

Emerson Edge Controllers Help Satisfy Variable Demands of Aviation Fueling Systems

RESULTS

- Critical control for life safety and equipment protection
- Better risk management
- 66% reduction in labor requirements
- 50% reduction in system failures
- Better results in more rugged environments



APPLICATION

Aviation fueling

CUSTOMER

The largest aviation fueling system supplier in the world

CHALLENGE

Major airports and military bases have changed their methods of fueling aircraft from tank-type vehicles to automated or “hydrant” fueling systems with pump houses that provide fuel through piping beneath the apron. Fuel is dispensed to pits or dispensing stations located at parking positions, fueling lanes or passenger loading gates. Fuel is then loaded onto the aircraft via hydrant service vehicles, hose carts or pantograph assemblies, eliminating the need for vehicular storage and transport to the aircraft.

Hydrant fueling systems typically feature a minimum of two tanks, one dedicated to receiving fuel and the other dedicated to dispensing fuel. Both tanks incorporate pump houses with two to ten identical fueling pumps handling individual capacities from 600 gallons per minute (gpm) to 1,200 gpm.

Servicing different types of aircraft, from helicopters to large cargo planes, adds yet another variable, as each tank accepts fuel at a different flow rate based on its size and the amount of fuel already present. Nozzle connection pressures range from a maximum 55 psig in operation to 120 psig maximum surge pressure, requiring the system to perform within those parameters while supplying peak fueling rates. Meanwhile, the system’s dispensing valves must be capable of closing within a split second to avoid surges.

Constantly changing fuel demands create the continuous challenge of maintaining safe, yet efficient pressures for optimum fuel distribution.

“With Emerson’s edge technology monitoring and controlling pump activities, we’re able to maximize fuel dispensing rates and, more importantly, protect operators and equipment from dangerous surge conditions.”

President of aviation fueling system supplier

SOLUTION

The fuel system supplier's latest hydrant control systems uses Emerson's PACSystems™ RX3i edge control technology in combination with GE's CIMPLICITY software to monitor and control 500 I/O points, comprising 90 percent digital I/O and ten percent analog I/O.

The company's control systems vary from highly sophisticated systems that include tank inventory management and reporting capabilities, to simpler systems including basic logic and alarm functions. Every system incorporates redundant controls using parallel CPU operation, in which one CPU operates as the primary and the other operates as the backup. Redundant controls minimize the risk of downtime which can cause delays and cost more than \$1,000 per minute at commercial airports.

Each controller is programmed to react to pressure conditions within a closed communication loop. A non-automated pump requires approximately three operators per pump house, while an automated system can be safely managed by one operator. Based on this 66 percent reduction in required personnel, military fueling operations continue to advance their infrastructure from hardwired I/O and LED operator notifications to more advanced systems with computer interfaces.

Fueling systems perform under demanding and largely unpredictable circumstances. Fuel system operators must have confidence in every component, from the controllers, valves and hoses, right down to the smallest screw.

RESOURCES

PACSystems

www.emerson.com/pacsystems



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00830-0100-0011

