JIG Joint Inspection Group

Technical Bulletin

Bulletin No. 58

January 2013

Hydrant Servicer Filter Monitor Vessels
Differential Pressure Switches

Introduction

Since the Surabaya aircraft fuelling Incident in April 2010 there has been much discussion on how to avoid a repeat of the differential overpressure of the monitor elements that was a major contributory factor to the event. It is recognised that there are a number of proprietary monitoring systems available on the market to prevent differential overpressure, and this Bulletin does not preclude them being fitted. However, the following is a minimum requirement for equipment to be installed on all hydrant servicers that are operated to JIG Standards.

Differential Pressure (dP) Switches

JIG requires that filter monitors shall never be operated above a differential pressure of 22 psi (see JIG 1, A6.3.4). A sudden increase in dP during a hydrant servicer fuelling operation may be caused by excessive water or particulate contamination from the hydrant system. To protect the fuelling operation from a sudden rise in dP, a dP switch shall be installed to activate if a high dP (22 psi) is encountered.

A dP switch shall be connected in parallel with the dP gauge and linked to the deadman and fuelling control system. The dP switch shall be set to 22 psi and designed to automatically stop the fuelling operation. The system shall not be capable of being reset by the fuelling operator and it shall be installed so that the deadman override does not reset and reactivate the system.

The system shall also be fitted with a mechanism (eg. a key operated device) to reset the dP switch after installing new filter elements or following dP gauge free movement tests. Procedures for aircraft fuelling by hydrant servicer shall be updated to include a requirement for management intervention before the system is reset following activation of the switch during a fuelling operation.

DP switches shall meet the hazardous area classification for the installed location. Fuel-wetted parts shall be stainless steel with elastomers manufactured from Buna N, Viton or as recommended by the manufacturer. For hydrant servicers with PLC systems that monitor dP, an algorithm can be programmed to shut down the system at 22 psi.

Action in Event of Switch Activation.

Following any activation of a dP switch, the hydrant servicer shall be removed from the fuelling operation for investigation and the fuelling operation management and the hydrant operator, shall be notified immediately. Other fuelling operations at the airport should be notified by the hydrant operation management.

The hydrant servicer filter elements shall be replaced before the vehicle is returned to service. A second servicer may be used to complete the fuelling provided that the dP is monitored closely during the remainder of the operation and fuel sampling requirements are carried out (see JIG 1, 5.3.2).

Investigations following dP Switch Activation

For investigative purposes the following list, which is not exhaustive, should be used by the Into-plane Operation:

- What is the cause of the high dP? (Check fuel samples and condition of monitor elements)
- Is the dP switch circuit functioning correctly?
- Are there other servicers operating close to the affected servicer, and are they experiencing an increase in dP?
- If a second servicer is in use to complete the fuelling, is there any indication of increasing dP?
- Was the dP increase a sudden change from a low value, indicating a problem, rather than a “normal” increase?

The Hydrant Operator should investigate the following:

- Has the hydrant pit in question been used recently?
- Have there been any changes in the hydrant flow rate or direction?
- Has there been any engineering work carried out on the hydrant?
- Have the into-hydrant filters shown an increase in dP? (Check sump samples)

Overall, the Hydrant Operator will need to respond appropriately and proportionately. Guidance for the optimum response cannot be prescriptive but in the event of a small number of dP switch activations, hydrant pit valve flushing and sampling may be required. In the worst case, where a significant number of dP switches have been activated and there is other strong evidence of fuel quality problems in the hydrant system, the Hydrant Operator should consider the suspension of hydrant use.

Action for JIG Into-plane JVs with Hydrant Servicers

Carry out Tool Box Talks as a reminder of the following points

The fitting of dP switches to fuelling equipment filtration does not alter the requirement for fuelling operators to monitor the dP throughout fuelling operations (see JIG 1, 6.5.1 (f)). The recording of observed dP and flow rate by the fuelling operator during every fuelling (see JIG 1, A6.2.2) shall form part of the process for the planned withdrawal from service of hydrant servicers for the replacement of monitor elements before the 22 psi limit is reached.

The installation of dP switches does not alter the requirement for completion of weekly dP graphs (see JIG 1, A6.2.2). Weekly graphs of flow-corrected dP are also part of the process for the planned withdrawal from service of hydrant servicers for the replacement of monitor elements.

Routine Testing of dP Switches

The function of the dP switch shall be checked to ensure that the fuelling operation would be stopped when a pressure of 22 psi is applied to the dP switch. This check shall be performed and recorded every six months and can be performed during the dP gauge free movement check (see JIG 1, 4.10.3).

Timeline for Compliance

All new hydrant servicers with filter monitor vessels shall be ordered with a dP switching device (or PLC system) as described above.

All existing hydrant servicers with filter monitor vessels shall have a dP switching device (or PLC system) installed by December 31st 2013.