

# Preparing for temporary steam outages with rental boiler equipment

Understand your options and plan for contingencies now – before an emergency arises.

Chelsey Ryker Carvalho, Marketing Manager, Nationwide Boiler Inc.



Courtesy Nationwide Boiler.

Installation of six 75,000-lb/hr trailer-mounted package watertube rental boilers.

The rental boiler industry emerged more than 50 years ago, and since then the practice of renting temporary steam and hot water boilers has become commonplace in the United States and beyond.

The three most common reasons that companies and institutions rent boilers are (1) to substitute for a permanent boiler during periods of extended maintenance, (2) to meet peak season or peak load requirements and (3) to solve emergency boiler system outages caused by accidents or acts of nature. Although these three situations account for a large majority of rental boiler uses, occasional other needs can occur due to failed inspections, utility companies or other “next door” steam providers failing to provide continuous supplies, and short-term requirements such as research and development programs.

To be ready for any of these scenarios, steam system owners and operators may find it helpful to review what types of temporary boiler equipment are

available – from a single boiler to a full steam plant – and how to prepare for a rental.

## THE RENTAL BOILER INDUSTRY

Prior to the first trailer-mounted boiler being developed and put into service, temporary steam supply was sourced from steam locomotives or “jury-rigging” obsolete boilers that had been scrapped. None of these early systems was efficient or easy to get to a job site.

Pioneered by Nationwide Boiler Inc., trailer-mounted boilers brought a solution to all of these problems. It began with two 20,000-lb/hr, 300-psi design package boilers mounted on special-design, highway-legal trailers. This concept eliminated the need for cranes to load and off-load, in most cases, as well as the need for special highway permits. Because the boilers were trailer-mounted, delivery times were cut dramatically and response time improved from weeks to as little as 24 hours from the time of dispatch to being brought on line.

Since the introduction of the first trailer-mounted boilers, the rental boiler industry has grown to include a variety of equipment types and a wide range of steam capacities and operating parameters. Ranging in size from about 50 HP (smallest firetube) to 250,000 lb/hr (largest watertube), rental boilers typically come in any of the three following types (see sidebar): (1) trailer-mounted firetube and watertube boilers, (2) skid-mounted firetube and watertube boilers and (3) complete mobile steam plants (enclosed and open-trailer systems). Boiler support equipment, such as mobile feedwater vans, is also available for use in conjunction with a rental boiler.

Generally speaking, firetube rental boilers range in size from 50 to 1,000 HP while watertube rental boilers are offered in larger capacities up to 250,000 lb/hr. The largest single trailer-mounted boiler today is a 125,000-lb/hr package watertube boiler. For larger steam demands that may not be met with just

one boiler, multiple units can be rented and installed in parallel.

If existing auxiliaries are available for use with the temporary rental unit, a boiler-only option will be sufficient. However, a complete mobile steam plant can be provided when necessary. Along with the boiler system, a mobile steam plant will include all auxiliaries necessary to produce steam.

In addition to rental boilers and mobile steam plants, specific auxiliary equipment rentals are available to fill voids in the boiler room when additional

### Standard rental boiler equipment

#### For temporary steam requirements

##### Trailer-mounted boilers

- permanently mounted to highway-legal trailers for mobility
- firetube or watertube boilers
- typically up to 125,000 lb/hr
- saturated or superheated steam

##### Skid-mounted boilers

- package boilers mounted on a skid, not mobile
- may require cranes and rigging for on-/off-loading
- firetube, watertube or electric steam boilers
- typically up to 250,000 lb/hr
- saturated or superheated steam

##### Mobile steam plants

- complete steam plant systems, enclosed or open-trailer
- permanently mounted on highway-legal trailers for mobility
- typically include firetube boilers up to 1,000 HP
- also include a feedwater system, water softener and blowdown separator

##### Mobile feedwater vans

- complete feedwater treatment systems, often rented in conjunction with a rental boiler
- equipment installed inside a highway-legal, semi-van trailer for mobility
- typically include a feedwater system, feedwater pumps, water softener and chemical feed system
- other auxiliary equipment options also available

requirements need to be met, or if other equipment goes down for maintenance, is being replaced or unexpectedly fails. This includes water treatment equipment (feedwater systems, deaerators, water softeners or complete mobile feedwater vans), efficiency-enhancing equipment, emissions control equipment and other various types of equipment like gas pressure regulators, blowdown separators and more.

### PREPARING FOR A RENTAL BOILER

The most efficient way to prepare for the eventual use of a temporary steam plant is to incorporate into the initial facility design those features and capabilities that will facilitate installation of a temporary unit. Although these accommodations may add a small amount to the initial facility cost, engineers, architects, facility designers and consultants have found that such investments are extremely cost-effective and the costs are frequently recovered the first time a rental unit is required.

#### THE MOST EFFICIENT WAY TO PREPARE FOR EVENTUAL TEMPORARY STEAM PLANT USE IS TO INCORPORATE IT INTO INITIAL FACILITY DESIGN.

While it is ideal, contingency planning in the design has not been done for many existing facilities, and the following steps can be taken at any point in time. It is recommended, however, that facilities produce a contingency plan – possibly with the assistance of a qualified boiler rental firm or consultant – that considers these factors before an emergency arises:

#### 1. Understand your operating parameters – steam capacity needs, steam temperature and operating pressure.

The anticipated worst-case steam load that would be required for a temporary steam plant should be defined. This is not always the same size as the permanent plant; sometimes a lower-capacity unit can cover the heating or production needs for the limited time that a temporary rental would be necessary.

#### 2. Know the details around your fuel supply.

Typically, rental boilers fire

on natural gas, No. 2 oil or propane. Gas-fired equipment will likely have a specific range requirement for the incoming fuel supply pressure. If renters cannot meet the supply pressure requirement, a gas regulator can often be included at an additional cost.

It is not uncommon to come across facilities where the primary fuel supply available cannot meet the needs of the rental boiler. Depending on the situation, this can be due to inaccessibility, issues with the operation of or maintenance work on the fuel system, or simply insufficient fuel capacity to supply both the existing equipment and the temporary unit. In these scenarios, a temporary gas line can be installed, or rental fuel tanks can be sourced. End users must consider and understand the implications of fuel supply when preparing for a temporary steam plant.

### 3. Analyze facility access and identify/prepare the best location for installing the rental equipment.

The installation location should be a level surface with adequate space around all sides of the equipment to permit personnel and equipment access. The foundation and its ability to support heavy equipment must also be con-



A mobile boiler room typically includes the boiler/burner package, atmospheric feedwater system, water softener, chemical feed system, blowdown separator and motor control panel.

sidered when installing large rental boilers. While paved areas are ideal, trailer-mounted boilers can also be positioned on level, unpaved areas, but they must always be blocked and leveled upon arrival.

If possible, the installation location selected should be adjacent to the steam main and in an area where connecting the temporary unit to the steam main can be done with minimum difficulty. Furthermore, to simplify hookup, a steam line can be installed through which the temporary boiler may be tied into the permanent steam header. This steam line would need to be outfitted with the appropriate isolation valves.

**4. Install stub outs for the steam main, feedwater supply lines, fuel supply lines and electrical power distribution in convenient and accessible locations to make installation easier.**

If planned for ahead of time during the facility design, the most conservative approach would be to size fuel lines for a worst-case scenario.

If natural gas is the fuel to be used, adequate pressure, flow regulators and safety valves also need to be installed. Additionally, water lines for makeup water and a power distribu-

tion panel with a sufficient amount of power at appropriate voltages and current capacity should be installed adjacent to the rental boiler site.

**5. Consider taking additional important steps to be ready in advance.** This includes

- listing the local regulatory agencies and individuals that would have to be contacted to issue the necessary installation and operating permits;
- obtaining installation drawings that show the placement and hookup of the equipment;
- selecting a qualified local contractor to handle installation, as needed; and
- working through hypothetical boiler rental scenarios and logistics – including identifying suitable equipment options and any special tools or handling equipment required during installation or startup.

**RENTAL PROCESS AND CUSTOMER RESPONSIBILITIES**

There are many things that can be done to make bringing a rental unit on line quick and less costly, and one key component is understanding the rental process and customer versus supplier responsibilities. A signed rental agreement, purchase order, deposit and proof

of insurance coverage are standard items that are required before the equipment is delivered. A well-written rental agreement will carefully outline customer responsibilities and liabilities.

**UNDERSTANDING CUSTOMER VERSUS SUPPLIER RESPONSIBILITIES CAN HELP MAKE THE RENTAL PROCESS QUICK AND LESS COSTLY.**

As a standard practice, most rental companies will provide a service technician to bring the unit on line and train the plant operators, but the installation, piping and utilities are the responsibility of the customer. The renter will also be responsible for boiler maintenance and weatherproofing to ensure continuous, safe and trouble-free performance throughout the term of the rental. That said, most rental boiler suppliers can provide additional services for their customers, including engineering services, accessories, drawings and specifications, shipping arrangements, operation and maintenance manuals, and, if needed, full-time steam plant operators.

Another standard practice in the rental industry is that the rental period begins when the unit leaves the rental



Courtesy Nationwide Boiler Inc.

Feedwater pumps inside a mobile feedwater van also equipped with deaerator, water softener, chemical feed system and motor control panel.



Courtesy Nationwide Boiler Inc.

Interior of a mobile feedwater van, the auxiliary equipment often rented with boiler systems.

boiler storage facility and ends upon return to the storage facility. This is an important cost and time factor to consider. Unfortunately, all too often the company receiving the rental equipment is not ready to hook up the boiler upon arrival. If the site is not ready for installation and the boiler sits for weeks to months without being used, the rental cost will continue to accrue. With a reasonable amount of planning, a critical-path timeline can be developed among all parties involved in boiler installation, startup and operation. This extra planning will minimize idle time and unnecessary rental charges.

Communication between the supplier, customer and any involved third-party companies is also key to avoiding costly mistakes. Key personnel who will be responsible for operating and maintaining the boiler should be selected, and their availability should be ensured for the time when the startup technician arrives. Whenever possible, a method to operate the boiler at full-load conditions

should be provided during the startup phase.

Finally, to expedite timing and minimize the cost associated with startup, the rental boiler company should provide drawings and documentation regarding the operation and maintenance of the rental equipment before it arrives. This will give operators a chance to review the equipment design and understand the requirements of operation.

### EVALUATION AND SELECTION

Whether in the early planning stages of renting a boiler or when seeking a fast solution to an emergency situation, renters can take a number of precautionary steps during the selection process. They should thoroughly evaluate the proposal, the equipment and even the supplier to ensure there are no surprises throughout the term of the rental.

The principal factors one should consider when evaluating a rental boiler proposal are much the same as for any major equipment purchase. What equip-

ment is the boiler rental company going to provide? What will the charges be, and what are the terms of the contract? What is covered in the rental rate, and what scope are you responsible for? All of these are questions that any astute contract negotiator would logically ask.

Understanding the equipment offered is also an important step in the evaluation process. The best way to know what you are renting is to visit the supplier and visually inspect the unit. Be sure to consider all aspects of the boiler upon review: equipment condition, steam capacity, operating pressure and fuel requirements, whether the equipment is built for outdoor operation and even the compatibility of any auxiliaries being offered.

Choose a company with a purpose-built fleet of rental boilers, designed with complementary components to avoid system incompatibilities. These units are often trailer-mounted, as described above, and completely mobile to provide substantial savings in terms

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of time and money. Since many surplus boilers become available each year, it is not unusual for companies to purchase, refurbish and offer these units for rent. Some are essentially an accumulation of salvaged parts that have been assembled and called a rental boiler.

Furthermore, renters should look at the supplier's reputation in the industry, whether it is a full-time boiler rental firm with the required experience and capabilities, its equipment storage locations, and local sales and service representation. Do your research and speak with others in your industry who have gone through the rental process. Reputable boiler rental firms will be able to provide a customer reference list, and you can often find someone in the same or related industry who will understand your needs.

The last recommendation when evaluating a boiler rental company is to visit its facility. Observing the work in progress can provide good insight into the quality of the equipment and ser-

vice the company is accustomed to providing.

#### PLAN AHEAD AND BE READY

Ultimately, if your plant relies on steam as an essential part of your facility and/or process, there is a good chance you will someday need a temporary steam plant. As the saying goes, hope for the best but plan for the worst. Having a contingency plan in place will be well worth it in the long run. 



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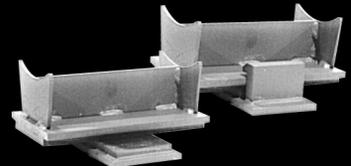
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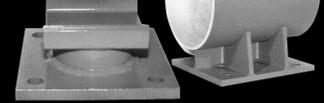
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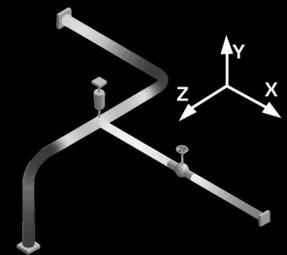
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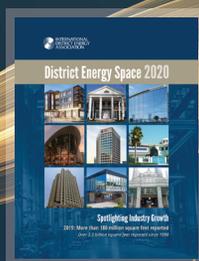
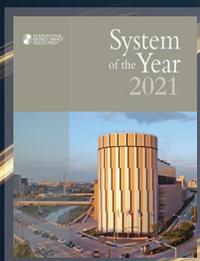


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