



PROCESS HEATING SYSTEMS:

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Benefits
of Proper
Maintenance



SIGMA THERMAL INC.

INDUSTRIAL PROCESS HEATING SYSTEMS,
AUTOMATION, SERVICES AND PARTS

WHY PROPER MAINTENANCE IS CRUCIAL TO SYSTEM RELIABILITY AND LONGEVITY

Proper functionality of your process heating system and subsequently your plant operation is crucial to the success of your business. Every plant manager strives to keep equipment operating at its best for as long as possible.

While we know that plant managers understand that periodic maintenance must be performed to keep equipment operating reliably for many years, all too often maintenance activities are postponed or sidelined. What is the reason for the delay? The most common responses are, “We can’t afford to shut down for an inspection” or “It costs too much money.”

In reality – the downtime caused by unexpected equipment failure is always longer and costlier than routine planned maintenance. Failure to perform standard preventative maintenance can result in unforeseen safety risks and diminished system efficiency (more money spent!).



Increased Safety

Planned maintenance helps enhance the safety measures that a plant may already have in place. Investing in a maintenance plan that includes safety evaluations can have a direct impact on the performance of your operation. Regularly analyzing systems for safety issues helps to limit or prevent unnecessary expenses associated with workplace incidents (i.e. lost-time injury, workers compensation, OSHA violations, etc.). Taking measures to increase safety will also help to protect plant employees and property.

Typical Safety Concerns

- Surfaces, fluids, and gases can climb to extreme temperatures, creating unexpected leaks or unintended heating of surfaces that can generate serious risks to employees. When you have staff working directly with and around process heating systems, workplace burns from leaks and exposed surfaces are a major concern.
- If insulation failure occurs, a system can overheat and become very dangerous to your plant staff. Insulation failure can expose bare metal surfaces to high chamber temperatures. Eventually, the failure will allow hot gases to breach areas that were not designed for high temperatures. However, if the breakdown of the insulation is caught beforehand during a regular inspection, situations like this can be remedied quickly and without incident.

- Burners that remain active for extended periods of time also present significant risks, especially when they are not regularly monitored. Some burners have alloy discharge sleeves that can deform over time, redirecting the flame toward the coil or through the shell, creating a variety of dangerous scenarios. Regular burner monitoring can help limit the risks that could occur.
- Routine checks for leaking gases and fluids are essential. Leaks from these systems can pose fire hazards, cause a slip or fall, or create inhalation dangers.

Sigma Thermal typically recommends that on-site personnel perform visual safety inspections a minimum of once daily, however, two to four times daily on a per-shift basis is preferable. Complete visual safety inspections should include the use of thermal imaging cameras to determine possible areas of concern.

Expert Advice: Safe Equipment Operation

With more than a decade of field service experience, Sigma's Service Manager, Tony Brookshire, has a few recommendations for maintaining safe equipment operation and ensuring staff safety.

- Ensure all personnel are trained on the proper operation of all equipment
- Verify all personnel are trained on how to conduct basic visual safety inspections.
- Confirm that a minimum of one safety inspection is conducted daily.
- Keep the area around heaters, pumps, and pump skids clean and clear of debris.
- Keep cleaning materials in easily accessible locations throughout your facility for quick spill cleanup.
- Clearly identify hot surfaces and surfaces that could become hot.
- Provide adequate personnel protection against hot surface contacts.
- Schedule inspections with a qualified inspection technician — at least once a year.



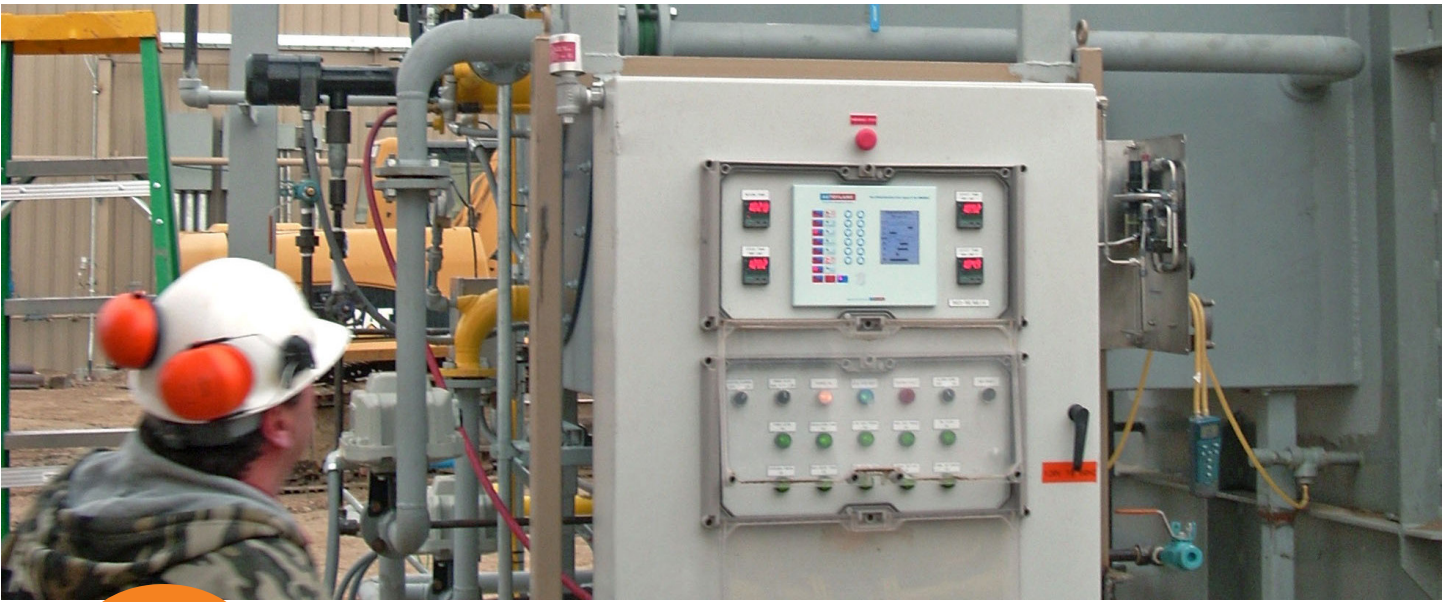
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Increased Efficiency

Maintaining equipment and operation efficiency is important. Optimization of a system can enable the manufacturing of higher-quality end products, and combined with reduced operating costs, can allow for a significant increase in profit.

During an annual or biannual maintenance inspection, experienced technicians can help you increase your system's efficiency by performing the following functions:

- **Check of fuel-air ratios** for correctness to eliminate costly overconsumption of fuel.
- **Check for leaks** to reduce raw material costs.
- **Burner tuning** to maintain optimal function and avoid fouling the coils.
- **Analysis of emissions** to reduce risk of equipment damage, avoid fines from regulatory bodies, and protect the environment.
- **PID loop tuning** for process controls, particularly for system variable controls (i.e. temperature, flow, pressure, level, and speed controls), to enable increased product output.
- **Fluid sampling and analysis** for thermal oil systems, which is critical for the health of your system.



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Increased Reliability

When performing inspections, on-site personnel should be on the lookout for a range of issues that, if left unchecked, could prevent your system from running properly. Regularly scheduled inspections help to prevent downtime and ensures that your system will continue running. Unplanned downtime typically lasts longer than the downtime associated with scheduled maintenance and is costlier in terms of productivity and profit.

There are a few issues that our technicians check for during scheduled maintenance visits to help ensure your system's reliability:

- Worn, faulty, or near-faulty components
- Signs of overheating (i.e. hot spots)
- Missing or failing insulation or refractory
- Signs of leaking gases or fluids
- Excess noise from pumps or motors indicating imminent failure
- Poor combustion
- Out-of-specification emissions

Stocking Critical Spare Parts

Stocking spares and having them on hand should be the preferred, proactive measure taken to eliminate lengthy downtime, allowing for the quick restart of a system — usually on the same day. Keeping spare parts on hand helps operators avoid the profit loss and stresses that present themselves when a system restart is dictated by manufacturing lead times.

Unfortunately, many companies rely on original equipment manufacturers (OEM) or distributors to supply replacements after a part has failed. Even in cases where OEMs can ship parts within a day or two, the unplanned downtime can result in thousands of dollars of lost production.

Learn About Sigma's Total Customer Care Program

To help our customers improve safety, efficiency, and reliability while working with their process heating systems, Sigma Thermal has developed a Total Customer Care Program (TCCP). This support program was developed to help plant managers realize that safety, efficiency, and reliability are directly linked to consistent, periodic maintenance.

As an industry-leading manufacturer and supplier of process heating systems, Sigma Thermal is proud to offer a unique Total Customer Care Program to clients, existing and new alike. The focus of TCCP is preventative inspection and maintenance; we aim to make it easier for customers to properly maintain their systems and facilities, thereby helping them to prevent problems and unexpected downtime.

This program provides several benefits, including priority scheduling for annual inspection and service visits, priority phone support, and access to reference materials (including helpful videos). Within TCCP, complete support for all your operational and maintenance requirements are provided — from parts and retrofits to service and training.

To learn more about Sigma Thermal's Total Customer Care Program and how it can help keep your systems and plants running efficiently and without interruption, [contact us](#) today.

About Us

Sigma Thermal designs, engineers, supplies, and services process [heating systems](#) for industry. Our products include thermal oil and [thermal fluid heating systems](#), indirect process [bath heaters](#), electric process heaters, [biomass fired energy systems](#), direct fired process heaters, [system automation](#), parts, [retrofits/upgrades](#), and supporting services. Our staff is comprised of dedicated and experienced industry veterans who are prepared to learn about your application and provide solutions specific to your project needs. Whether you need a standard package heater, a highly engineered process heating system, or just a tune up on your current system, our engineers and technicians have the knowledge and experience to make your project a success.

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