Smoke Procedure Finalization
Review of the Airbus Smoke Procedure

Crew (cockpit or cabin) perception without ECAM Warning

When to apply the procedure?

SMOKE / FUMES / AVNCS SMOKE

ASAP
Review of the Airbus Smoke Procedure

ECAM “AVIONICS SMOKE” Warning

Crew (cockpit or cabin) perception without ECAM Warning

When?

WHEN TO APPLY THE PROCEDURE?

SMOKE / FUMES / AVNCS SMOKE
Review of the Airbus Smoke Procedure

When to apply the paper procedure: ECAM AVNCS SMOKE

- On Long Range Aircraft
  - Common actions followed by reference to paper procedure.

- SMOKE AVNCS VENT SMOKE
  - OXY MASK .................... ON
  - CKPT/CABIN COM ...... ESTABLISH
  - VENT EXTRACT .......... OVRD
  - CABIN FANS ............. OFF
  - GALLEYS .................. OFF
  - CAB SIGNS .............. ON

LAND ASAP

- CAB SIGNS ...................... ON
- SMOKE/FUMES PROC ...... APPLY

LAND ASAP
Review of the Airbus Smoke Procedure

When to apply the paper procedure: ECAM AVNCS SMOKE

- On Single Aisle Aircraft
  - Common actions followed by count down and procedure for setting Electrical Emergency procedure.

- If perceptible smoke
  - Oxygen masks/goggles... on
  - Cab fans... off
  - Blower... OVRD
  - Extract... OVRD

- If smoke after 5mn00s:
  - Emer electric gen1 lin... off
  - Emer electric pwr... man on
  - When Emer gen avail
  - APU gen... off
  - Gen 2... off
  - Min rat speed... 140KT

LAND ASAP
Review of the Airbus Smoke Procedure

When to apply the paper procedure: ECAM AVNCS SMOKE

- On Single Aisle Aircraft
  - Paper procedure may be applied as soon as the caution is triggered, or after completion of the common actions

![Diagram showing ECAM AVNCS SMOKE procedure]

© AIRBUS 2006 S.A.S. All rights reserved. Confidential and proprietary document.
Review of the Airbus Smoke Procedure

When to apply the paper procedure: ECAM AVNCS SMOKE

- On Single Aisle Aircraft, with FWC F4 standard
  - Removal of the ELEC EMER part.
  - Addition of a reference to the paper procedure.

- Harmonization with LR procedure.
Review of the Airbus Smoke Procedure

ECAM “AVIONICS SMOKE” Warning

Crew (cockpit or cabin) perception without ECAM Warning

Any other Smoke warning

WHY?

WHEN TO APPLY THE PROCEDURE?

SMOKE / FUMES / AVNCS SMOKE
Review of the Airbus Smoke Procedure

Why referring to paper procedure…

- Smoke in monitored area potentially due to other source.
  - Example: smoke detected in the Video Control Center (VCC), due to Air Conditioning smoke

- In case of any doubt on the smoke origin:
  - Always apply the ECAM
  - Consider referring to SMOKE/FUMES/AVNCS SMOKE paper procedure
Review of the Airbus Smoke Procedure

ECAM “AVIONICS SMOKE” Warning

Crew (cockpit or cabin) perception without ECAM Warning

Any other Smoke warning

Any other Smoke warning

SMOKE / FUMES / AVNCS SMOKE

SMOKE / FUMES REMOVAL
Review of the Airbus Smoke Procedure

When to apply the Smoke Removal procedure

- SMOKE REMOVAL procedure only called by SMOKE FUMES AVNCS SMOKE procedure.
  - The crew should not apply the SMOKE REMOVAL procedure directly
  - Procedure applicable to all sorts of smokes or fumes (including toxic fumes)
Quick Recall of the Smoke Procedure Philosophy

- One Single Checklist
- Cockpit / Cabin Communication
- Initial steps
- "At any Time" recommendations
  - Not a memory item
- Procedure for source identification / isolation for
  - Air Conditioning smoke
  - Cabin Equipment smoke
  - Avionics / Electrical smoke
Review of the Airbus Smoke Procedure

Initial Steps

- OXY MASK (if RQRD) ..................ON/100% EMERG
- CKPT/CABIN COMM ..........................ESTABLISH
- VENT EXTRACT ................................OVRD
- CAB FANS .........................................OFF
- GALLEYS ..........................................OFF
- CAB SIGNS .........................................ON

• IF FAULTY SMOKE SOURCE IMMEDIATELY OBVIOUS ACCESSIBLE AND EXTINGUISHABLE:
  - FAULTY EQUIPMENT .........................ISOLATE
• IF SMOKE SOURCE NOT IMMEDIATELY ISOLATED:
  - DIVERSION ..................................INITIATE
  - DESCENT (FL 100/MEA) ..................INITIATE

**“AT ANY TIME” items**

- SMOKE / FUMES / AVNCS SMOKE
- Electrical Emergency Configuration
- Research/Isolation

Initial Steps

- LAND ASAP

- OXY MASK (if RQRD) ..................ON/100% EMERG
- CKPT/CABIN COMM ..........................ESTABLISH
- VENT EXTRACT ................................OVRD
- CAB FANS .........................................OFF
- GALLEYS ..........................................OFF
- CAB SIGNS .........................................ON

• IF FAULTY SMOKE SOURCE IMMEDIATELY OBVIOUS ACCESSIBLE AND EXTINGUISHABLE:
  - FAULTY EQUIPMENT .........................ISOLATE
• IF SMOKE SOURCE NOT IMMEDIATELY ISOLATED:
  - DIVERSION ..................................INITIATE
  - DESCENT (FL 100/MEA) ..................INITIATE

**“AT ANY TIME” items**

- SMOKE / FUMES / AVNCS SMOKE
- Electrical Emergency Configuration
- Research/Isolation

**Electrical Emergency Configuration**

- RECHARGE PWR
- SMOK/EVT PWR
- SMOKE TOXIC PLS REMOVAL

**SMOKE SOURCE**

- RECHARGE PWR
- SMOK/EVT PWR
- SMOKE TOXIC PLS REMOVAL

**Research/Isolation**

- RECHARGE PWR
- SMOK/EVT PWR
- SMOKE TOXIC PLS REMOVAL

**“AT ANY TIME” items**

- SMOKE / FUMES REMOVAL .................CONSIDER
- ELEC EMER CONFIG .........................CONSIDER

At ANY TIME of the procedure, if SMOKE/FUMES becomes the GREATEST THREAT:

- SMOKE / FUMES REMOVAL .................CONSIDER
- ELEC EMER CONFIG .........................CONSIDER

At ANY TIME of the procedure, if situation becomes UNMANAGEABLE:

- IMMEDIATE LANDING .......................CONSIDER

**IF AIR COND SMOKE SUSPECTED**

- APU BLEED ....................................OFF
- PACK 2 ........................................OFF
- SMOKE/TOXIC FUMES REMOVAL ..........CONSIDER

**IF CAB EQUIPMENT SMOKE SUSPECTED**

- EMER EXIT LT ................................ON
- COMMERCIAL ................................OFF
- SMOKE/TOXIC FUMES REMOVAL ..........CONSIDER

**IF AVIONICS/COCKPIT SMOKE SUSPECTED**

- AC BUS 1 1 + 1 2 can be shed as follows:
- AC BUS 2 3 + 3 4 can be shed as follows:

**TO SET ELEC EMER CONFIG**

- EMER GEN AVAIL
- EMER ELEC PWR ................................MAN ON
- WHEN EMER GEN AVAIL:

- ELEC EMER CONFIG
- EMER EMERG PROCEDURE WITHOUT PERFORMING THE GEN RESET.
Contents

1. Introduction
2. Review of the Airbus Smoke Procedure
3. Latest Changes in the Procedure
4. e-briefing
4. Conclusion
Latest Changes in the procedure

Smoke / Fumes Checklist Industry Workshop

Associations/Organization
- Flight Safety Foundation
- IFALPA
- IATA
- KCPA
- APAC
- NASA

Regulators/Safety Board
- Federal Aviation Administration
- Transportation Safety Board of Canada

Airlines
- Swiss
- Lufthansa
- United
- British Airways
- Air Canada
- American Airlines
- Delta
- FedEx

Manufacturers
- Airbus
- Boeing
- Bombardier
- Dassault Aviation
- Embraer
Smoke / Fumes Checklist Industry Workshop

BEFORE
Manufacturer and Customer checklists vary widely in format & content

Industry Consensus

- A common philosophy for flight crew response to in-flight Smoke/Fire/Fumes events
- A generic checklist template based on the established philosophy
Latest Changes in the procedure

Smoke / Fumes Checklist Industry Workshop Outcome

- The ENTIRE crew must be part of the solution.
- For Smoke/Fire/Fumes events: TIME IS CRITICAL.
- A SINGLE CHECKLIST template to address non-ECAM events.
- SMOKE REMOVAL Checklist easily accessible.
- Use of LARGE FONT for legibility of checklist in smoke environment.
- Definition of INITIAL STEPS:
  - quick / simple / reversible
  - to stop smoke recirculation, enable Crew Protection & Communication.
  - not requiring analysis by the crew
  - not making the situation worse or inhibit further assessment
Smoke / Fumes Checklist Industry Workshop Outcome

- Application of **SMOKE REMOVAL**
  - IF DENSE SMOKE replaced by if SMOKE / FUMES becomes the GREATEST THREAT.

---

- The text box indicates the immediate applicable procedure, if at any time of the procedure, the smoke/fumes becomes the greatest threat and smoke removal is required, before continuing the SMOKE/FUMES/AVNCS SMOKE procedure.

---

- **At ANY TIME** of the procedure, if smoke/fumes becomes the GREATEST THREAT:
  - SMOKE FUMES REMOVAL
    - When necessary, the smoke removal procedure must be applied before the electrical emergency configuration is set. Indeed, in electrical emergency configuration, smoke removal cannot be performed.
  - ELEC EMER CONFIG
    - Refer to the end of the procedure to set ELEC EMER CONFIG

---
Latest Changes in the procedure

Smoke / Fumes Checklist Industry Workshop Outcome

- **Diversion** initiation

- **FCOM Vol 3**

  In parallel, when smoke is detected, the crew must **immediately be prepared to perform a diversion**. This diversion may be avoided if the smoke source is obvious, extinguishable and accessible or confirmed isolated after completion of these immediate actions.

- **QRH**

  - **IF SMOKE SOURCE IMMEDIATELY OBVIOUS, ACCESSIBLE AND EXTINGUISHABLE:**
    - FAULTY EQPT .............................................. ISOLATE
  
  - **IF SMOKE SOURCE NOT IMMEDIATELY ISOLATED:**
    - DIVERSION .............................................. INITIATE
    - DESCENT (FL 100/MEA, min obstacle clearance altitude) INITIATE
Latest Changes in the procedure

Smoke / Fumes Checklist Industry Workshop Outcome

- **“Immediate Landing”**
  - If situation **UNMANAGEABLE**
  - May mean:
    - Overweight landing
    - Tail wind landing
    - Off airport landing

\[\text{At ANY TIME of the procedure, if situation becomes UNMANAGEABLE:} \]
- **IMMEDIATE LANDING**.................................CONSIDER\]
Contents

1. Introduction
2. Review of the Airbus Smoke Procedure
3. Latest Changes in the Procedure
4. e-briefing
4. Conclusion
e-briefing: Introduction

- Objectives of the FCTM
  - To ensure proper understanding of the design and procedures
  - To explain *why* and *how* to apply a procedure
  - To answer the most frequent questions
  - To avoid the most frequent errors

- Objectives of the e-briefing
  - To gather all the information available on a subject.
  - To take the benefit of audio and video
  - To enhance coordination between cabin and cockpit crew
e-briefing: Introduction

- HTML document soon available on www.airbusworld.com

- Click on underlined topic
e-briefing: General view

Cockpit

- Avionic bay or cockpit (electrical equipment)
- Lavatory

Cabin

- Air conditioning
- Cabin (electrical equipment)
- Cargo

Procedures

- Use of QRH procedure
- SMOKE, FUMES OR ODORS IN COCKPIT WITHOUT ECAM WARNING
- SMOKE IN THE CABIN ANNOUNCED BY CABIN CREW WITHOUT ECAM WARNING
- AVNCS SMOKE ECAM CAUTION (A320 family)
# e-briefing: General view

## Smoke

### Various smoke sources

- **Avionic bay or cockpit** (electrical equipment)
- **Air conditioning**
- **Cabin** (electrical equipment)
- **Lavatory**
- **Cargo**

### Procedures

- **Use of QRH procedure**
- **Smoke, fumes or odors in cockpit without ECAM warning**
- **Smoke in the cabin announced by cabin crew without ECAM warning**
- **AVNCS smoke ECAM caution** (A320 family)
e-briefing: Left column

- Validity of the e-briefing
- Welcome video
- Statistics
  - Smoke events
- OPS documentation
  - FCCM 3.02.26
  - FCTM 3.026
  - CCOM 03.020
- Other documentation
  - Getting to grips with cabin safety
  - FAA Advisory Circular 121-90
  - Working group FSF conclusions
Smoke

Various smoke sources

- Avionic bay or cockpit (electrical equipment)
- Air conditioning
- Cabin (electrical equipment)
- Lavatory
- Cargo

Procedures

- Use of QRH procedure
- Smoke, fumes or odors in cockpit without ECAM warning
- Smoke in the cabin announced by cabin crew without ECAM warning
- AYNCs smoke ECAM caution (A320 family)
Communication and coordination between the cabin and flight crew are essential. The information that the flight crew receives from the cabin crew determines the course of action that the flight crew will take. Therefore, it is vitally important that the flight crew receives a realistic account of the events in the cabin, as they occur.

If smoke or fumes are detected in the cabin, the flight crew should be informed immediately. One cabin crewmember should act as a liaison between the cabin and the cockpit, via the interphone: This will avoid conflicting information. The information should be clear and concise, and reflect the conditions in the cabin. Remember to “Keep it Simple”!

• Location
• Source (if possible)
• Severity (density, color, odor, how it is affecting people)

Never underestimate the severity of smoke and fire, when reporting to the flight crew. Do not mention fire, unless flames are actually visible.

Cockpit/Cabin coordination

• Coffee maker smoke, immediately identified and isolated
• Smoke source not immediately identified
Communication and coordination between the cabin and flight crew are essential. The information that the flight crew receives from the cabin crew determines the course of action that the flight crew will take. Therefore, it is vitally important that the flight crew receives a realistic account of the events in the cabin, as they occur.

If smoke or fumes are detected in the cabin, the flight crew should be informed immediately. One cabin crewmember should act as a liaison between the cabin and the cockpit, via the interphone: This will avoid conflicting information. The information should be clear and concise, and reflect the conditions in the cabin. Remember to “Keep it Simple”!

• Location • Source (if possible) • Severity (density, color, odor, how it is affecting people) • Action taken.

Never underestimate the severity of smoke and fire, when reporting to the flight crew. Do not mention fire, unless flames are actually visible.

Cockpit/Cabin coordination

• Coffee maker smoke, immediately identified and isolated
• Smoke source not immediately identified
• Coffee maker smoke, immediately identified and isolated
• Smoke source not immediately identified

Smoke Procedure Finalization
Communication and coordination between the cabin and flight crew are essential. The information that the flight crew receives from the cabin crew determines the course of action that the flight crew will take. Therefore, it is vitally important that the flight crew receives a realistic account of the events in the cabin, as they occur.

If smoke or fumes are detected in the cabin, the flight crew should be informed immediately. One cabin crewmember should act as a liaison between the cabin and the cockpit, via the interphone: This will avoid conflicting information.

The information should be clear and concise, and reflect the conditions in the cabin. Remember to “Keep it Simple”!

- Location
- Source (if possible)
- Severity (density, color, odor, how it is affecting people)
- Action taken.

Never underestimate the severity of smoke and fire, when reporting to the flight crew. Do not mention fire, unless flames are actually visible.

**Cockpit/Cabin coordination**

**Coffee maker smoke, immediately identified and isolated**

**Smoke source not immediately identified**
Smoke

Various smoke sources
- avionic bay or cockpit (electrical equipment)
- Air conditioning
- Cabin (electrical equipment)
- Lavatory
- Cargo

Procedures
- Use of QRH procedure
- SMOKE, FUMES OR ODORS IN COCKPIT WITHOUT ECAM WARNING
- SMOKE IN THE CABIN ANNOUNCED BY CABIN CREW WITHOUT ECAM WARNING
- AVNCS SMOKE ECAM CAUTION (A320 family)
e-briefing: Main area

Various smoke sources
Smoke

Various smoke sources

- Avionic bay or cockpit (electrical equipment)
- Air conditioning
- Cabin (electrical equipment)
- Lavatory
- Cargo

Procedures
e-briefing: Procedures for pilots

Use of QRH procedure

ECAM or Paper?

ECAM “AVIONICS VENT SMOKE” warning

Crew (cockpit or cabin) perception without ECAM warning

Other ECAM smoke warning

Switching from ECAM to paper:
- On A320
- On A330/340

Apply ECAM first. Then, if any doubt about smoke origin: Ref to QRH
e-briefing: Procedures for pilots

LAND ASAP

Anticipate Diversion

Immediate Actions

Initiate Diversion

Source identification and fighting

Air Conditioning

Cabin equipment

AVNCS/CKPT (Electrical)

At any time:

BOXED ITEMS

Consider SMOKE/FUMES removal

Consider EMER CONFIG

Consider IMMEDIATE LANDING
e-briefing

- It will be enriched progressively with video and other documents.
Airbus smoke procedure philosophy finalized and in line with international recommendations.

SA and LR paper procedures harmonized. ECAM procedures will soon be harmonized as well (FWC F4).

Situation Awareness and procedure understanding improved by the FCTM and the e-briefing.