

Comment				Comment summary	Suggested resolution	Comment is an observation (suggestion)	Comment is substantive (objection)	EASA comment disposition	EASA response
NR	Author	Section, table, figure	Page						
1	Aerossurance Limited			<p>One comment on issue 01 revision 1:</p> <p>It would be advantageous to include a comment in the 'Management of TBO Interval' that the existence/use and capability/maturity/effectiveness of health monitoring during the TBO extension should be considered when documenting the process. The intent is to maximise both the 'protection' of aircraft fitted with the extended items and the data on which the ultimate TBO extension decision will be made.</p> <p>This report includes discussion on TBO extensions that may be of use: DOT/FAA/TC-12/20 Development, Validation and Demonstration of HUMS Technology to detect Rotorcraft Mechanical Faults (Larder, Damin et al [of GE Aviation Systems and Sikorsky], FAA, April 2013).</p>				Partially accepted	<p>EASA agrees that HUMS data, when available, should be used as a complementary means as part of a gearbox TBO development programme. As such, this data should be reviewed and considered prior to TBO evolution. EASA is of the opinion that HUMS can provide useful technical information of gearboxes health but that this should only supplement the other technical analyses.</p> <p>In order to address Helicopters being fitted with HUMS, an additional "Note" is added in paragraph 3.1 chapter "Management of TBO interval.</p> <p><i>"Note 3: When HUMS data are available during a TBO evolution process, they should be reviewed and considered as complementary data prior to confirming a step."</i></p>
2	Airbus Helicopters	/	/	<p>It is agreed that potential degradation or environmental condition may lead to an in service catastrophic or hazardous failure if not adequately monitored.</p> <p>Nevertheless, Airbus Helicopters considers that the TBO process could be shared with the Agency only when the preventive maintenance is identified as a compensating factor in the FMECA for potential failure effects that might be catastrophic or hazardous.</p>	The conditions under which the proposed EASA Policy applies should be precisely identified, i.e. when the preventive maintenance is identified as a compensating factor for potential failure effects that might be catastrophic or hazardous.		Yes	Partially accepted	<p>The comment and associated proposal refer to a safety assessment which can only be systematic under CS 29.917(b) application while the proposed certification memorandum intends to cover both, the CS-27 and CS-29 products.</p> <p>EASA considers that the potential degradation of many parts contained in a typical helicopter gearbox could lead or contribute to catastrophic or hazardous failure. EASA agrees that one of the primary objectives of a gearbox overhaul is to monitor & restore the condition of the gearbox parts in order to minimize the likelihood of gearbox failure (e.g. "compensating provision" as required by CS-29.917(b)).</p> <p>A periodic overhaul provides a continued verification of the gearbox condition in service. Accordingly, EASA believes that it is worthwhile establishing a TBO plan for each new helicopter type in order to verify gearbox condition and confirm that no unexpected modes of degradation are present.</p>
3	Airbus Helicopters	§ 3.1	5	<p>(Section "TBO Period Step Increase")</p> <p>Airbus Helicopters considers that the TBO increase plan could be agreed with EASA during the certification process, in line with note 1.</p> <p>Details of the plan (sample size, criteria, assembly inspection at extended TBO or current TBO ...) have not to be defined by EASA, but proposed by the Type Certificate Holder and reviewed during the certification process.</p>	In the 3 rd bullet, suppress "As an example, when a minimum sample of 3 gearboxes have been identified to validate a step increase, then the complete sample should be operated in service to the increased TBO step and inspected to verify acceptable behaviour and condition of the gearbox components prior to starting a new increase phase;".	Yes		Partially accepted	<p>EASA agrees that the TBO increase plan should be proposed by the Type Certificate Holder and accepted during the certification process as referred in the initial Note 1.</p> <p>In order to better emphasise the expected process, the Note 1 is revised as follows:</p> <p><i>"Note 1: The plan, and associated validation steps, should be defined by the Type certificate Holder and accepted during the certification process."</i></p> <p>The 3rd bullet is revised as follows:</p> <p><i>"Justification of each step should be completed prior to formally increasing the TBO period to verify acceptable behaviour and condition of the gearbox components prior to starting a new increase phase."</i></p>

Comment				Comment summary	Suggested resolution	Comment is an observation (suggestion)	Comment is substantive (objection)	EASA comment disposition	EASA response
NR	Author	Section, table, figure	Page						
4	Airbus Helicopters	§ 3.1	6	<p>It is necessary to have the capacity to review the plan and the process as a function of the results found on the samples, under the responsibility of the Type Certificate Holder, with reporting to the Agency if considered relevant.</p> <p>The acceptance of each step will be endorsed by the Type Certificate Holder as described in “Note 4” and as it is up to now.</p>	This capability should be explicitly stated in the CM.		Yes	Accepted	<p>EASA agrees that initial steps defined during the certification process might need to be adapted depending on the results of the overhauled gearboxes.</p> <p>The note 1 is amended to better reflect this capability.</p> <p><i>“Note 1: The plan, and associated validation steps, should be defined by the Type certificate Holder and accepted during the certification process. Results of the validation steps might lead to revisions of the validation plan.”</i></p>
5	Airbus Helicopters	§ 3.1	6	<p>Regarding Note 3, Airbus Helicopters considers that the plan and associated validation steps are not to be part of the ICAs.</p> <p>In any case there is no reason or safety benefit to inform the customer about the TBO validation process.</p> <p>Only the Agency and the Type Certificate Holder need to have visibility on the validation process.</p>	Remove Note 3.		Yes	Accepted	<p>EASA agrees that the validation plan is not part of the Instructions for Continued Airworthiness, and that the validation steps can be communicated to the concerned operators in different ways.</p> <p>The objective of the 4th bullet point of “management of TBO interval” is considered to be sufficiently clear without the note; initial note 3 is removed.</p>
6	Airbus Helicopters	§ 3.1	5	<p>(Section “TBO Period Step Increase”)</p> <p>1st bullet states: “A TBO increase plan should only be envisaged when the actual TBO in place has demonstrated acceptable gearbox overhaul inspection results”.</p> <p>Nevertheless, the TBO management <u>plan</u> needs to be established before (in the frame of the certification process, in line with Note 1).</p>	Suggestion is to remove the word “plan”	Yes		Accepted	<p>The proposed change is accepted.</p> <p>TBO Period Step Increase:</p> <ul style="list-style-type: none"> A TBO increase should only be envisaged when the actual TBO in place has demonstrated acceptable gearbox overhaul inspection results