

# Steam Trap Training presented with Spirax Sarco

Janet Sebahar  
Nicor Gas Energy Efficiency Program  
Trade Ally Manager



Energy  
Efficiency  
Program

# Safety moment – Call before you dig

## I'm planning to dig. How does **811** work?



1. Call 811 or go to Call811.com a few days before digging to request that buried utilities in your yard be marked.
2. Wait a few days for all utilities to respond to your request.
3. Confirm that all utilities have responded.
4. Respect the utility marks or flags.
5. Dig carefully around buried utilities.



Call811.com

KNOW THE COLOR CODE	
WHITE :	Proposed Excavation
PINK :	Temporary Survey Markings
RED :	Electric Power Lines, Cables, Conduit and Lighting Cables
YELLOW :	Gas, Oil, Steam, Petroleum or Gaseous Materials
ORANGE :	Communication, Alarm or Signal Lines, Cables or Conduit
BLUE:	Potable Water
PURPLE :	Reclaimed Water, Irrigation and Slurry Lines
GREEN:	Sewer and Drain Lines



Know what's below.  
**Call before you dig.**

# Nicor Gas Energy Efficiency Program

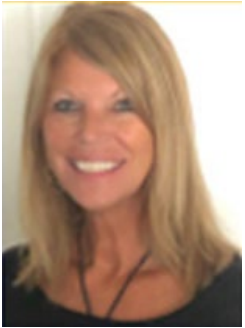
- Nicor Gas designs and implements cost effective energy efficiency offerings that:
  - Help customers save energy and money
  - Educate about energy efficiency products and actions
  - Offer rebates for efficiency improvements
- Nicor Gas does not promote specific brand
- Perform regular surveys and replace/repair failed steam traps to save money and energy

# Steam Trap Rebate Offerings

Hilary Snover  
Nicor Gas Energy Efficiency Program  
Program Manager



# Commercial and Public Sector Outreach Team



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Visit our website for commercial offerings:  
[nicorgas.com/bizsavings](https://www.nicorgas.com/bizsavings)

# Steam Trap Rebates

- Commercial steam traps (< 15 psig)
  - \$25 (no survey required)
  - \$100 rebate per failed open trap if survey is included
- Dry cleaner steam traps ( $\geq 15$  psig) - \$300
- Industrial/Process steam traps ( $\geq 15$  psig) - \$300
- Repairs/replacements must be completed on existing steam traps that are failed leaking or blow-through. Blocked traps do not qualify.

**Steam trap workbook link:**

[nicorgas.com/steamsurvey](http://nicorgas.com/steamsurvey)

Steam traps		
Qualifying equipment		Rebate
Industrial/process steam trap	Steam trap survey is required—repair or replace existing, failed steam traps on a process steam system with operating pressure $\geq 15$ psig	\$300/trap
Dry cleaner steam trap	Steam trap survey is required—repair or replace existing, failed steam traps on a steam system located in a laundromat or dry cleaner with operating pressure $\geq 15$ psig	\$300/trap
Commercial steam trap with survey	Survey is required—repair or replace existing steam traps	\$100/trap
Commercial steam trap	Repair or replace existing steam traps	\$25/trap

# Rebate Requirements

- **Itemized invoice** must include:
  - Contractor name, address and phone number
  - Account holder or business name and installation address (as it appears on the Nicor Gas bill)
  - Date installed and operational
  - Equipment manufacturer and model
  - Total installed cost
  - Proof of payment or payment terms (for example: balance due of zero, paid in full stamp or financing terms)
- **Application** must include:
  - Account number and account holder information
  - Check your funding type as either Public or Private
  - Select correct steam trap type to ensure the correct rebate is applied.
  - Building Type must be selected, please choose only one.
  - If customer is receiving rebate and will be “Payee”:
    - Customer is the “applicant” and signs application
  - If Contractor Circle member offered rebate as an instant discount and will be “Payee”:
    - Contractor is the “applicant” and signs application
    - Customer signature required on **invoice** or **instant discount checklist**







# Outreach program support

- Our team is here to support you!
  - Answer rebate questions
  - Review application materials prior to submitting
  - Provide support if corrections are needed
  - Convert long form survey into Nicor Gas approved workbook, as needed
  - Applications can be [submitted online](#); however, we are available to submit on your behalf

# Our Presenter – Spirax Sarco



# Presenter



Andrew Fadel  
Spirax Sarco

[Andrew.Fadel@us.spiraxsarco.com](mailto:Andrew.Fadel@us.spiraxsarco.com)

Cell: 630.487.9412

- Graduated from Ball State University
- 12+ years of experience with fluid process systems
- Service Sales Manager for Spirax Sarco- Central Region over 1 year
- Fun Fact: Every summer for 9 weeks, is a performer at the Bristol Renaissance Faire, in Bristol Wisconsin!!

# INTRODUCTION TO STEAM TRAPS



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# Learning Objectives

- Gain an understanding of the basic types of steam traps, how they operate, and how to select traps
- Be able to describe the 3 common applications for steam traps
- Understand some common reasons why traps fail
- Justify the importance of a Complete Steam Trap Management program

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# What is a Steam Trap?

- Automatic valve that stops the flow of steam
- Differentiates between steam and condensate
- Closes in the presence of steam
- Opens in the presence of condensate
- Removes air and non-condensable gases
- Used so heat energy can be transferred
- Does not pass live steam



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# Broad Categories of Steam Traps

- **Thermodynamic** (Velocity driven)
- **Mechanical** (Density driven)
- **Thermostatic** (Temperature controlled)

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# Broad Categories of Steam Traps

- **Thermodynamic** (Velocity driven)
- **Mechanical** (Density driven)
- **Thermostatic** (Temperature controlled)

Thermodynamic	Mechanical		Thermostatic		
Thermodynamic	Ball float	Inverted bucket	Balanced pressure	Bimetallic	Liquid expansion
					

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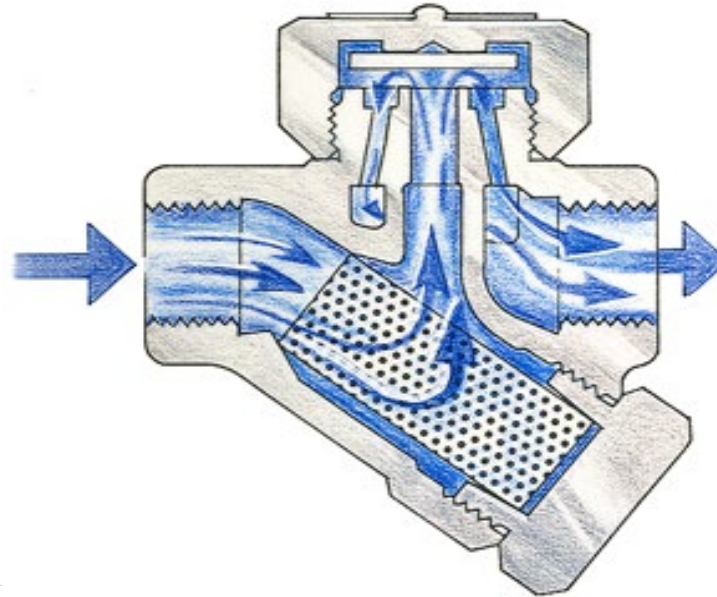
# Thermodynamic Trap

## ADVANTAGES:

- Excellent drip trap choice for pressures above 10 psig
- Limited air venting capabilities
- Operating pressure range from 3.5 psig to 3190 psig and superheat
- Easy to install, tested & maintain
- Gives an indication of wear before final failure
- Gives a distinct audible clicking sound to show wear
- Not damaged by waterhammer or freezing
- Spirax Sarco Cool Blue design comes with a 5 year warranty

## DISADVANTAGES:

- Does not operate well under low pressure below 3.5 psig
- Does not operate well with extremely high back pressure (80% max)
- Limited in air handling capability



Thermodynamic

Thermodynamic



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# Mechanical Traps

- Two designs:
  - **Float and Thermostatic**
  - **Inverted Bucket**



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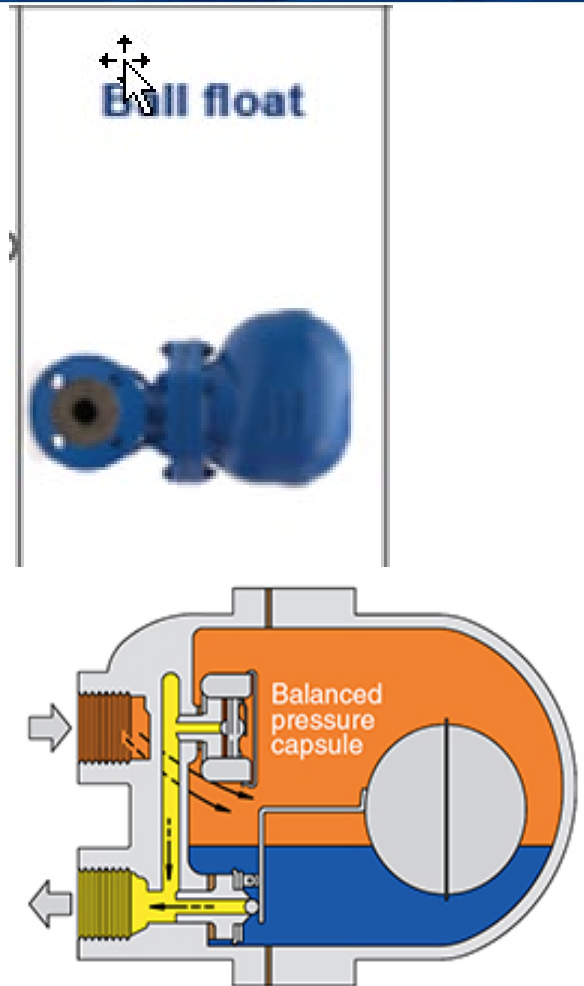
# Mechanical Traps: Float and Thermostatic

## ADVANTAGES:

- Excellent trap choice for process applications where load fluctuates
- Heat exchangers, Process equipment, Low pressure drip
- Excellent air venting capabilities
- Operating pressures range from ¼ psig to 450 psig
- Handles fluctuating condensate loads - Adjust automatically to heavy or light loads
- Can withstand up to 45°F of superheat
- Operating with pressure differential as low as ¼ psig
- Condensate removal done at steam temperature so maximum efficiency use of energy supply
- Air and non-condensable are removed immediately

## DISADVANTAGES:

- The power of the float is constant (steam pressure up – size of permissible discharge orifice goes down)
- Different sizes of valves and seats for different pressure ranges
- Float and lever has to have enough energy to lift the float off the seat at the design operating pressure
- If not enough energy to lift – trap fails closed because it was overcome with steam pressure



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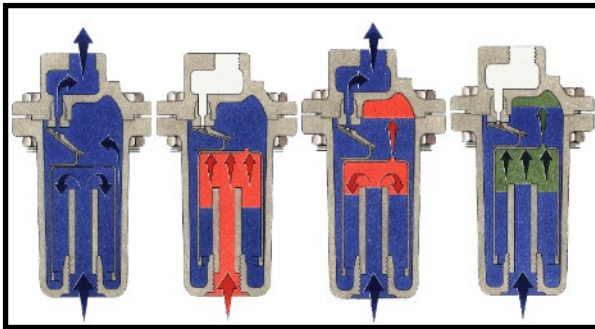
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# Mechanical Traps: Inverted Bucket

## ADVANTAGES:

- Good choice – drip application with constant loads
- Withstands high pressures and waterhammer quite well
- In freezing conditions damage to the body of the trap not the mechanism
- Operating pressure range from 15 psig to 900 psig



## DISADVANTAGES:

- Oversizing the trap can cause erratic operation
- Suffers from freeze damage
- Limited ability to discharge air from “vent hole” – very small vent
- Poor air venting capabilities
- Low differential pressure drives the trap so not a lot of air being discharged
- Trap requires a “prime” (maintains a water seal around the bucket) makes trap subject to rapid pressure changes

Inverted bucket



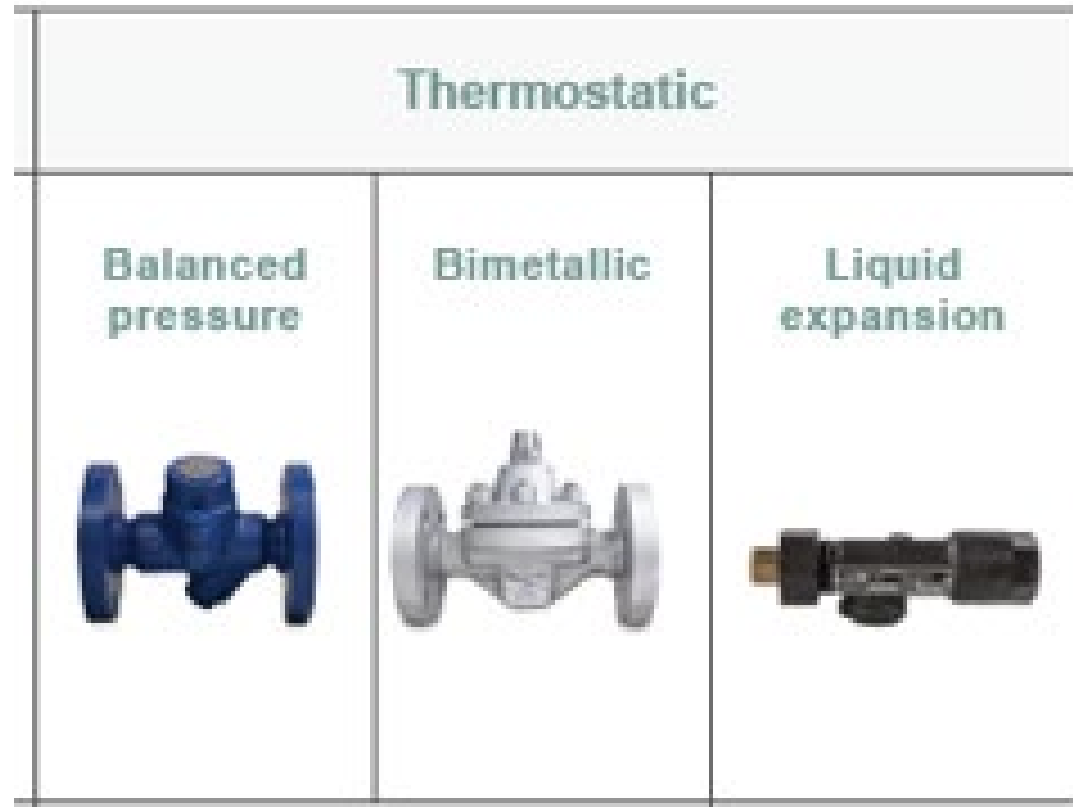
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# Thermostatic Traps

- Three designs:
  - **Balanced Pressure Trap**
  - **Bimetallic Trap**
  - **Liquid Expansion Trap**



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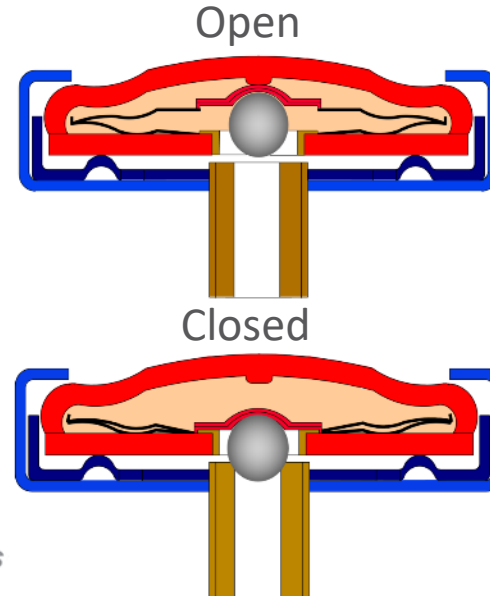
# Thermostatic Traps: Balanced Pressure

## ADVANTAGES:

- Good trap choice for clean steam applications, Tracing lines, Radiators, Kitchen and Laundry equipment because air and non-condensables are removed immediately
- Also used very commonly in air venting, distribution, main drip drainage and in tracing applications
- Great air venting capabilities
- Unlikely to freeze
- Operating pressures range from 1 psig to 600 psig
- Easy to install, check & maintain
- Sub-cools Condensate at constant and consistent manner
- Best operated between 20 to 40 °F of saturated steam (condensate) temperature

## DISADVANTAGES:

- Always a backup of condensate in the system
- Heat transfer reduced by condensate
- Need longer start-up time to adjust to designed operating load
- Can cause waterlogging



Balanced  
pressure



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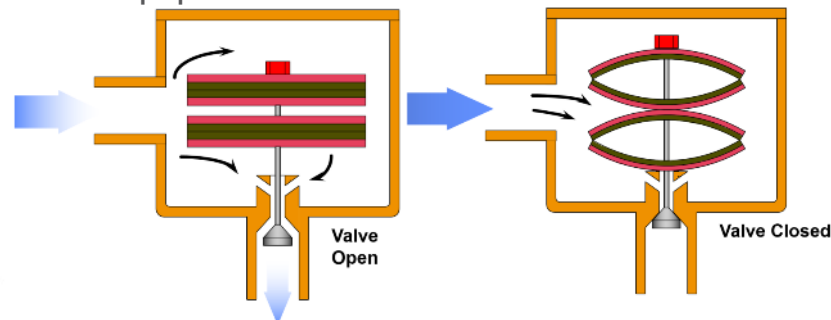
# Thermostatic Traps: Bimetallic Trap

## ADVANTAGES:

- Good trap choice high pressure drip, some non-critical tracing (freeze protection)
- Excellent air venting capabilities
- Operating pressure range: 0 to 99 psig
- Best used with steady condensate loads
- Can handle large amounts of condensate to be a small trap
- Can withstand superheat
- Can withstand waterhammer
- Has large degree of sub-cooling (low temperature sensitivity)
- Can subcool to 100°F below saturation temps (condensate temps)
- Trap drains freely on drop in temperature (eliminates freezing risk)

## DISADVANTAGES:

- Response to condensate load changes are slow
- Highly susceptible to dirt between valve head and seat
- Dirt attaches to disc which acts as insulator, changing discharging characteristics
- Because of subcooling ability, large amounts of condensate backup
- Trap must be fully closed before air and non-condensables are removed
- Extreme caution must be used to limit condensate backup into process equipment



## Bimetallic



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# Summarize: Broad Categories of Steam Traps

- **Mechanical** (Density driven)
- **Thermostatic** (Temperature controlled)
- **Thermodynamic** (Velocity driven)

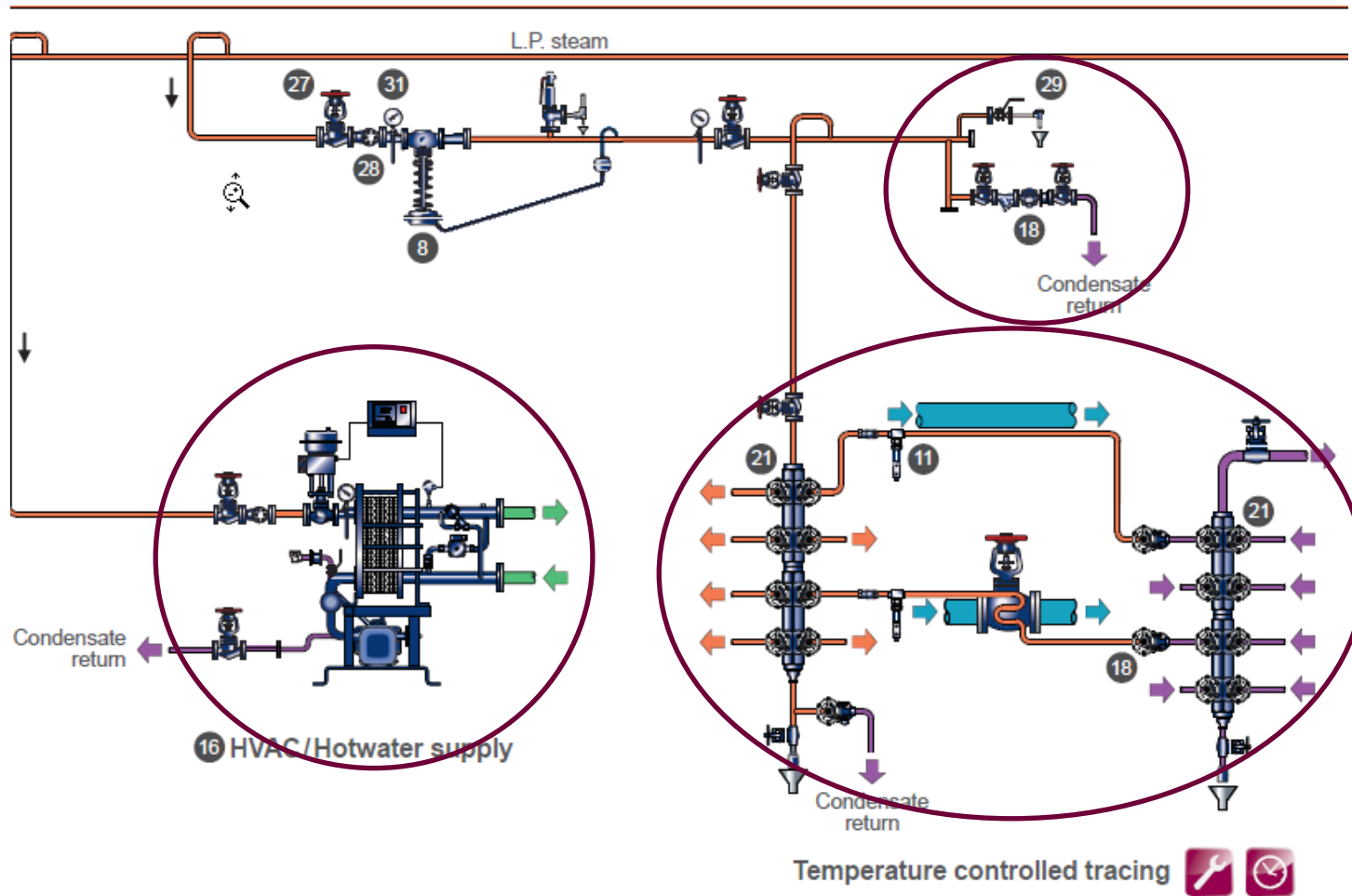
Thermodynamic	Mechanical		Thermostatic		
Thermodynamic	Ball float	Inverted bucket	Balanced pressure	Bimetallic	Liquid expansion
					

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# Steam Trap Applications



## Steam traps for:

- Distribution (drip legs)
- Steam tracing
- Process

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# Why Are Steam Traps Necessary For These Applications?



## ➤ Causes of Unreliability:

- CORROSION
- WATERHAMMER
- DIRT

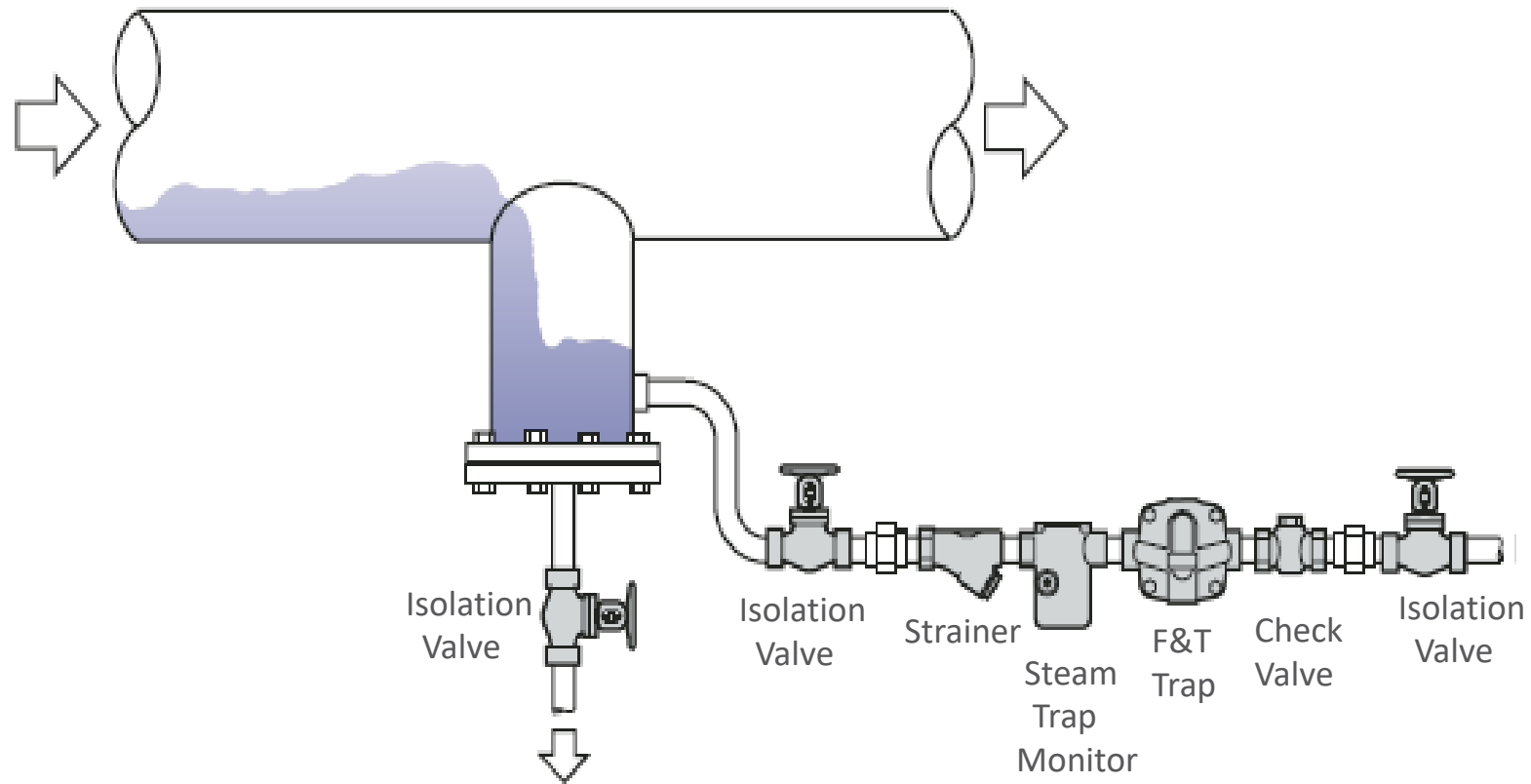
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# Steam Main Drainage – Drip Pocket

Steam Drip Stations (Pockets)

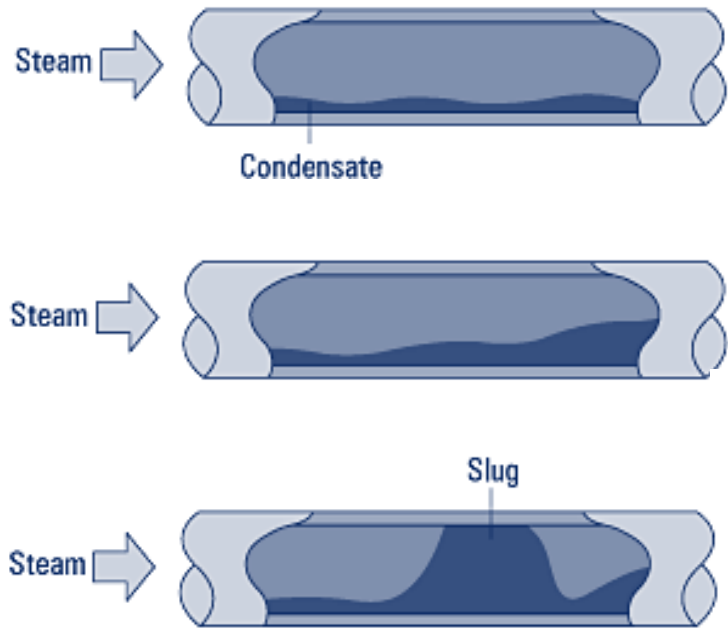


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# Issues Caused By Inadequate Drainage



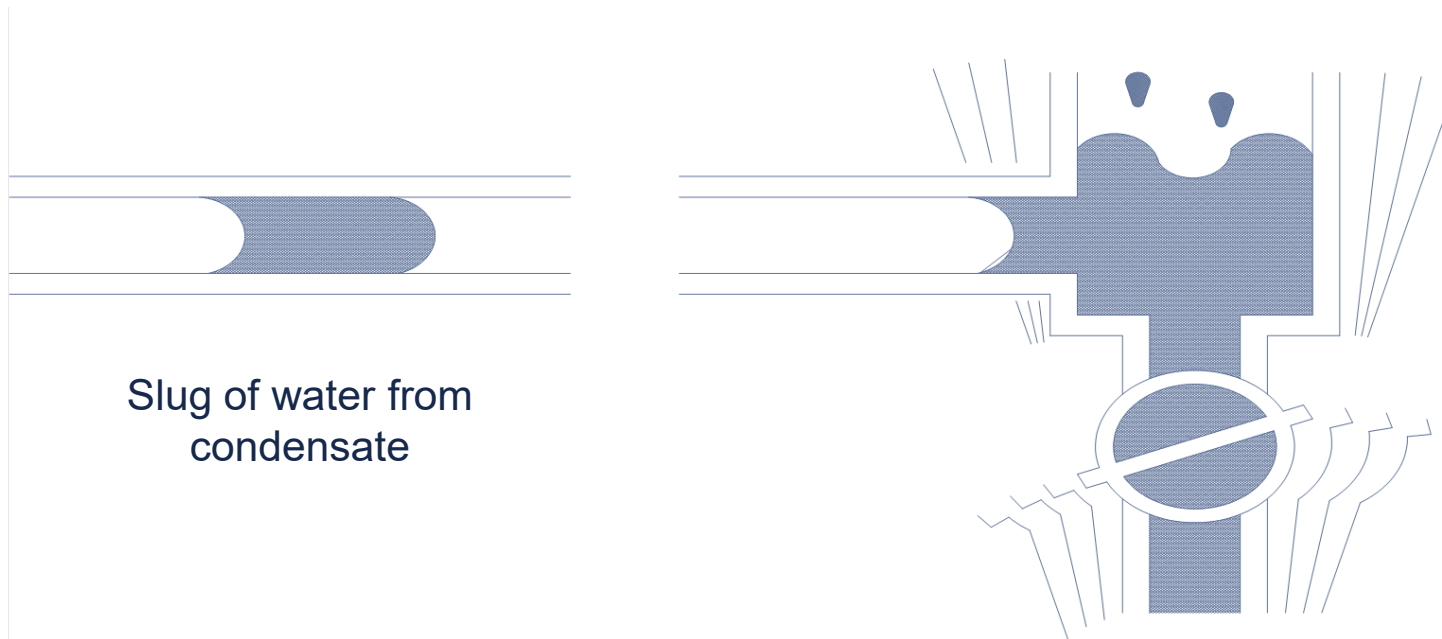
- Condensate backs up into the steam main and results in higher steam velocities and potential for waterhammer
- Cool condensate forms carbonic acid and accelerates system corrosion and deterioration

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# Waterhammer



Waterhammer causes noise, vibration, and damage

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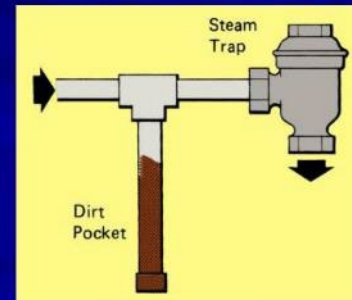
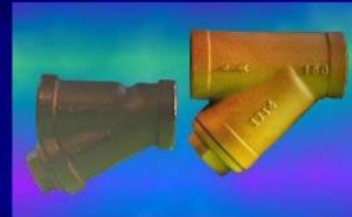
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# Dirt in Steam Traps

## What would happen?

### Pipe Scale & Dirt

- When new piping is installed, chunks of solder, fragments of metal parts, packing, and even nuts and bolts are often left inside.
- In older piping systems, there is a build-up of scale and dirt that can break free and travel through the steam system.
- Pipe scale and dirt can permanently damage steam equipment, especially steam traps. To overcome this:
  - Install a strainer prior to every steam trap
  - Utilize a dirt pocket in front of the trap to accumulate dirt and scale.



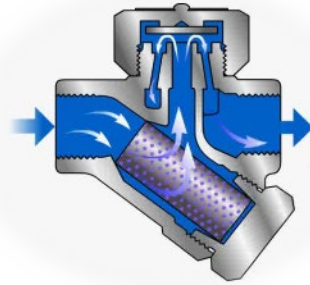
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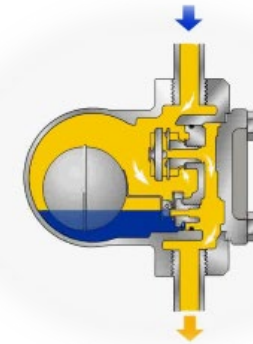
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# Steam Trap Selection

Thermodynamic

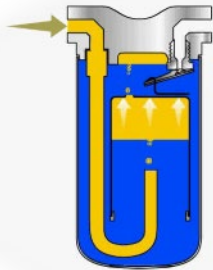


Ball Float



Which One?

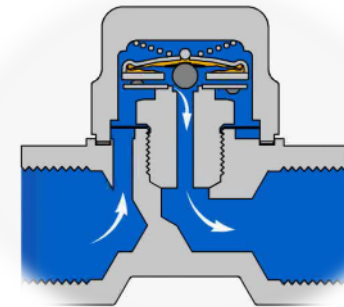
Inverted Bucket



Bimetallic



Balanced Pressure



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# Steam Trap Selection

**Figure 35**

Requirements for Steam Trap/Applications

<b>REQUIREMENTS FOR STEAM TRAP/APPLICATIONS</b>			
TYPES	DISCHARGE	DISCHARGE TEMPERATURE	AIR HANDLING
Balanced Pressure	Continuous (Dribble)	20 - 40 deg. F Subcool	Excellent
Bi-metallic	Continuous (Dribble)	50 - 100 deg. F Subcool	Excellent (but may close too quickly due to subcooling)
Inverted Bucket	Intermittent	Saturated Steam Temperature	Limited
Float and Thermostatic	Continuous	Saturated Steam Temperature	Excellent
Disk (TD)	Intermittent	2 to 10 deg. F Subcool	Limited
<b>APPLICATION REQUIREMENTS</b>			
APPLICATION	DISCHARGE	SUB-COOL	AIR HANDLING
Drip	Continuous or Intermittent	Little	Little
Tracer/Critical	Continuous or Intermittent	Little	Little
Tracer/Non-Critical	Continuous	Some	None
Process	Continuous	None	Much

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# Steam Trap Selection Guide

Figure 36: Steam Trap Selection Guide

As the USA's leading provider of steam system solutions, Spirax Sarco recognizes that no two steam systems are identical. Because of the wide array of steam trap applications with inherently different characteristics, choosing the correct steam trap for optimum performance is difficult. Waterhammer, superheat, corrosion, or other damaging operating characteristics dramatically affect performance of a steam trap. With years of experience in steam technology, Spirax Sarco is committed to helping its customers design, operate and maintain an efficient steam system. You have our word on it!

Application	1st Choice						2nd Choice					
	Float & Thermostatic	Thermo-Dynamic <sup>a</sup>	Balanced Pressure	Bimetallic	Liquid Expansion	Inverted Bucket	Float & Thermostatic	Thermo-Dynamic <sup>a</sup>	Balanced Pressure	Bimetallic	Liquid Expansion	Inverted Bucket
Steam Mains	to 30 psig	✓										✓
	30-400 psig		✓									✓
	to 600 psig		✓									✓
	to 900 psig		✓									✓
	to 2000 psig		✓									✓
	with Superheat		✓									✓
Separators		✓										✓
Steam Tracers	Critical		✓					✓	✓			
	Non-Critical		✓									
Heating Equipment												
	Shell & Tube Heat Exchangers	✓										
	Heating Coils	✓										
	Unit Heaters	✓										
	Plate & Frame Heat Exchangers	✓										
	Radiators		✓									
General Process Equipment												
	to 30 psig	✓										
	to 200 psig	✓										
	to 465 psig	✓										
	to 600 psig											
	to 900 psig											
	to 2000 psig											
Hospital Equipment												
	Autoclaves	✓										✓
	Sterilizers	✓										✓
Fuel Oil Heating												
	Bulk Storage Tanks									✓		
	Line Heaters	✓										
Tanks & Vats												
	Bulk Storage Tanks									✓		
	Process Vats	✓									✓	
Vulcanizers		✓								✓		
Evaporators		✓										✓
Reboilers		✓										✓
Rotating Cylinders		✓										✓
Freeze Protection					✓							

<sup>a</sup> With the addition of thermostatic air vent device

Application	1st Choice						2nd Choice					
	Float & Thermostatic	Thermo-Dynamic <sup>a</sup>	Balanced Pressure	Bimetallic	Liquid Expansion	Inverted Bucket	Float & Thermostatic	Thermo-Dynamic <sup>a</sup>	Balanced Pressure	Bimetallic	Liquid Expansion	Inverted Bucket
Steam Mains	to 30 psig	✓										✓
	30-400 psig		✓									✓
	to 600 psig		✓									✓
	to 900 psig		✓									✓
	to 2000 psig		✓									✓
	with Superheat		✓							✓		

Application	1st Choice	2nd Choice	3rd Choice	4th Choice	5th Choice
Separators					
General Process Equipment					
Steam Tracers	Critical	to 30 psig	✓		✓*
	Non-Critical	to 200 psig	✓		✓*
Heating Equipment		to 465 psig	✓		✓*
	Shell & Tube Heat Exchangers	to 600 psig		✓	
	Heating Coils	to 900 psig		✓	
	Unit Heaters	to 2000 psig		✓	
Plate & Frame Heat Exchangers					
Radiators					
Hospital Equipment					
Autoclaves	✓				✓
Sterilizers	✓				✓
Fuel Oil Heating					
Bulk Storage Tanks			✓		✓
Line Heaters	✓				
Tanks & Vats					
Bulk Storage Tanks			✓		✓
Process Vats	✓				✓
Vulcanizers			✓		✓
Evaporators		✓			✓
Reboilers		✓			✓
Rotating Cylinders		✓			✓
Freeze Protection				✓	

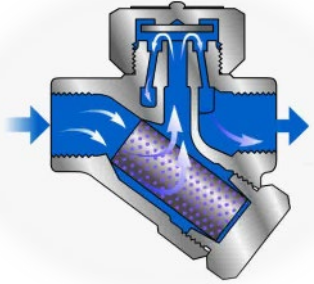
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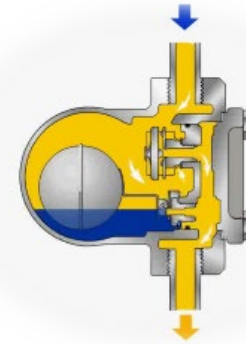
# Steam Trap Common Applications

## Thermodynamic



Tracing  
Drip legs over 30 psig

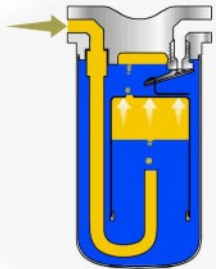
## Ball Float



Any process  
Drip legs under 30 psig

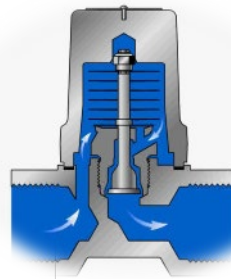
Which One?

## Inverted Bucket



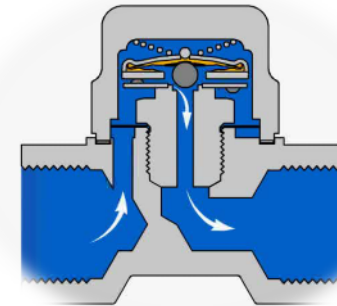
Tracing  
Drip legs under 30 psig

## Bimetallic



Superheated steam

## Balanced Pressure



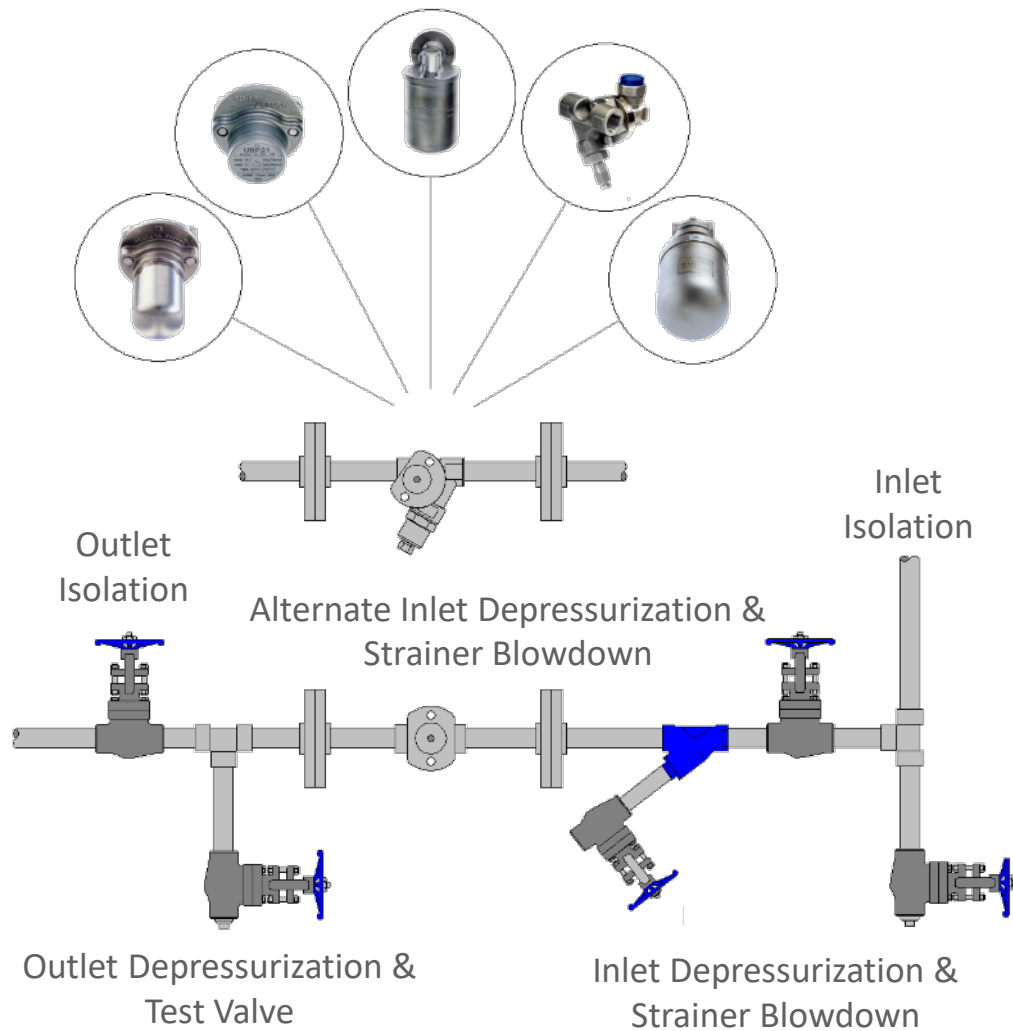
Tracing  
Radiators  
Bulk storage tanks

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# Standardization – 30 Minute Repairs Using Test Valves Pipeline Connectors with Universal Traps



UFT  
Float & Thermostatic



UTD  
Thermodynamic



UIB  
Inverted Bucket



UBP  
Thermostatic



USM  
BI-Metallic



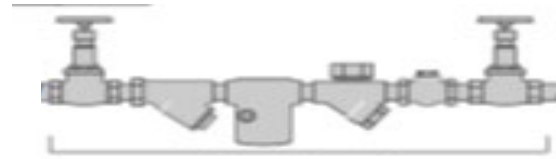
# Standardization – 30 Minute Repairs Using Test Valves Pipeline Connectors with Universal Traps

## BENEFITS:

- Reduced footprint for the steam trap set
- More energy efficient
- Less maintenance time
- Less downtime
- Rapid trap change out
  - 5-minute change out
  - Reduced labor costs
  - Reduced material cost
- Interchangeability
  - Permits all trap technologies

## DISADVANTAGES:

- Higher Upfront Cost
- Up-front Installation Required



**Typical Steam Trap Set**



**Modern Steam Trap Set**

**Universal TD Trap and Strainer  
Connector with Blow Down  
Valve**



UFT  
Float & Thermostatic



UTD  
Thermodynamic



UIB  
Inverted Bucket



UBP  
Balanced Pressure



USM  
BI-Metallic



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# Why Do Traps Fail?

- Normal wear over time (3 years)
- Plugged with dirt/rust
- Piping/installation issues
- Damage- Waterhammer
- Incorrect sizing
- Incorrect trap selection
- Freezing
- Loss of prime
- Stall

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# What's Wrong With This Picture?



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# BEST PRACTICE: Installation Tips

## ALWAYS...

- Follow the arrows
- Install below the drainage point
- Avoid long horizontal runs that could cause “steam locking”
- Install a strainer with blow-down valve prior to trap
- Install full port isolation valves upstream and downstream
- Install unions for easy maintenance
- One application per trap. No “group trapping”

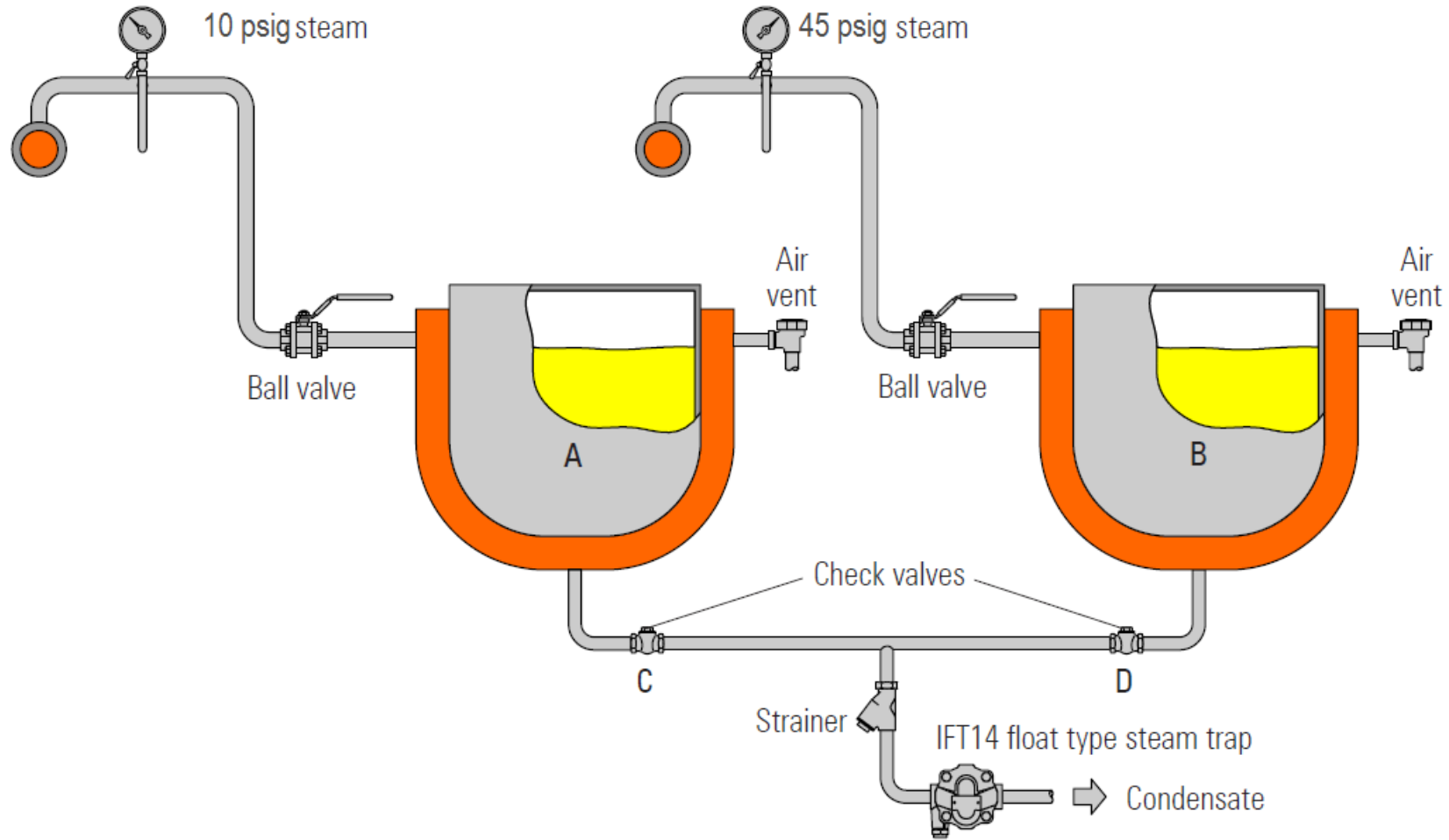
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# Group Trapping – Preferential Flow Paths



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# Steam Trap Management Programs



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# Complete Steam Trap Management

Aiming to improve the **overall reliability** of our customer's steam trap population, **reduce CO2** emissions, and help to **maximize production uptime**...

## 4 CORE SERVICE CAPABILITIES



Manual surveying  
of the steam trap  
population.



Supply and  
installation of  
replacement  
items.



Proactive  
management of  
the steam trap  
population.



Continuous  
monitoring of the  
steam trap  
population.

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# Complete Steam Trap Management: STEP 1: Tier 1 Assessment (Surveys)

- Visual testing
- Sound (ultrasonic) trap testing
- Temperature testing



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# Complete Steam Trap Management: STEP 1: Tier 1 Assessment (Surveys)

- Benefits of a Tier 1 Assessment (Trap Survey)
  - Improve System Performance
  - Reduce Risk of Failure
  - Achieve Safety Standards and Compliance
  - Meet Sustainability Targets

1150 Northpoint Blvd  
Blythewood, SC 29016



## Trap Assessment Report

Customer:

Project #:

Date: 7/10/2024

The following report is provided as a result of a recent trap assessment performed at your facility. Detailed within this document is a consolidated report of findings. Provided with this data is the detailed data in spreadsheet form. Following the delivery of this information will be a detailed proposal for the replacement of failed traps.

### Sustainability Data

The following data represents potential savings to your facility including CO<sub>2</sub>, Water and Steam Losses.



11

Tonnes/Year



488

Mature Trees



21,422

Gallons/Year



0.03

Olympic Swimming Pools/Year



3,191

MMBTU/Year



11

Average US Household Energy Usage (Per Person)



32,887

Total Savings (\$/Year)

Calculations based on:

Steam Costs: 0.9999psig = \$10/1000 lb; Failed Closed Risk Avoidance = 35.6 lb/hr

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# Complete Steam Trap Management: STEP 2: Supply and Installation of Failed Trap Replacements

Location	Location Detail	Q	S	Trp Mod	MFG	Type	Conn to Tr	Connecti Standard	Uni	Op Fr	Applicat	Pr	Temp	Operat Wkly	Qualty	Test Date	Engineer	Notes	Oriental	Stre	Isolation	Serve Interv	Co	acc	Replacement	Trap Part
K Line Bailer Room	West wall above square tank	18	0.75	800-20	Armstrong	Inverted Bucket	Scroued	NPT	Na	Na	Drip	15		52	Not In Use	02/26/24	Michael Sitar		Horizontal	Present	Up and Down Stream	Annually	1	0.75	UTD52L	661730
Bailer Room far Reddi Whip	PRV station	3	0.75	UTD52L	Spirax	Thermodynamic	Scroued	NPT	Yes	Na	Drip	115	348	52	Ok	02/26/24	Michael Sitar		Horizontal	Present	Up and Down Stream	Annually	2	0.75	UTD52L	661730
Bailer Room far Reddi Whip	PRV station	3	0.75	UTD52L	Spirax	Thermodynamic	Scroued	NPT	Yes	Na	Drip	115	352	52	Ok	02/26/24	Michael Sitar		Horizontal	Present	Up and Down Stream	Annually	3	0.75	UTD52L	661730
Bailer Room far Reddi Whip	an wall fram incumalator	2	2	FT14-10	Spirax	Floaf	Scroued	NPT	Na	Yes	Heat Exchanger	90	345	52	Ok	02/26/24	Michael Sitar		Horizontal	Mizing	Upstream	Annually	4	2	FT-30	50928
Bailer Room far Reddi Whip	an wall fram incumalator	2	2	FT14-10	Spirax	Floaf	Scroued	NPT	Na	Yes	Heat Exchanger	90	345	52	Ok	02/26/24	Michael Sitar		Horizontal	Mizing	Upstream	Annually	5	2	FT-30	50928
Bailer Room far Reddi Whip	Above North bailer	15	0.5	TSS300	Spirax	Balanced Prazzur	Scroued	NPT	Na	Yes	Drip	30		52	Not In Use	02/26/24	Michael Sitar		Horizontal	Mizing	Upstream	Annually	6	0.5	TSS300	62002
Bailer Room far Reddi Whip	Above South bailer	15	0.5	TSS300	Spirax	Balanced Prazzur	Scroued	NPT	Na	Yes	Drip	30		52	Not In Use	02/26/24	Michael Sitar		Horizontal	Mizing	Upstream	Annually	7	0.5	TSS300	62002
Bailer Room far Reddi Whip	Next to South Bailer an operator	16	1.5	FT14-10	Spirax	Floaf	Scroued	NPT	Na	Na	Drip	115	347	52	Ok	02/26/24	Michael Sitar		Horizontal	Present	Up and Down Stream	Annually	8	1.5	FT-30	50928
Bailer Room far Reddi Whip	PRV station	3	0.75	UTD52L	Spirax	Thermodynamic	Scroued	NPT	Yes	Na	Drip	90	323	52	Ok	02/26/24	Michael Sitar		Horizontal	Present	Up and Down Stream	Annually	9	0.75	UTD52L	661730
Bailer Room far Reddi Whip	PRV station	3	0.75	TD52	Spirax	Thermodynamic	Scroued	NPT	Na	Na	Drip	90	323	52	Ok	02/26/24	Michael Sitar		Horizontal	Present	Up and Down Stream	Annually	10	0.75	TD52	545310
Bailer Room far Reddi Whip	save 115 prig PRV Station, South end of Food Water to	20	1	TD52	Spirax	Thermodynamic	Scroued	NPT	Na	Na	Drip	20	258	52	Ok	02/26/24	Michael Sitar		Horizontal	Present	Up and Down Stream	Annually	11	1	TD52	545320
Brine Transfer Room	West Wall Space Heater	12	0.75	800-20	Armstrong	Inverted Bucket	Scroued	NPT	Na	Na	Drip	15	249	52	Ok	02/26/24	Michael Sitar		Horizontal	Present	Up and Down Stream	Annually	12	0.75	UTD52L	661730
CIP Area by Remelt	Above heat exchanger far CIP	20	0.75	811-125	Armstrong	Inverted Bucket	Scroued	NPT	Na	Na	Drip	115	347	52	Ok	02/26/24	Michael Sitar		Horizontal	Present	Up and Down Stream	Annually	13	0.75	UTD52L	661730
CIP Area by Remelt	On culinary steam behind tk 128	7	0.5	UTD52L	Spirax	Thermodynamic	Scroued	NPT	Yes	Na	Drip	30		52	Removed	02/26/24	Michael Sitar	Not Found	Horizontal	Mizing	None	Annually	14	0.5	UTD52L	661730
Dry Goods Warehouse	Behind Hot water Tank	1	0.75	FTS14-10	Spirax	Floaf	Scroued	NPT	Na	Na	Drip	40		52	Not Tested	02/26/24	Michael Sitar	Not Found	Horizontal	Present	Up and Down Stream	Annually	15	0.75	FTS14-10	1453951
Dry Goods Warehouse	Behind Hot water Tank	5	0.75	UTD52L	Spirax	Thermodynamic	Scroued	NPT	Yes	Na	Drip	30		52	Not Tested	02/26/24	Michael Sitar	Not Found	Horizontal	Mizing	Downstream	Annually	16	0.75	UTD52L	661730
CIP Area by Remelt	On Culinary steam behind TK 128	1	0.75	UTD52L	Spirax	Thermodynamic	Scroued	NPT	Yes	Na	Drip	115		52	Removed	02/26/24	Michael Sitar		Horizontal	Present	None	Annually	17	0.75	UTD52L	661730
CIP Area by Remelt	On Culinary steam behind TK 128	1	0.75	UTD52L	Spirax	Thermodynamic	Scroued	NPT	Yes	Na	Drip	115	268	52	Ok	02/26/24	Michael Sitar		Horizontal	Present	None	Annually	18	0.75	UTD52L	661730
CIP Area by Remelt	On Culinary steam behind TK 128	1	0.75	UTD52L	Spirax	Thermodynamic	Scroued	NPT	Yes	Na	Drip	115		52	Removed	02/26/24	Michael Sitar		Horizontal	Present	None	Annually	19	0.75	UTD52L	661730
CIP Area by Remelt	Heat exchanger far CIP Skid	1	2	FT0750	Huffman	Floaf	Scroued	NPT	Na	Na	Heat Exchanger	20		52	Removed	02/26/24	Michael Sitar		Horizontal	Present	Up and Down Stream	Annually	20	2	FTB-20	58476
CIP Area by Remelt	Tank 105	1	1	813-30	Armstrong	Inverted Bucket	Scroued	NPT	Na	Na	Tank Coil	20		52	Removed	02/26/24	Michael Sitar		Horizontal	Mizing	Upstream	Annually	21	1	FT-30	50928
CIP Area by Remelt	Heat exchanger far CIP Skid	5	0.75	B110-180	Spirax	Inverted Bucket	Scroued	NPT	Na	Na	Drip	115		52	Not Tested	02/26/24	Michael Sitar	Not Found	Horizontal	Present	Up and Down Stream	Annually	22	0.75	UTD52L	661730
CIP Area by Remelt	Bolau heat exchanger	1	2	FTB-20	Spirax	Floaf	Scroued	NPT	Na	Na	Heat Exchanger	90		52	Not Tested	02/26/24	Michael Sitar	Not Found	Horizontal	Mizing	None	Annually	23	2	FTB-20	58476

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## QUOTE WORKSHEET

Quote Date:  
Project Name:  
Customer:

Prepared By:  
Phone:  
Email:

Qty	Item #	Description	Weight (lbs)	Lead Time (days)	NET Unit Price	Total Extended Price
1	59196	3/4" NPT FT-150 Float & Thermostatic Steam Trap, Cast Iron, Parallel Pipe Connections	15.00		\$ 1,314.00	\$ 1,314.00
5	66173C	UTD52L Universal Thermodynamic Steam Trap Cool Blue, Stainless Steel, Low Capacity	2.80		\$ 456.00	\$ 2,280.00
2	50930	3/4" NPT FT-75 Float & Thermostatic Steam Trap, Cast Iron, Parallel Pipe Connections	9.00		\$ 580.00	\$ 1,160.00
3	50931	1" NPT FT-75 Float & Thermostatic Steam Trap, Cast Iron, Parallel Pipe Connections	9.00		\$ 652.00	\$ 1,956.00
2	50928	3/4" NPT FT-30 Float & Thermostatic Steam Trap, Cast Iron, Parallel Pipe Connections	9.00		\$ 425.00	\$ 850.00
2	66178	1/2" NPT Universal Connector, Stainless Steel	1.30		\$ 268.00	\$ 536.00
1	67978	1/2" NPT Strainer Connector, Stainless Steel, w/ Blowdown	2.60		\$ 505.00	\$ 505.00

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# Complete Steam Trap Management: STEP 2: Supply and Installation of Failed Trap Replacements EXAMPLE: ESTIMATED SAVINGS CALCULATOR

Approximate number of steam traps on site:

Steam pressure:   bar g  psi g

How often are steam traps surveyed / maintained:

Seldom in past 5 years

Less than every 2 years

Less than once / year

## Results

Typical steam savings:	4343	Tonnes / yr	<b>4787 US TONS</b>
Equivalent energy savings:	2895	MWh / yr	<b>9878 MMBTU</b>
Reduced CO <sub>2</sub> emissions:	668	Tonnes / yr	<b>736 US TONS</b>
Value of energy savings:	86860	£ / yr	<b>\$115,000 USD</b>
Value of water, effluent & treatment chemicals:	5211	£ / yr	<b>\$7,000 USD</b>
<b>Total value of savings:</b>	<b>92071</b>	<b>£ / yr</b>	<b>\$122,000 USD</b>

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# Complete Steam Trap Management: STEP 3: Proactive Steam System Assessment and Management


## ➤ Tier 2 – Steam and Condensate System


- Energy savings opportunities
- Increase process efficiencies
- Increase productivity
- Installation best practice

## ➤ Target energy savings opportunities and ways to improve process efficiencies and productivity throughput, including sustainability savings.




### Summarized Sustainable Benefits

	Carbon Savings	Annual Carbon Savings 1,050 tons/year	Annual Carbon Site Target X,XXX tons/year	% Reduction in Site Target XX%
---	----------------	--	--	-----------------------------------

	Energy Savings	Annual Energy Savings 17,950 MMBTU/year	Annual Energy Site Target X,XXX tons/year	% Reduction in Site Target XX%
---	----------------	--	--	-----------------------------------

	Water Savings	Annual Water Savings 13.3M gal/year	Annual Water Site Target X,XXX tons/year	% Reduction in Site Target XX%
---	---------------	--	---	-----------------------------------

	Financial Savings	Investment \$360,697	Annual Savings \$235,091 / year	Payback 1.53 year
---	-------------------	-------------------------	------------------------------------	----------------------

	Fuel Savings	Annual Fuel Savings 17.9M Cu ft / year	Annual Fuel Site Target X,XXX Cu ft / year	% Reduction in Fuel XX%
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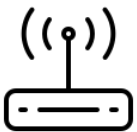
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# Complete Steam Trap Management: STEP 4: Wireless Steam Trap Monitoring




Sensors & Smart Products.



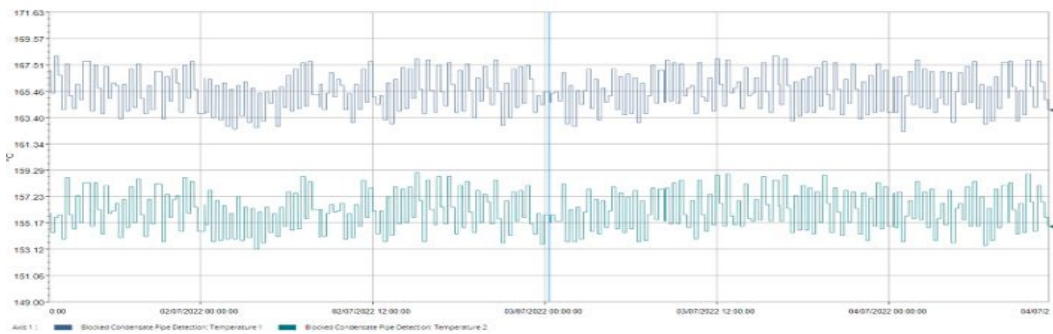
Gateways & Database



Engineer & Algorithm



Dashboard & Report



Sensor



Gateway



Cloud



Platform

Continuous Steam Trap Monitoring

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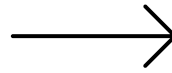
Diagnostic Kits



# Wireless Steam Trap Monitoring

Digital is an enabler to improve Productivity, Efficiencies & Safety...

Why going digital makes sense.



**Think of physical as a photograph:**

- A snapshot in time.
- Typically manually collected.
- Non-critical applications.
- Limited scalability.
- Lengthy periods between surveys.
- Larger sustainability losses.

**Think of digital as a video:**

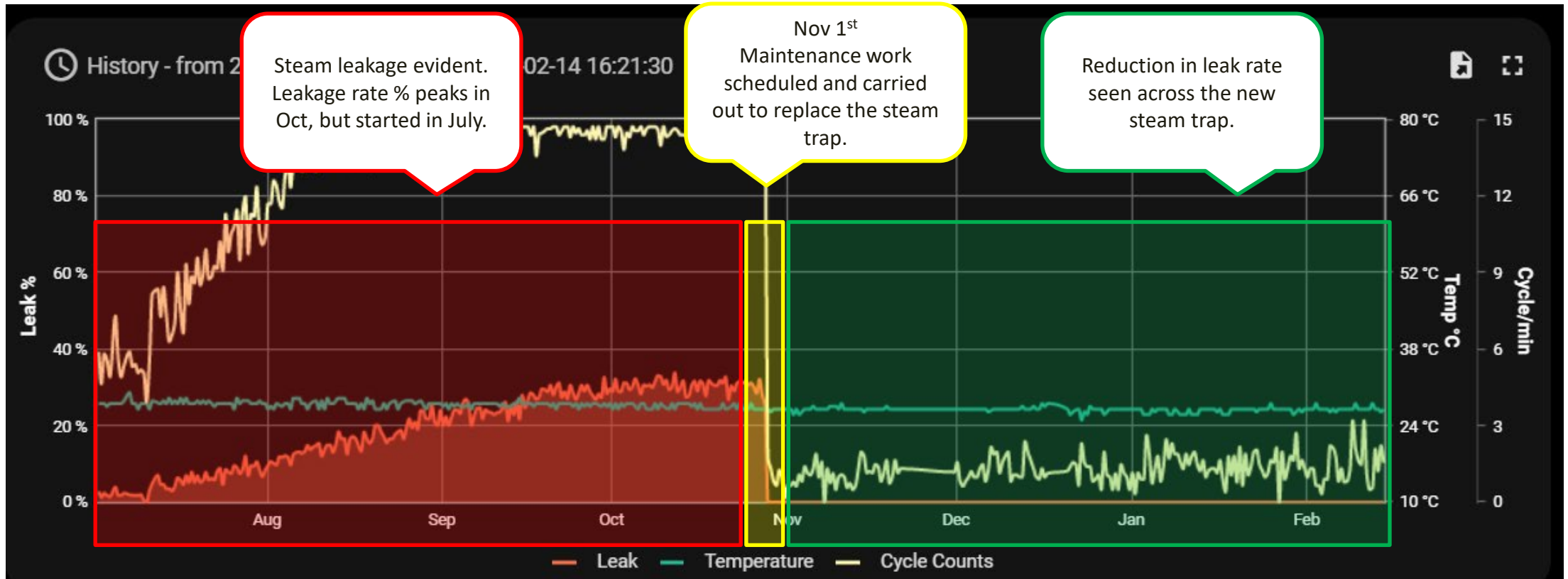
- Real-time monitoring collected by sensors.
- Insight into events leading up to, and immediately after an event.
- Typically critical applications such as, high pressure or hard to reach applications.
- Scalable and repeatable.
- Greatest sustainability benefits.

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# Wireless Steam Trap Monitoring: A Success Story



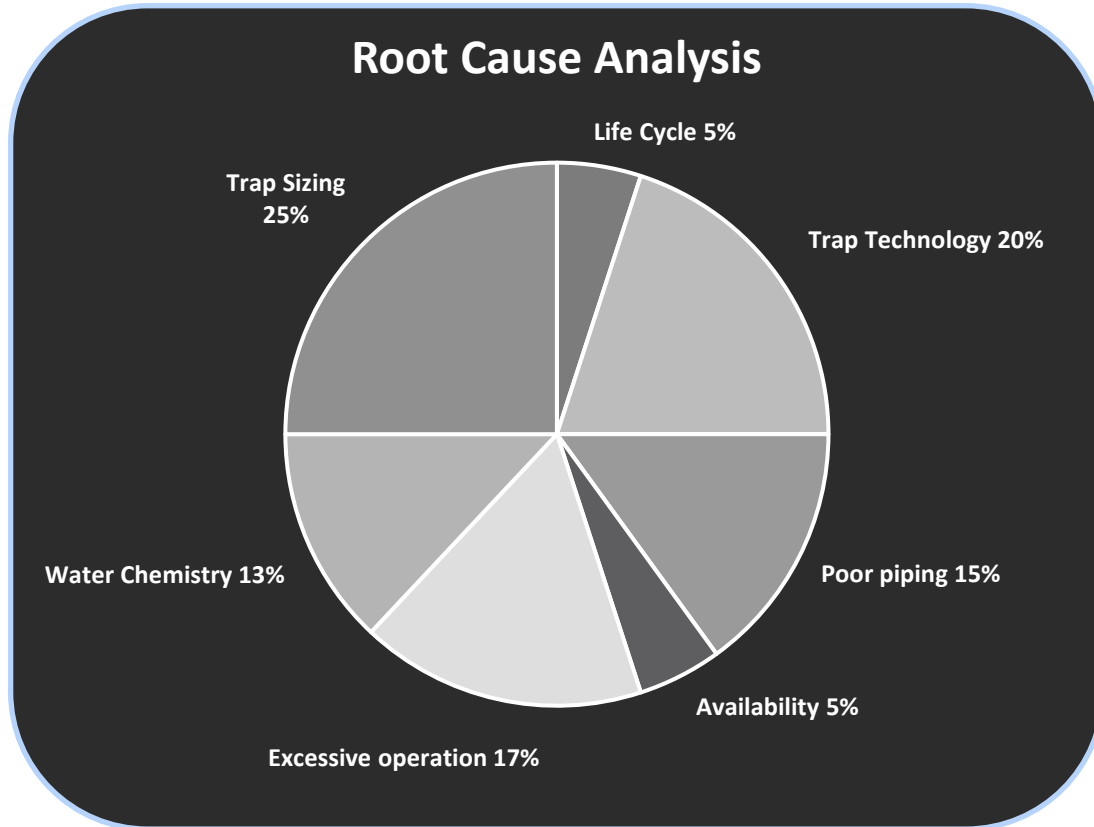
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# Complete Steam Trap Management: Root Cause Analysis

Determining root cause for failures is critical to the program success



### Tier 1 Assessments

Steam Traps

Pumps

Control Valves

Safety Valves

Steam Quality  
Testing

Steam Leaks

### Tier 2 Assessments

Boiler House

Process

Steam  
Distribution

Condensate  
System

Flash/Heat  
Recovery

Safety /  
Reliability

HAZOP

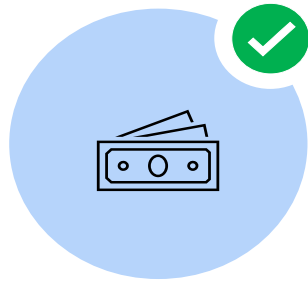
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# Complete Steam Trap Management: IMPACT AND VALUE

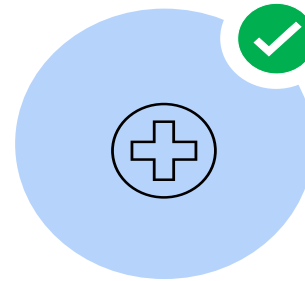
A sustainable program focused on reducing total cost of ownership and maximizing production capabilities while leaving a positive impact on the environment.



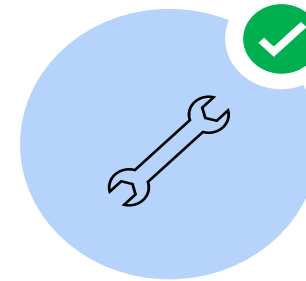
+50% reduction  
in energy losses



+50% reduction  
in sustainability  
losses



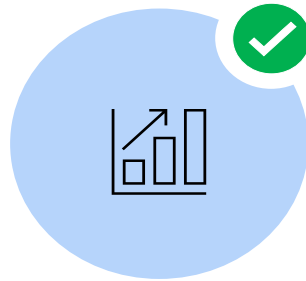
Improve Safety  
Risks



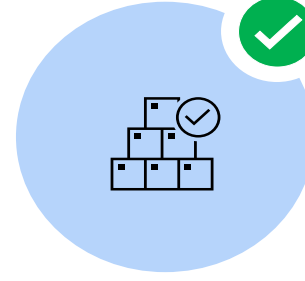
Reduce  
Maintenance  
costs



Improve  
compliance



Increase  
Throughput



Increase Yield



Increase Quality

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# Complete Steam Trap Management: IMPACT AND VALUE

## Savings Example **UPDATE WITH YOUR CUSTOMERS INFO**



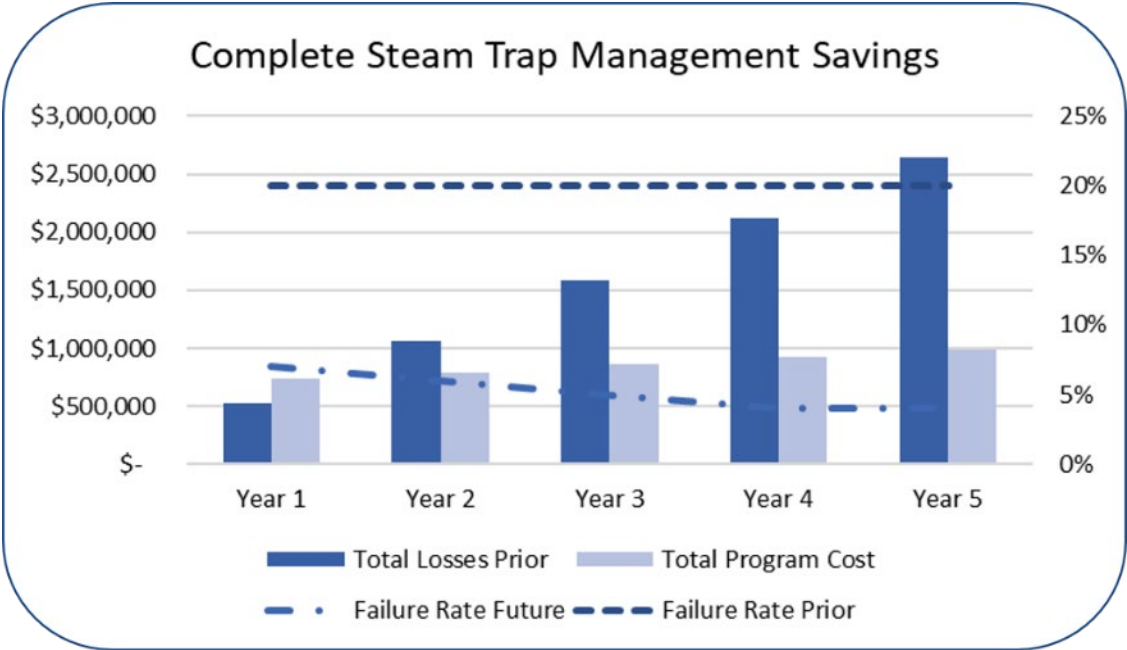
Carbon Savings

**5 YR Carbon Savings**  
**1,834 tons/year**



Water Savings

**5 YR Water Savings**  
**1.90 Mgal / year**



Financial Savings

**5 YR Savings**  
**\$320,000/year**



Energy Savings

**5 YR Energy Savings**  
**35,052 MMBTU/year**

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# Introduction to Steam Traps Summary

- There are 3 main types of steam traps. Each type of trap has characteristics that make it suitable for certain applications.
- Proper selection and installation are important for trap performance.
- A Complete Steam Trap Management program is vital for maximum energy savings, plant and personnel safety, reliability, and plant performance.



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# For Additional Help/Questions:



**Andrew Fadel**  
*Spirax Sarco – Service Sales  
Engineer, Central Region*

- For additional training, questions, or assistance, please feel free to contact me:
  - Mobile: 630-487-9412
  - E-Mail: [Andrew.Fadel@us.spiraxsarco.com](mailto:Andrew.Fadel@us.spiraxsarco.com)

*REMEMBER: “Ambition without knowledge is like a boat on dry land.” – Mr. Miyagi (The Next Karate Kid)*

For more information on what you saw today, contact us at [US.Orders@us.spiraxsarco.com](mailto:US.Orders@us.spiraxsarco.com) or visit our website at <https://www.spiraxsarco.com/us>

For steam expertise, technical tips and solutions, follow **Spirax Sarco USA** on social media.



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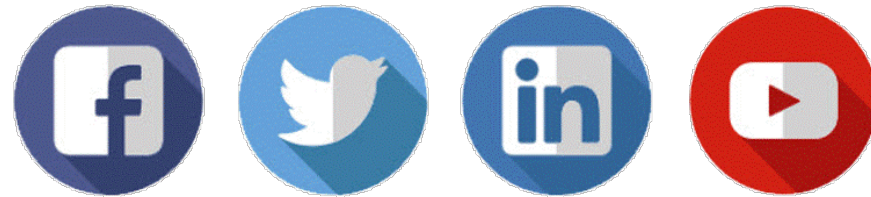
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For steam expertise, technical tips and solutions, follow **Spirax Sarco USA** on social media.



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Questions?

