

## SERIOUS INCIDENT

<b>Aircraft Type and Registration:</b>	Airbus A320-232, G-EUUT
<b>No &amp; Type of Engines:</b>	2 International Aero Engine V2527-A5 turbofan engines
<b>Year of Manufacture:</b>	2007 (Serial no: 3314)
<b>Date &amp; Time (UTC):</b>	14 June 2022 at 1309 hrs
<b>Location:</b>	London Heathrow Airport
<b>Type of Flight:</b>	Commercial Air Transport (Passenger)
<b>Persons on Board:</b>	Crew - 2 pilots      Passengers - 159 4 cabin crew
<b>Injuries:</b>	Crew - None      Passengers - None
<b>Nature of Damage:</b>	None reported
<b>Commander's Licence:</b>	Airline Transport Pilot's Licence
<b>Commander's Age:</b>	49 years
<b>Commander's Flying Experience:</b>	13,786 hours (of which 8,373 were on type) Last 90 days - 136 hours Last 28 days - 55 hours
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot

### Synopsis

The pilots noticed a strong unpleasant smell in the cockpit during an approach to London Heathrow Airport. The aircraft landed uneventfully but after landing both pilots suffered ill effects from the fumes. A PAN was declared when on stand but there was a 17-minute delay until ground personnel could access the aircraft. The commander was taken to hospital but released the same evening following medical checks.

### History of the flight

The aircraft, an Airbus A320 (Figure 1), was operating a passenger service from Malaga-Costa del Sol Airport, Spain, to London Heathrow Airport. During the arrival procedure, Heathrow ATC gave the crew radar vectors, which reduced the ground track to landing. The aircraft was therefore going to capture the ILS glidepath from above and the crew described their workload on the approach as "quite high". Just before intercepting the glidepath, at approximately 3,000 ft agl and five minutes from landing, the co-pilot noticed a strong unpleasant odour in the flight deck. He described the smell as being like "a wet dog or sweaty socks". Once the co-pilot had reported the smell the commander also noticed the odour. Neither pilot felt any sense of impairment and given their high workload, they briefly discussed the odour and decided to continue the approach without actioning the smoke/fumes removal procedure. Neither pilot was therefore on oxygen, though the much-increased workload that would have been incurred by carrying out the procedure was avoided.



**Figure 1**  
Airbus A320

The approach was continued, and the aircraft made a normal landing. After clearing the runway, the aircraft was taxied toward Stand 548L at Heathrow and the crew had stopped noticing the smell. As the aircraft approached the stand, the crew noticed the parking guidance system was not active. There was a delay of approximately 10 minutes in waiting to park before an airport Marshaller guided the aircraft onto the stand. During this period, as the pilots were no longer noticing the smell, they asked the Senior Cabin Crew Member to come into the flight deck to ask if they noticed anything. They did not. The co-pilot began to feel nauseous and lightheaded during the wait to park but did not tell this to the rest of the crew. When the aircraft reached its final parking position the co-pilot was feeling very unwell and had begun coughing and retching. The co-pilot described himself as “quite scared” by the level of the symptoms. The commander shut down the aircraft, made a PAN call via RTF requesting Emergency Services assistance and opened his cockpit window.

The commander was also now feeling unwell and so the cabin crew gave both pilots portable oxygen sets, which they used. Due to a lack of appropriately trained personnel at Heathrow, there was a 17-minute delay from the aircraft parking until an airbridge was attached. The Emergency Services did not enter the aircraft until the airbridge was attached, when paramedics entered the flight deck to assess the pilots’ condition. The RFFS also entered the flight deck with gas monitors, which gave a negative result. This equipment can detect combustible gases and vapours, as well as oxygen, carbon monoxide, hydrogen sulphide, nitrogen dioxide and sulphur dioxide. The RFFS have a set of mobile evacuation stairs which could be deployed to such incidents if more rapid access to the aircraft is required.



The co-pilot felt anxious but was reassured by the paramedics and it was not judged that he required any further medical checks. Due to elevated blood pressure and pulse rate, the paramedics took the commander to hospital for further assessment. During that assessment the commander had a blood test for exposure to toxic gases which gave a negative result. The commander was released from hospital following the medical checks.

None of the cabin crew noticed any unusual smells at any stage of the flight. All of the passengers were disembarked without further incident. Neither of the pilots suffered any further ill effects post flight.

### Smoke / Fumes / Avncs Smoke Procedure

The aircraft's Quick Reference Handbook (QRH) contains a procedure for when smoke and fumes are detected. When the pilots smelt the unusual odour, however, their workload was high and neither felt any sense of impairment. The aircraft was only a few minutes from landing and so the pilots landed without carrying out the QRH procedure. The first action in the procedure is to land as soon as possible.

The procedure in the QRH gives guidance on immediate protection of the crew through the use of oxygen masks and then offers a structured system to diagnose the source of fumes and eliminate that. Should the smoke or fumes become the greatest threat, the procedure has guidance on removing smoke from the cabin. These procedures are long and would have taken more time to complete than the few minutes left to landing. The first page of the QRH procedure is shown at Figure 2.

 <small>A318/A319/A320/A321 CEO</small>	ABNORMAL AND EMERGENCY PROCEDURES SMOKE	27.1 <small>02-Mar-22</small>
<b>SMOKE / FUMES / AVNCS SMOKE</b>		
<small>Applicable to: MDW D1014</small>		
<p><b>LAND ASAP</b></p> <p>IF PERCEPTIBLE SMOKE / FUMES APPLY IMMEDIATELY:</p> <p>CREW OXY MASKS (if required) .....USE/100%/EMER</p> <p>VENTILATION BLOWER..... OVRD</p> <p>VENTILATION EXTRACT..... OVRD</p> <p>CAB FANS.....OFF</p> <p>GALLEY .....OFF</p> <p>SIGNS..... ON</p> <p>CKPT / CABIN COM ..... ESTABLISH</p> <ul style="list-style-type: none"> <li>● If smoke/fumes source immediately obvious, accessible, and extinguishable:            FAULTY EQPT.....ISOLATE</li> <li>● If smoke/fumes source not immediately isolated:            DIVERSION ..... INITIATE            DESCENT TO FL 100 / MEA-MORA ..... INITIATE</li> </ul>		
<ul style="list-style-type: none"> <li>● At ANY TIME of the procedure, if SMOKE / FUMES become the GREATEST THREAT:            REMOVAL OF SMOKE / FUMES .....CONSIDER  <i>Refer to ABN-27 Removal of Smoke / Fumes</i>            ELEC EMER CONFIG .....CONSIDER  <i>Refer to the end of the procedure to set ELEC EMER CONFIG</i></li> </ul>		
<ul style="list-style-type: none"> <li>● At ANY TIME of the procedure, if situation becomes UNMANAGEABLE:            IMMEDIATE LANDING .....CONSIDER</li> </ul>		
 <span style="float: right;"><small>Continued on the next page</small></span>		
<small>BAW A318/A319/A320/A321 CEO QRH ABN-27-1</small>		

**Figure 2**

Smoke/Fumes/Avionics Smoke QRH procedure

In any fumes event, the operator's training department strongly advocates completion of the items to CKPT/CABIN COM as a minimum. This would include the pilots donning oxygen masks and using the Emergency setting. This provides positive oxygen pressure to the mask to protect the user from inhaling noxious fumes.

The QRH procedure is not, however, designed to be carried out by memory. One of the pilots would have had to read the actions from the QRH and this would have increased crew workload.

### **Aircraft examination**

The aircraft was removed from service after the event and examined using a maintenance protocol for smoke and fumes events that was developed as a Safety Action during a previous AAIB investigation.<sup>1</sup> No technical cause was identified, and the aircraft was returned to service without any rectification being required. For all aircraft in the operator's fleets that have been examined post fumes events, a definitive technical cause has only been identified in approximately 5% of occurrences.

### **Union cabin air quality campaigns**

Unions representing both pilots and cabin crew have been campaigning on the issue of fumes on board commercial aircraft. These campaigns have supplied information on how to respond to such events to the respective union members. The information contains descriptions of common symptoms, and suggests that crews should report all such events via the operator's reporting systems and via MORs to the CAA. It also recommends that crew should use oxygen in such events and that they should seek medical advice if they suffer any ill effects. The descriptions of events used in these campaigns frequently appear in the reporting of fumes events.

### **NHS Care Pathway**

The CAA has an information page for fumes related events<sup>2</sup> which gives guidance to health professionals caring for those exposed to them. The page describes the situation as follows:

*'The pattern of symptoms reported is quite variable and health professionals have asked for guidance on how best to manage such patients. The Care Pathway has been developed by an independent working group including experts in toxicology, epidemiology, aviation medicine and primary care, in order to provide advice to health professionals in managing such patients.'*

The principal response mentioned is the NHS Care Pathway. This is outlined in the flow chart at Figure 3.

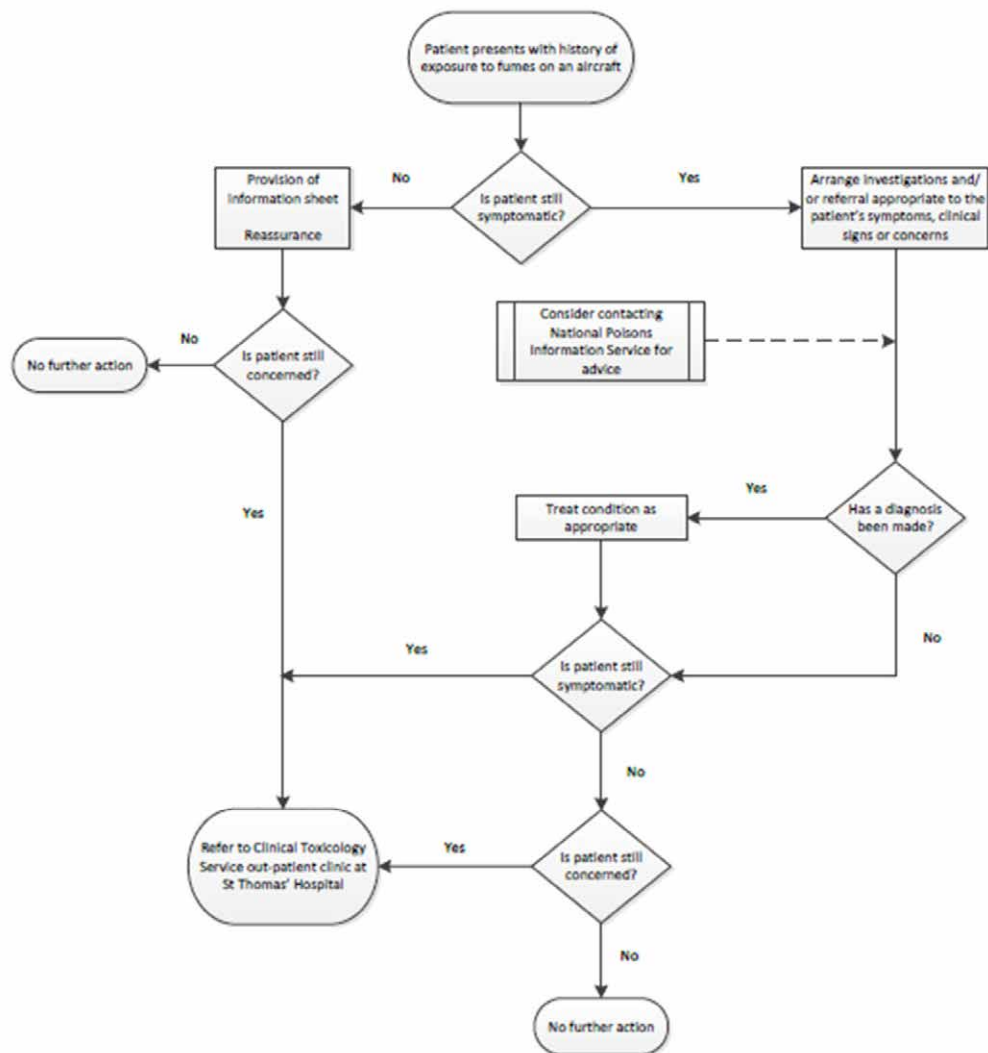
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#### **Footnote**

<sup>1</sup> <https://www.gov.uk/aaib-reports/aaib-investigation-to-airbus-a320-232-g-euyb> [accessed August 2022].

<sup>2</sup> <https://www.caa.co.uk/Passengers/Before-you-fly/Am-I-fit-to-fly/Guidance-for-health-professionals/Aircraft-fume-events/> [accessed August 2022].

### NHS CARE PATHWAY PATIENTS EXPOSED TO FUMES ONBOARD COMMERCIAL AIRCRAFT



**Figure 3**  
NHS Care Pathway flowchart

The CAA Information also considers the possibility of a '*Nocebo effect*' where there may be a psychologically mediated response (see note) triggered by awareness of irritation or an odour. In such cases illness, often with physical symptoms and signs, is triggered through psychological processes in response to a perceived harmful exposure. The phenomenon is analogous to a placebo effect in which symptoms improve in response to a perceived beneficial exposure.

There is no specific medical test which the CAA recommends for crew who have been exposed to fumes events. Advice from the CAA Medical department for fumes exposure is as follows:

*'The likely background to the Poisons Service referral is that they have the 24/7 NHS expertise/mechanics to investigate specific 'potential poison' incidents which could be technically almost anything from a chemicals perspective, and because there is not a firm/causative link between what is found in fume events and clinical symptoms / pathology etc. each case would need individual assessment as described in the guidance.'*

## **Meteorology**

The Heathrow weather at the time of the event gave a wind of 220° at 8 kt varying between 170 and 260°. The visibility was greater than 10 km and no cloud was detected. Some previous reports of fumes events on A320 aircraft have been associated with the passage of cloud. This was not a factor in this case, and so weather was not considered to be a factor in the event.

## **Organisational information**

The operator has duty managers who provide immediate support to crew members who have been involved in operational events. Such occurrences are followed up by flight crew management and the level of support offered is tailored on a case-by-case basis. The support offered can include dealing with significant post-event issues such as Post Traumatic Stress disorder.

The operator has its own medical service, which does not advocate post-event testing of crew unless there are symptoms or physical signs on which to base a medical investigation. Their view is that:

*'The most appropriate medical management is to get a person with symptoms to the most appropriate medical facility, i.e. an acute care facility such as A&E if needed. Such a department will then investigate, based on symptoms and, if necessary, consult the National Poisons Service.'*

## **Other information**

The operator's maintenance personnel use Aerotracer equipment to measure the presence of odours, such as those from oils. The equipment allows detection and identification of common volatile compounds used in connection with aircraft, for example hydraulic fluids or lubricating oil. Another system, GrayWolf, allows for the detection of a range of toxic gases. Both systems gave a negative result aboard the aircraft.

## **Analysis**

The pilots noticed the presence of an unusual and unpleasant odour only a few minutes before landing. Aside from the odour there were no other indications of a fault with the aircraft and, initially, neither pilot felt any sense of impairment from the odour in the cockpit. They briefly discussed the issue but, as their workload was high and both felt unaffected, decided to continue with their approach without undertaking any QRH procedures. As a result, neither pilot was wearing an oxygen mask. The operator strongly recommends

that during fumes events pilots complete at least the initial actions of the '*Smoke / Fumes / Avncs Smoke*' QRH procedure. These actions would have directed the pilots to don their oxygen masks and use the Emergency setting on the mask. The positive oxygen pressure thus delivered would provide a high degree of protection against inhaling toxic fumes. The aircraft landed safely and taxied toward its parking stand, and by this point both pilots had stopped noticing the odour.

During the 10-minute delay waiting with engines running for the parking stand guidance to be turned on, the co-pilot began to feel nauseous. As the aircraft parked, the co-pilot felt increasingly unwell and the severity of his symptoms increased. The commander carried out the shutdown check, made a PAN call to ATC and opened his window. During these actions the commander also began to feel lightheaded.

The Senior Cabin Crew Member entered the cockpit and provided both pilots with oxygen, although he did not perceive any odour. There was a delay of approximately 17 minutes before an airbridge was attached to the aircraft, which allowed paramedics and the RFFS to enter the flight deck. If toxic fumes were present in the flight deck this long delay would have increased exposure to them. The RFFS conducted gas checks which proved negative. Nevertheless, after both pilots were checked by the paramedics, the commander's symptoms were considered sufficient to warrant assessment in hospital.

The odour was not noticed by any cabin crew or passengers and nor did any display any symptoms.

There have been a significant number of suspected fumes events in the operator's A320 fleet, but no decisive technical findings have been made. The awareness of such events has been raised by the campaigning conducted by pilot and cabin crew Unions, and the CAA indicates the possibility of a psychological response to the perceived problem of aircraft fumes events. That cannot be discounted but neither can the occurrence of toxic fumes.

The operator has no formal medical blood test protocol for crew that could capture evidence of symptoms or exposure to toxins because its policy, based upon its own medical service's recommendations, is to take anyone with symptoms to the most appropriate medical facility. The CAA does not recommend any specific medical test which could be deployed to detect exposure to toxic fumes in crew. Each medical case is assessed individually.

The issue has previously been given prominence by the CAA, and a Care Pathway has been created to give information to healthcare professionals caring for those exposed to such events. The pilots in this event recovered quickly and have shown no subsequent ill effects.

## **Conclusion**

The pilots noticed an unpleasant odour in the flight deck shortly before landing. Due to their high workload and lack of symptoms they decided to continue the approach without carrying

out QRH procedures. The aircraft landed safely but, due to a delay in ground handling, there was a delay in emergency services gaining access to the flight deck. Both pilots developed symptoms and were given medical attention by Emergency Services personnel. After medical checks both recovered and suffered no further ill effects.