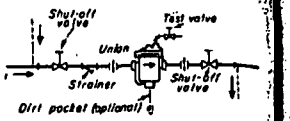


PROPER installation of piping, returns cuts down on your maintenance headaches **LIFT** fittings make it possible to raise condensate over various building members



TESTING auxiliaries should be a simple procedure that fits right into operation

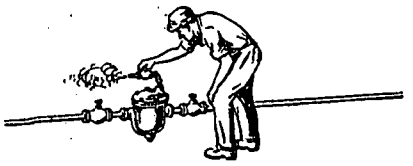
Long Life For Auxiliaries Is a Design Problem

Put Heating-System Maintenance On a Long-Range Operating Program

Here's a somewhat different approach to heating-system upkeep. It's based on an operating background that takes into account expected useful life of system auxiliaries

By **THOMAS J BARRETT**, *Building Supt, Waldorf-Astoria Hotel*

► HEATING-SYSTEM MAINTENANCE is no part-time job for any large steam user. It involves three major steps—testing, replacing; modernizing. Behind each of these steps there ought to be a well thought-out program and, most important, a final judgment on whether the costs, direct or indirect, are worth the candle.



TESTING

Let's look at the first of our steps, heating-system testing. In the hotel business our final test is the guest's satisfaction. He's usually looking for the best in comfort, and is quick to call us if he thinks we're falling down on the job.

To our mind, the best and only answer to his questionable judgment is a good zone control, monitored by an outdoor thermostat. It gives you an absolute reference point, and safeguards you against getting your whole heating system out of whack to oblige an isolated few. Yet it does take into account the fact that direct sunlight hitting one zone greatly changes that zone's need for heat from your central plant. It wasn't too long ago that we ignored this fact.

When it comes to testing the parts of a heating system, like traps, expansion joints, valves, piping, we consider maintenance so much a part of operation that we set up no hard-and-fast rules. For example, many trap manufacturers recommend monthly to annual tests for all traps throughout a system.

We feel differently about this. We believe the extent of our testing should be the simple, easy checks an operator can make on his regular rounds. To that end we put in the usual shutoff valves before and after the trap, protect it with a strainer ahead, and then install the trap with union fittings before and after. On each trap that permits it, we put a test valve.

We also school the operator on what to expect when he opens that test valve, or how to make a rough temperature check with his hand before and after a trap. If he gets anything different when he makes his quick check, like a steady blast of steam from a bucket trap or a continuous flow of condensate, he reports trap trouble at once. Right here is where we depart from the usual practice.

We buy all our traps from a single manufacturer. You'll see why later when we talk about replacement and installation. With this buying policy we've found traps protected by strainers give pretty satisfactory service for their normal life. When one goes bad we yank it out and stick in a replacement. Then we scrap the old trap. We figure it has probably seen its best days anyway.

Sure, we know manufacturers give a good set of instructions for inspection and repair. We've found, though, that we've had mighty few trap failures to begin with. Then only a couple out of those few are troubles our shop can fix up. So we feel it is cheaper in labor and in parts inventory to junk our ailing traps. And that's what we do today.

Some of our engineer friends have argued this point with us, but stop and think. If you've got valve or seat trouble, you should remember never to use a new seat with an old valve, or the other way around. Or you should run rather delicate checks on thermal buckets, or bellows. We say for the very few traps you'll save, for maybe another year or so, you'll be money ahead by junking each one and replacing it with a new trap whose life expectancy is probably years more.

PIPING CHECKS

When troubles show up on maintenance of piping and fittings, we blame most of them on design or installation. We feel the first fundamental in heating-system design is to be sure condensate returns flow by gravity even if you plan a vacuum pump such as we use. We correct with drip connections any shifts in pitch of piping runs that come to our attention, or indications of too few drips or drains, made evident by water hammer banging away. Now and again, you hear of horizontal steam-supply mains acting up from condensate slugs.

The first drawing, p 120, is an excellent way of handling this problem. It gathers the condensate from the bottom of the pipe and returns it directly to the return line. We're strong believers in dripping individual risers as a definite aid to a better heating system.

What's more, we personally like the vacuum-return system because it gives us positive action. Then, too, it helps solve the occasional condensate-return problem of lifting condensate over building structural members by letting you use lift fittings, middle drawing, top of p 120.

We've always felt there are a flock of disadvantages in using an ordinary trap to lift condensate to a higher level. We know it can be done and you explain it by the fact that the steam pressure inside the equipment the trap is draining supplies the energy to raise the condensate. But the limitation on how high you can lift condensate by this method, plus the difficulties in warm-up periods, is enough to discourage us. We just don't think there's enough pressure available when you need it most.

Expansion joints are a particular maintenance problem with us. Our piping system is getting along in years. So we've been replacing runs with wrought iron, and are gradually making headway. Where expansion room seems in order, we're putting in loops in place of the old corrugated joints.

The failure of these parts is probably due to two things —their age and possibly some corrosion attack from dissolved gases in the returning condensate. Occasionally we've had the vacuum on our vacuum pump drop off fast. By now we know it's one of our older corrugated expansion joints splitting, and we shut down different risers until the vacuum climbs back. This way, we isolate the riser at fault and get to work on it quickly. If space allows, we put in a loop.



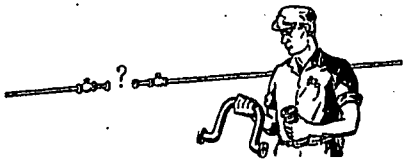
INSTALLATION, REPLACEMENT

All the way through these comments on piping checks and heating-system tests we've been working in something on replacements, like the loops instead of corrugated expansion joints. Their only purpose is to give us longer life, less maintenance.

There's nothing quite like a sound, engineered installation to cut down on later maintenance. And as a part of a sound installation we believe you ought to look ahead to replacements by right equipment selection and location in your system.

This means in getting equipment, like traps, for example, order from one manufacturer and standardize on that selection. That way you can insist on the right size and design trap for your system with assurance that the manufacturer will check and confirm your selection. Next, when a trap fails, your men can pull a duplicate trap out of stock. You know it will be the same as the one it replaces. Any engineer who has ever run a sizable steam system will tell you that pipefitters have a habit of replacing traps by pipe-fitting size. And in a system as big as ours we can't be standing by for occasional trap replacements.

Next, locate traps in the right place, that is, close to drip points and below them where possible, but in a spot where you can get at them to test or replace easily.



MODERNIZATION

To our way of thinking, the last phase of a good heating-maintenance program is modernization. Standardizing on equipment may not look like a good start. But we don't consider it any handicap. If anyone shows us a piece of equipment that will do a better job than we get with what we're using and the improvement is large enough to justify the cost, we're for it.

We mean particularly developments in engineering practices like the use of amines to protect condensate-return systems from corrosion. Or, possibly, some of the newer ideas of spotting newer, differently designed heat-transfer equipment like convectors under large windows to offset the heavy cold-wall losses from greater and greater use of glass.