GEORGETOWN UNIVERSITY FUEL CELL BUS

Georgetown University, in partnership with the National Automotive Center (NAC), introduced the first commercial prototype, liquid-fueled, fuel cell-powered transit bus in May 1988. The objective of the program, which was developed with a grant from the Federal Transit Administration (FTA), was to advance true commercialization of fuel cell technology. To date, it has achieved this objective by successfully applying the technology to the transit bus application, focusing on liquid fuels, demonstrating technology readiness, developing series-hybrid propulsion systems, and conducting full-scale vehicle demonstrations, testing, and reporting.

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The 40-feet electric bus uses a 100 kW Phosphoric Acid Fuel Cell (PAFC) manufactured by UTC Fuel Cells, a division of United Technologies Corporation, as its primary energy source. Traction batteries provide surge power and a means to recover braking energy by regeneration.

Currently, all endeavors for transportation are dedicated to the newer Proton Exchange Membrane Fuel Cell (PEMFC) technology. This program introduced the first and only urban transit bus powered by a liquid-fueled PEMFC at the Electrical Vehicles of the Americas Association (EVAA) conference in Sacramento, CA last December. This 40-feet electric bus uses a 100 kW PEMFC manufactured by Ballard Power Systems, AG, as its primary energy source. The PEMFC power plant is the most powerful unit ever built capable of operating on liquid fuel.

The fuel cell combines hydrogen fuel with oxygen from the air to produce energy silently and without combustion. Using hydrogen, it generates electricity; the by-product is water. Oxygen is taken from ambient air while hydrogen is extracted from liquid methanol using an onboard reformer. This allows continuous operation and rapid conventional refueling. Emission levels are well below current clean air standards. In addition, the fuel cell allows for quiet operation and gives the bus a range in excess of 350 miles before refueling.

The bus platforms are Nova BUS RTS wide front door models. Each uses an electric drivetrain developed by BAE SYSTEMS Controls. Booz Allen Hamilton is the system integrator and developer of the vehicle system controller. The buses seat 40 passengers, meet all transit industry standards, and outperform any standard diesel bus.

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