

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



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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
- Water Softeners & Chemical Feed Systems
- EconoStak Economizers
- CataStak™ SCR Systems
- DataStak™ Emissions Monitoring
- Blowdown Tanks
- Blowdown Heat Recovery Systems
- Gas Regulators
- Propane Vaporizers
- Feedwater pumps
- Fuel Oil Sets
- Gas Flow Meters
- Heat Exchangers
- Valves
- Additional Boiler Stack
- Spare Parts Packages

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 four 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. Mobile boilers consisting of a package boiler and blowdown tank, mounted inside a container and on a chassis for mobility.

Type 3. Trailer-mounted package watertube boilers.

Type 4. Skid-mounted package watertube or firetube boilers.

CAPACITY	DESIGN PRESSURE	TYPE
50 hp (1,725 lb/hr)	150 psig, saturated	1
80-100 hp (3,000 lb/hr)	150 psig, saturated	1
200-350 hp (6-10,000 lb/hr)	150 psig or 200 psig, saturated	1
500 hp (17,250 lb/hr)	250 psig, saturated	1, 2
650 hp (22,425 lb/hr)	250 psig, saturated	1, 4
800 hp (27,600 lb/hr)	250 psig, saturated	1, 2
1,000 hp (34,500 lb/hr)	299 psig, saturated	1
30,000 lb/hr	300 psig, saturated	3
40,000 lb/hr	750 psig, saturated	3
70,000 lb/hr	300 psig or 400 psig, saturated	3
75,000 lb/hr	350 psig or 750 psig, saturated	3
75,000 lb/hr	750 psig, 750F superheat	3
82,500 lb/hr	350 psig, saturated	3
110,000 lb/hr	750 psig, 750F superheat	3
125,000 lb/hr	750 psig, saturated	3
150,000 lb/hr	500 psig, saturated	4
200,000 lb/hr	750 psig, 750F superheat	4

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

MOBILE BOILER CAPACITIES	APPROX. SHIPPING DIMENSIONS (L, W, H)	APPROX. SHIPPING WEIGHT	APPROX. OPERATING WEIGHT	TYPE
50 hp	20'0" x 8'0" x 8'6"	20,000 lbs	25,000 lbs	1
80-100 hp	30'0" x 8'6" x 13'0"	30,000 lbs	45,000 lbs	1
200-350 hp	50'0" x 8'6" x 13'8"	60,000 lbs	80,000 lbs	1
500-800 hp	53'0" x 8'6" x 13'8"	85,000 lbs	100,000 lbs	1
1,000 hp	54'0" x 8'6" x 13'8"	100,000 lbs	130,000 lbs	1
30-60,000 lb/hr	55'0" x 10'0" x 14'0"	80,000 lbs	100,000 lbs	3
70-82,500 lb/hr	50'0" x 10'7" x 14'0"	100,000 lbs	125,000 lbs	3
75,000 lb/hr	75'0" x 10'0" x 14'0"	140,000 lbs	180,000 lbs	3
110-125,000 lb/hr	95'0" x 12'0" x 14'5"	220,000 lbs	200,000 lbs	3

4.0 Standard 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
- FD 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

Additional auxiliary equipment such as a deaerator, water softener, economizer, or SCR can be supplied as needed. Installing hardware (nuts, bolts, gaskets, etc.) is normally furnished by the customer or installer.

5.0 Fuels

TYPE OF FUEL	TYPICAL SUPPLY PRESSURE
Natural gas	15 psig regulated
No. 2 fuel oil	150 psig regulated
Propane	15 psi regulated

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

Propane: Boiler size: _____ lb/hr X 0.512 = _____ GPH

NOTE: Hp X 34.5 = _____ lb/hr

6.0 Power Requirements

BOILER ONLY CAPACITY	TYPICAL POWER REQUIREMENTS (480VAC, 3-PHASE, 60HZ)
1-10,000 lb/hr	25 - 50 Amps
10-20,000 lb/hr	50 - 75 Amps
20-40,000 lb/hr	75 - 100 Amps
40-65,000 lb/hr	100 - 150 Amps
65-100,000 lb/hr	200 - 250 Amps
100-200,000 lb/hr	Consult Nationwide Boiler Inc.

MOBILE STEAM PLANT CAPACITY	TYPICAL POWER REQUIREMENTS (480VAC, 3-PHASE, 60HZ)
1-4,000 lb/hr	50 - 100 Amps
5-10,000 lb/hr	100 - 150 Amps
10-20,000 lb/hr	150 - 200 Amps
20-35,000 lb/hr	200 - 250 Amps

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

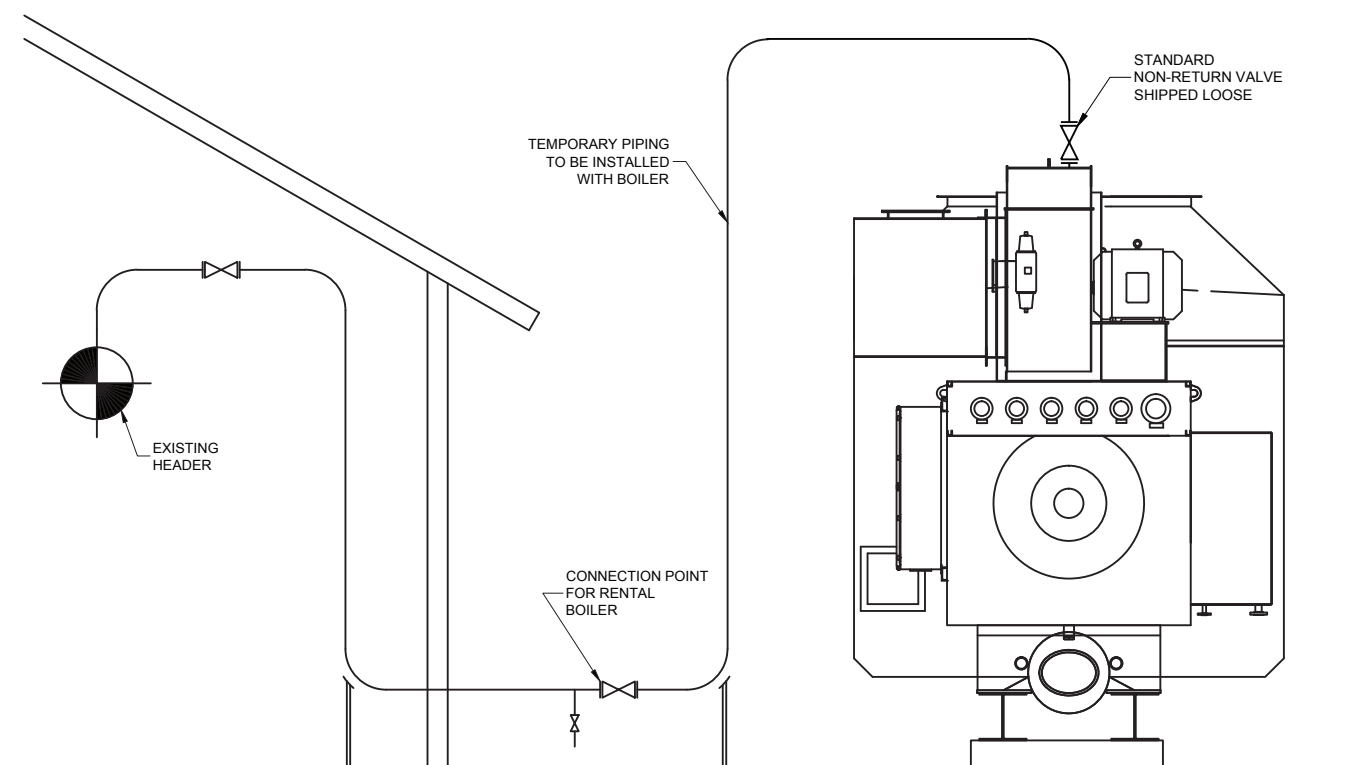
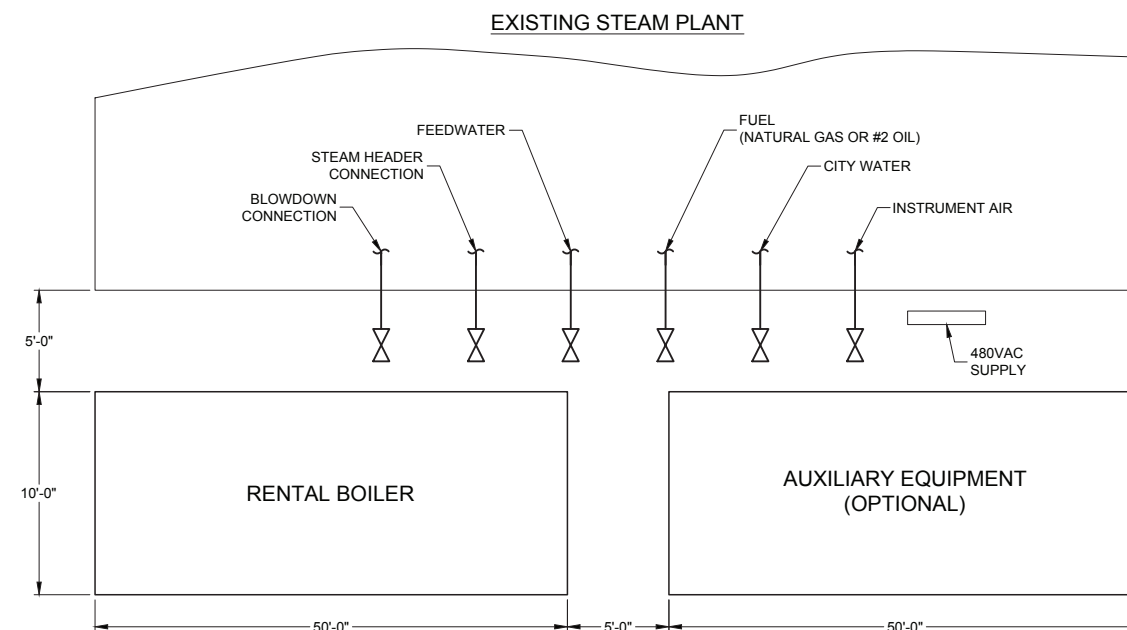
Generally, all rental boilers are equipped with weather protection. However, if low temperatures are expected, provisions should be made to protect the boiler from freezing. A shelter in front of and around the boiler should be considered for the comfort of the operating personnel during inclement weather.

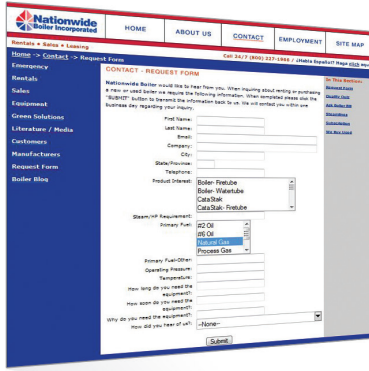
10.0 Local Codes & Permits

Check local codes for stack height restrictions, emission limits, and other boiler installation requirements. Site specific air and operating permits will be required as well. Check with your local jurisdiction for additional information. Nationwide can assist with the process.

11.0 Piping Diagram

Temporary Steam Plant Typical Installation





12.0 Rental Boiler Specifications

The form below includes the usual information required by Nationwide Boiler to accurately quote your rental project. Inquires can be made online by visiting www.nationwideboiler.com and completing the Quick Quote Form, or by calling Nationwide Boiler's toll free phone number at 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 _____ Propane _____

Emission Requirements: NOx ppm _____ CO ppm _____

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

AUXILIARY EQUIPMENT

EconoStak Economizer

CataStak™ SCR System

DataStak™ Emissions Monitoring System

Deaerating Feedsystem Propane Vaporizer

Water Softener Gas Regulator

Chemical Feed System Gas Flow Meter

Blowdown Tank Blowdown Heat Recovery System

Other (please describe): _____

Required Delivery Date: _____

Required Rental Duration: _____

Reason for Need: _____



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