MISTRAS | TRIPLE 5 INDUSTRIES

One Source for Asset Protection Solutions

PRODUCTS & SYSTEMS ***PRODUCT BULLETIN***

*"The SteamPAC™ device does an excellent job of not only identifying leaking valves, but also quantifying the magnitude of the leak. Quantification is critical for proper prioritization of valve maintenance. During the initial training on the use of the SteamPAC™ device we identified a leaking valve that resulted in an **annual cost of $50,000**."*

Duke Energy, Miami Fort

*In 2007 a major mid-west utility with a 690-MW unit, found and repaired leaking cycle valves with SteamPAC™. This improved the condenser's back-pressure allowing them to realize a reduction in overall heat rate resulting in a **savings of $1.6 Million** in 2008.*

SteamPAC™ The Hand-held Through-Valve Leak Detection System

INTRODUCTION

Handheld leak detection system identifies and quantifies through-valve loss of normally-closed steam valves for power generation.

LOST STEAM EQUALS LOST DOLLARS

The closed loop design of a boiler directs the steam through the most efficient path for producing electricity. Thermal efficiency in a plant is the amount of steam produced versus the amount of steam that ultimately reaches the turbine. Each leaking valve along the path contributes to a reduction in efficiency. These losses require more fuel to provide the same energy at the turbine, increasing costs and stack emissions.

As the power fleet ages, so do the primary components of the plant. From isolation and stop valves to vent and relief valves, continual repair and replacement of these components is necessary to keep plants operating at optimal efficiency. Identifying the valves that are allowing the greatest loss is a critical tool in the financial management of a plant.

LOCATION: MD Date:

Test Point	Valve I.D.	Signal Level (dB)	Pressure Difference PSI	Pressure Difference (bar)	Inlet Size (ins NB)	Gate Valve (y/n)	Ball Valve (y/n)	Leak Rate (l/min)	Fluid Density (kg/m^3)	Cubic Feet/ Hour	Gallons Per Hour
e.g											
1	DDV401	70	32	2	12	n	N	3435	0.900	7276.0	54447.5
2	SDV101B	12	37	3	16	N	N	4.4	1.18	9.4	70.0
3	SDV400B	18	1800	122	6	N	N	1.1	1.18	2.3	17.2
4	FIC100A	62	245	17	6	N	N	189.0	1.18	400.5	2996.3
5	FIC200A	92	1050	71	3	N	N	524.0	1.18	1111.0	8310.8
6	FIC300A	89	1800	122	2	N	N	638.7	1.18	1353.2	10125.0
7	FIC100D	71	245	17	6	N	N	483.3	1.18	1023.9	7661.0
8	FIC200D	88	880	60	3	N	N	1032.1	1.18	2188.8	16380

Loss calculation software data

THE RIGHT TOOL FOR THE JOB!

SteamPAC™, with a powerful formula for estimating leak rates, is used in fossil fuel plants to survey the entire inventory of steam valves and traps while in service. This results in positive impacts on Heat Rate and CO_2 stack emissions.

The SteamPAC™ sensor "listens" to the turbulence created during expansion of high pressure liquids and gasses passing through a small opening. High frequency detection is not susceptible to normal operating background noise and vibration, virtually eliminating false positives seen by airborne detection.

SteamPAC™ uses a proprietary algorithm to identify through-valve gas losses and estimates leak rate. Using the readings from SteamPAC™ along with the valve type, size and differential pressure, the calculations are performed within the handheld or the supplied software.

STEAMPAC™ LOSS EXAMPLE

TYPICAL 400 MW PULVERIZED COAL BOILER

Thermally Efficient Pulverized Coal Boiler (PCB)
- 1 ton of coal = 26,000,000 BTU
- 1 MW requires 9,000,000 BTU per hour
- 400 MW requires 138 tons of coal per hour

Less Efficient Pulverized Coal Boiler (PCB)
- 1 ton of coal = 26,000,000 BTU
- 1 MW requires 14,500,000 BTU per hour
- 400 MW requires 223 tons of coal per hour

Savings in fuel cost with increased thermal efficiency... At $14/ton of coal, fuel cost savings is $1100/hour ($26,400/day) by reducing loss of steam through normally closed valves - reduction of 84 tons of CO_2/day.

The route-based user interface is simple and intuitive. A single button press will store readings from a valve. Wirelessly transferring the readings to a computer provides trend analysis and leak cost equivalents to justify repair and replacement.

A LONG HISTORY OF IDENTIFYING LEAKS

MISTRAS | Triple 5 has been identifying boiler tube leaks for over 25 years. The Acoustic Monitoring System (AMS) is installed in 100's of power plants around the world, has identified 1000's of leaks, saving plants millions of dollars.

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Local Presence, Global Reach!