



# EASA

European Aviation Safety Agency

# Determination of Unsafe Condition for Risk of Rotorcraft Engine IFSD and Power Loss

Frédéric Chambon

Project Certification Manager – Propulsion

02 December 2015

**Your safety is our mission.**

An agency of the European Union 

TE.GEN.00409-001



# Publication of Proposed CM-PIFS-011

- ▶ Proposed **EASA CM-PIFS-011** "Determination of an Unsafe Condition following Rotorcraft Engine In-Flight Shut-Down (IFSD) and Power Loss"
  - ▶ Published 03 July 2015 for a consultation period of 8 weeks
  - ▶ Consultation period ended 28 Aug 2015
  - ▶ 45 comments received from 8 entities

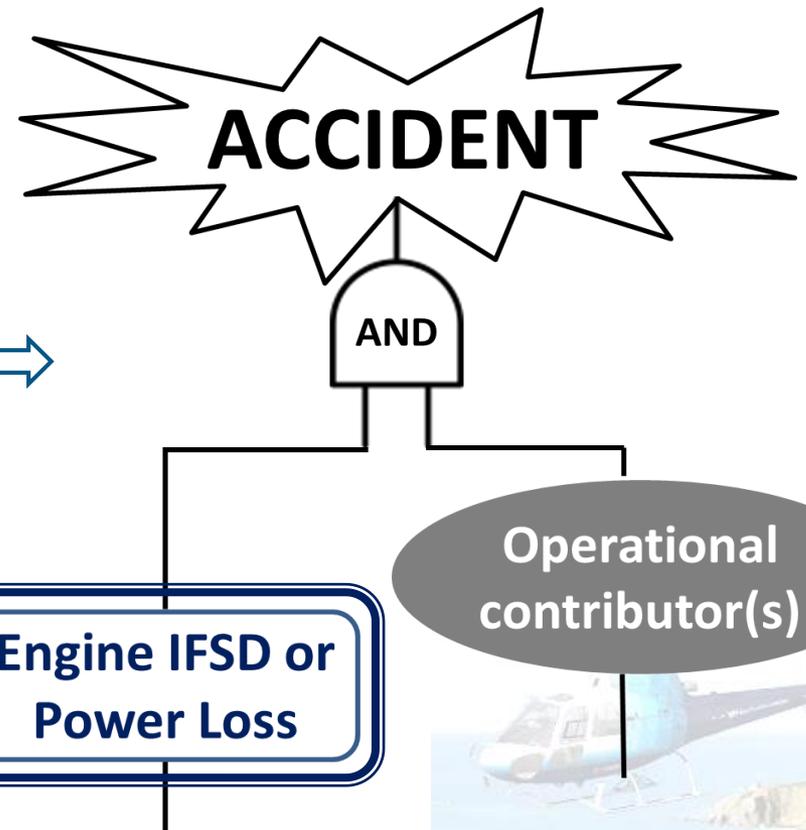




# Proposed CM-PIFS-011 – Background

- ▶ Per Certification Specifications, IFSD or power loss of one engine should not result in Hazardous or Catastrophic Effect
- ▶ However...

The following happens →



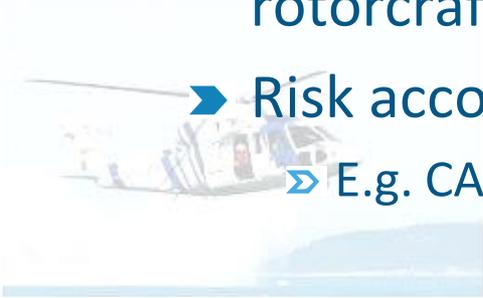
**Scope of  
CM-PIFS-011**





# Proposed CM-PIFS-011 – Purpose & Scope

- Proposed EASA CM-PIFS-011 provides **guidance to 21.A.3A and 21.A.3B** for determination of unsafe condition related to the risk of engine IFSD and power loss, for both single- and multi-engine rotorcraft
- Proposes to base the determination of unsafe condition on **rates and consequences of IFSD** caused by engine or rotorcraft **defects**
  - Common reviews and agreements between engine and rotorcraft TCHs, whenever possible
  - Risk account for operational usage of the fleet, when known
    - E.g. CAT Operations PC2 or PC3





# CM-PIFS-011 – Clarifications

- Some comments suggest some misunderstanding of the scope and objective of the proposed CM-PIFS-011

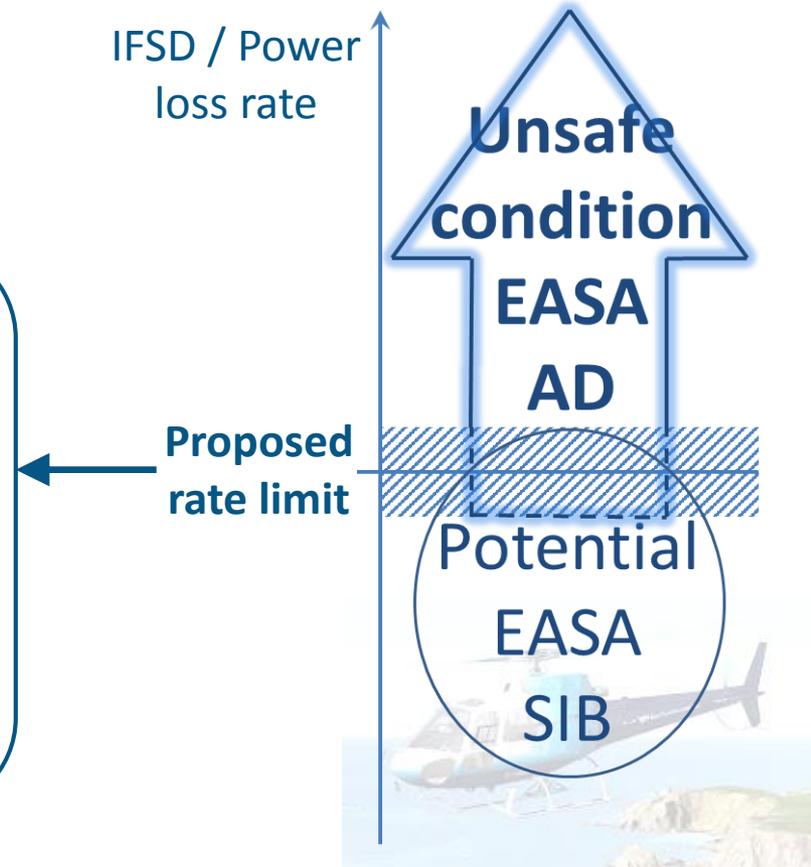
What the CM « does not »	What the CM « does »
<u>It is not</u> a « new requirement »...	<b>It documents and clarifies current practice.</b>
<u>It is not</u> intended to « measurably » improve the level of safety.	<b>It will ensure consistency for EASA/TCHs in the process of determination of unsafe condition, therefore maintaining a high level of safety in relation to engine IFSD.</b>
<u>It does not</u> directly address the operational contributors to incidents/accidents.	<b>It accounts for operational aspects in maintaining acceptable IFSD rates due to engine or rotorcraft defects.</b>
<u>It does not</u> deal with all unsafe conditions on rotorcraft...	<b>... only with contribution of engine IFSD.</b>



# IFSD Rate Limits vs. Unsafe Condition

- What would be the IFSD rate limits above which a potential unsafe condition may exist ?

- **Proposed by TCH**
  - based on consequences at rotorcraft level
  - Account for operational usage, when known
- **To be agreed by EASA**





# ISFD Rates – “Watch” Rates

- When is focussed attention required ?
- « Watch » rates 
  - $10^{-5}$  / FH for global rates
  - $10^{-6}$  / FH for individual rates, i.e. for identified engine or rotorcraft **defects** (\*)
  - These are not to be considered as « rate limits »

Note (\*): **Defects** (or deficiencies) are referred to in Part 21, paragraphs 21.A.3A, 21.A.3B and GM 21.A.3B(d)(4). They encompass issues for which the TC holder has obligations for collecting, reporting, investigating and correcting. For the purpose of this policy, ‘engine defects’ or ‘rotorcraft defects’ refer to defects of part or system which belong respectively to the engine or rotorcraft type design. They typically include **design, production** (such as manufacturing or assembly) and **in some cases maintenance issues** (e.g. when it has been found that maintenance instructions are unclear or not sufficient).



# IFSD Rates – Reporting Intervals

- IFSD / power loss rates should be monitored – at what intervals should they be shared with EASA ?
  - For global rates and trends, at regular intervals, normally not to exceed every 12 months, unless justified otherwise e.g. by the characteristics of the fleets.
  - For rates associated with identified engine or rotorcraft defect(s), as soon as the rate limits for potential unsafe conditions are reached, or show a trend indicating that these limits may be reached in the future.





# Corrective Actions : Applicability & Compliance Times vs. Risks

➤ Corrective actions : How to determine applicability and compliance times ?

➤ Example : Risk for CAT Operations

*Increased risk /  
Decreased compliance  
time*

SEH (PC3) and MEH  
operated in PC2 or PC3  
without an assured safe  
forced landing capability

MEH operated in PC2 or PC3  
with an assured safe forced  
landing capability

*Decreased risk /  
Increased compliance  
time*

MEH operated in PC1

Note: SEH = Single-Engine Helicopter ; MEH = Multi-Engine Helicopter ; PC = Performance Class



- Proposed **EASA CM-PIFS-011** "Determination of an Unsafe Condition following Rotorcraft Engine In-Flight Shut-Down (IFSD) and Power Loss"
  - Comments reviewed internally and with Industry representatives during dedicated « break-out » session held on 1<sup>st</sup> December 2015
  - Plan to incorporate comments and publish CRD and **Final CM** by end Q1 2016





**EASA**  
European Aviation Safety Agency

**Thank you for your attention !**

**Questions ?**

**Your safety is our mission.**

An agency of the European Union 