

SYSTEMS & SOLUTIONS

The Troubleshooter's Art

"So they heard this noise in the building," the Old-timer said. "A really nasty noise." We always enjoy seeing the Old-timer because his stories are so interesting. He makes us think, and he usually leaves us a bit sharper than we were before.

"One of the tenants on the second floor told me the noise sounded like a machine gun. Rap-rap-rap-rap-rap! Real fast, just like that. Happened a couple of times an hour, according to the guy. Woke him and his wife up every night."

He took a sip of his black coffee and smiled at us. "What would you have done first, boys?"

We looked at each other and started to laugh. He wasn't giving us much to go on this time. "Now wait a minute," one of us said. "Back up to the beginning. Was this a steam or a hot water job?"

"Hot water," he said, blowing on his coffee. And then he added, "...mostly."

"What do you mean 'mostly'," we chuckled

He just smiled at us. We figured we were in for a good story.

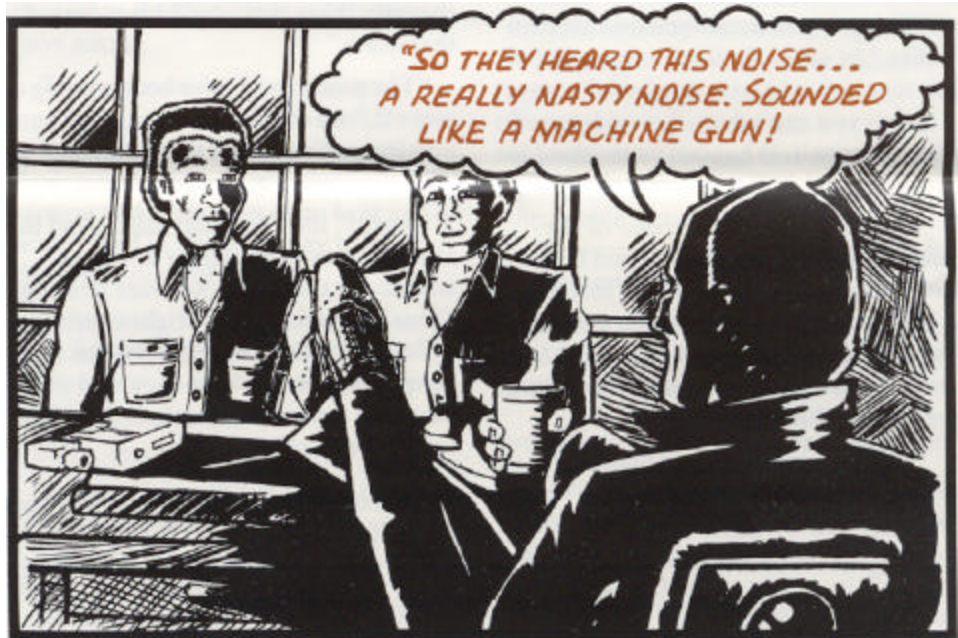
"Okay, we'll go along," one of us said. "It was a hot water job...mostly. What type of radiation did they have?"

"Copper fin-tube baseboard," he answered.

"Was it an expansion noise," one of our guys blurted out.

"Yep, that's just what it was, an expansion noise." He took another sip of his coffee and looked out the window.

A quiet settled over the room. The Old-timer drank his coffee and gazed out that window for what seemed like a very



long time.

Finally, one of us asked, "Is that it?" "Is that what?" the Old-timer replied, a twinkle in his eye.

"The whole problem job? Just an ordinary expansion noise? Where's the mystery to that? You must be slipping, old fella. Your brain teasers are usually a lot tougher than this one."

He snapped his fingers and pointed at the guy who was speaking. "Did I mention the other noise?"

"There was another noise?" We settled back in our seats.

"Oh sure," he said. There was a real bad one in just a couple of the apartments on the first floor. 'Jangle, jangle, jangle,' that noise went. Not all the time, mind you, but often enough to be real annoying." he took another sip of his coffee and smiled.

"Why would it happen just some of the time?" we asked.

"Well, that's what we have to figure out, boys," he answered with a laugh. "No one ever gives you the answers when you're on a problem job. You have to examine the clues and think real hard. And of course, you understand I wasn't there for the noises. Did I mention that? The noises were just the clues!"

He had us going now. "Well, why the heck were you there?" we asked in exasperation.

"Oh, I didn't tell you? The boiler was leaking. It had a couple of tiny cracks in the rear section. The boiler was practically brand-new, too. A real shame. The owner wanted to know what had gone wrong. Those noises were just clues, fellas, just clues!" He flashed a playful smile and looked back out the window again.

Now he *really* had us going.

The Wrong Tool for the Job

When something like this happens, when a new boiler cracks, a good troubleshooter always asks one simple "question: What can cause that? And then he goes about the business of finding the answer to that question in a very methodical way. A good troubleshooter doesn't try to solve a problem before he fully defines it. He takes things slowly.

The Old-timer, needless to say, is a *very* good troubleshooter.

"This job had a million-Btu cast-iron boiler," he said. "It didn't seem right to me that it should have cracked the way it did, but you can't deny the evidence. So I asked myself, What can cause that? He

"Now, I know for sure, one of the things that will crack a cast-iron boiler is cold water, so that's one of the first things I looked for." His face took on a thoughtful expression -just as though he was back in that basement, reasoning his way toward a solution.

"It's like taking a heated plate out of an oven and sticking it under cold tap water," he said. "It's thermal shock, fellas. The plate contracts too quickly and breaks because its tensile strength is low.' He waited a moment to make sure his point had sunk in.

"Cast-iron's like that, too, you know." he continued. "It will break if you shock it with cold water when it's *hot*.' He smacked his two calloused hands together for emphasis. "So that's what I looked for."

"The contractor suggested an HWR but the owner wanted to use a used unit from another building." Some good deal, eh?"

"A pump can shock the boiler," one of our guys said.

"Exactly right." the Old-timer whispered. "I figure that's what happened here. I figure one day the boiler was particularly hot when the pump brought back a load of cold water. Bang! She cracked right in the rear section.

"The boiler was always hot in this

place because these folks had a tankless coil in their boiler. Just like most apartment buildings do."

"But what did that have to do with the noises you mentioned earlier? one of our guys asked.

He smiled at us. "Ahhh yes, the clues! You guys were right about the expansion noises," he said. "When you hit cold copper fin-tube radiation with hot water it's going to grow quite a bit. That's what the people on the second floor were hearing -expansion noises. But what's the only thing that could have caused that noise:'

"The pump must have been cycling on and off," we offered, "moving hot water into the radiation and then letting it cool off before moving more hot water in"

"Right!" the Old-timer said. "And that also explains the jangling noise the tenants on the first floor were hearing. Their apartments were right over the boiler room. They were hearing the spring coupler on the big base-mounted pump snap like a snow chain when the pump went on and off.

"These noises told me the pump had been kicking in and out:'

"So where was the thermostat in this building?" we asked.

"They didn't have a thermostat, boys. You should *know* that." He had a twinkle in his eye. "I told you it was an apartment building, didn't I? You know apartment building owners don't trust their tenants with thermostats."

"So what was turning the pump on and off?"

He smiled for a long time before speaking. "Are you sure you want me to tell you? Don't you want to figure it out on your own?"

We did. And we're pretty sure we had the answer. "Did he have a Heat- Timer on the job?" we asked.

"Of course!"

"Was it an HWR hot water control?" He laughed out loud. "Of course *not*! I told you this was an apartment house, didn't I?"

We started to laugh as well. "Did they have a steam controller on the job?" one of our guys asked.

"They sure did! An EPU-CH. I told

you it was a hot water job...mostly."

"Oh, brother," one of our guys said, "An EPU-CH is for a steam job with cast- iron radiation! This job was hot water and it had copper fin-tube radiation:'

"Right," the Old-timer said. "They had the wrong tool for the job. Care to guess what was running the pump?"

"A sensor on the return line?"

"Right again! They were applying the correct procedure to the wrong system. As you guys know, when you use an EPU- CH control on a steam system, you want to sense the temperature at the end of the main. When that pipe gets hot it starts the heating cycle. Here, they put the sensor on the return line and just had it turn the pump on and off."

"A Heat-Timer HWR controller lets you take control of a hot water system in a large building because it regulates the water temperature based on the temperature of the outdoor air."

"That will never work right," one of our guys said. "What sort of piping system did they have in this building?"

"Two-pipe, direct-return," the Old- timer said with a wide grin.

"Oh brother!"

"You got that right You know two-pipe direct-return works," the Old-timer continued. "You have a supply main and a return main. You connect the radiators between the two like rungs on a ladder. The first radiator supplied with hot water is also the first radiator to return hot water to the boiler."

"So," one of our guys jumped in, "as soon as the first radiator received hot water, it started to pass it back into the return main."

"Correct," the Old-timer said, "and that's where the sensor which was controlling the pump was -the sensor that should have been used on a *steam* system. That's what was bumping the pump on and off and giving them the noises. The folks who were complaining about the expansion noise were the ones who were living right near the boiler room. In other words, they were heating off the lower "rungs" of the ladder." The other people in the building were

uncomfortable most of the time because, like most apartment buildings, this one wasn't well balanced for flow:

"So how did the boiler break?" one of our guys asked.

"Well, from what I can decipher from my conversations with the super, here's what happened: The contractor installed this boiler during the early fall, which is the case with *most* apartment buildings. The pump cycled on and off, during the milder days of early fall -that was a time when the tenants didn't need that much heat. The tenants near the boiler room started to complain about the noise.

"And then the weather started to get real chilly. The super said the people in the far apartments began to complain more and more about the heat. They just weren't getting enough. Naturally, they blamed the new boiler, but the boiler was running up to temperature, just as it should."

"So what did the super do?" we asked.

"What every superintendent does. He jacked up the boiler temperature even higher. He had it up to about 210 degrees. believe me, they weren't wanting for domestic hot water from that tankless coil!

"Anyway, even the higher temperature didn't seem to help. At least not as far as the folks in the far apartments were concerned. The tenants in the apartments near the boiler began to complain more and more about the expansion and air noises, of course. But they had heat, so in a way, they felt lucky.

"This job had a million-Btu cast-iron boiler, didn't seem right to me that it should have cracked but you can't deny the evidence."

"So what did the super do?" we asked.

"Well, when he finally had his bellyful of complaints, he flipped a switch and had the pump come on continuously. That stopped the expansion noise complaints, all right! those people near the boiler room started to regulate the heat by opening the windows.

"And it also satisfied the lack-of-heat complaints because the pump now moved that very hot water continuously

through the system. Even though it was out of balance, the continuous circulation was better able to match the needs of the building.

"Unfortunately, on the day the super switched the pump to 'continuous,' it dumped a ton of cold water into that red hot boiler."

"And that's what caused the crack?" we asked.

"That's the way I figure it," he said. "Why did they use the EPU-CH control in the first place," one of our guys asked.

The super said, "The contractor suggested an HWR but the owner wanted to use a used unit from another building." Some good deal, eh? It cost them a boiler section and a few days of no heat and hot water. And in the end, they had to buy the HWR control anyway.

"I just wish they would have called you guys first and gotten the right information. It would have saved them a lot of grief.

Using the *right* tool

A Heat- Timer HWR controller lets you take control of a hot water system in a large building because it regulates the water temperature based on the temperature of the outdoor air. Typically, it runs the pump continuously when the temperature drops below a pre-set minimum. The HWR then works with either a three- or four-way valve to maintain the right temperature in the system radiators. This eliminates expansion noise and saves money because only the BTU's that are needed at any particular time are sent out to the building.

By using a three- or four-way valve, you're able to maintain a higher temperature in the boiler which is to your advantage if you're making domestic hot water with a tankless coil.

If you're not using a tankless coil, the HWR can run the pump continuously, without the use of a three- or four-way valve and fire the burner intermittently to provide the radiation with the perfect temperature based on the conditions outside.

By using the *right* tool for the job, you gain control over the system, eliminate a lot of the common noise problems

which plague most systems and lower the fuel bills once and for all.

Our Parts Sales Tell A tale

In looking over our sales statistics the other day we noticed an interesting trend. The sales of our thermostatic mixing valves are way up and this, of course, pleases us. We put a lot of thought, solid engineering and care into its design and manufacturing, and we're pleased to see you've accepted it as a fine way to control domestic water temperature.

What we couldn't understand at first, though, was why we were selling so many replacement thermostats for our new valve. The numbers were alarming! We thought perhaps there was a problem with the valve, but no one was calling in to complain. Then we thought, maybe the people who operate the buildings our valves serve just want to keep a spare thermostat on hand.

But even considering that, the numbers still didn't make sense. We were simply selling too many.

"One of the tenants on the second floor told me the noise sounded like a machine gun. Rap-rap-rap-rap!"

So we decided to do an informal survey. As people ordered the spare thermostats, we asked them how they were planning to use them. To our surprise, nearly everyone told us they were using them to repair Holby mixing valves!

Of course, we've known all along that our parts will work well in the Holby valve, but we were delighted to hear that most of you have chosen our parts to replace Holby's genuine parts in their own valve.

Imagine how well these thermostats work in a valve body *totally* designed and manufactured by the people at Heat - Timer!

Thanks For Your Continuing Support....

SEE YOU NEXT TIME!
