

# connexions

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# Your introduction to the world of steam

The fact that you're reading this suggests that, just like us, you have an interest in steam. The difference is: your level of familiarity with steam might not be as extensive as you'd like it to be – particularly if you're responsible for plant maintenance or repair. Thankfully, help is at hand.

Let's say you're a maintenance technician and your daily duties are centred around ensuring your boiler plant or energy centre is as safe and productive as possible. As an expert in maintenance and repair operations, you know your plant from the inside-out, but wouldn't it be great if you had an equally strong grounding in steam?

Good news! That's precisely what our *Introduction to steam and condensate systems* course is designed for. Whether you're an apprentice or an experienced technician, your questions on steam will be answered on this course. In fact, if you're new to it all, there's really no better place to start.

## What does the course cover?

By the end of the one-day course, you will have solidified your understanding of the following:

- The fundamentals of steam and its uses;
- Why condensate is formed, how and why to remove it, and its value;
- The major components of a steam and condensate system;
- How steam gets to its point of use;
- The reasons for reducing pressure at steam's point of use.

You will also gain a broad understanding of the purpose, and safe operational requirements, of steam and condensate systems, as well as the factors affecting their performance. The result: a clear understanding of how your steam and condensate systems contribute towards the output of your plant.

## Let's get practical

As well as the theory, you'll get practical demonstrations throughout each session from each of our experts, who will take you through the key system components and the processes they run.

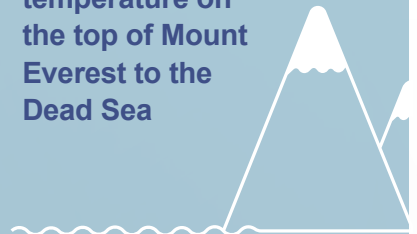
As one of our recent delegates commented, the course provided a "really good introduction as to how the different components work and why they are needed".

With the option of attending the course at our Cheltenham headquarters or arranging an on-site visit for groups of five or more, there's plenty of scope to start your journey with steam at a time and a location that suits you.

When you've completed the course, you'll go back to work with a knowledge of the key principles, an understanding of how to get the best from your plant, and the confidence to identify any potential problems that could arise further down the line.

## Did You Know?

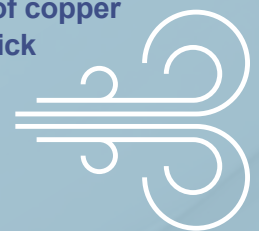
Water boils at a different temperature on the top of Mount Everest to the Dead Sea



Steam can hold five or six times as much potential energy as an equivalent mass of water



1mm of air has the same resistance to heat flow as a wall of copper 15m thick



## FIND OUT MORE

To book your place on our *Introduction to steam and condensate systems* course, please visit [sxsc.com.uk/introductiontosteam](https://sxsc.com.uk/introductiontosteam)





## Are you disposing of your system's most valuable resource?

It's no longer enough to strike a good deal on energy supplies or achieve high levels of productivity: now we are expected to do both, while complying with a complex web of regulation. Striking the right balance can make that crucial, tangible contribution to your company's revenue flow but, with ageing equipment and economic uncertainty coming into play, the potential to achieve this balance is virtually impossible. That is, until we consider our use of condensate and the heat we may have otherwise wasted.

### The value of condensate

It's widely known that condensate is hot, but it's only when we consider how this translates to heat energy that we realise how useful it is as a resource. The condensate generated by the steam heating system will normally have about 25% of the energy that the steam had and contains little to no dissolved solids. If the condensate is merely discharged from the system and, subsequently, disposed of, then that valuable energy resource is thrown away with it. This is an easily avoidable waste that few of us can afford.

Draining condensate, rather than re-using it, can trigger water and effluent management costs, which can be significant. Similarly, draining condensate can make it harder for us to comply with the regulatory standards around environmental effluent. In many countries, including the UK, condensate often has to be cooled before it can be drained. This, again, often comes at an extra cost.

### The uses of condensate

We might now realise that condensate – and the heat energy it carries – is too valuable to be tipped down the drain, but how can it be put to better use?

#### 1. Boiler feedwater

- Reduces need for (and cost of) fresh water
- Reduces need for (and cost of) treatment chemicals
- Requires much less energy than cold make-up water.

#### 2. Flash steam recovery

- Recovers up to 80% of the energy from the rejected Total Dissolved Solids (TDS) water
- Saves on fuel
- Reduces carbon dioxide emissions
- Eliminates unsightly plumes of steam.

### The recovery process

As you're well aware by now, steam is usually generated for most industrial and process industries. How it is recovered can be broadly summarised in three steps.

1. Steam traps are used to remove condensate from the steam system. A steam trap survey can offer invaluable insight into the performance of a given system and will almost certainly reveal impressive savings potential through reduced fuel consumption, fuel emissions, water and effluent charges.
2. Pumps are used to return any condensate not captured by steam traps to the boiler feedtank.
3. Condensate is mixed with other types of feedwater to heat it within the feedtank.

Condensate recovery is one process that is genuinely capable of boosting boiler efficiency, saving energy, enhancing equipment lifespan and complying with legislation – all of which can, in turn, generate substantial savings to those who use steam systems.

It may not play the leading role in the steam system, but condensate recovery is undeniably the unsung hero of the boiler house.

### FIND OUT MORE

The unsung hero of boiler house efficiency: How condensate recovery can transform steam system performance is available to download from [sxsc.com.uk/boilerhouseefficiency](https://sxsc.com.uk/boilerhouseefficiency)







## Strathmore Foods: Great things come in small packages

**Like most family-operated firms, Strathmore Foods places sustainability at the heart of its business. When the company set out to improve its process efficiency, it hadn't anticipated all the benefits that could be gained from the installation of a compact heating device.**

Scottish food manufacturer, Strathmore Foods is one of the UK's leading ready-meal manufacturers and produces a wide range of chilled and frozen products. Renowned for its Macaroni Pie, Strathmore Foods' portfolio caters for the modern lifestyle, offering tasty meals in minutes at affordable prices.

In a world where efficiency is king, plant managers and operators are constantly looking to improve the energy efficiency of heat transfer and maximise savings – and Douglas Nisbet, Operations Director at Strathmore Foods, is no different.

“To remain competitive, we believe that we must invest in appropriate areas and this philosophy will sustain our growth for generations to come,” says Douglas.

As food manufacturers are notoriously large consumers of water and energy, fuel costs will always represent a high proportion of their overheads. Strathmore Foods predominantly use hot water for wash-down and clean-

“**WE KNEW WE HAD A PROBLEM BUT WE DIDN'T KNOW HOW TO SOLVE IT**”

in-place (CIP) processes. Douglas explains: “Our site has expanded over the years but our existing hot water heating solution remained the same. It came to our attention that we were struggling to deliver a suitable flow-rate and temperature, which was causing inefficiencies in the amount of time spent to clean everything effectively.

“We knew we had a problem but we didn't know how to solve it, so we decided to conduct a plant audit to better understand the efficiency of our equipment.”

### Walking the plant

Strathmore Foods worked with Spirax Sarco to identify opportunities for

improving process efficiency and energy savings. “We completed a ‘walk the plant’ to check the health of the steam and hot water system, including the associated equipment. We worked together to identify areas that would improve our plant's performance in terms of health and safety, process productivity and sustainability. The ultimate goal was to find ways to achieve savings in water, fuel, chemicals and CO<sub>2</sub>,” says Douglas.

Following the audit Strathmore Foods made the decision to upgrade the plant's current steam/water mixing unit with a more suitable alternative – one that would not only improve efficiency, but reliability too.

The decision was made to replace the seven mixing units with a single, more compact packaged plate heat exchanger. Douglas explains: “Following the survey, we were advised to upgrade our existing heating solution with the EasiHeat™ system as it was more appropriate for our hot water generation requirements.

## EXECUTIVE SUMMARY

**Company name:** Strathmore Foods Ltd.

**Location:** Forfar, Scotland

**Objective:** Accurate, reliable and consistent hot water supply to provide efficient cleaning for wash-down processes.

**Solution:** Following a plant audit, the business installed a new packaged plate heat exchanger unit.

**Results:** Fast and instantaneous supply of hot water through a single unit which has the ability to cope with greater demand, providing the opportunity for expansion in the future.

The new unit has the ability to deliver hot water instantaneously, enabling CIP and wash-down to be completed in a much more productive way.”

A packaged plate heat exchanger is a compact unit that captures and reuses heat, which may otherwise be wasted, to deliver a constant supply of instantaneous hot water at a stable temperature. This reduces the amount of steam required, which in turn cuts fuel demand and the associated CO<sub>2</sub> emissions.

### Quality over quantity

“As you can imagine, a single unit is much easier to manage than it was before, therefore maintenance time and costs have been cut dramatically, as has downtime. While the packaged plate heat exchanger certainly doesn’t eliminate the need for annual servicing, its requirements are much simpler to manage.

“Our new system is part of an existing service agreement we have with Spirax which has made our annual servicing procedure a fairly effortless one. All of this helps us to keep the system running at optimum efficiency all year round, which is our main objective,” Douglas adds.

### Sweet success

Since updating its steam/water mixing units, Strathmore Foods has even greater control of the amount of water they are using. “We’re already seeing improvements over our previous solution. What’s more, the new packaged plate heat exchanger unit supplied to Strathmore Foods generates increased volumes of hot water and provides the business with an opportunity for expansion when the time is right,” says Douglas.

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### THE FLEXIBILITY OF THE SYSTEM ENABLES US TO RUN MORE CONFIDENTLY

”

“We now have the ability to cope with high and low capacity and we can tailor the output we require on demand.”

Douglas concludes: “At the early planning stages, we were quite simply looking at ways to improve our wash-down process, but we have gained a lot more than we bargained for. Our primary aim was to improve process efficiency, and not only

have we achieved that but we’ve also secured a sustainable future for the business as this device will allow us room to grow.

“The fact we now have a reliable and consistent supply of hot water is a huge benefit to the business in terms of time and cost, while the flexibility of the system enables us to run more confidently. Spirax is a trusted partner of ours and we have the peace of mind that with this solution we can ensure everything is cleaned in an efficient and effective way. They say great things come in small packages. In this case we can wholeheartedly agree!”







# TOP FIVE TIPS FOR IMPROVING EFFICIENCY

Steam systems are efficient and reliable. Yet even so, many users often struggle to utilise their plant's valuable assets as much as they could be. If you're curious about what you could be doing to increase efficiency and achieve more 'bang for your buck', there are five basic strategies that could just be the answer.

## 1. Water treatment

An effectively conditioned water system is the basic starting point for any efficient steam system. But how do you make sure your water is always as clean as it can be?

Effective water treatment tackles problems such as corrosion, deposit build-up, and foaming at source. While the traditional approach uses water softening supplemented by chemical treatment, reverse osmosis (RO) forces water through a semi-permeable membrane, stripping out nearly all of its contaminants. The benefit to you is pure water which has had 98-99% of its impurities removed.

## 2. Boiler control

Having the right controls is a crucial ingredient in the optimisation of any steam system. Your level controls, for example, ensure sufficient water is fed to the boiler to meet demand. If the water level falls too low, the heating surfaces could become exposed and the boiler would overheat. Too high, and water could be sucked into the steam, leading to poor quality steam that could impair heating or production efficiency. Automated boiler controls can also deliver major savings, especially in the area of total dissolved solids (TDS) boiler blowdown.

## 3. Heat transfer efficiency

Whether steam is being used to drive an industrial process or provide heating and hot water, effective heat transfer is a key driver for almost every installation. Using the most efficient heat exchangers should therefore be a priority.

Traditional shell-and-tube calorifiers used to be the workhorses of steam, but they're looking increasingly outdated in the face of more efficient, compact alternatives. Modern plate heat exchangers, such as Spirax Sarco's EasiHeat™ systems, are much smaller and typically improve energy efficiency by around 6-10%, simply by reducing radiation heat losses from their surfaces.

## 4. Condensate recovery

Condensate contains about 20% of the energy of the steam from which it came, which is why most steam system operators recognise it as being a particularly valuable resource.

Most systems could be achieving a condensate recovery rate of 75-80% by using it to heat the boiler feedwater, saving on energy and disposal costs, and limiting the need for fresh water treatment. Recovering flash steam can also capture energy that would have otherwise been lost and return it safely to the boiler.

## 5. Steam system services and thermal energy audits

No two steam systems are the same, so only a technical assessment and cost saving calculation will determine the energy-savings payback of a particular project.

You may not count steam as a core area of your expertise. Your business could even be suffering from a skills shortage. Either way, calling in specialists to provide service and support for the steam system can be the most realistic, cost-effective way of keeping things running at their optimum. Best of all, payback will typically be achieved in as little as one to two years, if not in a matter of weeks.

### Don't miss out

If you have a steam system, you're already sitting on a large investment, so efficiency is really all about making the most of your existing assets – and who can afford to miss a trick like that?

**Boost boilerhouse efficiency**

**5 TOP TIPS**

Download your guide:  
[sxsc.com.uk/boilerhouseefficiencyquickstartguide](https://sxsc.com.uk/boilerhouseefficiencyquickstartguide)

### FIND OUT MORE

Contact us on **01242 521361** to discuss your specific requirements or download our services overview brochure to learn more about the services we offer: [sxsc.com.uk/sxsservicesbrochure](https://sxsc.com.uk/sxsservicesbrochure).





# Service Contracts: Why over 55 heads are better than one

**Running a steam business is a busy job full of deadlines and complexities and sometimes it's difficult to stay on top of system upkeep. So how do you make sure your steam system operates at peak efficiency, even when it's difficult to work out what needs doing and when?**

Chances are, the most cost-effective way for you to keep your steam system operating at its full potential, is to outsource some, or all, of the maintenance work – and that's where we can help. A service contract is a flexible way to make sure your plant hits peak operational efficiency and stays there, thanks to the expertise of over 55 specialists who work with steam day in and day out.

## The freedom to choose

Whether you've replaced old equipment to update your plant, or installed a completely new system, having a service agreement in place ensures you have the freedom to choose a level of support to match your needs and your budget. What's more, we can service your equipment either on site or at our workshop. We can also flex to fit this in with any plant shutdowns or planned maintenance.

You will also never have to commit to a contract that provides services which don't apply to you, as we make sure we talk to you specifically about what you want included in your own, bespoke agreement. Do you need regular cleaning for your plate heat exchanger,

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**IMAGINE THE PROSPECT OF AN EFFICIENT PLANT THAT RUNS SMOOTHLY, SAFELY, AND EFFICIENTLY**  
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but don't need 24 hour priority response cover? No problem – you choose (and pay for) what you need, and nothing more.

## Safe and sound

We all know that things don't always go to plan in the plant room or boilerhouse, but it certainly needn't be a disaster if those unplanned issues do rear their heads from time-to-time. A service contract gives you priority over those without a contract in place, while the cost will also come at a preferential rate. It really is a win-win for you and your business just when you need it.

Imagine the prospect of an efficient plant that runs smoothly, safely, and efficiently, but also has a much lower risk of breakdown and costly downtime. That's exactly what you get when you have a service contract in place. After all, more heads are better than one.



**We offer a wide range of services across the steam system covering:**

- Boilerhouse
- Controls
- EasiHeat™
- Humidifier
- Metering
- Plate heat exchanger cleaning
- Steam system conditioning
- 24-hr priority response cover
- Multi-product – encompassing all of your Spirax Sarco equipment
- Extended warranty on a range of products

## FIND OUT MORE

For more information, visit [sxscom.uk/ServiceContracts](https://sxscom.uk/ServiceContracts)





## News

### INTRODUCING OUR CHARITY OF THE YEAR

We're pleased to say that Midlands Air Ambulance is our chosen charity of the year for 2018! It's a cause that has really captured the imagination of our staff. When you consider that it serves a population of over six million people yet is funded entirely by charitable donations, and that it's one of the busiest air ambulance organisations in the UK, you can see why.

We're running multiple charity days throughout the year in order to raise money – we've even been lucky enough to have a helicopter pod visit



both our Cheltenham sites recently! We're looking forward to seeing how much we've raised at the end of the year. For more information on Midlands Air Ambulance, visit <http://www.midlandsairambulance.com/>

### BRINGING STEM TO LIFE

Spirax Sarco once again exhibited at the Cheltenham Science Festival from 5th-10th June.



Hundreds of school children visited the stand during the Festival, which was organised and run by our Early Careers team. The factory activity and cyclone separator made a welcome

return following their success last year - this time with some exciting improvements including sensor based LED lighting. The team also developed a virtual reality tour and vintage style arcade game which were a big hit with visitors!

### YOUNG ENTERPRISE

Spirax Sarco was thrilled to sponsor the annual Young Enterprise Trade fair at Pittville Pump Rooms on March 7th, 2018. It was a fantastic event with 15 teams of students from various schools showcasing their innovative companies, and all competing for prizes as judged by volunteers from the local business community.

The students will now progress to the next stages of the competition where they will have the opportunity to win a place at the national final.

To top off what was already a great event, we're pleased to say that Spirax Sarco also won a Young Enterprise award for 'Supporter of the Year'!

## Training

### WE WANT YOUR FEEDBACK

Have you been on one of our training courses? What did you think of our training and facilities? Do you have any specific training requirements you'd like to see included in our calendar moving forwards? We'd love to know what you think!

Our training survey is live until 31st July 2018 and, as a thank you for taking part, you could win an iPad Mini! [sxscom.uk/2018trainingcentresurvey](http://sxscom.uk/2018trainingcentresurvey)

### UPCOMING COURSE DATES

#### Introduction to Steam and Condensate Systems (B1):

31st Aug | 3rd Sept | 4th Oct | 19th Oct | 31st Oct | 21st Nov | 3rd Dec

#### Design of Steam and Condensate Systems (D1):

20th-23rd Aug | 17th-20th Sept | 8th-11th Oct | 26th-29th Nov



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*First for Steam Solutions*

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