

JASC Fuel System Reliability Upgrade



Performance results after 5+ years of field operation*

300+ successful fuel transfers with less than 4 check valve related trips over a 5 year period

Only 1 forced outage due to a major fuel system component failure over a 5 year period

Liquid fuel system recommended maintenance at major turbine service intervals is refurbishment of liquid fuel, purge air and water injection check valves

Annual gas to liquid transfer success rates typically 100%

*JASC installed turbine base includes the U.S., Middle East, Africa and Asia.

New JASC Tees



Tube adapter "Tee" for standard fuel nozzle

Positional "Tee" for DLN fuel nozzle

Featuring Integral High-Temperature Metal-to-Metal Seal Technology

SAE J1926 compatible for purge air, liquid fuel check valves and nozzle connections

Adjustable orientation for easy connection interface to existing piping

Engineered for continuous service at 750°F ambient and 2000 psi

Eliminates leaks associated with high temperature O-ring degradation

Multiple make-and-break capability provides years of leak free service

New F-Class Water Injection Check Valve



High-Temperature Metal-to-Metal Internal Seat

Dash 12 and 16 SAE with Crush Seal Gasket eliminates O-rings

Exceeds ANSI Class VI seal rating

Crack Pressure: 15 PSID Nominal

Flow Range: 0-20 GPM

Solving the Gas Turbine Back-up Liquid Fuel System Reliability Issue

Addressing system inadequacies is a fundamental part of improving the overall reliability of the liquid fuel system and its related components. High system and environmental temperatures naturally create a situation ideal for coke formation. Operationally compromised control system components are responsible for the inability to start on liquid fuel or transfer from gas to liquid fuel.

Check valve failures, flow divider failures, fuel system evacuation, exhaust temperature spreads and other related turbine trips have been resolved with an array of patented designs developed by JASC including:

- Water cooled valves for prevention of coking formation.
- Water cooled 3-way purge valves with a water cooled flange for use on DLN turbines using primary and/or secondary liquid fuel.
- Smart Fluid Monitor providing leak detection and automatic shut-off of cooling water to valves and flame detectors should faults occur.
- Multiple-use crush gasket technology which replace O-rings and are rated for 750°F ambient at 2000 psi.

These system specific products have three common design goals. First, provide reliable valve function and system operation for a minimum of 32,000 hours or until a scheduled turbine service interval is reached.

Second, the valves must maintain better than ANSI Class VI sealing capability from installation until removal for refurbishment. Elimination of combustion gas back-flow results in back-up fuel system availability and reliability typically exceeding 98%.

Third, incorporation of JASC's new metal to metal seal fitting design serve as replacements for O-rings and other elastomeric materials.

The "Tee" designs can be used on standard or DLN fuel nozzles, they are SAE J1926 compatible, provide adjustable orientation for easy connection interface to existing piping and are rated for continuous service at 750°F ambient and 2000 psi.

JASC's solutions are configured to be interchangeable with the turbine's existing hardware. This minimizes project cost and time associated with performing a fuel system upgrade.

Transferring from gas to liquid fuel, starting on liquid fuel and executing these sequences without tripping the turbine allows systems to be exercised regularly with no negative impact. Case studies of power plants which have performed JASC fuel system upgrades reveal that after



five years of operation, maintenance typically consists of normal refurbishment of the JASC check valves.

Two decades of innovative product development and implementation demonstrates that gas turbine owners can realize significantly reduced operation and maintenance costs when a JASC fuel system upgrade is performed.

Learn more about JASC's unique products and services by contacting your local Power Generation representative: <http://jasc-controls.com/about/partner-alliances>



Positional "Tee" with liquid fuel check valve and purge air check valve



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