

WINTER ENERGY

EFFICIENCY SPECIAL

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2023

A REFLECTION ON THE YEAR



A total of 536 surveys completed in 2023



A total of 65,064 traps completed in 2023



Of those we identified 6,182 failed traps



29,537 KG/HR
of leaks identified



These leaks equated to
35,328 METRIC TONNES
of possible CO2 savings

Failed traps (conditions:Failed Open, Failed Closed, Rapid Cycle, External Leak)

YOUR WINTER STEAM SYSTEM CHECKLIST

ENSURING OPTIMAL PERFORMANCE FOR END USERS.

As the winter chill sets in, it's crucial for industries relying on steam systems to prepare for the challenges that colder temperatures bring. At Spirax Sarco UK and Ireland we understand the importance of a well-maintained steam system to ensure efficiency, reliability, sustainability and safety during the winter months.

We've put together a comprehensive winter steam system checklist tailored for our end users.

1

CONDENSATE MANAGEMENT

- + Start by inspecting condensate return lines for any signs of leaks or blockages
- + Ensure that condensate pumps are operating smoothly and efficiently
- + Check pump receiver vents and overflows; when were the level controls & pumps last calibrated or serviced?
- + Check the insulation on condensate return lines to prevent heat loss
- + Check for signs of excessive flash / plant steam emissions (sign of failed traps?)

2

STEAM TRAPS INSPECTION

- + Start by inspecting condensate return lines for any signs of leaks or blockages
- + Ensure that condensate pumps are operating smoothly and efficiently

AS WINTER SETTLES IN, ENSURING THE EFFICIENCY OF YOUR STEAM SYSTEM BECOMES PARAMOUNT.

- + Check pump receiver vents and overflows; when were the level controls & pumps last calibrated or serviced?
- + Check the insulation on condensate return lines to prevent heat loss
- + Check for signs of excessive flash / plant steam emissions (sign of failed traps?)

3

PRESSURE AND TEMPERATURE CONTROLS

- + Calibrate and test pressure and temperature controls to ensure they respond accurately
- + Check safety valves for proper operation, ensuring they're set to the correct pressure
- + Do the safety valves have the recommended drain points?
- + Inspect pressure and temperature gauges for accuracy

CHECK SAFETY VALVES FOR PROPER OPERATION

4

INSULATION AND HEAT TRACING

- + Examine the insulation on pipes, valves, and fittings to minimise heat loss and reduce the risk of any trapped condensate freezing

BY IMPLEMENTING THESE MEASURES, OPERATORS CAN NOT ONLY MITIGATE ENERGY WASTAGE BUT ALSO CONTRIBUTE TO A MORE SUSTAINABLE AND COST-EFFECTIVE OPERATION OF THEIR STEAM SYSTEMS.

- + Ensure that heat tracing systems are operational and set to appropriate temperatures
- + Repair or replace any damaged insulation promptly

5

WATER TREATMENT

- + Check the effectiveness of water treatment chemicals and adjust dosage if necessary
- + Conduct a water analysis to ensure that the water quality meets the specified standards.
- + Inspect and clean water strainers and filters
- + Service & calibrate dosing pumps

CONDUCT A WATER ANALYSIS TO ENSURE WATER QUALITY

6

INSTRUMENTATION AND CONTROLS

- + Check the calibration of pressure, temperature, and level instrumentation
- + Test the functionality of control valves and actuators.
- + Check the performance of any advanced control systems in place

7

PIPE AND VALVE INSPECTION

- + Inspect pipes and valves for leaks, corrosion, erosion or damage
- + Lubricate valve stems and ensure that they open and close smoothly

- + Check for proper alignment and support of pipes to prevent stress on the system and prevent condensate from sitting inside any sagging pipework

8

TRAINING AND EDUCATION

- + Train steam system operators on best practices for winter optimisation
- + Stay informed about the latest advancements in steam system technology through Spirax Sarco's training programs.

As winter settles in, ensuring the efficiency of your steam system becomes paramount. By implementing these measures, operators can not only mitigate energy wastage but also contribute to a more sustainable and cost-effective operation of their steam systems.

STAY WARM, STAY EFFICIENT. ARE YOU WINTER READY?



VISIT

www.spiraxsarco.com/global/en-GB/services
and start benefiting from Spirax Sarco services
and support today!

BULLET-PROOFING YOUR STEAM SYSTEM FOR WINTER

A GUIDE TO OPTIMAL ENERGY EFFICIENCY AND RELIABILITY.

As the winter season is in full swing, businesses and industries with steam systems face the challenge of maintaining optimal energy efficiency and reliability. Steam systems play a crucial role in various sectors, including pharmaceuticals, healthcare and food and drink.

Let's explore strategies to winterise your steam system, ensuring it operates at peak performance while minimising energy consumption.

1

CONDUCT A THOROUGH SYSTEM AUDIT:

Before the winter months fully set in, conduct a comprehensive inspection of your steam system. Check for leaks, insulation integrity, and potential points of heat loss. Identifying and addressing issues early on will contribute to energy savings and enhance the overall reliability of the system. A Spirax Sarco Energy

Audit is tailored to your process or application and your budget. An audit can include the complete steam distribution loop, starting with the water treatment plant, right through to process applications and condensate return. We can scope an audit to fit your needs, for instance it can be focused on energy efficiency, health & safety, or best practice.

2

INSULATE STEAM PIPES AND COMPONENTS

Proper insulation of steam pipes and components is essential to prevent heat loss. During winter, uninsulated pipes and components can lead to significant energy waste as heat dissipates into the surroundings. Install high-quality insulation to keep the steam at the desired temperature throughout its journey from the boiler to its destination.

Put simply, good insulation = Less heat loss and improved energy efficiency, but also - fewer traps required (less CapEx), fewer traps to maintain (less OpEx); fewer potential points of failure; more energy in the steam (energy saving, again); less heat loss = less erosion, corrosion, and water hammer.

3

IMPLEMENT REGULAR MAINTENANCE

Scheduled maintenance is key to the longevity and reliability of any system. Establish a routine maintenance schedule for your steam system, focusing on cleaning and calibration. This proactive approach can identify and address potential issues before they escalate, minimising downtime and ensuring optimal performance.

4

UTILISE CONDENSATE RECOVERY

Implementing a condensate recovery system allows you to reclaim and reuse condensate. By returning condensate to the boiler, you maximise efficiency and minimise the need for additional energy to heat fresh water.

This is probably the quickest win there is after steam trap surveys, remember the rule of thumb: 6c temperature improvement = 1% Fuel saving.

6c
TEMPERATURE
IMPROVEMENT
= 1% FUEL
SAVING

**GOOD INSULATION
MEANS LESS HEAT
LOSS AND IMPROVED
ENERGY EFFICIENCY**

THE INTEGRATION OF SPIRAX SARCO'S ADVANCED METERING PRODUCTS IN INDUSTRIAL SETTINGS CONTRIBUTES TO A MORE SUSTAINABLE AND ENVIRONMENTALLY RESPONSIBLE APPROACH TO WINTER ENERGY MANAGEMENT

5

OPTIMISE BOILER WATER TREATMENT

Proper water treatment is essential to prevent corrosion and scale build-up in the boiler. During winter, water conditions can change, making it crucial to monitor and adjust water treatment parameters accordingly. Regular testing and adjustment of water treatment chemicals will help maintain the efficiency and reliability of your steam system.

Service and calibrate your pumps to maintain required TDS and TDS blowdown within the range recommended by Boiler OEM. Too much = Energy loss BUT too Little = scaling on Boiler tubes, excess foam & scale in pipework (barrier to Heat X and Maintenance issues).

6

INSTALL STEAM TRAPS

Well-functioning steam traps are crucial for removing condensate and ensuring that only dry steam enters the distribution system. Faulty or malfunctioning traps can lead to energy waste and decreased system reliability. But it's not JUST incorrectly operating traps, but also traps that have been incorrectly selected (type) or sized; installed incorrectly or exposed to a poor quality of steam that will cause them to fail. Regularly inspect and replace steam traps as needed.

Whether you want to check the health of your steam traps, or partner with us to ensure your processes run trouble free, our Complete Steam Trap Management programme can be tailored to suit your needs, offering a total customer solution.

Any steam traps found to be needing maintenance will be specified, supplied, and installed as part of the fixed price contract. The cost of a Steam Trap Management Contract is typically far less than the cost of the average energy loss caused by not maintaining your steam trap population regularly.

7

METERING

Spirax Sarco's metering products play a crucial role in promoting energy efficiency during winter months. By offering precise and reliable measurement of steam and other fluids within industrial processes, these products enable organisations to optimise their energy usage.

In winter, when heating demands are heightened, the accurate monitoring and control of steam flow, temperature, and pressure become paramount. Spirax Sarco's metering solutions empower businesses to fine-

tune their heating systems, ensuring that energy is utilised efficiently and only when needed. This not only helps in reducing energy consumption but also minimises operational costs.

Like a steam trap – a meter needs to be selected, sized and installed correctly – and should be installed with the appropriate ancillaries and in the correct flow orientation and run of pipework upstream and downstream, NOT as a 'standalone product' and also serviced and calibrated regularly.

The integration of Spirax Sarco's advanced metering products in industrial settings contributes to a more sustainable and environmentally responsible approach to winter energy management, aligning with the growing emphasis on eco-friendly practices in today's business landscape.

Winterising your steam system is a proactive and essential step in ensuring energy efficiency and reliability during the colder months. By conducting thorough inspections, investing in proper insulation, upgrading equipment, implementing regular maintenance, and utilising advanced technologies, you can optimise your steam system's performance. These measures not only contribute to cost savings but also enhance the sustainability and resilience of your operations throughout the winter season and beyond.



DISCOVER MORE



www.spiraxsarco.com/global/en-GB/advance/audit-and-advisory

UNLOCKING WINTER EFFICIENCY

Optimising Energy Efficiency in Steam Systems

As the winter sets in, the demand for heating systems, particularly steam systems, surges to keep the chill at bay. However, with great demand comes the challenge of ensuring energy efficiency to minimise costs and environmental impact.

In this article, we'll delve into practical strategies to optimise energy efficiency for your steam system during the winter months.

1

REGULAR MAINTENANCE IS KEY

Just like any other engineering system, steam systems require regular maintenance to perform at their best. Conduct thorough inspections, check for leaks, and ensure all components are in prime condition. Addressing issues promptly not only prevents energy wastage but also prolongs the life of the system.

A SPIRAX SARCO STEAM TRAP MANAGEMENT PLAN WILL GIVE YOU COMPLETE PEACE OF MIND THAT YOUR STEAM TRAPS ARE BEING REGULARLY SURVEYED AND MAINTAINED. ANY STEAM TRAPS FOUND TO BE NEEDING MAINTENANCE WILL BE SPECIFIED, SUPPLIED AND INSTALLED AS PART OF THE FIXED PRICE OF YOUR PLAN.

IN THE COLD MONTHS OF WINTER, OPTIMISING ENERGY EFFICIENCY IN STEAM SYSTEMS BECOMES NOT JUST A COST-SAVING STRATEGY BUT A RESPONSIBILITY TOWARD A SUSTAINABLE FUTURE.

2

INSULATION MATTERS

Proper insulation is crucial for retaining heat within the steam system. Insulate pipes, valves, and other components to prevent heat loss. Pay special attention to the condition of any existing insulation to ensure maximum efficiency. Investing in high-quality insulation jackets will pay off in the long run.

SPIRAX SARCO'S INSULATION JACKETS EMPLOY CUTTING-EDGE MATERIALS AND ADVANCED CONSTRUCTION TECHNIQUES TO DELIVER EXCEPTIONAL THERMAL EFFICIENCY. THEY EFFECTIVELY MINIMISE HEAT LOSS AND PREVENT ENERGY WASTAGE, ENSURING OPTIMUM PERFORMANCE AND COST SAVINGS FOR INDUSTRIAL OPERATIONS.

INVESTING IN HIGH-QUALITY INSULATION PAYS OFF

3

OPTIMISE BOILER EFFICIENCY

The heart of any steam system is the boiler. Ensure your boiler is operating at its peak efficiency by carrying out planned preventative maintenance. Regular servicing including inspecting the combustion chambers and optimising fuel-to-air ratios. Upgrading to a more energy-efficient boiler model may also be a viable option in the long term.

4

IMPLEMENT CONDENSATE RECOVERY SYSTEMS

Potentially a significant source of energy loss in steam systems is the condensate that forms during the heating

process. Implementing condensate recovery systems allows you to capture and reuse this valuable heat, reducing the need for additional energy input. This not only optimises fuel efficiency but also lowers water consumption.

5

UTILISE VARIABLE SPEED DRIVES

Variable speed drives (VSDs) allow for better control of pump and fan speeds based on the actual demand. By adjusting the speed of these components to match the required output, VSDs help in minimising energy consumption. This is also effective in periods of varying steam demand, such as during seasonal temperature fluctuations.

VSDS HELP
MINIMISE
ENERGY
CONSUMPTION

6

CONDUCT ENERGY AUDITS

Regular energy audits can provide valuable insights into the performance of your steam system. Identify areas of inefficiency and prioritise improvements. Energy audits may reveal simple adjustments or more substantial upgrades that can significantly enhance the overall efficiency of the system.

A SPIRAX SARCO AUDIT IS TAILORED TO YOUR PROCESS OR APPLICATION AND YOUR BUDGET. THEY CAN INCLUDE THE COMPLETE STEAM DISTRIBUTION LOOP, STARTING WITH THE WATER TREATMENT PLANT, RIGHT THROUGH TO PROCESS APPLICATIONS AND CONDENSATE RETURN. WE CAN SCOPE AN AUDIT TO FIT YOUR NEEDS, FOR INSTANCE IT CAN BE FOCUSED ON ENERGY EFFICIENCY, HEALTH AND SAFETY OR BEST PRACTICE.

Following the on-site work conducted by experienced Spirax Sarco audit project engineers, a detailed and comprehensive report is produced and presented back to you. We can then provide design and consultancy support to assist in integrating proposed solutions.

7

UPGRADE TO ENERGY-EFFICIENT CONTROLS

Consider upgrading your control systems to the latest, energy-efficient models. Advanced control systems enable precise monitoring and adjustment of various parameters, ensuring optimal performance. Smart controls can adapt to changing conditions, further enhancing efficiency during the unpredictable winter months.

8

TRAIN YOUR TEAM FOR EFFICIENCY

The human element plays a crucial role in optimising energy efficiency. Train your personnel on best practices, efficient operating procedures, and the importance of regular maintenance. A knowledgeable and well-trained team can contribute significantly to the success of energy-saving initiatives.

AT SPIRAX SARCO WE HAVE AN INTERNATIONAL REPUTATION FOR THE QUALITY OF TRAINING WE PROVIDE OUR CUSTOMERS, DESIGNERS, INSTALLERS, SYSTEM OPERATORS AND MAINTAINERS OF STEAM AND CONDENSATE SYSTEMS. OUR AIM IS TO ENSURE THAT YOU ACHIEVE THE MAXIMUM BENEFIT FROM YOUR PLANT BOTH EFFICIENTLY AND SAFELY.

Training courses are delivered at our state-of-the-art training facility in Cheltenham. We have a fully working boiler house, demonstration rigs providing hands-on fault finding and assembly exercises, and practical areas which allow delegates the chance to get hands-on and put the theory into practice

In the cold months of winter, optimising energy efficiency in steam systems becomes not just a cost-saving strategy but a responsibility toward a sustainable future. Through regular maintenance, strategic upgrades, and a commitment to best practices, businesses can navigate the winter months with minimised energy consumption, reduced costs, and a positive impact on the environment.

GET IN TOUCH

to arrange a call with an expert to find out more:
www.spiraxsarco.com/global/en-GB/contact-us



DEBUNKING THE MYTH

STEAM IN INDUSTRIAL PROCESSES IS DETRIMENTAL TO THE ENVIRONMENT

Implementing an effective steam trap management plan, doesn't need to be complicated. Lowering Carbon output, increased production and energy savings are all benefits you could achieve from regular management.

STEAM AS A CLEAN ENERGY SOURCE

Contrary to the belief that steam contributes to pollution, steam has been utilised as a clean energy source for centuries. Steam turbines are widely employed in power generation, effectively converting heat energy into electricity. This process emits no direct greenhouse gases or pollutants, making it a viable alternative to fossil fuel-based power generation. Additionally, advancements in technology have led to the development of more efficient and environmentally-friendly steam-based power plants.

ROLE IN ENERGY EFFICIENCY

Steam plays a significant role in enhancing energy efficiency in industrial processes. Through techniques like cogeneration, excess heat from processes can be utilised to produce steam, which in turn can generate electricity. This approach not only reduces the demand for external energy sources but also minimises waste heat released into the environment, promoting sustainable energy practices.

STEAM FOR PROCESS HEAT

Many industrial processes require high temperatures for various tasks, such as sterilisation, distillation, and chemical reactions. Steam proves invaluable in meeting these temperature requirements efficiently and cleanly. By using steam as a heat source, industries can reduce their reliance on fossil fuels and cut down emissions associated with traditional heating methods.

STEAM AS A CLEANING AGENT

Many industrial processes require high temperatures for various tasks, such as sterilisation, distillation, and

chemical reactions. Steam proves invaluable in meeting these temperature requirements efficiently and cleanly. By using steam as a heat source, industries can reduce their reliance on fossil fuels and cut down emissions associated with traditional heating methods.

REDUCING WATER USAGE

The myth that steam contributes to environmental harm sometimes stems from concerns about water consumption. However, modern steam-based systems are designed with water conservation in mind. Technologies like closed-loop steam systems and condensate recovery systems significantly reduce water waste, making steam a responsible choice for industrial applications.

STEAM, A
RESPONSIBLE
CHOICE FOR
INDUSTRIAL
APPLICATIONS

STEAM'S ROLE IN EMISSIONS REDUCTION

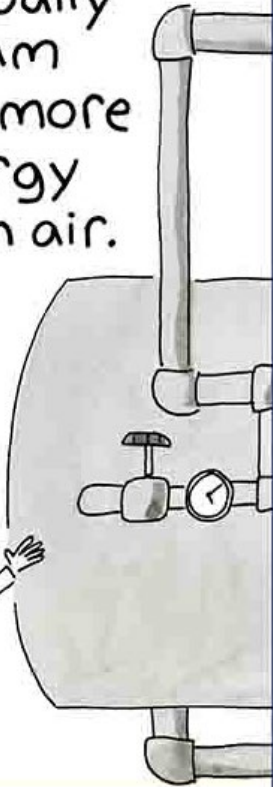
Industries worldwide are under pressure to reduce their carbon footprint and lower emissions. Steam-based technologies can be part of the solution. For instance, steam reforming is used to produce hydrogen, a clean fuel that can replace fossil fuels in various applications. This can help industries transition towards more sustainable practices and contribute to a greener future.

IN CONCLUSION, THE IDEA THAT USING STEAM IN INDUSTRIAL PROCESSES IS DETRIMENTAL TO THE ENVIRONMENT IS A MISCONCEPTION THAT OVERLOOKS THE MYRIAD OF BENEFITS STEAM CAN OFFER.

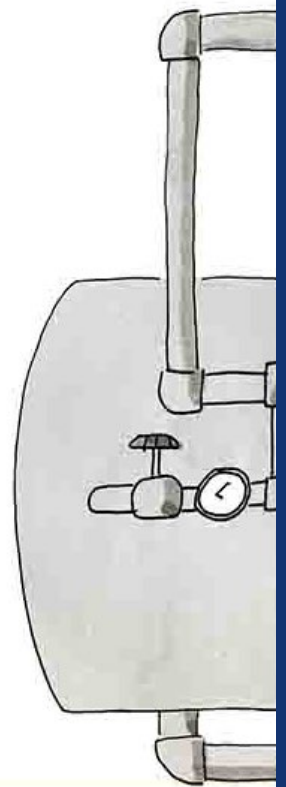
Steam, when utilised responsibly, can be a vital tool in promoting energy efficiency, reducing emissions, conserving water, and facilitating cleaner industrial processes. As industries continue to seek sustainable solutions, it's essential to debunk these myths and embrace steam as an ally in the journey towards a greener and more environmentally-friendly future.

That's a lot of hot air.

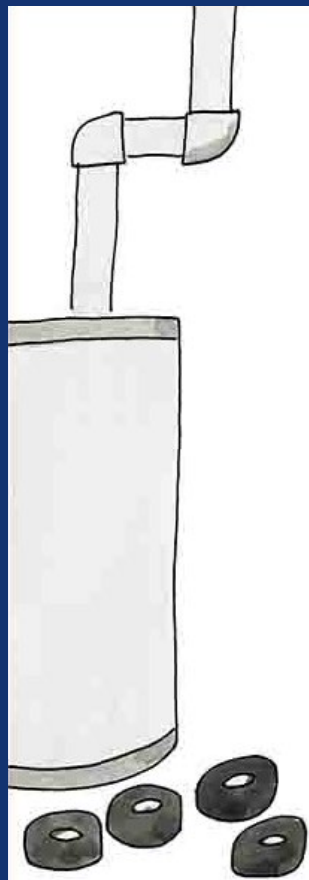
Actually steam has more energy than air.



No I meant some of the talk about de-steaming.



If you're going to call steam "old-fashioned," then so is the wheel.



When steam's job is done,
it only leaves behind water

spirax/sarco



UNVEILING OPERATIONAL EXCELLENCE

5 Key Solutions for optimal performance of your Steam System

In the realm of industrial operations, the efficiency and reliability of steam systems are paramount. Steam plays a vital role in various processes, from heating to sterilisation in hospitals. However, when your steam system isn't regularly monitored and optimised it can lead to downtime, increased energy consumption and operational inefficiencies that could easily be avoided by putting the right plan in place.

At Spirax Sarco we offer a range of innovative products and services designed to optimise the operational condition of the steam system and ensure operational excellence.

1

COMPREHENSIVE STEAM SYSTEM AUDITS

One of the first steps in preventing steam system issues is understanding the current state of the system. Spirax Sarco's comprehensive steam system audits provide businesses with detailed insights into their steam infrastructure. By identifying and areas for efficiency improvements, these audits empower organisations to proactively address issues before they impact operations.

2

CONDENSATE RECOVERY SOLUTIONS

Efficient condensate management is crucial for preventing energy waste and system disruptions. This not only reduces energy consumption but also ensures a smooth and reliable steam system operation.

- + WATER CHARGES ARE REDUCED
- + EFFLUENT CHARGES AND COOLING COSTS ARE REDUCED
- + FUEL COSTS ARE REDUCED
- + MORE STEAM CAN BE PRODUCED FROM THE BOILER
- + CHEMICAL TREATMENT OF RAW MAKE-UP WATER IS REDUCED

3

ELECTRONIC BOILER CONTROLS

Spirax Sarco's electronic boiler control systems are designed for simple installation, easy commissioning and provide safe and trouble free operation. By investing in these controls, businesses can prevent issues such as inefficient fuel usage, boiler downtime, and associated operational disruptions.

Modern boilers are designed to meet the needs of a variety of industries and their associated processes. Consequently the engineers at Spirax Sarco have developed an advanced electronic boiler control system to match the performance and operating requirements of most boiler houses. Spirax Sarco's electronic boiler control systems are designed for simple installation and can be integrated into existing systems.

4

RELIABLE STEAM TRAPS

Steam traps play a critical role in the efficient and safe operation of a steam system. They are essential components designed to discharge condensate (the liquid formed when steam condenses) and non-condensable gases while preventing the escape of live steam. The primary value that steam traps bring to a steam system includes:

- + CONDENSATE REMOVAL
- + ENERGY SAVINGS
- + EQUIPMENT PROTECTION
- + TEMPERATURE CONTROL
- + PREVENTION OF WATER HAMMER
- + REDUCED MAINTENANCE COSTS
- + ENVIRONMENTAL IMPACT
- + PROCESS EFFICIENCY



EFFECTIVE TROUBLESHOOTING AND MAINTENANCE:

Upskilled professionals possess the expertise to troubleshoot issues within steam systems efficiently.



COMPLIANCE WITH SAFETY STANDARDS AND REGULATIONS:

Knowledge of industry standards, codes, and regulations is essential for ensuring compliance with safety and environmental requirements reducing the risk of non-compliance and associated penalties.



OPTIMISED EQUIPMENT PERFORMANCE:

Skilled steam engineers can optimise the performance of steam-related equipment, such as boilers, pressure/temperature control, and steam traps.



ADOPTION OF MODERN TECHNOLOGIES:

Upskilling allows professionals to stay abreast of advancements in steam engineering technologies.



COST SAVINGS:

By implementing energy-efficient practices, reducing downtime, and optimising equipment performance, organisations can achieve significant cost savings over time.

5

TRAINING & SUPPORT

Upskilling in steam engineering can bring significant value to individuals and organisations in various industries e.g.



ENHANCED OPERATIONAL EFFICIENCY:

A deep understanding of steam engineering allows professionals to optimise the design, operation, and maintenance of steam systems. This optimisation can lead to increased operational efficiency, reduced energy consumption, and improved overall performance.



ENERGY CONSERVATION:

Upskilling in steam engineering equips individuals with the knowledge to identify and implement energy-efficient practices within steam systems.



SYSTEM DESIGN AND IMPLEMENTATION:

Skilled steam engineers can design and implement steam systems that are tailored to specific operational requirements.

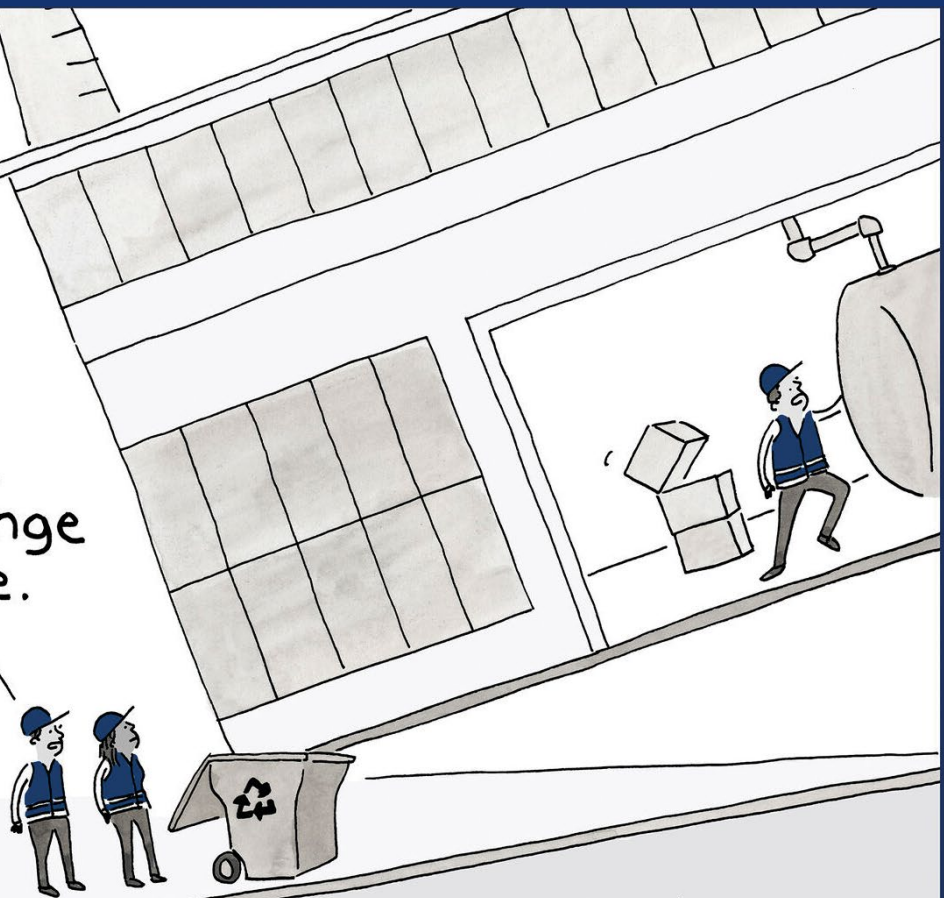
Unveiling operational excellence in steam systems requires a strategic approach to prevent issues and ensure optimal performance. The five key solutions highlighted - thorough system design, regular maintenance practices, advanced monitoring technologies, employee training, and data-driven analysis - collectively form a robust framework for mitigating steam system challenges.

By integrating these solutions, you can look to benefit from enhanced energy efficiency, reduced downtime compliance with safety regulations, and ultimately achieve operational excellence in your steam system. Investing in preventive measures not only addresses immediate concerns but also contributes to long-term cost savings and sustainability, establishing a foundation for reliable and efficient steam system operations.

I think modernising our steam system is a more reliable low-cost way to move away from fossil fuels.



Maybe instead of ripping and replacing everything, we could just change the fuel source.



When steam's job is done,
it only leaves behind water

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