

Comment Response Document 1 of 2 – Original Equipment Manufacturers

Task 0020: Helicopter Terrain Awareness & Warning Systems (HTAWS) for Offshore Operations

The purpose of Task 0020 is to enhance safety by mandating the use of improved Helicopter Terrain Awareness and Warning Systems (“HTAWS”) for all specified helicopters operating offshore in the UK.

The objective is to improve the safety of offshore helicopter operations by ensuring that medium and large helicopters engaged in offshore operations are provided with an effective HTAWS.

To achieve this aim, it is proposed to extend the scope of the current HTAWS mandate under UK Regulation (EU) No. 965/2012, Annex V, Sub-Part K, Part SPA.HOFO.160(c) to include all medium and large HTAWS-equipped helicopters and apply new HTAWS standards optimised for offshore helicopter operations.

A focussed consultation was conducted with affected aircraft and original equipment manufacturers (“OEMs”) and offshore helicopter operators.

Below are CAA responses to comments received from the OEMs in response to the consultation.

Commentors have been dis-identified for commercial reasons.

OEM 1

Summary:

- No OEM1 helicopters will be affected by the UK CAA mandate.
- No timescales or costs for any HTAWS upgrades provided.
- No plans to implement Mode 7/7a in any HTAWS upgrade but are considering Mode 7b.
- OEM 1 does not favour Mode7/7a for a number of reasons, all of which UK CAA would contest.

	CAA Question	OEM 1 Response	CAA Comments
1	HTAWS OEMs: What are your timescales and costs for providing a modification (Service Bulletin) to upgrade your existing HTAWS to provide the CAP 1519 functionality?	N/A	N/A
2	HTAWS OEMs: If your current HTAWS can be upgraded to meet ED-285/DO-376, what are your timescales and costs for providing a modification (Service Bulletin)?	N/A	N/A
3	HTAWS OEMs: If your current HTAWS cannot be upgraded to meet ED-285/DO-376, what are your timescales and costs for providing new HTAWS?	N/A	N/A
4	Aircraft OEMs: What are your timescales and costs for providing modifications (Service Bulletins) to install CAP 1519 HTAWS both with and without Mode 7 for each of your helicopter types currently engaged in offshore operations in the UK?	OEM 1 does not currently have helicopters engaged in offshore activities in the UK. For future OEM 1 products, the EASA (now also UK CAA) requirements for HTAWS in the offshore environment are well understood. OEM 1 has no plans for implementation of CAP 1519 Mode 7 as this relies heavily on data obtained from FDM in the specific operating environment.	<ul style="list-style-type: none"> • The proposed mandate will only apply to helicopters being operated under the corresponding UK air operating rules (SPA.HOFO). OEM 1 aircraft will therefore not be affected unless/until introduced into UK operations. • CAP 1519 does not contain any FDM-derived Mode 7 alert envelopes for OEM 1 aircraft, but these could be produced following the process described in CAP 1538. Alternatively, Appendix B to ED-285/DO-376 provides guidance on deriving Mode 7a alert envelopes using aircraft performance data. This represents an acceptable alternative to FDM-derived Mode 7 envelopes and will be addressed in the AMC.
5	Aircraft OEMs: What are your timescales and costs for providing modifications (Service Bulletins) to install ED-285/DO-376 HTAWS both with and without Mode 7a for each of your helicopter types currently engaged in offshore operations in the UK.	OEM 1 does not currently have helicopters engaged in offshore activities in the UK. For future OEM 1 products, the EASA (now also UK CAA) requirements for HTAWS are well understood. OEM 1 has no plans for implementation of the optional ED-285/DO-376 HTAWS Mode 7a. OEM 1 is considering implementation of VRS protection (Mode 7b).	<ul style="list-style-type: none"> • The proposed mandate will only apply to helicopters being operated under the corresponding UK air operating rules (SPA.HOFO). OEM 1 aircraft will therefore not be affected unless/until introduced into UK operations. • Mode 7b utilises vertical speed and airspeed. This combination was evaluated during the UK research and did not provide any improvement over existing Modes for the accident/incident

			cases studied – see CAP 1538 Appendix B.2. Mode 7b does not, therefore, represent and acceptable alternative to Mode 7a.
6	Aircraft OEMs: What is your position on the CAP 1519 Mode 7 and why?	CAP 1519 generates protection envelopes based on very specific data obtained from offshore operations. There is no consensus standard for how data will be used to develop envelopes and therefore no means to ensure that protection provided based on these envelopes is adequate, functions as intended and is inspectable and verifiable. During Offshore HTAWS discussion, OEMs were consistent in their assertion that generating protection envelopes based on CAP 1519 has significant issues in the implementation throughout the certified aircraft envelope. It was for this reason that methods that did not rely on FDM were developed to derive similar protection envelopes. In addition, for OEM 1 products data obtained using FDM to support CAP 1519 Mode 7a is not available.	<ul style="list-style-type: none"> • All of the CAP 1519 alert envelopes were empirically derived and using FDM data as described in CAP 1538 and validated using FDM data (nuisance alert rate) and flight recorder data from accidents and incidents (alert time). The alert envelopes for Modes 1 and 4 (for example) in ED-285/DO-376 are based on the corresponding CAP 1519 envelopes - no significant additional analysis or validation was performed. It is not clear why the CAP 1538 approach is apparently acceptable for some ED-285/DO-376 Modes but not Mode 7a. • Provided that the FDM data sample size is adequate, the CAP 1538 process for generating alert envelopes captures the characteristics of the corresponding operations. Any flight conditions not covered are, by definition, 'corner cases' and therefore insignificant for all practical purposes. • Mode 7 alert envelopes that have been validated to the satisfaction of the Authority are already published in CAP 1519 for several helicopter types. It is expected that the process detailed in CAP 1538 would be followed if envelopes are required for additional helicopter types. Otherwise, Mode 7a envelopes may be produced from aircraft performance data using the process described in Appendix B to ED-285/DO-376. NB: The S-92 FDM derived Mode 7 envelope in CAP 1519 was found to be consistent with the Mode 7a envelope(s) produced by Sikorsky using the approach described in Appendix B to ED-285/DO-376.
7	Aircraft OEMs: What is your position on the ED-285/DO-376 Mode 7a and why?	Although there is the possibility of generating protection envelopes in accordance with ED-285/DO-376 the TRL for the practical implementation is currently quite low. The benefits have not been verified through any practical implementation and will take several years to realize to a level that would allow implementation that will provide the theoretical safety benefits.	<ul style="list-style-type: none"> • The benefits of CAP 1519 Mode 7 have been clearly demonstrated using flight data from accidents and incidents – see CAP 1538 Appendix D. ED-285/DO-376 Mode 7a is equivalent to CAP 1519 Mode 7 and can reasonably be expected to provide the same benefits. • A later introduction date for ED-285/DO-376 HTAWS is anticipated which would allow due time for the development of Mode 7a alert envelopes.

8	HTAWS and aircraft OEMs: Any relevant thoughts/comments/ideas?	<p>Consensus standards are developed to ensure that not only the potential safety benefits are identified but the feasibility of implementation is catered for. In the case of Mode 7a, WG-110/SC-237 agreed through consensus that Modes 7a and 7b would be optional protection envelopes due to the additional efforts and time required by industry to increase the technical readiness to an acceptable level and ensure that the perceived theoretical safety benefit can be realized in a practical application. Companies participate in committees and standards activities at considerable expense in manpower, travel, and cost. These efforts and expenses are undertaken because of recognized benefits of developing consensus standards with industry experts with the goal of improving safety. Standards generated without consideration of the industry participants are not likely to be successful and will likely produce unintended negative effects. The notion that the UKCAA may ignore the consensus of WG-110/SC-237 and mandate CAP 1519 Mode 7 or ED-285/DO-376 Mode 7a for UK operations is very disappointing and undermines this process and has calls into question whether continued industry participation in such efforts has benefit.</p>	<ul style="list-style-type: none"> • Mode 7 has already been implemented in the Honeywell Mk XXII EGPWS (-036 software) and is available now. The only issue is the selection of alert envelopes for helicopter types not already addressed in CAP 1519. • UK CAA agreed to Mode 7a being optional in ED-285/DO-376 as the research published in CAP 1538 had suggested that the Mode would not be applicable to the S-76 and might not be for other types as well. The analysis of two S-76 incidents by TSB Canada, however, demonstrated that Mode 7a would have outperformed all other Modes in the case of one of the incidents. In addition, there are currently no S-76 helicopters engaged in offshore activities in the UK so no S-76 aircraft will be impacted by the mandate. • Due allowance will be made for the production of Mode 7 alert envelopes for any helicopter types affected for which Mode 7 alert envelopes are not published in CAP 1519. • A later introduction date for ED-285/DO-376 HTAWS is anticipated which would allow due time for the development of Mode 7a alert envelopes. • UK CAA does not consider that it is ignoring the consensus of WG-110/SC-237. UK CAA proposes to apply ED-285/DO-376 as written but taking up the option of Mode 7a. What is the point of an option that is effectively 'prohibited'? It is not the role of EUROCAE or RTCA to set policy for National Aviation Authorities.
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OEM 2

Summary:

- CAP 1519 HTAWS already available, no cost information provided.
- ED-285/DO-376 HTAWS available by end 2022, no cost information provided.
- General, non-technical concern expressed regarding mandate of Mode 7/7a.

	CAA Question	OEM 2 Response	CAA Comments
1	HTAWS OEMs: What are your timescales and costs for providing a modification (Service Bulletin) to upgrade your existing HTAWS to provide the CAP 1519 functionality?	Already available.	Noted.
2	HTAWS OEMs: If your current HTAWS can be upgraded to meet ED-285/DO-376, what are your timescales and costs for providing a modification (Service Bulletin)?	Available before end of 2022.	Noted.
3	HTAWS OEMs: If your current HTAWS cannot be upgraded to meet ED-285/DO-376, what are your timescales and costs for providing new HTAWS?	N/A	Noted.
4	Aircraft OEMs: What are your timescales and costs for providing modifications (Service Bulletins) to install CAP 1519 HTAWS both with and without Mode 7 for each of your helicopter types currently engaged in offshore operations in the UK?	N/A	N/A
5	Aircraft OEMs: What are your timescales and costs for providing modifications (Service Bulletins) to install ED-285/DO-376 HTAWS both with and without Mode 7a for each of your helicopter types currently engaged in offshore operations in the UK.	N/A	N/A
6	Aircraft OEMs: What is your position on the CAP 1519 Mode 7 and why?	N/A	N/A
7	Aircraft OEMs: What is your position on the ED-285/DO-376 Mode 7a and why?	N/A	N/A
8	HTAWS and aircraft OEMs: Any relevant thoughts/comments/ideas?	It is expected that the new mandate will be in line with the ED-285/DO-376. In particular, Mode 7A shall remain optional as agreed by the working group stakeholders.	UK CAA proposes to apply ED-285/DO-376 as written but taking up the option of Mode 7a. It is not the role of EUROCAE or RTCA to set policy for National Aviation Authorities.

OEM 3

Summary:

- Will produce ED-285/DO-376 compliant HTAWS only, costs to be determined by aircraft OEM(s).
- ED-285/DO-376 compliant HTAWS expected to be available early 2023.
- Concern regarding input parameters required for Mode 7/7a alert envelopes.

	CAA Question	OEM 3 Response	CAA Comments
1	HTAWS OEMs: What are your timescales and costs for providing a modification (Service Bulletin) to upgrade your existing HTAWS to provide the CAP 1519 functionality?	OEM 3 first released an HTAWS-A version in 2019. It is largely compliant with CAP 1519. As DO-376 was formally published in March 2021, OEM 3 does not plan to proceed with an interim step of CAP 1519 compliance but rather is proceeding direct to an implementation which is ED-285/DO-376 compliant. Cost and timing information is therefore N/A.	Noted.
2	HTAWS OEMs: If your current HTAWS can be upgraded to meet ED-285/DO-376, what are your timescales and costs for providing a modification (Service Bulletin)?	OEM 3 plans to update its HTAWS-A software to be fully compliant with ED-285/DO-376. The software is scheduled to be available to aircraft OEM's for consideration of incorporation into their type certificated products in the first part of 2023. Aircraft OEM's will determine timing and costs for inclusion into newly produced type certificated helicopters as well as availability, timing and cost for providing a modification (Service Bulletin) for fielded aircraft.	Noted.
3	HTAWS OEMs: If your current HTAWS cannot be upgraded to meet ED-285/DO-376, what are your timescales and costs for providing new HTAWS?	N/A, see prior question/answer.	Noted.
4	Aircraft OEMs: What are your timescales and costs for providing modifications (Service Bulletins) to install CAP 1519 HTAWS both with and without Mode 7 for each of your helicopter types currently engaged in offshore operations in the UK?	N/A	N/A
5	Aircraft OEMs: What are your timescales and costs for providing modifications (Service Bulletins) to install ED-285/DO-376 HTAWS both with and without Mode 7a for each of your helicopter types currently engaged in offshore operations in the UK.	N/A	N/A
6	Aircraft OEMs: What is your position on the CAP 1519 Mode 7 and why?	N/A	N/A
7	Aircraft OEMs: What is your position on the ED-285/DO-376 Mode 7a and why?	N/A	N/A
8	HTAWS and aircraft OEMs: Any relevant thoughts/comments/ideas?	Regarding the statement "...it is likely that the "optional" Mode 7a will be required in the UK version of ETSO-2C522 (UK TSO-2C522)". While the OEM 3 HTAWS-A	<ul style="list-style-type: none"> • For the 'fixed' Mode 7/7a alert envelopes detailed in CAP 1519 and allowed by ED-285/DO-376, the only input parameters required are airspeed and

		<p>implementation does provide a Mode 7a alert, it is our opinion that it would be a mistake to mandate the inclusion of this alert for all rotorcraft as not all rotorcraft that install HTAWS-A systems may be able to provide the necessary inputs to support this alert. Perhaps just limiting the requirement to larger rotorcraft called out in air operating rule SPA.HOFO.160 (c) would suffice.</p>	<p>total torque. It is believed that these parameters are available on all aircraft that will be affected by the UK CAA mandate.</p> <ul style="list-style-type: none">• Although variable Mode 7/7a envelopes may provide improved performance, they do require additional parameters (e.g. OAT, GW, descent gradient). The UK CAA considers that the performance of fixed envelope Mode 7/7a is adequate and does not propose to mandate variable alert envelopes.
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OEM 4

Summary:

- CAP 1519 HTAWS already available, cost approx. \$27k per aircraft.
- ED-285/DO-376 HTAWS initially expected to be available 2 years from publication of mandate, later revised to 3 years. No cost information provided.
- Difference in Mode 7/7a aural alert between CAP 1519 and ED-285/DO-376 HTAWS standards highlighted.

	CAA Question	OEM 4 Response	CAA Comments
1	HTAWS OEMs: What are your timescales and costs for providing a modification (Service Bulletin) to upgrade your existing HTAWS to provide the CAP 1519 functionality?	HTAWS software from OEM 4 is already available. Leonardo has a Service Bulletin available for AW-139 Phase 7 and Phase 8 aircraft. Leonardo and OEM 4 have a business arrangement that has Leonardo providing the items needed to accomplish the SB update. The cost is approximately \$27K (please check with Leonardo for current pricing).	Noted.
2	HTAWS OEMs: If your current HTAWS can be upgraded to meet ED-285/DO-376, what are your timescales and costs for providing a modification (Service Bulletin)?	OEM 4's HTAWS can be updated to meet ED-285/DO-376. System/software changes would be applied to the approved system/software baseline. OEM 4 can supply a compliant ED-285/DO-376 system two years after a mandate has been published. This timeline does not include OEM integration of the new system update.	Noted.
3	HTAWS OEMs: If your current HTAWS cannot be upgraded to meet ED-285/DO-376, what are your timescales and costs for providing new HTAWS?	N/A. OEM 4's HTAWS can be updated.	Noted.
4	Aircraft OEMs: What are your timescales and costs for providing modifications (Service Bulletins) to install CAP 1519 HTAWS both with and without Mode 7 for each of your helicopter types currently engaged in offshore operations in the UK?	N/A	N/A
5	Aircraft OEMs: What are your timescales and costs for providing modifications (Service Bulletins) to install ED-285/DO-376 HTAWS both with and without Mode 7a for each of your helicopter types currently engaged in offshore operations in the UK.	N/A	N/A
6	Aircraft OEMs: What is your position on the CAP 1519 Mode 7 and why?	N/A	N/A
7	Aircraft OEMs: What is your position on the ED-285/DO-376 Mode 7a and why?	N/A	N/A
8	HTAWS and aircraft OEMs: Any relevant thoughts/comments/ideas?	With regard to Mode 7a, as a reminder, the HTAWS has the aural "Check Airspeed". ED-285/DO-376 requires "Power Power".	Understood. Whereas UK CAA will likely align with ED-285/DO-376 for future/new HTAWS installations, a "Check Airspeed" aural alert for Mode 7 would be acceptable to UK CAA for the upgrade of existing HTAWS to the CAP 1519 'standard'.

OEM 5

Summary:

- Only the one of OEM 5's helicopter types will be affected as others are no longer used for offshore operations in the UK.
- An aircraft software update will be required to enable either the CAP 1519 or ED-285/DO-376 HTAWS to be installed.
- The Service Bulletin for the single aircraft type was initially expected to be available Q2 2023 at a cost of approx. \$20k per aircraft, later revised to Q4 2024 and up to \$50k.
- The CAP 1519 Mode 7 is considered uncertifiable by OEM 5.
- OEM 5 is including aircraft provisions to permit the future implementation of ED-285/DO-376 Mode 7 and 7a.

	CAA Question	OEM 5 Response	CAA Comments	OEM 5 Response 2
1	HTAWS OEMs: What are your timescales and costs for providing a modification (Service Bulletin) to upgrade your existing HTAWS to provide the CAP 1519 functionality?	N/A	N/A	N/A
2	HTAWS OEMs: If your current HTAWS can be upgraded to meet ED-285/DO-376, what are your timescales and costs for providing a modification (Service Bulletin)?	N/A	N/A	N/A
3	HTAWS OEMs: If your current HTAWS cannot be upgraded to meet ED-285/DO-376, what are your timescales and costs for providing new HTAWS?	N/A	N/A	N/A
4	Aircraft OEMs: What are your timescales and costs for providing modifications (Service Bulletins) to install CAP 1519 HTAWS both with and without Mode 7 for each of your helicopter types currently engaged in offshore operations in the UK?	The affected aircraft design is expected to be certified as compliant with the CAP 1519 HTAWS standard in Q2 2023 but there are risks to schedule due to business climate and flight aircraft availability. The cost for the HTAWS software on the aircraft is expected to be on the order of \$20k.	<ul style="list-style-type: none"> • It is stated that Mode 7 will not be activated in the CAP 1519 HTAWS software when the aircraft software upgrade is available due to concerns regarding the CAP 1519 Mode 7 implementation. These concerns could all 	An update of CAP 1519 HTAWS Mode 7 to DO-376/ED-285 form, which for the purposes of this response is assumed to include at least gross weight and OAT input, will require an HTAWS software revision and platform certification effort, over and above the current project in work for CAP 1519 HTAWS certification. HTAWS software revision to host the aircraft type performance model

	CAA Question	OEM 5 Response	CAA Comments	OEM 5 Response 2
		The other aircraft type has very limited exposure to offshore CAT operations in Europe, and a business case does not exist at this time to bring Offshore HTAWS to the platform. OEM 5 is continuing to study how this functionality may be brought to this platform economically.	<p>be addressed by upgrading to the ED-285/DO-376 standard which the aircraft software upgrade will also enable.</p> <ul style="list-style-type: none"> There is currently only one of OEM 5's aircraft types engaged in UK offshore operations. 	has not been analyzed for impact to HTAWS computer. It should be noted that risks to the aircraft software upgrade schedule have materialized, and fielding is expected no earlier than Q1 2024 currently. The aircraft software upgrade is required for CAP 1519 HTAWS certification.
5	Aircraft OEMs: What are your timescales and costs for providing modifications (Service Bulletins) to install ED-285/DO-376 HTAWS both with and without Mode 7a for each of your helicopter types currently engaged in offshore operations in the UK.	There are no plans between OEM 5 and the HTAWS OEM to exclusively update the HTAWS software for the three minor gaps between the CAP 1519 build and ED-285/DO-376. The gaps between the CAP 1519 software and ED-285/DO-376 standard are small enough that it is economically unreasonable for HTAWS OEMs, aircraft OEMs, and operators to field a new HTAWS software build for these updates alone. Therefore, operations involving aircraft compliant to CAP 1519 HTAWS requirements should continue until the ED-285/DO-376 compliant equipment are installed.	<ul style="list-style-type: none"> In addition to the three minor gaps noted, the ED-285/DO-376 standard would also enable the implementation of the variable Mode 7a alert envelopes preferred by OEM 5. UK CAA has published evidence (CAP 1538) which clearly demonstrates that the benefits of Mode 7/7a are significant and, on their own, arguably present sufficient justification to upgrade from CAP 1519 to ED-285/DO-376 if OEM 5 will only support variable Mode 7a alert envelopes. 	OEM 5 agrees that Mode 7A (variable envelope Mode 7) provides a safety benefit but must weigh all safety benefit projects in work against limited financial resources. A new HTAWS software build and platform certification effort, even if minor, is expected to be => \$1M. HTAWS OEMs, to OEM 5's knowledge, have not determined impact and cost of developing advanced Mode 7.
6	Aircraft OEMs: What is your position on the CAP 1519 Mode 7 and why?	Mode 7 in its CAP 1519 form is considered uncertifiable but additional software interfaces are being made in the affected aircraft type to support future development of an ED-285/DO-376 based Mode 7a. A timeline and cost is not available at this time.	<p>It is not clear why Mode 7 in its CAP 1519 form is considered uncertifiable. It is understood that there are primarily two issues:</p> <ul style="list-style-type: none"> Aural alert: The "Power Power" alert was agreed for ED-285/DO-376 standard after significant debate. Although strongly favoured by OEM 5, other parties preferred the 	<ul style="list-style-type: none"> The "Check Airspeed" alert is considered indeterminate and possibly hazardous in low vertical separation and high sinkrate cases and is considered uncertifiable by OEM 5. "Power Power" visual is already in the aircraft software

	CAA Question	OEM 5 Response	CAA Comments	OEM 5 Response 2
			<p>“Check Airspeed” alert. UK CAA can probably accept the “Power Power” alert for ED-285/DO-376 HTAWS but does not consider the CAP 1519 “Check Airspeed” alert to be unacceptable in the context of this caution.</p> <ul style="list-style-type: none"> Fixed versus variable alert envelopes: It has been demonstrated (see CAP 1538) that fixed, FDM-derived Mode 7 alert envelopes can provide timely warnings significantly ahead of other HTAWS Modes with <1% nuisance alert rate. OEM 5’s own data showed that the nuisance alert rate for the Mode 7 fixed envelope was less than that for Mode 1. In addition, the affected OEM 5 aircraft type FDM-derived fixed Mode 7 envelope in CAP 1519 was found to be consistent with the Mode 7a envelope(s) produced by OEM 5 using the approach described in Appendix B to ED-285/DO-376. Variable envelopes may be better in theory but, in practice, not necessary to realise significant benefits. Fixed FDM-derived Mode 7a envelopes are permitted by ED-285/DO-376 (see Appendix B) and are considered to be both acceptable and certifiable by UK CAA. 	<p>upgrade. Conflicting visual and aural alerts further render the CAP 1519 HTAWS form of Mode 7 uncertifiable.</p> <ul style="list-style-type: none"> The CAP-1519 Mode 7 envelope “Flights with Alert Rate (%)” was calculated to be 5.5%. Shifting the bottom right vertex of Mode 7 envelope 10% resulted in an alerting rate of 1.7%. However, analysis showed that some offshore tails would have alerting rates as high as 20% and the discrepancy between tails highlights the importance of consider the entire operating envelope rather than averages.

	CAA Question	OEM 5 Response	CAA Comments	OEM 5 Response 2
7	Aircraft OEMs: What is your position on the ED-285/DO-376 Mode 7a and why?	Mode 7 in its CAP 1519 form is considered uncertifiable but additional software interfaces are being made in the affected aircraft type to support future development of an ED-285/DO-376 based Mode 7a. A timeline and cost is not available at this time.	<ul style="list-style-type: none"> UK CAA does not believe that there is sufficient reason to consider the CAP 1519 Mode 7 to be uncertifiable. Although it includes variable Mode 7a alert envelopes, ED-285/DO-376 does also permit fixed Mode 7a alert envelopes derived either analytically or using FDM data. The only substantial difference between CAP 1519 Mode 7 and ED-285/DO-376 fixed Mode 7a alert envelopes is the aural alert. 	<ul style="list-style-type: none"> Mode 7 CAP 1519 HTAWS callout is not considered certifiable and is not compliant with ED-285/DO-376 MOPS. See previous comments in 6 above for more detail. OEM 5 does not believe that a single static envelope is certifiable given the certified operating range of the aircraft. See comments above.
8	HTAWS and aircraft OEMs: Any relevant thoughts/comments/ideas?	Nil	N/A	Mode 7 should remain as an optional mode for the same reasons it was provided as optional in the ED-285/DO-376 MOPS.

Comment Response Document 2 of 2 – Offshore Helicopter Operators

Task 0020: Helicopter Terrain Awareness & Warning Systems (HTAWS) for Offshore Operations

The purpose of Task 0020 is to enhance safety by mandating the use of improved Helicopter Terrain Awareness and Warning Systems (“HTAWS”) for all specified helicopters operating offshore in the UK.

The objective is to improve the safety of offshore helicopter operations by ensuring that medium and large helicopters engaged in offshore operations are provided with an effective HTAWS.

To achieve this aim, it is proposed to extend the scope of the current HTAWS mandate under UK Regulation (EU) No. 965/2012, Annex V, Sub-Part K, Part SPA.HOFO.160(c) to include all medium and large HTAWS-equipped helicopters and apply new HTAWS standards optimised for offshore helicopter operations.

A focussed consultation was conducted with affected aircraft and original equipment manufacturers (“OEMs”) and offshore helicopter operators.

Below are CAA responses to comments received from the offshore helicopter operators in response to the consultation.

Summary

	CAA Question	NHV Response	OHS Response	CHC Response	Bristow Response	CAA Comments
a).	What is your position regarding the inclusion of Mode 7 (CAP 1519)/ Mode 7a (ED-285/DO-376) in the mandate?	It is our intention to install Mode 7 to our fleet dependent on OEM availability and fleet status.	Welcomed.	SOC: Agree.	We support this development. It is an IOGP 690 requirement which theoretically meant that financial support from oil companies would be made available. This has not turned out to be the case and so the operators are mostly self-funding in a difficult	Mode 7/7A supported by all 4 operators.

					market, where they can afford to do it at all.	
b).	What is your position on the acceptability of the CAP 1519 Mode 7 "Check Airspeed" alert (as opposed to the "Power Power" alert strongly favoured by Sikorsky and included in ED-285/DO-376 Mode 7a)?	We will be largely guided by the OEM and what they provide. Check airspeed is more relevant than Power Power.	Welcomed.	SOC: happy with "Power Power"; this was agreed by the RTCA / EUROCAE working group (of which I was a member).	We have no strong view. 'Check Airspeed' gives commonality with other types, but since we do not dual rate pilots this is not too much of an issue. 'Power, Power' gets the appropriate message across.	Neutral overall – "Check Airspeed" and "Power Power" both acceptable.
c).	Do you have access to FDM data (total torque & airspeed) in order to generate Mode 7 alert envelopes?	Probably, we would need to download specific datasets. OEM?	Yes.	SOC: yes, and already done.	Yes, on all types and these alerts exist and are monitored.	FDM data available.
d).	Consideration is being given to removing the current Mode 6 height call outs mandated by CAT.IDE.H.145. The height call-outs generate a lot of 'nuisance' alerts and the same functionality is much better provided by Mode 4 in the CAP 1519 or ED-285/DO-376 Offshore HTAWS. On the other hand, flight crews are accustomed to hearing the call-outs on every approach/landing and might actually wish to retain them. What is your position?	Not something that we have data or reports to justify any change.	They are a nuisance and sometimes a distraction so maybe removing them would be applicable.	SOC: Mode 4 provides equivalent functionality to the S92 radalt fixed setting ("100") as a function of height, speed and landing gear position, but does not provide the equivalent functionality to variable radalt bug settings such as for example MDH-20 or set hover height -20. The baralt bug is not affected by this proposal. I think the Mode 6 functionality mandated by CAT.IDE.H.145 should be retained.	These have a useful function and do not generate many nuisance calls offshore. Generally ambivalent.	Neutral overall – propose to keep Mode 6 call-outs to simplify rule change.
e).	What is your position regarding the transition from CAP 1519 HTAWS to ED-285/DO-376 HTAWS?	Neutral	If it enhances flight safety, then it's welcomed.	SOC: For simplicity I suggest we go straight to ED285 / DO376 rather than have an intermediate modification.	Positive.	Move to ED-285/DO-376 standard supported.

f).	<p>For your current (as at 01 January 2022) offshore helicopter fleet:</p> <p>i) What is the composition of your UK offshore helicopter fleet (number of airframes/types)?</p> <p>ii) What is the make and modification state of the HTAWS equipment, if any, installed?</p> <p>iii) Do you have any aircraft (number of airframes/types) that would require substantially more cost/effort than a HTAWS software upgrade to comply with the mandate?</p>	<p>i) 8x H175, 4x AW139, 2x AW169.</p> <p>ii) OEM or Rockwell Collins MK XXII-030.</p> <p>iii) AW139 Phase 7 should not require hardware, H175 free, AW169 TBC.</p>	<p>i) As of 1st January – 8 X S92A. 7 X H175. 3 X AW139.</p> <p>ii) Honeywell MKXXII V30 on S92A & AW139. H175 uses Helionix HTAWS system supported by Jeppesen.</p> <p>iii) AW139 fleet.</p>	<p>i) SOC: S92 (10), AW139 (3), EC175 (3).</p> <p>ii) SOC: S92 and AW139, Honeywell Mk22 EGPWS -030; EC175, Airbus (Helionix) HTAWS.</p> <p>iii) SOC: I don't believe so.</p>	<p>i) 8 x AW139, 1 x AW189 (stored), 9 x S92</p> <p>ii) 8 x AW139 with Honeywell Mk XXII EGPWS with -036 software and 9 x S92 with Honeywell Mk XXII EGPWS.</p> <p>iii) Sikorsky S92, system currently unavailable. Quote from Sikorsky <i>'The -036 EGPWS product is not compatible with our existing aircraft management system (AMS). We are working through the integration of not only the -036 but also additional capability enhancements for incorporation in a forthcoming AMS version.'</i> There is currently no date or cost available. It has been mentioned that it might be part of AMS 11 software. The global S92 fleet is currently using AMS 9 indicating that this might be a few years away.</p>	<p>i) Total of 27 x S92, 18 x AW139, 18 x H175, 2 x AW169 and 1 x AW189 = 66 aircraft.</p> <p>ii) 45 x Honeywell MkXXII EGPWS, 18 x Helionix HTAWS, 3 x Collins HTAWS.</p> <ul style="list-style-type: none"> • SB already available for Honeywell HTAWS. • Airbus say Helionix upgrade will be available in time. • Collins Aerospace say upgrade will be available in time. <p>iii) S92 requires upgrade of a/c software to AMS 11.0, which should be available in time according to Sikorsky.</p>
g).	<p>What are the estimated costs of complying with the mandate proposed in 2. above? NB: Please include due allowance for any flight crew training, updating of</p>	<p>We don't have sufficient data to provide an estimate at this time. AW139 software estimated at c. £24,000</p>	<p>Approximately \$300K on AW139 fleet. Honeywell costs unclear at this point.</p>	<p>SOC: cost of upgrade to -036 for AW139 is currently \$27,500 per airframe. Additional costs for Mode 7 not known. Upgrade for S92 will be in AMS 11, estimated</p>	<p>AW139 unit cost was \$27,000 per aircraft, plus labour. The pilot training was accomplished via 6-monthly sim checks as the simulator has had the modification for some</p>	<p>The cost of £21k per aircraft assumed in the Impact Assessment is considered to be reasonable.</p>

	documentation etc. in addition to the direct cost of the purchase and installation of the aircraft modification.	Training, documentation etc. are sunk costs so difficult to split out.		end 2023, costs not yet known. EC175, costs not yet known. Training and documentation costs will be minimal.	time. Total cost for 8 aircraft was about \$250,000. There is no cost yet for S92, but likely to be more expensive.	
h).	Do you consider the proposed timescales to be reasonable/realistic for all of your aircraft?	2025 is sensible.	Reasonable.	SOC: yes.	If the modification is available for the S92 in time.	Proposed schedule is supported subject to modifications being available in time.
i).	If the answer to h). above is no, what timescales would be reasonable/realistic?	N/A	Consideration should be given if there is a hardware upgrade required and not just a software upgrade.	N/A	The proposed dates should be achievable.	N/A