

Pinching Pennies or Cost-Efficient? Does Curtailing Fuel Loss During Refilling Add Up?

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Accomplishing these goals will save the agency money by reducing fuel costs, allow the agency to accurately judge fuel demand, and reduce its emissions, he said. "Our operations are very intense. We have to maintain and refuel in a very short time period. We're always looking for ways to make a big difference in our operations."

A conversation between Peck and ASCENT's president, Alex Spataru, about tank monitoring at an industry meeting led to the testing of ASCENT's Maximus Stop Fill Instrument. The genesis for the device was to curb fugitive emissions during the refueling process.

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ment that detects liquid propane as it reaches a prescribed mark on the tank. The instrument can be fully portable and used similarly to a stethoscope. For VIA's fast-fill requirements, the design is to separate the instrument from the sensors and permanently attach the sensors to the onboard tanks. In this scenario, the portable instrument would be connected to the sensors when the bus comes in to be refilled.

According to a recent fugitive emissions study conducted by The ADEPT Group Inc. (an engineering consulting firm based in Los Angeles), estimated emissions from a typical outage valve (#54 drill size) are between 4 and 5 g/s while in liquid phase and between 1 and 2 g/s while in vapor phase. Peck said the Maximus worked well during its initial testing period. It accurately pinpointed the tank's fuel level. It is conservatively estimated that the Maximus can help VIA reduce close to 300 g/tank of emissions during the typical refueling process, saving about 20 gal. per day and about \$5000 per year in fuel costs.

VIA now owns two portable Maximus stethoscope instruments. According to Peck, the agency is looking forward to the PERC-assisted project and incorporating the Maximus stop-fill devices into its refueling operations.

However, Peck faces one issue in fully implementing the Maximus once it's commercially available. The standard refueling method by volume requires the use of the outage valve. To fully utilize the Maximus technology, VIA would need the Railroad Commission's permission to operate under its regulations that refer to the NFPA 58 code. With the commission's involvement in development and field tests, Peck believes the new method will take hold.

San Antonio Workhorses Depend on Propane

Propane is the fuel of choice for VIA MTA.

Even for one of the 10 largest cities in the country, San Antonio, Texas' public transit numbers are impressive. The city's VIA buses cover 1230.98 square miles daily, 99% of Bexar County. Close to 38 million passengers rode on VIA's buses, streetcars, and vans during fiscal year 2003-2004. Average weekday ridership on VIA's scheduled services during this period was 113,495. About a quarter of its buses and all of its streetcars and paratransit vans run on propane.

Acknowledged as a leader in using clean fuels for its vehicles, VIA was honored in 2000 with a SuperStar award from the Alternative Fuels Research & Education Division (AFRED) of the Railroad Commission of Texas. In addition, VIA has been nominated for the Propane Education & Research Council's Clean Fleet award.

Centralized and Fast

Appropriate for a town with strong ties to its Old West past, VIA's buses and streetcars run routes laid out with radial and circular lines like a wagon wheel. This route pattern lends itself to a single maintenance and refueling operation, as opposed to several other large public bus fleets that have several maintenance and refueling facilities spread out over their service areas. The agency has five different route categories that efficiently move 113,495 passengers on an average day and even more during big events such as the recent NBA Finals between the San Antonio Spurs and Detroit Pistons.

VIA operates out of a newly-remodeled and enlarged central fueling facility, which is at the center of the wagon wheel, that has room for fueling and maintenance. It's an intense operation



maintenance. It's an intense operation between runs twice a day, according to Doug Peck, VIA's vice president of maintenance. "400+ large buses come through the gates, park, and then are moved through the refueling center and then are gone over by a cleaning crew and maintenance. The service folks have a 13½-minute cycle to get the work done. They operate just like a race car pit crew."

The agency's "pit crew" can handle just about everything on-site—from refueling propane, diesel, and gasoline vehicles, to cleaning, and the gamut of maintenance work. They are trained in-house to perform the various tasks needed to maintain the buses and 104 paratransit vehicles during four shift changes. The agency also takes advantage of any training offered by AFRED or any of its suppliers.

VIA's remodel included enlarging its service area to 10 bays in one location and a small adjacent service area. Nearby are the propane and diesel storage tanks. VIA had one 10,000-gal. and one 18,000-gal. propane tank, which are being replaced by a 30,000-gal. tank that is expected to go online shortly.



The fleet currently includes 67 Champion Bus (Imlay City, Mich.) vehicles, 61 New Flyer (Winnipeg) buses, 19 Chance (now called Optima Bus; Wichita) streetcars, 217 North American Bus Industries (Anniston, Ala.) vehicles, and 64 RTS (Roswell, N.M.) buses. When 78 replacement vehicles arrive by November, 100% of the fleet will be wheelchair-accessible.

The agency's budget is always a concern, but Peck says VIA is open to trying out new technology. One of the agency's latest forays was to test an innovative sonic liquid level stethoscope designed by Adept Science & Technologies LLC (Los Alamos, N.M.). The results have been very positive, according to Peck, who expects these devices to save the agency money while reducing fuel loss during the filling process as well as lowering evaporative emissions.



The majority of VIA's buses and streetcars are handicapped-accessible with low-floor design. Slegers Engineering tanks are the preferred fuel tanks.

As for alternative fuels, a number of San Antonio city agencies have utilized propane as a vehicle fuel off and on since the 1950s. Garbage trucks, public buses, and school buses were

among the fleets with the most propane-powered units. One of the most notable propane fleets is operated by the city's Northside Independent School District, which has several hundred propane vehicles in operation and several decades of experience.

Propane has been in constant use at VIA since 1991, according to Peck. The agency began adding propane vehicles to its fleet for several reasons, including less emissions and government incentives. Of VIA's current vehicles, nine of the streetcars and 67 of the 30-ft Champion buses run on propane. The fleet of 104 demand-response paratransit vans, which operates within three-quarters of a mile of



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the wagon wheel route system, plus 74 service vehicles, use propane. VIA management has been pro-alternative fuel for years, said Peck, it's the engine manufacturers and technology that has had trouble fulfilling the agency's demand.

Since he joined VIA, Peck said it's been a continual learning process for him and the agency. Regulations, technology, and manufacturers have changed quite a bit. VIA was using OHG conversion kits for a while before switching vehicles over to Technocarb Equipment (Abbotsford, B.C.) for its paratransit vans. When VIA puts out a tender for vehicles and engines, it always gives specs for

propane along with other fuels. Unfortunately, Peck noted, there isn't always a propane engine available for the bus sizes it needs.

With every tender for new vehicles, VIA always specifies models that meet the latest emission requirements from the Environmental Protection Agency. While the agency is unable to run its entire fleet on clean-burning propane, it now refuels its diesel models with ultra-low-sulfur fuel.

Operating Expectations

In addition, one of the agency's goals when going with an alternative fuel is that the vehicle operates within 10% of diesel costs. Peck explained

that VIA uses the Transit Cooperative Research Program fuel comparison guide, which includes a life cycle analysis. Using that guide, the Champion buses came in at about 8% more than diesel's costs.

One of its recent tenders was for additional streetcars. By August, Peck said, VIA will have received 14 new Optima propane streetcars and will be retiring 14 of the older vehicles, some of which have been in service since 1983. The new Optima streetcars have Cummins 5.9-liter LPG engines, which consume about 10,700 gal. each during a typical year, and two fuel tanks—one large tank across the rear of the vehicle and one smaller one on the side. The buses and streetcars have Slegers Engineering Inc. tanks. All of the streetcars are designed to replicate San Antonio's streetcars from the 1900s.

While the streetcars are used in the central business district, the Champion buses are used on circular and radial routes among the spokes. The larger buses, which use diesel, run the routes along the wheel spokes. VIA would use propane on these routes if there was a large engine capable of running on propane, said Peck.

110,000 Gal./Month Required

The Champion buses are mid-size vehicles that are outfitted with three Slegers Engineering tanks with a total of about 122 gal. capacity. Also powered by the Cummins 5.9-liter engine, the 67 Champion buses use about 110,000 gal. during an average month.

VIA will be replacing its 104 propane-powered paratransit units with gasoline vehicles. Unfortunately, a recent tender for new vehicles did not garner any bids with propane vehicles. The current fleet is about 11 years old and most of the vehicles have about 700,000 miles on them. Converting the new vehicles to propane is an option, said Peck, depending on the costs and emissions output after the conversion.

Ferrellgas' Central Texas district won the bid for providing VIA's propane last fall. It delivers approximately 17 to 24 transport loads of product a month under its contract, which calls for 2.5 MMgal./year of HD-5 propane. The HD-5 specification was made to ensure the fuel's quality because of issues in the past. —Ann Rey