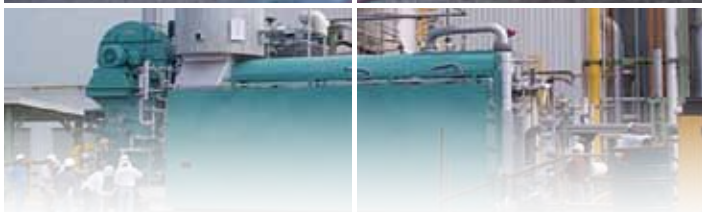


Guidelines for Preparing for a Temporary Steam Plant



TRAILER-MOUNTED BOILERS • SKID MOUNTED BOILERS • MOBILE BOILER ROOMS • MOBILE FEEDWATER VANS • MOBILE STEAM PLANTS



Emergency Preparedness Plan



Table of Contents

1.0 Introduction	3
2.0 Boiler Requirements	4
3.0 Boiler Size & Weight	4
4.0 Basic Equipment to be Supplied with the Rental Boiler	5
5.0 Fuels	5
6.0 Power Requirements	5
7.0 Piping Sizes	6
8.0 Instrument Air	6
9.0 Weather Protection	6
10.0 Local Codes	7
11.0 Piping Diagram	7
12.0 Rental Boiler Specifications	8

Guidelines For Preparing For A Temporary Steam Plant (Emergency Preparedness Plan)

1.0 Introduction

When operating a steam plant, there are many factors which determine the reliability and availability of a steam supply. Whether the steam is used to power a system or as a part of a process, mechanical engineers and power plant operators know that, in the majority of installations, management expects the system to run 24 hours per day throughout the year. Real-world conditions often make this impossible.

Frequently, there is a need for a temporary steam plant to replace or augment the permanent system for one of the following reasons:

- Unplanned outages for emergency repair
- Planned outages for repair, maintenance or upgrades
- Increased capacity requirements to handle peak loads
- Testing of a new process or production run
- Research and development projects
- Delays in bringing new systems on line

Although management expects steam plants to operate without interruption, as well as to meet new and changing requirements, the likelihood that one of the above listed factors will affect any steam plant operation in one year's time is 100 percent! Furthermore, the probability that some part of a steam plant will cause an interruption in service at least once during any year is about 20 percent.

One way to greatly improve the chances that your system will be able to supply steam reliably and without interruption is by planning for installation of a temporary steam plant. Typically, this means making adequate provisions for quickly installing a rental boiler and auxiliary equipment. Steam plant equipment that can be rented for both short- and long-term periods include:

- Boilers
- Deaerators
- Demineralizers, water softeners, chemical feed systems
- EconoStak economizers
- CataStak™ SCR systems
- Feedwater pumps
- Fuel oil heater sets
- Blowdown tanks
- Diesel generators
- Air compressors
- Valves
- Controls

The best time to plan for installing a temporary steam plant is before the need actually arises. Including provisions for a temporary steam plant can be very cost effective if accomplished when building a new facility, or when making changes to upgrade your current power boiler or steam plant. Such provisions can be as simple as installing additional connections for steam, water, fuel and power.

2.0 Boiler Requirements

There are three different types of boilers that are available for rent:

Type 1. Mobile boiler rooms consisting of a complete system with firetube boiler and auxiliaries mounted in a semi-trailer van. Units are pre-piped and pre-wired.

Type 2. Trailer-mounted watertube boilers

Type 3. Skid-mounted package watertube or firetube boilers

The capacity and design pressures of these boilers are as follows:

CAPACITY	DESIGN PRESSURE	TYPE
100 hp (3,000 lb/hr)	150 psig, saturated	1
200 hp (6,000 lb/hr)	150 psig, saturated	1
350 hp (10,000 lb/hr)	200 psig, saturated	1
650 hp	250 psig, saturated	1
800 hp	200 psig, saturated	3
30,000 lb/hr	300 psig, saturated	2
40,000 lb/hr	600 psig, saturated	2
60,000 lb/hr	300 psig, saturated	2
75,000 lb/hr	350 psig, saturated or 750 psig/750 F	2
82,500 lb/hr	500 psig, saturated	3
82,500 lb/hr	350 psig, saturated	2
120,000 lb/hr	350 psig, saturated or 750 psig/750 F	2
180,000 lb/hr	400 psig, saturated	3
200,000 lb/hr	750 psig/750 F	3

Note: Multiple boilers can be used in parallel to meet a steam demand that is higher than the capacity of a single boiler.

3.0 Boiler Size & Weight

Temporary boilers require a firm foundation or footing. A concrete pad is the best support and asphalt is an acceptable alternative. At a minimum, a stable, well drained, compacted area is required with wood timbers sufficient to support the boiler's weight. The boiler must be blocked-up prior to operation. All weight must be removed from the running gear on trailer-mounted boilers.

CAPACITY	SHIPPING DIMENSIONS (W,H,L)	SHIPPING WEIGHT	OPERATING WEIGHT
100 hp	8'0" x 14'0" x 30'0"	30,000 lbs	45,000 lbs
200-300 hp	8'0" x 14'0" x 30'0"	45,000 lbs	60,000 lbs
350-600 hp	8'0" x 14'0" x 30'0"	50,000 lbs	65,000 lbs
20-40,000 lb/hr	10'0" x 14'0" x 50'0"	60,000 lbs	80,000 lbs
40-60,000 lb/hr	10'0" x 14'0" x 50'0"	80,000 lbs	100,000 lbs
75-100,000 lb/hr	12'0" x 14'0" x 30'0"	100,000 lbs	125,000 lbs
150,000 lb/hr	10'0" x 16'0" x 40'0"	130,000 lbs	160,000 lbs

4.0 Basic Equipment Supplied with a Rental Boiler

The following items are normally provided as a part of the complete rental boiler:

- Boiler
- Combustion controls
- Trailer
- Safety valves
- F.D. fan, motor and starter
- Blowdown valves
- Burner
- Feedwater stop and check valves
- Feedwater controls
- Steam gauge and other trim
- Flame safeguard system
- Non-return valve

All other equipment is normally furnished by the customer or installer.

5.0 Fuels

TYPE OF FUEL	SUPPLY PRESSURE
Natural gas	15 psig regulated
No. 2 fuel oil	150 psig regulated
No. 6 fuel oil	150 psig regulated and heated to 220 F (approx.)

To determine the amount of fuel required:

Natural gas: Boiler size: _____ lb/hr X 1.28 = _____ SCFH

No. 2 fuel oil: Boiler size: _____ lb/hr X 0.0095 = _____ GPH

No. 6 fuel oil: Boiler size: _____ lb/hr X 0.009 = _____ GPH

NOTE: Hp X 34.5 = _____ lb/hr

6.0 Power Requirements

CAPACITY	POWER (480VAC, 3-PHASE, 60HZ)
5-10,000 lb/hr	50 Amps
10-20,000 lb/hr	75 Amps
20-40,000 lb/hr	100 Amps
40-65,000 lb/hr	150 Amps
65-100,000 lb/hr	200 Amps
100-200,000 lb/hr	Consult Nationwide Boiler Inc.

A disconnect switch must be provided between the power source and the rental boiler. Install temporary conduit and wiring after the rental boiler arrives at the site.

7.0 Piping Size

150 PSI STEAM					
CAPACITY	STEAM LINE	FEED WATER	NATURAL GAS	FUEL OIL	BLOWDOWN/DRAIN
10,000 lb/hr	4"	1"	2"	3/4"	2"
20,000 lb/hr	6"	2"	2-1/2"	3/4"	2"
30,000 lb/hr	6"	2"	3"	3/4"	2"
40,000 lb/hr	8"	2"	3"	1"	2"
50,000 lb/hr	8"	3"	3"	1"	2"
60,000 lb/hr	8"	3"	3"	1-1/2"	2"
75,000 lb/hr	8"	3"	4"	1-1/2"	2"
100,000 lb/hr	10"	4"	6"	2"	2"
150,000 lb/hr	12"	4"	6"	2"	2"
200,000 lb/hr	14"	4"	6"	2"	2"

650 PSI STEAM					
CAPACITY	STEAM LINE	FEED WATER	NATURAL GAS	FUEL OIL	BLOWDOWN/DRAIN
30,000 lb/hr	4"	2"	3"	3/4"	2"
40,000 lb/hr	6"	2"	3"	1"	2"
50,000 lb/hr	6"	3"	3"	1"	2"
60,000 lb/hr	6"	3"	3"	1-1/2"	2"
75,000 lb/hr	8"	3"	4"	1-1/2"	2"
100,000 lb/hr	8"	4"	6"	2"	2"
150,000 lb/hr	10"	4"	6"	2"	2"
200,000 lb/hr	10"	4"	6"	2"	2"

All connections 1-1/2" and larger should be flanged.

All piping should be ASTM A-106 GrB or A53 GrB, SCH 80 or equivalent.

8.0 Instrument Air

On larger boilers, instrument air is required to drive the dampers, combustion controls, valves and regulators. Generally this requires a supply of 1-2.5 SCFM of dry, clean instrument air, supplied at 80-100 psig and regulated to 20-25 psig.

9.0 Weather Protection

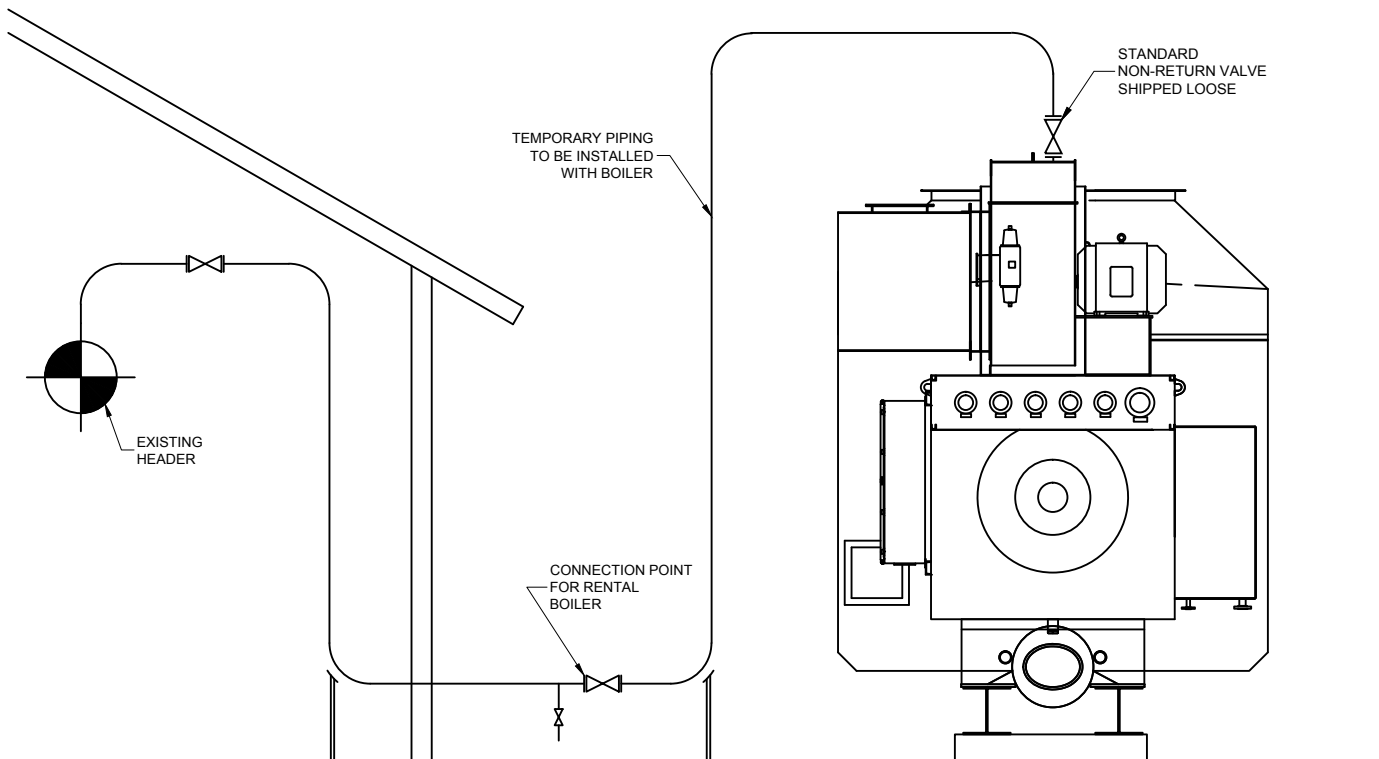
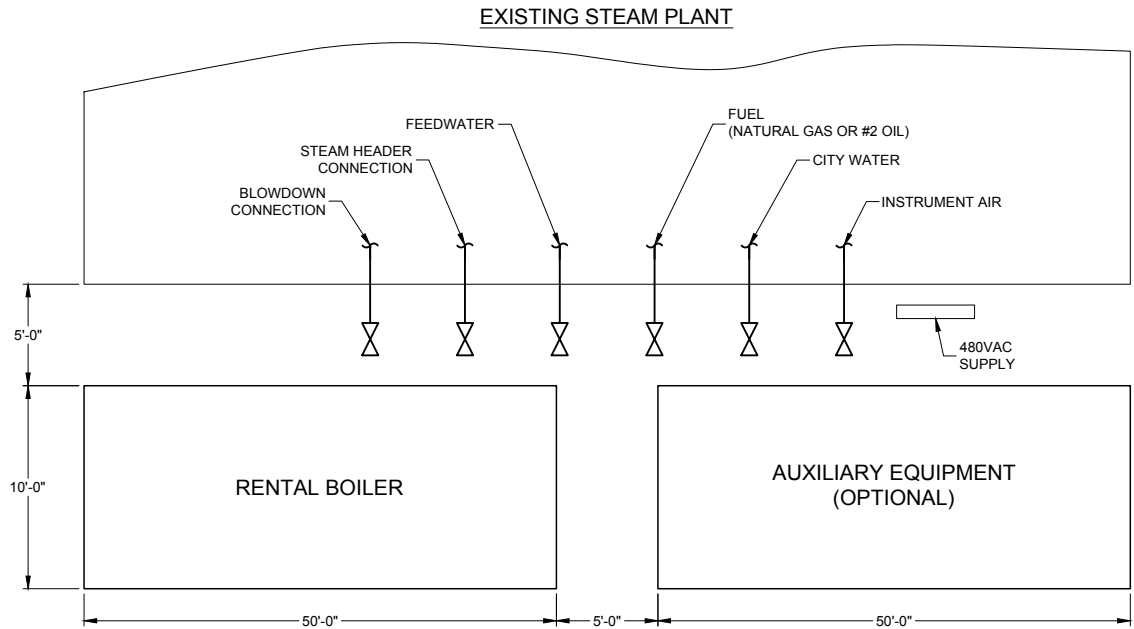
Generally, all rental boilers are equipped with weather protection. However, if low temperatures are expected, provisions should be made to protect the boiler from freezing. A shelter in front of and around the boiler should be considered for the comfort of the operating personnel during inclement weather.

10.0 Local Codes

Check local codes for stack height restrictions, emission limits, and other boiler installation requirements.

11.0 Piping Diagram

Temporary Steam Plant Typical Installation





12.0 Rental Boiler Specifications

When inquiring about a rental boiler, the following information is required by Nationwide Boiler. Rental inquiries can be made online by visiting www.nationwideboiler.com and completing the Nationwide Boiler Rental Inquiry Form or by calling the Nationwide Boiler toll free phone number: **1-800-227-1966**. In most instances, Nationwide Boiler can provide a quotation within 1 hour.

CONTACT INFORMATION

Name / Title: _____

Company: _____

Address: _____

City / State / Zip: _____

Phone: _____

E-Mail: _____

BOILER REQUIREMENTS

Steam pressure – design _____ psig

Steam temperature _____ °F

Steam pressure – operating _____ psig

Steam capacity _____ lb/hr

Fuel: Natural gas _____ No. 2 fuel oil _____ No. 6 fuel oil _____

Emission data (if available): NOx ppm _____ CO ppm _____

Electrical power available: _____ Amps @ 480VAC, 3-phase, 60Hz

AUXILIARY EQUIPMENT

EconoStak economizer

CataStak™ SCR system

Deaerator

Feedwater pump

Demineralizer or water softener

Chemical feeder

Blowdown tank

Other (please describe): _____

Required Delivery Date: _____

Required Rental Period: _____

Reason for Need: _____



“...Integrity, Dependability,
Real Customer Service.”

Nationwide Boiler Incorporated

Corporate Headquarters

42400 Christy Street, Fremont, CA 94538

Phone: **1-800-227-1966**, 1-510-490-7100 | Fax: 1-510-490-0571

Web: www.nationwideboiler.com | Email: info@nationwideboiler.com

Sales Offices

Major cities throughout the world