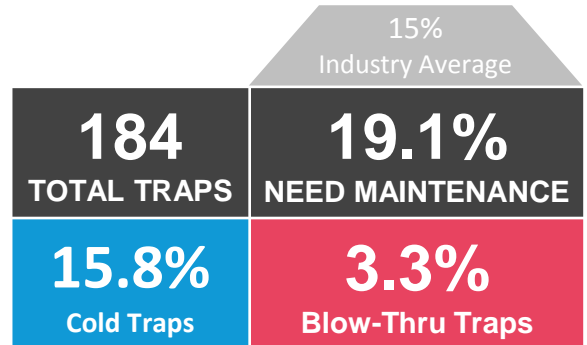
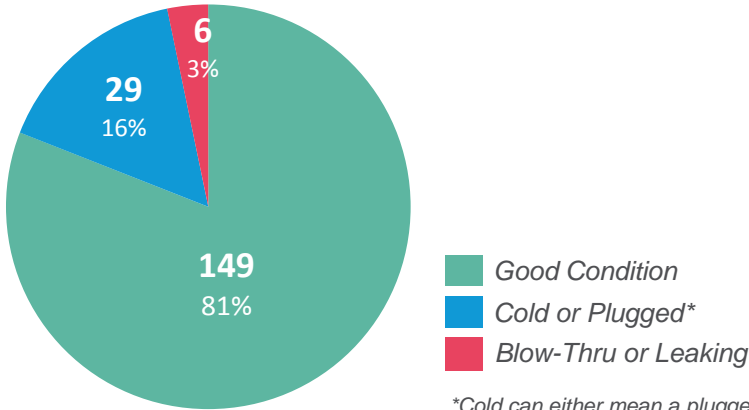


STEAM TRAP HEALTH MONITORING SERVICE

▶ EXECUTIVE SUMMARY

OVERVIEW

Emerson's *Steam Trap Health Monitoring Service* at customer facility began November 15, 2015. A total of 184 steam traps are being monitored continuously for failures. On a weekly basis, a status report has been provided to the maintenance organization outlining the traps in need of attention. This report summarizes the results of this activity.



*Cold can either mean a plugged failure or that the steam supply has been shut off.

LOOK INTO YOUR PLANT

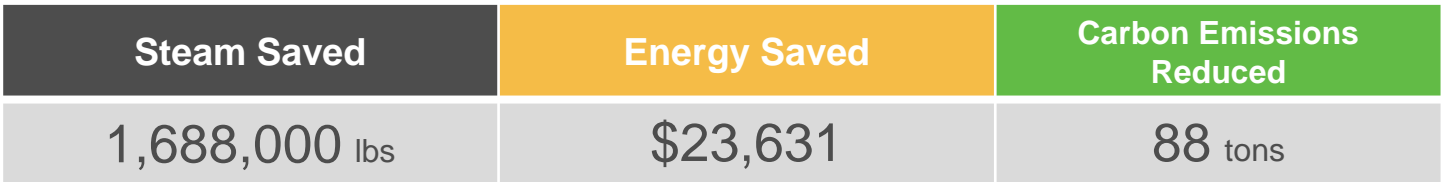
Traps Repaired

since service began



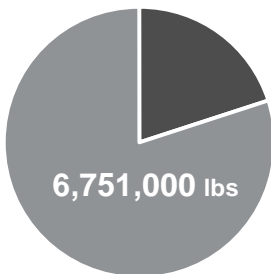
Captured Savings

due to the maintenance performed since the service began.

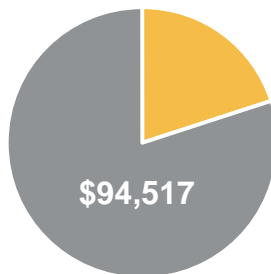


Annualized Projected Savings

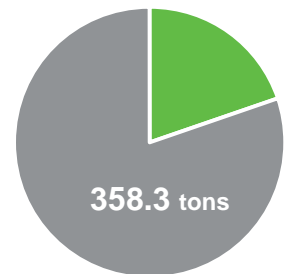
as compared to annual audits**.



Steam Saved









Energy Saved



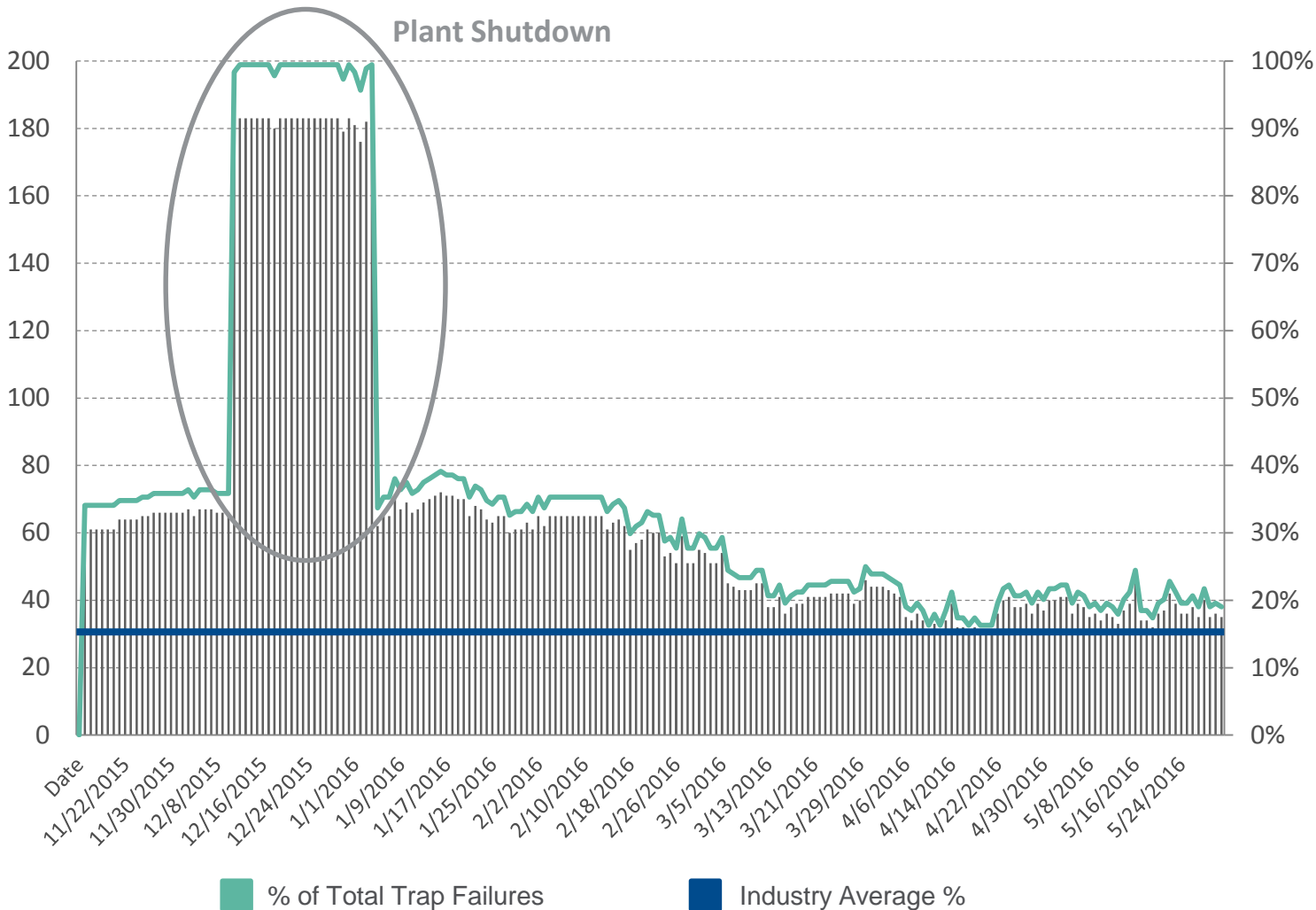
Carbon Emissions Reduced

**Annualized projected assumes 6 months of savings as compared to annual audits.

IMPACT OF WELL MAINTAINED STEAM SYSTEM

-  **Increased yield and product quality** by assuring optimal temperature control and transfer of steam enthalpy
-  **Improved plant reliability** by reducing damage to equipment caused by water impingement, water hammer, corrosion and freezing
-  **Reduced risk of safety incidents** by minimizing water hammer, manual rounds and foot traffic in high risk areas
-  **Optimized productivity** by enabling plant resources to focus on more critical activities
-  **Reduced environmental impact** by minimizing carbon emissions and water usage
-  **Improved energy efficiency** by expediently addressing steam leaks and blow-thru failures to reduce boiler load and fuel use

TOTAL STEAM TRAP FAILURES SINCE SERVICE BEGAN



COLD TRAPS ► PLANT INCIDENT PREVENTION



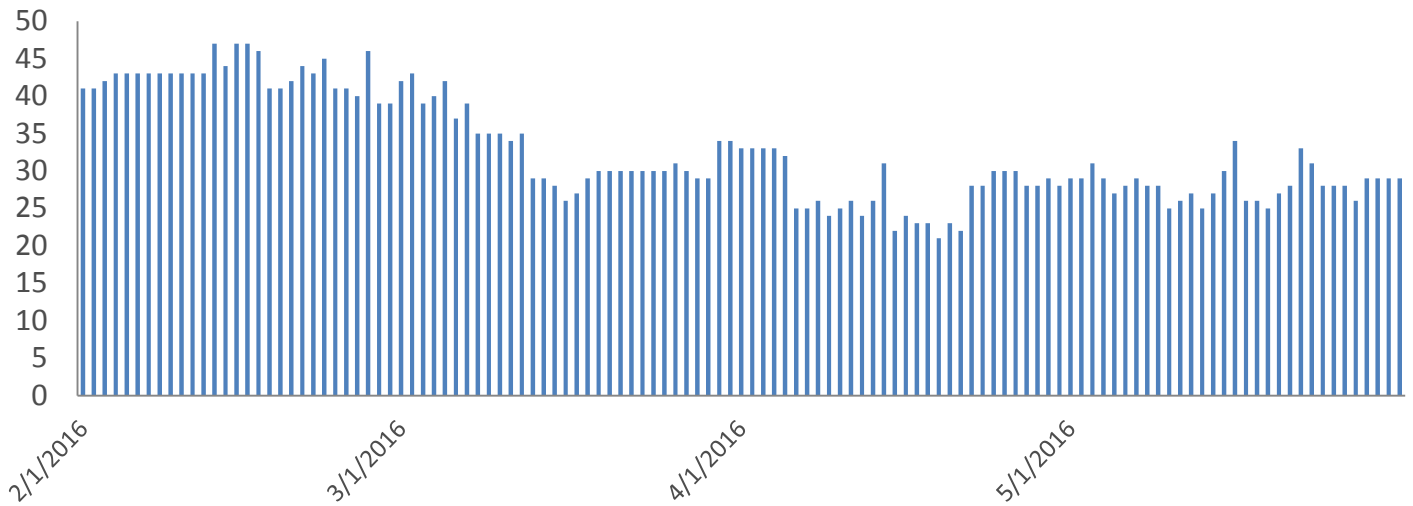
Increased yield and product quality by assuring optimal temperature control and transfer of steam enthalpy



Improved plant reliability by reducing damage to equipment caused by water impingement, water hammer, corrosion and freezing



Reduced risk of safety incidents by minimizing water hammer and sending personnel to the incident better informed and prepared



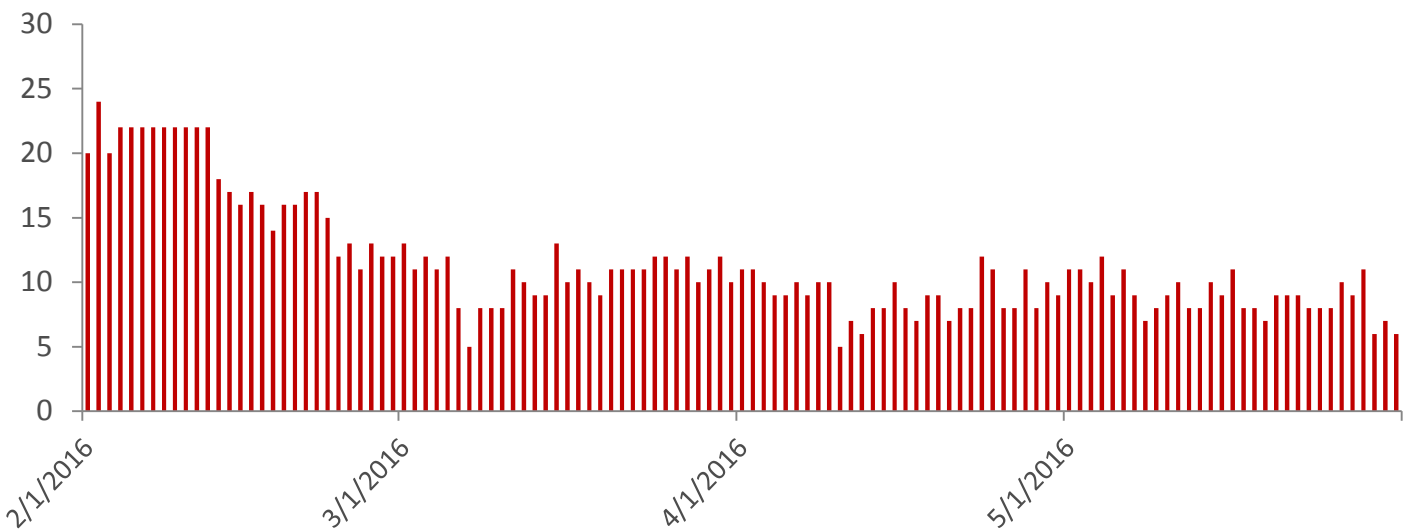
BLOW-THRU TRAPS ► STEAM LOSS PREVENTION



Reduced environmental impact by minimizing carbon emissions and water usage



Improved energy efficiency by expediently addressing steam leaks and blow-thru failures to reduce boiler load and fuel use



COST OF INACTION ► OPPORTUNITY

Potential Savings had repairs been performed immediately following the blow-thru failure. Of course, this isn't possible in the real world, but we can see how shortening the time between failure and remediation can really help achieve lower energy usage and emissions.

Steam Saved	Energy Saved	Carbon Emissions Reduced
2,380,000 lbs	\$33,315	126.8 tons

SUSPECT STEAM TRAPS

The following steam traps have demonstrated pre-failure behavior and deserve additional investigation. The cold conditions may simply be due to batch processing but are changing states more frequently than expected.

Area	Location	Trap Tag	Pre-Failure Mode
		003A	Leaking
		011A	Leaking
		012A	Leaking
		017A	Leaking
		021A	Cold
		022A	Cold
		025A	Cold
		029	Leaking
		048	Cold
		057	Leaking
		114	Leaking
		124	Cold
		135	Leaking
		136	Leaking
		148A	Cold
		51A	Cold

COLD STEAM TRAPS AWAITING REPAIR

29

Cold Steam Traps

15.8%

of Total Inventory

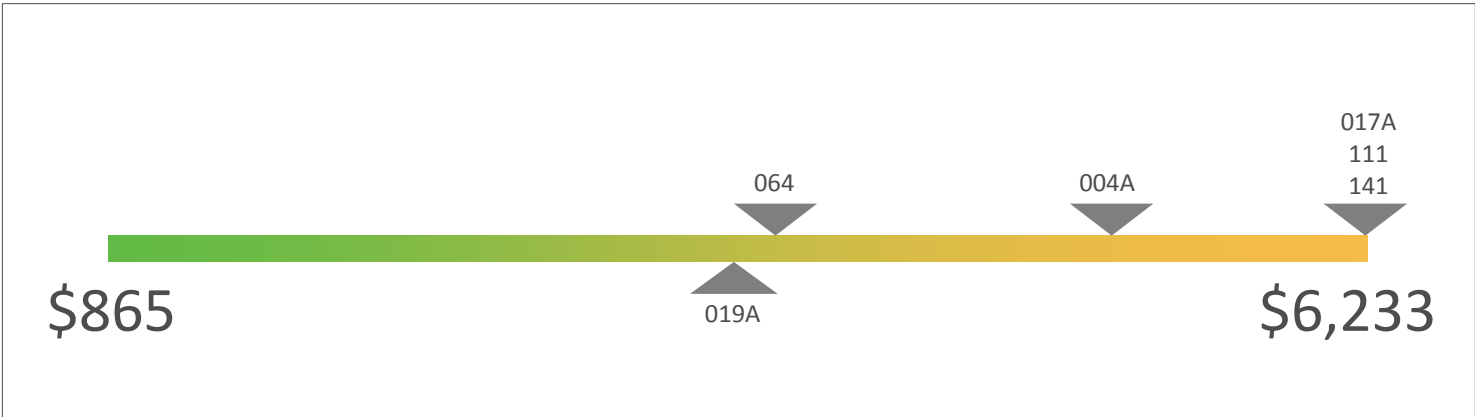
Trap	Status	Duration (days)	Area	Location	Mfr	Model	Type
019	Cold	166			Barnes & Jones	2GW	Thermostatic
021A	Cold	45			TLV	J3X-21	Float
022A	Cold	4			TLV	J3X-21	Float
025 A	Cold	13			TLV	J3X-21	Float
041	Cold	148			TLV	J3X-21	Float
048	Cold	3			Barnes & Jones	2GW	Thermostatic
052	Cold	66			Barnes & Jones	2GW	Thermostatic
065	Cold	7			Barnes & Jones	2GW	Thermostatic
066	Cold	7			Barnes & Jones	2GW	Thermostatic
066A	Cold	30			Barnes & Jones	2GW	Thermostatic
066B	Cold	7			Barnes & Jones	2GW	Thermostatic
067	Cold	7			TLV	J3X-21	Float
068	Cold	7			TLV	J3X-21	Float
069	Cold	7			Barnes & Jones	2GW	Thermostatic
070	Cold	7			Barnes & Jones	2GW	Thermostatic
100 – Vent	Cold	166			Armstrong	TTF1	Thermostatic
102 - Vent	Cold	166			Armstrong	TTF-1	Thermostatic
110	Cold	17			Barnes & Jones	2GW	Thermostatic
133	Cold	166					Inverted Bucket
147	Cold	160					Inverted Bucket
148 A	Cold	66			Armstrong	811	Inverted Bucket
76	Cold	166			Armstrong	TTF-1	Thermostatic
78 - Vent	Cold	166			Armstrong	TTF-1	Thermostatic
83 - Vent	Cold	166			Armstrong	TTF-1	Thermostatic
93 - Vent	Cold	166			Armstrong	TTF-1	Thermostatic
96 - Vent	Cold	166			Armstrong	TTF-1	Thermostatic
97	Cold	10			TLV	J3X-21	Float
98 - Vent	Cold	166			Armstrong	TTF1	Thermostatic
TV213	Cold	113					Thermostatic

LEAKING STEAM TRAPS AWAITING REPAIR

<h2 style="margin: 0;">6</h2> <p style="margin: 0; color: white;">Leaking / Blow-Thru Traps</p>	<h2 style="margin: 0;">3.3%</h2> <p style="margin: 0; color: white;">of Total Inventory</p>
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Trap	Status	Duration (days)	Area	Location	Mfr	Model	Type	Annual Energy Loss	Annual Emissions (tons)
004 A	Blow-Thru	14			TLV	J3X-21	Float	\$5,072	19.4
017A	Blow-Thru	3			Spirax Sarco	TD52	Disc	\$6,233	23.5
019 A	Blow-Thru	49			TLV	J3X-21	Float	\$3,330	13.1
064	Blow-Thru	45			Barnes & Jones	2GW	Thermostatic	\$3,525	13.27
111	Blow-Thru	17			TLV	J3X-21	Float	\$6,233	23.5
141	Blow-Thru	2			Armstrong	U1011	Inverted Bucket	\$6,233	23.5

Annual Energy Loss Rank within total inventory



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