

More PLANT PROBLEMS

TIGHTEN NUTS with full pressure on the boiler. I've never felt it was unsafe. If gasket leaks badly, take boiler off line and allow it to cool. Drain enough water so manhole can be worked on.

Install a new gasket after cleaning bearing surfaces. We usually coat our gaskets with a mixture of cylinder oil and graphite. Seat gasket evenly all around and pull up nuts evenly. Start fire after filling boiler, and wait until there's full pressure in the drum. Then tighten nuts again.

C H ELBERT Irvington, N.J.

CLEAN BEARING SURFACES before renewing gaskets. This is the most important step in the job. Draw up nuts on all manholes after running hydrostatic test on boiler. Draw them up again when boiler pressure is close to normal. When boiler is out of service and not carrying pressure, you can draw up nuts again.

A A HUNNEWINKEL Woodstock, Ill.

RUN HYDROSTATIC TEST before firing boiler. Water pressure should be about one and one-half times normal steam pressure, temperature about 150 F. Tighten manhole nuts until all leaks stop.

After test, raise steam pressure slowly.

ly. Leave air cock on drum open until all air is purged, then close it. Manholes won't leak if you've tightened them correctly.

Taking up manhole nuts with hydrostatic pressure on boiler is safer than with steam because if anything blows you'll only get wet instead of scalded. It's the most sensible test.

Open air cock as soon as you shut down boiler. This prevents a vacuum in drum, which may cause leaks in piping valves and joints.

L E POLIKOFF Brooklyn, N.Y.
EDWARD DELNICK Brooklyn, N.Y.

SERIOUS ACCIDENT in our plant taught us that waiting until boiler had full line pressure was wrong. We now start taking up slack when boiler pressure is 25 psi, and continue at intervals of 50 psi until line pressure is reached.

FRED THOMSEN Milwaukee, Wis.

SOME ASBESTOS GASKETS shrink if stored for long periods. This changes contour. Stretch gaskets by hand before installing on manhole.

Check how much nut is pulled up by measuring stretch of manhole bolt. You can figure stretch needed or obtain it from a table of bolt properties. We make

our final pull-up with a few psi on the boiler and get good results.

G E BOYHAN New York, N.Y.

USE MIRROR to examine drum seal surface from outside. Smooth any burrs with emery cloth. Deep nicks require grinding of sealing surface with special equipment that allows grinding wheel to follow manhole contour.

Don't use gaskets more than once. Use dry graphite on both faces of a gasket to prevent sticking when manhole is removed. Pull up manhole when boiler is cold and as soon as leak appears after you start to raise steam on the boiler.

If no leaks appear, pull up nuts when boiler is at line pressure. There's no danger in this practice. F A have better results with spirally wound gaskets. Use them dry or as the manufacturer directs you.

J J GEIST Brooklyn, N.Y.

OTHER READERS send in answers, which we omitted because of lack of space. Here are the following:

A H MOULTON Pittsfield, Mass.

A J BRUGELMANS New York, N.Y.

YOUR TWO NEW PROBLEMS FOR FEBRUARY

1 What Causes Feed-Pump Vibration?

Our 4-stage boiler-feed pumps are designed to handle 650 gpm of 300-F water at 3400 rpm with 209-ft suction head and 1193-ft discharge head. Head developed by pumps was to be 984 ft.

First pump vibrates seriously at speeds between 2150 and 2200 rpm. Second unit developed same condition after running a short time. Third pump now does the same after running well for three years.

Balancing drum and shaft sleeves on No. 3 were badly worn when we opened it. Replacing

them hasn't done any good because pump still vibrates.

Our operating conditions are not the same as design values used. Suction head is 225 ft, discharge head 1035 ft.

What causes this vibration? How can we stop it now?—BP

2 How Many Men for Maintenance Work?

Within about a month our new industrial plant for manufacturing chemicals will be ready to begin production. It has close to 4000 electric motors ranging from fractional to 600-hp units.

Right now I am planning my

maintenance crew for electrical work. We will do all ordinary maintenance jobs, but will send out heavy coil-rewinding jobs.

Besides these motors we will have modern lighting throughout the plant, several elevators, complete alarm systems for process vessels and numerous automatic controls.

In planning my department I'd like some help from *Power* readers in choosing the number and type of men. How many foremen do we need? How many master electricians and helpers? What's the best way of finding number of men needed for each job?—KL

Don't miss next month's problems. Another chance to use your ingenuity

Will you help readers who sent us problems? Extra pay for photos or sketches

YOU'RE PLAGUED BY RETURN LINE CORROSION

THEN READ THIS...

As an engineer responsible for efficient, economical plant operation, you know only too well that corrosion of steam and condensate lines can send costs skyrocketing through pipe replacement, interrupted production, and increased labor and maintenance. Perhaps you, like many other engineers, have tried stop-gap methods to check the problem only to find them partially effective or far too costly.

Realizing the importance of this major industrial problem, Betz Laboratories has developed its patented filming amine treatment. Here, at last, is a simple, inexpensive, and practically 100% effective method of eliminating this costly and production-disrupting headache.

For example, a linoleum company, operating at 150 psi and producing 300,000 pounds of steam per day, employed sodium zeolite softening for a high bicarbonate raw water. The carbon dioxide content of the steam averaged 40 ppm. Continued maintenance was required due to failure of condensate lines from the steam kettles and unit heaters. After the film-

ing amine treatment was applied, maintenance records showed an annual saving of approximately \$8,000.00! And, a large part of this saving was obtained by eliminating weekend over-time work on pipe replacements.

Why not take the first step toward ridding your plant of corrosion now? Call in a Betz Engineer. Ask him to show you how Betz Specialized Water Conditioning Service can help you... quickly... economically... effectively. W. H. & L. D. BETZ, Gillingham & Worth Streets, Philadelphia 24, Pa. In Canada: Betz Laboratories Limited, Montreal 1.

See for yourself how Betz filming amine treatment eliminates return line corrosion and reduces operating costs. Send for Technical Bulletin No. 124.

BETZ

CONSULTANTS ON ALL WATER PROBLEMS