

PJM Pipeline

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Boilers - Yesterday and Today



Above, an old dual-fired boiler that ran on oil. Its two-pass design is inherently inefficient, and improper CO₂ levels caused soot buildup, further reducing energy efficiency.



PJM replaced two old, oversize boilers with multiple smaller units. Individual boilers operate only as needed to match the heating load for greater efficiency, and redundancy eliminates downtime if failure occurs.

Boilers and Improving Energy Efficiency

By Ricky Folk

In years past, when fuel was relatively inexpensive and emissions were of little concern, manufacturers were producing large, low-cost boilers that utilized basic technology and were largely inefficient. As energy costs rose and users recognized the need for better efficiency, significant technological advances were made in boiler design.

Replacing your Old Boiler

Today's boilers feature improved coil and heat transfer technology, sophisticated microprocessor-based controls, and BAS integration. Multiple small, high-efficiency boilers are increasingly being used to replace large, inefficient models. Most boiler replacements qualify for tax incentives or rebates from local, state, or federal agencies.

Existing Boiler Upgrades

If replacing a boiler is not in your capital budget, users can look into add-on technology, such as meters, water-side economizers, high-efficiency replacement burner trays, and upgraded control packages, which can increase the efficiency of their existing boiler. Boiler retro-commissioning can identify and address areas of energy inefficiency through testing and data analysis.

Boiler Maintenance and Service

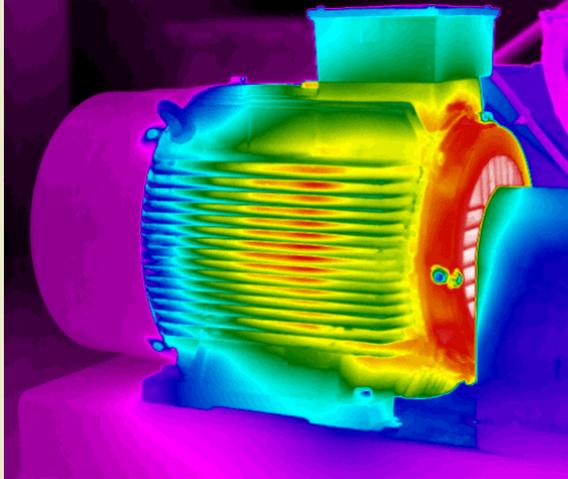
Regular preventive maintenance is essential to the efficient operation of a boiler. Most importantly, it should be kept as clean as possible. Personnel should be properly trained on boiler maintenance and operation and should have working knowledge of today's high-tech boiler control systems. For installation, service, retrofit, and maintenance, it is very important to use an experienced contractor like PJM that is knowledgeable in both old oil-, gas-, and dual-fired boilers as well as sophisticated new high-efficiency models.

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HVAC Hot Spots: Thermal Imaging Detects Impending Equipment Failure

Thermal imaging is a technology in which thermal radiation, or heat, is captured and displayed as an electronic image, making hot and cold spots easily identifiable. Because excessive heat is often a primary sign of trouble in mechanical systems, thermal imaging is utilized in numerous ways to detect hidden issues that can result in equipment failure.



Bearing failure can often be prevented by comparing surface temperatures to recorded benchmarks, as well as to other bearings working under similar conditions, and addressing any “hot spots”. Thermal imaging can be particularly effective when used in tandem with vibration analysis.

Because overheating is a good indicator of impending failure in pumps, fans, and compressors, thermal imaging can be used to detect increases in temperature around drives, motors, gearboxes, seals, and gaskets. It is also highly useful in identifying electrical problems, moisture accumulation, blockages in pipes, leaky ductwork, and voids in insulation.



Not long ago, thermal imaging equipment was prohibitively expensive, but costs have come down tremendously over the past few years. Handheld infrared devices are easy to use and relatively inexpensive, especially in comparison with the high cost of equipment failure. When used as part of preventive and predictive maintenance programs, as well as for many other potentially cost-saving purposes, thermal imaging can be an excellent investment.

For more information on thermal imaging, call PJM at 609-921-1394.

Service Photo Album



Vibration in pumps, fans, motors, and other equipment cannot be completely eliminated in many cases, but it can be isolated and contained in a specific area.

On the discharge of the above condenser water pump, the fitting cracked due to excessive vibration. A transition and flexible connection were installed to remedy the problem and get things back up and running.



HVAC systems that cool electrical rooms, tele-data closets, or other mission-critical spaces require emergency backup cooling. Oftentimes, however, these systems are not tested in the emergency mode. The split system serving the room above operated properly in an emergency, but the condensate pump was not connected to emergency power, resulting in water damage to vital equipment.

PJM EMPLOYEE PROFILE



**Sheet Metal Detailer
Mark Heil**

The subject of this issue's PJM Profile is sheet metal detailer Mark Heil, who joined PJM's AutoCAD department in October 2012.

Mark began his career as a sheet metal installer and draftsman, and over the years gained vast training and expertise in 3D and 4D technologies. Working alongside piping detailer Gary Takata, Mark acts as an integral part of a project team to coordinate all aspects of a building's mechanical systems, including ductwork location, maintenance access, equipment rigging, and more.

Mark lives in Levittown, PA with his wife of 25 years, Karen, and his son Keith. His professional technological capabilities extend to his personal interests, from building computer systems and components to competitive gaming.

Prefabrication Saves Time & Money



Prefabrication of piping, plumbing, and ductwork components help keep projects on-schedule and costs in check. **PJM provides highest-quality prefabricated ductwork, carbon steel piping, and fittings of all sizes** for rapid pickup, de-

livery, or installation. All items are professionally fabricated in our full state-of-the-art shop using customer-provided specifications, or PJM can provide on-site measuring and design assistance. No fabrication job is too large, small, or complex for our expert team of fabrication professionals.

In these photos, a manifold exhaust system is welded from carbon steel pipe and inspected to verify that it meets the quality standards our clients expect.



WINTER WORK SITE SAFETY

With the arrival of winter comes the possibility of frigid temperatures, ice, and snow, and employers and workers must show extra diligence to safe working conditions.



When possible, indoor and outdoor work should be managed accordingly to avoid hazardous winter conditions. Stairs and walkways should be salted and sanded, taking care to do so on a daily basis as ice melts and refreezes overnight. Avoid piling snow too high on the work site to prevent collapse. Workers should take extra care and avoid taking unnecessary risks when going to and from their work areas. Work zones should be clearly marked. Workers should wear appropriate PPE and follow safe work practices to protect against the elements.