

This past year, and really for several years in a row, a great percentage of our airports have participated to one extent or another in safety, security, maintenance, and modernization projects. And every year at this conference, the TAC has recognized one for the award titled Most Improved. Since the track record across Tennessee has been so strong, it is very difficult to select only one for that Most Improved status.

However, what we did have this past year were a couple very significant individual projects—special projects—significant for their uniqueness, their complexity, and their overall impacts on the airports involved. So the TAC has taken some liberty, and for our 2016/2017 awards has selected two very special, but very different projects for recognition. The first will highlight a project at an air carrier airport. Will representatives from the Metropolitan Nashville Airport Authority please come forward.

While they are coming forward, let's look at a couple photos of what is probably the most innovative and unique project we've seen in years—the installation of a geothermal lake plate cooling system which was officially opened in May 2016. Guided by their sustainability plan, MNAA's strategic planning and sustainability teams saw an opportunity to use the very large 43-acre limestone quarry located on the east side of the airport to provide a water-sourced lake plate cooling system that could support the 3600-ton maximum cooling load in the nearly 900,000 square foot terminal building. The quarry averages 150 feet in depth, and the water at a depth of 50 feet stays a cool 50 degrees year-round. Eleven large heat exchanger skids were submerged to take advantage of the cool water and 1.6 miles of 20-inch pipe carry the lake-cooled water from the quarry to the airport and back in a closed loop system. The return water enters the heat exchangers sunk in the reservoir at about 79 degrees and is cooled by the reservoir water to 50 degrees before being cycled back to the terminal air conditioning systems—over and over again.

The result has been even better than anticipated. In the first six months of the geothermal system operation, during a very warm summer, energy consumption for cooling was reduced by 40 percent. The system will also save millions of gallons of potable water annually through the decommissioning of the old cooling tower system and through use of the quarry water for terminal landscape irrigation. The \$10.4M project is expected to realize energy savings in excess of \$400,000 a year for the next 50 years.

Construction presented extreme challenges. In addition to sinking the heat exchangers to the correct depth in the quarry, the piping required a runway cut on one of Nashville's primary runways, boring beneath a four-lane highway and a long traverse along an airport service road. Ground was broken in October 2015 and system startup occurred in February 2016, with project completion in May 2016.

The cooling system is the largest of its kind in North America—and perhaps even the world. For its innovation and unique solution to sustainability and energy conservation, the TAC is proud to recognize the BNA Geothermal Lake-Plate Cooling System as special project of the year for 2017.