Australian Government
Australian Transport Safety Bureau

Aircraft cabin water leak event involving an Airbus A380, VH-OQD

near Los Angeles, USA, 2 July 2014

ATSB Transport Safety Report
Aviation Occurrence Investigation
AO-2014-116
Final – 15 October 2014

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

Publishing information

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Addendum

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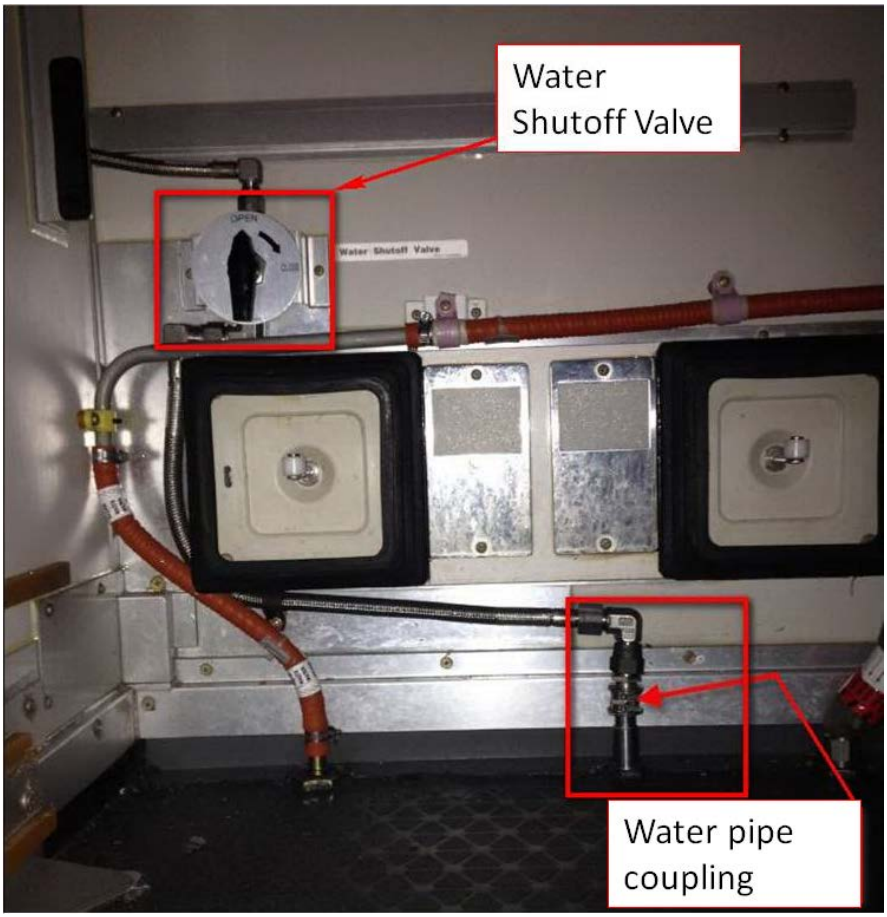
What happened

On 2 July 2014, a Qantas Airbus A380 aircraft, registered VH-OQD, departed Los Angeles, USA, for Melbourne, Victoria. During the climb, the captain switched off the seatbelt sign. A few minutes later, a cabin attendant entered the business class galley to retrieve hot towels for the passengers. As the attendant switched the hot water on, she observed water leaking out from under the meal carts.

The cabin supervisor then entered that galley and pulled the carts forward to access and switch off the water shut off valve (Figure 1), but that did not stem the flow of water. The cabin attendant contacted the flight crew and alerted them to the situation. The cabin crew used blankets and pillows in an attempt to direct the water down the drain; however the water flow rate was too high and the water continued to flow into the aircraft cabin.

Figure 1: Galley shut off valve and clam shell location



Source: Operator

A second officer went back into the cabin to determine how much water had leaked and confirmed that the valve was switched off. He advised the captain that there was quite a large flow of water coming from a loose water pipe coupling (Figure 1). The flight crew contacted maintenance watch ground staff who advised the crew that there was a main switch to the potable water on the flight attendants' panel (FAP). The cabin crew located the switch and selected it to 'OFF', which then stopped the water flow. The second officer observed the tank quantity indicator on the FAP

showing that about 40% of the potable water remained, which after taking off with 80% of the total capacity, indicated about 700 L of water had leaked into the cabin.

Maintenance watch advised that the water would drain towards the bilges and away from the aircraft's main electronic systems, which were located at the front of the aircraft, and they had no immediate concern for the safety of the aircraft. The crew then assessed the discomfort of passengers in the cabin, the quantity of water remaining for the planned flight to Melbourne, and the potential impact on the aircraft systems of the leaked water. The aircraft continued towards the destination during the troubleshooting phase, while the crew assessed the situation.

As a precaution, the cabin crew switched off the in-flight entertainment system and the power to all controls in the seats. The water had progressed through the upper deck floor and water was 'raining' on passengers in the vicinity of row 65 of the main deck. The cabin crew moved passengers from the central seats to the side seats. With the potable water supply switched off, there was no water available for the toilets or basins for the duration of the flight. The cabin crew determined that it was therefore untenable to continue the 14 hour flight. Leakage of that quantity of water had not occurred previously, and the eventual impact of the water on the aircraft was unknown.

The first officer and was able to secure the water pipe coupling in the galley that had come undone and caused the leak. However, the potable water remained switched off as a precaution. The crew did not receive any electronic centralised aircraft monitor (ECAM) indications or warnings. The crew conducted a decision making process in accordance with their crew resource management (CRM) procedures, and decided that the best option was for the aircraft to return to Los Angeles. The flight crew jettisoned some fuel to reduce the overall landing weight to 445 tonnes, which was above the maximum landing weight of 391 tonnes. The flight crew then prepared to conduct an overweight landing.

As the aircraft commenced descent, a cabin crew member advised the flight crew that the leaked water was moving forwards in the aircraft. The flight crew then conducted a slow speed descent to keep the water stabilised and prevent it flowing forwards. The aircraft landed without further incident.

The following day, the flight from Los Angeles to Melbourne was to be operated by a different Airbus A380 aircraft. During pre-flight maintenance, a maintenance engineer checked the same coupling that had leaked on the previous day. As aircraft power was switched on at the time, the potable water supply was pressurised. As the engineer tested the coupling, it came undone and some water leaked out. The engineers attempted to dry out the leaked water in the cabin, resulting in the aircraft arriving about one hour late at the departure gate. Conscious that the water may affect the same passengers from the previous day, the crew alerted the passengers prior to departure, that the coupling had been checked and secured, but that some water had escaped during the process.

As the flight crew increased the thrust during the take-off run, some water came down from the overhead bins in the main deck; however the quantity was similar to that normally arising from condensation and not considered to be significant. The flight continued to Melbourne.

Engineering report

An initial engineering inspection found that the coupling that joins the water pipe at the floor level where the water supply enters the galley was unlatched.

There was evidence that the rope-style mops used by cleaners may have contributed to the coupling coming undone. Fleet-wide inspection of the fittings found strands of cleaning mops tangled in the brackets, with evidence of couplings rotated in opposing directions.

Safety action

Whether or not the ATSB identifies safety issues in the course of an investigation, relevant organisations may proactively initiate safety action in order to reduce their safety risk. The ATSB has been advised of the following proactive safety action in response to this occurrence.

Aircraft operator

As a result of this occurrence, Qantas has advised the ATSB that they are taking the following safety actions:

Initial fleet wide inspection

Within 72 hours of the incident, a fleet wide inspection of all Qantas A380 aircraft was carried out and temporary preventative action taken on all similar galley installations. Each clamp was inspected, cleaned and refitted and then tested with the water tanks pressurised. When nil leakage was ensured, the clamp was then protected.

Cleaning and coupling protection

As an interim measure and in consultation with Airbus, aluminium tape has been double wrapped around the couplings to avoid the likelihood of unintentional disturbance. The aircraft are to be cleaned under the galley bench areas using sponge style mops instead of cotton rope mops.

Subsequent fleet wide inspection

A subsequent fleet wide inspection will be carried out on 14 September 2014. At this inspection, Qantas proposes fitment of lock-wire to prevent the clamp coming adrift.

Aircraft manufacturer

Airbus is working on providing an interim and a permanent solution.

Safety message

This incident provides an excellent example of effective crew resource management techniques. The crew were faced with an abnormal and unusual situation. Communication between flight crew, cabin crew and ground maintenance staff enabled a variety of scenarios and options to be considered. The ultimate decision to turn back to Los Angeles rested with the Captain and he was able to make that decision using all available resources and in a collaborative way.

General details

Occurrence details

Date and time:	2 July 2014 – 0830 UTC	
Occurrence category:	Incident	
Primary occurrence type:	Furnishings and fittings	
Location:	near Los Angeles International Airport, USA	
	Latitude: 33° 56.55' N	Longitude: 118° 24.48' W

Aircraft details

Manufacturer and model:	Airbus A380-842	
Registration:	VH-OQD	
Operator:	Qantas Airways	
Serial number:	0026	
Type of operation:	Air transport high capacity	
Persons on board:	Crew – 24	Passengers – 377
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Minor	

About the ATSB

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; and fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, relevant international agreements.

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the safety factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

About this report

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.