

ECA GUIDELINES on SMOKE & FUME / SMELL EVENTS

Introduction

Smoke and fume / smell events – usually referred to as ‘cabin air contamination’ – have recently been highlighted as a potential threat to air safety and awareness of the inherent risk of such events has been growing. Studies and occurrence / accident reports have shown that such events could pose a threat to the safety of flight operations as well as to the health of cockpit / cabin crew and passengers. Reporting of such events is of great importance to gather reliable data on the phenomenon and hopefully reduce the risk of smoke and fume / smell events in the future.

Against this background ECA introduces guidelines on how to deal with fume / smell events. The aim is to ensure that such events are correctly recognized by air crew, are adequately dealt with during flight operations, and are followed-up upon, including through proper reporting to the company / authority.

The primary aim of occurrence reporting in aviation is for organizational learning. By proper reporting, each crew member makes sure that operators manufacturers and authorities have access to the best available information from the flight and cabin crew.

The ECA Task Group on Cabin Air Quality introduces these guidelines with the intention to give each ECA Member Association the opportunity to adapt them to their needs and local procedures and to thereby enhance the flight crews’ reporting of these events.

1. Definitions (ICAO circular 344)

- **Smoke.** The product of burning materials made visible by the presence of small particles.
- **Fume(s).** Odorous, gaseous compounds which are not visible.
Note. — In the context of the ICAO circular, fumes and odours are deemed to be synonymous, and the term “fume(s)” includes both fumes and odours.
- **Contaminant.** An airborne constituent that may reduce air quality.



2. Effects

The symptoms associated with cabin air contamination are diverse, but nervous and respiratory symptoms prevail.

List of possible symptoms:

Headache	Drowsiness
Dizziness	Impaired vision
Nausea	Vomiting
Tingling (e.g. hands, feet, etc.)	Trembling
Numbness	Irritated eyes/throat/nose
Difficulty speaking and finding words	Memory problems
Muscle incoordination	
Breathing difficulties	Coughing

Note: these symptoms are given as examples, and may not necessarily mean you suffer(ed) from a fume / smell intoxication. These symptoms can also be provoked by other factors. However, when several of these symptoms occur (in combination) within a short time frame and are of a pronounced nature, they deserve particular attention.

3. Flight Operations

How to react during & after flight operations?

» Apply QRH «Smoke/Fumes» checklist

- Consider use of Crew Oxygen/ 100% if not included in the QRH checklist
- Try to identify possible source
- Check procedures in OMA/OMB

» Record symptoms (cockpit/cabin crew as well as passengers if possible or convenient)

- Be prepared for possible crew or passenger incapacitation



- » **Inform airline (Maintenance, Dispatch or Operations)**

- » **Perform a Tech Log Entry**
 - Take pictures of the log entry for further personal reference.

- » **Fill in an occurrence report in line with company regulations and EU376/2014 as required**
 - Include effect on occupants, use of oxygen masks, possible source (Engines (type + which one) /APU), phase of flight, nature and severity of event, etc.

- » **Fill in the Smoke and Smell Report (See ICAO Circular 344, Appendix to Chapter 4 “Standardized Smoke/Fumes Reporting Form”)**

- » **Debrief with the whole crew**
 - Symptoms, what they did/saw, use of oxygen mask
 - Write down contact details of other crewmembers for information tracking purposes.

- » **In case of symptoms/health problems:**
 - See a doctor ASAP or at least within 48h

- » **File an occupational health and safety report, as applicable.**

Note 1: Make sure to explain to your members the differences between an Occurrence Report and an Occupational Health and Safety Report.

Note 2: ICAO circular 344-AN/202 is a guideline to states to support the development of relevant advisory material for operators to provide suitable awareness and/or training to flight crew, cabin crew and AMT to enable them to prevent, recognize and respond to the presence of fumes, particularly aircraft air supply system-sourced engine or auxiliary power unit (APU) oil or hydraulic fluid fumes. It does not address on-board exposure to smoke or fire. This circular is not only aimed at educating flight crews, but is also meant to train aircraft maintenance technicians and management personnel. Ask a copy from this circular to your operator and request the operator's gap analysis and implementation into the SMS system, as required by this circular.



Note 3:

- *EU Reg. 376/2014 on Occurrences in civil aviation — reporting, analysis and follow-up (For a summary, the Regulation's text and related 'Implementing Regulation' with the list of occurrences: http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=URISERV%3A320504_1).*
- *Implementing Regulation 2015/1018: Annex I, Section 2 (4):*
- *Implementing regulation contains:*

ANNEX I - OCCURRENCES RELATED TO THE OPERATION OF THE AIRCRAFT

2. TECHNICAL OCCURRENCES

- (4) Leakage of any fluid which resulted in a fire hazard or possible hazardous contamination of aircraft structure, systems or equipment, or which has or could have endangered the aircraft, its occupants or any other person.

4. EMERGENCIES AND OTHER CRITICAL SITUATIONS

- (1) Any event leading to the declaration of an emergency ('Mayday' or 'PAN call')
- (2) Any burning, melting, smoke, fumes, arcing, overheating, fire or explosion.
- (3) Contaminated air in the cockpit or in the passenger compartment which has or could have endangered the aircraft, its occupants or any other person.
- (9) Any use of crew oxygen system by the crew.
- (10) Incapacitation of any member of the flight or cabin crew that results in the reduction below the minimum certified crew complement.

4. Medical

Scientific research in the field of Cabin Air Quality is still ongoing, and the types of tests that would need to be performed routinely after a fume event have not been established yet. Therefore, only general guidelines on what medical tests should be performed can be given.

Some airlines have their own medical procedure in case of fume / smell events and these should be followed if your airline has such a procedure. In addition, different tests can be performed as part of research purposes depending where the medical examination takes place.

In any case:

- Note all symptoms and record them continuously thereafter. Note when and for how long they appeared.
- Take pictures or make a video recording of visual symptoms if any, for later use.
- Take notes with you to the medical examination.



- Perform medical examination ASAP, or at least within 48h of event.
- Write down contact details of other crewmembers for information tracking purposes.
- Ask for your medical report.

Medical Self assessment checklist (see Appendix 1 on page 6):

(IATA Guidance for airline health & safety staff on the medical response to Cabin Air Quality events)

The examination should include (refer to IATA Guidance for airline health and safety staff on the medical response to Cabin Air Quality events, Chap. 8 for more details):

- Clinical history
- Physical examination, including neurological status/examination
- Laboratory tests, depending on the clinical situation, that may include, but are not limited to
 - O₂-Saturation and arterial blood gas analysis (PaO₂, PaCO₂, Ph, HCO₃⁻)
 - Hemoglobin, methemoglobin, carboxyhemoglobin
 - Blood-glucose, lactate, electrolytes
- In case of respiratory problems, spirometry and lung diffusion capacity test.

References for the ECA Guidelines on Smoke & Fume / Smell Events:

ICAO Circular 344 "Guidelines on Education Training and Reporting Practices related to Fume Events"

IATA Guidance for airline health and safety staff on the medical response to Cabin Air Quality events. <https://www.iata.org/whatwedo/safety/health/Documents/guidance-medical-respon-se-cabin-air-events.pdf>

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Appendix 1

