NORTH STAR Processing, LLC

Steam Trap Survey Results

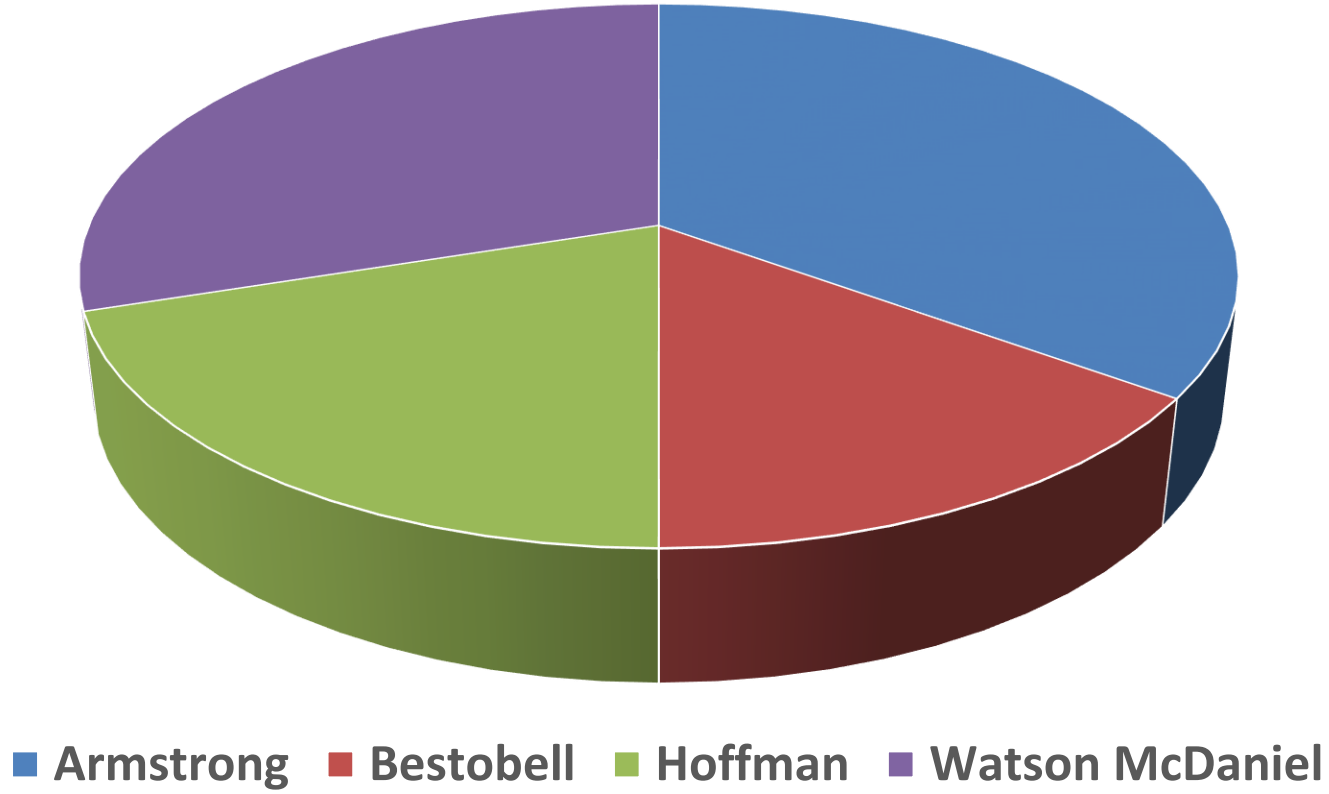
Survey Performed on 11/29/2021

APEX INDUSTRIAL SOLUTIONS

Watson McDaniel

Trap Population Breakdown (Manufacturer)

Armstrong	14
Bestobell	6
Hoffman	8
Watson McDaniel	12
TOTAL	**40**

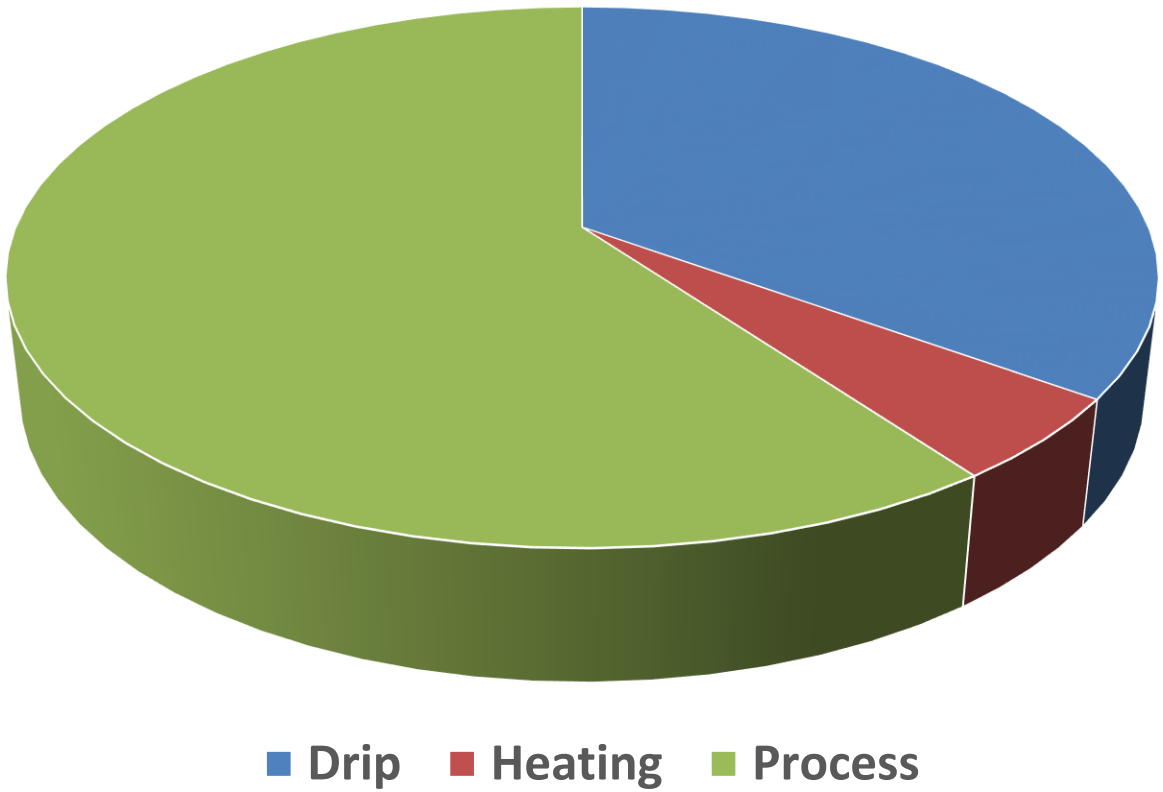


APEX INDUSTRIAL SOLUTIONS

Watson McDaniel

Trap Population Breakdown (Application)

Drip	14
Heating	2
Process	24
TOTAL	40



APEX INDUSTRIAL SOLUTIONS

Watson McDaniel

Overview

Total Steam Traps Surveyed = 40

Total Steam Traps In Service = 25

Total Steam Traps Not In Service = 15

Total Steam Traps Failed = 2

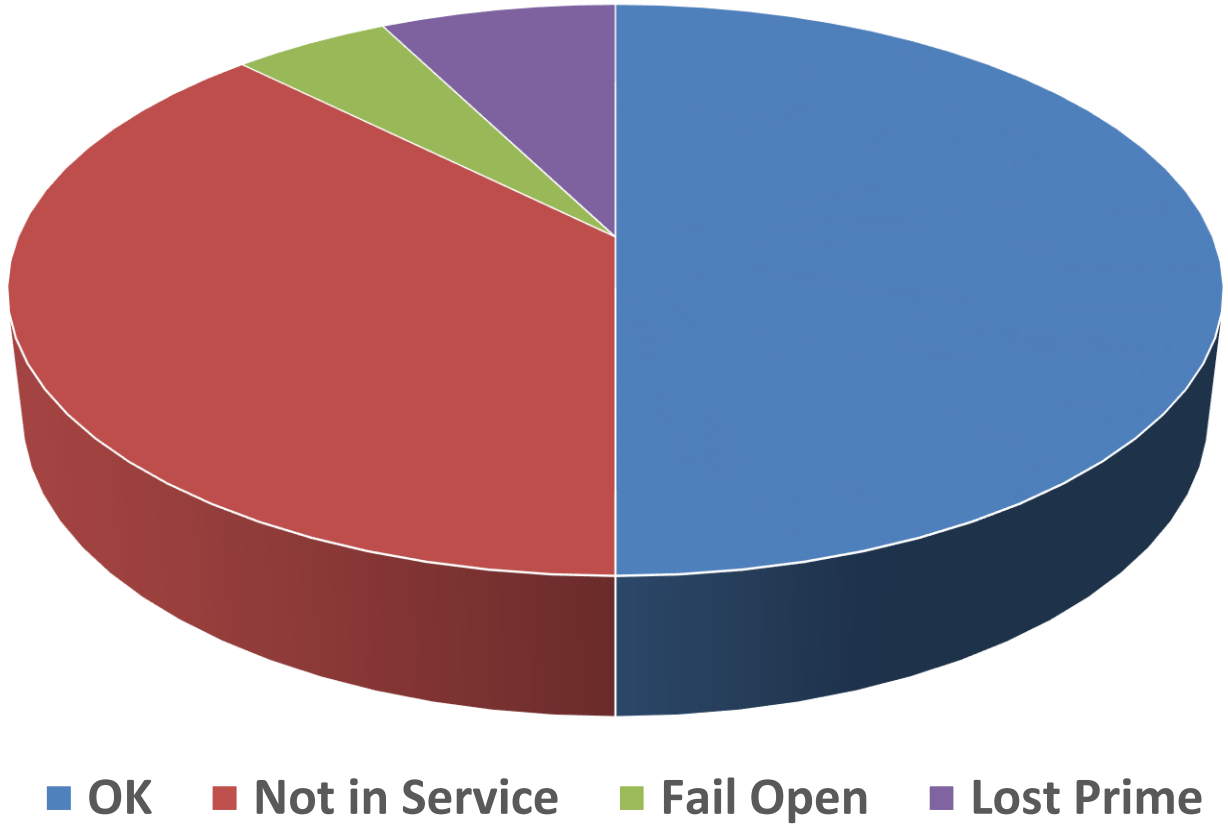
Steam Trap Failure Rate = 8%

APEX INDUSTRIAL SOLUTIONS

Watson McDaniel

Trap Population Breakdown (Status)

OK	20
Not in Service	15
Fail Open	2
Lost Prime	3
TOTAL	40



APEX INDUSTRIAL SOLUTIONS

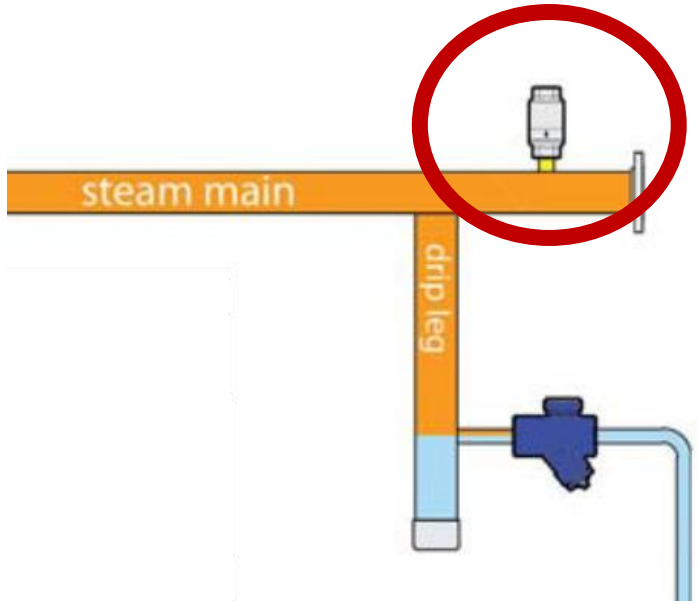
Watson McDaniel

Associated Cost of Failed Steam Traps

Total # of Failed Steam Traps	Lbs. of Steam Lost – Annual (Based on 24 hr. operation, 365 days)	Steam Loss (USD) – Annual (Based on $6.00 per 1,000 lbs. of steam)
2	194,296 * Only Failed Open Traps contribute to this calculation	$ 1,165.78 * Only Failed Open Traps contribute to this calculation

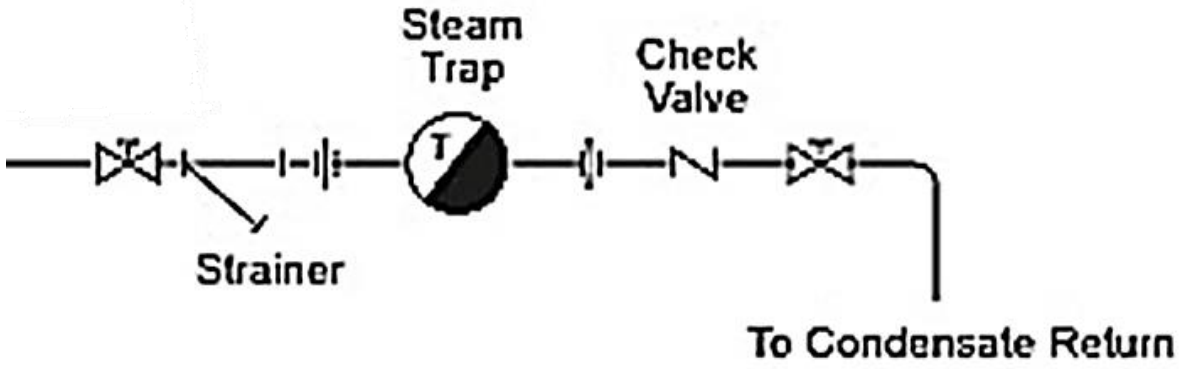
Watson McDaniel

Other Observations / Suggestions:



Installation of Thermosatic Air Vents:

Installation of Thermostatic Air Vents at the end of steam distribution headers helps to prevent air and other non-condensable gases from remaining suspended in the pipes.



Typical Configuration for Steam Traps that Discharge into a Return Header:

1) Upstream Isolation Valve
2) Strainer
3) Steam Trap
4) Check Valve
5) Downstream Isolation Valve

Watson McDaniel