The Kennecott Radiator Retrofit

Kennecott Copper, known originally as the Utah Copper Company, began on June 4, 1903 to mine and process low-grade copper ore found in a mountain in Bingham Canyon, about 25 miles southwest of Salt Lake City. Most experts of that day said the company would never make money—the ore grade was too low, only 39 pounds of copper per ton of ore.

Steam shovels began working on the mountain in 1906. For more than 100 years, shovels, trains and trucks have converted the mountain into the world famous Bingham Canyon Mine, a huge open pit copper mine that is more than 3/4 of a mile deep and more than 2¾ miles wide across the top (and still growing).

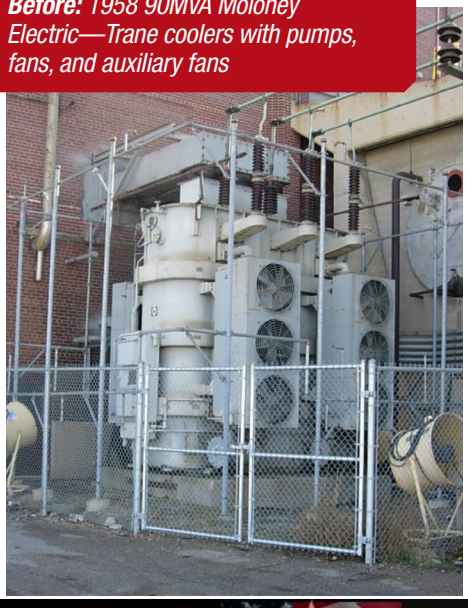
The onsite power generation station and the 90-MVA Moloney electric transformer, built in 1958, were installed halfway up the mountain slopes. With continuous load growth, the transformer was operating well above the nameplate recommendations. The single 5-hp oil pump and the three 1-hp fans on each of the four traditional oil coolers were not providing adequate cooling. The onsite operations manager of the generation station told us, “The coolers were not cooling at all. They were plugged or the fluid was passing through too quickly to cool.” Mountain States Transformers (MST), who maintained the transformer, said “The coolers were fouled and the oil temperature was hitting the warning trips often.”

The production manager of MST came to us to help resolve this issue in September 2007. After considerable dialogue, we designed a radiator cooling system with no fouling risks. A site visit was conducted in December 2007 to finalize the design. We needed to make sure we met customer preferences to fit the radiators with no fans for forced air cooling in the space-constrained corner of the building where the transformer was situated. The radiators were made and shipped in parts up the narrow steep roads by January 2008, and after the initial hurdles of onsite assembly, were operational.

After a month of operations, infrared pictures were reviewed. The uniform temperature profile on the radiators assured us of good heat dissipation as designed. After several months of operation, no warning switches had tripped. From the sample operating data provided, we were able to calculate and verify that the cooling package would operate at 60°C above ambient at full load, well within the requirement to not exceed the 65°C nameplate rating.

The short lead time from design concept to execution, staying within the budget, and the performance of the new radiators earned us one more satisfied and happy customer.

Before: *1958 90MVA Moloney Electric—Trane coolers with pumps, fans, and auxiliary fans*



After: *Trantech Manifold and Radiator Assembly—no fans or pumps*