

***NAWTEC14 Speaker Abstract: Experiences in Testing an Innovative Thermal Energy Transport Technique***

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Joint parties representing industry, education, and government set out to conduct a test in Miami Florida in order to validate an innovative thermal energy transportation technique. German engineers originally developed the technique for application on the International Space Station, but it was too heavy for use. The 6-month validation test took otherwise normally wasted thermal energy and recovered it for use elsewhere. The waste heat during the testing was recovered from the Miami-Dade County Department of Solid Waste Resources Recovery Facility, a Waste to Energy plant, and transported it to a local industrial shop where it was used to heat water for bathrooms and other industrial uses.

The process involved reclaiming waste heat from the boiler continuous blow down tank through a simple heat exchanger. The heat exchanger transferred the heat from the water to a mineral oil, which was pumped through a sealed tank containing an oil and salt mixture. The majority of heat is stored by the phase change the salt undergoes during heating. Two containers were used, one reclaiming and storing heat from the WTE plant, and one discharging the heat at the industrial facility approximately 2 miles away. An exchange of containers was anticipated to be weekly. The heat source was too intermittent to test the exchange more than one time at the Miami facility. Environmental benefits are significant in reduced green house gasses.

The data will show: temperatures and heat values of the heat rejected, reclaimed, stored, and reused. Test results of the 6-month validation in Miami as well as some results and experience with testing the method in Europe will be presented. Other subjects presented will be the challenges encountered with obtaining permits, changes to the system were required in order to obtain insurance, economics of the heat reclaim, and future plans.

Mr. Marra graduated in 1982 from the University of Detroit with a Bachelor of Mechanical Engineering. He was with Detroit Edison Company for 8 years. He was with Westinghouse Electric, in the Steam Turbine Performance Division for 3 years. Currently, he has been with Montenay-Onyx Power Corporation, Miami Dade County for 13 years., with assignments at other facilities. He had paper presentations at NAWTEC 12 & 13, and internal presentations to staff and management.