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Forestall Steam System Outages

Understand your temporary boiler requirements and plan ahead to minimize downtime

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Steam plays a prominent role in many chemical, manufacturing, refining and other industrial processes. When a boiler goes down, companies can be faced with a potential loss of hundreds to thousands of dollars for each minute of lost production time.

The best time to plan for an emergency is before one arises. Although many plants operate 24 hours per day,



seven days a week, without interruption, the likelihood of requiring a temporary steam plant at some point in time is 100%.

Many factors in steam plant operation determine the reliability and availability of steam supply. A temporary steam plant can be required for a number of reasons, including emergency repair, planned maintenance, increased capacity requirements, equipment retrofits and even research and development projects. It is important to be prepared for all possibilities, planned or unplanned, that can cause a production disruption.

Plan ahead and follow this guide when preparing for a temporary steam plant rental.

KNOW WHAT'S AVAILABLE

Take a moment and imagine one or all of your facility boilers has to be taken out of service unexpectedly. What steam capacity would be required to continue positive production? Whatever the amount, that is your sweet spot and the minimum capacity that you should plan for when sizing your emergency boiler. You need to determine the capacity requirement (lb/hr or hp) ahead of time and provide it to the supplier for proper rental boiler selection.

Most dedicated rental companies have boilers in a range of sizes and configurations. The three major types of rental boilers on the market are:



INTERNAL VIEW OF MOBILE BOILER ROOM

Figure 1. This trailer-enclosed mobile boiler room contains a fire tube boiler and all necessary auxiliary equipment.

- **mobile steam plants/mobile boiler rooms** (Figure 1) that consist of a fire tube boiler and all necessary auxiliary equipment, mounted on a trailer or in an enclosed, semi-trailer van.
- **trailer-mounted boilers** (Figure 2), typically water tube, mounted to a dedicated trailer for mobility.



TRAILER MOUNTED BOILERS

Figure 2. The typical configuration of an open-trailer mobile steam plant consists of a water tube mounted to a trailer for mobility.

- **skid-mounted boilers** (Figure 3), both fire tube and water tube, which require cranes for offloading and placing at the jobsite.

Generally, fire tube rental boilers range in size from 50 to 1,000 hp, while water tube rental boilers are larger, ranging from 30,000 to 250,000 lb/hr. In addition, water tube rental boilers (Figure 4) can be built to supply either saturated or superheated steam. You often can rent multiple boilers in parallel to meet your desired capacity if one unit is not sufficient (Figure 5).

Most rental boiler systems will consist of the following items: boiler, burner, combustion controls, safety valves, forced-draft fan and motor with starter, blowdown valves, feedwater stop and check valves, feedwater controls, steam gauge and other trim, flame safeguard system, nonreturn valve and trailer (unless skid-mounted). The customer



SKID-MOUNTED UNITS

Figure 3. Installing these two high-pressure, skid-mounted deaerators rental units required cranes for offloading and placing at the jobsite.



WATER TUBE BOILER

Figure 4. This 200,000-lb/hr package water tube boiler is ready for a long-term rental overseas.

or installer furnishes the piping and other items required for installation.

NOTE YOUR OPERATING REQUIREMENTS

The supplier also will need to know operating pressure, fuel source and available power to provide the correct equipment for your process.

Most rental boilers can fire on natural gas, #2 oil or propane. Burners often can be configured to run on refinery and other fuels, as well, but also consider increases in emissions and other operational effects.

Be sure to note your power requirements to ensure you have enough supply for the rental boiler. Rental boiler systems commonly are configured with a 480-V single-point connection.

Your supplier also will ask about:

- **Steam temperature:** Does your process require saturated or superheated steam?
- **Available gas pressure:** Your supplier can provide a stand-alone gas regulator if the incoming pressure is higher than that required of the rental boiler.
- **Water source and treatment plan:** Suppliers need to ensure that the water going into the boiler has been treated properly to avoid damage to the internals.

DO YOU NEED AUXILIARY RENTAL EQUIPMENT?

Water treatment is vital to the life of a boiler, be it a permanent system installed in your facility or a temporary boiler that eventually will be removed.

If your support equipment is down or is in a location distant to the rental boiler, you



MULTIPLE BOILERS INSTALLED IN PARALLEL

Figure 5. Five 75,000 lb/hr trailer-mounted superheated steam boilers with Urea-based CataStak selective catalytic reduction systems are installed in parallel.



FEEDWATER TRAILER

Figure 6. This application required temporary installation of two 82,500-lb/hr boilers and a mobile feedwater trailer.

should inquire about additional equipment rentals to complete the steam plant. Most companies maintain ancillary equipment to support their rental boiler fleets. This rental inventory might include mobile feedwater trailers (Figure 6), high-pressure deaerators, water softening systems, blowdown heat recovery units, selective catalytic reduction (SCR) systems and economizers.

Working with a company that maintains both rental boilers and support equipment will ensure that you have a plethora of options when equipment is down.

FIND A PLACE TO SPOT THE BOILER

The temporary boiler's location should be easily accessible to all required utility connections (water, fuel and power) and able to support the boiler's weight. Compare site and equipment dimensions and watch for obstructions that can hinder the rental boiler's entry. Keep in mind that a

skid-mounted boiler rental unit may require a special foundation in addition to crane handling and special rigging.

FACTOR IN TRAVEL TIME

Shipping large equipment can take time, so be sure to factor in the length of time it will take to ship the equipment to your facility. Some suppliers offer pre-permitted trailer-mounted boilers for shipment; however, every state has different permitting requirements. Loose items such as gas regulators, economizers and auxiliary equipment may require a separate flat bed for shipment.

Finding a supplier with multiple storage locations for its rental equipment



WEATHERPROOF ENCLOSURE

Figure 7. This package water tube rental boiler includes a temporary enclosure for temperature conditions at or below freezing.



NOX COMPLIANCE

Figure 8. This application required temporary installation of one trailer-mounted package water tube boiler and CataStak SCR system for sub 5ppm NOx compliance.

can minimize transportation costs and travel time.

BOILER MAINTENANCE AND WEATHERPROOFING

To ensure continuous, safe and trouble-free performance, daily checks and routine maintenance must be performed during the rental equipment's normal operation. This includes inspection of all safety devices and low-water cutoffs during every shift. Feed-water treatment and blowdown services also must be performed to ensure proper boiler performance.

If you live in an area with freezing temperatures, prepare to weatherproof your rental

boiler (Figure 7). If you don't, be aware that you will be responsible for any repairs freeze damage causes. The rental boiler supplier should be able to provide you with maintenance instructions as well as freeze protection recommendations before your rental.

FIND A LOCAL CONTRACTOR FOR INSTALLATION

Boiler rental companies provide the rental equipment but typically do not install it. Find a local reputable contractor with boiler installation experience to install your rental equipment. The rental company will supply detailed drawings and data to aid the installation.

LEARN LOCAL CODES AND PERMITTING REQUIREMENTS

Both construction and air permits are required by every state before installing a rental boiler, and the requirements differ by state. Check with your local permitting offices and get the equipment permitted before taking delivery on your rental boilers. Some permits take months to process.

If your emissions requirements are 15 ppm NO_x or less, look for a supplier who can offer an SCR system rental or an ultra-low NO_x boiler (Figure 8). If an SCR system is required, and your company is opposed to the use of ammonia, find a supplier that maintains a fleet of both ammonia- and urea-based SCR rental systems.

BE AWARE OF VENDOR VS. CUSTOMER RESPONSIBILITIES

In addition to finding an installing contractor and obtaining permits, the customer is responsible for providing piping and utilities, determining emissions and other site requirements and installing freeze protection as needed. The rental boiler company generally will require a signed rental agreement, purchase order, deposit and proof of insurance coverage before delivery takes place. A well-written rental agreement will carefully outline customer responsibilities and liabilities.

Most rental boiler suppliers provide additional services for their customers as needed — rental equipment engineering services, accessories, drawings and specifications, shipping arrangements, operation and maintenance manuals, start-up technicians, operator training and full-time operators.

DO YOUR RESEARCH

Choosing a reputable and reliable rental boiler supplier may be the most important step in this process. Decision-makers should take some time to research suppliers that maintain their own fleet of mobile steam boilers specifically for temporary use. Furthermore, taking the time to visit your chosen supplier can provide valuable intel on its equipment, capabilities and quality of workmanship.

Last, be sure to consider whether the company is a full-time, dedicated rental

company with experience, reliable equipment and the capabilities to handle your project. Be cautious of firms that claim to be reliable and offer low-market pricing.

The preparation time required to create a contingency plan is minimal when

compared to the possible production, time and money lost when an emergency arises. As the saying goes, hope for the best but plan for the worst. It will be well worth it in the long run. ●

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