

EASA Proposed CM-PIFS-004 Issue 01 – Large Rotorcraft - Oil Low Pressure Warning - Comment Response Document

Comment				Comment summary	Suggested resolution	Comment is an observation or is a suggestion*	Comment is substantive or is an objection**	EASA comment disposition	EASA response
NR	Author	Section, table, figure	Page						
1	UK CAA	2	6	<p>It would be concerning if large transport helicopters are provided with an engine oil pressure indication and warning system stemming from one source which could lead to an unnecessary engine shutdown following a single point of failure. From an operational perspective, a more robust and at least a twin source of indication/warning should be designed into and provided in such helicopters.</p> <p>The interpretation seems to be to allow there not being an independent pressure transducer (driving a pressure gauge) and pressure switch (driving a low pressure warning light) for each engine. It is mentioned that this is the same philosophy as applied to fixed wing and that, in any case, an engine shutdown is only a 'major' event. In the offshore environment for a large helicopter, an unnecessary engine shutdown could present problems.</p> <p>However, the worst case could be continuing to run an engine with inadequate oil pressure which might result in something worse than a relatively benign IFSD. Such issues should be addressed in any safety assessment. Also there is the MEL angle – if there is an independent gauge and warning light then it is possible to despatch with either inoperative; if they are both driven by the same transducer and wiring then all indication is lost and, arguably, it is not possible to despatch.</p>				Not Accepted	<p>The large airplane experience, with same rule interpretation as the one proposed, is not evidencing adverse effect. The comment "In the offshore environment for a large helicopter, an unnecessary engine shutdown could present problems" maybe related to some operational conditions and rules which are out of the scope of the product type certification covered by CS-29 with this proposed interpretation. Severity of one engine loss shall be established in compliance to CS 29.1309 and shall be related to the category of product certification pursued (CAT.A vs Cat B) by the applicant. Loss of one engine on CAT A aircraft could be classified MINOR but is generally retained as MAJOR in consideration of potential IFSD crew workload. CAT A aircraft are designed and demonstrated to continue safe flight and landing under OEI conditions.</p> <p>Inadequate oil pressure is monitored through the oil pressure sensing system and indicated to the crew. Engine running with higher and/or lower oil pressure than the normal operation pressure range would be identified through the indication and associated crew procedure followed.</p> <p>A situation of letting running an engine with inadequate oil pressure could result from a combination of oil system failure and loss of the oil pressure sensing system. Modern FADEC are designed to monitor the health of the oil pressure system signal and sent information to the crew in case of invalid/erroneous oil pressure system information. EASA confirm that those scenarios are evaluated part of the CS 29.1309 compliance that include FHA, SSA and CCA.</p> <p>The comment on the MEL and dispatch consequences are also cross-referring to some operational rules and are not related to the product type certification. However it is recognized that applicant may propose design integrating the operational/commercial constraints (MEL, Maintenance,...)</p>
2	EUROCOPTER	Title	1	<p>As stated in § 1.1, the subject is not only applicable to large rotorcrafts but also to small rotorcrafts in category A.</p> <p>This is not reflected by the title.</p>	Replace "Large Rotorcraft" by "Rotorcraft".	yes	no	Accepted	Title is amended as follow: Large Rotorcraft – Oil Low Pressure Warning
3	EUROCOPTER	2	6	<p>"For example, the oil pressure sensor (engine part) can also be used as a warning device once the pressure exceeds predefined thresholds."</p> <p>The term "exceeds" does not match with a concept of low pressure warning.</p>	Replace "exceeds predefined thresholds" by "falls below predefined thresholds".	yes	no	Accepted	"exceeds predefined thresholds" is replaced by "falls below predefined thresholds".
4	EUROCOPTER	2.2.2	7	<p>The following citation of CAR Part 4b 31st of December 1953 § 604 is incorrect (incomplete):</p> <p>"(h) An individual oil pressure indicator for each engine and either an independent warning device for all engines with means for isolating the individual warning circuit from the master warning device,"</p>	<p>Insert correct citation, which is:</p> <p>"(h) An individual oil pressure indicator for each engine and either an independent warning device for each engine or a master warning device for all engines with means for isolating the individual warning circuit from the master warning device,"</p>	yes	no	Accepted	<p>Citation will be amended with the proposed commenter wording:</p> <p>"(h) An individual oil pressure indicator for each engine and either an independent warning device for each engine or a master warning device for all engines with means for isolating the individual warning circuit from the master warning device,"</p>

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5	TCCA	3.1	7	<p>Transport Canada agrees with the interpretation provided in section 3.1 of the subject CM for CS 29.1305(b)(1) as long as the existing CS 29.1305(b)(2) & (3) are retained.</p> <p>This would be equivalent to the above if by policy, CS 29.1305(b) would read:</p> <p><i>(b) For Category A rotorcraft:</i></p> <p>(1) An individual oil pressure indicator for each engine,</p> <p>(2) An oil pressure warning for each engine or a master warning for all engines with means for isolating the individual warning circuit from the master warning device.</p> <p><i>(3) An individual fuel pressure warning device for each engine or a master warning for all engines with means for isolating the individual warning circuit from the master warning device; and</i></p> <p><i>(4) fire warning indicators;</i></p> <p>Considering the current design practices, even on single engine normal category helicopter, Transport Canada doesn't concur with the considerations provided in section 3.1 on the reliability of the sensor system and the consequences for Category A for the following reasons:</p> <ul style="list-style-type: none"> - When operations require Category A capability at the destination (such as a pinnacle landing site), IFSD is no longer only a "major" event but would cause the planned mission to be aborted if an engine is shut down by error well before the decision point. - Historical data based on segregated signals or sensors should not be used to justify a single thread reliability for both instruments without mitigation. <p>Transport Canada interpretation is that single fault or failure must not mislead the flight crew to shut down an healthy engine nor not acting on the RFM instructions to secure a failing engine. Transport Canada engine design experience is engine oil system providing 2 ports or engine providing 2 electrically independent oil pressure signals to the aircraft.</p> <p>Literal reading of the background and position sections about interpretation #2 of the CM could be misused to justify unmitigated aircraft instrument design without recording the rationale for an equivalent safety finding.</p>				Noted	<p>EASA confirms that the certification memorandum intends to clarify the interpretation of CS 29.1305(b)(1) and does not affect 29.1305 (b)(2) and (b)(3) as existing today where (b)(2) deals with fuel pressure warning and (b)(3) with fire warning.</p> <p>EASA is proposing to modify the paragraph as follows in order to avoid confusion with the existing numbering for the subsequent requirements:</p> <p><i>'CS 29.1305(b)(1) should be interpreted as follows:</i></p> <p><i>The following are required power plant instruments:</i></p> <p><i>For Category A rotorcraft:</i></p> <ul style="list-style-type: none"> - <i>An individual oil pressure indicator for each engine, and</i> - <i>An oil pressure warning for each engine or a master warning for all engines with means for isolating the individual warning circuit from the master warning device.'</i>