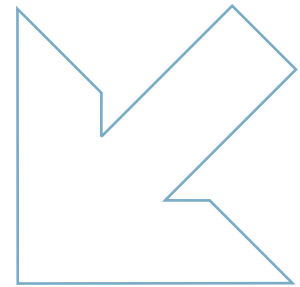




# Fuel spills during refuelling operations



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## 1 | Introduction

During 2008, Airbus received a report of significant fire damage following a fuel overspill from the wing NACA duct. The fire in the reported event was ignited by a passing service truck. No injuries were reported but the event highlights the risks associated with fuel spills.

This subject and the associated safety objectives are well documented. While legislation continues to develop, industry-working groups have established recognised procedures that can be applied as “standard” during all commercial into-plane refuelling operations. However Airbus continues to receive reports of fuel spills from the in-service fleet.

This article provides a reminder to the Airbus Operators community of the need to adhere to the published procedures and operational recommendations currently available within the industry.

## 2 | Consequences of a fuel spill

In the last 12 months there have been 11 fuel spill events reported to Airbus associated with aircraft refuelling.

In the worst case scenario the fuel spill presents a fire hazard in the vicinity of the aircraft, passengers and crew.

Reports from across the industry also record failure of the hose/refuel connector and incidents of refuel trucks driving away from the aircraft still connected to the aircraft. An accident in year 2001 associated with disconnection of the hose from the aircraft resulted in a fatality.

In addition to the stated safety hazards there is the potential disruption to the airline and airport operations.

The consequences of a fuel spill during refuelling include:

- Delay the aircraft departure
- Evacuation of the passengers
- Fire services on the scene
- Specialist services on scene to tidy the fuel spill

In addition to the costs associated with disruption to the aircraft operation most airport authorities /companies will pass on the charges of the clean-up operation to the airline/refuel company involved.

## 3 | Guidance Material

As per design, should a tank(s) be overfilled, the vent system allows the fuel to spill into the surge tank. Should the excess fuel quantity be greater than the capacity of the surge tank, the fuel exits via the surge tank NACA duct onto the ground.

Under normal circumstances the auto-refuel will close the refuel valve at the requested fuel-on-board preselected value. High-level sensors within the fuel tank will also automatically close the valve if high-level is reached. If the high level sensors fail, then an additional overfill sensor in the surge tanks, if wet, will also automatically close the valve. A basic step requested in the AMM refuel procedure is the high level / overfill sensor test via the dedicated pushbutton on the refuel panel.

The majority of events reported to Airbus occur during manual refuel or defuel procedures or fuel transfers from one tank to another within the aircraft fuel system.

When manual refuel/defuel/transfer is required, care should be taken to ensure individual tank quantities are not exceeded. Individual tank quantities are provided in the Aircraft Maintenance Manual (AMM). Airbus recommends the use of the auto-refuel procedure.

### 3.1 Airbus

The following chapter highlights the procedural and guidance material available to Airbus operators and refuel companies. The recommendations contained in the referenced documents build on the lessons learnt. Note that the AMM remains the reference document for the necessary accomplishment tasks.

To assist refuelling operations, and troubleshoot the system in the event of a failure indication, Airbus Customer Services, in response to customer feedback, has published the following relevant guides;

- A300-600R, A310-300 Trim Tank System, Troubleshooting Guidelines (ref STE/948.1341/90)
- A330-A340, Refuel System, Description and Troubleshooting Guidelines (ref SEE31/951.1398)
- A340-600, Auto Refuel Checklist, Troubleshooting Guidelines (ref SEE21/2006-100182)

### 3.2 Joint Inspection Group

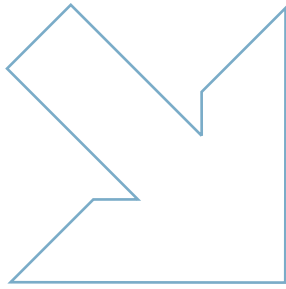
A feature of into-plane refuelling is the operation is performed by fuelling companies not the airline personnel. Several industry guides summarise safe operational practices. One of the most widely used is the Joint Inspection Group's "**Guidelines for Aviation Fuel Quality Control and Operating Procedures for Joint Into-Plane Fuelling Services**".

The Joint Inspection Group (JIG) comprising, BP, Chevron, ENI, ExxonMobil, Kuwait Petroleum, Shell, Statoil and Total, conducts yearly inspections at 120 Airport Fuelling Facilities worldwide, reporting on the level of compliance with all international standards and requirements in design and operation of fuel quality control and safety. JIG's inspection guidelines are also endorsed by the IATA Technical Fuel Group.

This document states:

"The majority of accidents can be attributed to lack of attention to, or failure to carry out, or deviations from prescribed procedures."





The guidelines place emphasis on training quoting: “The training and indoctrination of all personnel at all levels in all of the operational tasks they are normally required to undertake, and the tasks they would be expected to perform in an emergency, is of prime importance in seeking to achieve “accident-free operations”

Airbus also recommends that refresher training be given on a regular basis to ensure safety awareness is maintained.

This document provides recommendations and jointly agreed guidelines, which can be used to develop detailed quality control and aviation fuel handling procedures for into-plane fuelling services. Under the auspices of IATA membership, the fuel companies developed the guide to promote standard processes and procedures at airport facilities across the world.

### 3.3 IATA Technical Fuel Group

#### “Guidance Material on Standard Into-Plane Fuelling Procedures”.

IATA Into-plane standard procedures were developed under the IATA umbrella to develop “standardised procedures” for personnel involved with and carrying out into-plane refuelling. As stated previously, aircraft refuelling is carried out by the refuel companies not airline personnel. Hence there is a level of shared responsibility during this operation to ensure safety standards are maintained.

One objective of this guide was to identify and where possible harmonise procedures across the various aircraft types to reduce variations in procedures, thus mitigating the risk of applying the wrong procedure for a given aircraft type. Chapter 2 of the guide is dedicated to safety precautions and specifies the split in responsibility between the airline and the fuel company. Airbus has, where possible, brought the AMM procedure in line with the IATA guidance material.

Also under the IATA umbrella is the IATA Fuel Quality Pool (IFQP). The IFQP is a group of airlines that actively share airport fuel facility inspection reports and the associated workload of the inspections at locations worldwide. The fuel facilities inspection remit is quality and safety.

For further information visit:

[http://www.iata.org/whatwedo/aircraft\\_operations/fuel/](http://www.iata.org/whatwedo/aircraft_operations/fuel/)

## 4 | Conclusion

Airbus received information of significant fire damage to a passenger aircraft following a fuel spill in 2008. While there were no injuries and all passengers evacuated safely, the event highlights the need to follow published procedures and recommendations.

In 2001, there was a fatality associated with a refuelling accident.

Into-plane refuelling requires co-ordination between the airline and the into-plane refuel company. Adherence to the published procedures and industry recommendations will significantly reduce the risk of fuel spills. As highlighted by the industry groups adequate training and refresher training is essential to ensure that procedures are followed.

Airbus supports this approach, highlighting that all actors, the airline and the into-plane refuel company, must ensure the appropriate procedures are in place supported by an effective training plan.

### REFERENCES

- 1/ Flight Safety Foundation, Airport Operations, In Aircraft Fuelling, Fire Prevention Requires Strict Compliance with Routine Procedures
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