	0.250	15	74	0.2	7500	111	7.50	\$830	1	\$830	
Spirax Sarco	FT-125	0.125	80	59	0.2	7500	89	7.50	\$664	1	\$664	
Spirax Sarco	b1h-125	0.125	80	59	0.2	7500	89	7.50	\$664	1	\$664	
Trane	55AL	0.3	30	160.2	0.2	7500	240	7.50	\$1,802	3	\$5,407	
Trane	55AH	0.3	30	160.2	0.2	7500	240	7.50	\$1,802	4	\$7,209	
Watson McDaniel	WFT-015	0.253	15	75.53062	0.2	7500	113	7.50	\$850	1	\$850	
Watson McDaniel	WFT-30	0.236	30	99.13888	0.2	7500	149	7.50	\$1,115	9	\$10,038	
Watson McDaniel	WFT-125	0.125	80	59.0625	0.2	7500	89	7.50	\$664	5	\$3,322	
Watts	WFT-15	0.253	15	75.53062	0.2	7500	113	7.50	\$850	2	\$1,699	
Watts	WFT-30	0.236	30	99.13888	0.2	7500	149	7.50	\$1,115	15	\$16,730	
Grand Total												\$86,039

