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PERSONNEL LICENSING

GENERAL

IMPLEMENTATION OF A NEW SYSTEM FOR THE CPL AND ATPL THEORETICAL KNOWLEDGE EXAMINATIONS

1. PURPOSE:

On 2014-01-13, a revised theoretical knowledge examination system came into effect. This affected the theoretical knowledge examinations towards the Commercial Pilot's Licence (CPL) and the Airline Transport Pilot's Licence (ATPL).

Updated aspects involve new examination system hardware and software as well as revised syllabi and questions.

The system is operational and it is now feasible to give feedback to the industry.

The purpose of this circular is therefore to provide guidance to the aviation training industry and examination candidates and explain the extent of the changes. AIC 31.1.3 dated 8 March 2012 will be revised in due course.

The following examination syllabi and databases are unaffected by the changes referred to in this AIC:

- Cabin crew licences;
- Flight engineer ratings and licences;
- Flight instructor ratings;
- Private Pilot's (PPL) licences;
- Night rating and
- Radiotelephony.

2. INTRODUCTION:

The examinations towards the CPL and ATPL are managed by two departments within the South African Civil Aviation Authority. These are:

a) **Aviation Personnel Standards (APS).**

This department is responsible for the training and testing standards of flight crew licences, i.e. the compilation of syllabi and question databases.

b) **Licensing & Examinations.**

This department is responsible for the administration of the examination process, including bookings, invigilation, crediting of results and remarks.

The Aviation Personnel Standards department within the CAA is therefore responsible for the content of the theoretical examinations within its domain.

More information about the department as well as inspector contact details may be found on the South African CAA website.

The link to the Aviation Personnel Standards departmental page may be found under the "Information for the industry" drop-down menu. www.caa.co.za

3. **BACKGROUND:**

Up to December 2013, examinations towards the CPL and ATPL were conducted on the Legacy examination system. There were several problems with the previous examinations, including:

- a) an outdated operating system (Windows 98);
- b) outdated syllabi;
- c) miss alignment between the syllabi and the examination questions;
- d) obsolete evaluation due to the rapid development of modern aviation;
- e) examinations were only possible on a fixed-question (i.e. non-randomized) basis;
- f) commercially available study material and courses were often biased only towards the passing of the exams, instead of addressing knowledge requirements;
- g) the increasing disparity between the officially published syllabi and the available study material and
- h) the deterioration of the examination effectiveness because of an over-exposed question bank.

The decision was consequently taken four years ago to upgrade the examination software and hardware, modernize the syllabi and update the question database.

4. **IMPLEMENTATION:**

The international Questionmark examination system was decided on because of the success of the PPL and Flight Instructor examination process with the same system.

Questionmark is a widespread, high-quality international system and is used by numerous international establishments (e.g. Louisiana State University and the University of South Alabama) as well as South African (e.g. Compliance Institute of South Africa, Colleges of Medical Sciences of South Africa, University of Pretoria, ATNS and SAA). It is also in use in the corporate environment (e.g. Discovery Health, Sanlam and Outsurance).

In conjunction with the upgrading of modern hardware and software, APS renewed the question database. The largest portion of this question bank was sourced from the European Aviation Safety Agency (EASA). This is the organization that in 2008 assumed most of the responsibilities of the Joint Aviation Authorities (JAA).

The EASA-sourced questions have been supplemented by internally generated questions and by selected questions from the old Legacy question bank.

Certain subject question banks inevitably had to be populated with South African-generated questions e.g. Air Law and Operational Procedures.

Simultaneously, syllabi were modernized in a few critical areas.

More information about these changes may be found under the heading "SUMMARY OF CHANGES TO INDIVIDUAL SUBJECT SYLLABI" below.

5. **EXPECTED IMPROVEMENTS:**

It is anticipated that the new examination system will better evaluate candidates' knowledge, specifically their *insight* into concepts that were learnt. This means that the evaluation of the practical application of knowledge obtained during exam preparation will receive increasing attention.

In addition, the system aims to:

- neutralize the harmful effect of public knowledge about the previous database;
- limit the opportunity for cheating;
- introduce modern technology into the testing process;
- increase user-friendliness;
- increase the transparency of the testing methodology;
- increase the consistency of examination standards;
- evaluate candidates comprehensively but fairly;
- align the content of available study material with the syllabi; and
- meet the needs of modern aviation technology.

It is accepted that these goals will take time to achieve. It is acknowledged that there are still problem areas, but these are addressed actively and progressively as the system is refined. The intention is to attain an excellent standard of theoretical evaluation through continuous improvement.

6. **REFERENCE MATERIAL:**

The CAA does not distribute exam study material, but publishes the official knowledge standard in the form of subject syllabi. These may be found in the appendices to the South African Civil Aviation Technical Standards (CATS), but are also published on the website under the Aviation Personnel Standards (APS) section.

The preparation or sourcing of suitable study material has historically been left to the Industry, although guidelines were given. However, it was found that there were often large discrepancies between industry-produced study books and the officially published syllabi. The deteriorating quality of some material also became problematic.

Various consequential problems were encountered, such as:

- The CAA was accused of not being consistent in examination conduct;
- Editing errors introduced into commercial material made successful preparation for exams challenging;
- Some manuals were often out-of-date;
- Material content did not adhere diligently to the syllabus;
- Books were often tailored to known exam questions, instead of correctly reflecting the requirements of the syllabi.

Eventually, this state of affairs led to an unacceptable situation and the decision was taken to source and recommend a suitable set of reference books for the examinations.

Although by no means a panacea, the JEPPESEN ATPL series of study books have been recommended by the CAA as suitable for use. Selected additional reference books have been added to allow complete coverage of the syllabus.

Other important documents should be studied in conjunction e.g. the SA Civil Aviation Regulations (CAR's). The series is supplemented with other sources e.g. ICAO PANS-OPS Document 8168.

A detailed list may be found on the last page of this AIC, as well as on the CAA website.

Illustrations of the front covers of the suggested study books have been included below to help candidates with the identification of the correct material.

Candidates should make their own arrangements to obtain the study material.

Documents CAP 696/697/698 may be downloaded free of charge from various sources e.g. www.caa.co.uk

The CAA has selected the suggested books as a standard reference which candidates will have reasonable access to and may use for all their preparation towards the South African CPL and ATPL exams. The exam renewal project included finding a page reference within the recommended material for every question in the database.

According to accepted practice, there may be questions of such difficulty that they specifically cater for exceptional candidates. These will be the exception, not the norm.

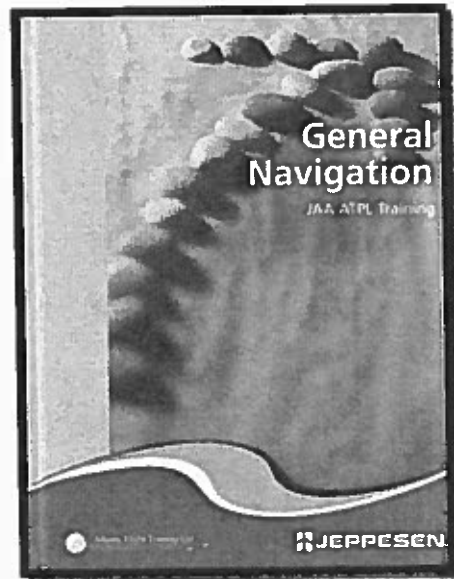
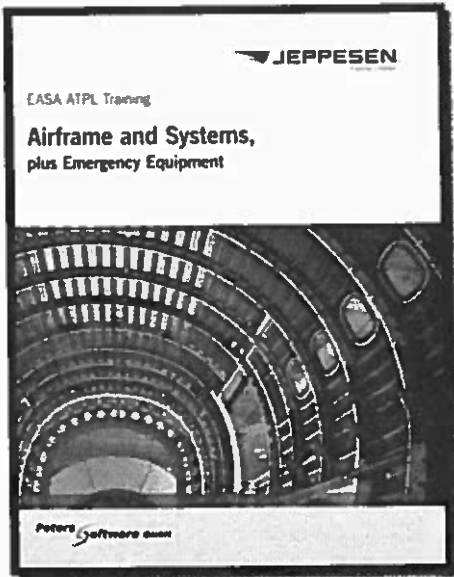
The CAA does not distinguish between sections in the study material for the different pilot licences. These distinctions are drawn only in the published syllabi. Exam candidates doing self-study at home will have to be especially diligent to identify required learning matter in the study books in conjunction with the syllabus for each subject.

This situation has its potential drawbacks, but echoes ICAO recommendations which differentiate between the knowledge required for different licences in terms of the level of insight required, not merely the scope of material to be covered.

Extract from ICAO Annex 1 to the Convention on International Civil Aviation - Personnel Licensing:
"The applicant shall have demonstrated a level of knowledge appropriate to the privileges granted to the holder of a commercial pilot licence (Comment: or "an airline transport pilot licence") and appropriate to the category of aircraft intended to be included in the licence..."

ILLUSTRATIONS OF SUGGESTED STUDY MATERIAL

**Jeppesen EASA Training ATPL series
(Peters Media Publishing)**

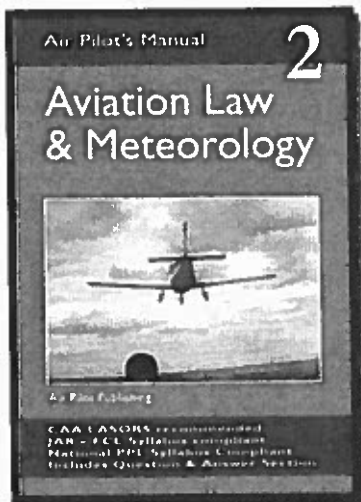


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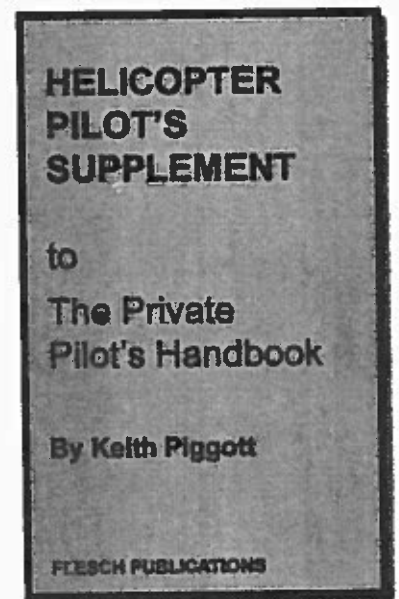
**JEPPESEN JAA TRAINING ATPL SERIES
(Jeppesen & Atlantic Flight training Ltd., 2nd edition)**

**AIR PILOT'S MANUALS,
Volume 2 (Meteorology) and 4 (ATG)**

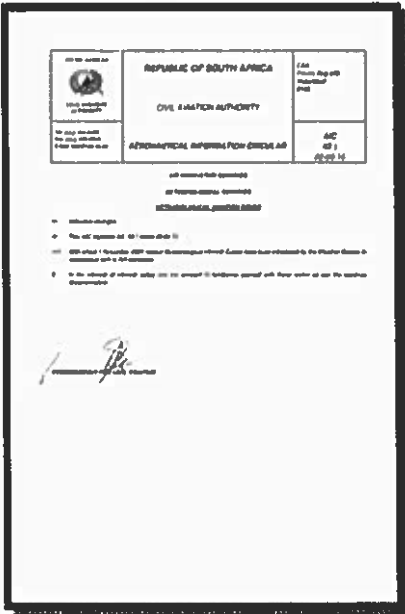
**HELICOPTER PILOT'S SUPPLEMENT
(Keith Piggott)**



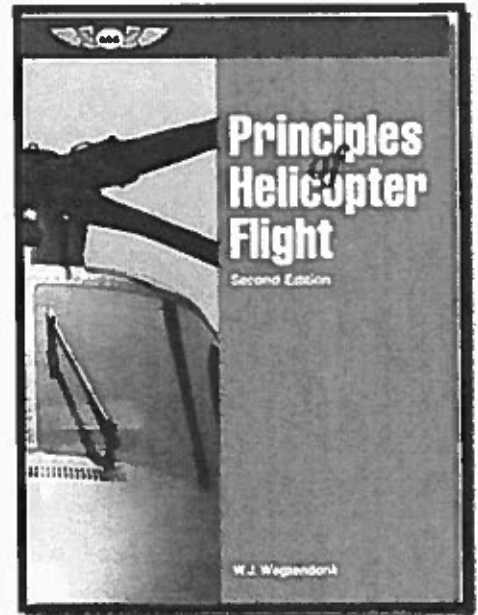
**METEOROLOGY FOR THE
SOUTH AFRICAN PRIVATE PILOT
(Stephen Medcalf)**



RSA AIC 43.1
(Meteorological codes for aviation)



ASA – PRINCIPLES OF HELICOPTER FLIGHT
(W.J. Wagtendonk)

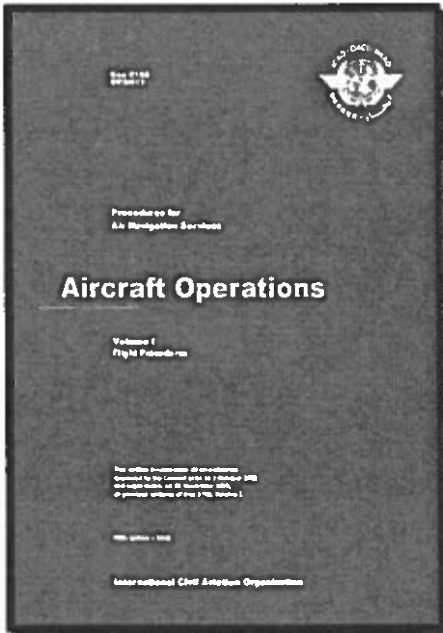


FAA Document FAA-H-8083-21
Rotorcraft Flying Handbook

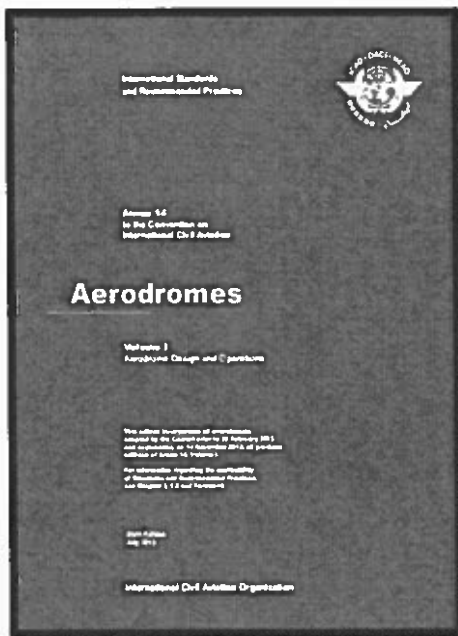


ICAO PUBLICATIONS:

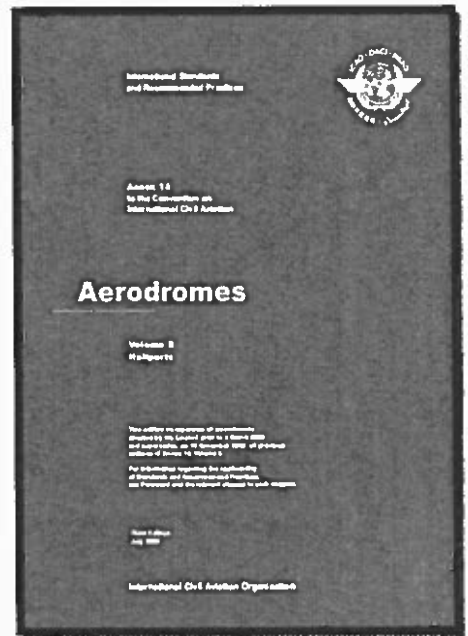
PANS-OPS Doc 8168



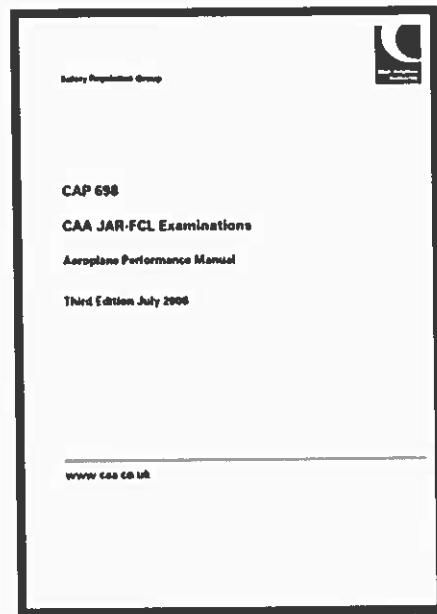
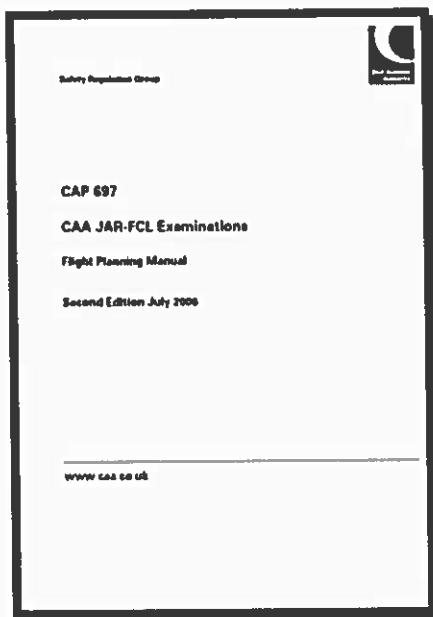
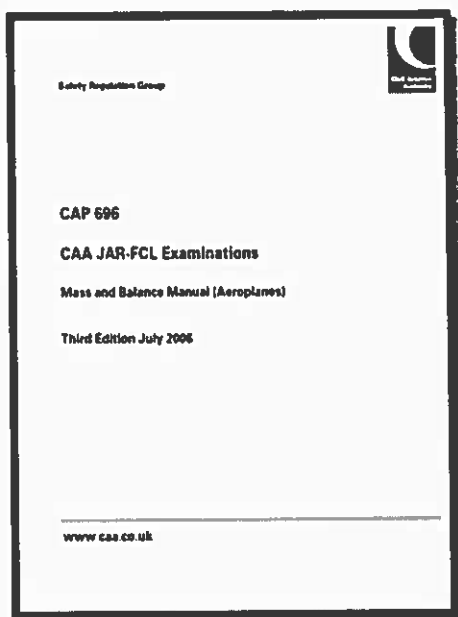
Annex 14, Volume 1 Aerodromes



Annex 14, Volume 2 Heliports



**UK CAA/ EASA DOCUMENTS CAP 696/697/698
(For Flight Planning and Performance)**



7. SUMMARY OF CHANGES TO INDIVIDUAL SUBJECT SYLLABI:

The following information is intended to provide for a rationale behind the major changes in subject syllabi. It is not intended as study guidance, but rather as a broad guideline to clarify the intention of the CAA and to help candidates understand the objective of the exams. Candidates will hopefully also gain a sense of the CAA's future strategy with examinations.

Meteorology

Syllabus updated to specify unclear areas.

The intention is to progressively increase the required level of knowledge from PPL to ATPL.

It is expected that a candidate for a CPL exam understand the weather patterns of a broader international geographic area (appropriate to the expected operational exposure of a commercial pilot). It is expected that an ATPL candidate to have meteorological understanding commensurate with the responsibilities of the commander of a large transport aircraft.

Northern hemisphere questions have been introduced into both exams (e.g. METAR's and TAF's), although these are not intended to test knowledge of northern hemisphere geography.

Wind circulation patterns of both hemispheres have to be understood. International climates and winds will be introduced in the future as per syllabi.

Emphasis has changed to include more applied aviation meteorology. Continuous improvement is planned with input from the SA Weather Service (SAWS).

Future changes will include an increased emphasis on important weather information (e.g. METAR's, TAF's and charts). Practical interpretation of weather information will be included e.g. the recognition of important and common weather patterns on synoptic charts.

Instruments

Decreasing emphasis on theoretical magnetism aspects.

Emphasis moved slightly to practical aspects and modern cockpit equipment e.g. EFIS.

For ATPL (A) candidates a significant shift has been introduced towards the modern cockpit environment e.g. FMS, IRS and Boeing 737 instrumentation.

Radio Aids

The syllabus is largely unchanged, but the emphasis has shifted slightly to relevant and modern elements.

NDB aspects are still included due to similar display of navigation data on RMI indicators. This is not expected to be removed from the syllabus in the near future.

A pronounced weighting has been given to modern technical satellite navigation (e.g. GPS) aspects.

Emphasis is on equipment relevant to practical flying duties e.g. weather radar, SSR.

Air law (Discussed independently of Operational Procedures)

CAR and CATS 2011 with amendments should be understood well.
Candidates should familiarize themselves with newly promulgated parts e.g. Part 93 (Corporate Operations).
Decreased emphasis on employer-related parts e.g. 121, 127 and 135.
Increased emphasis on Part 1 (Definitions) and Part 91 (General Aviation and Operating Flight Rules).

Operational Procedures (Discussed Independently of Air Law)

This is regarded as a critically important subject.
Aspects from ICAO Doc 8168 need to be known and understood well.
GNSS questions are prevalent, but generally do not concentrate on purely technical parameters.
Practical, operationally important knowledge of the South African AIP is essential. This includes knowledge of radar facilities and noise abatement procedures. This focus is intended to address a general unfamiliarity with this document.
Strong emphasis on operational aspects e.g. practical chart interpretation and applied AWOPS. This emphasis will increase in future.
Practical emphasis on the recognition of physical aerodrome aspects (e.g. runway lighting, taxiway markings).
This subject currently does not reflect the general operational emphasis that ICAO recommends, because these elements are evaluated in Aircraft/ Helicopter Technical and General.

Flight Planning and Performance

Syllabus has been expanded to include more theoretical aspects.
Required aspects have been clearly detailed.
The King Air 200 and Boeing 747 graphs have been replaced with generic graphs from the European CAP 696, 697 and 698 documents.
Helicopter candidates use the BELL 206L helicopter manual.

Navigation

Little change in emphasis and syllabus.

Human Performance

This subject is relevant and very topical.
Human Factors aspects are receiving much attention in aviation worldwide.
Technical malfunctions have shown a strong decrease in their proportional contribution to accidents and the focus has moved to the human element. The emphasis has historically been mostly on physiological aspects, but the international tendency is to attempt to understand the individual better. This includes mental and psychological facets, but incorporates organizational influences more and more.
The syllabus reflects these tendencies. The traditional aspects of this syllabus have been retained, but modern Human Factors concepts have been included e.g. Threat and error management features. This emphasis will increase in future.

Aircraft/ Helicopter Technical and General

The syllabus has largely remained unchanged.
The level of evaluation has shifted to detailed technical questions.
Emphasis has also been placed on the emergency elements of the syllabus, as well as the special operational procedures.

8. HARDWARE CHANGES:

Compared to the previous system, candidates can expect larger screens and a touch screen interface. Plug-in mouses and keyboards have been discarded for the CPL and ATPL examinations conducted at the CAA.

9. MISCONCEPTIONS:

Various misconceptions about the exam renewal process have become apparent in the period since its implementation.

The following is intended to give clarity about several common misunderstandings:

- Passing the new exams does NOT exempt candidates from writing the exams required towards an EASA licence.
- The Jeppesen EASA ATPL Training series of books does not replace the official exam syllabi as published in the appendices to the SA-CATS and on the CAA website.

- A candidate may still use any study material to prepare for the theoretical knowledge exams.
- The recommended study books represent exactly that. The books are NOT compulsory to use. It is nevertheless strongly suggested that candidates use these reference works for their completeness, quality and for ease of study due to uniformity.
Multiple sources are able to supply many other suitable study books – many of which encompass high-quality technical reference works.
The time required to sift through information might, however, not always be available to all candidates.
- Negative marking is not employed i.e. marks are not subtracted for incorrect answers.
- The exam renewal process does not generate additional revenue for the CAA.
The opposite is true – the process has been expensive, both in man hours and capital outlay.
The CAA now has the additional expense of a licence fee that has to be paid to the software proprietor for every candidate that registers for the exams.
Despite these expenses, exam fees have not been increased.
- On the left-hand side of the published syllabi documents, certain numbers may be seen in the column with the heading “REF” (as abbreviation for the term reference). These numbers have no significance for examinees, but are only administrative figures for CAA data capturing purposes.
- The marks in the right-hand columns of the syllabi indicate the following:

I = Instrument rating
A = Aeroplane
H = Helicopter
√ = Applicable to the particular licence examination
X or n/a = Not applicable to the particular licence examination
- The EASA Jeppesen ATPL series contains certain manuals which are purely European in nature, e.g. the Air Law volume. By recommending the series, the CAA clearly does not imply that candidates will be evaluated on these immaterial aspects.

10. **GENERAL REMARKS:**

It has to be understood that the nature of the EASA questions contained in the question bank is distinctively technical. Many questions contain detailed stimuli (“question stems”) and were designed to test highly specific knowledge areas.

This has to be kept in mind both during preparation for the exams and during the writing of exams. Questions often require very precise answers to a degree that candidates may not be accustomed to. Questions should be read very carefully before being answered due to the level of evaluation. Please note that the CAA will not recommend sources of practice questions to assist with exam preparation.

11. **REMARKING OF PAPERS:**

The examinations office and APS receive substantial enquiries and feedback. While both are welcome, some candidates have insisted on personal consultations with exam and APS personnel regarding individual exam papers. This is both impossible due to the workload involved, as well as undesirable due to possible exposure of the question database.

Most importantly, however, this is also in contravention with the Civil Aviation Technical Standards (CATS). See extract below.

SA-CATS 61.01.10 THEORETICAL KNOWLEDGE EXAMINATIONS

Examination procedure: CPL, IF and ATPL candidates

(8) Results

- (b) The Director cannot enter into discussion or correspondence with candidates on the subject of their examination results, but candidates may apply for any paper to be remarked in terms of the CAR on payment of the fee prescribed in Part 187.

Candidates are reminded that the procedure available to them to query the result of an exam is that of a remark. Marking is conducted by a contracted external moderator who examines individual examination papers in detail, including even aspects such as the phraseology used in questions, the fairness of the evaluation and the availability of study material. See extract below in this regard.

SA-CATS 61.01.10 THEORETICAL KNOWLEDGE EXAMINATIONS

Examination procedure: CPL, IF and ATPL candidates

(9) Re-mark after failure

- (a) A candidate, who fails an examination conducted by the Civil Aviation Authority, may, within 30 days from the date of notification of the examination results, apply in writing for a re-mark. Candidates who fail with a mark of 65% or above may request a remark.

- (b) The application shall be accompanied by the appropriate fee prescribed in Part 187.
- (c) If the re-mark is successful, the fee will be refunded.

(10) Re-write after failure

- (a) A candidate, who fails an examination conducted by the Civil Aviation Authority, may apply in writing for a re-mark up to 30 days after the date of notification of the examination results.
- (b) Candidates cannot apply to re-write examinations, which they believe they may have failed, until they have received the official result notification. Furthermore, applicants who have applied for a re-write may not apply for the examination being remarked until they receive the official examination result notification.

12. FEEDBACK TO THE CAA:

The remarking process does not preclude candidates and industry from providing constructive feedback to the CAA.

Comments regarding administrative examination matters should be addressed to the examination office.

Usable observations and remarks relating to syllabi, evaluation content, study materials and the like should be forwarded in writing to APS. It is suggested that this is sent via email to one of the departmental email addresses which may be found on the website.

Persons electing to provide comment to the CAA are requested to provide clear, concise and detailed information e.g. venue, date and session number of the exam, examinee licence number and details of the concern.

13. CONCLUSION:

It should be kept in mind that examinations may often be an emotional issue.

Raising the bar of standards is seldom easy, but the long-term benefit to the aviation industry is significant.

Ultimately, this can only be achieved by candidates understanding the motivation behind such changes and committing themselves with dedicated effort to improving their own knowledge, skills and attitudes in agreement with the competency requirements laid down by ICAO.

The SACAA wishes to ensure a high standard of aviation examinations in terms of quality, transparency and fairness of content.

This AIC will be updated when required as part of a process of continuous improvement.

14. BIBLIOGRAPHY:

Currently, the main reference documents are:

Jeppesen EASA ATPL manuals;

Meteorology for the South African Private Pilot (S. Medcalf);

ICAO Annex 14 (for Procedures);

ICAO doc 8168 Vol 1 (for Procedures);

Air Pilot's manual Vol 4 (for ATG);

Air Pilot's Manual Volume 2 (For Meteorology);

Principles of Helicopter flight -Wagtendonk;

Helicopter pilot's supplement – Keith Piggott;

South African Civil Aviation Regulations and Technical Standards 2011, as applicable, up to and including amendment 4;

South African Aeronautical Information Publication (AIP);

Examination supplements- These will be placed on the website in January 2014;

AIC 43.1 dated 2002-08-15 (For Meteorology);

FAA Rotorcraft Flying Handbook FAA-H-8083-21 (Some versions might be marked "For Gyroplane Use Only").



DIRECTOR OF CIVIL AVIATION