Comment-Response Document 2016-03(E)

Appendix

to ED Decision 2018/001/R

Subject 070 — OPERATIONAL PROCEDURES

Subject 081 — PRINCIPLES OF FLIGHT — AEROPLANES

Subject 082 — PRINCIPLES OF FLIGHT — HELICOPTERS

(Subject 090 — VFR AND IFR COMMUNICATIONS: RESERVED)

RELATED NPA: 2016-03(E) — RMT.0595 — 6.2.2018

Table of contents

1. Summary of the outcome of the consultation

Please refer to the Explanatory Note to Decision 2018/001/R.

2. Individual comments and responses

In responding to comments, a standard terminology has been applied to attest EASA's position. This terminology is as follows:

(a) **Accepted** — EASA agrees with the comment and any proposed amendment is wholly transferred to the revised text.

(b) **Partially accepted** — EASA either agrees partially with the comment, or agrees with it but the proposed amendment is only partially transferred to the revised text.

(c) **Noted** — EASA acknowledges the comment but no change to the existing text is considered necessary.

(d) **Not accepted** — The comment or proposed amendment is not shared by EASA.

(General Comments)	-

comment	*163-E* comment by: *René Meier, Europe Air Sports* Check
response	Noted.

comment	*168-E* comment by: *CAA-NL* Enclosed the comments of the Netherlands on the **Notice of Proposed Amendment 2016-03 (E)** **Operational procedures** The requirements for operators are not relevant for practical flying so have to be deleted. ETOPS, selection of Alternates and NAT HLA can remain in 071 and transfer to 033 is not necessary. Transfer to 033 would give a lot of extra costs for all stakeholders. 071 02 10 01 05 delete as it is meant for operators 071 01 02 03 delete as it is for operators 071 01 02 04 02 08 delete as these are responsibilities for operators 071 01 02 05 01 delete, for operators 071 01 03 02 02 LO is unclear, delete this one 071 02 13 05 delete as it is covered in 050. 090 Communication *In general: all LO's have to be in force for all licenses and ratings* 090 01 02 00 LO (02) is incomplete: verb is missing. Proposal:

090 01 02 00 Air traffic services ATS abbreviations
(01) Define commonly used ATS abbreviations
- flight conditions
- airspace
- services
- time
- VFR related terms
- IFR related terms
- miscellaneous

(02) to be deleted since included in proposal (01)

090 01 03 00 LO (01) doesn't match with the heading: in "air-*to*-ground" *to* has to be deleted
(ref Annex 10 par 1.3 communication methods. Different definitions of air-ground and air-to-ground).

Proposal:
090 01 03 00 Q-code groups commonly used in radio telephony (RT) air-ground communications
(01) Define Q-code groups commonly used in RT air-ground communications:
- pressure settings
- directions and bearings

090 02 02 00 Heading ……" (including level information)" is superfluous and confusing, has to be deleted

Proposal:
090 02 02 00 Transmission of numbers

090 02 03 00 LO (01) as UTC is the only accepted time system the mentioning in the LO is superfluous

Proposal:
(01) - state the standard time reference
(02) - describe the way of transmitting time

090 02 05 00 Heading ….. (relevant RT phraseology included) is superfluous and has to be deleted

Proposal:
090 02 05 00 Standard words and phrases

090 02 05 00 LO's (02), (03), (04), (05) and (06) are confusing and have to be rephrased

Proposal:
(01) Recognise and describe the correct standard phraseology for each phase of VFR flight
- before taxi
- taxi
- departure

- en route
- circuit
- final
- landing
- after landing

(02) Recognise and describe the correct standard phraseology for each phase of IFR flight
- before pushback and taxi
- pushback
- taxi
- departure
- en route
- approach
- final approach
- landing
- after landing

(07) has to be renumbered in (03)

090 02 07 00 LO (04) ”should” has to be ”shall”

Proposal:
(04) Explain when the suffix ”HEAVY” or “SUPER” shall be used with an aircraft call sign

090 02 10 00 LO’s (02), (03), and (04) are not consistent with each other, either “state” or “describe” describe is here preferable

Proposal:
(02) Describe the requirements …….
(03) Describe the requirements ……
(04) Describe the requirements ……jel

090 05 01 00 All items mentioned in the heading between brackets have to be deleted.

090 05 01 00 Distress

090 05 01 00 New LO has to be added: LO (03) State the DISTRESS signal Following LO’s have to be renumbered

090 05 01 00 old LO (07) “Describe the content of a DISTRESS signal/message in the correct sequence” is not correct.

Proposal:
(08) List in the correct sequence and describe the content of a DISTRESS message.

090 05 02 00 All items mentioned in the heading between brackets have to be deleted.

090 05 02 00 Urgency

Proposal
090 05 02 00 New LO has to be added: LO (03) State the URGENCY

	signal Following LO's have to be renumbered 090 05 02 00 old LO (06) "Describe the content of a URGENCY signal/message in the correct sequence" is not correct . Proposal: (07) List in the correct sequence and describe the content of a URGENCY message. 090 06 00 00 LO's (01), (02) and (03) confusing LO (09) has not to be deleted Proposal: (01) Describe the bands into which the radio-frequency spectrum is divided. (02) State the frequency range of the VHF band. (03) State the band normally used for aeronautical mobile service (AMS) voice communication. (04) State the frequency separation allocated between consecutive VHF channels. (05) Describe the factors which reduce the effective range and quality of radio transmissions. (06) State which of these factors apply to the VHF band. (07) Calculate the effective range of VHF transmissions. Text below the table in incomplete, has to read: The table containing ……in the table of Subject 090 'VFR **and IFR** communications'
response	Thank you for your multiple comments on Subjects 070 and 090. EASA has carefully assessed all the comments received. For the responses to the comments referring to Subject 090, EASA would like to refer you to the CRD to NPA 2016-03(E) for Subject 090 (planned to be published in 2018/Q2). Regarding your comment that the requirements for operators are not relevant for practical flying therefore to be deleted: Noted. EASA would like to state that this may be true in some cases, not in all cases. The relationship between the operators' responsibilities (and requirements) and the subsequent procedures for pilots is important to maintain. Flights do not always work out within the confines of an Operations Manual and pilots need a deeper knowledge for the cases when those events will occur. Regarding your comment referring to ETOPS: Noted. Regarding your comment referring to LO 071 02 10 01 (05): Accepted. EASA agrees that the core information for pilots' requirements is contained in the previous LOs and this LO (05) is deleted. Regarding your comment referring to Subject 071 01 02 03: Not accepted. EASA is of the opinion that background of the core of operations is vital. Regarding your comment referring to LOs 071 01 02 04 (02) and (08): Not accepted. EASA is of the opinion that pilots must have an understanding of the 'reasons' that their

procedures are constructed the way they are. Otherwise there may be a tendency to teach just to follow the instructions, which leaves no deeper understanding of what to do when events fall outside the remit of the Operations Manual.

Regarding your comment referring to LO 071 01 02 05 (01): Not accepted.

EASA is of the opinion that pilots must have an understanding of the 'reasons' that their procedures are constructed the way they are. Otherwise there may be a tendency to teach just to follow the instructions, which leaves no deeper understanding of what to do when events fall outside the remit of the Operations Manual.

Regarding your comment referring to LO 071 01 03 02 (02): Not accepted.

EASA is of the opinion that the LO is clear like it is and will not be deleted.

Regarding your comment referring to Subject 071 02 13 05: Not accepted.

EASA would like to state that although SNOWTAM/METAR is covered in other subject areas, there is a TEM aspect to operations which is vital for pilot training/understanding.

comment

181-E comment by: *Luftfahrt-Bundesamt*

The LBA has no comments on NPA 2016-03 (E).

response

Noted.

Thank you for your general comment.

comment

182-E comment by: *European Cockpit Association*

- Overall, ECA acknowledges there has been reorganization of the way some Learning Objectives (LOs) are presented. The splits / moves are visible, and it seems to add clarity and make logical sense.
- At the same time, the review shows a **misunderstanding of the concept of Competency-based-training (CBT)**, and therefore puts an almost exclusive focus on checking/assessment provision, **with very few**, if not no, provision on area 100 KSA **training**. In particular, no provision is proposed to develop the trainee's relevant *Core Competencies* through the relevant de-briefings.
- Moreover, as CBT is to be the new standard for training and licensing purposes, it is essential that there is a **common and coordinated logic sustaining the relevant EASA Rulemaking activities** to avoid duplication, overlaps, and conflicting provisions. In that respect, there should be only one basis for the definition and implementation of Competencies Frameworks throughout the whole Part FCL, and potentially all Aviation Personnel Licensing and Training provisions.
- Furthermore, with the introduction of CBT, Learning Objectives should emphasize - with regard to e.g. operational procedures - on the importance of the policy update of certain documents and procedures. New students should be able to keep up with the continuous development of new documents or updates of old ones. Therefore, it is not

only necessary to know certain information (e.g. which documents to keep on board) but also to know the sources of amendments and future developments. Especially concerning long-range operations, pilots are usually further down the career path and the time of flight school is much in the past.

- We agree with the need to establish the **minimum amount/percentage of classroom instruction**. However, it is not clear how we can define *the minimum* percentage of classroom instruction. This issue is of particular importance as the classroom instruction, in general, is necessary to check the competencies of the student.
- We further fear that the lack of **consistency between the *Competencies* developed by an ATO and an airline** will create not only extra cost, but also a potential mismatch between the pilot profile required by the airline and the one provided by the ATO. This may cause some pilots being hired and subsequently dismissed by the airline due to their competency level being inappropriate. This will create not only an extra financial burden, but also a significant social cost for pilots-to-be.
- We **welcome** the **improvements in certain fields**, e.g. **subject Instrumentation** (022) where we see a good update of the learning objectives, removing irrelevant topics and adding useful new ones. In particular addition of FMA's, Fly by Wire, general **improved automation knowledge** and unreliable airspeed are a positive change. At the same time, we are missing knowledge requirements on the implementation of HUD displays on more next-gen aircraft as the B787/737Max/A350/etc.
- The introduction of ***Threat and Error Management* (TEM) is welcomed**. It does add a physical/operational dimension to a subject that some find not very practical. If performed properly it helps the student to think in terms of *understanding => recognition => prevention/recovery*, as per UPRT.
- We further **welcome** the **introduction of the *Fatigue and stress management chapter.*** However, ECA is surprised not to find a new Learning Objective demanding explanation of the **components of FRMS**, given the emphasis put on this subject in the foreword. The student should be able to describe FRMS and explain the main components of it.
- Similar refers to the ***Peer Support Programs (PSP).*** It is for the benefit of both ATPL and CPL holder to know of the existence of PSP programs and their importance for the safety-culture of an operator.
- Finally, there seems to be a global search for clarification of theoretical notions, which can only be welcomed if it is in addition to the explanation of the notion itself (and not just vulgarization with less resulting knowledge / understanding).

response

Noted.

Thank you for your general multiple comments and positive feedback.

comment

194-E comment by: *Rogerio Pinheiro*

Dear Sirs,

APTTA – Associação Portuguesa de Transporte e Trabalho Aéreo is pleased to submit its comments regarding NPA 2016-03 (E).

1) 070 OPERATIONAL PROCEDURES

- The amendments appear to be rational and correct, except, as stated, that "Polar Navigation has been deleted (as it is covered in 061 and 022)" and this issue is not mentioned in General Navigation 061 having been eliminated.
- As for the question regarding ETOPS, Selection of alternate Aerodromes and NAT HLA, we suggest to maintain the current LO .

2) 081 Principles of Flight - Airplanes

APTTA welcomes the amendments suggested.

3) 090 VFR/IFR COMMUNICATIONS

APTTA welcomes the amendments suggested.

Kind regards,
APTTA

response Noted.

Thank you for your general multiple comments and positive feedback.

Regarding your comment referring to ETOPS, EASA would like to state that ETOPS is procedural-based and should remain in this subject area 070. Note that ETOPS has been moved 'within' Subject 070 to Subject 071 01 03 04.

Notice of Proposed Amendment 2016-03(E) — General comments p. 1

comment *184-E* comment by: *DGAC FRANCE*

General comment
First DGAC France would like to thank EASA for the update of the learning objectives, the theoretical knowledge syllabi and ground school exams. We congratulate the Agency on the comprehensive overhaul of the learning objectives which will lead to more simplicity. We notice in particular that the subject 022 in particular is well done, the learning objectives are clearer and the curriculum is both more precise and less redundant.
Secondly DGAC France supports the introduction of the TEM concept and application in the training programs. Nevertheless, without entering too much into details DGAC France wants to develop only two points among those that caught our attention and arose questions.
§ One of the goals of the area 100 KSA is to teach the future pilots the need for developing these core competencies so that they could manage the threats and errors in the TEM model.
We would like to emphasize that there is no need to assess future pilots on that knowledge, the only need is that the trainees understand the use of competencies in a TEM model, and the way they can rely on them.
The ICAO-defined competencies should be all introduced (and not only a selection of them) with their ICAO definitions, in order to prepare students to use them during practical training and need not to be assessed during the theoretical part of the training.

	We suggest ensuring an identical level of use within the ATOs, that the observable indicators for these learning objectives should be in compliance with the ICAO principles. DGAC France also considers that it is necessary to ensure consistency between the different EASA working groups on the EBT core competencies before implementing them. § We are surprised by the important focus on mental maths developed in this NPA. Mental maths should only be exercised to develop the situation awareness competency. Therefore, the assessment should be as less pervasive as possible since we do not see a significant safety or competency concern nowadays with the evolution of the cockpits.
response	Noted. Thank you for your general multiple comments and positive feedback. Regarding your comments referring to Area 100 KSA: Noted. EASA would like to refer you to the responses in CRD to NPA 2016-03(F) for Area 100 KSA.

Overview of the proposed amendments to Subject 070 'Operational procedures' p. 2

comment	*34-E* comment by: *Paul Smith* With regard to 071 01 03 04 (ETOPS): I believe that this LO sits very well in Operational Procedures and would suggest it is left in subject 071. It will not effect all flights and therefore does not belong, for example, in subject 033 (Flight Planning) 071 01 03 04 - again, this is best left in `OPS` and does not need to be moved as it is concerned with PROCEDURES. 07 01 03 01 - no need to move this subject. Leave as is in 071 071 01 03 04 - I suspect that there is some `appetite` to move this LO into Flight Planning & Monitoring. When today`s commercial pilots (and former military multi-engine pilots such as myself) conduct a North Atlantic crossing, the actual flight planning element is very limited as your route, FL and fuel plan are generated by a computer flight planning system such as Jeppesen `Jet Plan`. All the pilots do will be to ensure they have sufficient chart coverage for the generated route and then EXECUTE that plan using the myriad of North Atlantic PROCEDURES that are laid down in the ICAO source documents. This topic is all about knowing how to apply PROCEDURES for flying cross the Atlantic safely. Therefore this important topic (NAT HLA) must surely be left as is in subject 071.
response	Thank you for your general multiple comments. Regarding your comment referring to ETOPS: Noted. EASA would like to state that ETOPS is procedural-based and should remain in this subject area 070. Note that ETOPS has been moved 'within' Subject 070 to Subject 071 01 03 04. Regarding your comment referring to Subject 07 01 03 01: Noted. EASA would like to state that the subject area has been administratively changed around

	rather than removed. Regarding your comment referring to Subject 071 01 03 04: Noted. From the EASA's perspective, there is currently no plan to move this LO. EASA may review these LOs at a future update.
comment	*84-E* comment by: *LeenVANDERSPEK* Leave all three items in 071 as every ATO is free to chose their lesson plans and order. It saves a lot of costs for all stakeholders if LO's are not transferred from one subject to another one.
response	Noted. Thank you for your general comment referring to Subject 070. EASA acknowledges your opinion.
comment	*94-E* comment by: *KLM Flight Academy* - OP 070 00 00 00 00 All proposals to exchange the LO level from state to explain should not be done. This subjects requires factual knowledge. The term explain is too deep for facts and figures. In most cases there is no explanation available. - The requirements for operators are not relevant for practical flying so can be deleted. - ETOPS, selection of Alternates and NAT HLA can remain in 071 and transfer to 033 is not necessary. Transfer to 033 would give a lot of extra costs for all stakeholders.
response	Thank you for your general multiple comments. Regarding your general comment referring to Subject 070: Not accepted. EASA acknowledges that the term 'explain' is too deep for facts and figures. In most cases there is no explanation available. EASA agrees that in some cases the use of the term 'explain' may be true, but this comment relates to the entire NPA and therefore cannot be accepted. Regarding your comment that requirements for operators are not relevant for practical flying and therefore can be deleted: Not accepted. EASA is of the opinion that pilots must have an understanding of the 'reasons' of why and how their procedures have been constructed the way they are. Otherwise, there may be a tendency to teach in a way which leaves no deeper understanding of what to do when events fall outside the remit/scope of the Operations Manual. Regarding your comment referring to ETOPS: Noted. EASA would like to state that ETOPS is procedural-based and should remain in this subject area 070. Note that ETOPS has been moved 'within' Subject 070 to Subject 071 01 03 04.

comment *156-E* comment by: *pe*

Syllabus reference	#		
071 02 02 01	(12)	new LO	what has the LO to do with Icing? suggest => 040 HPL
071 02 07 00			since 3 of the original 8 LOs are moved to 050 MET suggest: only 1 headline; e.g.: *Effects of wind shears and actions to recognise, avoid or recover.*
071 02 12 02	(01)	DG	add: *state loading restrictions* (from (07))
071 02 12 02	(04)	DG	add: *list the labeling and marking requirements* (from (13))
071 02 13 02			should be covered by 070 OPS
071 02 13 03			who will cover this subject?
071 02 13 04			could be moved to 071 02 01 02 (01) "OM-B"
071 02 13 05	(01)	SNOWTAM	is covered in 010.08 "AIS"

response Thank you for your multiple comments.

Regarding your comment referring to LO 071 02 02 01 (12): Partially accepted.

EASA agrees that this LO (12) is not clear and will be reworded.

The text will be amended as follows:

Explain why safety must come before commercial pressures in relation to the de-icing and anti-icing of aircraft (consider time and financial cost versus direct and indirect effects of an incident/accident).

Source: **N/A**

Regarding your comment referring to Subject 071 02 07 00: Not accepted.

Although three out of the eight LOs of this Subject are moved to Subject 050, EASA is of the opinion that the current title still covers the content of the five remaining LOs.

Regarding your comment referring to LOs 071 02 12 02 (01) and (04): Not accepted.

Making a list of the requirements seems less operationally important than being able to identify the meaning(s) of labels on dangerous goods. EASA will not retain the deleted LOs (07) and (13) and add them to LOs (01) and (04).

Regarding your comment referring to Subject 071 02 13 02: Accepted.

EASA agrees that friction knowledge is a vital part of training and will reinstate LOs 071 02 13 02 (01) and (02) and the heading of the subject.

Regarding your comment referring to Subject 071 02 13 03: Accepted.

EASA agrees that vital knowledge of hydroplaning principles and effects must be included in the LOs and will reinstate LOs 071 02 13 03 (01), (02) and (03).

In comment 177-E, the same issue was raised regarding this subject.

Regarding your comment referring to Subject 071 02 13 04 Not accepted.

EASA is of the opinion that Subject 071 02 01 02 covers the location of material in the Operations Manual (Part A & B).

comment *160-E* comment by: *Bristol Groundschool*

Subject 070 — Operational procedures

I really thought I was going to be steaming mad on this lot – but strangely not!! Most of the LOs and references are fine – no problems. However, some of the LOs still have no references which makes answering questions difficult. An example of this it is the admission at the last CTKI meeting that 'Oxford Couse Notes' were being used as the authoritative reference for a question answer – unacceptable.

Another area that really presents problems is BIRD questions – these must be tidied up. As an example:
From a choice of: 1. HOTELS, 2. CAMP SITE, 3. GOLF CAMP, 4. REFUSE DISPOSAL SITE – select which attract birds, or where wouldn't you build an airport next to??
The answer was NOT just 4. REFUSE SITE, one or two of the others had to be included – any ideas?? I cannot answer that – it depends on any number of factors!!

For these questions can the wording of ICAO Doc 9137 Part 3 be the sole reference, (and even then there seems to be quite a significant scope for different interpretations).

Braking questions have been another source of uncertainty – I think these are better now, but once again, LO source reference is required.

So, my NUMBER ONE request is for accurate referencing of LO s.

response Noted.

Thank you for your general comment referring to Subject 070.

EASA acknowledges your opinion.

comment *170-E* comment by: *European Cockpit Association*

Subject 070 — Operational procedures	**page**	
Overview of the proposed amendments to Subject 070 'Operational procedures'	**2**	Changing of the term "state" to "explain" does not necessarily account for deeper learning objectives. That is particularly relevant in the context of CBT. In many aspects "explain" still has the same meaning.

response	Not accepted. Thank you for your general comment referring to Subject 070. EASA acknowledges that the term 'explain' is too deep for facts and figures. In most cases there is no explanation available. EASA agrees that in some cases the use of the term 'explain' may be true, but this comment relates to the entire NPA and therefore cannot be accepted.

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comment	*95-E* comment by: *KLM Flight Academy* OP 071 01 01 02 (01) Deeper LO level is not relevant, change Explain to State
response	Accepted. Thank you for your comment referring to LO 071 01 01 02 (01). EASA agrees that a deeper LO level is not relevant, and will change back the term 'Explain' to 'State'. The text will be amended as follows: State that Part I shall be applicable to the operation of aeroplanes by operators authorised to conduct international commercial air transport (CAT) operations. ~~(~~ ***Source:*** **ICAO Annex 6, Part I, Chapter 2**~~).~~

comment	*96-E* comment by: *KLM Flight Academy* 071 01 01 02 (02) Deeper LO level is not relevant, change Explain to State
response	Accepted. Thank you for your comment referring to LO 071 01 01 02 (01). EASA agrees that a deeper LO level is not relevant, and will change back the term 'Explain' to 'State'. The text will be amended as follows: State that Part III shall be applicable to all helicopters engaged in international ~~commercial air transport~~ CAT operations or in international general aviation operations, except ~~it is not applicable to~~ helicopters engaged in aerial work. ~~(~~ ***Source:*** **ICAO Annex 6, Part III, Section 1, Chapter 2**~~).~~

comment	*97-E* comment by: *KLM Flight Academy* OP 071 01 01 03 (01) Deeper LO level is not relevant, change Explain to State and change LO to read: State that the execution of flights have to be in compliance with .....
response	Not accepted. Thank you for your comment referring to LO 071 01 01 03 (01). EASA is of the opinion that deeper LO level is relevant in this LO. Not all students are comfortable with 'legal' terminology. An understanding of 'why' these regulations/procedures are in place provides the student with a stronger learning foundation.

comment	*98-E* comment by: *KLM Flight Academy* 071 01 01 03 (03) delete, too detailed part of safety management system
response	Not accepted. Thank you for your comment referring to LO 071 01 01 03 (03). EASA feels that this area is necessary for the student pilot.

comment	*99-E* comment by: *KLM Flight Academy* 01 02 01 ((01) Too general and deeper LO level is not relevant, more precise: State that the operational regulatons are applicable....
response	Not accepted. Thank you for your comment referring to LO 071 01 02 01 (01). EASA feels that this area is necessary for the student pilot.

comment	*101-E* comment by: *KLM Flight Academy* 01 02 02 01 (02) change LO to: Define CAT operations
response	Not accepted. Thank you for your comment referring to LO 071 01 02 01 (02). EASA is of the opinion that CAT operations are better explained than defined.

comment	*102-E* comment by: *KLM Flight Academy* 01 02 02 (01) deeper LO level not relevant, change back to state 01 02 02 (06) deeper LO level not relevant, change back to state

response	Thank you for your multiple comments. Regarding your comment referring to LO 071 01 02 02 (01): Not accepted. EASA is of the opinion that deeper LO level is relevant in this LO. Regarding your comment referring to LO 071 01 02 02 (06): Not accepted. EASA is of the opinion that deeper LO level is relevant in this LO. Some depth about the importance of communicating effectively is a good lesson for pilots to understand, given the substantive errors that arise from poor communication.

comment	*103-E* comment by: *KLM Flight Academy* (08), (09) ands (12) Change Explain into State, otherwise LO level is too deep.
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 02 (08), (09) and (12). EASA is of the opinion that deeper LO level is relevant in this LO.

comment	*104-E* comment by: *KLM Flight Academy* (16), (17), (19) and (23) Change Explain into State, deeper LO level is not relevant.
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 02 (16), (17), (19) and (23). EASA is of the opinion that deeper LO level is relevant in this LO.

comment	*105-E* comment by: *KLM Flight Academy* (21) Delete this LO, info is not relevant for a pilot
response	Not accepted. Thank you for your comment referring to LO 071 01 02 02 (21). EASA is of the opinion that this LO is relevant for the pilot and will not be deleted as proposed.

comment	*106-E* comment by: *KLM Flight Academy* Item 071 01 02 03 is for operators and not relevant for pilots, so delete this item completely.
response	Not accepted. Thank you for your comment referring to Subject 071 01 02 03.

	EASA is of the opinion that this subject is relevant for the pilot and will not be deleted as proposed. Pilots need some background knowledge of what enables their airline to function as such.

comment	*107-E* comment by: *KLM Flight Academy* 02 04 (01) In the reference the items are isolated aerodrome and adequate aerodrome. Is that meant with the terms?
response	Noted. Thank you for your comment referring to LO 071 01 02 04 (01). EASA is unsure what the comment relates to.

comment	*108-E* comment by: *KLM Flight Academy* 01 02 04 (02) not relevant for pilots, so to be deleted
response	Accepted. Thank you for your comment referring to LO 071 01 02 04 (02). EASA agrees that this LO is not relevant for the pilot and will be deleted. The subject matter is covered in Subject 071 02 01 00. See also response to comment 153-E.

comment	*109-E* comment by: *KLM Flight Academy* (04) Not covered by mentioned LO and irrelevant for a pilot, so deletion is better.
response	Noted. Thank you for your comment referring to LO 071 01 02 04 (04). EASA would like to state that this LO is already deleted in the NPA text. The subject matter is covered by LO 071 01 02 02 (01).

comment	*110-E* comment by: *KLM Flight Academy* (08) irrelevant for pilots, so to be deleted.
response	Not accepted. Thank you for your comment referring to LO 071 01 02 04 (04). EASA is of the opinion that this subject is relevant for the pilot and will not be deleted as proposed.

comment	*111-E* comment by: *KLM Flight Academy* (09), (10) and (11) change explain back to state, deeper LO level not appropriate.
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 04 (09), (10) and (11). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*112-E* comment by: *KLM Flight Academy* (16), (17) and (19) change Explain to State, deeper level not appropriate
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 04 (16), (17) and (19). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*113-E* comment by: *KLM Flight Academy* (18) Do not delete, Stowage of baggage is relevant
response	Not accepted. Thank you for your comment referring to LO 071 01 02 04 (18). EASA would like to state that this LO remain deleted as proposed in the NPA text. This LO is irrelevant for a pilot.

comment	*114-E* comment by: *KLM Flight Academy* (23) not for ETOPS?
response	Noted. Thank you for your comment referring to LO 071 01 02 04 (23). EASA has deleted in the NPA text the part between brackets (including ETOPS configuration), but made a new reference to '(CAT.OP.MPA.180)'.

comment	*115-E* comment by: *KLM Flight Academy* (24), (25), (26), (27), (28) and (29) Change LO level back to State.
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 04 (24) to (29). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*116-E* comment by: *KLM Flight Academy* (31), (32), (36) and (37) amend LO level to State.
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 04 (31), (32), (36) and (37). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*117-E* comment by: *KLM Flight Academy* (01) irrelevant for pilots, delete this LO.
response	Not accepted. Thank you for your comment referring to LO 071 01 02 05 (01). EASA is of the opinion that this subject is relevant for the pilot and will not be deleted as proposed.

comment	*118-E* comment by: *KLM Flight Academy* (37) Add "occurrence" in front of report so it reads: ...under which occurrence report shall...
response	Not accepted. Thank you for your comment referring to LO 071 01 02 04 (37). EASA is of the opinion that the wording of this LO is correct like it is. In the LO, the reference is to ORO.GEN.160. This requirement and related AMCs/GM are referring to occurrence reporting.

comment	*119-E* comment by: *KLM Flight Academy* (07), (09) and (10) change LO level to State, deeper LO level not appropriate.
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 05 (07), (09) and (10). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*120-E* comment by: *KLM Flight Academy* (12) Not an LO, so no number for this rule

response	Noted. Thank you for your comment referring to LO 071 01 02 05 (12). EASA is unsure what the comment relates to.

comment	*121-E* comment by: *KLM Flight Academy* (11), (12) and (17) State is the right LO level, not deeper.
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 05 (11), (12) and (17). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*122-E* comment by: *KLM Flight Academy* (14) Change to: Explain why...
response	Not accepted. Thank you for your comment referring to LO 071 01 02 05 (14). EASA is of the opinion that just the term 'Explain' is sufficient instead of 'Explain why'.

comment	*123-E* comment by: *KLM Flight Academy* (15) Change to: State that the take-off RVR value depends on the availability of the facilities.
response	Not accepted. Thank you for your comment referring to LO 071 01 02 05 (15). EASA is of the opinion that the LO is correct like it is.

comment	*124-E* comment by: *KLM Flight Academy* (16) Explain why the minima for ..... (not the system minima!)
response	Not accepted. Thank you for your comment referring to LO 071 01 02 05 (16). EASA is of the opinion that the LO is correct like it is.

comment	*125-E* comment by: *KLM Flight Academy*

	(18), (19), (20), (21), (22) and (23) change Explain to State, deeper LO level not appropriate.
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 05 (18) tot (23). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*126-E* comment by: *KLM Flight Academy* (02), (04) and (09) change LO level to State.
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 06 (02), (04) and (09). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*127-E* comment by: *KLM Flight Academy* (01) Delete as not relevant for pilots
response	Not accepted. Thank you for your comment referring to LO 071 01 02 06 (01). EASA is of the opinion that this subject is relevant for the pilot and will not be deleted as proposed.

comment	*128-E* comment by: *KLM Flight Academy* (10) Change LO to: State the conditions under which an altitude alert system is required.
response	Not accepted. Thank you for your comment referring to LO 071 01 02 06 (10). EASA is of the opinion that the LO is correct like it is.

comment	*129-E* comment by: *KLM Flight Academy* (11) Reword to: State the conditions under which radio altimeters are required. (12) State the conditions under which ... are required (13) State the conditions under which an airborne collision avoidance system is required (14) State the conditions under which a weather radar is required
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 06 (11) to (14).

	EASA is of the opinion that the LO is correct like it is. The statement of conditions is too limiting and does not then relate to knowledge of equipment and/or requirements.

comment	*130-E* comment by: *KLM Flight Academy* (21), (22), (23), (24) AND (25) Explain is too deep, change it to State as LO level.
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 06 (21) to (25). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*131-E* comment by: *KLM Flight Academy* (31), (32), (33), 934), (35), (36) AND (37) Explain is too deep, change to State is appropriate.
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 06 (31) to (37). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*132-E* comment by: *KLM Flight Academy* (38), (39), (03) and (06) amend the LO level to State. (01) Add LO level to read: State and explain ...
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 06 (38) and (39), and LOs 071 01 02 07 (01), (03) and (06). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*133-E* comment by: *KLM Flight Academy* (07), (10), (11), (01), (02) and (03) Deeper LO level not appropriate, change to State.
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 07 (07), (10) and (11), and LOs 071 01 02 09 (01) to (03). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*134-E* comment by: *KLM Flight Academy* (04) State is a better LO level for this one.
response	Not accepted. Thank you for your comment referring to LO 071 01 02 09 (04). EASA is of the opinion that deeper LO level is relevant in this LO.

comment	*135-E* comment by: *KLM Flight Academy* (13), (14), (15), (01), (03) and (04) State is a better LO level indicator.
response	Not accepted. Thank you for your comment referring to LOs 071 01 02 09 (13) to (15), and LOs 071 01 02 10 (01), (03) and (04). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*136-E* comment by: *KLM Flight Academy* (05), (01), (02) and (03) Change LO level to State
response	Not accepted. Thank you for your comment referring to LO 071 01 02 10 (05) and LOs 071 01 02 12 (01) to (03). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*137-E* comment by: *KLM Flight Academy* (06) Amend to: State what the operators responsibility is .....
response	Not accepted. Thank you for your comment referring to LO 071 01 02 12 (06). EASA is of the opinion that the LO is correct like it is.

comment	*138-E* comment by: *KLM Flight Academy* (04), (05) and (08) amend LO level to State
response	Not accepted.

	Thank you for your comment referring to LOs 071 01 02 12 (04), (05) and (08). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*139-E* comment by: *KLM Flight Academy* (06) Amend to: State that it is ..... to deviate from the standard duty requirements
response	Noted. Thank you for this comment. EASA is unsure to which LO this comment relates to.

comment	*140-E* comment by: *KLM Flight Academy* (07) State..... time
response	Noted. Thank you for this comment. EASA is unsure to which LO this comment relates to.

comment	*141-E* comment by: *KLM Flight Academy* (01) State is more appropriate than explain
response	Noted. Thank you for this comment. EASA is unsure to which LO this comment relates to.

comment	*142-E* comment by: *KLM Flight Academy* (14) unclear, what precautions? And is the INS still valid?
response	Not accepted. Thank you for your comment referring to LO 071 01 03 02 (14). EASA is of the opinion that the LO is clear like it is.

comment	*143-E* comment by: *KLM Flight Academy* (20) MNPS to be exchanged for NATL HLA

response	Noted. Thank you for your comment referring to LO 071 01 03 03 (20). There have been multiple changes involving the exchange of (NAT) MNPS to NAT HLA.

comment	*144-E* comment by: *KLM Flight Academy* (34) NAT MNPS to be changed to NAT HLA
response	Noted. Thank you for your comment referring to LO 071 01 03 03 (34). There have been multiple changes involving the exchange of (NAT) MNPS to NAT HLA.

comment	*145-E* comment by: *KLM Flight Academy* (01), (02), (03), (05) and (06) State is a more appropriate LO level
response	Not accepted. Thank you for your comment referring to LOs 071 02 01 01 (01), (02), (03), (05) and (06). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*146-E* comment by: *KLM Flight Academy* (01), (02), (03) deeper LO level no relevant remark
response	Accepted. Thank you for your comment referring to LOs 071 02 01 02 (01) to (03). EASA agrees that in these LOs the term 'State' is used and not the deeper LO level 'Explain'. Therefore, the comment in the 'Comments' column can be deleted. EASA would like to state that all comments in this column will be deleted, and the column will be renamed 'Remarks'. The comments were in these column only to help to read the NPA.

comment	*147-E* comment by: *KLM Flight Academy* 02 09 03 (03) State is a better LO level for this one
response	Accepted. Thank you for your comment referring to LO 071 02 09 03 (03). EASA agrees that the term 'State' is a better LO level for this LO and will change it back to 'State', like it is in the current LO.

	The text will be amended as follows: ~~Explain~~ State the requirements regarding reporting acts of unlawful interference. ***Source:*** **ICAO Annex 17, 13.5 Reporting acts of unlawful interference**

comment	*148-E* comment by: *KLM Flight Academy* 12 01 (03) State is a more appropriate LO level 12 03 (03) State is a more appropriate LO level
response	Not accepted. Thank you for your comment referring to LOs 071 02 12 01 (03) and 071 02 12 03 (03). EASA is of the opinion that deeper LO level is relevant in these LOs.

comment	*149-E* comment by: *KLM Flight Academy* (12) State is a more appropriate LO level
response	Not accepted. Thank you for your comment referring to LO 071 02 12 03 (12). EASA is of the opinion that deeper LO level is relevant in this LO.

comment	*150-E* comment by: *KLM Flight Academy* 14 02 (01) effects with one 's'
response	Accepted. Thank you for your comment referring to LO 071 02 14 02 (01). EASA agrees to amend this typographical error. The text will be amended as follows: ~~State~~ Explain ~~the~~ its effects~~ on~~: soil erosion, water dispersal and spray, recirculation, damage to property, loose articles.

comment	*151-E* comment by: *KLM Flight Academy* 03 02 (02) LO is unclear, State that a warning is generated when a navigation system degrades
response	Accepted. Thank you for your comment referring to LO 071 01 03 02 (02). EASA agrees that this LO is unclear and will be reworded.

	The text will be amended as follows: Describe the possible indications of navigation system degradation, including any system-generated warning. ***Source:*** **NAT 007, Chapter 12 Procedures in the event of navigation system degradation or failure**

comment	*152-E* comment by: *KLM Flight Academy* 071 02 13 05 Covered in 050, so delete both LO's
response	Not accepted. Thank you for your comment referring to LO 071 02 13 05. EASA does not agree to delete both LOs because they are covered in Subject 050. The second LO discusses mitigation of the effects and is of operational significance. Since the first LO is covered in other subjects (MET & AIR LAW), it provides an insight into the second.
comment	*153-E* comment by: *KLM Flight Academy* 01 02 04 (02) delete, as it is not for pilots
response	Accepted. Thank you for your comment referring to LO 071 01 02 04 (02). EASA agrees that this LO is not relevant for the pilot and will be deleted. The subject matter is covered in Subject 071 02 01 00. See also response to comment 108-E.

comment	*154-E* comment by: *KLM Flight Academy* 01 02 40 (02), (04), (05), (06), (07) and (08) delete as it is not for pilots.
response	Not accepted. Thank you for your comment referring to LO 071 01 02 40 (02), (04), (05), (06), (07) and (08). EASA would like to state that those LOs do not exist, and is apparently a numbering mistake. EASA could not find out to which LOs you probably wanted to refer.

comment	*171-E* comment by: *European Cockpit Association*

Subject 070 — Operational procedures	**page**	
Overview of the proposed amendments to Subject 070 'Operational procedures'	**2**	Changing of the term "state" to "explain" does not necessarily account for deeper learning objectives. That is particularly relevant in the context of CBT. In many aspects "explain" still has the same meaning.
071 01 01 03 (02) General	**4**	In LO 071 01 01 03 (02) there should be an emphasis on the non-punitive character of such a system. Also, a reference to the European framework is necessary in addition to the ICAO's work in the field of safety management systems. Further more, this LO (071 01 01 03 (02) & (03)) should be included for helicopters, introducing the following wording: "*for helicopters, ICAO annex 6, Part III, Chapter 1.3, including the structure and purpose of a safety management system*"
071 01 01 03 (6) *(New)*	**4**	Add new Learning Objective: **State the existence of Peer support programs, FRMS, just culture principles, and explain their importance for the safety-culture of an operator.** Knowledge useful for ATPL and CPL.
071 01 02 02 (04)	**5**	Proposed LO 071 01 02 02 (04) and its amendment, as "hostile" environments (not the definition as per Annex 1) become more common in terms of critical areas (e.g. Afghanistan, Ukraine, Sudan). Add to the LO: **Explain, that there are certain areas, which should not be overflown and state possible sources of that information (e.g. governmental warnings, operator risk assesment)**
071 01 02 06 (13) Instruments and equipment	**18**	**Add to the LO 071 01 02 06 (13): Explain the hazards that come with airplanes/helicopters not equipped with an ACAS (also for HEL). State that airspace observation is necessary in certain areas.**
071 01 02 09 (11) - Flight crew	**23**	This LO is applicable also to helicopters
071 01 02 10 (05) - Cabin crew/ crew members other than flight crew	**25**	This LO is applicable also to helicopters. Including Reg 965 /ORO.TC in helicopters
071 01 02 12 - Flight and duty time limitations and rest requirements	**25**	Introduce a LO for helicopter about FDT and FTL, explaining the definitions used and the regultations.
071 01 03 01 - Long	**27**	Introduce a new LO about long range flight for helicopters

range flight H		adapted to its needs (hostile envioroment, fuel calcualtion and reserves, flight planning, isolated helidecks, etc) including Reglament 965 requirements
071 01 03 03 North Atlantic High Level Airspace (NAT HLA)	**34**	A new LO may be added, regarding the future developments as per **NAT Doc 007 1.10: RLatSM**, Datalink mandates etc. CBT should focus on building competencies, which are undoubtedly necessary for future and frequent changes of certain procedures (as NAT). Knowledge required for ATPL.
071 02 03 00 (05)	**58**	Add to the LO 071 02 03 00 (05): **Explain what kind of land use attracts birds around airports.**
071 02 05 01 & 071 02 05 02 Carburettor fire & engine fire	**60**	In relation to the LOs 071 02 05 01 & 071 02 05 02 Carburettor fire & engine fire- there should be a LO to **state the general importance of memory items.** Both Los are applicable to helicopters. Not completely covered in 071 03 00 02
071 02 05 03 - Fire in cabin, flight deck and cargo compartment	**61**	Include this LO becauese is applicable for helicopters, except toilets.
071 02 05 03 (04) (New) Fire in the cabin, cockpit flight deck, and cargo compartment	**61**	Add a new Learning Objective: **Explain the different types of cargo holds and associated firefighting strategies as it became clear that cargo is a real hazard especially in unprotected holds.**
071 02 05 04 - Smoke in the flight deck and in the cabin	**61**	Include this LO becauese is applicable for helicopters. Not completely covered in 071 03 00 02
071 02 07 01 (04) Effects and recognition during departure and approach	**63**	The LO 071 02 07 01 (04): Explain how to identify low-level wind shear. (ICAO Circular 186, Chapter 4) - should be moved to 050 as well.
071 02 08 00 Wake turbulence	**64**	Wake turbulence is also mentioned in LO **081 01 04 01**. This could be combined.
071 02 11 00 - Fuel jettisoning	**67**	Although is not a common practice for helicopters, some are equipped with fuel jettison systems, so an LO should be introduced regarding safety and requirements for fuel jettison also in helicopters
071 01 02 07	**21**	Explain why certain areas require special communication procedures due to the lack of radar and/or communication equipment (e.g. IFBP)

response

Thank you for your multiple comments.

EASA has carefully assessed all the comments received.

For the responses to the comments referring to Subject 090, EASA would like to refer you to the CRD to NPA 2016-03(E) for Subject 090 (planned to be published in 2018/Q2).

Regarding your general comment referring to changing the term 'state' to 'explain': Noted.

EASA would like to refer you to its responses to this matter in other comments in this CRD.

Regarding your comment referring to LOs 071 01 01 03 (02) and (03): Partially accepted.

EASA agrees that these LOs should be included for helicopters. Instead of adding the wording proposed, EASA will put an 'X' in the applicable helicopter column.

Regarding your comment referring to Subject 071 01 01 03: Not accepted.

EASA is of the opinion that it does not seem necessary to include the proposed new LO since this knowledge is very operator-specific and not essential to the pilot regarding the operation of an aircraft.

Regarding your comment referring to LO 071 91 92 92 (04): Accepted.

EASA agrees that this LO needs rewording.

The text will be amended as follows:

Define ~~O~~operations over a hostile environment — a~~A~~pplicability. Explain that there are certain areas which should not be overflown and state possible sources of that information (e.g. governmental warnings, operator risk assessment).

Regarding your comment referring to LO 071 01 02 06 (13): Not accepted.

EASA would like to state that this LO (13) is deleted in the NPA text and will not retain this LO and add your proposed text.

Regarding your comment referring to LO 071 01 02 09 (11): Accepted.

EASA agrees that this LO should be included for helicopters. EASA will put an 'X' in the applicable helicopter column.

Regarding your comment referring to LO 071 01 02 10 (05): Accepted.

EASA would like to state that this LO (05) is already applicable to helicopters. Probably you are referring to LO (06) which was not numbered yet. EASA agrees that this LO (06) should be included for helicopters. EASA will put an 'X' in the applicable helicopter column.

Regarding your comment referring to Subject 071 01 02 12: Not accepted.

EASA does not agree to introduce a new LO for helicopters about FDT and FTL, explaining the definitions used and the regulations. FDT/FTL is only applicable to aeroplane crews at this time.

Regarding your comment referring to Subject 071 01 03 01: Not accepted.

EASA does not agree to introduce a new LO about long-range flights for the helicopter category.

Regarding your comment referring to Subject 071 01 03 03: Not accepted.

EASA does not agree to introduce a new LO regarding the future developments as per NAT

Doc 007 1.10: RLatSM, Datalink mandates, etc.

Regarding your comment referring to LO 071 02 03 00 (05): Partially accepted.

The text of the former LO covering this area was removed/amended due to clarification issues. However, EASA agrees there should be an educating statement for students.

A new LO will be added to cover this.

A new LO will be inserted as follows:

State that birds tend to flock to areas where food is plentiful. Such areas include: rubbish (garbage) facilities; open sewage treatment works; recently ploughed land as well as their natural habitats.

Source: **N/A**

Regarding your comment referring to Subjects 071 02 05 01 and 071 02 05 02: Not accepted.
EASA would like to state that memory items and use of checklists are covered in 'Human performance and limitations'.

Regarding your comment referring to Subject 071 02 05 03: Accepted.

EASA sees that little has been awarded to helicopters for 'fire and smoke' in general.

EASA will add an 'X' in the column of the helicopter categories for all the following learning objectives:

071 02 05 02 XX

071 02 05 03 XX

071 02 05 04 XX

Regarding your comment referring to Subject 071 02 05 03: Not accepted.

EASA does not agree to add a new LO (04) as proposed.

These types of working principles are overviewed in aircraft general knowledge.

At this stage of training it is considered more important for the student pilot to be fully aware of the needs of cabin/flight deck/engine procedures and then, when training moves on to 'type', to learn the associated procedures for the aircraft type/variant concerned.

Regarding your comment referring to Subject 071 02 05 04: Accepted.

See EASA's response above on Subject 071 02 05 03.

Regarding your comment referring to LO 071 02 07 01 (04): Not accepted.

EASA does not agree to move this LO as well to Subject 050. Leaving this LO place allows the student to be taught the actions that follow (to avoid and actions to take during an encounter) in a natural lesson flow.

Regarding your comment referring to Subject 071 02 08 00: Not accepted.

EASA does not see the need to combine this with Subject 081 01 04 01.

Regarding your comment referring to Subject 071 02 11 00: Not accepted.

EASA does not see the need to add an LO regarding safety and requirements for fuel jettison also in helicopters. Fuel jettisoning is very limited in its helicopter application — appearing to be mainly required by larger military/SAR types. This area should be left to

'specialists' to teach during the associated type training rather than confuse new students with aeroplane-specific information.

Regarding your comment referring to Subject 071 01 02 07: Noted.

EASA is of the opinion that the proposed LO answers itself.

comment *177-E* comment by: *AHS*

LO 071 02 13 03 The exclusion of hydroplaning from the 071 syllabus without adequate coverage in 050 or 032 is an area of concern. This has been raised by a handful of Subject Matter Experts involved with the ECQB Project in Subject 071. Considering the focus on 'runway excursions' when considering flight safety, the omission of a basic understanding of hydroplaning, the speeds at which such events can occur, and the possible consequences, from the theoretical knowledge training syllabus is considered to be unwise.

response Accepted.

Thank you for your comment referring to Subject 071 02 13 03.

EASA agrees that friction knowledge is a vital part of training and will reinstate LOs 071 02 13 03 (01) and (02) and the heading of the subject.

In comment 156-E, the same issue was raised regarding this subject.

comment *185-E* comment by: *DGAC FRANCE*

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Subject:
SUBJECT 070 – OPERATIONAL PROCEDURES
syllabus reference 071 01 03 03
~~*MNPS airspace*~~ *North Atlantic High Level Airspace (NAT HLA)*
LO (02) Define the following acronyms : MNPS, OCA, OTS, PRM, RVSM, LRNS, MASPS, SLOP, WATRS (NAT Doc 007, Glossary of Terms).
LO (03) State the navigation requirements for unrestricted minimum navigation performance specifications (MNPS) airspace operations.
LO (06) State that horizontal (i.e. latitudinal and longitudinal) and vertical navigation

performance of operators within NAT MNPS airspace is monitored on a continual basis.
LO (10) Illustrate routes between northern Europe and the Spain/Canaries/Lisbon flight information region (FIR) (T9, T13 and T16) within NAT MNPS airspace.
LO (20) State that if an aircraft, which would normally be RVSM- and/or MNPS-approved, encounters, whilst en route to the NAT oceanic airspace, a critical in-flight equipment failure, or at dispatch is unable to meet the minimum equipment list (MEL) requirements for RVSM or MNPS approval on the flight, then the pilot must advise ATC at initial contact when requesting oceanic clearance.
LO (34) … State that the pre-flight procedures for any NAT MNPS flight must include a Universal Time Coordinated (UTC) time check.
LO (43) State the altimeter cross-check to be performed into the MNPS airspace.
LO (44) State that in NAT MNPS airspace pilots always have to report to ATC immediately when reaching any new cruising level.
LO (47) … - the remaining system fails after entering MNPS airspace.

Content of comment:

In all topics, replace MNPS airspace by NAT HLA airspace.

The requirements to fly on some tracks (ADS C, CPDLC) are not addressed neither the requirements to fly on tracks with reduced lateral separation.

Alternative draft for proposed amendment

Modify the following topics in 071 01 03 03

LO (02) Define the following acronyms : ~~MNPS~~ NAT HLA, OCA, OTS, PRM, RVSM, LRNS, MASPS, SLOP, WATRS (NAT Doc 007, Glossary of Terms).
LO (03) State the navigation requirements for unrestricted North Atlantic High Level Airspace (NAT HLA) operations ~~minimum navigation performance specifications (MNPS) airspace operations.~~
LO (06) State that horizontal (i.e. latitudinal and longitudinal) and vertical navigation performance of operators within NAT ~~MNPS~~ HLA airspace is monitored on a continual basis.
LO (10) Illustrate routes between northern Europe and the Spain/Canaries/Lisbon flight information region (FIR) (T9, T13 and T16) within NAT ~~MNPS~~ HLA airspace.
LO (20) State that if an aircraft, which would normally be RVSM- and/or ~~MNPS~~ NAT HLA-approved, encounters, whilst en route to the NAT oceanic airspace, a critical in-flight equipment failure, or at dispatch is unable to meet the minimum equipment list (MEL) requirements for RVSM or ~~MNPS~~ NAT HLA approval on the flight, then the pilot must advise ATC at initial contact when requesting oceanic clearance.
LO (34) … State that the pre-flight procedures for any NAT ~~MNPS~~ HLA flight must include a Universal Time Coordinated (UTC) time check.
LO (43) State the altimeter cross-check to be performed into the ~~MNPS~~ NAT HLA airspace.
LO (44) State that in NAT ~~MNPS~~ HLA airspace pilots always have to report to ATC immediately when reaching any new cruising level.
LO (47) … - the remaining system fails after entering ~~MNPS~~ NAT HLA airspace.

response

Accepted.

	Thank you for your comment referring to Subject 071 01 03 03. EASA agrees to reword the LOs in Subject 071 01 03 03 by replacing 'MNPS' with 'NAT HLA'.

comment	*186-E* comment by: *DGAC FRANCE* **Doc E** **Page 63/222** **Subject:** **SUBJECT 070 – OPERATIONAL PROCEDURES** *syllabus reference 071 02 07 02* *Actions to avoid and actions to take during encounter* **Content of comment:** Reference is made to ICAO circular 186 whereas DOC 9817 is addressing Low-level Wind Shear and is more recent.
response	Noted. Thank you for your comment referring to Subject 071 02 07 02. EASA is of the opinion that the reference to ICAO Circular 186 Chapter 4 is correct. ICAO Doc 9817 does not have the same status as the ICAO Circular.

comment	*193-E* comment by: *GNSS Centre of Excellence* **Minor concern - several aspects of RNAV are missing** **071 01 02 08 RNAV/RNP** LO State the need for certification of RNAV operations and a particular RNP. LO State the areas where RNAV/RNP is mandatory in European airspace. LO State the requirement for additional equipment to fly GBAS or SBAS based approaches. LO Explain RNAV/RNP operating procedures: Pre-flight preparation, briefing and checks. In-flight action in case of RNAV capability failure. LO Explain procedures for RNP APCH
response	Noted. Thank you for your comment referring to Subject 071 01 02 08. This subject is 'intentionally left blank'. From the EASA's perspective, there is currently no plan to introduce RNAV/RNP into Subject 070. EASA may review this at a future update.
comment	*93-E* comment by: *UK CAA*

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Paragraph No: n/a

Comment: Several Learning Objectives (LO) have been categorised in all subject tables as Basic Knowledge (BK). The intention is that these LOs will be taught by the Approved Training Organisation (ATO) and tested in progress test, but not examined by the National Aviation Authority (NAA) using the European Central Question Bank (ECQB).

The LOs that have been identified as BK are the principles on which all topic areas are developed and higher levels of understanding are achieved, therefore it should be a requirement that these principles are examined. If BK is being taught and tested by the ATO, there is no reason why the ECQB is not used to verify this knowledge and that these principles have been embedded and understood by the student.

Justification: If BK is removed from the ECQB along with the existing questions, new more complex questions to a higher level will have to be developed to make the examination generate with an adequate coverage of all topic areas in individual subjects. This could have a detrimental effect on some students who are naturally nervous when taking examinations, as there will be no BK questions in the test to allow them to build their confidence and they will be seriously disadvantaged by this proposal.

The EASA Exams Team require each topic area to be 5 deep with the number of questions available in the ECQB, this will not be achievable in some subjects as it will not be possible to write additional question one topic area.

With additional questions examining to a higher level, the table at AMC1 ARA.FCL.300(b), detailing the time allowed for an examination and the number of questions for each topic area, will need to be reviewed to establish if an examination is achievable. We are not aware of any evidence that the RMG have confirmation of this or have carried out any sort of analysis or testing.

Proposed Text: n/a

response

Noted.

Thank you for your general comment referring to BK.

EASA acknowledges your opinion.

comment *45-A* comment by: *FTEJerez*

Comment on:
Subject 070 —Operational Procedures
Theoretical knowledge examination

Operational Procedures is a vast subject and teaching it has been a challenge in the pilot training industry since the beginning, as the instructor has to convene teaching a subject

	for a real life scenario where 90% of the times you have to consult the reference material with an exam that is 100% memory items. The training should be focused in replicating the practical use of Operational Procedures, such as SOP and reference material, as much as possible and, as so, we propose that the exam splits its questions in two categories: - Emergency descent procedure, nb of fire extinguishers and their location, first aid medical kits availability, etc... - mostly memory items, no reference material; - CAP with SOPs, checklists and an example of a MEL or CDL and OPS manual Part C - All documentation available to be used as reference material, the student has to search through and find the correct answer. We believe that this change in the examination procedure would help provide a more practical use of the documentation. Rather than having instructors directing the students to whatever more or less random set of facts EASA has on their exams in any given moment, this focuses the instruction and the examination toward a working knowledge of the documents.
response	Noted. Thank you for your general comment referring to Subject 070. EASA acknowledges your opinion.

Additional comments received by email:

comment	*Per email* comment by: SAT: Blatter Patrick 070 OPERATIONAL PROCEDURES 071 01 03 03 (31) Delete “in bands ranging from 2.8 to 18 kHz” (No practical use) 071 01 03 03 (40) Delete last sentence as it is repeated in (41) 071 02 04 02 (01) Replace “etc” by “configuration”. Only three parameters from NDAP: speed, alt, configuration
response	Noted. Thank you for your multiple comments. Regarding your comment referring to LO 071 01 03 03 (31): Accepted. EASA agrees that ‘in bands ranging from 2.8 to 18 kHz’ does not have practical use and will be deleted. The text will be amended as follows: State that even with the growing use of data-link communications, a significant volume of NAT air–ground communications are conducted using voice on single sideband (SSB) HF frequencies. To support air–ground ATC communications in the North Atlantic Region, 24 HF frequencies have been allocated, in bands ranging from 2.8 to 18 MHz. ***Source:* NAT 007, 6.1.3** Regarding your comment referring to LO 071 01 03 03 (40): Accepted. EASA agrees that the last sentence of this LO (40) is repeated in LO (41) and will be deleted. The text will be amended as follows: State that both aircraft and operators must be RNP 10- or RNP 4-approved by the State of the Operator or the State of Registry, as appropriate. ***Source:* NAT 007, 1.3.4** Regarding your comment referring to LO 071 02 04 02 (01): Accepted. EASA agrees that there are only three parameters from NDAP: speed, alt, configuration. ‘etc.’ will be replaced by ‘configuration’. The text will be amended as follows: List the main parameters for NADP 1 and NADP 2 (i.e. speeds, heights, and configuration ~~etc.)~~ (***Source:* ICAO Doc 8168 ‘Procedures for Air Navigation Services — Aircraft Operations’ (PANS-OPS), Volume 1, Part I, Section 7, Chapter 3, 3.3 & Appendix to Chapter 3**

Appendix

to ED Decision 2018/001/R

Subject 081 — PRINCIPLES OF FLIGHT — AEROPLANES

RELATED NPA: 2016-03(E) — RMT.0595 — 6.2.2018

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3. Summary of the outcome of the consultation

Please refer to the Explanatory Note to Decision 2018/001/R.

4. Individual comments and responses

In responding to comments, a standard terminology has been applied to attest EASA's position. This terminology is as follows:

(a) **Accepted** — EASA agrees with the comment and any proposed amendment is wholly transferred to the revised text.

(b) **Partially accepted** — EASA either agrees partially with the comment, or agrees with it but the proposed amendment is only partially transferred to the revised text.

(c) **Noted** — EASA acknowledges the comment but no change to the existing text is considered necessary.

(d) **Not accepted** — The comment or proposed amendment is not shared by EASA.

Overview of the proposed amendments to Subject 081 'Principles of flight (aeroplane)' p. 78

comment *172-E* comment by: *European Cockpit Association*

Subject 081 — Principles of flight (aeroplane)	**page**	
		General remarks on the changes introduced by the NPA 2016-03(E) Subject 081 • The introduction of TEM is welcomed. It does add a physical/operational dimension to a subject that some find not very practical. If performed properly it helps the student to think in terms of understanding => recognition => prevention/recovery, as per UPRT. • There seems to be a global search for clarification of theoretical notions, which can only be welcomed if it is in addition to the explanation of the notion itself (and not just vulgarization with less resulting knowledge / understanding). • There has been a bit of reorganization of the way some learning objectives are presented. There are some splits / moves. It seems to make sense and add clarity. • In terms of the Syllabus itself the big critical point we see is the removal of the stability part of the aircraft equations of motion: the explanations of aerodynamics of basic forces on the aircraft remain, but the notion of moments of forces and their effects on the stability / manoeuvrability of the aircraft are proposed to be removed. It is classified as "irrelevant" or "non essential for line pilot"… We strongly disagree with this and ask to keep it in the Syllabus. More explanation on this has been provided in the detailed comments on the NPA 2016_03.

		What is missing in Subject 081: • Since we are reviewing the theoretical part of the ATPL and introducing TEM we feel this would be the perfect occasion to add some knowledge / chapters on very specific points. This could be very basic but touching on potential challenges for airline pilots, e.g.: 2.1. Very large airplanes, effects of aero-elasticity (ailerons reversal effects…), increased wing loading, reduced static stability and their effects on longitudinal dynamics and roll response (especially at high mach and landing configuration). 2.2. Re-grouping some practical information about high altitude handling challenges into one chapter. 2.3. Stability augmentation on FBW airplanes, and TEM related to the loss of it in failure cases: loss of turn coordination, loss of load factor or pitch rate control laws, loss of pitch turn compensation and or spoilers / engine compensation. Again it does not need to be very detailed, but it may be useful to introduce these notions.

response

Thank you for your extensive feedback, which has been greatly appreciated.

EASA has carefully assessed all the comments received.

Regarding your comment referring to 'General remarks' on the changes introduced by NPA 2016-03(E) Subject 081: Noted.

EASA acknowledges your comment.

Regarding your comment referring to Subject 081, 2.1: Not accepted.

EASA would like to state that there already are dedicated and examinable LOs which are written in a way that both require teaching and allow a question-writer to address all the concepts mentioned.

Regarding your comment referring to Subject 081, 2.2: Not accepted.

EASA would like to state that these LOs are not built as a pedagogic manual, but as a listing of the knowledge that ATOs are required to teach.

Regarding your comment referring to Subject 081, 2.3: Not accepted.

EASA would like to state that this information is already covered in Subject 022 07 03 00.

SUBJECT 081 — PRINCIPLES OFFLIGHT (AEROPLANE) p. 79-162

comment

1-E comment by: *Tore Jopperud*

081 01 02 09 02 - Should be more specific as it is open to individual interpretation of the term "significant points".

response | Accepted.

Thank you for providing this comment referring to LO 081 01 02 09 (02).

EASA agrees that this LO should be more specific as it is open to individual interpretation because of the term 'significant points'.

The text will be amended as follows:

Explain the significant points:

— point where the curve crosses the horizontal axis (zero lift);

— point where the curve crosses the vertical axis ($\alpha = 0$);

— point where the curve reaches its maximum (C_{LMAX}).

comment | *2-E* comment by: *Tore Jopperud*

081 01 04 01 XX - Should include the danger posed by wake vortices to other aeroplanes such as an upset attitude that may result from an encounter. This is more important to a line pilot rather than describing spanwise flow and wing planforms.

response | Not accepted.

Thank you for providing this comment referring to Subject 081 01 04 01.

EASA will not take over your proposal. The explanation of the consequences of wake turbulence is already included in new LOs 081 01 04 01 (07) and (09), and LO 081 03 03 00 (02).

Additionally, understanding spanwise airflow and wing planforms is required building block to understand wake turbulence.

comment | *4-E* comment by: *Tore Jopperud*

081 01 04 02 02 - This should be reclassified as "BK" as more relevant to an aerodiynamicist than a line pilot.

081 01 04 02 07 - The pilot has no real significant influence on changing lift distribution and should be reclassified as "BK".

081 01 04 02 10 - This should be "BK" as more relevant to an aerodynamicist than a line pilot.

081 01 04 02 13 - This should be "BK" as too deep to be relevant to a line pilot.

081 01 04 02 14 - This is way too detailed for a line pilot and relevant to an aerodynamicist. Should be "BK" or deleted as it stands.

response | Not accepted.

Thank you for your multiple comments referring to LOs 081 01 04 02 (02), (07), (10), (13) and (14).

EASA has carefully assessed all the comments and those LOs should not be BK.

The level of knowledge of the concepts that is required for those LOs is adequate for a line pilot. Moreover, the lack of understanding of the concept of induced drag and its relation with wing-tip vortices is the root of many popular misconceptions in the business.

Pilots' poor understanding of ground effect or the consequences of changes in configuration can be traced back to their poor grasp of these concepts.

comment *5-E* comment by: *Tore Jopperud*

081 01 09 01 07 - In depth analysis of graphs are not relevant to a line pilot. The effects of various flap types on aeroplane behaviour is. Should be "BK".

081 01 09 01 08 - Graphs are for aerodynamicists. Should be "BK".

081 01 09 01 12 - Should be wider ranging and include flap mis-selection during flight and the potential effects and attitude upset of premature extension and retraction of flaps (either because of pilot moving the flap lever in the incorrect direction or pilot monitoring making a flap selection based on an inappropriate command from pilot flying).

response Thank you for your multiple comments.

EASA has carefully assessed all the comments.

Regarding your comment referring to LOs 081 01 09 01 (07) and (08): Not accepted.

The level of knowledge of the concepts that is required for those LOs is adequate for a line pilot. Graphs are not only for aerodynamicists — aerodynamicists develop the graphs, and airline pilots should be able to interpret them. A graph is a visual and empiric way of representing the relationship between two factors, which is within the level of knowledge a pilot should have, and the LOs require only that. Furthermore, the overall lack of understanding of the effect of flaps that many airline pilots show, and how it affects climb and glide performance, can be traced back to not being able to distinguish lift and coefficient of lift, which these LOs help make clear.

Regarding your comment referring to LO 081 01 09 01 (12): Partially accepted.

EASA agrees that this LO should be clearer.

The text will be amended as follows:

Explain the effects of flap-setting errors, such as mis-selection and premature/late extension or retraction of flaps on:

— take-off and landing distance and speeds;

— climb and descent performances;

— stall buffet margins.

In comment 43-E, the same issue was raised regarding this LO.

comment *6-E* comment by: *Tore Jopperud*

	081 01 09 02 08 - Again, the implication on graphs are not relevant to a line pilot but the effects of leading edge devices are. Should be "BK". 081 01 09 02 09 - Graphs not relevant to a line pilot. Should be "BK". 081 01 09 02 XX - Should include the applicability of extending leading edge device only during a stall recovery.
response	Not accepted. Thank you for your multiple comments. EASA has carefully assessed all the comments. Regarding your comment referring to LOs 081 01 09 02 (08) and (09): Not accepted. The level of knowledge of the concepts that is required for those LOs is adequate for a line pilot. Graphs are not only for aerodynamicists — aerodynamicists develop the graphs, and airline pilots should be able to interpret them. A graph is a visual and empiric way of representing the relationship between two factors, which is within the level of knowledge a pilot should have, and the LOs require only that. Furthermore, the overall lack of understanding of the effect of flaps that many airline pilots show, and how it affects climb and glide performance, can be traced back to not being able to distinguish lift and coefficient of lift, which these LOs help make clear. Regarding your comment requesting to include a new examinable LO regarding systems that extend LE devices during stall recovery: Not accepted. EASA would like to state that this is a type-specific functionality and the remaining LOs already ensure that the student will have the required level of knowledge to understand this functionality during their type rating.

comment	*7-E* comment by: *Tore Jopperud* 081 01 10 01 02 - Should be "BK" as graphs are not relevant to a line pilot but the effects of the devices are. 081 01 10 01 03 - Should be "BK" as graphs are not relevant to a line pilot but the effects of the devices are.
response	Not accepted. Thank you for your multiple comments referring to LOs 081 01 10 01 (02) and (03). EASA has carefully assessed all the comments and those LOs should not be BK. The level of knowledge of the concepts that is required for those LOs is adequate for a line pilot. Graphs are not only for aerodynamicists — aerodynamicists develop the graphs, and airline pilots should be able to interpret them. A graph is a visual and empiric way of representing the relationship between two factors, which is within the level of knowledge a pilot should have, and the LOs require only that.

comment	*8-E* comment by: *Tore Jopperud* 081 01 10 02 02 - Should be "BK" as graphs are not relevant to a line pilot but the effects of the devices are. 081 01 10 02 XX - Should include the efficiency of speedbrakes at various speeds and that limitations of their use may exist when flaps are extended and the implications this may have to a line pilot on recovering a vertical profile (if aeroplane is high).
response	Thank you for your multiple comments. Regarding your comment referring to LO 081 01 10 02 (02): Not accepted. The level of knowledge of the concepts that is required for those LOs is adequate for a line pilot. Graphs are not only for aerodynamicists — aerodynamicists develop the graphs, and airline pilots should be able to interpret them. A graph is a visual and empiric way of representing the relationship between two factors, which is within the level of knowledge a pilot should have, and the LOs require only that. Regarding your comment referring to Subject 081 01 10 02: Not accepted. The remaining LO, namely (01), already ensures that the student will have the required level of knowledge.

comment	*9-E* comment by: *Tore Jopperud* 081 02 01 03 03 - Must also include converting to a too low Mach number during climb leading to low speed stall at high altitude. 081 02 01 03 03 - Is the term "managed" referring to managed speed mode (Airbus) or "pilot managed" (manual) pilot intervention on the IAS/Mach no./IAS conversion.
response	Accepted. Thank you for your multiple comments on LO 081 02 01 03 (03). EASA agrees that this LO should be clearer. The text will be amended as follows: ~~Referring to 081 06 01 04 and 081 06 01 05, Explain that maximum operating airspeed (V_{MO}) could be exceeded during a descent at constant Mach number, and that the maximum operating Mach number (M_{MO}) could be exceeded during a climb at constant IAS, if climb or descent is not managed.~~ Explain: — risk of exceeding the maximum operation speed (V_{MO}) when descending at constant Mach number; — risk of exceeding the maximum operating Mach number (M_{MO}) when climbing at constant IAS; — risk of a low-speed stall at high altitude when climbing at a too low Mach number.

comment	*10-E* comment by: *Tore Jopperud* 081 02 02 01 01 - Not relevant to a line pilot. Should be "BK" unless deleted. 081 02 02 01 02 - Not relevant to a line pilot. Should be deleted. 081 02 02 01 03 - Very limited relevance to a line pilot. Should be "BK". 081 02 02 01 04 - Very limited relevance to a line pilot. Shuld be "BK".
response	Not accepted. Thank you for your multiple comments referring to LOs 081 02 02 01 (01) to (04). EASA has carefully assessed all the comments and those LOs should not be BK. Fundamental knowledge for the understanding of shock stall.

comment	*11-E* comment by: *Tore Jopperud* 081 02 03 02 04 - This is a design decision made by aerodynamicists and not something that can be influenced by pilots in any way and no FCOM/aeroplane literature for pilots will require any such knowledge. Should be reclassified "BK".
response	Partially accepted. Thank you for your comment referring to 081 02 03 02 (04). The LO is relevant, as the knowledge that most airliners can fly above M_{CRIT} is fundamental for understanding concepts such as Mach tuck, shock stall and the need for increased artificial stability at high altitudes. However, it should be clarified that there are not only advantages but also threats of doing so, hence the text will be amended as follows: Explain ~~Describe~~ the ~~of~~ consequences of exceeding M_{CRIT} with respect to C_L and C_{LMAX}. — ~~gradient of the C_L–α graph;~~ — ~~C_{LMAX} (stall speed).~~ Next to that, a new LO 081 02 03 02 (07) will be introduced: Explain the advantages of slightly exceeding M_{CRIT} in aeroplanes with supercritical aerofoils with respect to: — speed versus drag ratio; — specific range; — optimum altitude. In comment 48-E, the same issue was raised regarding this LO.

comment	*12-E* comment by: *Tore Jopperud* 081 02 03 03 01 to 081 02 03 03 03 - Should be reclassified as "BK".

	081 02 03 03 04 - Exceedance of any maximum speed pose a hazard. Should be generalised to this effect as all maximum speeds have built in safety factors, including MMO, and operationally there is no difference to a line pilot.
response	Thank you for your multiple comments. Regarding your comment to LOs 081 02 03 03 (01) to (03): Not accepted. These LOs are relevant for understanding concepts such as Mach tuck, shock stall and the need for increased artificial stability at high altitudes. Regarding your comment to LO 081 02 03 03 (04): Not accepted. Relevant to associate the drag divergence Mach number to the shock stall. As for the operational relevance of this knowledge, EASA considers that an airline pilot should be very aware of the different consequences of exceeding M_{MO} and V_{MO}.

comment	*13-E* comment by: *Tore Jopperud* 081 02 05 01 01 - Should be reclassified as "BK". This is design features used by the aerodynamic engineers in the design phase. No pilot has any means of influencing this. 081 02 05 01 03 - Should be reclassified as "BK". This is a design feature and cannot be influenced by the pilot.
response	Not accepted. Thank you for your comments referring to LOs 081 02 05 01 (01) and (03). EASA will not take over your proposal to reclassify these two LOs as BK. The subject matter covered in these LOs is relevant to understand that different sweepback angles will lead to different shock stall behaviours.

comment	*14-E* comment by: *Tore Jopperud* 081 02 05 02 XX - Three remaining LOs should be reclassified as "BK". The pilot has no influence on any of this as this is a concern of the aeroplane designers.
response	Not accepted. Thank you for your comment referring to Subject 081 02 05 02. EASA will not take over your proposal to reclassify these LOs as BK. The fact that these are design characteristics does not make it irrelevant for an airline pilot, as they affect the aircraft behaviour at high speed and, crucially, close to the high-speed stall. Additionally, showing the ability to understand these concepts is also a way of assessing the overall capacity and understanding of the student pilot.

comment	*15-E* comment by: *Tore Jopperud*

	081 03 01 01 06 - Should be reclassified as "BK" as the term is of no use to a line pilot. 081 03 01 01 09 - Should be reclassified as "BK". Principles and are for aerodynamicists and not essential for a line pilot. 081 03 01 01 10 - Should be reclassified as "BK" as the term is of no use to a line pilot. 081 03 01 01 12 - The factor "Pitching moment" (deleted) is the only factor included in the list that is of relevance to a pilot. This is directly related to aeroplane behaviour and is the only factor that can ever be recognised by a pilot. All other factors should be reclassified "BK" as of interest to an aerodynamicist rather than a line pilot. 081 03 01 01 16 - No mention is made of appropriate use of controls for stall recovery, either from incipient or developed stall.
response	Thank you for your multiple comments. Regarding your comment to LOs 081 03 01 01 (06), (09) and (10): Not accepted. Fundamental LOs to access whether the student pilot has the required knowledge of the mechanics of the stall. These are the basic concepts behind the phenomena that should be evaluated directly as not knowing them could lead to misconceptions. Regarding your comment to LO 081 03 01 01 (12): Partially accepted. EASA agrees that the 'pitching moment' is relevant and will be retained. EASA does not agree to reclassify the other factors to BK. The text will be amended as follows: Describe in straight and level flight the influence of increasing the α on: — the forward stagnation point; — the pressure distribution; — the CP location ~~centre of pressure~~ (straight and swept-back wing); — C_L ~~and L~~; — C_D and D; — the pitching moment (straight and swept back wing)~~;~~. — ~~the downwash at the horizon stabiliser.~~ Regarding your comment to LO 081 03 01 01 (16): Not accepted. The reference of the appropriate use of controls for stall recovery, either from incipient or developed stall, is already covered in 081 03 01 04 (05).

comment	*16-E* comment by: *Tore Jopperud* 081 03 01 02 02 - Should be deleted or reclassified "BK". Makes little sense as stall speed does not vary with varying airspeed? Relevant calculations of varying stall speed with loadfactor/weight etc. are covered in 082 03 01 02 09 to 082 03 01 02 11.
response	Partially accepted.

	Thank you for your comment referring to LO 081 03 01 02 (02). EASA would like to state that varying airspeed does not affect the stall speed, hence it should be removed. As for C_L, it should be maintained as it is relevant to the understanding of the effects of aerofoil section, high lift devices and compressibility in the stall speed. The text will be amended as follows: Solve ~~the~~ V_{S1G} from the lift formula~~,~~ given varying~~:~~ C_L.

comment	*17-E* comment by: *Tore Jopperud* 081 03 01 03 01 - What aeroplane in commercial use has a delta wing configuration or elliptical planform? Delta wing is not included in other parts of 081 so no reason why it should be in this LO. These two wing designs should be reclassified "BK".
response	Not accepted. Thank you for your comment referring to LO 081 03 01 03 (01). EASA is of the opinion that the elliptical planform should remain, as it is an excellent tool to evaluate the student's understanding of the effects of wing-tip vortices in stall behaviour. Additionally, given the range of aeroplanes one can fly with an ATPL licence, the understanding of this planform is fundamental. Regarding the delta wing, there is not a significant difference regarding teaching the sweepback part — fundamental for airline pilots.

comment	*18-E* comment by: *Tore Jopperud* 081 03 01 04 04 - The design of stall warning devices are examined in 022 and should be reclassified "BK".
response	Accepted. Thank you for your comment referring to LO 081 03 01 04 (04). EASA agrees that Subject 022 contains all technical aspects of stall warning/protection, etc., and all LOs are examinable: 022 12 03 XX XX covers stall warning technical aspects; 022 12 04 XX XX covers stall protection technical aspects; 022 02 03 XX XX covers angle of attack measurement and functions; 022 08 03 XX XX covers flight envelope protection including stall protection. As these are systems, their description and function belong in 022 and therefore examined there and cover way beyond what is in Subject 081. EASA agrees that this LO belongs to BK and will add an 'X' in the 'BK' column. Using the same type of material in Subject 081 as BK for revision purposes is reasonable when explaining the aerodynamic principles of a stall.

comment	*19-E* comment by: *Tore Jopperud* 081 03 01 05 01 - Reference needed as too broad and open to individual interpretation. 081 03 01 05 07 - Should be reclassified "BK" if not deleted. The important effects of ice and contamination to a pilot is covered by 081 03 01 05 14. 081 03 01 05 08 - Does not make sense as written. 081 03 01 05 09 - Needs to be more specific as anything can be abnormal. 081 03 01 05 10 - Sentence does not read well effectively stating "explain the cause of stabiliser stall caused by ice". Also, what is a "negative tail"? 081 03 01 05 11 - Needs to be more specific as it is completely open for individual interpretation as written. Important factors such as aeroplane design, speed, where build-up of ice occur first etc. may be omitted if not specified. 081 03 01 05 15 - Where is the reference for the term "on-ground" icing? I presume it means airframe contamination during ground operation in wintry conditions. "Winter operations" is the common term used in the industry. 081 03 01 05 16 - What is meant by this? Is it any aerodynamic effects resulting from the fact that parts of the aeroplane is covered by viscous fluid or is it the fact that the fluid does not provide adequate protection after the holdover time has expired.
response	Thank you for your multiple comments. EASA has carefully assessed all the comments received. Each comment has been dealt with on a one-by-one basis. Comments on LOs as indicated by LO number. Regarding your comment referring to LO 081 03 01 05 (01): Accepted. EASA agrees that this LO belongs to BK and will add an 'X' in the 'BK' column. Regarding your comment referring to LO 081 03 01 05 (07): Accepted. EASA agrees that the fundamentals are already covered in LOs 081 03 01 01 (12), 081 03 01 04 (04), 081 03 01 05 (08) and 081 03 01 05 (14). Therefore, this LO (07) will be deleted. The text will be deleted as follows: ~~(07) Explain the effect of ice, frost or snow on the stagnation point.~~ Regarding your comment referring to LO 081 03 01 05 (08): Accepted. EASA agrees that this LO is not clear and will rewrite it. The text will be amended as follows: Describe the factors that can lead to the a~~A~~bsence of stall warning and explain the associated risks. Regarding your comment referring to LO 081 03 01 05 (09): Partially accepted. EASA agrees that this LO is not clear. Instead of your proposal to make this proposal more

specific, EASA will delete this LO.

The text will be deleted as follows:

~~Abnormal behaviour of the stall.~~

Regarding your comment referring to LO 081 03 01 05 (10): Accepted.

EASA agrees that this LO does not read well and will be reworded.

The text will be amended as follows:

Describe the indications and explain the ~~cause and effects~~ consequences of ~~the~~ premature stabiliser stall due to ice contamination (negative tail stall).

Regarding your comment referring to LO 081 03 01 05 (11): Not accepted.

EASA would like to point out that the details referred are covered in Subject 081 01 12 01.

Regarding your comment referring to LO 081 03 01 05 (15): Accepted.

EASA agrees that this LO is not clear and will be reworded.

The text will be amended as follows:

Explain ~~what 'on ground' icing is~~ airframe contamination and the aerodynamic effects when parked and during ground operations in winter conditions**.**

Regarding your comment referring to LO 081 03 01 05 (16): Accepted.

EASA agrees that this LO is not clear and will be reworded.

The text will be amended as follows:

~~Describe the aerodynamic effects and hazards of de-icing/anti-iceing fluid after the holdover time has been reached.~~ Explain de-icing/anti-icing holdover time and the likely hazards after it has expired**.**

comment *20-E* comment by: *Tore Jopperud*

081 03 02 01 05 - Should state reference to where the term "1.3g altitude" is defined.

response Accepted.

Thank you for providing you comment referring to LO 081 03 02 01 (05).

EASA agrees that this LO should be reworded as you proposed.

The text will be amended as follows:

Explain the concept of the '1.3g~~G~~' buffet margin altitude.

comment *21-E* comment by: *Tore Jopperud*

081 03 03 00 01 - The sentence "take-off with or without error in extension of leading-edge devices" makes little sense. Does this mean mis-selection of configuration for take-off?

081 03 03 00 01 - Should also include "secondary stall" or load factor induced stall during a

stall recovery manoeuvre, particularly at high altitude where a significant change to pitch attitude is required.

081 03 03 00 01 - The effect of underslung engines is also appropriate during stall recovery where selection of idle may be appropriate during the initial recovery procedure to assist the pitch down required and careful application of thrust during the latter stages of the recovery manoeuvre to avoid excessive pitch-up moment.

081 03 03 00 04 - Should include reference to automatic flight (autopilot/autothrust). Inappropriate mode and loss of speed control is relevant to all altitudes and whether climbing, descending or maintaining level flight. Mode awareness and knowledge of whether speed is controlled by pitch or thrust is essential to ascertain any possible effects of either system faults or mode mis-management. 022 cover more in depth description of the system limitations.

081 03 03 00 04 - Should include "pitch and power" as reference and solution to unreliable speed or loss of speed indications.

response

Thank you for your multiple comments.

Regarding your comment referring to LO 081 03 03 00 (01): Partially accepted.

EASA agrees that this LO is not clear and should be reworded.

The text will be amended as follows:

Explain why buffet or stall could occur in the following pilot-induced situations, and the methods to mitigate them:

— inappropriate take-off configuration, detailing the consequences of errors associated with leading edge devices;

— steep turns;

— go-around using take-off/go-around (TOGA) setting (underslung engines).

Regarding your comment referring to LO 081 03 03 00 (04): Partially accepted.

EASA agrees that this LO is not clear and should be reworded.

The text will be amended as follows:

Explain why buffet or stall could occur in the following situations, and how to mitigate them:

— inappropriate autopilot climb mode;

— loss of, or unreliable, airspeed indication.

comment

22-E comment by: *Tore Jopperud*

081 03 04 00 XX - No reference is made to how to recover from a stall once it is recognised. There should be an LO stating vital actions such as reducing the pitch attitude highlighting the potentially significant changes required at high altitude (e.g. towards 15º pitch down at high altitude for a medium jet in a developed stall).

response	Not accepted. Thank you for your comment referring to Subject 081 03 04 00. EASA would like to state that the details referred are covered in Subject 081 01 12 01.

comment	*23-E* comment by: *Tore Jopperud* 081 04 01 01 01 - Should be reclassified as "BK". Also, one set of terms should be used, either stable/neutral/unstable or positive/neutral/negative. This is essential for aeroplane designers but of limited relevance to a line pilot so should be simplified to a relevant level. 081 04 01 01 04 - Should be reclassified as "BK". Also, one set of terms should be used, either stable/neutral/unstable or positive/neutral/negative. This is essential for aeroplane designers but of limited relevance to a line pilot so should be simplified to a relevant level. 081 04 01 01 05 - Should be deleted or reclassified as "BK". Not relevant to line pilots as this is applicable during the design and test stage of an aeroplane not the regular use.
response	Not accepted. Thank you for your comment referring to LOs 081 04 01 01 (01), (04) and (05). EASA considers these LOs are not BK. The level of knowledge required by the LO is considered adequate. Understanding the concepts stated in the referred LOs is fundamental for a holistic understanding of aircraft stability.

comment	*24-E* comment by: *Tore Jopperud* 081 04 01 04 01 - The terms used for the various moments vs. appropriate axis should be defined to ensure consistency.
response	Not accepted. Thank you for your comment referring to LO 081 04 01 04 (01). EASA would like to state that the terms used for the various moments vs appropriate axis are already included in Subject 081 05 00 00.

comment	*25-E* comment by: *Tore Jopperud* 081 04 03 04 01 - Should be reclassified as "BK". No relevance to a line pilot as the pilot has no means of manipulating its position since it is determined by design and not operation.
response	Not accepted. Thank you for your comment referring to LO 081 04 03 04 (01). EASA considers these LOs are not BK. The level of knowledge required by the LO is considered adequate. Requiring the student to demonstrate understanding of the

	relationship between the neutral point and the aerodynamic surfaces' aerodynamic centre is an adequate way of evaluating their overall grasp of aircraft stability.

comment	*26-E* comment by: *Tore Jopperud* 081 04 04 04 01 - Should be reclassified as "BK". These are design features decided by the aeroplane designer over which the line pilot has no input whatsoever.
response	Not accepted. Thank you for your comment referring to LO 081 04 04 04 (01). EASA considers these LOs are not BK. The level of knowledge required by the LO is considered adequate. Requiring the student to demonstrate understanding of the influence of aircraft design in directional stability is an adequate way of evaluating them.

comment	*27-E* comment by: *Tore Jopperud* 081 04 05 05 01 - Should be reclassified as "BK". This is decided at the design stage and factors that a line pilot have no way of manipulating.
response	Not accepted. Thank you for your comment referring to LO 081 04 05 05 (01). EASA considers these LOs are not BK. The level of knowledge required by the LO is considered adequate. Requiring the student to demonstrate understanding of the influence of aircraft design in directional stability is an adequate way of evaluating them.

comment	*28-E* comment by: *Tore Jopperud* 081 05 04 01 04 - The term "general conditions" is too broad and open to individual interpretation based on aeroplane type/experience. Conditions should be defined.
response	Accepted. Thank you for your comment referring to LO 081 05 04 01 (04). EASA agrees that this LO is not clear and should be reworded. The text will be amended as follows: ~~Explain~~ State that the outboard ailerons are locked out ~~the general conditions under which this feature is used~~. above a given speed to prevent: — over-control; — exceeding structural limitations; — aeroelastic phenomena (flutter, divergence and aileron reversal).

comment	*29-E* comment by: *Tore Jopperud* 081 05 06 02 03 - Should be expanded to include its purpose and effects of a failure as it may be interpreted to concern the technical aspect only (covered in 021).
response	Partially accepted. Thank you for your comment referring to LOs 081 05 06 02 (01) and (03). EASA agrees that this set of LOs could benefit from a clearer and more objective redaction, which would answer the request for expansion of the commentator. The text will be amended as follows: ~~Describe~~ State the differences between fully powered controls and power-assisted controls. Describe the advantages of ~~Explain why~~ artificial feel in fully powered control ~~is required~~.

comment	*30-E* comment by: *Tore Jopperud* 081 05 08 02 01 - There is cockpit indications for trim tabs. Only way to establish it is in a suitable position for take-off (often neutral). Any cockpit indications are more vital to the pilot than the mechanical working principle.
response	Accepted. Thank you for your comment referring to LO 081 05 08 02 (01). EASA agrees that there are cockpit indications for trim tabs and will undo the proposed deletion of the reference to this. This means the LO stays like it is.

comment	*31-E* comment by: *Tore Jopperud* 081 05 08 03 06 - Should also include go-around as, depending on where the stabiliser jammed, the aeroplane may be fine for landing but virtually uncontrollable if selecting of TOGA thrust.
response	Accepted. Thank you for your comment referring to LO 081 05 08 03 (06). EASA agrees that this LO should include 'go-around'. The text will be amended as follows: Explain the ~~landing considerations with a~~ the consequences of a jammed stabiliser during take-off, landing, and go-around. In comment 81-E, the same issue was raised regarding this LO.

comment	*32-E* comment by: *Tore Jopperud*

	081 06 01 01 03 - Should be reclassified to "BK" as the pilot has no influence on how the balancing to reduce flutter is achieved.
response	Not accepted. Thank you for your comment referring to LO 081 06 01 01 (03). EASA considers these LOs are not BK. The level of knowledge required by the LO is considered adequate. Requiring the student to demonstrate understanding of the influence of mass and balance to alleviate the flutter problem is an adequate way of evaluating their grasp over the important concept of flutter.

comment	*33-E* comment by: *Tore Jopperud* 081 06 01 03 04 - Should include possible exceedances as a result of mis-selection of flaps during flight and that such warnings/indications may be based on lever position or actual flap/slat position.
response	Not accepted. Thank you for your comment referring to LO 081 06 01 03 (04). EASA is of the opinion that there is no need to further clarify the LO.

comment	*35-E* comment by: *Lufthansa Flight Training (Jae)* 081 01 02 04 (1): Why explanation of AC here ? It is not needed here, its only use is at 081 04 03, longitudinal stability. There I would place it as it makes more sense there.
response	Not accepted. Thank you for your comment referring to LO 081 01 02 04 (01). The comment is relevant. However, the LOs were not built as a teaching programme but as a list of knowledge required to be taught. No reorganising of the LOs will be done at this point.

comment	*36-E* comment by: *Lufthansa Flight Training (Jae)* 081 01 03 01 (02) is the same as 081 01 02 09 (01)
response	Partially accepted. Thank you for your comment referring to LOs 081 01 03 01 (02) and 081 01 02 09 (01). EASA would like to state that the purpose of LO 081 01 03 01 (02) was to put the focus on the effects of camber on the C_L vs α curve. The text of this LO will be amended as follows:

Describe the effect of camber on the C_L–α graph (symmetrical and positively/negatively cambered aerofoils).

comment	*37-E* comment by: *Lufthansa Flight Training (Jae)* 081 01 03 01 (03) Not necessary knowledge for a pilot
response	Not accepted. Thank you for your comment referring to LO 081 01 03 01 (03). EASA considers this LO is not BK. The level of knowledge required by the LO is considered adequate. Understanding the lift formula, the factors affecting lift, and performing simple calculations is a good way of accessing a student's overall capabilities and suitability to becoming a pilot.

comment	*38-E* comment by: *Lufthansa Flight Training (Jae)* 081 01 04 01 (01): needs a more detailed specification, as it is it is not clearly defined what the student should learn
response	Not accepted. Thank you for your comment referring to LO 081 01 04 01 (01). EASA is of the opinion that this LO is considered specific enough.

comment	*39-E* comment by: *Lufthansa Flight Training (Jae)* 081 01 04 02 (02): not necessary knowledge for a pilot
response	Not accepted. Thank you for your comment referring to LO 081 01 04 02 (02). EASA would like to state that the level of knowledge of the concepts that is required for those LOs is adequate for a line pilot. An airline pilot should be able to recognise and interpret such a relevant formula. A formula is an empiric, logic way of representing the relationship between several factors, which is within the level of knowledge a pilot should have, and the LOs require only that.

comment	*40-E* comment by: *Lufthansa Flight Training (Jae)* 081 01 04 02 (10): not necessary knowledge for a pilot
response	Not accepted. Thank you for your comment referring to LO 081 01 04 02 (10).

EASA would like to state that the level of knowledge of the concepts that is required for those LOs is adequate for a line pilot. Moreover, the lack of understanding of the concept of induced angle of attack, lift and its relation with wing-tip vortices is the root of many popular misconceptions in the business. Pilots' poor understanding of ground effect or the consequences of changes in configuration can be traced back to their poor grasp of these concepts.

comment *41-E* comment by: *Lufthansa Flight Training (Jae)*

081 01 04 02 (14): parabolic polar curve not necessary knowledge for a pilot

response Not accepted.

Thank you for your comment referring to LO 081 01 04 02 (14).

EASA would like to state that level of knowledge of the concepts that is required for those LOs is adequate for a line pilot. An airline pilot should be able to interpret a graphic. A graph is a visual and empiric way of representing the relationship between two factors, which is within the level of knowledge a pilot should have, and the LOs require only that.

comment *42-E* comment by: *Lufthansa Flight Training (Jae)*

081 01 09 01 (07): CD is not shown in that graph

response Accepted.

Thank you for your comment referring to LO 081 01 09 01 (07).

EASA agrees that C_D is not shown in the C_L–α graph. The second bullet point will be removed.

The text will be amended as follows:

Compare their influence on the C_L–α graph:

- indicate the variation in C_L at any given α~~angle of attack~~;
- ~~indicate the variation in C_D at any given αangle of attack;~~
- indicate their effect on C_{LMAX};
- indicate their effect on the stall or critical α~~angle of attack~~;
- indicate their effect on the α~~angle of attack~~ at a given C_L.

comment *43-E* comment by: *Lufthansa Flight Training (Jae)*

081 01 09 01 (12): needs clarification which effects should be explained

response Accepted.

Thank you for your comment referring to LO 081 01 09 01 (12).

EASA agrees that this LO should be clearer.

The text will be amended as follows:

Explain the effects of flap-setting errors, such as mis-selection and premature/late extension or retraction of flaps on:

— take-off and landing distance and speeds;

— climb and descent performances;

— stall buffet margins.

In comment 5-E, the same issue was raised regarding this LO.

comment *44-E* comment by: *Lufthansa Flight Training (Jae)*

081 01 09 02 (11): I cannot see an increased leading edge radius with common LE devices

response Accepted.

Thank you for your comment referring to LO 081 01 09 02 (11).

EASA agrees with you comment; the last bullet point is an unnecessary detail as LOs (04) and (05) already cover the basic working principle of the most common LE devices. The last bullet point will be deleted.

In comment 83-E, the same issue was raised regarding this LO.

comment *45-E* comment by: *Tore Jopperud*

081 06 02 01 04 - Where is the definition of "equivalent airspeed boundary" found? It should be kept in mind that both equivalent airspeed and most features of this diagram is for design level and not encountered in any way for a line pilot or most other pilots for that matter.
081 06 02 01 07 - See no purpose of calculating this. The next LO (08) covers what is relevant to a pilot. Should be reclassified as "BK".

response Thank you for your multiple comments.

Regarding your comment referring to LO 081 06 02 01 (04): Partially accepted.

EASA would like to state that equivalent airspeed boundary is referring to the VD vertical line. Furthermore, the level of knowledge of the concepts that is required for those LOs is adequate for a line pilot. An airline pilot should be able to interpret a graphic. A graph is a visual and empiric way of representing the relationship between two factors, which is within the level of knowledge a pilot should have, and the LOs require only that. In this specific case, it presents a very clear image of the relationship between speed, angle of attack and structural limitations.

EASA will reword this LO.

The text will be amended as follows:

Identify and explain the varying features on the V_N diagram:

	— load factor 'n'; — speed scale, equivalent airspeed~~, EAS~~; — equivalent airspeed envelope; — C_{LMAX} boundary; — 1g stall speed; — accelerated stall boundary ~~speed~~ (refer to 081 01 08 02). Regarding your comment referring to LO 081 06 02 01 (07): Not accepted. EASA considers this LO is not BK. Requiring the student to know how to calculate the change of the Vs and VA is an adequate way of evaluating their grasp over the concept.

comment	*46-E* comment by: *Lufthansa Flight Training (Jae)* 081 02 01 04 (02): needs clarification, how does the streamline pattern change in a compressible flow but without a shock wave?
response	Accepted. Thank you for your comment referring to LO 081 02 01 04 (02). EASA agrees that not only does this LO need clarification, but also the first and last LO of Subject 081 02 01 04. The text will be amended as follows: State that compressibility means that density can change along a streamline, and that this occurs in the high subsonic, transonic and supersonic flow~~above~~. ~~Describe how the streamline pattern changes due to compressibility~~ State that compressibility negatively affects the pressure gradient, leading to an overall reduction of the C_L. […] Describe that compressibility increases low-speed stall speed and decreases ~~the critical angle of attack~~α_{CRIT}.

comment	*47-E* comment by: *Lufthansa Flight Training (Jae)* 081 02 02 01 (03): this looks as a normal shock appears on a wing only, but there are other locations as well
response	Noted. Thank you for your comment referring to LO 081 02 02 01 (03). It is considered that being able to properly understand shockwaves on wings is sufficient.

comment	*48-E* comment by: *Lufthansa Flight Training (Jae)*

081 02 03 02 (04): needs description what the advantages are, buffeting and reduction in clmax is not an advantage, but can happen above Mcrit

response

Accepted.

Thank you for your comment referring to 081 02 03 02 (04).

The LO is relevant, as the knowledge that most airliners can fly above M_{CRIT} is fundamental for understanding concepts such as Mach tuck, shock stall and the need for increased artificial stability at high altitudes. However, it should be clarified, as there are not only advantages but also threats of doing so, hence the text will be amended as follows:

Explain ~~Describe~~ the ~~of~~ consequences of exceeding M_{CRIT} with respect to C_L and C_{LMAX}.

— ~~gradient of the C_L–α graph;~~

— ~~C_{LMAX} (stall speed).~~

Next to that, a new LO will be introduced:

Explain the advantages of slightly exceeding M_{CRIT} in aeroplanes with supercritical aerofoils with respect to:

— speed vs drag ratio;

— specific range;

— optimum altitude.

In comment 11-E, the same issue was raised regarding this LO.

comment

49-E comment by: *Lufthansa Flight Training (Jae)*

081 02 03 03 (04): needs clarification about what the hazard above MDD is. drag rise is no hazard

response

Accepted.

Thank you for your comment referring to 081 02 03 03 (04).

EASA agrees that this LO needs clarification and this LO will be split in two.

The text will be amended as follows:

Describe the effects and hazards of exceeding the ~~Define~~ 'drag divergence Mach number' ~~and explain the relation to with M_{CRIT}~~, namely:

— drag rise;

— instability;

— Mach tuck;

— shock stall.

State the relation between M_{CRIT} and M_{DD}.

comment

50-E comment by: *Lufthansa Flight Training (Jae)*

081 02 03 05 (01): needs clarification about what the effects are. for a subsonic jet

	transport aeroplane there are usually no effects as the control surfaces are at a portion of the airfoils where the flow is subsonic
response	Not accepted. Thank you for your comment referring to LO 081 02 03 05 (01). EASA is of the opinion that this LO is clear like it is. The effects of shockwaves on the control surfaces' effectiveness is relevant knowledge.

comment	*51-E* comment by: *Lufthansa Flight Training (Jae)* 081 02 05 01 (01): the explanation of wing sweep on Mcrit is ok, but thickness/chord ratio or perpendicular velocity component is not necessary knowledge as these are just vehicles to give the student an idea how sweepback could work. it does not reflect reality.
response	Noted. Thank you for your comment referring to LO 081 02 05 01 (01). Although the second bullet point may be implied in the first, its existence is justified to ensure the knowledge is delivered to an appropriate level.

comment	*52-E* comment by: *Lufthansa Flight Training (Jae)* 081 03 01 05 (03): needs clarification about the difference
response	Not accepted. Thank you for your comment referring to LO 081 03 01 05 (03). EASA is of the opinion that this LO is clear like it is.

comment	*53-E* comment by: *Lufthansa Flight Training (Jae)*
response	Noted. No text in this comment.

comment	*54-E* comment by: *Lufthansa Flight Training (Jae)* 081 03 02 01 (02): why only turbulence ? manoeuvres could also increase the load factor to 1.3
response	Accepted. Thank you for your comment referring to LO 081 03 02 01 (02).

	EASA agrees that the addition made in the NPA text for this LO made this LO too specific. The text will be amended as follows: Explain how the buffet onset boundary chart can be used to determine: — manoeuvre capability; — buffet margin. — ~~manoeuvre capability~~.
comment	*55-E* comment by: *Tore Jopperud* 081 07 04 02 02 - Should be reclassified as "BK" unless some aeroplane types suffer from a very pronounced gyroscopic effect. This effect is negligible for typical propeller aeroplanes and not noticed by the pilot during normal flying as it is overcome by slipstream and similar effects.
response	Accepted. Thank you for your comment referring to LO 081 07 04 02 (02). EASA agrees that this LO belongs to BK and will add an 'X' in the 'BK' column. The effect should be known but the focus it gets by being examinable can be misleading.
comment	*56-E* comment by: *Tore Jopperud* 081 07 04 05 01, 081 07 04 05 02 - Too broad and should be more specific. This "management" is very different between different aeroplane types. The propeller effects in mind should also be more specific as the relevant effects may be very different between aeroplane types (such as turboprop vs. piston or twin vs. single). Also "management" should be more specific as to intended scenarios and subsequent actions. 081 07 04 05 03 - Seems like a duplication of 081 07 04 05 02. Again too broad and non-descriptive as to its intention.
response	Accepted. Thank you for your comment referring to LOs 081 07 04 05 (01) to (03). EASA agreed that these LOs are too broad and could be more specific and will be reworded. The text will be amended as follows: Describe, given direction of propeller rotation, the propeller effects during take-off run, rotation and initial climb, and their consequence on controllability. Describe, given the direction of propeller rotation, the propeller effects during a go-around and their consequence on controllability. Explain how the hazards associated with propeller effects during go-around can be aggravated by: — high engine performance conditions and their effect on the VMC speeds;

	— loss of the critical engine; — crosswind; — high flap setting; — engine failure at the moment of the go-around. In comment 79-E, the same issue was raised regarding this LO.
comment	*57-E* comment by: *Tore Jopperud* 081 08 01 02 03 - The equivalent of this LO is changed to "BK" for straight and level flight and this should also be reclassified as "BK". 081 08 01 02 04 - This is of no relevance or use to a line pilot. Should be reclassified as "BK" unless deleted. 081 08 01 02 07 - This is of no relevance or use to a line pilot. Should be reclassified as "BK" unless deleted. 081 08 01 02 08 - An aeroplane will never be flown in this fashion. A climb is achieved at either a constant IAS/CAS/Mach or vertical speed. The only time pitch is a target is initial rotation on departure, initial pitch up during go-around, pitch and power targets during unreliable airspeed and stall recovery. Should be completely reworded to reflect normal, relevant operations encountered by line pilots.
response	Thank you for your multiple comments. Regarding your comment referring to LO 081 08 01 02 (03): Accepted. EASA agrees that this LO belongs to BK and will add an 'X' in the 'BK' column. This LO can be examined on the following LOs. Regarding your comment referring to LOs 081 08 01 02 (04) and (07): Not accepted. EASA is of the opinion that the level of knowledge of those LOs is adequate for a line pilot. An airline pilot should be able to work with the referred formulas. Regarding your comment referring to LO 081 08 01 02 (08): Accepted. EASA agrees that this LO should be completely reworded to reflect normal, relevant operations encountered by line pilots. The text will be amended as follows: Explain how IAS, ~~angle of attack~~ α, and γ~~flight path~~ ~~angle~~ change in a climb performed with constant ~~pitch attitude and normal thrust decay with altitude~~ vertical speed and constant thrust setting.
comment	*58-E* comment by: *Tore Jopperud* 081 08 01 03 01 - The equivalent of this LO is changed to "BK" for straight and level flight and this should also be reclassified as "BK".

	081 08 01 03 02 - This is of no relevance or use to a line pilot. Should be reclassified as "BK" unless deleted.
response	Thank you for your multiple comments. Regarding your comment referring to LO 081 08 01 03 (01): Accepted. EASA agrees that this LO belongs to BK and will add an 'X' in the 'BK' column. This LO can be examined on the following LOs. Regarding your comment referring to LO 081 08 01 03 (02): Not accepted. EASA is of the opinion that the level of knowledge of those LOs is adequate for a line pilot. An airline pilot should be able to work with the referred formulas.

comment	*59-E* comment by: *Tore Jopperud* 081 08 01 04 01 - The equivalent of this LO is changed to "BK" for straight and level flight and this should also be reclassified as "BK". 081 08 01 04 02 - This is of no relevance or use to a line pilot. Should be reclassified as "BK" unless deleted. 081 08 01 04 03 - Calculations are not relevant to a line pilot and gradient should be changed back to angle as this is the value that is of concern to a pilot and it is no point making things sound complex for the sake of it. Should be reclassified as "BK". 081 08 01 04 07 - Should also include the use of speedbrakes to modify the glide angle and should include that a glide can never be extended, only shortened (within reason). 081 08 01 04 08 - Old LO was definition of gradient and revised LO now appear confusing as gradient is a result and not a factor. 081 08 01 04 09 - In most aeroplanes Vmp may not be known. Standard is to glide for range and that is what pilots a taught in flying training as a glide can only be shortened. Since there is no equivalent of this LO regarding gliding at Vmd it should be removed or reclassified as "BK" since it's more theoretical than practical. 081 08 01 04 10 - Gliding is a practical skill about visual inputs and judging movement of features. Unless there is extraordinary circumstances pilots are only taught one speed and that is Vmd. As most jets are in effect gliders during a normal descent it would be more useful to include it as a part of profile management.
response	Thank you for your multiple comments. Regarding your comment referring to LO 081 08 01 04 (01): Noted. EASA agrees that this LO belongs to BK and would like to note that in the NPA text this LO already was classified as BK. Regarding your comment referring to LOs 081 08 01 04 (02) and (03): Not accepted. EASA is of the opinion that the level of knowledge of those LOs is adequate for a line pilot.

	An airline pilot should be able to work with the referred formulas. Regarding your comment referring to LO 081 08 01 04 (07): Accepted. EASA agrees that the new changes in the NPA text actually make the LO come across as more restricted than what is intended and will be reverted. Regarding your comment referring to LO 081 08 01 04 (08): Not accepted. EASA is of the opinion that the changes introduced bring further clarification to the LO. Regarding your comment referring to LOs 081 08 01 04 (09) and (10): Not accepted. EASA is of the opinion that the introduction of a LO to specifically address the differences between glide endurance and range is important, as it is one of the most popular misconceptions among students that can lead to inadequate altitude management when gliding.
comment	*60-E* comment by: *Tore Jopperud* 081 08 01 05 02 - This is of no relevance to a line pilot. Should be reclassified as "BK" if not deleted. 081 08 01 05 04 - This is described opposite to the normal point of view for a line pilot. Normal flight is rate 1 turn up to maximum bank angle (30º for normal turns) and radius of turn is the resultant and not a factor. 081 08 01 05 05 - This is of no relevance to a line pilot. Should be reclassified as "BK" if not deleted. 081 08 01 05 06 - Numerical examples are all well and good but the relevance to line flying can be questioned. The only numeracy related to turning is timed turns for heading changes using a direct reading compass, and the time element has been deleted from LO. Should be reclassified as "BK". 081 08 01 05 07 - Thrust is produced by the engines and the thrust produced is independent of bank angle. Thrust required to maintain level flight is more sensible. 081 08 01 05 11 - The calculation has no practical application to a pilot other than as an example. Should be reclassified as "BK". 081 08 01 05 12 - All instrument procedures defined in PANS OPS (Doc 8168) are designed according to speed categories and not only the ones mentioned. The implications of speed exceedance can include separation issues, airspace issues, obstacle clearance issues or noise issues. All these speeds are based on IAS/CAS and not TAS because pilots fly using IAS/CAS and never TAS.
response	Thank you for your multiple comments. Regarding your comment referring to LOs 081 08 01 05 (02), (05), (06), (07) and (11): Not accepted. EASA is of the opinion that the level of knowledge of those LOs is adequate for a line pilot.

	An airline pilot should be able to work with the referred formulas. Regarding your comment referring to LO 081 08 01 05 (04): Not accepted. It is not possible to write an LO regarding turning that would reflect the normal point of view of a pilot, as turning in a small aircraft is very different from turning in a large aircraft. As an example, the commentator mentions that normally aircraft do rate-1 turns, which is only applicable for small aeroplanes, as trying to do it in large aircraft would imply exceeding the allowed load factor. What never changes is the radius of turn for a given bank angle and speed, hence the focus on these on the LO. Regarding your comment referring to LO 081 08 01 05 (12): Noted.

comment	*61-E* comment by: *Tore Jopperud* 081 08 02 01 03 - Should be deleted. This is in reality a duplicate of 081 08 02 11 XX which is much better worded and makes more sense. 081 08 02 01 05 - Is balance in this context directional control or is it balanced/co-ordinated flight? Should be more specific.
response	Thank you for your multiple comments. Regarding your comment referring to LO 081 08 02 01 (03): Partially accepted. EASA would like to state that this LO is not a duplicate, but it contains information that can be indirectly examined through LO 081 08 02 (11). EASA will reclassify this LO as BK and will add an 'X' in the 'BK' column. Regarding your comment referring to LO 081 08 02 01 (05): Accepted. EASA agrees that this LO should be more specific. The text will be amended as follows: Describe the methods to achieve directional balance after engine loss.

comment	*62-E* comment by: *Tore Jopperud* 081 08 02 03 01 - Where is the "in wing-down method" term defined and described? 081 08 02 03 03 - Should also include the possibility of overstressing the tail section if excessive rudder is applied. 081 08 02 03 04 - This is a bit obscure and theoretical and should be reclassified as "BK".
response	Thank you for your multiple comments. Regarding your comment referring to LO 081 08 02 03 (01): Noted. EASA does not know of an industry name for using bank as an aid to produce the required yaw moment, and the 'wing down method' seems sufficiently self-explanatory. Regarding your comment referring to LO 081 08 02 03 (03): Partially accepted.

	EASA agrees to reword this LO, but the changes you propose can be misleading. The text will be amended as follows: Explain why the required small bank angle~~, must be limited.~~ is limited by: — increased overall lift required and increase in drag in banked attitude; — fin stalling angle. Regarding your comment referring to LO 081 08 02 03 04: Not accepted. EASA considers this LO as a relevant LO and will not be reclassified as BK.

comment	*63-E* comment by: *Tore Jopperud* 081 08 02 04 01 - Should also include the effect of airspeed on controllability as the speed is under direct influence of the pilot during fight and the weight is not.
response	Accepted. Thank you for your comment referring to LO 081 08 02 04 (01). The range of speeds used are a consequence of the mass of the aircraft, which is the problem that the LO intends to address and hence it can be further clarified. The text will be amended as follows: Explain why controllability with one-engine-inoperative is a typical problem arising from the low speeds associated with ~~encountered at~~ low aeroplane mass.

comment	*64-E* comment by: *Tore Jopperud* 081 08 03 00 01 - Should be reclassified as "BK" as more nice to know rather than need to know for aeroplane operation. Curve is not found in any readily available aeroplane documentation.
response	Not accepted. Thank you for your comment referring to LO 081 08 03 00 (01): EASA considers this LO as a relevant LO and will not be reclassified as BK.

comment	*65-E* comment by: *Lufthansa Flight Training (Jae)* 081 04 01 02 (01): not clear: an equilibrium of forces and moments does not provide static stability, it is necessary for a steady flight, but for static stability a disturbance of the equilibrium must result in forces and moments that tend to return the aeroplane to the equilibrium.
response	Accepted. Thank you for your comment referring to LO 081 04 01 02 (01).

	EASA agrees that this LO should be clearer. The text will be amended as follows: Explain an equilibrium of forces and moments as the initial condition for the concept of static stability.

comment	*66-E* comment by: *Lufthansa Flight Training (Jae)* 081 04 03 05 (01): somewhere the important requirement for static longitudinal stability must be stated: Aeroplane CG in front of the aeroplane NP
response	Not accepted. Thank you for your comment referring to LO 081 04 03 05 (01). EASA would like to state that the implied knowledge can be found in LO 081 04 03 05 (03).

comment	*67-E* comment by: *Lufthansa Flight Training (Jae)* 081 04 05 05 (02): not required for CAT, dihedral is in 081 04 05 05 (01) mentioned as a factor of lateral stability
response	Accepted. Thank you for your comment referring to LO 081 04 05 05 (02). EASA agrees with your comment and will delete this LO. The text will be deleted as follows: ~~(02) Define 'dihedral effect'.~~

comment	*68-E* comment by: *Lufthansa Flight Training (Jae)* 081 05 02 02 (02): the relation of stabiliser trim and downwash is not clear, please clarify
response	Noted. Thank you for your comment referring to LO 081 05 02 02 (02). Downwash changes the AoA of the stabiliser, hence requiring different trim settings for different downwash intensity and direction.

comment	*69-E* comment by: *Lufthansa Flight Training (Jae)* 081 05 04 01 (02): ailerons themselves have no adverse effect, aileron delfection has an adverse effect: adverse yaw
response	Accepted.

	Thank you for your comment referring to LO 081 05 04 01 (02). EASA agrees that aileron deflection has an adverse effect: adverse yaw. The text will be amended as follows: Describe the adverse effects of ailerons deflection. *(Refer to 081 05 04 04 and 081 06 01 02)*

comment	*70-E* comment by: *Lufthansa Flight Training (Jae)* 081 05 04 04 (01): the same as 081 05 04 01 (02)?
response	Not accepted. Thank you for your comment referring to LO 081 05 04 04 (01). EASA would like to state that the depth of knowledge required to teach is different in both.

comment	*71-E* comment by: *Lufthansa Flight Training (Jae)* 081 06 03 02 (02): it is all contained in 081 06 03 02 (01), so why again?
response	Accepted. Thank you for your comment referring to LO 081 06 03 02 (02). EASA agrees that this new LO proposed in the NPA covers the same as in the current LO (01) and will delete this proposed new LO.

comment	*72-E* comment by: *Lufthansa Flight Training (Jae)* 081 07 03 00: not required for CAT pilot
response	Not accepted. Thank you for your comment referring to Subject 081 07 03 00. EASA would like to state that the understanding of the difference between the power an engine can deliver and the power the propeller can absorb is not a challenging concept and constitutes an acceptable level of knowledge for a pilot to have. We can even imagine operational situations that are not so farfetched where this knowledge could be an important part of a proper diagnosis of a problem such as, for example, a malfunctioning pitch control unit.

comment	*73-E* comment by: *Lufthansa Flight Training (Jae)* 081 07 03 03: not relevant for a CAT pilot

response	Not accepted. Thank you for your comment referring to Subject 081 07 03 03. EASA would like to state that the understanding of the advantages and disadvantages of increasing the number of blades is not a challenging concept and constitutes an acceptable level of knowledge for a CAT pilot to have. The idea of the theoretical knowledge phase of the licence is not to provide the bare minimum knowledge necessary for a person to fly an aeroplane in normal conditions, but also to assess their overall capacity, suitability and learning capabilities.

comment	*74-E* comment by: *Lufthansa Flight Training (Jae)* 081 08 01 04 (10): speed stability is of no relevance when there is no engine thrust (glide)
response	Not accepted. Thank you for your comment referring to LO 081 08 01 04 (10). EASA is of quite the contrary opinion. Speed stability is of relevance when there is no engine thrust (glide), because most aeroplanes glide for minimum rate of descent in the speed unstable range or limit. In that case, there is no engine thrust to pay for. Any disturbance that reduces the aircraft's speed is crucial.

comment	*75-E* comment by: *Lufthansa Flight Training (Jae)* 081 08 01 05 (12): not understandable, please clarify
response	Noted. Thank you for your comment referring to LO 081 08 01 05 (12). EASA would like to clarify that this LO introduces the focus on the practical implementation of turn radius management, specifying the most common limitations regarding an airliner.

comment	*76-E* comment by: *Lufthansa Flight Training (Jae)* 081 08 02 10 (03): I think there is not much influence of the CG on the VMCG, so delete
response	Not accepted. Thank you for your comment referring to LO 081 08 02 10 (03). EASA is of the opinion that this LO is relevant and will not delete it. The CG position is crucial for the rudder's yaw control moment, hence the V_{MCG} test being made with the CG in the most aft.

comment	*77-E* comment by: *Lufthansa Flight Training (Jae)* 081 08 02 03 (01): there is also a fuselage sideforce with the wing-down method, there is always a fuselage sideforce when there is sideslip
response	Noted. Thank you for your comment referring to LO 081 08 02 03 (01). The LO does not say it does not exist, it simply focuses on the predominant factors.

comment	*78-E* comment by: *Lufthansa Flight Training (Jae)* 081 08 01 05 (03): what are the hazards when using rudder in a turn on a swept wing ? Clarify !
response	Accepted. Thank you for your comment referring to LO 081 08 01 05 (03). EASA agrees that this LO is not clear and will split this LO into two. The text of LO (03) will be amended as follows: Describe the difference between a coordinated and an uncoordinated turn, and ~~explain~~ describe how to correct an uncoordinated turn using turn and slip indicator or turn coordinator. The text of the new LO will be inserted as follows: Describe the hazards of excessive use of rudder to tighten a turn in a swept-wing aeroplane.

comment	*79-E* comment by: *Lufthansa Flight Training (Jae)* 081 07 04 05 (03): Clarify ! Its is hazardous to apply suddenly full power at slow speed as in a go-around. Which are situations where this is more dangerous ?
response	Accepted. Thank you for your comment referring to LOs 081 07 04 05 (01) to (03). EASA agrees that these LOs are too broad and could be more specific and will be reworded. The text will be amended as follows: Describe, given direction of propeller rotation, the propeller effects during take-off run, rotation and initial climb, and their consequence on controllability. Describe, given the direction of propeller rotation, the propeller effects during a go-around and their consequence on controllability. Explain how the hazards associated with propeller effects during go-around can be aggravated by: — high engine performance conditions and their effect on the VMC speeds;

	— loss of the critical engine; — crosswind; — high flap setting; — engine failure at the moment of the go-around. In comment 56-E, the same issue was raised regarding this LO.

comment	*80-E* comment by: *Lufthansa Flight Training (Jae)* 081 07 03 03 (01): what is this good for ? no required knowledge
response	Not accepted. Thank you for your comment referring to LO 081 07 03 03 (01). EASA would like to state that the understanding of the advantages and disadvantages of increasing the number of blades is not a challenging concept and constitutes an acceptable level of knowledge for a CAT pilot to have. The idea of the theoretical knowledge phase of the licence is not to provide the bare minimum knowledge necessary for a person to fly an aeroplane in normal conditions, but also to assess their overall capacity, suitability and learning capabilities.

comment	*81-E* comment by: *Lufthansa Flight Training (Jae)* 081 05 08 03 (06): please clarify
response	Accepted. Thank you for your comment referring to LO 081 05 08 03 (06). EASA agrees that this LO should include 'go-around'. The text will be amended as follows: Explain the ~~landing considerations with a~~ the consequences of a jammed stabiliser during take-off, landing, and go-around. In comment 31-E, the same issue was raised regarding this LO.

comment	*82-E* comment by: *Lufthansa Flight Training (Jae)* 081 04 06 03 (02): - conditions for a stable, neutral or unstable durch roll motion: not required knowledge for a CAT pilot
response	Not accepted. Thank you for your comment referring to LO 081 04 06 03 (02). Fundamental knowledge for understanding the Dutch roll motion, a crucial building block for an operational understanding of the yaw dumper system and the risks associated with

	this instability.

comment	*83-E* comment by: *Lufthansa Flight Training (Jae)* 081 01 09 02 (11): is the reason for reduced leading edge separation the increase in LE radius ? First is that the radius does not change by extended slats, second is that for a pilot it is sufficient to know the fact that there is less separation, no matter what the exact reason is. So: delete LO
response	Partially accepted. Thank you for your comment referring to LO 081 01 09 02 (11). In comment 83-E, the same issue was raised regarding this LO. The LO is not deleted but amended. EASA is of the opinion that the last bullet point is an unnecessary detail, as LOs (04) and (05) already cover the basic working principle of the most common LE devices. The last bullet point will be deleted.

comment	*85-E* comment by: *Bristol Groundschool* In LO 081.06.02.01 "Manoeuvring Load Diagram": Item (03) Vc and Vd are speeds relevant to test flying only. Line pilots are limited by Vmo Item (05) Mc and Md. As above. Line pilots are limited by Mmo
response	Not accepted. Thank you for your comment referring to LOs 081 06 02 01 (03) and (05). EASA is of the opinion that the understanding of the design speeds is not a challenging concept and constitutes an acceptable level of knowledge for a CAT pilot to have. The idea of the theoretical knowledge phase of the licence is not to provide the bare minimum knowledge necessary for a person to fly an aeroplane in normal conditions, but also to assess their overall capacity, suitability and learning capabilities. More could even be said regarding the importance of properly understanding the different maximum operational speeds, and how they are defined, to learn the different threats that arise from exceeding each of them.

comment	*86-E* comment by: *Bristol Groundschool* In LO 081.06.03.01 "Gust Load Diagram": Item (01) Knowledge of the precise strength of the gusts in ft/sec, m/sec and knots that are considered in test flying is of no practical use for line pilots.

response	Not accepted. Thank you for your comment referring to LO 081 06 03 01 (01). EASA is of the opinion that good awareness about the actual conditions the aircraft is built to endure is an important contribution to the decision-making process when dealing with turbulence.

comment	*87-E* comment by: *Bristol Groundschool* I would like to see improved clarity in: LO 081.03.01.03 "The initial stall in a spanwise direction" Item (04) "the influence of chines on engine nacelles". In my experience, "Chine" is not a word commonly used in aviation. It's a strake, apparently. My Collins English dictionary refers only to geology, and butchery!
response	Thank you for your multiple comments. Regarding your comment referring to the title of Subject 081 03 01 03: Partially accepted. EASA is of the opinion that the right wording lexicographically is 'spanwise' instead of 'span-wise', but will not put the indefinite article 'a' before it. The text will be amended as follows: **081 03 01 03** ***The initial stall in ~~span-wise~~ spanwise direction*** Regarding your comment referring to LO 081 03 01 03 (04): Accepted. EASA agrees that 'chine' is not the appropriate wording and will reword the LO. The text will be amended as follows: Explain the influence of fences, vortilons, saw teeth, vortex generators and strakes on engine nacelles.

comment	*88-E* comment by: *Bristol Groundschool* I would like to see improved clarity in: LO 081.08.01.04 ""Straight, steady glide" Item (03) "Describe the relationship between the glide gradient angle and the lift–drag ratio, calculate glide range from given data and discuss relevance." What "Given Data", exactly? If it's just the lift drag ratio, then say so. Other factors will influence the glide RANGE, and add complexity to the calculation.
response	Accepted. Regarding your comment referring to LO 081 08 01 04 (03). EASA agrees that this LO should be clearer. The LO can be clarified by including what factors should be considered.

The text will be amended as follows:

Describe the relationship between the glide gradient ~~angle~~ and the lift–drag ratio~~,~~ and calculate glide range given:

— initial height;

— L–D ratio;

— glide speed and wind speed.

comment *93-E* comment by: *UK CAA*

Page No: 80 - 162 Table

Paragraph No: n/a

Comment: Several Learning Objectives (LO) have been categorised in all subject tables as Basic Knowledge (BK). The intention is that these LOs will be taught by the Approved Training Organisation (ATO) and tested in progress test, but not examined by the National Aviation Authority (NAA) using the European Central Question Bank (ECQB).

The LOs that have been identified as BK are the principles on which all topic areas are developed and higher levels of understanding are achieved, therefore it should be a requirement that these principles are examined. If BK is being taught and tested by the ATO, there is no reason why the ECQB is not used to verify this knowledge and that these principles have been embedded and understood by the student.

Justification: If BK is removed from the ECQB along with the existing questions, new more complex questions to a higher level will have to be developed to make the examination generate with an adequate coverage of all topic areas in individual subjects. This could have a detrimental effect on some students who are naturally nervous when taking examinations, as there will be no BK questions in the test to allow them to build their confidence and they will be seriously disadvantaged by this proposal.

The EASA Exams Team require each topic area to be 5 deep with the number of questions available in the ECQB, this will not be achievable in some subjects as it will not be possible to write additional question one topic area.

With additional questions examining to a higher level, the table at AMC1 ARA.FCL.300(b), detailing the time allowed for an examination and the number of questions for each topic area, will need to be reviewed to establish if an examination is achievable. We are not aware of any evidence that the RMG have confirmation of this or have carried out any sort of analysis or testing.

Proposed Text: n/a

response Accepted.

Thank you for your comment referring to several BK LOs.

EASA would like to state that several BK LOs were reinstituted as examinable LOs as to

	permit a fair, well-balanced exam, which will also allow NAAs to provide their candidates with a better diagnostic of their knowledge insufficiencies when failing an exam. EASA would like to refer you to the response to comment 162-E.

comment	*158-E*	comment by: *KLM Flight Academy*
response	Noted. No comment made in this box.	

comment	*159-E*	comment by: *KLM Flight Academy*
	Suggest to remove “back” because forwardsweep has the same effect on Mkrit but a diferent effect on lowspeed behaviour	
response	Not accepted. Thank you for your comment but there is no LO reference.	

comment	*162-E*	comment by: *FTEJerez*
	Comments on Subject 081 ‘Principles of flight (aeroplane)’ The overall changes are very good and bring the subject to the modern age. We only have some minor comments: 081 01 01 03 (09) not BK 081 01 01 04 (03) - (07) (09) not BK 081 01 01 05 (03) BK , (05) not BK , (07) BK, LO(11) bring it back 081 01 02 01 (03) not BK 081 01 03 01 (04) not BK 081 01 04 00 (01) not BK 081 01 04 01 (03) not BK 081 04 03 01 (05) (06) needs clarifying 081 05 01 03 look at it 081 05 08 03 LO(02) bring it back	
response	Thank you for your multiple comments. Regarding your comment referring to LO 081 01 01 03 (09): Not accepted. EASA is of the opinion that this BK LO is examinable through LO 081 01 04 00 (02) and remains BK. Regarding your comment referring to LOs 081 01 01 04 (03) to (07) and (09): Accepted. EASA agrees that these LOs are relevant building blocks for higher level knowledge. Their reinstitution as examinable LOs also allows the creation of fair, well-balanced exam, which	

will also allow NAAs to provide their candidates with a better diagnostic of their knowledge insufficiencies when failing an exam. EASA agrees that these LOs remain examinable (not BK) and will delete the 'X' in the 'BK' column.

Regarding your comment referring to LO 081 01 01 05 (03): Not accepted.

EASA is of the opinion that this BK LO is examinable through LO 081 01 04 00 (02) and remains BK.

Regarding your comment referring to LO 081 01 01 05 (05): Accepted.

See above. EASA agrees that these LOs remain examinable (not BK) and will delete the 'X' in the 'BK' column.

Comments on LO 081 01 01 05 (07): Accepted.

Concept evaluated through 081 04 03 05. We propose the LO become BK.

Regarding your comment referring to LO 081 01 01 05 (11): Accepted.

EASA agrees that this LO contains fundamental knowledge to understand wingspan stall. This LO will be reinstated and will become BK.

Regarding your comment referring to LO 081 01 02 01 (03): Not accepted.

EASA would like to state that this LO is BK, as it is examinable through other LOs.

Regarding your comment referring to LO 081 01 03 01 (04): Not accepted.

EASA would like to state that this LO is BK, as it is examinable through other LOs.

Regarding your comment referring to LO 081 01 04 00 (01): Not accepted.

EASA would like to state that this LO is BK, as it is examinable through other LOs.

Regarding your comment referring to LO 081 01 04 01 (03): Accepted.

EASA agrees that this LO contains fundamental knowledge to understand 3D airflow, hence should be directly examinable. This LO will be reinstated (not BK).

Regarding your comment referring to LOs 081 04 03 01 (05) and (06): Not accepted.

EASA considers these LOs clear enough.

Regarding your comment referring LO subject 081 05 01 03 (01): Accepted.

EASA agrees that this LO contains fundamental knowledge to understand the controls functioning. This LO will be reinstated and will become BK.

Regarding your comment referring to LO 081 05 08 03 (02): Accepted.

EASA agrees that this LO contains fundamental knowledge for a holder of an ATPL licence, who will be allowed to fly practically every type of aircraft around. This LO will be reinstated.

comment *173-E* comment by: *European Cockpit Association*

Subject 081 — Principles of flight (aeroplane)	**page**	
		General remarks on the changes introduced by the NPA 2016-03(E) Subject 081 • The introduction of TEM is welcomed. It does add a

		physical/operational dimension to a subject that some find not very practical. If performed properly it helps the student to think in terms of understanding => recognition => prevention/recovery, as per UPRT. • There seems to be a global search for clarification of theoretical notions, which can only be welcomed if it is in addition to the explanation of the notion itself (and not just vulgarization with less resulting knowledge / understanding). • There has been a bit of reorganization of the way some learning objectives are presented. There are some splits / moves. It seems to make sense and add clarity. • In terms of the Syllabus itself the big critical point we see is the removal of the stability part of the aircraft equations of motion: the explanations of aerodynamics of basic forces on the aircraft remain, but the notion of moments of forces and their effects on the stability / maneuverability of the aircraft are proposed to be removed. It is classified as "irrelevant" or "non essential for line pilot"… We strongly disagree with this and ask to keep it in the Syllabus. More explanation on this has been provided in the detailed comments on the NPA 2016_03.
		What is missing in Subject 081: • Since we are reviewing the theoretical part of the ATPL and introducing TEM we feel this would be the perfect occasion to add some knowledge / chapters on very specific points. This could be very basic but touching on potential challenges for airline pilots, e.g.: 2.1. Very large airplanes, effects of aero-elasticity (ailerons reversal effects…), increased wing loading, reduced static stability and their effects on longitudinal dynamics and roll response (especially at high mach and landing configuration). 2.2. Re-grouping some practical information about high altitude handling challenges into one chapter. 2.3. Stability augmentation on FBW airplanes, and TEM related to the loss of it in failure cases: loss of turn coordination, loss of load factor or pitch rate control laws, loss of pitch turn compensation and or spoilers / engine compensation. Again it does not need to be very detailed, but it may be useful to introduce these notions.
081 01 01 03 Aerodynamic forces on aerofoils	**82**	We disagree with a deletion of 081 01 01 03 (04) till (08), that is deletion of explanation of the moment of an aerodynamic force. This notion is fundamental if one wants to be able to understand the notion of aircraft trim / equilibrium. How could we understand the need for stabilizer necessity and how it acts if the basic mechanics principle is not explained? This needs to remain in the syllabus.

081 01 02 08	**86**	We disagree with suppression of explication of flow separation at high angle of attack. This is a fundamental physical notion to explain stall. We acknowledge that it is still introduced later in 081.03.01.01, however "repetition is the mother of learning" and the LO 081 01 02 08 should not be deleted.
081 01 06 01 (01) Influence of ground effect	**93**	We suggest keeping the technical term (*angle of attack)* for clarification reasons, instead of the proposed change to symbol.
081 02 03 04 (04)	**112**	We disagree with deletion of LO on the aerodynamic functioning of the Mach trim system. This knowledge helps understanding what the FCS does in normal case, and what could happen if / when it fails. It could be part of a larger TEM on loss of control recognition / prevention
081 04 03 01 (03)		We disagree with deletion of LO requiring an explanation of the effect of speed on stabilizer position. The fact of possible lack of pilot's awareness of stabilizer position is an issue.
081 03 01 00 Stall, shock stall, and upset prevention and recovery	**115**	Add a new Learning Objective: **Describe the difference between escape manoeuvres of high level and low level stalls**
081 04 03 06 The Cm–alpha graph, and 081 04 03 10	**129 & 131**	We disagree with deletion of LO related to the Cm_alpha curve. Basic understanding of the effect of CG / alpha on static stability as well as on stabilizer position is essential. It does help to understand the later paragraph on Take-off trim position (081.05.08.03(03)). Again it is very basic knowledge/culture and it will help the pilot in understanding basic stabilizer position physics, e.g. stab position gross check for take-off or in flight during an upset. **For the same reasons 081 04 03 10 LO (stick force function of IAS) should remain.**
081 04 04 00, and 081 04 04 03 Static directional stability, and Cn–Beta graph	**133 and 134**	We disagree with deletion of LO 081 04 04 03; the understanding e.g. the balance of forces is at least as important as the understanding of the forces acting on the aircraft
081 04 05 04 The Cl–β graph	**135**	We disagree with deletion of LO 081 04 05 04 related to Cl_Beta. We strongly believe that the notion of sideslip induced roll remains of prime importance to the pilot, even in the age of FBW. The recent Air Asia crash or the saving of the A300 in Baghdad a few years ago are 2 examples of the practical use of this notion and how to fly an aircraft in a degraded state. We are confident that this knowledge could save lives one day, as it constitutes a basic understanding of how an aircraft fly.

response

Thank you for your extensive feedback, which has been greatly appreciated.

EASA has carefully assessed all the comments received.

Regarding your comments under 'General remarks on the changes introduced by the NPA 2016-03(E) Subject 081' and under 'What is missing in Subject 081': Not accepted.

EASA already replied to your similar comment 172-E above.

Regarding your comment referring to LOs 081 01 01 03 (04) to (07): Partially accepted.

EASA agrees that these concepts are indeed important to understand stability later on, but they do not all need to be examinable.

EASA will make the following changes:

- LOs 081 01 01 03 (04) and (05) are reinstated and classified as BK;
- LOs 081 01 01 03 (06) and (07) are reinstated as examinable LOs.

Regarding your comment referring to Subject 081 01 02 08: Not accepted.

While EASA does not disagree about the usefulness of repetition for the learning process, it has no place in the LOs. The LOs are not built as a pedagogic manual, but as a listing of the knowledge that ATOs are required to teach.

Regarding your comment referring to LO 081 01 06 01 (01): Not accepted.

EASA is of the opinion that the term is defined clearly. The LOs are not built as a pedagogic manual, but as a listing of the knowledge that ATOs are required to teach.

Regarding your comment referring to LO 081 02 03 04 (04): Accepted.

EASA agrees that understanding the basic functioning of the Mach trim is fundamental knowledge, as it is associated with one of the areas where we can find more misconceptions. However, one could argue that this is necessary knowledge to understand LO 081 02 03 (05) and answer any question on it. Hence, EASA proposes that the best way to answer this issue is to reinstate 081 02 03 04 (04) as BK.

Regarding your comment referring to LO 081 04 03 01 (03): Accepted.

EASA agrees with yours reasons pointed out and will reinstated this LO as an examinable LO.

Regarding your comment referring to LO subject 081 03 01 00: Partially accepted.

EASA agrees that in the attempt of removing some unnecessary knowledge, this Chapter's review may have oversimplified it. EASA will not add your proposed LO, but will reinstate LO 081 04 03 06 (01) as BK.

Regarding your comment referring to LO 081 04 03 06 (02): Accepted.

This LO will be reinstated as BK and with a new redaction.

The text will be amended as follows:

Describe the C_m–α graph with respect to the ~~:~~

— ~~positive and negative sign;~~

— ~~linear relationship;~~

— ~~angle of attack for equilibrium state;~~ relationship between the slope of the graph

and static stability.

Regarding your comment referring to LO 081 04 03 07 (01): Accepted.

This LO will be reinstated as BK.

Regarding your comment referring to LO 081 04 03 10 (01) to (04): Accepted.

These LOs will be reinstated as BK.

Regarding your comment referring to LO 081 04 03 10 (last LO, not numbered): Accepted.

This LO will be reinstated and examinable with a new redaction.

The text will be amended as follows:

Explain how a pilot perceives stable static longitudinal stick force stability regarding changes in:

— speed;

— altitude;

— mass.

Regarding your comment referring to LO 081 04 03 14 (01): Accepted.

The title of Subject 081 04 03 14 and LO (01) will be reinstated and examinable with a new redaction.

The text will be amended as follows:

81 04 03 14 Factors affecting the manoeuvring stability/stick force per g~~G~~

Explain the influence on stick force per g~~G~~ of:

— CG location;

— trim setting~~;~~

— ~~a down spring in the control system;~~

— ~~a bob weight in the control system~~.

Regarding your comment referring to LO 081 04 04 01 (02): Accepted.

This LO will be reinstated as BK.

Regarding your comment referring to LO 081 04 04 02 (01) and (02): Accepted.

The title of Subject 081 04 04 02 and LOs (01) and (02) will be reinstated as BK.

Regarding your comment referring to LOs 081 04 04 03 (01) and (02): Accepted.

These LOs will be reinstated as BK and a new BK LO will be added.

The text will be inserted as follows:

Identify how the slope of the C_n–β graph is affected by altitude.

Regarding your comment referring to LO 081 04 05 02 (01): Accepted.

The title of Subject 081 04 05 02 and this LO (01) will be reinstated as BK.

Regarding your comment referring to LOs 081 04 05 04 (01) and (02): Accepted.

The title of Subject 081 04 05 04 and LOs (01) and (02) will be reinstated as BK and a new BK LO will be added.

The text will be inserted as follows:

Identify how the slope of the C_l–β graph is affected by altitude.

comment *183-E* comment by: *FAA*

Page 124-125: *081 03 04 00 Recognition of stalled condition*

(02) A stall may also be recognized by an uncommanded pitch down motion and possibly an uncommanded roll. Stick pusher activation is also an indication of a stall. Recommend adding these indicators to the list.

response Accepted.

Thank you for your comment referring to LO 081 03 04 00 (02).

EASA agrees to add the indicator regarding 'uncommanded pitch' to the list.

The text will be amended as follows:

Explain that a stall may be recognised by continuous stall-warning activation accompanied by at least one of the following:

— buffet, that can be heavy;

— lack of pitch authority;

— uncommanded pitch down and uncommanded roll;

— inability to arrest the descent rate.

comment *187-E* comment by: *DGAC FRANCE*

Doc E
Subject:
SUBJECT 081 – PRINCIPLES OF FLIGHT (Aeroplane)

Content of comment:
No comment

response Noted.

No comment in this box.

Additional comments received by email:

comment	*Per email* comment by: SAT: Blatter Patrick 081 Principles of Flight 081 01 01 05 (11) This LO should be kept for the understand of the aerodynamic understanding.¨ 081 02 02 02 It is part of “high speed” and should be kept 081 02 02 03 (02-03) Should be kept for understanding! 081 02 04 00 (04-05) Important for pilots of subsonic airplanes.
response	Thank you for your multiple comments. Regarding your comment referring to LO 081 01 01 05 (11): Accepted. EASA agrees that this LO contains fundamental knowledge to understand wingspan stall. This LO will be reinstated and will become BK. Regarding your comment referring to Subjects 081 02 02 02 and 081 02 02 03: Not accepted. As interesting as these concepts are, there are currently no supersonic civilian aircraft. Moreover, should they appear again, these would be type-specific concepts, hence to be taught later. Regarding your comment referring to Subject 081 02 04 00: Noted.

Appendix

to ED Decision 2018/001/R

Subject 082 — PRINCIPLES OF FLIGHT — HELICOPTERS

RELATED NPA: 2016-03(E) — RMT.0595 — 6.2.2018

Table of contents

5. Summary of the outcome of the consultation

Please refer to the Explanatory Note to Decision 2018/001/R.

6. Individual comments and responses

In responding to comments, a standard terminology has been applied to attest EASA's position. This terminology is as follows:

(a) **Accepted** — EASA agrees with the comment and any proposed amendment is wholly transferred to the revised text.

(b) **Partially accepted** — EASA either agrees partially with the comment, or agrees with it but the proposed amendment is only partially transferred to the revised text.

(c) **Noted** — EASA acknowledges the comment but no change to the existing text is considered necessary.

(d) **Not accepted** — The comment or proposed amendment is not shared by EASA.

SUBJECT 082 — PRINCIPLES OF FLIGHT (HELICOPTER) p. 164-208

comment	*89-E* comment by: *Bristol Groundschool* **082 03 02 01** (01). I support the removal of tilt-wing. But compound and tilt-rotor are very much still with us, and likely to be even more so. Suggest retaining them in this LO.
response	Accepted. Thank you for providing this comment referring to LO 082 03 02 01 (01). EASA agrees that compound helicopter and tilt-rotor should stay in this LO, and only the tilt-wing will be deleted. The text will be amended as follows: Describe (briefly) the single-main-rotor helicopter and other configurations: tandem, coaxial, side by side, synchrocopter (with intermeshing blades), the compound helicopter~~,~~ ~~tilt-wing~~ and tilt-rotor.

comment	*90-E* comment by: *Bristol Groundschool* **082 04 01 01** (13). Comment not entirely correct, as manufacturers are already incorporating military (BERP-derived) technology into blades, especially AW. Airbus are also playing around with Blue Wave blades with some very different planforms. Suggest retaining this LO.
response	Accepted. Thank you for providing this comment referring to Lo 082 04 01 01 (13). EASA agrees with your argumentation and will retain this LO, and will delete the comment in the 'Comments' column.

comment	*91-E* comment by: *Bristol Groundschool* **082 04 03 01** (02). Agreed. But lets be very sure we weed the QB for related questions before exam candidates start emerging with dazed stares please!
response	Noted. Thank you for providing this comment referring to LO 082 04 03 01 (02).

comment	*92-E* comment by: *Bristol Groundschool* **082 04 05 02** (07). Suggest 'raising' the collective is more accurate than 'pulling' - though I've pulled more than my share of pitch!
response	Accepted. Thank you for providing this comment referring to LO 082 04 05 02 (07). EASA agrees with your proposal to replace ‘pulling’ with ‘raising’ and will amend the text according to your proposal. The text will be amended as follows: Explain the final increase in rotor thrust caused by ~~pulling~~ raising the collective pitch to decrease the vertical descent speed and the decay in rotor ~~RPM~~rpm.

comment *174-E* comment by: *European Cockpit Association*

Subject 082 — Principles of flight (helicopter)	**page**	
(7) Types of rotor hubs. 1. Teetering rotor	**168**	This types of rotor hubs used to be called "semi-rigid" not "semi-articulated" as stated.
082 01 03 02 (03) - Show that downwash causes vortices	**179**	Keep this LO. It’s important for the student to understand that the downwash is a turbulent airflow. Relevant to understand "settling with power" and "vortex state"
082 02 01 01 - Speeds and Mach number	**180**	This LO is no of practical use for helicopters, besides the definitions and the effect of compressibility in the helicopter performances and the reason of the limited speed a helicopter can obtain. Covered in 082 04 03 04
082 02 01 02 - Shock waves	**181**	No practical use for helicopters, delete LO for H
082 05 04 02 - Fully articulated rotor	**197**	We ask for clarification why this type of rotor design (and LO) is moved to 021 17 01 01 and the other types are kept. This leads to confusion and will be difficult to address

		properly in classroom. Either maintain this LO or move all 082 05 04 00 to 021
082 07 03 03 and (01) - Static and dymanic rollover	**206**	Maintain Static in the head line. In LO (01) reword: "explain the mechanism which causes static and dynamic rollover". Justification: EHEST demonstrate that static rollover is a main cause of accidents, so this concept must remain in syllabus

response

Thank you for providing your six comments.

EASA has carefully assessed all the comments received.

Each comment has been dealt with on a one-by-one basis. Comments on LOs as indicated by LO number.

Regarding your comment referring to the heading on p. 168: Accepted.

EASA agrees with your proposal to replace ‘semi-articulated’ with ‘semi-rigid’, and will amend the text according to your proposal.

The text will be amended as follows:

> Teetering rotor or seesaw rotor: The two blades are connected together; the ‘hinge’ is on the shaft axis, and the head is underslung. A variation is the gimballed hub; the blades and the hub are attached to the rotor shaft by means of a gimbal or universal joint (Bell 47). It is sometimes called semi-rigid because there is no movement of the blade in a dragwise sense.

Regarding your comment referring to LO 082 01 03 02 (03): Accepted.

EASA agrees with your argumentation and this LO will be retained.

Regarding your comment referring to LO 082 02 01 01: Not accepted.

EASA is of the opinion that the definitions and the effect of compressibility on helicopter performance and the reason of the limited speed a helicopter can obtain are not covered in 082 04 03 04. Therefore, this LO will be kept here and your proposal to delete this LO is not accepted.

Regarding your comment referring to LO 082 02 01 02: Not accepted.

EASA is of the opinion that this LO is necessary and your proposal to delete this LO is not accepted.

Regarding your comment referring to LO 082 05 04 02: Not accepted.

EASA moved this subject to 021 17 01 01, as recommended by the experts of the RMT.0595 drafting group for the LO. EASA does not see that moving this LO will lead to confusion and will be difficult to address properly in classroom.

Regarding your comment referring to LO 082 07 03 03: Accepted.

EASA agrees with your argumentation to keep the word ‘static’ in the heading, and the heading will be retained as follows:

082 07 03 03 Static and dynamic rollover

Regarding your comment referring to LO 082 07 03 03 (01): Not accepted.

EASA is of the opinion that the wording is clear like it is and will not be reworded.