

Relief valve saves \$72,000 of refrigerant for Ontario college

Most of the time, backup safety parts grow old and dusty. However, their worth is golden when they are needed.

Just ask the facilities staff of Mohawk Community College (MCC) in Hamilton, ON. When a rupture disk in a chiller was found shattered at the college, a relief safety valve saved an estimated \$72,000 of refrigerant from being vented.

MCC technician Andrew Blom can attest that the valve works. During a routine maintenance check earlier this year, Blom found the rupture disk had been blown during routine operation.

BACKGROUND

Mark Provencher, of Black & McDonald in Hamilton, had worked with MCC in order to develop a refrigerant management plan that would attempt to minimize capital expenditures and operating costs, and achieve compliance with local regulations. One of the concerns was to contain all refrigerants and prevent them from being vented to the environment.

"The decision to retrofit the college's Carrier 19C centrifugal chiller with the 'RuptureSeal' Model RS-3 relief valve was because of the potential risk of an over-pressurization incident, that would burst the carbon rupture disk and leave the chiller open to the outside atmosphere," said Provencher.

He said this could lead to the loss of the entire refrigerant charge if a technician was not on site or capable of immediately replacing the shattered disk.

According to the valve's manufacturer (Redi Controls, Inc., Greenwood, IN), RuptureSeal is designed for installation in series with the existing carbon type fragmenting rupture disks used on low



pressure centrifugal chillers. The Company said the function of the valve is to minimize refrigerant loss to the atmosphere in the event of a burst rupture disk.

Redi Controls said the valve automatically closes off the vent path, thus resealing the chiller once pressure returns to normal. In the event of a burst rupture disk, the valve also serves as the interim primary relief.

SAVED BY THE VALVE

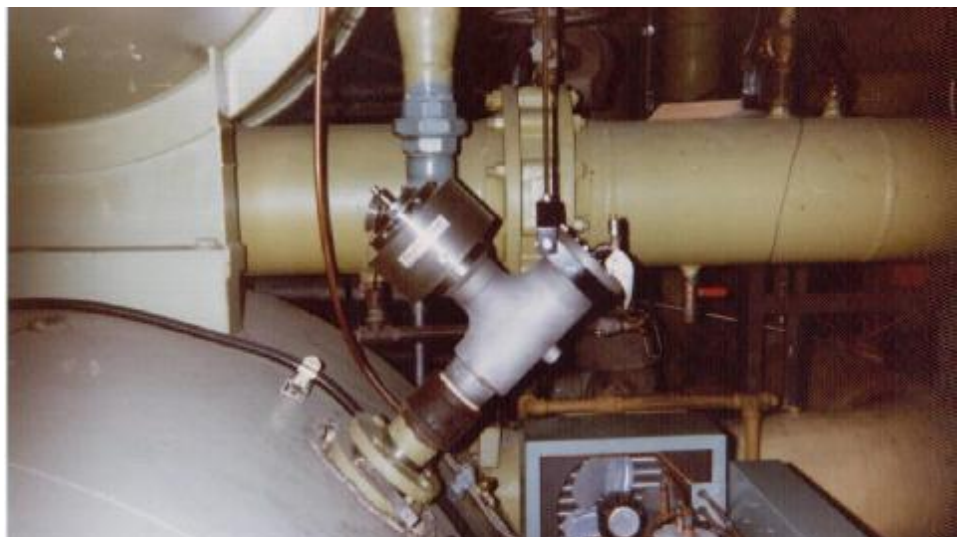
Blom said it appeared that when the

disk blew at MCC, the carbon fragments were propelled through the choke section of the collection chamber. He thought the weight of the fragmented rupture disk plus momentum projected the carbon particles ahead of the gas flow, in a manner similar to pellets from a shot gun.

The bottom line, said Provencher, the valve worked exactly as planned.

"The carbon fragments were propelled into the trap and collected, compression of existing air occurred, and the flow of refrigerant vapors was diverted into the valve nozzle, opening the valve disk and relieving the vapors in the vent line," he said. "Once the pressure in the chiller had dropped to an acceptable level, the valve closed bubble tight and contained the rest of the refrigerant charge."

According to Provencher, the relief valve saved 3,600 lb of a 4,400 lb charge. This equates to the college saving approximately \$72,000 in lost refrigerant.



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