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Title	Helicopter ditching and water impact occupant survivability
NPA Number	NPA 2020-16

UK CAA (European.Affairs@caa.co.uk) has placed **3** unique comments on this NPA:

Cmt	Segment description	Page	Comment	Attachments
62	4. Impact assessment (IA) — 4.5. What are the impacts	42 - 51	<p>Page No: 45</p> <p>Paragraph No: 4.5.1.5 Option 4: Irregular Wave Testing</p> <p>Comment: The probability of a sea condition greater than Sea State 4 quoted of 0.098 appears to be incorrect. With reference to Table 4 on page 205 of EASA NPA 2016-01, the correct probability is 0.294. It is suspected that the content is a misunderstanding of an analysis presented by CAA while a member of RMT.0120. In addition, the derivation of the assumed number of fatalities per capsizes is not stated.</p> <p>Justification: It is important that the derivation of the probability of capsizes and number of fatalities per capsizes are clearly explained as these figures can significantly affect the outcome.</p> <p>Proposed Text: 4.5.1.5 Option 4: Irregular Wave Testing</p> <p>Based on evidence derived from irregular wave testing of existing helicopter types (see CAA Paper 2005/06 (right click link to open or see attached) Appendix A), the capsizes threshold of existing helicopters is estimated to be a maximum of a significant wave height (Hs) of 4.0 m (or Sea State 5). Assuming that the probability of capsizes at wave heights up to and including Hs = 4.0 m meets the CS 27/29 Amendment 5 target of 0.03, that the probability of capsizes at greater wave heights is 1.0, and that operations do not take place when Hs ≥ 6.0 m:</p> <ul style="list-style-type: none"> • Probability of capsizes following a ditching in Hs ≤ 4.0 m = 0.03 • Probability of capsizes following a ditching in 4.0 m ≤ Hs ≤ 6.0 m = 0.068 (see Table 1 on page 212 of NPA 2016-01) • Overall probability of capsizes following a ditching = 0.03 + 0.068 = 0.098 <p>Applying this probability to the exposure assumed in NPA 2016-01 (for consistency):</p> <ul style="list-style-type: none"> • Probability of ditching event = 3.4e-6 per FH • Probability of capsizes = 3.33e-7 per FH <p>Based on typical CS-29 seating arrangements (S-92 = six rows of 3, AW139 = three rows of 4) and:</p>	CAA PAPER 2005-06.PDF (3017kb) 

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			<ul style="list-style-type: none"> • all passengers seated next to an exit will successfully egress • 50% of the remaining passengers will also successfully egress the helicopter with the use of EBS <p>The number of fatalities assumed per capsizes is 3.</p> <p>This was input to the CBA and was assumed as the safety benefit of preventing fatalities (caused by drowning) due to the capsizes of a ditched helicopter, based upon the probability of the helicopter ditching used for NPA 2016-01.</p>	
63	4. Impact assessment (IA) – 4.5. What are the impacts	42 - 51	<p>Page No: 50</p> <p>Paragraph No: 4.5.4.5 Option 4: Irregular Wave Testing</p> <p>Comment: The figure of 2.8, for the number of prevented fatalities for the period 2022 to 2048 appears to be too low.</p> <p>We recommend that the CBA needs to be reworked by EASA</p> <p>Justification: Pre-Covid, the UK fleet of 102 aircraft was flying approximately 80,000 flight hours per year. If the European fleet of 337 aircraft has the same utilisation, a total of 264,000 hours (or 2.64 x 10e5) are flown each year. Given a capsizes rate of 3.33e-7 per FH and 3 fatalities per capsizes gives 0.264 fatalities per year or 6.9 fatalities over the 26-year period 2022 to 2048. This is more than double the figure presented and would more than halve the cost per prevented fatality.</p>	
64	4. Impact assessment (IA) – 4.5. What are the impacts	42 - 51	<p>Page No: 50</p> <p>Paragraph No: 4.5.4.5 Option 4: Irregular Wave Testing</p> <p>Comment: The assumptions employed for the CBA do not consider the alternative approach of downgrading existing ditching certifications not performed to the CS 27/29 Amendment 5 procedure from Sea State 6 (Hs = 6.0 m) to Sea State 5 (Hs = 4.0 m).</p> <p>Justification: Downgrading the ditching certification may have a much smaller economic impact.</p> <p>Proposed Text: It is recommended the following is added to the bottom of page 50:</p> <p>“Alternatively, the certificated ditching performance of existing helicopters could be reduced from Sea State 6 to Sea State 5.”</p> <p>In addition, it is also recommended that EASA should perform a CBA for this alternative approach. It has been estimated that downgrading existing ditching certifications from Sea State 6 to Sea State 5 would lead to a loss of annual revenue of approximately 0.5%. Details are available if required.</p>	