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University maintenance workers snag patent

Inventors were just trying to fix school's boiler

By [Laura Snider](#) ([Contact](#))
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Photo by Sammy Dallal

Victor O. Mendez, left, and Ken Morse developed a new technology to help keep the boiler system for the University of Colorado's power plant working. Now the technology is being patented and possibly may be sold to boiler manufacturers.

Five years ago, one of the boilers at the University of Colorado's power plant went on the fritz "again" and this time, two of the men in charge of keeping the system up and running weren't keen on paying upward of \$50,000 to fix it.

So Victor O. Mendez and Ken Morse came up with their own way to patch the boiler. It worked so well that they patented their work "one of the few inventions born at CU that isn't the brainchild of a professor" and now CU's Technology Transfer Office is actively marketing it to boiler manufacturers.

"Our previous boss, she's the one that saw the potential," Mendez said. "We were just trying to fix a problem."

The problem was a buckled piece of metal that was welded into the top of the boiler's de-aerator tank, the part of the system that removes dissolved, corrosive gases.

Scalding steam, heated to temperatures above 250 degrees, causes the metal to shrink and expand, eventually cracking the metal plate at the top of the de-aerator tank and allowing gases to leak back into the system and eat away at the chambers and pipes.

In the past "the first time a CU boiler system got a cracked de-aerator tank was in 1967" the entire top of the tank had to be cut off, and a new piece of metal was welded back on. Morse and Mendez's new plates allow them to fix the problem from the inside "by crawling into a 24-inch manhole in the side of the de-aerator tank.

"It's kind of like building a ship inside a bottle," said Morse, pointing at a diagram from one of the boiler's original 1961 owners manuals. "Since I'm the little guy, I went in there."

Wiggling into the chamber was more than a parlor trick "it saved the university tens of thousands of dollars. The old method of fixing the cracks required all of the existing insulation, which is made of cancer-causing asbestos, to be replaced and the entire tank to be recertified after the top was welded back on. The total price tag could be somewhere in the neighborhood of \$50,000, Morse said.

Additionally, the new fix takes far less time than the old method "a long weekend instead of a couple of weeks" and, Mendez and Morse believe, will last much longer. The technique they invented allows multiple plates to expand within a sealed system, eliminating the buckling from the extreme heat.

CU's Technology Transfer Office is talking to several boiler companies that may be interested in licensing the technology.

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