ACD's SGV Series Exceeds Expectations at World's Largest Commercial Hydrogen Station

With the installation of the world's largest commercial hydrogen vehicle fueling station came a unique set of specifications required to provide the high pressure flow of liquid hydrogen from its large storage tanks to its vaporizers. ACD's SGV Series complies with all specifications and allows additional growth options for the customer.

Commissioned in Whistler, BC, Canada, the station was designed and built by Air Liquide Canada to fuel a fleet of twenty local transit buses. Engineering a station in which operators could fill a hydrogen fuel-cell bus in the same amount of time as a diesel bus was crucial to the promotion of low emission transportation initiatives. The station's design allowed one transit bus (46 kgs) to be fueled in less than ten minutes and the entire fleet within three hours. Hydrogen needed to be transferred safely at 350 bars (5,076 psi) and be available for fueling 99.9% of the time[1].

To meet the customer's specifications, ACD manufactured a system of three SGV reciprocating pumps to transfer hydrogen from the station's storage tanks to its vaporizers prior to fueling. Designed as a continuous duty system, each of the three single-cylinder SGV pumps were equipped with a belt-driven, 55.9 kW (75 hp), 3-phase TEFC electric motor to achieve a pump speed of 538 rpm and a flow of 20 lpm (5.28 gpm) at a maximum working pressure of 414 bar (6,000 psi) (Figure 1).

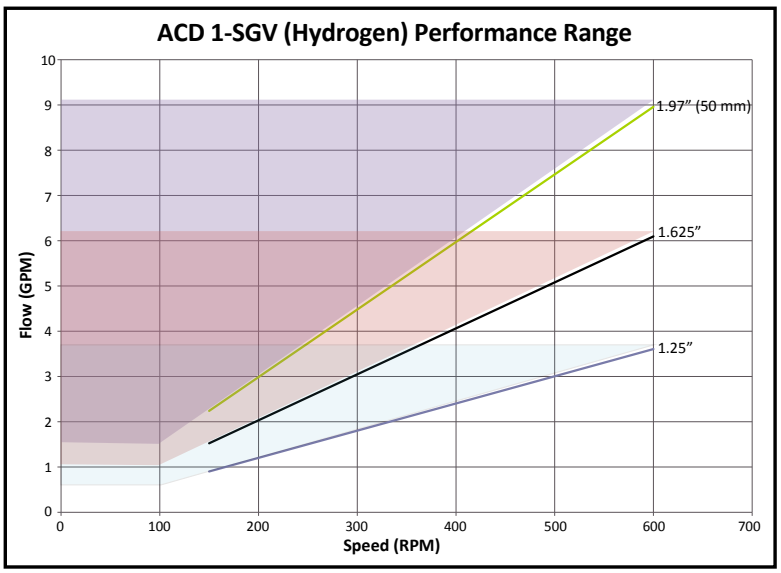

Figure 2. 1-Cylinder SGV Skid System for Hydrogen Station in Whistler, BC, Canada

Included in the ACD scope of supply were vacuum jacketed suction adapters with internal strainers and super-insulated cold ends to ensure minimal cool-down losses for the pumps. A pressurized, oil-lubricated drive with an integral oil pump and reservoir allows high bearing loads and prevents oil leakage.

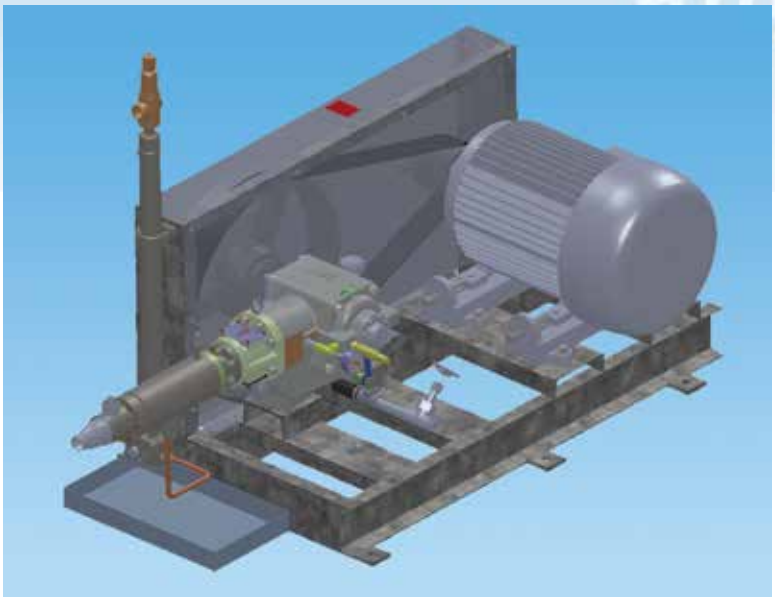

Figure 2. 1-Cylinder SGV Performance Range for Liquid Hydrogen

(Figure 2). Special consideration was given to extending pump life and reducing operational and maintenance costs, offering an economical solution for the liquid hydrogen refueling station.

With the installation of ACD's reciprocating pumping system, the Air Liquide station achieved its pressure and flow requirements, successfully filling each hydrogen transit bus in less than 10 minutes and providing a seamless fueling process for the fleet during the 2010 Winter Olympics. During its two years in operation, the performance and maintenance of the pumping system has exceeded expectations, providing the reliability needed by the station.

Both the 2010 Olympic guests and current Whistler residents have enjoyed zero-emission, low-noise transportation throughout the community. It is estimated that the fleet of buses fueled at the station will reduce green house gas emissions by approximately 1800 tons per year[1], demonstrating an industrywide commitment to a greener future.

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