

Fuel Hydrant Commissioning

PURPOSE

This Bulletin is issued as a reminder of the need to apply effective commissioning procedures for newly constructed, extended or modified airport fuel hydrant systems and following cleaning operations. These procedures are essential to ensure that fuel quality is acceptable for aircraft use when the system is put into service.

DESIGN CONSIDERATIONS

A method of commissioning the hydrant system or hydrant extension must be considered from the very outset of the project. The design must allow commissioning to be effectively carried out in accordance with relevant standards.

Four key aspects must be considered:

1. Effective isolation of the hydrant from existing systems during the hydrotest and soak test phases. The minimum requirement is double block and bleed segregation, however physical isolation is preferred.
2. Completion of a clean build to minimise the entry of dirt, water and construction debris such as rust and weld slag – methods, including the use of end caps to prevent ingress of contaminants, are detailed in EI 1585 “Guidance in the cleaning of aviation fuel hydrant systems at airports”.
3. Effective arrangements for flushing the hydrant system at line velocities capable of removing any dirt, water and construction debris in the system.
4. In many instances achieving appropriate velocities in main lines is difficult. An alternate design consideration is to provide the ability to pig - either the entire main line or the extension during construction.

Note: Flushing at appropriate velocities, or pigging operations, should not be considered to be a once-off operation only associated with initial commissioning. Consideration should be given to repeating the commissioning flushing or pigging operation on a periodic basis to ensure that sedimentation that may cause an accumulation of contamination in the hydrant system is controlled. As a consequence of this, consideration should be given to making any arrangements for commissioning flushing or pigging permanent.

PROCEDURES

Hydrant operating companies shall notify into plane operators and airport authorities when hydrant repairs or modifications are to be carried out. "DO NOT USE" signs / boards should be applied to pit valves that are not cleared for service and which cannot be isolated physically.

Commissioning procedures shall take into consideration all health and safety risks including appropriate mitigations.

A detailed procedure is required to ensure that the system is appropriately soak-tested with clean fuel. Following the required soak period, laboratory testing shall be carried out on representative samples and flushing continued until the entire system is clean. Flushing shall be carried out using a volume of clean fuel (minimum of twice line contents) at a velocity that effectively removes debris/contaminants from the system – note that "caked on" mud/sand, large particles and dense debris may not be removed by flushing alone. The criteria for successful commissioning are detailed in EI 1585 (filter membrane colorimetric test rating of less than 4 (dry) and filter membrane gravimetric test results of less than 0.2 mg/l) and the hydrant section shall not be released for service until low point and hydrant pit flushing at representative flow rates produce clear and bright samples with no distinctive colour change obtained with a chemical water detector.

Flushed product may be received into fixed and/or temporary mobile storage depending upon the design of the system. Where flushing vehicles are equipped with filtration, filter separators are preferred to filter monitors because of their greater capacity for particulates and because filter monitors will plug rapidly if any water is present. Monitoring of filter vessel differential pressure should help to determine if there is significant particulate/water contamination. Procedures should include criteria on minimum requirements to be taken into consideration before returning flushed product into the Jet Fuel system or when it needs to be downgraded. Fuelling vehicles used for hydrant flushing shall have their filter elements replaced and be thoroughly flushed and sampled before being returned to fuelling service.

Where all relevant parties agree, an alternative method to flushing may be used (e.g. when sufficient flow rate cannot be achieved in the main pipe).

It is essential that adequate numbers of trained and experienced persons are involved in the commissioning processes and that their roles and responsibilities are clearly defined in Method Statements. Method Statements shall also list all of the equipment required. Accurate records need to be kept of the commissioning processes including flush volumes, flow rates, stock movements (including disposals), sampling and testing results.

The hydrant operating company shall confirm when commissioning procedures have been completed and which stands / hydrant pit valves are available for fuelling.

PUBLICATIONS

Useful guidance regarding fuel hydrant design, construction and commissioning can be found in the following publications:-

- JIG Technical Bulletin Number 35, July 2010 “Soak Testing”
- EI 1540 “Design, construction, operation and maintenance of aviation fuelling facilities”
- EI 1541 “Performance requirements for protective coating systems used in aviation fuel storage tanks and piping”
- EI 1585 “Guidance in the cleaning of aviation fuel hydrant systems at airports”
- EI 1594 “Initial pressure and strength testing of airport fuel hydrant systems with water”

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