

How much does 2°F cost YOU?



QUESTION — A manufacturing process is powered by a 8000 K. W. turbine. For the most economical operation, water used in the process should be cooled from 105° F to 85° F, at 77° F wet bulb temperature. How much will this cooling tower cost?

ANSWER — A tower with a .78 water-air ratio is needed and will cost about \$50,000.

QUESTION — How much can be saved if the tower cools from 107° F to 87° F at 77° F wet bulb temperature — 2° F higher temperature?

ANSWER — This tower will require a .95 water-air ratio, and will cost only .78/.95 x \$50,000, or \$41,000, a saving of \$9000 in initial cost.

QUESTION — Then, isn't the second tower the better buy?

ANSWER — Before answering, let's examine your operating cost. The steam needed to operate a 8000 K. W. turbine costs about \$750 per day. The 2° F average on the second tower will increase your fuel consumption 3%, so your operating cost will be increased \$22.50 per day, or \$6750 per 300 day year. In ten years, your operating cost will be increased \$67,500, or more than the initial cost of the first tower. The answer is definitely, No!

When considering a new cooling tower, get the best engineering advice possible — consult a WCEC engineer. And after your tower is built, installed, and in operation, be sure that it meets your specifications.

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MARMADUKE

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going down. You can't save a sinking ship by stopping the engines.

"My mechanics crowded around me in the shop. It was plain they were wondering how I'd lick this problem. I started sketching a rig for finishing the job. I doped out a 20-ft steel table made of heavy channel iron with four legs about three feet high. On one end, I showed a cylinder and piston to be worked by feedwater.

"What in hell is this, a drawing class?" barked Drummerhauser. He'd finally come out of his trance and wobbled into the shop.

"This contraption is going to stretch those tubes exactly three inches," I replied. Drummerhauser blinked a few times and went out of the shop, muttering to himself. He was a top-notch engineer, but a bit short on imagination. Sounded like he was saying, "... what does he think those bronze tubes are made of, rubber or something?"

"After six hours our stretcher was finished. The long channel-iron stand had an old simplex feed-pump cylinder assembly at one end to do the pulling. We placed a 3-inch snug-fitting steel plug into each end of a new condenser tube. Then we fastened two steel clamps over the outside of each tube-end so they squeezed against the plugs on the inside. The clamps were bored to the exact outside diameter of the tube and split on one side so tightening two nuts sandwiched the tube-ends between the clamps and the plugs. That prevented changing these dimensions during stretching.

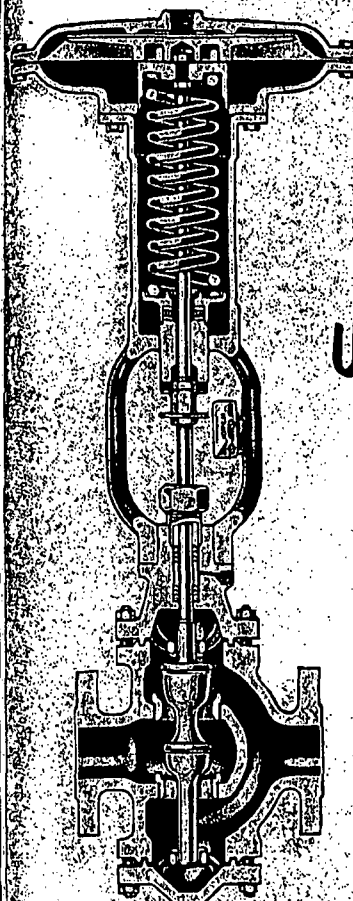
"We hooked one clamp over a bolt at one end of the steel frame. The second clamp was hooked through a hole in the end of the piston rod. By cracking a valve from the feedwater system, the piston started stretching the tube until it traveled exactly three inches.

"We soon got down the routine of removing the steel-plugs from a stretched tube, then tapping them into a new tube. Two men would place a tube onto the long channel-stand, bolt the clamps at two ends, hook them in place on the end of the stand and the piston rod. Then one man would crack the liquid valve until the piston stopped, which was after exactly a 3-inch travel. Then he'd open the cylinder drain, remove the stretched tube and start on another tube. My boys got this job down so well that in no time those old tubes were flying out of the condenser."

At this point O'Houlihan cut in skeptically, "That's a good story, Marmy, and I've stretched a few tubes myself—in a pinch. But tell us how long those tubes lasted."

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