SOUTH AFRICAN
CIVIL AVIATION AUTHORITY

GUIDE FOR AVIATION MEDICAL EXAMINERS

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1. AUTHORISATION

This DAMEs Guide is a living document. In the event of development in, or an amendment to, the scope and functions of this DAMEs, or developments in the aviation industry that necessitate changes, changes must be made, and this guide must be amended. Everyone affected by this manual is encouraged to propose ideas and changes to this document for general improvement, both in terms of the content and the professional execution of their duties.

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2. RECORD OF AMENDMENTS

(All amendments to this Manual must be made in accordance with GP002 which contains the Manual Amendment Procedure see GP002c)

Amendment Number	Pages Affected	Date Amended	Approved By: Name	Signature
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3. LIST OF EFFECTIVE PAGES

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Column 1				Column 2			
*	PAGE	REVISION	DATED	*	PAGE	REVISION	DATED

***Indicates page revised, added, or deleted by this revision. Column 2 should be completed only when column 1 is full.**

4. LIST OF DEFINITIONS AND ABBREVIATIONS USED IN THIS DOCUMENT

4.1. Definitions

TERMINOLOGY	DESCRIPTION
Ab initio	When referring to flight training, means the practical training required towards the first issue of a national pilot's licence or PPL, issued in terms of Part 61 or Part 62 of the Civil Aviation Regulations, or for the endorsement of such a licence with an additional category of aircraft, and for the purpose of regulation 91.02.3, which excludes cross-country flight training
Accredited medical conclusion	Means the conclusion reached by one or more medical experts that is acceptable to the Director for the purposes of the case concerned, in consultation with flight operations or other experts as necessary
Advisor	Means a person designated by the Director in terms of Regulation 12.01.7
Aerial work	Means an aircraft operation in which an aircraft is used for specialized services as determined by the Director, such as: a) agricultural spraying, seeding, and dusting. b) cloud spraying, seeding, and dusting. c) culling. d) construction. e) aerial harvesting. f) aerial patrol, observation, and survey. g) aerial advertisement, including banner towing and other towing of objects. h) search and rescue. i) parachuting. j) aerial recording by photographic or electronic means. k) fire spotting, control and fighting; and l) spraying, seeding, or dusting other than for agricultural purposes and clouds
Aerobatic flight	Means manoeuvres intentionally performed by the pilot-in-command (PIC) of an aircraft and involving an abrupt change in the attitude of the aircraft, an

	abnormal attitude, or an abnormal variation in speed, which is not necessary for normal flight
Aerodrome control service	Means an air traffic control service provided for the control of aerodrome traffic
Aerodrome control tower	Means an air traffic control unit established to provide an air traffic control service to aerodrome traffic
Aeronautical Information Circular	Means a circular containing information which does not qualify for the origination of a Notice to Airmen (NOTAM) or for inclusion in the Aeronautical Information Publication (AIP) issued by the Director in terms of Regulation 11.01.2
Air ambulance	Means an aircraft used for the purposes of transporting a patient, or a person for whom there can be reasonable expectations that they will require medical attention during the transportation, and equipped in accordance with the provisions of Part 138 of the Civil Aviation Regulations
Air traffic service assistant	Means the holder of an air traffic service licence and rating who provides: a) assistant services to an air traffic controller; or b) co-ordination services, clearance delivery services, flight information services or aerodrome flight information services
Aviation recreation	Means flying of a microlight, glider, balloon, gyroplane, hang glider, paraglider, model aircraft, light sport aeroplane, touring motor glider, or parachute, or involvement in aviation events
Adulteration	Means any process by which an individual knowingly interferes with (or attempts to interfere with) the processes of specimen collection, transport or analysis with the intention of avoiding a legitimate test result. The actions undertaken can include (but are not limited to) the addition of water or foreign substances to the specimen, specimen substitution, damaging bottle seals or packaging and the deliberate consumption of interfering substances or copious volumes of water prior to specimen collection
Aliquot	Means a fractional part of a specimen (taken as a sample representing the whole specimen) used for testing;
Authorising scientist	Means a person who reviews all pertinent data and quality control results in order to attest to the validity of the laboratory's test reports. This person may

	also function as the Toxicologist (see under Toxicologist)
Calibrator	Means a solution of known concentration used to calibrate a measurement procedure or to compare the response obtained with the response of a test sample/unknown sample. The concentration of the analyte of interest in the calibrator is known within limits ascertained during its preparation. Calibrators may be used as single point measurements or to establish a calibration curve over a range of interest
Chain of custody	Refers to procedures to account for each specimen by tracking its handling and storage from the point of collection to final disposal. These procedures require that the donor identity be confirmed and that a chain of custody form is used from the time of collection to receipt by the laboratory. Within the laboratory appropriate chain of custody records must account for the samples until disposal
Chain of custody form	Means a form used to document the procedures from the time of collection until receipt by the laboratory
Cabin crew member	Means a crew member licensed in terms of Part 64 of the Civil Aviation Regulations who performs, in the interest of the safety of passengers, duties assigned by the operator or the PIC of the aircraft, but who shall not act as a flight crew member
Cargo aircraft	Means any aircraft, other than a passenger aircraft, which is carrying goods or property
Collection cup	Refers to a single-use container, made of plastic, large enough to easily catch and hold at least 55 mL of urine voided from the body. Must be individually wrapped in a sealed plastic bag or shrink wrapping, or must have a peelable, sealed lid or other easily visible tamper-evident system
Collecting officer	Means a person trained to collect specimens from donors
Collection site	Means a place where individuals present themselves for the purpose of providing a specimen for subsequent analysis
Confirmation test	Means an analytical procedure to identify and quantify the presence of a specific drug or analyte which is independent of the initial test, and which uses a different technique and chemical principle from that of the screen test in

	order to ensure reliability and accuracy
Cut-off	Means a concentration level set to determine whether the sample is positive or negative for the presence of a drug
Customer	Means the organisation requesting the drug testing service
Donor	Means the individual from whom a specimen is collected
Critical phases of flight	Includes all ground operations involving taxi, take-off, climb to cruise up to 10 000 feet and approach from cruise below 10 000 feet
Commercial air transport operator	Means the provider of a commercial air transport operation
Co-pilot	Means a licensed, type-rated pilot required by the Regulations to serve in any piloting capacity other than as PIC, but excluding a pilot who is on board the aircraft for the purpose of receiving flight instruction
Designated Aviation Medical Examiner (DAME)	Means an aviation medical examiner designated by the Director in terms of Regulation 67.00.4
Enforcement Officer	Means an authorised officer, inspector, or authorised person
Fatigue	A physiological state of reduced mental or physical performance capability resulting from sleep loss or extended wakefulness, circadian phase, or workload (mental and/or physical activity) that can impair a crew member's alertness and ability to safely operate an aircraft or perform safety-related duties
Flight crew member	A licensed crew member charged with duties essential to the operation of an aircraft during flight time
Flight time – aeroplanes	The total time from the moment an aeroplane first moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight. **Note**: *Flight time as defined here is synonymous with the term "block to block" time or "chock to chock" time in general usage, which is measured from the time an aeroplane first moves for the purpose of taking off until it finally stops at the end of the flight*
Flight time – helicopters	The total time from the moment a helicopter's rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped

General aviation operation	Means an aircraft operation other than a commercial air transport, corporate aviation, air ambulance or aerial work operation
Glider	Means a heavier-than-air aircraft, other than a hang-glider, that is supported in flight by the dynamic reaction of the air against its fixed, lifting surfaces, and whereof free flight does not depend on an engine
Gyroglider	Means a non-power-driven heavier-than-air aircraft, supported in flight by the reactions of the air on one or more rotors rotating freely on substantially vertical axes
Gyroplane	Means a power-driven heavier-than-air aircraft, supported in flight by the reactions of the air on one or more rotors rotating freely on substantially vertical axes
Hang glider	Means a non-power-driven heavier-than-air aircraft capable of being carried, foot launched, and landed solely by the energy and use of the pilot's legs, having: • a rigid primary structure with pilot weight shift as the primary method of control; or • a rigid primary structure with movable aerodynamic surfaces as the primary method of control in at least two axes, and which, for the purposes of Parts 24, 94 and 96 of the Civil Aviation Regulations, includes a powered hang glider
Helicopter	Means a heavier-than-air aircraft supported in flight mainly by the reactions of the air on one or more power-driven rotors on substantially vertical axes
Human factors principles	Means the principles which apply to aeronautical design, certification, training, operations, and maintenance of aircraft, and which seek safe interface between the human and other system components by proper consideration of human performance
Human performance	Means the capabilities and limitations of a human being that have an impact on the safety and efficiency of aeronautical operations and services
Medical assessor	Means a physician, qualified and experienced in the practice of aviation medicine, who evaluates medical reports submitted to the Authority by medical examiners.

	Note 1: *Medical assessors evaluate medical reports submitted to the Licensing Authority by medical examiners.* **Note 2**: *Medical assessors are expected to maintain the currency of their professional knowledge*
Medical service provider	Means the person, associated with an air ambulance operator for the purposes of taking responsibility for the medical aspects of the operation and who is subject to the legislation administered by the Department of Health
Micro-light aeroplane	Means an aeroplane of which the minimum flying speed and the maximum take-off mass have been restricted for classification purposes. The values of these restrictions are defined in Document SA-CATS 24
Laboratory	Means the facility that is approved by the South African National Accreditation Standard (SANAS) providing the analytical services for detecting abuse of drugs
Medical Review Officer (MRO)	Means a medical physician responsible for receiving laboratory results from the drug-testing laboratory who has knowledge of substance abuse and has appropriate training or experience to interpret and evaluate an individual's positive test result, in light of declared information
Negative result (screen)	Means a preliminary result established by a screening test which indicates that a drug possibly present in the sample is not detected above a specified cut-off
Negative result (confirmation)	Means a result reported by the laboratory that indicates that a suspected drug present in the sample is below a specified cut-off
Non-negative result	Means a preliminary result established by screening test that indicates a drug possibly present in the sample is detected above a specified cut-off. A specimen that is reported as adulterated, substituted or invalid
Positive result (confirmation)	Means a result reported by the laboratory as positive, in which case there is conclusive evidence that a drug is present in the sample tested at a level greater than or equal to the confirmation cut-off concentration
Pilots	Means to manipulate the flight controls of an aircraft during flight time and may also be referred to as 'pilot flying' (PF);
Pilot-in-command (PIC)	Means the pilot designated by the operator as being in command and charged with the safe conduct of a flight, irrespective of whether or not he or she is

	manipulating the controls
Pilot-in-command (PIC) under supervision	Means a co-pilot performing the duties and functions of a PIC under the supervision of the PIC in accordance with a method of supervision acceptable to the Authority
Power-assisted glider	Means a glider with a maximum all-up mass of not more than 850 kg, fitted with a retractable engine that is used mainly for the purpose of launch and climb and short periods of free flight
Powered glider	Means an aircraft equipped with one or more engines which, with the engine or engines not operating, has the performance characteristics of a glider
Powered hang glider	Means a hang glider fitted with an engine attached either to the structure or to the pilot, and which may also be fitted with a detachable undercarriage, to support its launch and climb
Powered paraglider	Means a paraglider fitted with an engine attached to the pilot to assist in its launch and in short local powered flights, and which may have a fixed or detachable undercarriage
Problematic use of substances	The use of one or more psychoactive substances by aviation personnel in a way that: a) constitutes a direct hazard to the user or endangers the lives, health, or welfare of others; and/or b) causes or worsens an occupational, social, mental, or physical problem or disorder
Psychoactive substances	Means any substance with psychotropic effects, excluding caffeine and tobacco, but which includes the following: a) narcotic analgesics such as opiates. b) illicit substances such as cannabis and cocaine. c) sedative hypnotics. d) hallucinogens. e) central nervous system depressants; and f) central nervous system stimulants, including volatile solvents and alcohol
Quality control sample	Means a sample used to evaluate whether an analytical procedure is operating

	within pre-defined tolerance limits
Reference method	Means a method in analytical chemistry considered to be acceptable for confirmation of results (e.g., mass spectrometry, refractometry, pH electrode)
Sample	Means a representative portion of a specimen submitted to a laboratory for testing
Screen test	Means a test to eliminate negative samples from further consideration and to identify the non-negative specimens that require confirmation testing
Specimen	Means the portion of (generally) urine, blood or breath that is collected from a donor
Standard (1)	Means reference material of known purity or a solution containing reference material at a known concentration
Standard (2)	Means an agreed protocol or procedure (e.g., ISO:17025)
Standard Operating Procedure (SOP)	Means a written document giving the detailed steps to be followed when undertaking a particular task (e.g., the analysis of a given drug in a urine sample)
Toxicologist	Means a person (holding a degree in the chemical sciences specializing in Analytical Chemistry and Toxicology) responsible for interpreting a positive analytical result for the customer or the customer's designated Medical Review Officer (MRO). This person must have suitable training and experience in the theory and practice of all methods and procedures employed in the laboratory, including a thorough understanding of chain of custody procedures, quality-control practices, and analytical procedures relevant to the interpretation of a result.
Rated air traffic controller	An air traffic controller holding a licence and valid ratings appropriate to the responsibilities exercised by him or her
Rating	An authorization entered on or associated with a licence and forming part thereof, stating special conditions, privileges or limitations pertaining to such licence
Safety management system	A systematic approach to managing safety, including the necessary organizational structures, accountabilities, policies, and procedures
Safety pilot	In terms of Part 61 and Part 91 of the Civil Aviation Regulations, means a pilot

	whose sole purpose during flight time is to maintain a visual lookout for threats to an aircraft during simulated instrument flight and to monitor the aircraft's engine and navigation instruments to ensure exceedances do not occur
Safety-sensitive personnel	Persons who might endanger aviation safety if they perform their duties and functions improperly. This definition includes, but is not limited to, flight crew, cabin crew, aircraft maintenance personnel and air traffic controllers
Second-in-command	Means a licensed pilot serving in a piloting capacity other than as PIC, who is designated as second-in-command, but excluding a pilot who is on board the aircraft for the sole purpose of receiving flight instruction
Significant	In the context of the medical provisions in Annex 1 ICAO significant means to a degree or of a nature that is likely to jeopardize flight safety
State safety programme	An integrated set of regulations and activities aimed at improving safety
Valid	When used in connection with a licence, rating, certificate, validation, authority, approval or similar document, means: a) that the expiry date on the document, if any, has not been exceeded. b) that the document has been issued legally and properly to its holder, and has not been suspended or cancelled by the issuing authority; and c) that all requirements, prescribed by the Regulations in respect of the document, have been complied with

4.2. Abbreviations

ABBREVIATION	MEANING
AIP	Aeronautical Information Publication
AMA	Aviation Medical Assessors
AMC	Aeromedical Centre
AME	Aeromedical Examiner
ASD	Alcohol Screening Device
ATF	Alcohol Testing Form
ATPL	Airline Transport Licence
BAT	Breath Alcohol Technician
CPD	Continuing Professional Development
CRM	Crew Resource Management

DAME	Designated Aviation Medical Examiner
DCA	Director of Civil Aviation
EEG	Electroencephalogram
EBTD	Evidential Breath Testing Device (confirmatory breath test)
IAM	Institute for Aviation Medicine
ICAO	International Civil Aviation Organisation
ICASM	International Congress of Aviation and Space Medicine
JAA	European Joint Aviation Authorities
LOFT	Line-oriented Flight Training
MRO	Medical Review Officer
NOTAM	Notice to Airmen
PF	Pilot Flying
PIC	Pilot-in-Command
PPL	Private Pilot Licence
QAP	Quality Assurance Plan
RPAS	Remotely Piloted Aircraft System
SACAA	South African Civil Aviation Authority
SANAS	South African National Accreditation Standard
SARPS	Standards and Recommended Practices
SMS	Safety Management System
SOPs	Standard Operating Procedures
STT	Screening Test Technician
USC	Urine Specimen Collection

5. REFERENCE DOCUMENTS

a) ICAO ANNEX 1 CHAPTER 6
b) ICAO DOC 8984
c) ICAO 9654
a) ICAO ANNEX 19
b) ICAO DOC 9379
c) ICAO DOC 9841
d) ICAO DOC 9624
e) ICAO DOC 9734
f) ICAO DOC 9654
g) ICAO DOC 9779
h) ICAO COVid-19
i) PROMOTING, MAINTAINING AND SUPPORTING MENTAL WELL-BEING IN AVIATION DURING THE COVID-19 PANDEMIC
i) SAFETY MANAGEMENT SYSTEMS: GUIDANCE FOR AEROMEDICAL CENTRES (AEMC)
ii) OTHERS

5.1. FOREWORD

Flying is a highly skilled job that involves a complex interaction between the aviator and the machine in an environment that is full of stressors. Although the flying machine may fail occasionally, it is the human component that is the cause of aviation accidents more than 70% of the time. The aircraft environment differs from other occupational environments with respect to altitude stressors such as hypoxia, noise and vibration, low humidity leading to dehydration, fatigue, decompression syndrome, acceleration, and spatial disorientation. Because of these stressors, the aircrew is required to maintain a high level of physical and mental fitness and is legally required to assess their medical fitness in order to carry out their professional duties.

Aeromedical decisions must be based on factual and objective data, which is evidence-based and supported by documentation to ensure aviation safety. Aviation medicine combines aspects of preventative, occupational, environmental, and clinical medicine with the physiology and psychology of man-in-flight.

The medical standards and policies of the South African Civil Aviation Authority (SACAA) must be compliant with the Standards and Recommended Practices as stipulated by the International Civil Aviation Organization (ICAO) Regulations, Chapter 6, Annex 1. ICAO performs safety oversight audits on Contracting States on a regular basis to monitor compliance with the minimum standards and recommended practices, and States are required to notify ICAO when there is an inability to meet standards and recommended practices. A difference will then be filed for each specific requirement which is not being met.

Aviation medical examinations have evolved over the years for three reasons: to predict the success of training, especially in the military, to ensure a long productive career and to reduce the rate of accidents. Research in the West indicates that the risk of sudden incapacitation of aircrew is low; this is credited to the high standards of fitness required for initial screening medicals and follow-up surveillance. Despite the high medical standards imposed on aviation personnel, however extensive, there is no medical examination that can entirely exclude the possibility of incapacity; therefore, the problem must be solved with risk management. The incidence of incapacitation of aircrew due to the effect of medical conditions or physiological impairment is low: however, it represents a serious potential threat to flight safety.

Most potential pilots with a significant risk of incapacitation (e.g., Epilepsy, Type I Diabetes Mellitus) are screened out at the time of the initial examination. The civil aviation authorities internationally permit airmen with certain medical conditions to be medically certified, provided that such permission does not compromise aviation safety. Unfortunately, a comprehensive review of the proportion of medical conditions leading to medical unfitness and incapacitation has not been conducted on the African continent. This has led to limited knowledge of the causes of in-flight incapacitation, medical causes of aircraft accidents and other issues specific to the African continent. The limited research creates a challenge to the local aviation regulatory authority, as development and revision of local medical policies are based on information from the West, which differs significantly regarding the demography of those populations and diseases endemic on the African continent.

Over the years, a number of studies were documented about the medical conditions affecting the various aviation populations in the Western world. Knowledge of these medical conditions has assisted in relation to the regulatory aspect of flight crew licensing and the development of appropriate, evidence-based medical standards, and this research has also provided information relating to medical conditions responsible for in-flight medical incapacitation.

In June 2010, the Director of Civil Aviation initially established a committee known as the Aeromedical Committee, and a number of committees has since been appointed. The Aeromedical Committee is an advisory body of medical, psychological, and industry partners (IAM, SAASMA, ATNS, RAASA, ALPA and other ancillary health experts serving to advise the Director on the medical risks of existing or prospective aviation personnel who are required in terms of the Civil Aviation Regulations (1997), as amended, to hold medical certificates. The role of the Aeromedical Committee is to apply the ICAO Flexibility Clause and Accredited Medical Conclusion. Currently the panel meets once per month on the 3rd Tuesday of the month and a yearly calendar is published on the SACAA websites. All panel cases for consideration have to be submitted to the SACAA seven (7) working days before the panel.

The establishment of the Aeromedical Committee has minimised unnecessary medical appeals, and with the involvement of the non-medical aviation industry, has led to a better understanding and definition of the operational, psychological, training, legal and human resource issues. Through the input of these partners, the SACAA has been able to review a number of medical protocols, by making use of the B Sc Honours in Aviation Medicine at the University of Pretoria.

The composition of the Aeromedical Committee was determined by the SACAA, based on a research paper from the University of Pretoria, which assessed an analysis of common morbidity patterns that lead to medical unfitness among civil aviation aircrew in South Africa dating from 2000 to 2008.The study revealed that the most common system accounting for the majority of disqualifications was the central nervous system, with head injuries and convulsions being the most commonly encountered. The cardiovascular system accounted for the second most common cause of medical unfitness, with coronary artery disease and hypertension diseases accounting for the majority of the medical conditions, and psychiatric conditions accounting for the third most common system affected, with depression and substance abuse being responsible for the majority of the cases. A small proportion of these candidates had more than one medical condition.

The recent analysis of the cases presented at the Aeromedical Committee, dated 2010 to 2017, has informed the SACAA on which specialists to appoint and the areas of risk. Knowledge of common conditions will assist in the development of targeted protocols and the proactive training of aviation personnel. ICAO indicates that there is evidence that several fatal aviation accidents have been caused by psychiatric disorders or inappropriate use of psychoactive substances. As part of the periodic aviation medical examination there should thus be questions that pertain to these issues. Further, the number of non-physical conditions that could affect the health of pilots and could lead to long-term unfitness in those of middle age appear to be increasing. The SACAA has included mental health questions in the routine examination of applicants and encourages DAMEs to spend time on health education and prevention.

The SACAA recognizes the role and the wealth of knowledge at the Institute of Aviation Medicine and Designated Aviation Medical Examiners, which has led to South Africa being the only country in Africa to host the International Congress of Aviation and Space Medicine (ICASM) three times. There is a need for senior DAMEs to mentor regular examiners, share their experience and participate more in decision-making. The SACAA is encouraged by the increase of the number of DAMEs who have committed to attending the workshops. The participation of the DAMEs will grant them Continuing Professional Development (CPD) points.

Our office encourages a good and efficient relationship between the SACAA and the Institute for Aviation Medical Examiners, as this impacts on our clients' customer service as we all work on behalf of the Director.

Numerous workshops have been held with the industry, and more of these will take place to promote aviation medicine, identify challenges, and identify increased areas of risks and possible solutions.

DAMEs play a major role in safety management through information collected in routine medical examinations, which may assist in medical causes of in-flight medical events. The results of one such research have suggested that the conditions most likely to result in in-flight medical events were usually first observed during the period between routine examinations. They were not discovered during the periodic examination by a medical examiner.

ICAO requires the SACAA to conduct ad-hoc audits on designated aviation medical examiners, and to act against non-compliant examiners. The purpose of these audits is not punitive, but to improve on the medical certification systems. The SACAA has submitted legislation which is currently with the Minister for promulgation; this law will ensure that the Medical Assessors at the SACAA conduct audits on DAMEs' medical practices. The initial focus will be on new applicants and on those DAMEs who have been making errors.

DAMEs are to participate in the regulatory review processes (medical protocols) and to familiarize themselves with the latest amendments to minimize unnecessary delays in the medical certification processes. This will also prevent the consequence, namely negligent or wrongful certification, which would permit a medically unqualified person to take control of an aircraft, as this would be a serious situation for the medical examiner, the SACAA and the public. The designated aviation medical examiners are encouraged to visit the ICAO website or the CAA website to familiarize themselves with new SACAA developments and to read the ICAO (8980-AN 895) manual, which is extremely informative.

5.2. LEGAL RESPONSIBILITIES OF DESIGNATED AVIATION MEDICAL EXAMINERS

Part 67 of the Civil Aviation Regulations makes provision for the Director to designate aviation medical examiners to conduct medical examinations and issued medical certificates on his/her behalf. DAMEs are delegated the authority to examine applicants for aviation personnel (pilots, air traffic controllers and cabin crew) medical certificates and to issue or deny issuance of certificates. The first point of contact for aviation medical examinations are conducted by DAMEs in their private practice on behalf of the Director of the SACAA. An examiner is a designated representative of the SACAA Administrator with important duties and responsibilities and it is essential that examiners recognize the responsibility associated with their appointment.

DAMEs must consider their responsibilities in their capacity as examiners as well as the potential conflicts that may arise when performing in this dual capacity. The consequences of a negligent or wrongful certification, which would permit an unqualified person to take the controls of an aircraft or an air traffic controller position, can be serious for the public, for the Government, and for the examiner. If the examination is cursory and the examiner fails to find a disqualifying defect that should have been discovered during a thorough and careful examination, a safety hazard may be created, and the examiner may bear the responsibility for the results of such action. A number of aviation personnel and DAMEs have been referred to the Legal Department due to non-compliance with the regulations and technical standards, resulting in penalties imposed.

Of equal concern is the situation in which an examiner deliberately fails to report a disqualifying condition, either observed during the examination or otherwise known to exist. In this situation, both the applicant and the

examiner, in completing the application and medical report form, may be found to have committed a violation of Part 185 of the Civil Aviation Regulations, which stipulates that:

Part 185.00.1

(1) A person commits an offence if that person –

a) hinders or obstructs an authorized officer, inspector, or authorized person in the exercising of his or her powers or the performance of his or her duties.

b) when called upon by an authorized officer, inspector, or authorized person to do so, refuses or fails to give his or her name and address, or gives a false name or address.

c) obstructs or impedes any other person acting in the exercising or performance of any privileges, powers or duties conferred on such other person by or under the regulations.

d) makes or causes to be made, either orally or in writing –

e) any fraudulent, misleading, or false statement for the purpose of obtaining any licence, rating, certificate, permit, approval, authorization, exemption, or other document in terms of the regulations.

f) any fraudulent, misleading, or false entry in any logbook, record or report which is required to be kept, maintained, made, or used to show compliance with any provision of the regulations.

g) falsifies, counterfeits, alters, defaces, or mutilates, or adds anything to, any licence, rating, certificate, permit, approval, authorization, exemption or other document issued in terms of the regulations.

h) does or causes, or permits to be done or caused, any act contrary to, or who fails to comply with, any provision of the regulations, or a direction given, or a prohibition made, or a condition imposed in terms thereof.

i) exercises a privilege granted by, or uses, any licence, rating, certificate, permit, approval, authorisation, exemption, or other document issued under the regulations, of which he, she or it is not the holder.

j) unless otherwise authorised in the regulations, permits a licence, rating, certificate, permit, approval, authorization, exemption, or other document issued under the regulations, of which he, she or it is the holder, to be used, or a privilege granted thereby, to be exercised, by any other person.

k) operates or attempts to operate any aircraft in respect of which no valid certificate of registration or valid certificate of airworthiness have been issued.

l) commits any act, whether by interference with any flight crew member, ATS personnel member or AME, by tampering with any aircraft, or any part thereof, or by disorderly conduct or otherwise, which is likely to endanger the safety of any aircraft or its occupants.

m) without the permission of an aerodrome or heliport operator, enters any place within the boundaries of a licensed aerodrome or heliport which has been closed to the public.

n) gives false information pertaining to the investigation of any aviation accident or incident; and

o) contravenes in any manner the provisions of the Act, and regulations promulgated in terms of the Act which are administered by the Authority.

(2) Any person who –

a) contravenes any provision of part 5 of the Act, except section 111.

b) contravenes or fails to comply with any provision of a safety plan approved by the Minister and whereof the contents have been brought to his or her notice; and

c) is guilty of an offence and shall be liable on conviction to a fine not exceeding R50 000 or imprisonment not exceeding 10 years or to both such fine and imprisonment.

(2) Any aviation participant who – fails to comply with section 111 of the Act or fails to comply with the national Aviation security program instituted in terms of that section is guilty of an offence and on conviction liable to a fine or to imprisonment for a period not exceeding ten year or to both such fine or imprisonment.

(3) Any person who – is convicted of an offence in terms of sub regulation (1), shall be liable to the penalties prescribed in section 144 of the Act, read with section 332 of the Criminal Procedure Act, 1977 (Act No. 51 of 1977).

The Designated Aviation Medical Examiner (DAME) is delegated authority to:

a) Examine applicants for, and holders of, medical certificates to determine whether they meet the standards prescribed in Part 67 Regulations and Technical Standards for the issuance of a medical certificate.

b) Issue or deny medical certificates to applicants or holders of such certificates based upon whether they meet the applicable medical standards.

Oversight of medical practices by the Medical Assessors

The medical assessors of the SACAA conduct audits in the medical practices of the designated aviation medical examiners in line with ICAO requirements and part 67.00.4 of the Civil Aviation Regulations and Technical Standards. The focus of the audits is based on, but not limited to, the following:

a) Medical facility.

b) Communications and IT evaluation (EMPIC Medical Module).

c) HPCSA compliance (medical confidentiality, records storage – hard copies and electronic – in line with relevant legislation, including the National Department of Health and others).

d) DAMEs are required to familiarize themselves with this legislation.

e) Compliance with legislation conducted by DAMEs;Knowledge of the SACAA Regulations and Technical Standards.

f) DAMEs' knowledge of where to find the amended regulations.

g) Practice equipment (calibration, others – documentation is assessed based on the manufacturer's specifications).

h) How tests are conducted (e.g., Conversation and Whisper Test); and

i) EMPIC implementation and others.

DAMEs are required to have adequate facilities for performing the required examinations and possess the following equipment prior to conducting any SACAA examinations. History or current findings may indicate a need for special evaluations. Examiners shall certify at the time of designation, re-designation, or upon request that they possess (and maintain as necessary) the equipment specified.

5.3. IMPLEMENTATION OF THE EMPIC MEDICAL MODULE

On behalf of the South African Civil Aviation Authority, we wish to thank all the DAMEs who actively participated, provided constructive feedback, and attended the EMPIC Medical Training Module hosted by the SACAA, DAMES, SYNOVA and an expert from Switzerland. These DAMEs are considered to be change agents, who have been actively providing input on how the SACAA could improve the system and have shared the challenges that they experienced at the uncomfortable initial phase. The HPCSA was also invited at the Gauteng Workshop to make presentations on the following:

- Security and duration of storage of medical documentation (manual and electronic records):
- Medical confidentiality; and
- Informed consent.

The role of EMPIC today extends to orchestrating the inputs from the user community to ensure the software continues to meet all regulatory requirements and at the same time keeps pace with the deployment of new technologies. EMPIC's responsibilities also include identification and induction of new collaborators to join the project. The software, EMPIC-EAP, is unique in that there is no other solution available, worldwide, that provides an off-the-shelf, fully integrated, scalable, and configurable tool with a long-term development plan that comprehensibly meets all the requirements for oversight of Safety and Security Regulations by a National Aviation Authority. The implementation of the EMPIC Medical Module will improve the medical certification processes with the improved verification processes by minimizing delays in submission of medical records for verification, which process is sometimes affected by postal strikes and incomplete medical examination forms. The latter results in the SACAA and the Institute of Aviation Medicine having to address errors, which has time and costs implications. The implementation of the system will minimize medical tourism, delays in the medical verification processes, reduces lost documents.

The following features characterize the application:

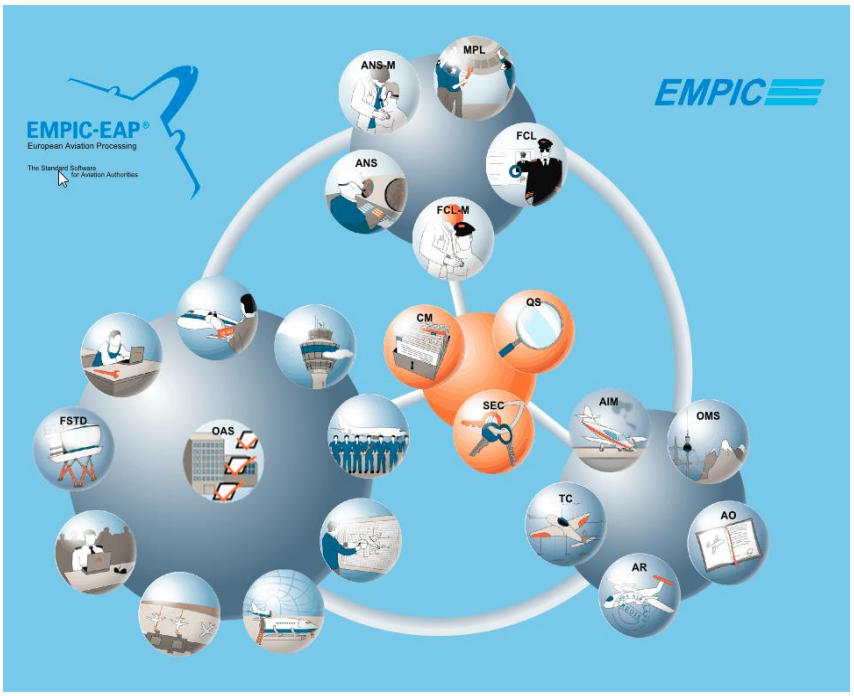
- Calculating all necessary examinations and computing the validity of the medicals (even for different examinations of one person at a certain examination date).

- Modelling a pilot's (and/or EMPIC® ANS) whole medical examination history.
- Multi-user application: several persons can work on a pool of applicants using "worklist".
- Multi-Licence approach: one applicant can be examined for several different kinds of medical certificates in parallel.
- Rights system to model different end-user roles with dedicated permissions within the system.
- Access to complete history for AME/AMC (if "own" pilots). AME/AMC can grant read rights to other AMEs/AMCs to give access to historical data.

The following features characterize the application:

- Numerous checks for completeness and dependency of the medical forms.
- Re-usage of old data from prior examination by "Easy Entry" function.
- Integration of data from external equipment (files such as PDF etc.).
- Automatic data transfer from extended forms to medical examination report.
- Printout of all forms and certificates completely filled in.
- Printout of several different medical certificates (FCL, ANS etc.) per person.
- Modelling specific workflows: expert consultation, temporary unfitness, unfitness, interim enquiry of AMS, allocating read rights on certain examinations to other physicians, further transfer, transfer back (reject).
- "Red alert flag" for suspicious applicants (message of the AMS to the user opening a suspicious candidate).
- Ability to import or scan documents as part of the examinee file.
- Decentralized user management for pilot physicians with larger surgeries (AMCs with shared workload).
- Ability to distribute work within one surgery between several workstations (multi-user application).
- Possibility to define a responsible AME and the working AME.
- Interface to EMPIC® CM and EMPIC® FCL (also to ANS module) via batch file transfer (due to installation in DMZ); and
- Export of statistical data.
- The general procedures in EMPIC MED are:
- Examination of a new applicant.
- Examination of a known applicant.
- Declaring an applicant "unfit" OR "fit" (medical certificate is only issued for "fit" applicants);
- Changing the medical status of an applicant, i.e., declaring him/her "temporarily unfit";
- Expert examination of an applicant; and

- Examination of a rejected applicant.
- N.B. The decision browser supports the national aeromedical section to review the examinations of an applicant and to declare him/her fit or unfit or to reject him/her for further examination. Please note that the types of examinations chosen for aviation personnel is deliberated by the AVMED department, therefore "fit" or "unfit" is based on these examination results.



INTERGRATED EMPIC SYSTEM

EMPIC-EAP – other non-MEDICAL MODULES
EMPIC® CM: Customer Management (Contacts, Addresses, Groups)
EMPIC® SEC: Security, Permission Management to all Modules
EMPIC® SL: Surveillance Layer for Compliance Management
EMPIC® QS: Query Synthesiser, Query Tool for Cross-module Reports
EMPIC® ERP: Interface to Enterprise Resource Planning Software
EMPIC® WEB: Facilitating Stakeholder Engagement
EMPIC® WF: Workflow
EMPIC® DMS: Interface to Document Management System
EMPIC® FCL-M: Flight Crew Licensing – Medical
EMPIC® FCL: Flight Crew Licensing
EMPIC® ANS: Air Navigation Services Air Traffic
EMPIC® MPL: Maintenance Personnel Licensing
EMPIC® EXS: Examination System

6. SECTION 1

6.1. International Civil Aviation Organisation

The International Civil Aviation Organization (ICAO) is a specialized agency of the United Nations, and it was created with the signing in Chicago, on 7 December 1944, of the Convention on International Civil Aviation. The ICAO is the permanent body charged with the administration of the principles laid out in the convention. The Convention establishes the privileges and restrictions of all Contracting States and provide for the adoption of International Standards and Recommended Practices (SARPs) regulating international air transport. The Convention on International Civil Aviation includes several articles which call for the adoption of international regulations in all fields where uniformity facilitates and improves air navigation.

These regulations, known as Standards and Recommended Practices (SARPs), have been promulgated in ICAO Annexes to the Convention which are amended from time to time when necessary. Each Annex deals with a specific aspect of international civil aviation, and those relating to medical regulations for licence applicants are included mainly in Annex 1 – Personnel Licensing and to some degree in Annex 2 – Rules of the Air and Annex 6 – Operation of Aircraft. Issues involving preparedness planning for a communicable disease of public health concern are considered in Annex 6, Annex 9 – Facilitation, Annex 11 – Air Traffic Services and Annex 14 – Aerodromes.

6.1.1. Definition of ICAO Standards and Recommended Practices Standards

Any specification for physical characteristics, configuration, material, performance, personnel or procedure, the uniform application of which is recognised as necessary for the safety or regularity of international air navigation, and to which Contracting States will conform in accordance with the Convention. In the event that a State finds it impracticable to comply in all respects with any such international standard but allows a less stringent practice, immediate notification to ICAO is compulsory under Article 38 of the Convention.

Recommended practices.

Any specification for physical characteristics, configuration, material, performance, personnel or procedure, the uniform application of which is recognised as desirable in the interest of safety, regularity or efficiency of international air navigation, and to which Contracting States will endeavour to conform in accordance with the Convention.

6.1.2. History of aviation medicine

In 1970, the Personnel/Training/Medical (PEL/TRG/MED) Divisional Meeting considered that availability of suitable medical guidance material was of importance to the uniform application of the Standards and Recommended Practices (SARPs) in Annex 1, as well as in such fast-moving fields as accident investigation and human factors in aviation. The meeting also recommended that action be taken to provide expert advice to the ICAO Secretariat in support of the preparation of such medical guidance material. Since that time, advances have been made, both in medical science generally and in aviation medicine. Assistance and advice have been provided by aviation medical specialists from many Contracting States, and their valuable contributions have enabled a second edition of the Medical Manual in 1985 and now this third edition to reflect those advances as they apply to civil aviation medicine in particular (ICAO Manual 2012).

The third edition of the ICAO Manual was developed with the intent to complement existing texts by emphasizing the clinical problems encountered in medical certification in civil aviation. This ICAO (8980-AN 895) document is designed for the experienced designated medical examiner as well as for the aviation medical expert and medical assessor, to aid in the approach and management of intricate borderline cases. When making a medical assessment, the medical examiner should consider the relevant operating environment in which the applicant is engaged; for example, single pilot commercial operations carrying passengers clearly require the most careful medical evaluation in order to reduce the risk of in-flight incapacitation. Those engaged in multi-crew operations, where there has been effective incapacitation training, may be considered less stringently. In many such cases, flight safety may be adequately protected by an operational condition or limitation applied to the licence.

ICAO states that over-regulation, apart from having an adverse financial impact on the State or the aviation industry, may not improve flight safety; instead, stringent national medical requirements can result in unnecessary restrictions or premature retirement of licence holders. This may also have the consequence of licence holders being reluctant to report illness to the medical examiner or the Licensing Authority, and this is important from the flight safety viewpoint since the value of the medical examination relies to a large extent upon an accurate medical history. Should States make demands in excess of those included in ICAO SARPs, the goal of harmonisation across Contracting States will not be achieved and the transfer of skilled personnel from one State to another will be inhibited. This also encourages “medical tourism” where a licence holder, if refused a licence on medical grounds in one State because of stringent medical requirements, seeks to obtain one in another, less demanding State.

In case a more stringent regulation is adopted by States, notification to ICAO is compulsory only when such regulation is applied also on foreign licence holders and aircraft. However, in a Resolution of 5 February 1999, the ICAO Council made it clear that, in principle, national requirements “more exacting” than the SARPs would be detrimental to the framework of the Chicago system within which international civil aviation has developed and continues to develop. In this Resolution the Council also called upon each Contracting State to utilise the multilateral mechanism of ICAO where it believes that changes to the content or level of implementation of the Standards and Recommended Practices in the Annexes to the Chicago Convention are necessary or desirable.

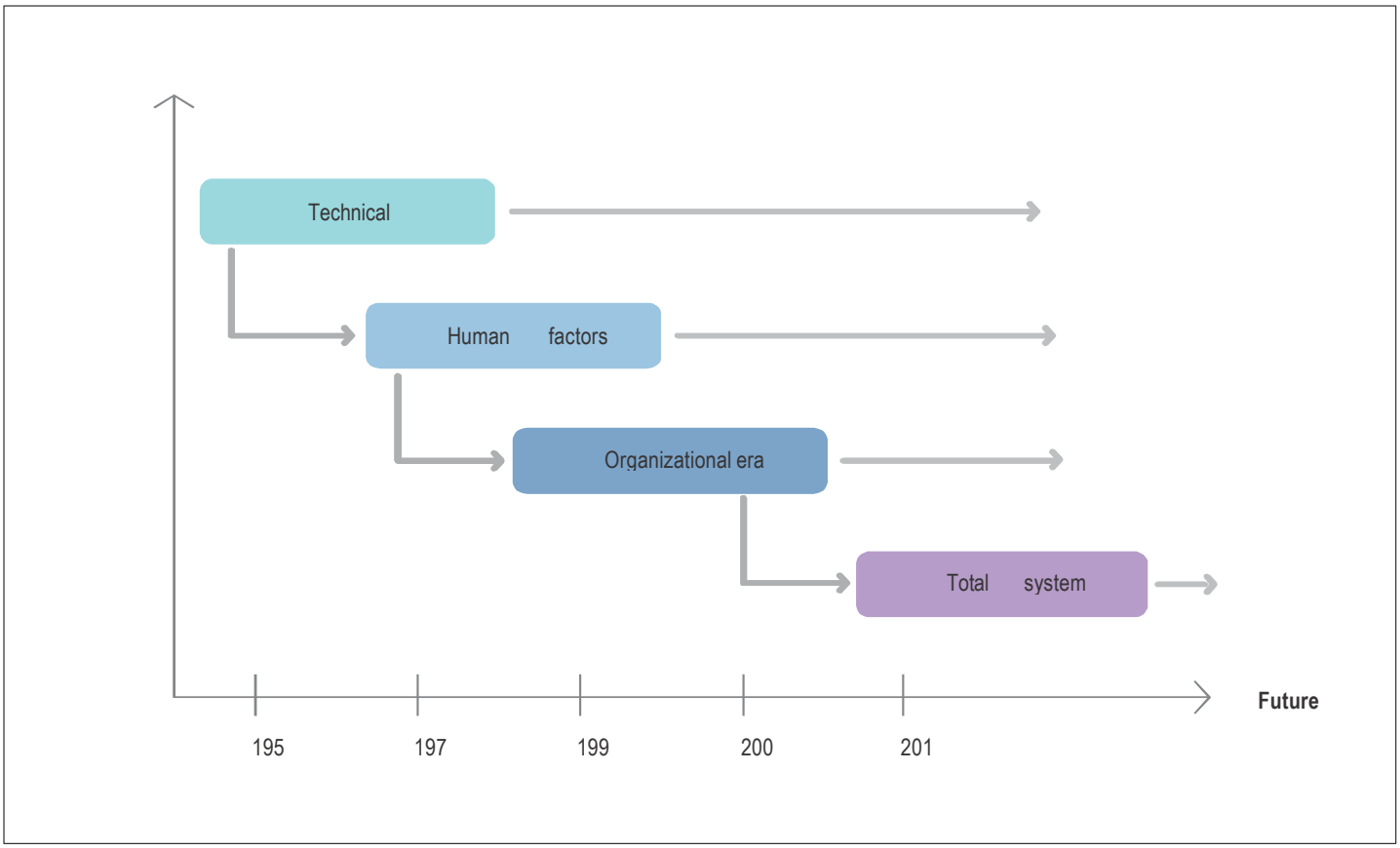
6.1.3. Safety management

The different interpretations by States (countries) of the aeromedical standards established by the International Civil Aviation Organisation (ICAO) has resulted in a variety of approaches to the development of national aeromedical policy, and consequently a relative lack of harmonisation. However, in many areas of aviation, safety management systems have been recently introduced and may represent a way forward. A safety management system can be defined as: “A systematic approach to managing safety, including the necessary organisational structures, accountabilities, policies, and procedures”. There are four main areas where, by applying safety management principles, it may be possible to better use aeromedical data to enhance flight safety.

These are: adjustment of the periodicity and content of routine medical examinations to more accurately reflect aeromedical risk; improvement in reporting and analysis of routine medical examination data; improvement in reporting and analysis of in-flight medical events; and support for improved reporting of relevant aeromedical events through the promotion of an appropriate culture by companies and regulatory authorities. This paper

explores how the principles of safety management may be applied to aeromedical systems to improve their contribution to safety.

Medical requirements for pilots were introduced during the early decades of the last century and although the content of the aeromedical examination has changed over time, few attempts have been made to monitor or quantify the safety benefits of the requisite aeromedical standards, it being self-evident that the licence holder needs to be 'fit'. ICAO sets medical Standards and Recommended Practices that have been agreed upon internationally. Despite this global agreement on a suitable international system, regulatory authorities interpret the medical Standards and Recommended Practices in different ways. In practice, this leads to different fitness levels being required of licence holders in different States (countries).



6.2. Basis for Regulatory Aeromedical Decision Making

Expert opinion

Aeromedical policy and individual decisions are often based on expert opinion. Although expert opinion may be evidence-based, such an approach (which may also be termed "eminence-based") is not as reliable as one that uses higher levels of evidence. However, expert opinion is often the easiest (quickest and least costly) to implement and may, therefore, be an attractive option for regulatory authorities. If a medical expert has

experience in aviation medicine and their own specialty, such an opinion may be of great value (it may be the only possible approach for uncommon conditions), but often opinions vary greatly among experts presented with similar cases.

The potential for variation in expert opinion was noted in 2004 when a European Joint Aviation Authorities (JAA) survey was undertaken to assess the value of the electroencephalograph (EEG) in determining medical fitness. A selection of representative EEG recordings was distributed to neurologists who were advising the chief medical officers of the various JAA member states. Some EEG were assessed as being acceptable for unrestricted Class 1 certification by certain consultant neurologists, while the same recordings were assessed by others as justifying an 'unfit' assessment.

Routine screening EEG was subsequently abandoned by the JAA for regulatory purposes. Given this disparity of views, it is not unexpected that an individual may be assessed as fit in one State and unfit in another, depending on the view of the expert who is advising the Licensing Authority.

6.3. Acceptable Aeromedical Risk

Another area where a diversity of views can be found among regulatory authorities is the level of aeromedical risk that is acceptable. Further, authorities differ in their opinions as to whether it is possible to use objective numeric aeromedical "risk criteria" as a basis for decision making in individual cases or for developing policy. Of the authorities that do use such risk criteria, there are differences regarding the maximum acceptable level of risk for certification, although for professional pilots a commonly held norm of maximum risk is 1% per annum. However, 2% per annum has also been proposed (10) and is in use in at least one State (country). A pilot incapacitation risk of "1% per annum" infers that if there were 100 pilots with an identical condition, one of them would be predicted to become incapacitated at some time during the next 12 months (and 99 would not). While the data for predicting incapacitation in the next 12 months for a condition is not always robust, there are some common medical conditions (e.g., ischemic heart disease) where high quality epidemiological data exist and can be used in assessing the aeromedical risk. Without any objective risk criteria, it can be unclear on what basis an aeromedical decision is being made, and expert opinion that seems 'reasonable', often based on similar precedents, is likely to hold sway.

6.4. Contribution to Aviation Safety of Medical Examinations

Routine periodic examination

There are few published studies on the safety value of the routine medical examination, yet millions of dollars are spent annually on the process. Regulatory authorities require licence holders to undergo an aeromedical examination for licence issue and each licence or medical certificate renewal. This examination varies little throughout a pilot's career, even though the incidence of most medical conditions varies with age, physical disease being less common in professional pilots under 40 years of age than in those over 40 years. Accordingly, physical disease is very rarely a significant factor in two-crew airliner accidents involving younger pilots. In the general population, behavioural factors such as anxiety and depression are more common in the under-40s age group, and illicit drug use and alcohol consumption also cause a considerable, increasing disease burden.

Despite this, relatively little formal attention is given to these aspects in the routine periodic encounter with an aviation medical examiner, with the emphasis usually placed on the detection of physical disease. Indeed,

although medical examiners may take it upon themselves to include some informal discussion of behavioral or mental health issues, the examination is often colloquially described as a pilot's "physical". Particularly in the younger licence holder there is an apparent mismatch between the likelihood of the existence of particular pathologies of flight safety importance (mainly mental and behavioral problems) and the tools being used to detect them (the traditional medical examination). ICAO is currently in consultation with its member States (countries) concerning whether the current emphasis on the detection of physical disease is appropriate in the periodic medical examination for professional pilots under 40 years of age.

6.5. Stringent Medical Requirements

One approach to aeromedical certification embraces a concept that "more stringent" medical standards result in "more effective" medical standards. At the 2002 Aerospace Medical Association annual scientific meeting, Hudson reported that 1200 of the professional pilots who sought advice from the U.S. Air Line Pilots Association medical consulting service had been diagnosed with depression and advised to take antidepressant medication.

On being advised of the Federal Aviation Administration's policy of not permitting antidepressant use in operating pilots, 710 of the 1200 indicated they would not take the recommended treatment and would continue to fly; 180 indicated they would take the recommended medication and continue to fly while withholding information concerning the medication from their aviation medical examiner; and 300 indicated they would stop flying while taking the medication. If this pilot group acted on their intentions, approximately 75% of pilots diagnosed with depression would have continued to fly, unknown to the regulator.

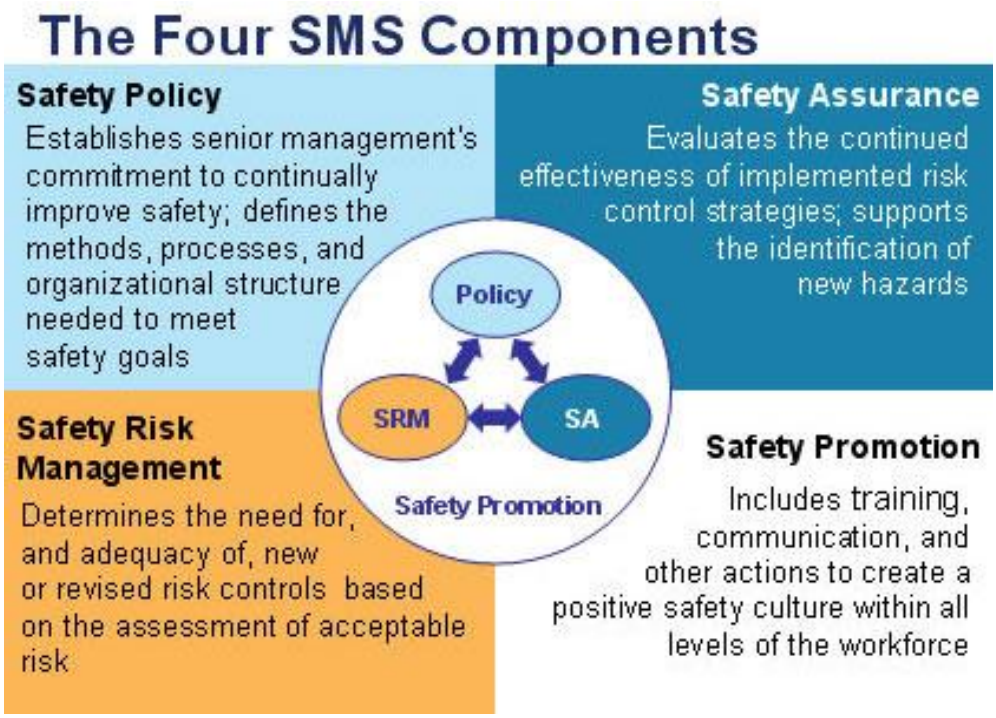
This data is open to a number of possible interpretations. One conclusion may be that regulating against pilots flying while taking antidepressants is, paradoxically, detrimental to flight safety since this could result in information concerning an important medical condition being withheld from the regulatory authorities while pilots continue to operate after having had a diagnosis of depression, treated or not. Conversely it may be concluded that as the current standards are not being adhered to, additional regulatory action such as more focused interview or survey techniques (to detect depression) and blood testing (to detect antidepressant use) is warranted. In a recent AsMA position paper, Jones et al. indicated that the use of modern antidepressants by pilots, under adequate supervision, need not be detrimental to flight safety.

This suggests that there are safe subpopulations among those with depressive disorders. Also, if pilots wished to hide their depressive illness and its treatment it is unlikely that interview and survey methods would identify any except the most clinically depressed. Blood testing for antidepressant medications would be very expensive if applied to the entire pilot population. We argue, therefore, that this additional data sways the interpretation of the Hudson data in favour of the first argument: that more stringent standards are not necessarily beneficial to overall flight safety. This, in turn, suggests that it would be a more effective safety strategy, both to accept the use of certain selected antidepressants and to structure the routine aeromedical examination to better identify those who may benefit from psychiatric intervention than it would be to try and continue to exclude all pilots with depressive disorders and to institute additional measures to try and increase their detection.

6.6. Safety Management as a Way Forward

Safety management principles

For some years, the concepts of safety management have been applied in the aviation industry, but largely outside the field of aviation medicine. ICAO has mandated the incorporation of a safety management system into the management processes of air traffic and aerodrome operators since 2001 and 2005, respectively, and safety management systems became mandatory in January 2009 for aircraft operator. When introducing a safety management system, an important first step is for a company to appoint a senior executive who takes direct responsibility for safety and who has some high-level influence on the distribution of funds. To fulfil this responsibility, the "accountable executive" needs to set safety targets, monitor and measure safety-related events, and then revisit and, if necessary, revise the safety targets. In other words, safety should be managed in a manner similar to other aspects of the business. In the past, this has not always occurred, with responsibility for safety often being delegated by senior



A recent comparison between in-flight medical events in the United States and the United Kingdom demonstrated that, in the United Kingdom, relatively minor pilot-related in-flight medical events were reported to the Licensing Authority at a rate approximately 40 times greater (55:1.3 per 10 million flight hours) than in the United States. While it is possible that this observation reflects an actual difference between US and UK pilots in the incidence of minor aeromedical events, it seems more likely that the explanation lies with differences in the reporting cultures in the United States and the United Kingdom, with relative under-reporting occurring in the former.

The same studies observed similar reporting rates for US and UK pilots for more serious medical events. A regular analysis of in-flight events by individual States and a comparison of reporting systems in different States would be of value in helping to better understand why such differences exist. Efforts to gather and analyse in-flight medical events may also be hampered by the lack of a single, widely accepted, classification system. For example, incapacitation from smoke or fumes may be reasonably regarded as medically related, but there is usually little connection between such events and the fitness of the pilot, as determined by the medical examiner. In addition, classification of events may need to be undertaken with less than full (medical) information, which introduces an element of error and subjectivity. Ideally, in order to maximise benefit from the analysis of in-flight aeromedical events, categorization should be undertaken by an individual who understands both the aviation environment and aviation medicine.

Medical events that occur between flights: On average, professional pilots spend between 5% and 10% of their time in the air, so noting events that occur between flights would greatly increase the size and utility of any database of medical events that affect pilots. An analysis of the medical conditions that come to light between routine examinations would be particularly useful. Some States require significant medical events to be reported to the regulatory authority after a certain time period, which provides the basis of a useful database for medical conditions that may appear, or deteriorate, between routine examinations. Further, as a medical history is required at each routine medical examination, it should be possible to obtain data on such events, which could be analysed.

6.6.1. Information from routine medical examinations

There are two types of information available from routine examinations: information from the medical history, and findings from the examination (mental and physical, including any investigations, e.g., electrocardiograms). The aero medical literature contains few studies that have attempted to investigate the relationship between those medical conditions that are identified during the routine periodic medical examination and those that cause in-flight medical events. The results of one such study suggested that the conditions most likely to result in in-flight medical events were usually first observed during the period between routine examinations – they were not discovered during the periodic examination by a medical examiner. If this is the case, it would seem important that the Licensing Authority ensures that the licence holder knows what action to take when such an event occurs so that flight safety is not eroded, and that the medical examiner and Licensing Authority are informed of the necessary information.

6.6.2. Reporting of medical conditions

Reporting of in-flight incidents involving operational errors may create a fear of adverse repercussions. An analogy can be made with medical events, both in-flight and on the ground, as a licence holder may withhold information if he/she believes his/her career may be adversely affected should he/she report a medical condition. However, systems which encourage reporting of events of safety relevance generate information that can be used to enhance safety. It is reasonable to assume that if medical conditions of licence holders are made known to the medical department of a Licencing Authority, a potential exists to improve safety.

Therefore, efforts should be made to encourage such reporting by licence holders. To this end, a regulatory authority should have, as part of its regulatory regime, a fair, transparent, and consistent system, developed in consultation with the licence holder's representative bodies. Such a system should be based as much as possible on evidence of aeromedical risk, and action in individual cases should be proportionate to the

individual risk. Such an approach might, as a formally stated goal, be included in the mission statement of a regulatory authority's medical department, with the aim of returning licence holders to operational status whenever possible. Experience shows that this is often mentioned as a desirable goal in aviation medicine circles, but rarely stated formally.

DAMES DUTIES IN CONTINIOUS IDENTIFICATION OF HAZARDS TO PREVENT INCIDENTS & ACCIDENTS

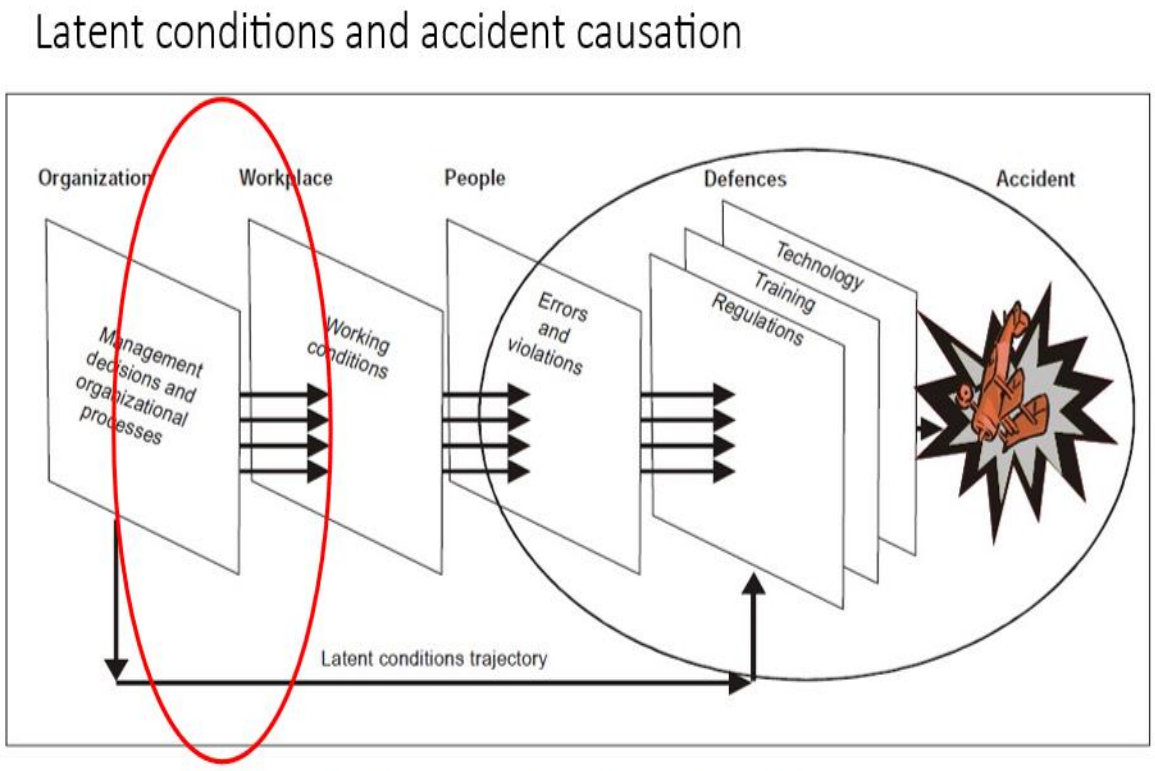


Figure 2-2. The concept of accident causation

SAFETY MANAGEMENT SYTEM ESIGNATED AVIATION MEDICAL EXAMINERS PROGRAMME

RESPONSIBILITTIES & ROLES IN THE AVIATION MEDICINE PRACTICE

The role of an Accountable Manager in the Aviation Medical Practice

a) Endorses the safety policy.

b) Provides the human and material resources necessary for operating the SMS and achieving the safety objectives.

c) Nominates the Safety Manager, the Compliance Monitoring Manager.

d) He has corporate authority for ensuring that all activities can be financed and carried out in accordance with the applicable requirements ant to the standards required by the competent authority.

e) Has overall responsibility for compliance monitoring system.

f) Responsible for establishing an effective management system.

The functions and role of the Safety Manager in the in the Aviation Medical Practice

a) To facilitate hazard identification, risk analysis and management;

b) To monitor the implementation of actions taken to mitigate risks as listed in the safety action plan;

c) To provide periodic reports on safety performance;

d) To ensure maintenance of safety management documentation;

e) To perform safety management initial and recurrent training for personnel and to ensure that it meets applicable standards;

f) To provide advice on safety matters;

g) To ensure initiation and follow-up of internal occurrence/accident investigations

The functions and role of the Compliance Monitoring Manger in the in the Aviation Medical Practice

a) Ensures that the company's activities are monitored for compliance with the applicable regulatory requirements.
b) Ensures that the compliance monitoring programme is properly implemented, maintained and continually reviewed and improved.
c) Requires corrective actions and verifies that corrective action is taken by the manager responsible in response to any finding of noncompliance.
d) Provides management with an independent assessment of corrective action, implementation and completion.
e) Monitors corrective action programme

The functions and role of the Internal Auditor in the in the Aviation Medical Practice

a) Carries out audits/inspections;
b) Identifies and records any concerns or findings and the evidence necessary to substantiate such concerns or findings;
c) Initiates or recommends solutions to concerns or findings;
d) Verifies the implementation of solutions within specific time scales;
e) Reports directly to Compliance Monitoring Manager.

The functions and role of the Head of Aviation Centre

a) Responsibility for coordinating the assessment of examination results and signing reports and initial class 1 certificates.
b) Assurance that all subordinates meet the qualification requirements for their respective activities.
c) Allocation of responsibilities and duties and issuing introductions to individuals.
d) Evaluation of relevant records in order to avoid the occurrence of undesirable trends.
e) Assurance of a comprehensive document and record management, storage, achieve and liaising with CAA regarding administration and coordination.
f) Performing medical assessments according to relevant standards and regulations;
g) Responsibility for the establishment and maintenance of medical assessment files;
h) Promoting corporate culture for safety standards of aviation medicine and medical knowledge and practice

EXAMPLE MEDICAL PRACTICE HAZARD LOG AND RISK ASSESSMENT

EXAMPLE MEDICAL PRACTICE HAZARD LOG AND RISK ASSESSMENT

Identified hazard	Associated risk / consequences	Existing mitigation measures in place	Current level of risk	Revised level of risk	Action by and when
1) Exercise electrocardiography using a treadmill	1) Slips, trips and falls on the treadmill	1) Handle bars on side of treadmill/Others	Severity 3 Likelihood 3 Review	Severity 3 Likelihood 3 Review	
2) Issuance Med Cert Non Compliant Client	2) Sudden Medical Incapity-Incident/Accident	2) Audit Exclude Errors /Summarized Protocols			

6.7. Conclusions

Despite the growth and acceptance of evidence-based practice throughout most fields of medicine, we still find ourselves routinely using the lowest level of evidence (expert opinion, unsupported by a systematic review) for regulatory aeromedical decisions. Such decisions are often not based on the explicit acceptance of any particular level of aeromedical risk. Without guidelines concerning acceptable risk levels, and with reliance on expert opinion for individual aeromedical decisions, consistent decision making is impeded, and comparisons between States (countries) are more difficult. A cornerstone of a successful future for regulatory aviation medicine is consistent decision making by Licensing Authorities using high-level evidence. Such an approach, if applied by different regulatory authorities, would assist global harmonization of medical fitness requirements. The principles of safety management can be used to help achieve both these goals. To promote these aims, several aspects of the aeromedical process should be reviewed and improved, such as:

a) The periodicity and content of periodic medical examinations should be adjusted to better reflect the medical demographics of applicants and the safety relevance of their medical conditions. For example, an increased emphasis on alcohol, drugs, and mental health may be warranted for younger pilots while it would be appropriate to give greater consideration to cardiovascular disease as pilots age.

b) Improvement in reporting and analysis of medical examination data. Few licensing authorities collect medical examination data in a format that is easily amenable to analysis and there is a lack of data concerning conditions of aeromedical significance that are discovered during routine medical examinations.

c) Improved reporting and analysis of in-flight medical event data. Few licensing authorities encourage the reporting of in-flight aeromedical data. Of those that do, it is rare that the reports are assessed in a systematic manner. Support for better reporting through the development of an appropriate culture by companies and a more supportive approach by regulatory authorities to license holders who develop medical problems should improve the reliability of data on which aeromedical policies are based by encouraging reporting of medical conditions.

6.8. Mental Health and Behavioural Questions for Use by Medical Examiners

As there is evidence that several fatal aviation accidents have been caused by psychiatric disorders or inappropriate use of psychoactive substances, it is reasonable that as part of the periodic aviation medical examination there should be questions that pertain to these issues. Little guidance has been provided concerning how such aspects could be addressed in the periodic medical examination, although experienced medical examiners have often informally and spontaneously included them in their evaluation of the applicant.

Further, the number of non-physical conditions that can affect the health of pilots and which can lead to long-term unfitness in those of middle age appears to be increasing. The conditions addressed by the proposed questions have been shown to be amenable to preventive action before they develop into significant health problems and before there is an impact on the pilot's medical status for flying. There are various questionnaires with various degrees of complexity available for assessing mental health and behavioural aspects of an individual's health. The questions below may serve to promote a relevant discussion between the medical examiner and the pilot, air traffic controllers and cabin crew.

To encourage dialogue, it is recommended that no written record of the conversation is retained (other than a record that mental health and behavioral topics were discussed) unless some item of immediate flight safety risk is uncovered – this understanding should be made clear to the pilot at the outset, thus increasing the likelihood of a frank discussion. It is to be expected that only rarely will any formal action need to be considered by the medical examiner to protect flight safety in the light of response to such questions, since the main aim is to discover behavioral patterns or mental aspects that are amenable to change before they become sufficiently severe to affect the medical fitness.

The questions suggested address those conditions that are most common in the age range of professional pilots and those which are most likely to affect performance on the flight deck. Statistics show that the main psychiatric conditions in this context are mood disorders and certain anxiety disorders, especially panic episodes. Additionally, in many Contracting States, excessive alcohol intake and use of illicit drugs in the general population are occurring with increasing frequency, and aviators are not immune from these social pressures. Questions have been developed to address these issues as well. In developing the questions, a review of the literature was undertaken by specialists in the field, with the aim of choosing simple questions that can be answered quite quickly. The vast majority of pilots will respond to all questions in the negative, and it is unnecessary to request pilots without any relevant problems to undertake a prolonged screening questionnaire.

Those who answer positively, or with uncertainty, can be engaged in further dialogue by the medical examiner. The aim is to encourage pilots to consider their lifestyle and thereby improve the likelihood that they will remain in good mental health during their careers; this, of course, includes the avoidance of problematic use of psychoactive substances. Occasionally, the medical examiner may find conditions that are amenable to medical support or even treatment; it is important to detect these at an early stage before they become significant problems and before they have a long-term impact on the pilot's medical fitness and on flight safety. The questions below may not represent the most suitable questions for the pilot populations of all States, but they offer guidance – a starting point – for States that intend to implement 6.3.1.2.1 and wish to develop an approach that includes these important aspects of medical fitness. The questions do not necessarily have to

be posed verbally by the medical examiner but could, for example, be given to the applicant to read prior to the examination.

DUTIES OF AVIATION MEDICAL EXAMINERS HEALTH PROMOTION

Responsibilities of Mental Health Promotion by Aviation Medical Examiners and Other Stakeholders

a) Collaborate in multi-sector, multi-stakeholder activities to promote, maintain and support mental health and well-being in aviation personnel to ensure operational safety by:

b) Recognizing that there are different cultural approaches and promoting a common understanding of supportive behaviors and activities;

c) Acknowledging the wide range of emotions in response to COVID-19; these are accepted as normal reactions to an abnormal situation; and

d) Providing a psycho-socially safe and supportive environment.

Role of the Civil Aviation Authority

a) Ensure collaboration between the aviation authority, aviation medical examiners, aviation medical assessors, other healthcare professionals, peer support groups and aviation personnel to support the mental health and well-being for all aviation personnel;

b) Provide appropriate guidance and support to aviation medical examiners to manage the impact of mental health conditions and other underlying causes such as COVID-19 on mental health and well-being in a consistent manner;

c) Encourage stakeholders to make available appropriate resources and tools to minimize the mental health impact including peer support programmes, by referring to ICAO guidance and other relevant supportive material;

d) Communicate on a regular basis to all stakeholders the means to maintain licensing and proficiency to enable safe performance of duties.

Professional and Industry Associations Responsibilities

a) Provide access to appropriate services to support health and well-being; and

b) Make peer support programmes available to all aviation personnel.

Industry Service Providers (e.g. aircraft operators, airports, air traffic control organizations, training organizations, etc.)

a) Raise awareness among leadership and management to support well-being among aviation personnel;

b) Continue to offer existing resources to support aviation personnel including peer support, employee assistance programmes (EAP) or other programmes;

c) As far as possible extend access to supportive resources to aviation personnel that have been furloughed, laid off or made redundant;

d) In the absence of employer-based resources, inform aviation personnel of other available resources;

e) Facilitate access to support programmes for all categories of aviation personnel (e.g. pilots, cabin crew, air traffic controllers, ground crew, maintenance personnel, aerodrome personnel etc.);

f) Educate on fitness for duty, self-care and the availability of peer support and encourage training programmes in this regard;

g) Ensure that the safety management system (SMS) addresses mental health related concerns including the biological and psycho-social risks and its interactions with flight safety; and

h) Identify the best channels to reach out to passengers and provide the relevant information to assist passengers in their preparations to travel.

Aviation Personnel

a) Practice self-care in all dimensions including healthy nutrition, regular exercise, obtaining sufficient sleep, practicing mindfulness, reducing stressors, engaging in healthy behaviors and regular interactions with a personal support network; and

b) Seek support pro-actively to maintain well-being and encourage fellow employees to seek support as needed.

Aviation Medical Assessors, Aviation Medical Examiners (AMEs) and related Healthcare Professionals

a) Provide a supportive environment for aviation personnel to address their well-being;

b) Proactively discuss work-related challenges during medical certification examinations;

c) Refer for further appropriate support (e.g., to Peer Support Programmes or specialist mental health support in a collaborative framework);

d) Actively collaborate with fellow AMEs to encourage support, scientific information exchange and inform decision making, which is consistent with national requirements;

e) Maintain awareness of peer support groups (if available) and keep contact details updated to facilitate referral of aviation personnel for appropriate support; and

f) Refer to health professionals, as appropriate, where peer support groups are not available or where more professional support is needed.

Mental Health Screening and Health Promotion

Aviation Medical Examiners are required to interview as part of a screening process of all applicants and holders of the medical certificates on the questions below to assess if they require further investigation and referral for treatment if necessary.

Suggested questions for Depression to be asked by Aviation Medical Examiners

i. During the past three months, have you often been bothered by feeling down, depressed, or hopeless?

ii. During the past three months, have you often been bothered by having little interest or pleasure in doing things?

iii. During the past three months, have you been bothered by having problems falling asleep, staying asleep, or sleeping too much, that is unrelated to sleep disruption from night flying or trans-meridian operations?

iv. In the past three months, has there been a marked elevation in your mood lasting for more than one week?

Suggested questions for Anxiety/Panic Attack to be asked by Aviation Medical Examiners

i. In the past three months, have you had an episode of feeling sudden anxiety, fearfulness, or uneasiness?

ii. In the past three months, have you experienced sensations of shortness of breath, palpitations (racing heartbeat) or shaking while at rest without reasonable cause?

iii. In the past year, have you needed to seek urgent medical advice because of anxiety?

Suggested questions concerning Alcohol Use o be asked by Aviation Medical Examiners

i. Have you ever felt that you should cut down on your drinking?

ii. Have people annoyed you by criticizing your drinking?

iii. Have you ever felt guilty about your drinking?

iv. Have you ever needed a drink first thing in the morning?

v. How many alcoholic drinks would you have in a typical week?

vi. How many alcoholic drinks would you have on a typical day when you are drinking?

Suggested questions concerning Drug Use to be asked by Aviation Medical Examiners

i. Have you used drugs other than those required for medical reasons?

ii. Which non-prescription (over the counter) drugs have you used? When did you last use this drug/these drugs?

Health Promotion

Aviation Medical Examiners are required to interview as part of a screening process of all applicants and holders of the medical certificates on the questions below to assess if they require further investigation and referral for treatment if necessary.Other areas of health promotion includes includes but are not limited to:

a) Health Education on the impact of smocking

b) Health Education on the impact of over and underweight

c) Health Education on screening for cancers and other conditions

d) Others related topics

6.9. Flexibility in the Application of Medical Requirements

The range of variation between individuals is such that if medical Standards are laid down in rigid terms, they will inevitably exclude a number of applicants who, though not meeting the Standards in all respects, might nevertheless be considered capable of performing duties safely in the aviation environment. Since the Chicago Convention lays on Contracting States the duty to promote efficient and safe aviation as well as to regulate it, provision has been made in Annex 1 for the exercise of a degree of flexibility in the application of medical Standards, thus avoiding the hardship and injustice which might otherwise occur. It is essential for the maintenance of flight safety that the manner in which flexibility is exercised should be reasonably uniform throughout the Contracting States if international acceptance of licences is to be maintained. In the past, flexibility has been used in widely differing ways by States. The application of the principles set out in this chapter will assist in achieving uniformity.

6.9.1. The Exercise of Flexibility

If the medical Standards prescribed for a particular licence are not met, the appropriate Medical Assessment shall not be issued or renewed unless the following conditions are fulfilled:

a) An accredited medical conclusion indicates that in special circumstances the applicant's failure to meet any requirement, whether numerical or otherwise, is such that exercise of the privileges of the licence applied for is not likely to jeopardize flight safety.

b) The relevant ability, skills and experience of the applicant and operational conditions have been given due consideration.

c) The licence is endorsed with any special limitation or limitations when the safe performance of the licence holder's duties is dependent on compliance with such limitation or limitations.

The provision of a degree of flexibility must not lead to a situation where its use becomes the rule rather than the exception. This has been worded clear in the ICAO manual, so that flexibility may be exercised only in the exceptional case. Failure to observe this requirement could result in routine approval of individuals not meeting specific medical requirements, such as visual standards, thus creating an abuse of the primary object of flexibility. When evidence accumulates that flexibility is being utilised repeatedly in a particular respect, then the appropriateness of regulations defining the medical requirements comes into question and the suspicion is raised that the regulations define a requirement which is not in keeping with the demands of flight safety.

However, when decisions to exercise flexibility are backed by an accredited medical conclusion, this indicates that these decisions have not been regarded as a routine measure but that they have been taken following close examination and assessment of all the medical facts and their relationship to occupational demands and personal performance. The degree and intensity of investigation lying behind each decision accurately measures compliance with the principles behind the flexibility Standard.

The just and safe exercise of flexibility should be confined to the exceptional case, and it ought to be considered in relation to the expertise of those concerned in applying accredited medical conclusion. As a consequence, "accredited medical conclusion" is a basic concept and has been specifically defined in Annex 1 as "the conclusion reached by one or more medical experts acceptable to the Licensing Authority for the purposes of the case concerned, in consultation with flight operations or other experts as necessary. The estimation of risk imposed by the individual upon flight safety is a most difficult task and one often requiring experts in a number of aspects of both medicine and aviation. Decisions should recognize that public interest and safety is the statutory basis for personnel licensing.

6.9.2. The terms "waiver" and "flexibility"

The standard term "waiver" is frequently referred to as the "waiver clause", and the term "medical waiver" in connection with medical certification and licensing is generally accepted. However, the use of the term "waiver", which in legal usage means "an act of dispensing with a requirement", and the verb "to waive" which is defined as "not to insist upon", "to ignore, neglect or disregard", "to refrain from applying or enforcing (a rule etc.) or "to make an exception", is unfortunate. In fact, the correct exercise of "flexibility" as described is quite the opposite of "waiver" because the decision to apply the clause is only reached after subjecting the individual involved to a critical analysis, possibly involving detailed personal examination together with deliberations by those who formulate the "accredited medical conclusion" and the decision of the Licensing Authority.Waivers are approved by the Aeromedical Committee through the Medical Assessors commonly on medication that is new and has not been officially approved on the list of medication that is acceptable or applicants who have been initiated on a new medical protocol .

6.9.3. Medical Practical Flight Test and Medical Deficiency Compensation and Flight Safety

Where a medical deficiency exists, the extent to which flight safety is affected is the vital factor, rather than the extent to which failure to attain the medical requirements is capable of being compensated. In some cases, the question of compensation for a deficiency will be irrelevant, for example where the risk is one of sudden incapacitation rather than an inability to physically carry out a required task. In other cases, the ability to compensate, for example, for an orthopaedic dysfunction may be an important factor in the overall assessment of the effect on flight safety. Previously acquired skills and experience may similarly be irrelevant or important to the overall assessment of the safety risk. The medical case requiring practical flight test may be identified through Aeromedical Committee or Verification Processes by the MA or PN. The specialist appointment are depended on the applicant's disability.

The medical practical flight test team comprise of MA, FOD flight inspector, Medical Specialist, senior DAME and other. The minimum time required to arrange a practical flight test is 6 (six) weeks as an aircraft or simulator have to be arranged. The Medical Department is responsible for coordinating a medical practical flight.

Medical Appeals

The Act makes provision for applicants to appeal against the medical decisions of the designated aviation medical examiners, authorized officers or designated bodies to the Director. The SACAA appoints medical specialists, clinical psychologists and senior designated aviation medical examiners to assist in the adjudication of medical appeals.

The Director is empowered to establish a medical appeal known as the Medical Appeal Panel (MAP) to adjudicate of medical appeal cases on ad hoc basis in line with medical practitioners appointed in terms of section with section 119(2) of the Civil Aviation Act, 2009 (Act No.13 of 2009). The MAP has no executive powers other than those specifically delegated to it in these Terms of Reference**.** The MAP is an appeal advisory body of medical, psychological and ancillary health experts to advise and make recommendations to the Director on the medical appeals lodged against the decision of the Aeromedical Committee by aviation personnel who are required in terms of the Civil Aviation Regulations (2011), to hold medical certificates and privileges.

6.10. Flight Crew Incapacitation

Introduction

The impressive growth of international civil aviation during the past decades has been accompanied by a continued concern for safety in air travel. The number of air carrier accidents per year will increase if industry growth continues and accident rates remain unchanged. It is, therefore, essential to continue to examine all areas which have an impact on flight safety. One such area is that of in-flight pilot incapacitation, which can be defined as any reduction in medical fitness to a degree or of a nature that is likely to jeopardise flight safety.

This might be regarded as a “medical definition” focusing as it does on medical fitness. Note, however, that incapacitation can also occur in a medically fit individual, e.g., smoke inhalation or effects of a laser beam on vision. A doctor practicing aviation medicine should be familiar with the relevant operational environment and the wide variety of possible causes of incapacitation. Minor degrees of reduced medical fitness may go undetected by other crew members during normal flight operations and lowered levels of proficiency may be rationalised, e.g., poor handling may be attributed to lack of recent handling experience. However, when abnormal conditions or an emergency occur, flight crew may have to perform complex physical and mental tasks under time constraints, and in such circumstances even a minor deficiency in performance could be operationally significant. Some effects of mild incapacitation include a reduced state of alertness, a mental preoccupation which may result in a lack of appreciation of significant factors, increased reaction time, and impaired judgment.

6.10.1. Controlling the risk of pilot incapacitation

Pilot incapacitation has been of concern for as long as powered flight has existed. It represents an operational risk, and it can therefore be defined operationally as “any physiological or psychological state or situation that adversely affects performance”. There are sound reasons for considering an operational definition. From the operational standpoint, it is irrelevant whether degraded performance is caused by a petit mal episode, preoccupation with a serious personal problem, fatigue, problematic use of psychoactive substances or a disordered cardiac function. The effects may be similar, and often other crew members will not know the difference. A great deal about pilot incapacitation has been learned over the past decades. One of the most important things is that the risk to aviation safety in situations where a pilot is physically incapacitated can be virtually eliminated in air transport (multi-crew) operations by training the pilots to cope with such events. In 1984 the medical director of a major British airline reported the results of a study of pilot incapacitation that remains the most comprehensive to date (see Chapman, 1984). It included over 1 300 “subtle” incapacitations which were simulated to occur at critical phases of flight during routine competency checks in a simulator.

Five hundred of these incapacitations were deliberately planned to occur with other major failures in a "worst case" scenario. Major failures were not included in the remaining 800 incapacitations so that "the simulation was of a subtle incapacitation, still taking place at a critical phase of flight, but as an event in itself and not complicated by other major failures". This latter scenario is the more realistic, since the risk of an incapacitation occurring simultaneously with a major technical failure is extremely remote. In the simulator it was found that only one in 400 "uncomplicated" incapacitations resulted in a simulator "crash", because the second pilot successfully took control on the 399 other occasions. If certain assumptions about a typical multi-crew flight are made, this knowledge can be used to calculate an acceptable risk of incapacitation for an individual pilot.

These assumptions are:

a. Each flight lasts one hour.

b. Only 10 per cent of the flight time is critical, viz. take-off and initial climb, approach, and landing (in a one-hour flight this comprises the first and last three minutes).

c. Pilot incapacitations occur randomly during a flight.

d. One in 100 real-life incapacitations occurring in the critical periods would result in a fatal accident, a more pessimistic view than that suggested by the simulator studies mentioned above (one in 400), where simulated incapacitations could be anticipated by the flight crew. Based on these four assumptions, the so-called "1% rule" has been developed.

6.10.2. Causes of Incapacitation

A dramatic form of pilot incapacitation, although not necessarily its most hazardous, is death in the cockpit. A survey (1993-1998) of flight crew incapacitation on United States scheduled airlines recorded five deaths in the cockpit, all owing to cardiovascular diseases. The youngest pilot was 48 years of age when he died. No case resulted in aircraft damage or operational incident. It should be noted that ICAO introduced the requirement for incapacitation training in two-pilot operations in the 1970s and this has undoubtedly reduced the risk to flight safety from pilot incapacitation.

Incapacitations from self-limiting illness may be less dramatic but are considerably more frequent. In two studies of airline pilots, in 1968 and again in 1988, more than 3 000 airline pilots completed an anonymous questionnaire survey including questions about whether they had ever experienced an incapacitation during a flight. In both studies, which revealed remarkably consistent results, about 30% answered "yes". However, only about 4% considered their incapacitation a direct threat to flight safety. In both studies the most frequently cited cause of incapacitation was acute gastroenteritis (see the table below).
Causes of incapacitation in airline pilots, in order of frequency (adapted from Buley, 1969; Green and James, 1991)

1.	Uncontrollable bowel action (21%) and "other" gastrointestinal symptoms (54%)	75%
2.	Earache/blocked ear	8%
3.	Faintness/general weakness	7%
4.	Headache, including migraine	6%
5.	Vertigo/disorientation	4%

As can be seen, most of these incapacitations are caused by gastrointestinal upsets which are usually impossible to predict. Whilst they may represent little more than varying degrees of discomfort and inconvenience, they can also be completely incapacitating. Here is an example taken from a pilot's report:
"Trip was normal up to time of incident. Approximately half-way between LAS and LAX, shortly after reaching cruise, I experienced severe abdominal pains which soon rendered me incapable of operating a safe flight. I turned command over to the First Officer and put the Second Officer in the First Officer's seat while I lay in great pain on the cockpit floor.Trip landed safety at LAX with First Officer . . . at the controls. An ambulance was requested by the crew...

I was taken to the Daniel Freeman Hospital in LAX where . . . (I was given) . . . a diagnosis of gastroenteritis.
I think that spells food poisoning in our language. After some medication I felt wonderfully relieved and was released from the hospital. "Fortunately, gastroenteritis rarely occurs so suddenly as to prevent a planned handover of control, thereby minimising the flight safety risk. Pilot incapacitation is clearly both a traditional aeromedical problem and a straightforward training problem. As long ago as 1970, a past Chief of ICAO's Aviation Medicine Section wrote: "It is suggested that acknowledgement of pilot on-duty incapacitation as a permanent part of the air transport industry scene in the foreseeable future constitutes a constructive rather than a defeatist medical position. Further, it appears essential that the design, management, operational, training, and licensing disciplines should recognise that pilot incapacitation must be given due weight in the overall judgment of what level of safety is practically available."

Medical screening, by itself, cannot be relied upon to reduce the hazard of incapacitation to an acceptable minimum level, even if significantly more rigorous medical standards were to be applied. Other important aspects include pilot education in the causes of incapacitation, pilot training for safe handover of controls in such an event and, especially, good food hygiene and low-risk, separate meals for the fight crew. From the operational/training viewpoint, the maxim that "any pilot can become incapacitated at any time" is apposite.

6.10.3. Pilot Incapacitation Training

Pilot training in the early recognition of incapacitation and in safe handover of controls, pioneered in the United States, has been highly effective in preventing accidents from physical incapacitation. It seems less effective in the case of mental incapacitation. Because the majority of accidents result from human failure of some sort, degradation of performance from commonly occurring sub-clinical conditions such as mild anxiety and depression, sleep loss and circadian rhythm disturbance is an important factor in this area of relative incapacitation. Although mostly a small problem amongst flight crew, the problematic use of psychoactive substances is likely to become more important as their general use in society increases.

Incapacitations can be divided into two operational classifications: "obvious" and "subtle". Obvious incapacitations are those immediately apparent to the other crew members. The time course of onset can be "sudden" or "insidious" and complete loss of function can occur. Subtle incapacitations are frequently partial in nature and can be insidious because the affected pilot may look well and continue to operate but at a less than optimum level of performance. The pilot may not be aware of the problem or capable of rationally evaluating it. Subtle incapacitations can create significant operational problems.

A series of 81 simulated obvious and subtle incapacitations showed that pilots needed help in two areas: their first need was for a method of detecting subtle incapacitations before they became operationally critical; their second need was for an organised method of handling the incapacitations once they were recognised. It was learned that all pilot incapacitations create three basic problems for the remaining crew. This is true whether

the incapacitation is obvious or subtle and whether there is a crew of two (or more) members. Although this study was carried out many years ago, its recommendations are still valid. If an in-flight incapacitation occurs, the remaining flight crew must:

a. Maintain control of the aircraft.
b. Take care of the incapacitated crew member. (An incapacitated pilot can become a flight deck hazard and, in any case, is a major distraction to the remaining crew. For this reason, responsibility for the incapacitated pilot, who should preferably be removed from the flight deck, should be given to the cabin crew.)
c. Reorganise the cockpit and bring the aircraft to a safe landing.

These three steps became the organised plan for handling in-flight incapacitation. They should be taken separately and in order.

6.10.4. "Two communications" rule

The "two communications" rule was developed to meet the need for a method of detecting subtle incapacitations before they become operationally critical. The rule states: "Flight crew members should have a high index of suspicion of a 'subtle' incapacitation any time a crew member does not respond appropriately to two verbal communications, or any time a crew member does not respond appropriately to any verbal communication associated with a significant deviation from a standard operating procedure or a standard flight profile." This rule is easy, straightforward, and effective.

6.10.5. Cognitive incapacitation

A particular category of incapacitations has been identified as "cognitive." The problem created by these incapacitations is how to deal with a pilot who is "mentally disoriented, mentally incapacitated or obstinate, while physically able and vocally responsive". In this category, the captain presents the most difficult case. While cognitive incapacitations may seem to be psychologically based, in some cases the underlying causes are pathological, as with a brain tumour, causing an erratic performance. Retrospectively, there often seems to have been ample warning of an impending problem. In most cases of cognitive incapacitation, the pilot demonstrates manifestly inappropriate behaviour involving action or inaction, and the inappropriate behaviour is associated with failures of comprehension, perception, or judgment.

These kinds of incidents seldom occur in isolation because, in most cases, they represent a pattern of behaviour. Two excerpts from reports to NASA's ASRS (National Aeronautics and Space Administration's Aviation Safety Reporting System) illustrate the repetitive nature – or pattern – of what may be examples of this grey, but important, problem area."On two occasions we descended through our assigned altitude. I was the non-flying pilot and made all the callouts. On both occasions, in addition to the required callouts, I informed the flying pilot that we were descending through our assigned altitude. His corrections were slow and on one occasion we went 400 feet below, and on the other, 500 feet below the assigned altitude. In addition, his airspeed and heading control were not precise . . ."

The reporter elaborated further in a telephone call:"Captain reacted almost catatonically to his altitude callouts and the additional callouts that they were descending through the cleared altitudes. Definitely very delayed reactions. Other aspects of the trip were reasonably normal except that Captain missed several radio transmissions. It was as if he simply didn't hear them."From a telephone call to a pilot reporting a different incident:

"Reporter believes Captain has serious and persistent 'subtle' incapacitation problem. Reported incident (which included successive altitude deviations) . . . happened on first trip of the month . . . Remainder of month with Captain has had same pattern with many cases of very poor performance . . . Seems to be increasingly slow thinker in the aeroplane. Must be reminded of things several times, even including getting his signature on required papers . . ."

The deliberate failure to follow established rules and procedures is a very old problem and the "maverick" pilot is by no means a new phenomenon. One Chief Medical Officer commented on the difficulties with dealing with aberrant behaviour in the medical context. The following paragraph is taken from his paper given at an aeromedical examiner symposium in the 1980s:"Psychiatric disturbances giving rise to unusual behavior are . . . like alcoholism . . . often covered up. There is, however, genuine difficulty here, for aviation attracts eccentrics — indeed, aviation has only reached its present state because of eccentrics. It is often very difficult to define the boundaries between normality, eccentricity, and psychiatric disorder, and individuals, not uncommonly, cross over these boundaries from day to day. The ICAO definition — 'manifested by repeated overt acts' — is a useful indicator of the need for, at least, investigation."

The nature of air transport operations is such that the individuals in the best position to observe repeated overt acts and, from a practical standpoint, the only ones situated to do so, are other crew members. This creates a different sort of resource management problem. It is an obvious challenge for management. It is also a challenge for pilot-representative organization's. Control of the incapacitation risk is dependent upon effective operational monitoring. A basic requirement for that monitoring is that all flight crew members must know what should be always happening with and to the aeroplane. This is one of the most important reasons for following standard operating procedures (SOPs) and flying standard flight profiles. The real importance of SOPs lies as much in the area of information transfer as it does with respect to the issue of the proper way to fly the aircraft. Routine adherence to SOPs helps to maximise information transfer in much the same way that the use of standard phraseology does in air traffic control communications.

Detection of subtle incapacitation may be indirect, i.e., as a result of a pilot not taking some anticipated action. If, for example, the pilot conducting the approach to land silently loses consciousness and his body position is maintained, the other pilot may not be aware of his colleague's predicament until the expected order of events becomes interrupted. Regular verbal communication built into standard operating procedures, and use of the "two communication rules" are helpful to detect subtle incapacitation, especially when physical control inputs are unnecessary, e.g. automatic approach.

6.10.6. "Fail-Safe Crew"

The object of "fail-safe crewing" is to provide an adequate number of crew members to cope with flight crew workloads, and to make it possible to fully integrate the flight crew members into a flight crew team so as to establish a crew in which there is always at least one fully competent pilot at the controls. Ideally the actions of each crew member should continuously be monitored by his fellow crew member(s). The concept aims at

achieving maximum safety in the operation of the aircraft and equitable distribution of cockpit workload so as to ensure the crew can cope with all requirements, including peak demands in adverse weather or under emergency conditions, such as in-flight pilot incapacitation.

The "fail-safe crew" concept is the key ingredient for successfully dealing with any form of pilot incapacitation. Support at all levels of management and pilot representation is needed for the "fail-safe crew" to, in practice, do justice to the concept. Meaningful simulator training, reinforced with a suitable education programme, is a requirement. The story of controlling the incapacitation risk in air transport is the story of a progress made in a series of small but important steps. Learning to manage the cognitive incapacitation risk remains an important goal.

6.11. Crew Resource Management

In modern flight operations, line-oriented flight training (LOFT) emphasises that resource management is making a substantial contribution to flight safety. A captain representing a pilots association explained the concept as follows:". . . One of the basic fundamentals of this philosophy is that it is the inherent responsibility of every crew member, if he be unsure, unhappy or whatever, to question the pilot-in-command as to the nature of his concern. Indeed, it would not be going too far to say that if a pilot-in-command were to create an atmosphere whereby one of his crew members would be hesitant to comment on any action, then he would be failing in his duty as pilot-in-command…"

Training in crew cooperation, called crew resource management (CRM), is now provided by most major airlines but frequently not to the same extent by smaller operators. In smaller companies, procedures are less standardised and a greater degree of individuality is tolerated, so behavioral problems can be expected to be more common, and experience has shown that this is the case. Over several years CRM has been expanded to include the interaction between flight and cabin crew in recognition of the fact that cabin crew members can sometimes have operationally relevant knowledge that flight crew do not have. This was dramatically demonstrated in the United Kingdom in 1989 when a flight crew shut down the wrong engine of a Boeing 737. Although the pilots believed their action was correct, the cabin crew had seen flames issuing from the other engine, but unfortunately this information was not communicated to the flight crew. In the ensuing crash several passengers and crew members were killed or severely injured. While most would agree that CRM training is helpful in promoting flight safety, its assessment is more controversial. Interpersonal relationships are not particularly amenable to measurement, and there is much suspicion among pilots about any process which attempts, or seems to attempt, to measure personality.

6.12. Evidence-Based Decision Making

A continued assessment of in-flight crew incapacitation as a flight safety hazard requires collection of related data. Reporting of incapacitation incidents to ICAO is an integral part of an accident/incident reporting system on a worldwide basis, but suffers from two major difficulties: firstly, the data is incomplete as not all Contracting States send information on accidents and incidents, and secondly, the data rarely assessed and classified by personnel who understand the medical implications. Moreover, Contracting States which have their own reporting system are often hampered by the confidential nature of the information supplied. For example, a report following an incapacitation is often filed by another crew member who does not reveal the name of the incapacitated person, making follow-up difficult.

Further, incapacitation data classified by means of a layman's diagnosis may be incorrect or misleading: a pilot who collapses with abdominal pain may be suffering from one of a number of medical problems but is likely to be diagnosed by other crew members as having a gastrointestinal upset. The diagnosis might not be relevant at the time of incapacitation but is important for monitoring medical standards and in determining where the maximum benefit for a given effort is achieved with respect to reducing the incidence of in-flight incapacitation. Attention needs to be given to devising a more accurate, preferably international, method of recording and classifying data on in-flight incapacitations.

In recent years ICAO has taken the initiative to require a Safety Management System (SMS) to be incorporated into the routine management of aerodromes, air traffic and airlines. An integral part of SMS is that of measuring and recording safety events, and of setting targets. In 2010, medical provisions became applicable in Annex 1 that recommend the application of safety management principles to the medical assessment process of licence holders, including the routine analysis of in-flight incapacitation events. It is to be hoped that this development will provide the stimulus towards a more evidence-based application of aeromedical standards. Safety management principles as applied to the medical certification process are addressed in more detail in Part I, Chapter 1, of this Manual.

6.13. Conclusions

In-flight pilot incapacitation is a safety hazard and is known to have caused accidents. Such incapacitation occurs more frequently than many other emergencies that are routinely trained for, such as sudden decompression. Incapacitation can occur in many forms, ranging from sudden death to a not easily detectable partial loss of function, and has occurred in all pilot age groups and during all phases of flight. It is important to recognise the operational ramifications of pilot incapacitation. Medical officers working for regulatory bodies should be fully aware of the operational aspects. Instruction and training of flight crew concerning action in the event of in-flight pilot incapacitation should include early recognition of incapacitation as well as the appropriate action to be taken by other flight crew members.

6.14. The 1% Rule

During the last decades of the 20th century, a number of Contracting States were approaching a fatal accident rate of one in 107 flying hours. Some Contracting States therefore set as their target a maximum fatal accident rate of one in 107 flying hours, with human "failure" constituting one tenth of the risk and human failure caused by medical incapacitation comprising one tenth of the human failure risk, or one hundredth of the total risk, i.e., medical incapacitation should not result in a fatal accident more often than one in 109 hours. Based on the assumptions stated above, a pilot flying a two-pilot aircraft can have an incapacitation risk of no more than one in 106 hours, and the operation will achieve the target medical cause fatal accident rate of no more than one in 109 hours, since the presence of a second pilot reduces the risk by a factor of 1 000. This is because in a multi-pilot aircraft only 10% of flight time is critical (risk reduced by a factor of 10) as incapacitations are assumed to occur randomly.

Therefore, only one in 10 in-flight incapacitations will occur during a critical stage of flight and thus pose a flight safety risk. Only one in 100 incapacitations occurring at a critical stage of flight is likely to result in a fatal accident (risk further reduced by a factor of 100). Therefore, the total risk reduction with the addition of a

second pilot is 1/10 × 1/100 = 1/1 000, i.e. the risk is one 1 000th of the risk of single pilot operations. For a pilot with an incapacitation risk of one in 106 hours, a second pilot therefore reduces the risk of a fatal accident from pilot incapacitation from one in 106 hours to one in 109 hours. In other words, only one fatal accident in one thousand in-flight pilot incapacitations would be expected to result in a fatal accident, because the other pilot would take over safely in the other 999 times. For an individual pilot flying a multi-crew aircraft the acceptable risk of incapacitation may therefore be increased by a factor of 1 000 from one in 109 to one in 106 hours.

An incapacitation rate of one in 106 hours approximates to a rate of 1% (or one in 102) per annum (since there are 8 760 – close to 10 000 or 104 – hours in one year). More explicitly:

One in 106 hours = 0.01 in 104 hours (dividing both figures by 100)
One in 104 hours = 1% in 104 hours
1% in 104 hours approximates to 1% in one year (because there are 8 760 hours per year)

The acceptable maximum incapacitation rate of 1% per annum outlined above has become known as the “1% rule”. This rule specifies a predicted annual medical incapacitation rate which, if exceeded, would exclude a pilot from flying in a multi-crew aircraft. This is widely regarded as an acceptable risk level and was adopted by the European Joint Aviation Authorities as the basis of aeromedical risk assessment. The “1% rule” cannot apply to a solo pilot flying in public transport operations, because it is derived from two-pilot operations and the availability of a second pilot to take over in the event of one pilot becoming incapacitated. However, the “1% rule” has also been applied to the private pilot population by some States, on a pragmatic basis, such that a private pilot who develops a medical problem may be permitted to continue to fly as a solo pilot if his risk of an incapacitation is 1% per annum or less.

This acceptance of an increased risk of incapacitation in a private pilot seems reasonable since the overall level of safety demanded of private operations is less than that of commercial operations, and it would therefore be out of place to demand a professional pilot medical standard for private pilot operations. The “1% rule” provides a rational, objective method of assessing the fitness of applicants. However, other limits of acceptable incapacitation risk, such as 2% per annum, or even greater, have been suggested. The important point is that States should endeavor to define objective fitness criteria to encourage consistency in decision making and to assist in improving global harmonisation of medical standards.

6.15. Licence Limitations

It should be noted that Annex 1 does allow for medical standards to relate to the specific duties that may be undertaken by an individual licence holder. This is indicated by relevant statements that appear in the Annex text referring to safe operation of an aircraft or to safe performance of duties while exercising the privileges of the licence. It follows that an applicant who has been assessed as unfit for one duty may be found fit for another, and it is possible to envisage a Licensing Authority deciding that an individual would be precluded from flying as a pilot while being judged capable of safely exercising the privileges of a flight engineer’s licence.

It is evident that many such possible operational restrictions exist, but they should only be established after consultation with flight operations experts. An applicant may be found fit to operate an aircraft as a pilot under supervision or as a co-pilot but not as a pilot-in-command. In cases where prognosis cannot be given with the

necessary degree of certainty, any potential risk to flight safety may, in general aviation where two pilots are not normally required, be mitigated by a restriction to fly without passengers, outside controlled airspace or with the carriage of a "safety pilot". Such a pilot should receive adequate information about the medical condition which has led to the restriction "valid with safety pilot only". In addition, he/she must be capable of acting as pilot-in-command in case of an emergency.

In commercial aviation, a restriction to multi-crew operations may serve a similar purpose. In such a manner it is often possible to fit individuals into aviation by restricting their licence or limiting their duties and thus mitigating the risk to flight safety while retaining the experience of individuals who would otherwise be denied a licence.

7. SECTION 2

7.1. History of Aviation Medicine in South Africa

The Aeronautical Society of South Africa was formed in 1911, and the pilot's medical requirements at the time included a good working knowledge of motorcycle/motorcars, a perfect short and distant eyesight, without the aid of glasses, a restriction on age (35), and marital status. Dr Danie Craven of rugby fame and Prof Jokkel, later of "Physical Fitness" at the Stellenbosch University, played a key role at Diskobolos near Kimberley in aircrew selection and fitness training. The formalisation of Aviation Medicine in South Africa took place when the Aviation Wing of the South African Medical Corps was established in 1922. At this time, a Royal Air Force medical officer was seconded to conduct the medical examination on the SAAF pilots and train local physicians about the processes involved in the selection of pilots. Between the period of 1960 and 1990, the Air Force upgraded to supersonic aircraft and the need for aviation medicine grew apace. A new Institution for Aviation Medicine was built to house the new technologies, including centrifuge, decompression chambers, re-compression chambers and other specialised equipment. Since the expensive equipment and technology were still housed at the Institute for Aviation Medicine (IAM), all disputes, reviews and appeals, were and still are referred to this institute for discussion.

After World War II, the civilian aviation environment expanded rapidly and the emphasis on aviation medicine shifted from the military to the civilian sector. In 1934, Union Airways was bought by the South African government, and renamed South African Airways on 1 February. The first cities served were Cape Town, Durban and Johannesburg. Dr Harry Z Gelman, a Consultant Ophthalmologist to the South African Airways wrote a letter on 10 June 1975 to Dr Marius Van der Spuy, the then Director of SAA's medical division, suggesting that SA should host an International Congress of Aviation and Space Medicine. Dr Gelman also suggested that SAA should become a corporate member of the American Aerospace Medical Association, which to this very day is still maintained. Dr Harry Z and Mrs Joan Gelman managed against high odds to attend the 23rd ICASM conference in Mexico at the end of September 1975, and their plan was to win the 1976 ICASM for South Africa. This was during the years of SA's worldwide isolation. Mrs Joan Gelman was chosen as chairperson of the International Reception Committee of the (big) American Aerospace Medical Association for two years in succession at that time, a unique honour which had never been given to a non-American citizen at the time, and in 1975 the 24th ICASM was awarded to SA to host. At this stage, Dr Harry Gelman realised that SA should have its own aviation medicine association, and he formed the SA Aviation Medical Association, which is currently known as the SA Society of Aerospace and Environmental Medicine.
Prior to the establishment of the SACAA, all aviation medicine activities were overseen by the Institute for Aviation Medicine (IAM), a military institution that reports to the Department of Defence. At the time, all the

aviation medicine activities were centralised, until 1991, when a decision was made to decentralise the system, and delegate the authority to designated medical examiners to examine and certify applicants.

The Aviation Medical Department of the SACAA was established subsequent to an audit finding by ICAO in 1999, which indicated the need for an in-house medical establishment within the SACAA. With the adoption of Part 67 of the Regulations and the creation of the Aviation Medical Department, the medical certification oversight function was now under the SACAA. The SACAA is responsible for ensuring that licensed aviation personnel meet the medical fitness standards prescribed by the International Civil Aviation Organisation (ICAO) Annex 1 and the Civil Aviation Regulations Part 67.

7.2. Establishment and Management of the SACAA

The SACAA is a regulatory parastatal body, which was established in October 1998. The SACAA's mandate is to control, regulate and promote aviation safety, security and the environment. The SACAA was formed in keeping with the new government's priorities of policy development, economic restructuring and reducing the burden on the general taxpayer, which was consistent with international trends. Aviation medicine in South Africa continuous to be decentralised, with the SACAA being responsible for the designation of aviation medical examiners, development of medical standards, participation in training of medical examiners, processing of medical appeals, application of accredited medical conclusions and flexibility. The medical department is also responsible for the oversight of air ambulances, first aid training for cabin crew, and oversight of communicable diseases at airports, airlines, and air traffic services.
The Institute of Aviation Medicine conducts medical verification processes on behalf of the Director and also gives initial and recurrent aviation medicine training to designated examiners. The legal responsibility of the function of the Institute for Aviation Medicine (IAM) is contained in Part 67.00.3 of the Civil Aviation Regulations. The SACAA is funded by a combination of user fees, levies and money paid by the Department of Transport for services performed on their behalf e.g., accident investigations. User fees are based on cost recovery. The SACAA is governed by a Board of Directors appointed by the Minister of Transport.

Following the establishment of the new SACAA in South Africa, the role of the SACAA in the practice of Civil Aviation Medicine had to be reviewed, as the Authority's objective is to promote aviation safety by utilising resources cost-effectively and by establishing partnerships with the industry. The different options available to the SACAA were evaluated, based on international practice. The oversight functions of the SACAA pertaining to aviation medicine were specifically explored, as well as the need for continued review of standards to ensure compliance with ICAO requirements and to maintain comparable standards with best international practice. A doctor was appointed on a contract basis in April 1999 to conduct research relating to international medical requirements and South Africa's compliance therewith. ICAO performed an audit in November 1999 and recommended the establishment of an in-house medical department. The SACAA's Aviation Medicine Department was formally established in April 2000. It was initially established to focus on policy and other medical matters that had not previously received attention, but soon expanded to include various other functions and services.

Structure and relationships in civil aviation medicine in South Africa

Medical Assessor

The SACAA utilises the services of medical assessors who are based who are based at the SACAA office. ICAO defines medical assessors as physicians, qualified and experienced in the practice of aviation medicine, who evaluate medical reports submitted to the Authority by medical examiners. The medical assessors evaluate medical reports submitted by medical examiners and are therefore required to maintain the currency of their professional knowledge.

Following medical examination, the medical examiner must forward the medical examination form and supporting documentation to the designated SACAA within 60 days of medical examination if the manual system is used, otherwise where the electronic system, where it will be reviewed by medical assessors at the SACAA, and once the documents are audited a medical certificate may be issued. This certificate may be different from the one issued by the medical examiner. The medical assessors at the SACAA conduct verification of medical examinations performed by the designated medical examiners.

7.3. Targeted Medical Standards

The SACAA, in consultation with IAM, SAASMA, RAASA, ATNS and other medical stakeholders, has identified a need to review the medical standards for Class IV, Air Traffic Controllers and Cabin Crew. The medical standards currently in force are not targeted towards the operational environment of licence holders, for example altitude vs non-altitude issues (ATC), terminology used (grounding vs medical withdrawal), multi-crew vs single crew environment, etc. Based on the information mentioned above, medical standards for Class Four (4) medical applicants were approved by CARCOM and are awaiting the revision of the class four (4) category to be finalised, which will be introduced at a later stage.

7.4. Aeromedical Committee of the Civil Aviation Authority (ICAO Flexibility)

The Director of the SACAA established the first civilian committee, known as the Aeromedical Committee, in June 2010, and the CAA has since appointed a number of committee members, as their contract is valid for three years. The Aeromedical Committee is an advisory body of medical, psychological, surgical, and ancillary health experts charged with advising the SACAA on any medical risks posed by existing or prospective aviation personnel who are required, in terms of the Civil Aviation Regulations (2011), to hold a medical certificate. Intricate borderline, protocol and complicated cases are referred to the Aeromedical Committee of the Civil Aviation Authority for review. The primary role of the Aeromedical Committee is to review and make recommendations on the medical fitness of licensed aviation personnel referred by the Designated Aviation Medical Examiners (DAMEs) and Aviation Medical Assessors (AMA) so that expert opinions can be tabled for the fair and consistent application of assessment.

The purpose of the Aeromedical Committee is to assess complex medical cases and to ensure that medical certificates are not issued or renewed unless the following conditions are fulfilled (ICAO's Flexibility Clause): accredited medical conclusion, which indicates that in special circumstances the applicant's failure to meet any requirement, whether numerical or otherwise, is such that exercise of the privileges of the licence applied for, is not likely to jeopardize flight safety, and that the relevant ability, skills and experience of the applicant and operational conditions have been given due consideration and the licence is endorsed with any special limitation or limitations when the safe performance of the licence holder's duties is dependent on compliance with such limitation or limitations.

7.4.1. Composition and appointment of the Aeromedical Committee

The appointment of members of the Aeromedical Committee was based on the research conducted through the University of Pretoria (entitled Common Morbidity Pattern, which leads to medical unfitness in civil aircrew in South Africa). The objective of this study is to: (1) determine the proportion of medical unfitness among the different medical classes of civilian aircrew in South Africa, (2) identify the medical conditions that lead to medical unfitness, (3) compare the morbidity patterns among the classes of medical certificate holders that lead to medical unfitness, (4) assess the average age of crew found to be medically unfit, and (5) compare the outcomes of the decision of the IAM panel from 2000 to 2008.The SACAA continuous to assess morbidity patterns based on the cases presented, to continuously ensure that the relevant specialists are represented.
The specialists appointed to the Aeromedical Committee are required to be linked to the Military Hospital and are nominated by the Deans of Medical Schools from the following institutions: the University of Pretoria, Walter Sisulu, University of the Witwatersrand and other Intuitions . The committee also has representatives from the Institute of Aviation Medical Examiners, the Southern African Aerospace Medicine Association, and the Airline Pilot Association. Air Traffic Control and Cabin Crew Representatives and Senior Designated Examiners with experience of occupational, regulatory, and clinical aviation medicine are appointed. On occasion, the Director of Civil Aviation may appoint specialists who are experts in their field but who are not linked to u
niversities.

7.4.2. Responsibilities of the Aeromedical Committee and dates of the meetings

The members are required to participate in committee meetings in an objective manner and in a way that enhances civil aviation safety and the civil aviation industry in general. They provide evidence-based medical opinions concerning specific medical cases and recommend action required to be taken. The members are required to conduct research and to investigate and interacting with relevant medical societies or research institutions to ensure that appropriate medical advice is given to the Director. Members are also required to be familiar with the requirements of the International Civil Aviation Organisation, other Civil Aviation Authorities and the South African Civil Aviation Medical Requirements prescribed in Part 67 of the Civil Aviation Regulations, 2011. The Aeromedical Committee meets once a month, on the third Tuesday of the month, and all documentation required to be presented at the Aeromedical Committee must be submitted seven (7) working days before the meeting.

7.5. Designated Aviation Medical Examiners

Applicants for Class 1, Class 2 Class 3 and 4 licences must be examined by a designated aviation medical examiner (DAME) who has been approved by the Director. The results are documented on the prescribed form and forwarded to the SACAA or designated institution for verification.

8. SECTION 3

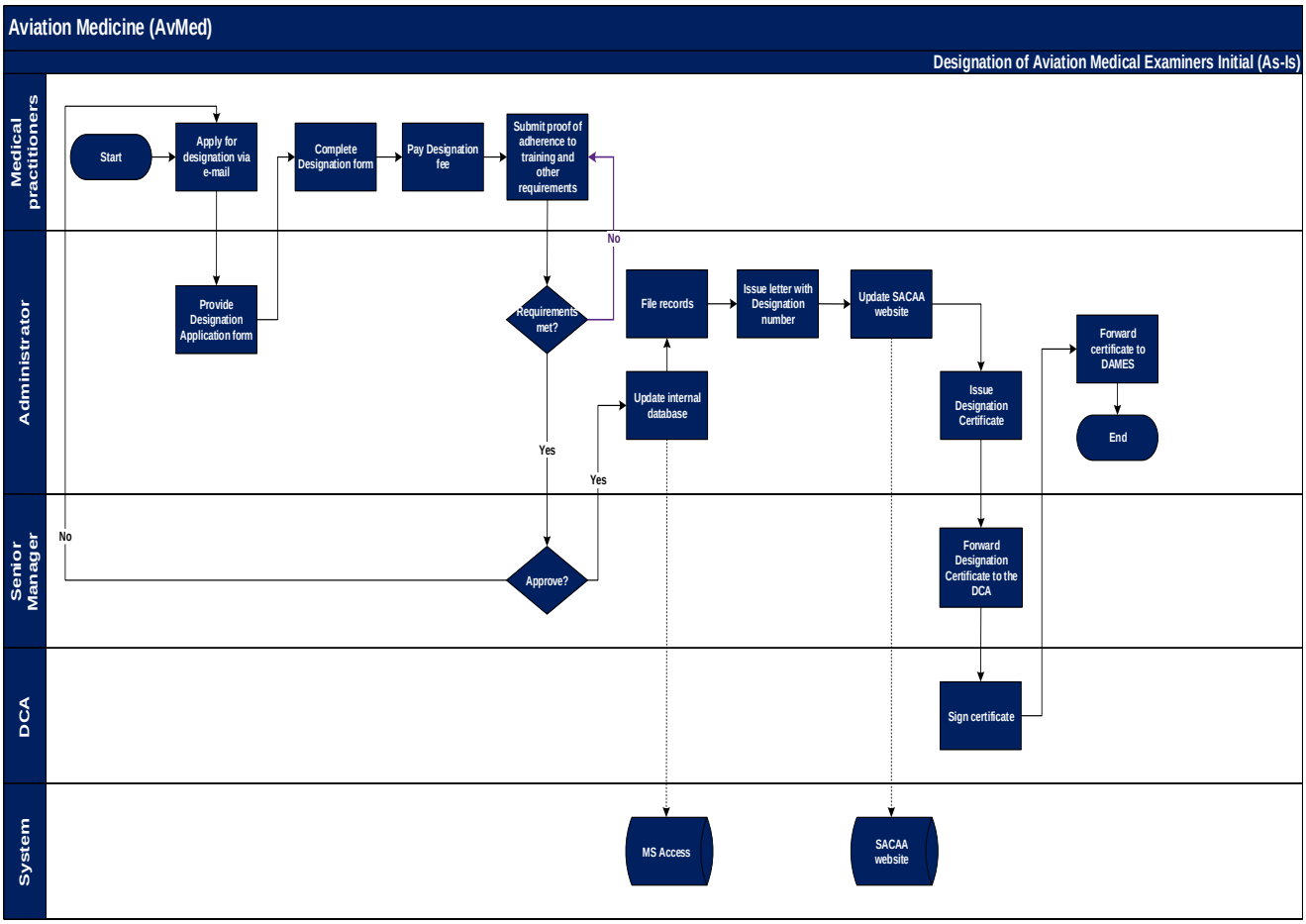
8.1. Designation of Aviation Medical Examiners

8.1.1. Designated junior aviation medical examiner.

An aeromedically qualified doctor designated by the Director, and who is granted the authority to perform medical examinations or tests required for the issuing of Class 4 medical certificates. The content of training of the Junior Aviation Medical Examiners is under review.

8.1.2. Designated aviation medical examiner

An aeromedically qualified doctor designated by the Director, after consultation with the designated institution, and granted the authority to perform medical examinations or tests required for the issuing of Class 2 and Class 4 medical certificates.



8.1.3. Designated Senior Aviation Medical Examiner

A designated aviation medical examiner given the additional authority to perform medical examinations or tests required for the issuing of Class 1 and Class 3 medical certificates.

DESIGNATION OF FOREIGN AVIATION MEDICAL EXAMINERS

(1) The designation of foreign aviation medical examiner shall be in line with Part 67 and is valid for a period of one (1) year and the designation application renewal certificate if the aviation medical examiner meets the requirements.

(2) A foreign aviation medical examiner shall receive training in aviation medicine and shall have practical knowledge and experience of the conditions under which the holder of licence and ratings carry out their duties.

(3) A foreign aviation medical examiner shall have practical knowledge and experience but not limited to flight experience, simulator experience, on-site observation and any other practical experience considered necessary by the Director.

(4) A foreign aviation medical examiner shall submit proof of competency in aviation medicine which was issued by a recognized institution before being designated by the Director.

(5) At the time of initial application for designation, an applicant shall submit the following documents or copies thereof –

(a) medical degree;

(b) certificate, diploma or degrees of any postgraduate professional training in aerospace medicine;

(c) registration and letter of good standing with the appropriate Health Professions Council statement affirming that –

(i) there are no current restrictions of medical practice, and there are no adverse actions proposed or pending by the appropriate Health Professions Council of the State of practice; and

(ii) there are no known investigations, charged indictments, or pending actions in any court of law.

(6) A foreign aviation medical examiner shall perform no less than 15 examinations per year after first 24 months.

(7) A foreign aviation medical examiner shall have the ability to read, write, speak, and understand the English language.

(8) A medical assessor shall conduct periodic oversight of the competence of all designated foreign aviation medical examiners to assess suitability of their facilities, equipment, and training of their personnel. A medical assessor shall conduct audits virtual, when necessary, as determined by the Director.Physical audit may be required at the costs of a designated foreign aviation medical examiner.

(9) A designated foreign aviation medical examiner shall attend least 80% of the continuous Medical Education sessions virtually coordinated by the Medical Assessor on behalf of the Director.

(10) A foreign aviation medical examiner shall pay an annual designation fee as prescribed in Part 187.

11) A foreign aviation medical examiner will be required to undergo training in the policies, procedures and tools used for the issuance of a medical certificate.

12) A foreign aviation medical examiner shall attend at least one aviation medical conference and/or CME course within each 4-year interval and travel costs and other expenses for the DAME and staff to attend the conferences are the responsibility of the attendees.

13) The designation and renewal of a foreign aviation medical examiner is subject to compliance of the stipulated regulations and technical standards prescribed under Part 67 of the Civil Aviation Regulations".”

9.3.1.1 Designation

The authority to exercise the powers and perform the duties of a designated aviation medical examiner, which commences on the date on which the document of designation is issued by the Director to the designated aviation medical examiner and remains in force for a period of 12 months following this date.

9.3.1.2 Termination of designation

The revoking of a designation before the expiry of the 12-month period.

9.3.1.3 Responsibilities of designated medical examiners

Aviation medical examiners have the responsibility to ensure that only those applicants who are physically and mentally capable of performing safely, may exercise the privileges of their certificates. To properly perform the duties associated with these responsibilities, DAMEs must:

a. Keep abreast of the general medical knowledge applicable to aviation.
b. Have detailed knowledge and understanding of all rules, regulations, policies, and procedures relating to the medical certification of applicants; and
c. Possess acceptable equipment and have adequate facilities necessary to carry out the prescribed examinations.

9.3.1.4 Selection and retention of DAMEs

In the selection and retention of DAMEs, the designated body or institution will recommend only professionally qualified, practising physicians who have an expressed interest in promoting aviation safety. Only those physicians who enjoy the fullest respect of their associates and members of the public, whom they serve, shall be designated, and retained as DAMEs.

9.3.1.5 Criteria for designation

Authority to perform Class 2 and Class 4 examinations.

Credentials

a. DAMEs shall receive training in aviation medicine and shall have practical knowledge and experience of the conditions under which the holders of licence and ratings carry out their duties.

b. The practical knowledge and experience shall include, but is not limited to, flight experience, simulator experience, on-site observation and any other practical experience considered necessary by the licensing authority.

c. DAMEs must demonstrate to the Director of their competency in aviation medicine before designation.

d. At the time of initial application for designation, the physician must submit the following documents or copies thereof:

Qualifications

a. Medical Degree.

b. Certificate, diploma, or degrees of any postgraduate professional training.

c. Registration with the Health Professions Council and Proof of good standing.

d. Special consideration will be given to those applicants who are pilots, who have special training or expertise in aviation medicine, or who were previously designated but have relocated to a new geographical area.

e. There should be no restrictions of medical practice; and

f. There should be no known investigations, charged indictments or pending actions in any court of law.

g. proof of the ability to read, write, speak, and understand the English language.

Distribution

a. There must be a determined need for a DAME in the area.

b. It should be based on adequacy of coverage related to pilot population; and

c. The applicant must agree to comply with the requirements.

Change of status

DAMEs must promptly notify the SACAA, should there be a change in DAME status of authority to practice medicine.

Professionalism

a. Be informed regarding the progress in aviation medicine.

b. Be thoroughly familiar with the relevant techniques of examination, medical assessment, as well as certification of applicants; and

c. To abide by the policies, rules and regulations of the designated institution as approved by the Director.

Examinations

a. A DAME is required to personally conduct all medical examinations. Other physicians or paraprofessional personnel may perform specialised parts of the examinations under the general supervision of the DAME, who must sign the documents, and list his/her designation identification number, both on the application form and on the medical certificate. In all cases, the DAME must review, certify, and assume responsibility for accuracy and completeness of the total report of examination.

b. In the event that the medical examination is to be conducted by two or more medical examiners, the Director shall appoint one of those medical examiners to be responsible for coordinating the results of the examination, evaluating the findings with regard to medical fitness and the signing of the reports.

c. The designated aviation medical examiner shall ensure, when submitting medical documentation manually or electronically for verification to the Medical Assessor, that they list their identification number as prescribed in technical standard 67.00.4(7).

Facilities and equipment

DAMEs must have adequate facilities for performing the required examinations and possess, or agree to obtain such equipment, or access to the necessary facilities, prior to conducting any aviation medical examination.

Conduct

DAMEs must comply with the policies, orders and regulations of the designated body or institution as approved by the Director.

Authority to perform Class 1 and Class 3 Examinations

In addition to the criteria for designation as a DAME, the physician must demonstrate, by compliance with the requirements for continued service as a DAME, acceptable prior performance as a DAME, authorised to perform Class 2 and Class 4 examinations for a period of at least three years.

Prohibited examinations.

A DAME may not perform self-examination for the issuing of a medical certificate nor issue a medical certificate to himself or herself.

Duration of designation

a. Designation of physicians as DAMEs is effective for one year following the date of issue, unless terminated earlier by the Director of Civil Aviation or the designee. For continued service as a DAME, the designee must reregister annually.

b. In the event of office relocation or change in practice, a designation will terminate and may be reissued, on request, by the Director of Civil Aviation. In respect of the relocation, a determination of adequacy or coverage will be made.

Authority of a DAME

a. The DAME must personally conduct physical examinations in accordance with the guidance and practices as laid down by the designated institution.

b. The DAME must issue, defer, or deny medical certificates in accordance with the provisions of the Civil Aviation Regulations Part 67, subject to reconsideration by the designated institution.

Procedures for Designation

a. Physicians must submit a written application to the Director for designation.

b. The Director will inform the applicant in writing of his or her designation and will issue a Certificate of Designation

c. The designated institution continuously evaluates the performance of each DAME.

d. Only physicians who have demonstrated satisfactory performance in the past and who continue to show a definite interest in the DAME programme will be re-designated.

e. In addition, the designated institution must identify those DAMEs committing examination and certification errors and notify the Director, in writing, for appropriate action to be taken.

Information collected by the designated institution and the CAA includes:

a. Data on the adequacy of information on reports of medical examination.

b. Errors made on reports of aviation medical examinations.

c. DAME interest and participation in aeromedical programmes and conferences; and

d. Reports from the aviation and/or medical community concerning professional performance and personal conduct as it may reflect on the designated institution as well as the Director.

Basis for termination or non-renewal of designation

a. Failure to re-register punctually each year.

b. No examinations performed during the 12 months of initial designation.

c. Performing less than 15 examinations per year after 24 months, while for senior examiners this figure shall be 30 examinations per year.

d. Disregard of or failure to demonstrate knowledge of the rules, regulations, policies and procedures of the designated body or institution.

e. Repeated errors after receiving warnings from the designated body or institution.
f. Failure to attend required conferences and/or continued aviation medical education.
g. Movement of the location of practice from where it is presently designated.
h. Failure to participate in any aviation medical programme when requested to do so by the designated institution or the Director.
i. Unprofessional conduct in performing examinations.
j. Failure to comply with the provisions of the Civil Aviation Regulations Part 67.
k. Personal conduct or public notoriety that may reflect adversely on the designated body or institution or the Director.
l. Loss, restriction, or limitation of a licence to practice medicine.
m. Any action that compromises public trust or interferes with the DAME's ability to fulfil the responsibilities of his or her designation.
n. Any illness or medical condition that may affect the physician's sound professional judgment or ability to perform examinations.
o. Arrest, indictment, or conviction for violation of the law.
p. Request by the physician for termination of designation; or
q. Any other reason determined by the Director to be in the best interest of aviation safety.

9.3.1.6 Procedures for renewing designations

Before expiration of designation, the DAME concerned must apply for re-designation, in writing, to the Director. DAMEs whose re-applications are not received will not be re-designated.

9.3.1.7 Procedures for terminating or not renewing designations.

The designated institution will advise the Director when to terminate or not renew a designation. When it is determined that a designation should be terminated or not renewed, the following procedures are applicable:

a. The DAME will be notified in writing, by certified mail, of the reason(s) for the proposed action.
b. The written notification will give the DAME the option to respond in writing or in person within 30 days of the date of letter.
c. In cases where a DAME is suspected of fraud or any other activity for which emergency action is necessary to assure aviation safety, the SACAA will immediately direct the DAME in writing to cease all further examinations pending further investigation.
d. The investigation must be conducted expeditiously; however, if the Medical Assessor believes that the DAME's cessation of further examinations should continue pending final disposition of the matter by the Director, he or she may so direct the DAME in writing, by certified mail. The termination procedures must be accomplished expeditiously.

Whether by determination to not re-designate or termination of designation during the designation year, the DAME must return all SACAA materials (including forms and certificate of designation) to the Director.

9.3.1.8 Fees related to designation.

From 1 April 2021 the following fees will apply to designation of medical examiners:
Regular examiners: Refer to the annual fee increase.
Senior examiners: Refer to the annual fee increase.

9.4 Legal Issues

9.4.1 Confidentiality of information

Examiners must always ensure that medical information remains confidential. Should an examiner, on the basis of clinical findings, require more tests, informed consent should be obtained from the applicant. Information must be released to the SACAA and the designated institution on request for purposes of issuing a medical certificate or a licence or if the examiner believes that it may have an impact on flight safety. Medical information may not be released to other parties, nor should it be printed on the medical certificate without the consent of the applicant.

Medical Examination Forms and Medical Certificates

The medical examiner must send the original medical examination form to the SACAA and issue the applicant with the original medical certificate, which may be manual or generated by the system.

For both the medical examination form and the medical certificate the following is required:

a. The medical certificate must be an original certificate obtained from the CAA or generated by the EMPIC System.
b. The medical examination form can be obtained from the CAA or can be downloaded from the CAA website.
c. No photocopies of medical certificates will be accepted.
d. No examination forms or medical certificates other than the ISO approved CAA documents will be accepted.
e. All documents must be signed by both parties in all the relevant places.
f. Forms with Tippex will not be accepted.
g. Incomplete/illegible forms or certificates will not be accepted.
h. The medical examiner's code must be on all documentation.
i. If any changes or corrections are made on the medical examination form, corrections must be signed by both parties.
j. No corrections will be accepted on the medical certificate.

k. Pilot licences and medical certificates are regularly inspected abroad, and they may be detained or even charged with fraud if all the documentation is not in order. It is therefore essential that the applicant carries the original medical certificate on his/her person, ensuring that no alteration made on the medical certificate and that the medical certificate is complete.

l. All documentation must be sent to IAM within 60 days of the date of examination. All late submissions will render the medical certificate invalid.

9.4.2 Training of Medical Examiners

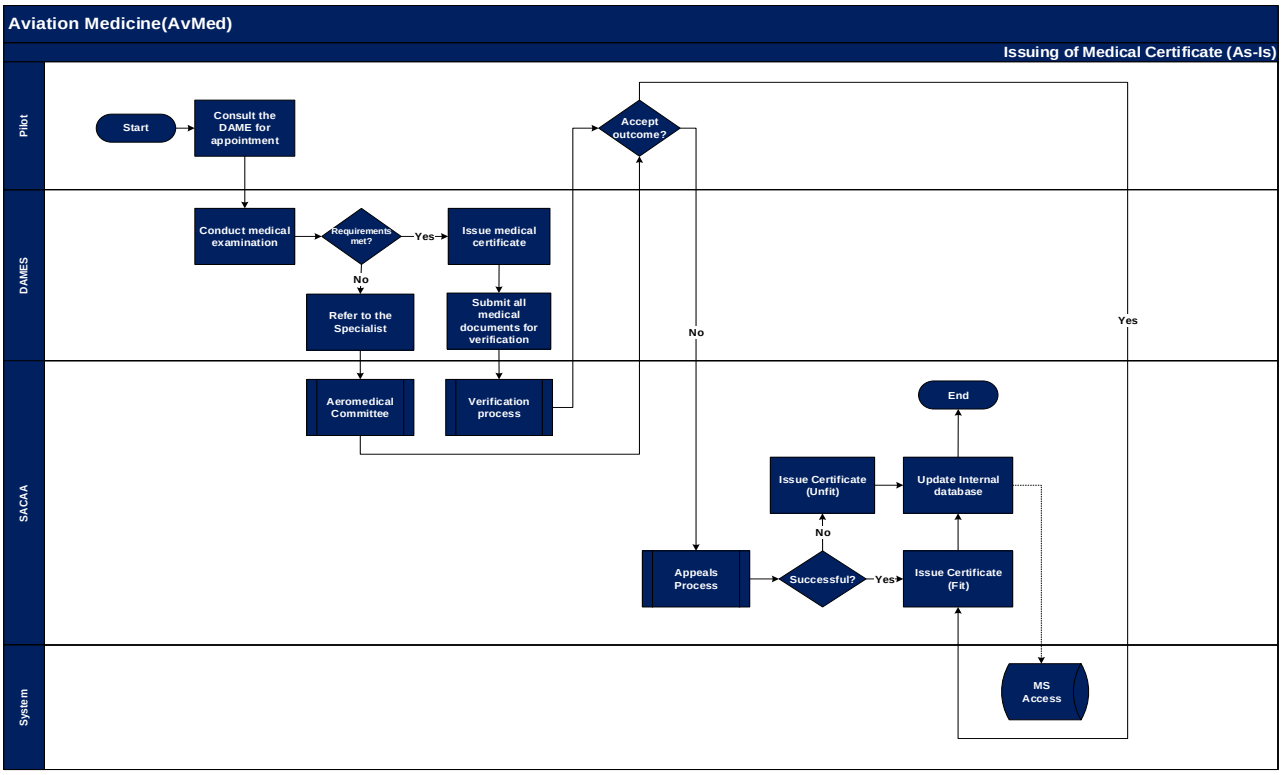
Medical examiners are required to attend a refresher course or attend an acceptable conference every four years. In addition, examiners should remain current with changes in legislation and the latest developments in aviation medicine. This can be achieved by reading publications on the CAA website and the Safety Link.

9.4.3 Examination of South African Pilot in Foreign Countries

An applicant in a foreign country should contact an aviation medical examiner that has been approved by the Director to perform medical examinations on South African pilots. A list of the approved aviation medical examiners can be found on the CAA web site.
The examination must be conducted in accordance with the requirements of the Civil Aviation Regulations Part 67 and the corresponding technical standards (SA-CATS-MR). The findings of the medical examination must be documented on the prescribed form and must be sent to the designated institution for certification.

Alternatively, an applicant can contact an examiner registered with other foreign Civil Aviation Authorities to perform the relevant Authority's examination. The examination forms and the medical certificate must be submitted to the SACAA or the designated institution. The designated institution may request additional examinations on behalf of the Director of Civil Aviation. The foreign medical examiner must hold a qualification recognised by aviation authorities internationally and submit proof thereof to the Director. A medical certificate will be issued by the designated institution or the SACAA and may be different from the certificate initially issued by the medical examiner. Once the applicant has returned to South Africa, he/she will be required to undergo a new medical examination by a South African aviation medical examiner.

9.4.4 Certification Process of Medical Examinations



Applicants may appeal to the Director of Civil Aviation during any stage of this process.

9.4.5 Summary of Requirements for Designated Aviation Medical Examiners

Examiner	Requirements
Junior medical examiner	Pass Short Course in Aerospace Medicine Attend refresher course or conference every four years. Acceptable performance Annual re-registration Examine Class 4 and 5 Medical Certificate applicants only
Regular medical examiner	Pass a 2-week Certificate Aerospace Medicine Course Perform no examinations during the 12 months of initial designation. Perform less than 15 examinations per year after 24 months. Attend refresher course or conference every four years. Acceptable performance Annual re-registration
Senior medical examiner	Acceptable performance as regular examiner for three years Perform a minimum of 30 examinations annually. Attend refresher course or conference every four years. Acceptable performance Annual re-registration

9.5 Civil Aviation Regulations 67

9.5.1 Part 67: Medical certification

List of regulations
67.00.1 Applicability
67.00.2 Classes of medical certificates
67.00.3 Functions of Director regarding medical examinations
67.00.4 Designation of aviation medical examiners
67.00.5 Class 4 medical certificates
67.00.6 Period of validity of medical certificates
67.00.7 Application for medical certificate
67.00.8 Issuing of medical certificate
67.00.9 Duties of holder of medical certificate
67.00.10 Validations
67.00.11 Foreign medical examinations
67.00.12 Period of validity of medical records
67.00.13 Substance abuse
67.00.14 Suspension or cancellation of medical certificate
67.00.15 Medical confidentiality

9. Applicability 67.00.1

- This part applies to the issuing of medical certificates for flight crew, cabin crew and air traffic service personnel.
- The Director may designate medical officers to perform any functions or duties on his or her behalf, in terms of this part.
- Where appropriate, the reference to the Director in this part shall be deemed to include medical assessors referred to in sub-regulation (2).

Classes of medical certificates

The classes of medical certificates are as follows: Class 1 Medical Certificate

- ATPL.
- CPL for aeroplane, airship, and helicopter.
- Class I test pilot rating.
- instrument rating.

Class 1 Medical Certificate

- SPL
- PPL for aeroplane, airship, and helicopter.

- flight engineer licence.
- free balloon CPL.
- Class II test pilot rating.
- commercial glider pilot.
- Part 96 authorisation issued under a Part 62 licence.

Class 3 Class 1 Medical Certificate

- ATC.
- Air Traffic Service Assistant.
- RPL.

Class 4 Class 1 Medical Certificate

a) cabin crew member licence.
b) microlight (conventional microlight weight shift) aeroplane pilot licence.
c) gyroplane pilot licence.
d) free balloon pilot licence (non-commercial).
e) light sport aeroplane pilot licence.
f) touring motor glider pilot licence.
g) glider pilot licence (non-commercial).
h) tandem paraglider pilot licence.
i) powered tandem paraglider and para trike pilot licence.
j) tandem hang-glider pilot licence.
k) powered tandem hang glider pilot licence.
l) powered parachute pilot licence.
m) tandem parachutist or skydiver licence.
n) flight instructor licence for microlight, light sport aeroplane, glider, touring motor glider, gyroplane, gyro-glider, tandem paraglider, powered paraglider, tandem hang-glider, powered hang-glider, and tandem powered parachute.
o) national test pilot rating.
p) SPL for the licence categories referred to in subparagraphs (i) to (xvi)

Class 5 Class 1 Medical Certificate

a. paraglider licence.
b. powered paraglider licence.

c. powered paratrike licence.
d. weight shift or surface control hang-glider licence.
e. powered hang-glider licence.
f. parachute licence.
g. powered parachute; solo instructor for para-gliding or hang-glider and all powered versions thereof;
h. paragliding, hang gliding and parachuting student licence.

a. A flight crew member who holds a valid Class 1 medical certificate shall be deemed to hold valid Class 2 and Class 4 medical certificates.

b. An ATS personnel member who holds a valid Class 3 medical certificate shall be deemed to hold a valid Class 4 medical certificate.

c. Upon expiry of a Class 1 medical certificate referred to in sub-regulation (2), a flight crew member may request, if he or she does not renew a Class 1 medical certificate, that such expired Class 1 medical certificate be substituted by a Class 2 or Class 4 medical certificate, which shall be valid for the remainder of the period for which it would have been valid as a Class 2 or a Class 4 medical certificate as the case may be in accordance with regulation 67.00.6.

d. Upon expiry of a Class 3 medical certificate referred to in sub-regulation (3), an ATS may, if he or she does not renew a Class 1 medical certificate, request that such expired Class 1 medical certificate be substituted by a Class 3 medical certificate, which shall be valid for the remainder of the period for which it would have been valid as a Class 3 medical certificate in accordance with regulation 67.00.6.

e. The medical requirements, standards or guidelines to be complied with by an applicant for, or a holder of, a medical certificate is as prescribed in Document SA-CATS 67.

f. A holder of a Class 4 medical certificate who flies above 12 000 ft. shall meet the respiratory and lung function test requirements of a Class 2 medical certificate as prescribed in Document SA-CATS 67.

g. A person under 60 years of age who submits to the Director a duly completed Class 5 medical self-declaration in the appropriate prescribed form, signed by a medical practitioner registered under the Health Professions Act. 1974 (Act No. 56 of 1974), shall be deemed to be a holder of a Class 5 medical certificate.

9.1. Functions of Director regarding medical examinations 67.00.3

(1) The Director must –

a. exercise control over medical examinations or tests and over aviation medical examiners performing such examinations or tests.
b. determine standards for such examinations or tests and for the training of such aviation medical examiners.

c. issue or amend medical certificates and keep all books or documents regarding such examinations or tests.

d. apply basic safety management principles to the medical assessment process of licence holders by inter alia:

i. routinely collecting and analysing medical findings during medical assessments to identify areas of increased medical risk.

ii. continuously re-evaluating the medical assessment process to concentrate on identified areas of increased medical risk;

iii. routinely collecting and analysing incapacitation in-flight and on active duty; and

iv. ensuring that accredited medical conclusions are reached.

The Director may designate a body or institution to –

a. exercise control over medical examinations or tests and over aviation medical examiners performing such examinations or tests;

b. determine standards for such examinations or tests and for the training of such aviation medical examiners;

c. issue or amend medical certificates and keep all books or documents regarding such examinations or tests; and

d. subject to the provisions of regulation 67.00.9, advise the Director on any matter connected with such examinations, tests or aviation medical examiners and on the training of flight crew and cabin crew in first aid.

e. The designation referred to in sub-regulation (2) shall be made in writing and shall be published in the Gazette within 30 days from the date of such designation.

f. The powers and duties referred to in sub-regulation (2) shall be exercised and performed according to the conditions, rules, requirements, procedures, and standards prescribed in Document SA-CATS 67.

g. The designated body or institution shall permit an authorised officer, inspector or authorised person to carry out such safety inspections and audits which may be necessary to verify the effective performance of the designated functions in terms of regulation 67.00.3(2).

h.

9.2. 67.00.4: Designation of aviation medical examiners

1. The Director may, after consultation with the designated body or institution, designate aviation medical examiners to perform medical examinations or tests required for the issuing of medical certificates.
2. The conditions and requirements for and the rules, procedures and standards connected with a designation referred to in sub-regulation (1) shall be as prescribed in Document SA-CATS 67.
3. The Director shall sign and issue to each DAME a document which shall state the full name of such aviation medical examiner and contain a statement that –
    a. such aviation medical examiner has been designated in terms of sub-regulation (1); and
    b. such aviation medical examiner is empowered to –
        i. perform the medical examination or test required for the issuing of the appropriate medical certificate;
        ii. subject to the provisions of regulation 67.00.8, issue such medical certificate; or
        iii. defer the issuing of such medical certificate pending an appropriate instruction from the designated body or institution.

9.3. 67.00.5 Class 4 medical certificates

1. Notwithstanding the provisions of regulation 67.00.4, any medical practitioner who is registered in terms of the Health Professions Council of South Africa, may perform a medical examination for the purpose of the issuing of a Class 4 medical certificate.
2. The provisions of regulations 67.00.7(1) and (2) apply with the necessary changes to an application for the issuing of a Class 4 medical certificate.
3. The medical practitioner concerned shall, within 60 days from the date on which the medical examination has been performed, submit the application to the designated body or institution for the verification of the application and the issuing of the medical certificate, together with any appropriate –
    a. supporting medical reports; and
    b. results of medical examinations or tests performed.
4. An applicant who complies with the appropriate medical requirements and standard referred to in regulation 67.00.2(6), shall be entitled to a medical certificate.
5. On receipt of the documents referred to in sub-regulation (3), the designated body or institution shall –
    a. verify the application concerned; and
    b. if the applicant complies with the appropriate medical requirements and standards referred to in sub-regulation 67.00.2(6), issue the medical certificate.
6. The designated body or institution may if a medical conclusion requires that –
    a. medical examinations or tests be performed at shorter intervals; or

b. additional examinations or tests be performed;
c. endorse the medial certificate with such requirement or limitation.

9.4. Period of validity of medical certificates 67.00.6

1. A Class 1 medical certificate shall, subject to sub-regulation (5), be issued for a period of –
   a. twelve (12) calendar months, calculated from the last day of the calendar month in which the medical certificate is issued, where the applicant is less than 40 years of age on the date on which the medical certificate is issued;
   b. six (6) calendar months in the case of an airline transport pilot (aeroplane or helicopter), engaged in single-crew commercial air transport operations, calculated from the last day of the calendar month in which the medical certificate is issued, where the applicant is 40 years of age or more on the date on which the medical certificate is issued
   c. twelve (12) calendar months in the case of an airline transport pilot (aeroplane or helicopter), engaged in multi-crew commercial air transport operations, calculated from the last day of the calendar month in which the medical certificate is issued, where the applicant is 40 years of age or more, but less than 60 years of age, on the date on which the medical certificate is issued
   d. twelve (12) calendar months in the case of a commercial pilot (aeroplane or helicopter), calculated from the last day of the calendar month in which the medical certificate is issued, where the applicant is 40 years of age or more, but less than 60 years of age, on the date on which the medical certificate is issued;
   e. six (6) calendar months in the case of a pilot as specified in subparagraphs (c) and (d), where the applicant is 60 years of age or more; and

2. A Class 1 medical certificate referred to in sub-regulations (1) (c) and (d) shall be valid, subject to the condition that the holder –

   submits a six (6) monthly medical report, if he or she has a medical disease or risk factor for which he or she receives regular treatment by his or her treating physician or DAME, and the report shall include:
   a. the nature of disease or risk factor;
   b. information regarding control of risk factors or disease;
   c. complications that have developed as a result of the disease or risk factor; and
   d. the type of treatment and side-effects of the treatment.

The licence holder should submit an annual follow-up blood test where applicable and adhere to the requirements of any Schedule or Protocol as detailed in Document SA-CATS 67, where applicable.

Class 2 and 3 Medical Certificates Period of Validity

3. A Class 2 and 3 medical certificates shall, subject to sub-regulation (5), be issued for a period of –
   a. in the case of Class 2 certificate, 60 months calculated from the last day of the calendar month in which the medical certificate is issued where the holder is less than 40 years of age;
   b. in the case of Class 3 certificate, 48 months calculated from the last day of the calendar month in which the medical certificate is issued where the holder is less than 40 years of age;
   c. 24 months, in the case where the holder of a Class 2 or Class 3 medical certificate has passed his or her 40th birthday;
   d. months, when the holder of a Class 2 or Class 3 medical certificate has passed his or her 50th birthday.

Class 4 Medical Certificates Period of Validity

4. A Class 4 medical certificate shall, subject to sub-regulation (5), be issued for a period not exceeding –
   a. sixty (60) calendar months, calculated from the last day of the calendar month in which the medical certificate is issued, where the applicant is less than 40 years of age on the date on which the medical certificate is issued; and
   b. thirty-six (36) calendar months, calculated from the last day of the calendar month in which the medical certificate is issued, where the applicant is 40 years of age or more on the date on which the medical certificate is issued.
5. Notwithstanding the provisions of sub-regulations (1), (2) (3) and (4), a DAME may, if indications require that –
   a. medical examinations or tests be performed at shorter intervals;
   b. additional examinations or tests be performed; or
   c. when the safe performance of the duties essential to the operation of an aircraft executed by the holder of such medical certificate, depends on a reduction in the period of validity of such medical certificate or compliance with any special limitation;
   d. reduce the period of validity of such medical certificate and endorse the medical certificate with the reason for such reduction or with any such requirement or limitation.

Medical Extension Requirement

   a. The holder of a medical certificate shall, at least 15 days immediately preceding the date on which such medical certificate expires, apply for the extension of such medical certificate.
   b. Notwithstanding the provisions of sub-regulations (1), (2), (3), (4) and (5), the Director may, on such conditions as he or she considers necessary, extend the medical certificate for a period not exceeding 30 days.

9.5. Application for Medical Certificate 67.00.7

1. An application for the issuing of a medical certificate shall be made on the appropriate prescribed form.
2. An applicant who attends a medical examination or test for the issuing of a medical certificate shall –
    a. produce proof of his or her identity;
    b. produce for inspection any licence held for which the certificate is required, and the most recent medical certificate held, if any; and
    c. provide the DAME with a personal statement of medical facts concerning personal, familial and hereditary history and sign a declaration confirming the accuracy, completeness and truthfulness of the information contained in the medical examination form.
3. Subject to the provisions of regulations 67.00.3(2)(c) and 67.00.4(3)(b)(iii), an applicant who complies with the appropriate medical requirements and standards referred to in regulation 67.00.2(6), shall be entitled to a medical certificate.
4. The DAME, after completing the medical examination, shall complete and sign the appropriate part of the medical examination form.
5. The DAME shall report to the medical assessor any individual case where, in the DAME's judgement, an applicant's failure to meet any requirement, whether numerical or otherwise, is such that exercise of the privileges of the licence being applied for or held is likely to jeopardize flight safety.

67.00.8 Verification

1. A medical certificate shall be issued by the DAME concerned on the appropriate prescribed form.
2. The DAME concerned shall, within 60 days from the date on which the medical certificate has been issued, submit the original application together with any appropriate –
    a. supporting medical reports; and
    b. results of medical examinations or tests performed, to the designated body or institution for verification purposes.
3. On receipt of the documents referred to in sub-regulation (2), the designated body or institution shall verify that the holder of the medical certificate complies with the appropriate medical requirements and standards referred to in regulation 67.00.2(6).
4. A medical certificate issued by a DAME, shall remain in force, subject to any requirement or limitation endorsed thereon and for the period for which it was issued, provided that the designated body or institution may –
    a. if the medical certificate has been issued to an applicant who does not comply with the appropriate medical requirements and standards referred to in regulation 67.00.2(6), cancel the medical certificate; or
    b. if medical conclusion requires that –

i. medical examinations or tests be performed at shorter intervals;
ii. additional examinations or tests be performed; or

c. when the safe performance of the duties essential to the operation of an aircraft, of the holder of the medical certificate, depends on compliance with any special limitation, endorse the medical certificate with such requirement or limitation.

5. Notwithstanding the provisions of this part, a medical assessor may, in exceptional circumstances, issue or renew a medical certificate to an applicant who does not meet some of the medical standards prescribed in this Part if –
   a. the accredited medical conclusion indicates that in special circumstances the applicant's failure to meet any requirement, whether numerical or otherwise, is such that exercise of the privileges of the licence applied for is not likely to jeopardize flight safety;
   b. the relevant ability, skills and experience of the applicant and operational conditions have been given due consideration; and
   c. the licence is endorsed with any special limitation when the safe performance of the licence holder's duties is dependent on compliance with such limitation.
6. For the purposes of sub-regulation (2), the words "original application" includes any incomplete application.

9.6. Duties of holder of medical certificate 67.00.9

1. The holder of a medical certificate shall –

   a. carry such medical certificate on his or her person when carrying out the duties as a flight crew member, an air traffic service personnel member or a cabin crew member, as the case may be;
   b. not under any circumstances act as a PIC, or in any other capacity as a flight crew member, an air traffic service personnel member or a cabin crew member, as the case may be –
      i. while he or she is aware of any medical condition or medication which could affect the validity of such medical certificate;
      ii. in the case of female licence holders, while pregnant during periods and under circumstances as prescribed in Document SA-CATS 67;
      iii. if the female holder has given birth in the preceding six weeks; or
      iv. after such medical certificate has expired;
   c. without undue delay, notify the designated body or institution of any –
      i. injury;
      ii. hospitalisation;
      iii. surgical operation or invasive procedure;

iv. regular use of medication;
v. pregnancy (in the case of female medical certificate holders);
vi. absence due to illness for a period of more than 21 days; or
vii. psychiatric treatment, which renders such holder unable to comply with the appropriate medical requirements and standards referred to in regulation 67.00.2(6).

2. For the purposes of sub-regulation (1)(c), the holder of a medical certificate shall, before such holder resumes the exercising of the privileges of the licence held by him or her, furnish the designated body or institution with proof that he or she has fully recovered from the decrease in medical fitness.
3. The holder of a Class 4 medical certificate shall, after the medical certificate has been issued to him or her, on an annual basis complete and submit to the designated body or institution the medical declaration as prescribed in Document SA-CATS 67.
4. No flight crew member shall –
    a. consume any alcohol less than 8 hours prior to the specified reporting time for operational duty or the commencement of a shift;
    b. commence an operational duty while the concentration of alcohol in any specimen of blood taken from any part of his or her body is more than 0,02 gram per 100 millilitres;
    c. consume alcohol during the operational duty period or whilst on standby for operational duty; and
    d. commence an operational duty period while under the influence of liquor or any drug having a narcotic effect.
5. Flight crew members shall not –
    a. exercise the privileges of their licences and related ratings while under the influence of any psychoactive substance which might render them unable to exercise these privileges safely and properly; and
    b. engage in any problematic use of substances.

9.7. Validations 67.00.10

1. The Director may, after consultation with the body or institution designated in terms of regulation 67.00.3, recognise a foreign medical report, medical assessment or medical certificate issued by an appropriate authority for the purpose of validating a foreign flight crew member's licence, air traffic service personnel's licence or cabin crew member's licence.

2. If, because of duty in a State or territory outside the Republic, deferral of the issuing of a South African medical certificate for a flight crew member or a cabin crew member, as the case may be, has to be made, such deferral shall not exceed –
    a. a single period of six months in the case of a flight crew member of an aircraft used in non-commercial operations; or
    b. two consecutive periods, each of three months, in the case of a flight crew member or a cabin crew member, as the case may be, of an aircraft used in commercial operations, provided that in each case a favourable medical report is obtained after examination by a designated examiner of the area concerned, or, in cases where such a designated medical examiner is not available, by a physician legally qualified to practice medicine in that area. A report of the medical examination shall be sent to the Authority where the licence is issued;
    c. in the case of a private pilot, a single period not exceeding 24 months where the medical examination is carried out by an examiner designated by the Contracting State in which the applicant is temporarily located. A report of the medical examination shall be sent to the Authority where the licence is issued.
3. After the expiry of the periods referred to in sub-regulation (2), the applicant will be required to undergo the appropriate medical examination as soon as he or she returns to the Republic.

67.00.10 Foreign Medical Applications

1. The Director may, after consultation with the body or institution designated in terms of regulation 67.00.3, recognise a foreign medical report, medical assessment or medical certificate issued by an appropriate authority for the purpose of validating a foreign flight crew member's licence, air traffic service personnel's licence or cabin crew member's licence.
2. If, because of duty in a State or territory outside the Republic, deferral of the issuing of a South African medical certificate for a flight crew member or a cabin crew member, as the case may be, has to be made, such deferral shall not exceed—
    a. a single period of six months in the case of a flight crew member of an aircraft used in non-commercial operations; or
    b. two consecutive periods, each of three months, in the case of a flight crew member or a cabin crew member, as the case may be, of an aircraft used in commercial operations: Provided that in each case a favourable medical report is obtained after examination by a designated

examiner of the area concerned, or, in cases where such a designated medical examiner is not available, by a physician legally qualified to practice medicine in that area. A report of the medical examination shall be sent to the Authority where the licence is issued;

c. in the case of a private pilot, a single period not exceeding 24 months where the medical examination is carried out by an examiner designated by the Contracting State in which the applicant is temporarily located. A report of the medical examination shall be sent to the Authority where the licence is issued.

3. After the expiry of the periods referred to in sub-regulation (2), the applicant will be required to undergo the appropriate medical examination as soon as he or she returns to the Republic.

9.8. Foreign Medical Examinations

1. The Director may recognise any foreign medical report, history and examination form and investigations issued by an appropriate authority for the purposes of renewing a flight crew member's licence.
2. The holder of the licence referred to in sub-regulation (1) shall submit all the medical records, which may include, but is not limited to, a history and examination form signed by both the licence holder and the examining doctor registered with the appropriate authority, and all relevant investigations.
3. All medical records submitted in terms of this regulation should be in English, or, if originally in a foreign language, translated into English by an official translator.

9.9. Period of validity of medical records 67.00.12

The records of a medical examination shall, for the purpose of issuing a medical certificate, be valid for a period not exceeding 90 days, and a medical certificate may not be issued after this period on the records of such examination.

9.10. Substance Abuse 67.00.13

1. If there is reasonable suspicion that the holder of a medical certificate is abusing substances, and thereby poses a risk to aviation safety, the medical officer designated in terms of regulation 67.00.1(2) may require such holder to undergo substance abuse testing, which shall be done as prescribed in Document SA-CATS 67.
2. Reasonable suspicion may be as a result of, but not limited to:

a. Observation of physical symptoms;
b. Physical, behavioural, performance indicators;
c. Direct observation of substance use;
d. A pattern of abnormal conduct/erratic behaviour;
e. Arrest or conviction for a drug related offence; or
f. Being the target of a criminal investigation for such an offence;
g. Evidence of tampering with previous substance test specimen;
h. Post rehabilitation.

3. The holder of a medical certificate must submit themselves within 48 hours of being required to do so, for preliminary substance abuse testing to a Collection Officer appointed by the Director, or to a DAME at the holder's expense, as prescribed in Document SA-CATS 67.
4. A holder of a medical certificate who has undergone preliminary testing must be informed of the results within three days of receipt thereof.
5. The medical officer referred to in sub-regulation (1) may suspend the medical certificate of a person who has received a non-negative result and such person must be subjected to further confirmatory testing.
6. The holder of a medical certificate who has received a negative result must be refunded of medical expenses incurred for collection and analysis of specimen in respect of the substance abuse testing.
7. The holder of a medical certificate who submits himself or herself after 48 hours of being required to do so is required to undergo confirmatory testing, as prescribed in the SA-CATS 67.
8. The medical officer designated in terms of regulation 67.00.1(2) shall suspend the medical certificate of a person who refuses to submit himself or herself to a substance abuse testing after being required to do so.
9. The holder of a medical certificate whose medical certificate is suspended in terms of sub-regulation (5) or (8) may appeal to the Director against the suspension within 14 days from the date of the suspension.
10. The provisions of regulation 185.00.6 apply, with the necessary changes, to an appeal lodged in terms of sub-regulation (9).
11. The site and specimen collection, packaging, transport and lab analysis must be done as prescribed in Document SA-CATS 67.

9.11. Suspension or cancellation of medical certificate 67.00.14

1. A medical officer designated in terms of regulation 67.00.1(2) may suspend a medical certificate if there is a reasonable suspicion that the holder of the medical certificate does not comply with the requirements prescribed in regulation 67.00.9.
2. The medical officer may require the holder of a medical certificate whose certificate has been suspended in terms of this regulation, to undergo medical examination at the holder's expense, at a medical specialist chosen by the medical officer.
3. A notice of the suspension of medical certificate contemplated in sub-regulation (1) must be given in writing, stating the reasons for the suspension.
4. Notwithstanding sub-regulation (3), the medical officer may notify the holder of the medical certificate of the suspension otherwise than in writing, provided that a written notification of such suspension is submitted to the holder immediately thereafter.
5. A person whose medical certificate is suspended in terms of sub-regulation (1) may appeal to the Director against the suspension within 14 days from the date of the suspension.
6. The provisions of regulation 185.00.6 apply, with the necessary changes, regarding the appeal contemplated in sub-regulation (5).
7. The holder of a medical certificate who succeeds in an appeal against the suspension shall be refunded the expenses referred to in sub-regulation (2).

9.12. Medical Confidentiality 67.00.15

1. Subject to the provisions of sub-regulation (2), all information provided by or on behalf of an applicant for a medical certificate, which is personal medical information, shall be confidential, and shall be used only in respect of the medical certificate and the entire medical certification process, unless otherwise authorised by the applicant.

2. Any medical practitioner employed by the designated body or institution shall ensure the protection of information referred to in sub-regulation (1) which is kept by such designated body or institution, provided that when medical information appears to be fraudulent, false or misleading, or when such medical information will jeopardise aviation safety, or when it is necessary for the purpose of an appeal in terms of regulation 67.00.13, the medical practitioner shall release to the Director such information for appropriate investigation and action.

Storage of Medical Records: Privacy, Confidentiality and Security of Patient Health Records

In terms of section 17 (1) of the National Health Act No. 61 of 2003, the person in charge of a health establishment in possession of a user's health records, must set up control measures to prevent unauthorised access to those records and to the storage facility in which, or system by which, records are kept. The above applies to the storage of all patient health records irrespective of the format of the record, whether electronic or hard copy. Ensuring secure and timely access to a patient's health record is essential in delivering safe and effective healthcare services. 6.4 All patient health records must be protected against improper access and disclosure. (i.e., storage facilities must have secure restricted and authorised access control, electronic data must be managed, stored and backed up using internationally accepted standards, e.g., ISO 27799:201, for information security management in health).

Ensure protection of patient confidentiality during electronic data transmission and when documents are being transferred between facilities and/or healthcare professionals. Patient health records should ideally be stored indefinitely particularly if this can be done using an electronic format. If this is not practical, a patient health record should be stored for at least a minimum of six (6) years as from the date that a patient health record has become dormant (dormancy commences at the time when a patient was last treated by a healthcare practitioner).

Ownership of Patient Health Records

A patient health record is owned by the health practitioner or the entity generating such a patient health record. A patient is entitled to have access and obtain the information contained in such a record (see section 9). In the case of state institutions, where records e.g., radiographs are the property of the institution, original records and images should be retained by the institution. Copies must, however, be made available to the patient (or referring health practitioner) on request for which a reasonable fee may be charged in terms of the Promotion of Access to Information Act (Act No. 2 of 2000). In cases where patients are required to pay for records and images (e.g., private patients or patients in private hospitals) such patients must be allowed to retain such records - unless the health practitioners deem it necessary to retain such records for purpose of monitoring treatment for a given period. Should the patient however require the records and / or images to further or protect an interest (e.g., such as consulting with another practitioner) he or she must be allowed to obtain the originals for these purposes.

As the ownership of patient health records in a multi-disciplinary practice depends on the legal structure of the practice, the governing body of such multi-disciplinary practice should ensure that these guidelines and the provisions of the Promotion of the Access to Information Act (Act No. 2 of 2000) relating to health records are adhered to. The Act requires public institutions to appoint information officers to administer access to information, and similar provisions apply to private bodies. Should a health practitioner in private practice (both in a single practice and in a partnership) pass away, his or her estate, which includes the patient health records, will be administered by the executor of the estate:

i. Should a practice be taken over by another health practitioner, the executor shall carry over the patient health records to the new health care professional.

ii. The new health practitioner is obliged to take reasonable steps to inform all patients regarding the change in ownership and that the patient could remain with the new health care practitioner or could request that their patient health records be transferred to another health care practitioner of their choice.

iii. Should the practice not be taken over by another health practitioner the executor should inform all patients in writing accordingly and transfer those patient health records to other health care practitioners as requested by individual patients;

iv. The remaining patient health records should be kept in safe keeping by the executor for a period of at least twelve (12) months with full authority to further deal with the files as he or she may deem appropriate, provided the provisions of the rules on professional confidentiality are observed;

v. It should be noted that certain partnership agreements may make specific provision for the management of a deceased partner's share in the partnership after the death of a partner and such management would include dealing with patient health records.

Access to Health Information and to Patient Health Records

Section 10 of the National Health Act (Act 61 of 2003) states that a health practitioner must provide a patient with a discharge report at the time of discharge from a health establishment. This report must always be in writing when discharging an inpatient. A verbal report can be provided in case of an outpatient, although it is not routinely recommended as a record have to be maintained on patient file. In terms of the law the following principles apply in regard to access to information in patient health records:

a) A health practitioner shall provide any person of age 12 years and older with a copy or abstract or direct access to his or her own records regarding medical treatment on request (Children's Act (Act No. 38 of 2005).

b) Where the patient is under the age of 16 years, the parent or legal guardian may make the application for access to the records, but such access should only be given on receipt of written authorization by the patient (Promotion of Access to Information Act (Act No. 2 of 2000).

c) Information about termination of a pregnancy may not be divulged to any party, except the patient herself, regardless of the age of the patient (Choice on Termination of Pregnancy Act (Act No. 92 of 1996).

d) A health practitioner shall provide any person of age 12 years and older with a copy or abstract or direct access to his or her own records regarding medical treatment on request (Children's Act (Act No. 38 of 2005).

e) Where the patient is under the age of 16 years, the parent or legal guardian may make the application for access to the records, but such access should only be given on receipt of written authorization by the patient (Promotion of Access to Information Act (Act No. 2 of 2000).

f) Information about termination of a pregnancy may not be divulged to any party, except the patient herself, regardless of the age of the patient (Choice on Termination of Pregnancy Act (Act No. 92 of 1996).

g) No health practitioner shall make information available to any third party without the written authorisation of the patient or a court order or where non-disclosure of the information would represent a serious threat to public health (National Health Act (Act No. 61 of 2003.

A health care practitioner may make available the patient health records to a third party without the written authorisation of the patient or his or her legal representative under the following circumstances:

i. Where a court orders the patient health records to be handed to the third party;

ii. Where the third party is a health care practitioner who is being sued by a patient and needs access to the records to mount a defence.

iii. Where the third party is a health practitioner who has had disciplinary proceedings instituted against him or her by the HPCSA and requires access to the patient health records to defend himself or herself.

iv. Where the health practitioner is under a statutory obligation to disclose certain medical facts, (e.g., reporting a case of suspected child abuse in terms of the Children's Act, (Act No. 38 of 2005)).

v. Where the non-disclosure of the medical information about the patient would represent a serious threat to public health (National Health Act (Act No. 61 of 2003).

In healthcare institutions, patient health records must be kept under the care and control of the responsible manager. Access to such patient health records shall be subject to compliance with the requirements of the Access to Information Act and such conditions as may be approved by the relevant authority. Protection of Personal Information Act (Act No. 4 of 2013) (POPIA) provides that special personal information, such as

religious beliefs, race, health or sex life, and biometric information may be processed by a health/medical professional, healthcare institutions or facilities or social services, if such information is necessary for the proper treatment and care for the data subject or patient for the administration of the institution or professional practice concerned.

Personal information should be kept confidential; and the rest of the conditions in POPIA should be complied with. 9.5.2 The POPI Act should be read in conjunction with Ethical Booklet 4- Seeking patients' informed consent: The ethical considerations, Ethical Booklet 5- Confidentiality: Protecting and providing information, and other rules and regulations of the HPCSA.

Checklist for Patient Health Record Keeping in Line with HPCSA

Good notes imply good practice, and the following checklist may serve to guide health care practitioners in the appropriate keeping of patient records:

a) Records should be complete, but concise.

b) Records should be consistent.

c) Self-serving or disapproving comments should be avoided in patient records. Unsolicited comments should be avoided (i.e., the facts should be described, and conclusions only essential for patient care made).

d) A standardised format should be used (e.g., notes should contain in order the history, physical findings, investigations, diagnosis, treatment, and outcome.

e) If the record needs alteration in the interests of patient care, a line in ink should be put through the original entry so that it remains legible; the alterations should be signed in full and dated; and, when possible, a new note should refer to the correction without altering the initial entry.

f) Copies of records should only be released after receiving proper authorisation.

g) Billing records should be kept separate from patient care records.

h) Attached documents such as diagrams, laboratory results, photographs, charts, etc. should always be labelled. Sheets of paper should not be identified simply by being bound or stapled together – each individual sheet should be labelled.

Signing of Official Documents in line HPCSA Guidelines

Rule 15 of the HPCSA's ethical rules states that:-

"Any student, intern or practitioner who, in the execution of his or her professional duties, signs official documents relating to patient care, such as prescriptions, certificates (excluding death certificates) patient records, hospital or other reports, shall do so by signing such document next to his or her initials and surname in block letters.

PART 67 TECHNICAL STANDARDS 67.00.4

General (all classes)

a. Impairment or sudden or subtle incapacitation.

Applicants must be free from any risk factor, disease, or disability, which renders them either unable, or likely to become suddenly unable, to perform assigned duties safely. These may include effects and/or adverse effects from the treatment of any condition and drugs or substances of abuse.

b. Medical deficiency: Applicants must be free from any of the following, if it results in a degree of functional incapacity likely to interfere with the safe operation of an aircraft of with the safe performance of their duties:

i. Congenital or acquired abnormality.

ii. Active, latent, acute, or chronic disability, disease or illness; and

iii. Wound, injury, or outcome of operation.

While physical medical and mental health forms the most important aspect of aviation medical examination it is important for the designated aviation medical examiners and medical assessors to emphasize health education and prevention of ill health for all applicants, with special emphasis on applicants who are under 40 years of age.

9.13. Class I medical certificates: Physical and mental standards

Applicants must have no established medical history or clinical diagnosis of –

Psychiatric

1. Any of the following conditions that are of a severity which renders the applicant incapable of safely exercising the privileges of the licence, or makes it likely that within two years of the assessment the applicant will be unable to safely exercise the privileges of the licence, will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation:

a. a psychotic disorder unless the psychosis was of toxic origin and there has been complete recovery.

b. alcohol or other psychoactive substance abuse or dependence.

c. character or behaviour disorder, severe enough to have resulted in an overt act.

d. any other psychiatric disorder.

e. an organic mental disorder.

f. a mental or behavioural disorder due to use of psychoactive substance, including dependence syndrome induced by alcohol or other psychoactive substances.

g. schizophrenia or schizotypal or delusional disorder.

h. a mood (affective) disorder.

i. a neurotic, stress-related or somatoform disorder.

j. a behavioural syndrome associated with physiological disturbance or physical factors.

k. a disorder of adult personality or behaviour, particularly if manifested by repeated overt acts.

l. mental retardation.

m. a disorder of psychological development.

n. a behavioural or emotional disorder with onset in childhood or adolescence; or

o. a mental disorder not otherwise specified.

2. An applicant who has a history of psychoactive substance abuse or dependence may apply for an exemption to the designated body or institution if the following circumstances exist –

a. the applicant has been under medical treatment for psychoactive substance abuse and the medical practitioner concerned, approved by the designated body or institution, certifies that the applicant is free from the effects of psychoactive substance abuse.

b. the applicant provides the name of a sponsor who is prepared to certify that the applicant no longer takes a psychoactive substance in any form. Such a sponsor must be a person acceptable to the designated body or institution for this purpose.

c. the applicant signs an undertaking not to take any psychoactive substance while holding a valid licence.

3. Any of the following conditions that are of a severity which renders the applicant incapable of safely exercising the privileges of the licence, or makes it likely that within two years of the assessment the applicant will be unable to safely exercise the privileges of the licence, will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation:

a. A psychotic disorder unless the psychosis was of toxic origin and there has been complete recovery.

b. Alcohol or other psychoactive substance abuse or dependence.

c. Character or behaviour disorder, severe enough to have resulted in an overt act.

d. Any other psychiatric disorder.

9.14. Class II medical certificates

Physical and mental standards

Applicants must have no established medical history or clinical diagnosis of –
Psychiatric

1. Any of the following conditions that are of a severity which renders the applicant incapable of safely exercising the privileges of the licence, or makes it likely that within two years of the assessment the applicant will be unable to safely exercise the privileges of the licence, will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation:

    a. a psychotic disorder, unless the psychosis was of toxic origin and there has been complete recovery;

    b. alcohol or other psychoactive substance abuse or dependence;

    c. character or behaviour disorder, severe enough to have resulted in an overt act;

    d. any other psychiatric disorder;

    e. an organic mental disorder;

    f. a mental or behavioural disorder due to use of psychoactive substance, including dependence syndrome induced by alcohol or other psychoactive substances;

    g. schizophrenia or schizotypal or delusional disorder;

    h. a mood (affective) disorder;

    i. a neurotic, stress-related or somatoform disorder;

    j. a behavioural syndrome associated with physiological disturbance or physical factors;

    k. a disorder of adult personality or behaviour, particularly if manifested by repeated overt acts;

    l. mental retardation;

    m. a disorder of psychological development;

    n. a behavioural or emotional disorder with onset in childhood or adolescence; or

    o. a mental disorder not otherwise specified.

2. An applicant who has a history of psychoactive substance abuse or dependence may apply for an exemption to the designated body or institution if the following circumstances exist –

    a. the applicant has been under medical treatment for psychoactive substance abuse and the medical practitioner concerned, approved by the designated body or institution, certifies that the applicant is free from the effects of psychoactive substance abuse;

    b. the applicant provides the name of a sponsor who is prepared to certify that the applicant no longer takes a psychoactive substance in any form. Such a sponsor must be a person acceptable to the designated body or institution for this purpose;

    c. the applicant signs an undertaking not to take any psychoactive substance while holding a valid licence.

3. Any of the following conditions that are of a severity which renders the applicant incapable of safely exercising the privileges of the licence, or makes it likely that within two years of the assessment the applicant will be unable to safely exercise the privileges of the licence, will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation:
    a. A psychotic disorder, unless the psychosis was of toxic origin and there has been complete recovery;

    b. Alcohol or other psychoactive substance abuse or dependence;

    c. Character or behaviour disorder, severe enough to have resulted in an overt act;

    d. Any other psychiatric disorder.

9.15. Class III medical certificates

Physical and mental standards

Applicants must have no established medical history or clinical diagnosis of –

Psychiatric

1. Any of the following conditions that are of a severity which renders the applicant incapable of safely exercising the privileges of the licence, or makes it likely that within two years of the assessment the applicant will be unable to safely exercise the privileges of the licence, will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation:

    a. psychotic disorder, unless the psychosis was of toxic origin and there has been complete recovery;

    b. alcohol or other psychoactive substance abuse or dependence;

c. character or behaviour disorder, severe enough to have resulted in an overt act;

d. any other psychiatric disorder;

e. an organic mental disorder;

f. a mental or behavioural disorder due to use of psychoactive substance; this includes dependence syndrome induced by alcohol or other psychoactive substances;

g. schizophrenia or schizotypal or delusional disorder;

h. a mood (affective) disorder;

i. a neurotic, stress related or somatoform disorder;

j. a behavioural syndrome associated with physiological disturbance or physical factors;

k. a disorder of adult personality or behaviour, particularly if manifested by repeated overt acts;

l. mental retardation;

m. a disorder of psychological development;

n. a behavioural or emotional disorder with onset in childhood or adolescence, or

o. a mental disorder not otherwise specified.

2. An applicant who has a history of psychoactive substance abuse or dependence may apply for an exemption to the designated body or institution if the following circumstances exist –

a. the applicant has been under medical treatment for psychoactive substance abuse and the medical practitioner concerned, approved by the designated body or institution, certifies that the applicant is free from the effects of psychoactive substance abuse;

b. the applicant provides the name of a sponsor who is prepared to certify that the applicant no longer takes a psychoactive substance in any form. Such a sponsor must be a person acceptable to the designated body or institution for this purpose;

c. the applicant signs an undertaking not to take any psychoactive substance while holding a valid licence.

3. Any of the following conditions that are of a severity which renders the applicant incapable of safely exercising the privileges of the licence, or makes it likely that within two years of the assessment the applicant will be unable to safely exercise the privileges of the licence, will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation:

a. A psychotic disorder, unless the psychosis was of toxic origin and there has been complete recovery;

b. Alcohol or other psychoactive substance abuse or dependence;

c. Character or behaviour disorder, severe enough to have resulted in an overt act;

d. Any other psychiatric disorder.

Effect of the flight environment

Proper visual performance is essential for flight crew and air traffic controllers if they are to carry out their duties safely and efficiently. In the flight environment the following factors should be kept in mind because they may reduce visual performance significantly:

a. high speed;

b. altitude;

c. inadequate cockpit illumination;

d. glare;

e. acceleration;

f. vibration;

g. poor ergonomics; and

h. adverse cabin environment.

The high speeds of modern aircraft while cruising and during take-off or landing make good static and dynamic vision and rapid reaction time particularly important. Visual perception is usually the first step in the reflex chain which initiates the motor activity to avoid collision.Altitude affects the quality and quantity of electromagnetic radiation to which the flight crew are exposed. During flight above clouds, sunlight is reflected upwards. This inverse light distribution leaves the instrument panel in shadow while the outside is very bright. The human visual system is designed to function best with illumination coming from above; in some aircraft with “bubble” canopies, flight over brightly lit clouds may be very uncomfortable. With increasing altitude, the sky becomes darker, and the contrast between objects seen against the sky increases.

In most commercial aircraft, cabin pressure is controlled but the slight degree of hypoxia experienced even in pressurised aircraft may impair dark adaptation, reduce visual fields and visual acuity, and cause a small increase in intraocular pressure. In prolonged flight, the low humidity of the cabin air may cause dryness and irritation of the mucous membranes, especially of the eyes and the nasopharynx. Space myopia, empty field myopia or night myopia may occur at high altitude or at any altitude when it is dark, owing to lack of visual targets outside the cockpit. Under low-contrast conditions a functional myopia of up to several dioptres may occur with blurred vision and loss of contrast sensitivity. Studies have shown that this kind of myopia is

relatively common.Inadequate cockpit illumination may produce visual problems. Low light levels cause reduced visual acuity and aggravate the symptoms of presbyopia making reading of small print difficult. Coloured maps may be difficult to see.

These problems may be accentuated when red lighting is used because of the chromatic aberration of the human eye. As much of the in-flight information in commercial aviation is gained from instruments, the minor gain in dark adaptation level using red light or low levels of white light is generally considered to be outweighed by the loss in overall visual performance.Furthermore, runway illumination on international airports throughout the world has now reached levels well above the absolute threshold of light perception. On the other hand, there are numerous situations in general aviation where some degree of dark adaptation is necessary. High acceleration forces are important in military aviation, agricultural flying and in aerobatics but less so in ordinary commercial flying. High G-forces may produce grey-out, blackout or red-out depending on the direction of the acceleration force.Vibration of cockpit instruments and printed material, especially in the 22–64 Hz range, may impair vision significantly. This is particularly troublesome in helicopters. Low frequency vibrations of 2–10 Hz encountered in turbulence or on rough runways can also degrade vision. Application of ergonomic principles and consideration of human factors have done a good deal to improve cockpit design and facilitate information flow to flight crew. Better instrument displays and thoughtful location of controls are found in many new aircraft but there is still room for improvement. Good visual function and adequate colour perception are necessary for proper use of the wide variety of maps, dials and gauges found in modern cockpits.

The Electronic Flight Instrument System (EFIS) in particular employs many different colours. Although these systems are designed to provide critical information in monochrome in the event of colour failure, it has been shown that the addition of colours facilitates the perceptual process and improves the understanding of geometrical figures. Colours are likely to be increasingly important in the virtual cockpit environment of the future. With ever-increasing sophistication of aircraft, the tendency for information overload remains, and colour discrimination in all parts of the spectrum is desirable. The older colour perception testing methods which were mainly concerned with congenital red-green defects in men will not suffice because they fail to detect yellow-blue defects which are frequently seen in gender-neutral acquired colour vision deficiencies.

9.16. Visual standards

9.16.1. Class I medical certificates

General

1. An applicant may not have –

   a. any condition or congenital abnormality of either eye or its attachments likely to impede the safe exercise of the privileges of the licence;

   b. any abnormality of visual fields or significant defect of binocular function;

   c. any manifest squint, or large errors of eye muscle balance (phoria);

   d. any anatomical or functional monocularity or substandard vision in one eye at initial issue of a Class 1 medical certificate. However, medical conclusion may permit experienced licence holders who develop monocularity or substandard vision to be granted a medical certificate with

appropriate restrictions after an adaptation period of at least six months following the loss of vision.

2. Monocularity means that either an eye is absent, or its vision cannot be corrected to better than 6/24. Such applicants require evaluation by an ophthalmologist to determine the cause of the visual loss. Fitness to fly will be determined on a case-by-case basis. The assessment will include practical flight testing by the SACAA.

3. For monocularity, the appropriate minimum restrictions initially are as follows:

   a. "If flying open cockpit aircraft, protective goggles not restricting visual field must be worn". (This must remain as a permanent restriction);

   b. "Any accompanying pilot must be made aware of the holder's monocular vision". (This must remain as a permanent restriction);

   c. "Not valid for flight as pilot-in-command by day or night until a satisfactory flight test has been completed with a flight examiner in each case". (This restriction may be removed at subsequent assessment, according to the results of the flight test, or amended to the endorsement in (d) below);

   d. "Not valid for flight as pilot-in-command by night until a satisfactory flight test has been completed with a flight examiner". (This restriction may be removed at subsequent assessment, according to the result of the flight test).

4. Substandard vision in one eye means one eye meets the required standards for a particular class of licence but the visual acuity of the other eye cannot be corrected to the required standards, i.e. central vision better than 6/24 but worse than 6/9, with normal visual fields. Such applicants require evaluation by an ophthalmologist to determine the cause of the visual loss. Fitness to fly will be determined on a case-by-case basis. A practical flight test by SACAA to evaluate visual performance may be required.

5. For substandard vision in one eye (vision between 6/12 and 6/24), the appropriate minimum restrictions are as follows –

   a. "Any accompanying pilot must be made aware of the holder's substandard vision in one eye". (This must remain as a permanent restriction);

   b. "Not valid for flight as pilot-in-command by night until a satisfactory flight test has been completed with a flight examiner". (This restriction may be removed at subsequent assessment, according to the results of the flight test.)

6. The relevant protocols are contained in Schedules 21 and 22.

Near vision and intermediate vision

1. Near vision: Applicants must be able to read N5 at a distance of 30-50 cm or have equivalent visual acuity of 6/9, 20/30.

2. Intermediate vision: An applicant must be able to read N14 at a distance of 100 cm or have equivalent visual acuity of 6/18, 20/100 at 100 cm.

3. An applicant who meets this standard only by use of spectacles may be granted a medical certificate provided this is endorsed with the following limitation: “Suitable corrective lenses must be readily available”.

4. This means that these must be available for immediate use when exercising the privileges of licence. This limitation may be satisfied by the availability of appropriate bifocal, trifocal or multifocal spectacles which permit the reading of instruments and a chart or manual held in one hand, without impeding the use of distance vision through the windscreen when wearing the spectacles. Single vision near correction (full lenses of one power only, appropriate to reading) is not acceptable, since wearing these significantly reduces distance visual acuity.

5. Near vision and intermediate vision should be recorded by ticking in the appropriate box if the pilot is able to see N5 at 30-50 cm and N14 at a distance of 100 cm respectively.

6. Near vision and intermediate vision should be tested using a Pocket Vision Screener.

Distant vision

1. Distant vision is to be examined with a 6 m Snellen Chart. A different chart is to be used for each eye. Visual acuity with and without correction must be recorded at each examination.

2. Distant visual acuity with or without correction shall be 6/9 or better in each eye separately, and binocular visual acuity shall be 6/6 or better. No limits apply to uncorrected visual acuity. Where this standard of visual acuity can be obtained only with correcting lenses, the applicant may be assessed as fit, provided that –

    a. the medical certificate is endorsed with the following limitation: “Suitable corrective lenses must be worn for distance vision”;

    b. such correcting lenses are worn during the exercise of the privileges of the licence or rating applied for or held; and

    c. in addition, a pair of suitable correcting spectacles is kept readily available during the exercise of the privileges of the applicant’s licence.

3. An applicant accepted as meeting these provisions is deemed to continue to do so unless there is reason to suspect otherwise, in which case an ophthalmic report is required at the discretion of the SACAA. Both uncorrected and corrected visual acuity are normally measured and recorded at each re-examination. Conditions which indicate a need to obtain an ophthalmic report include: a substantial decrease in the uncorrected visual acuity, any decrease in best corrected visual acuity, and the occurrence of eye disease, eye injury or eye surgery.

4. Applicants may use contact lenses to meet this requirement, provided that –

    a. the lenses are monofocal and non-tinted.

b. the lenses are well tolerated; and

c. a pair of suitable correcting spectacles is kept readily available during the exercise of the licence privileges.

5. Applicants who use contact lenses may not need to have their uncorrected visual acuity measured at each re-examination provided the history of their contact lens prescription is known.

6. Applicants with a large refractive error shall use contact lenses or high-index spectacle lenses.

7. Applicants whose uncorrected distant visual acuity in either eye is worse than 6/60 shall be required to provide a full ophthalmic report prior to initial medical assessment and every five years thereafter. The purpose of the required ophthalmic examination is to ascertain normal visual performance, and to identify any significant pathology.

8. Applicants who have undergone surgery affecting the refractive status of the eye shall be assessed as unfit unless they are free from those sequelae which are likely to interfere with the safe exercise of their licence and rating privileges.

9. An applicant shall have the ability to read, while wearing the correcting lenses, if any, required by subsection (2), the N5 chart or its equivalent at a distance of 30-50 cm and the ability to read the N14 chart or its equivalent at a distance of 100 cm. If this requirement is met only by the use of near correction, the applicant may be assessed as fit provided that this near correction is added to the spectacle correction already prescribed in accordance with subsection (2). If no such correction is prescribed, a pair of spectacles for near use shall be kept readily available during the exercise of the privileges of the licence. When near correction is required, the applicant shall demonstrate that one pair of spectacles is sufficient to meet both distant and near visual requirements.

10. An applicant who needs near correction to meet this requirement will require “look-over”, bifocal or perhaps multifocal lenses in order to read the instruments and a chart or manual held in the hand, and also to make use of distant vision, through the windscreen, without removing the lenses. Single vision near correction (full lenses of one power only, appropriate for reading) significantly reduces distant visual acuity and is therefore not acceptable. Whenever there is a requirement to obtain or renew correcting lenses, an applicant is expected to advise the refractionist of reading distances for the visual flight deck tasks relevant to the types of aircraft in which the applicant is likely to function.

11. When near correction is required in accordance with the above paragraph, a second pair of near-correction spectacles shall be kept available for immediate use.

12. The applicant shall be required to have normal fields of vision.

13. The applicant shall be required to have normal binocular function.

14. Reduced stereopsis, abnormal convergence not interfering with near vision, and ocular misalignment where the fusional reserves are sufficient to prevent asthenopia and diplopia need not be disqualifying.

Dioptre limits

A need for corrective lenses for either eye within the range of plus or minus 5 dioptres (spherical equivalent) may be accepted, provided that the distance visual acuity without correction is not worse than 6/60 in each eye separately. Spectacle lenses outside this range are not routinely acceptable, but medical conclusion may permit an applicant to be assessed as fit on production of satisfactory specialist reports. The medical certificate will, where appropriate, be endorsed with the following –

a. "Contact lenses must be worn"; and

b. "Spare spectacles must be readily available".

9.16.2. Class II Medical Certificates

Visual standards

1. An applicant may not have –

   a. any condition or congenital abnormality of either eye or its attachments likely to impede the safe exercise of the privileges of the licence;

   b. any abnormality of visual fields or binocular function;

   c. any manifest squint, or large errors of eye muscle balance (phoria).

   d. any anatomical or functional monocularity or substandard vision in one eye at initial issue of a Class 2 medical certificate. However, medical conclusion may permit experienced licence holders who develop monocularity or substandard vision to be granted a medical certificate with appropriate restrictions after an adaptation period of at least 6 months following the loss of vision.

2. Monocularity means that either an eye is absent, or its vision cannot be corrected to better than 6/24. Such applicants require evaluation by an ophthalmologist to determine the cause of the visual loss. Fitness to fly will be determined on a case-by-case basis. The assessment will include practical flight testing by SACAA.

3. For monocularity, the appropriate minimum restrictions initially are as follows –

   a. "If flying open cockpit aircraft, protective goggles not restricting visual field must be worn". (This must remain as a permanent restriction);

   b. "Any accompanying pilot must be made aware of the holder's monocular vision". (This must remain as a permanent restriction);

   c. "Not valid for flight as pilot-in-command by day or night until a satisfactory flight test has been completed with a flight examiner in each case". (This restriction may be removed at subsequent assessment, according to the results of the flight test, or amended to the endorsement in (d) below);

d. "Not valid for flight as pilot-in-command by night until a satisfactory flight test has been completed with a flight examiner". (This restriction may be removed at subsequent assessment, according to the result of the flight test).

4. Substandard vision in one eye means one eye meets the required standards for a particular class of licence but the visual acuity of the other eye cannot be corrected to the required standards, i.e. central vision better than 6/24 but worse than 6/18, with normal visual fields. Such applicants require evaluation by an opthalmologist to determine the cause of the visual loss. Fitness to fly will be determined on a case-by-case basis. In doubtful cases, a practical flight test by SACAA, to evaluate visual performance may be required.

5. For substandard vision in one eye (vision between 6/18 and 6/24), the appropriate minimum restrictions are as follows

   a. "Any accompanying pilot must be made aware of the holder's substandard vision in one eye". (This must remain as a permanent restriction);

   b. "Not valid for flight as pilot-in-command by night until a satisfactory flight test has been completed with a flight examiner". (This restriction may be removed at subsequent assessment, according to the results of the flight test).

6. The relevant protocols are contained in Schedules 21 and 22.

Near vision and intermediate vision

1. Near vision: Applicants must be able to read N5 at a distance of 30-50 cm or have equivalent visual acuity of 6/9, 20/30.

2. Intermediate vision: An applicant must be able to read N14 at a distance of 100 cm or have equivalent visual acuity of 6/18, 20/100 at 100 cm.

3. An applicant who meets this standard only by use of spectacles may be granted a medical certificate provided this is endorsed with the following limitation: "Suitable corrective lenses must be readily available".

4. This means that these must be available for immediate use when exercising the privileges of licence. This limitation may be satisfied by the availability of appropriate bifocal, trifocal or multifocal which permit the reading of instruments and a chart or manual held in one hand, without impeding the use of distance vision through the windscreen when wearing the spectacles. Single vision near correction (full lenses of one power only, appropriate to reading) is not acceptable, since wearing these significantly reduces distance visual acuity.

5. Near vision and intermediate vision should be recorded by ticking in the appropriate box if the pilot is able to see N5 at 30-50 cm and N14 at a distance of 100 cm respectively.

6. Near vision and intermediate vision should be tested using a Pocket Vision Screener.

Distant vision

1. Distant vision is to be examined with a 6m Snellen Chart. A different chart is to be used for each eye. Visual acuity with and without correction must be recorded at each examination.

2. Distant visual acuity with or without correction shall be 6/12 or better in each eye separately, and binocular visual acuity shall be 6/9 or better. No limits apply to uncorrected visual acuity. Where this standard of visual acuity can be obtained only with correcting lenses, the applicant may be assessed as fit provided that:

    a. the medical certificate is endorsed with the following limitation: “Suitable corrective lenses must be worn for distance vision”.

    b. such correcting lenses are worn during the exercise of the privileges of the licence or rating applied for or held; and

    c. in addition, a pair of suitable correcting spectacles is kept readily available during the exercise of the privileges of the applicant’s licence.

3. An applicant accepted as meeting these provisions is deemed to continue to do so unless there is reason to suspect otherwise, in which case an ophthalmic report is required at the discretion of the SACAA. Both uncorrected and corrected visual acuity are normally measured and recorded at each re-examination. Conditions which indicate a need to obtain an ophthalmic report include: a substantial decrease in the uncorrected visual acuity, any decrease in best corrected visual acuity, and the occurrence of eye disease, eye injury or eye surgery.

4. Applicants may use contact lenses to meet this requirement provided that:

    a. the lenses are monofocal and non-tinted.

    b. the lenses are well tolerated; and

    c. a pair of suitable correcting spectacles is kept readily available during the exercise of the licence privileges.

5. Applicants who use contact lenses may not need to have their uncorrected visual acuity measured at each re-examination provided the history of their contact lens prescription is known.

6. Applicants with a large refractive error shall use contact lenses or high-index spectacle lenses.

7. Applicants whose uncorrected distant visual acuity in either eye is worse than 6/60 shall be required to provide a full ophthalmic report prior to the initial medical assessment and every five years thereafter. The purpose of the required ophthalmic examination is to ascertain normal visual performance and to identify any significant pathology.

8. Applicants who have undergone surgery affecting the refractive status of the eye shall be assessed as unfit unless they are free from those sequelae which are likely to interfere with the safe exercise of their licence and rating privileges.

9. The applicant shall have the ability to read, while wearing the correcting lenses, if any, required by (2), the N5 chart or its equivalent at a distance of 30-50 cm. If this requirement is met only by the use of near correction, the applicant may be assessed as fit provided that this near correction is added to the spectacle correction already prescribed in accordance with (2) ; if no such correction is prescribed, a pair of spectacles for near use shall be kept readily available during the exercise of the privileges of the licence. When near correction is required, the applicant shall demonstrate that one pair of spectacles is sufficient to meet both distant and near visual requirements.

10. An applicant who needs near correction to meet this requirement will require "look-over", bifocal, or perhaps multifocal lenses in order to read the instruments and a chart or manual held in the hand, and also to make use of distant vision, through the windscreen, without removing the lenses. Single vision near correction (full lenses of one power only, appropriate for reading) significantly reduces distant visual acuity and is therefore not acceptable. Whenever there is a requirement to obtain or renew correcting lenses, an applicant is expected to advise the refractionist of reading distances for the visual flight deck tasks relevant to the types of aircraft in which the applicant is likely to function.

11. When near correction is required in accordance with the above paragraph, a second pair of near-correction spectacles shall be kept available for immediate use.

12. The applicant shall be required to have normal fields of vision.

13. The applicant shall be required to have normal binocular function.

14. Reduced stereopsis, abnormal convergence not interfering with near vision, and ocular misalignment where the fusional reserves are sufficient to prevent asthenopia and diplopia need not be disqualifying.

Dioptre limits

A need for corrective lenses for either eye within the range of plus or minus 5 dioptres (spherical equivalent) may be accepted, provided that the visual acuity without correction is not worse than 6/60 in each eye separately. Spectacle lenses outside this range are not routinely acceptable, but medical conclusion may permit an applicant to be assessed as fit on production of satisfactory specialist reports. The medical certificate will be, where appropriate, endorsed with the following:

a. "Contact lenses only must be worn"; and

b. "Spare spectacles must be readily available".

9.16.3. Class III medical certificates

Visual standards

General

An applicant may not have –

a. any condition or congenital abnormality of either eye or its attachments likely to impede the safe exercise of the privileges of the licence;

b. any abnormality of visual fields or binocular function;

c. any manifest squint, or large errors of eye muscle balance (phoria).

d. any anatomical or functional monocularity or substandard vision in one eye at initial issue of a Class 3 medical certificate. However, medical conclusion may permit experienced licence holders who develop monocularity or substandard vision to be granted a medical certificate with appropriate restrictions after an adaptation period of at least 6 months following the loss of vision.

1. Monocularity means that either an eye is absent, or its vision cannot be corrected to better than 6/24. Such applicants require evaluation by an ophthalmologist to determine the cause of the visual loss. Fitness to be licensed will be determined on a case-by-case basis. Practical testing in the Air Traffic Control environment is a requirement.

2. Substandard vision in one eye means one eye meets the required standards for a particular class of licence but the visual acuity of the other eye cannot be corrected to the required standards, i.e. central vision better than 6/24 but worse than 6/12, with normal visual fields. Such applicants require evaluation by an ophthalmologist to determine the cause of the visual loss. Fitness to be licenced will be determined on a case-by-case basis. Practical testing in the Air Traffic Control environment may be required.

3. The relevant protocols are contained in Schedules 21 and 22.

Near vision and intermediate vision

1. Near vision: Applicants must be able to read N5 at a distance of 30-50 cm or have equivalent visual acuity of 6/9, 20/30.

2. Intermediate vision: An applicant must be able to read N14 at a distance of 100 cm or have equivalent visual acuity of 6/18, 20/100 at 100 cm.

3. An applicant who meets this standard only by use of spectacles may be granted a medical certificate provided this is endorsed with the following limitation: “Suitable corrective lenses must be readily available”.

4. This means that these must be available for immediate use when exercising the privileges of the licence. This limitation may be satisfied by the availability of appropriate bifocal, trifocal, or multifocal spectacles, which permit the reading of displays and a chart or manual held in one hand, without impeding the use of distance vision when wearing the spectacles. The wearing of single vision near correction (full lenses of one power only, appropriate to reading), significantly reduces distance visual acuity and is not acceptable in an air traffic control tower. Nevertheless, full lenses may be acceptable in a radar room in which case the medical certificate must be endorsed with the following:

5. Applicants who use contact lenses may not need to have their uncorrected visual acuity measured at each re-examination provided the history of their contact lens prescription is known.

6. Applicants with a large refractive error shall use contact lenses or high-index spectacle lenses.

7. Applicants whose uncorrected distant visual acuity in either eye is worse than 6/60 shall be required to provide a full ophthalmic report prior to initial medical assessment and every five years thereafter. The purpose of the required ophthalmic examination is to ascertain normal visual performance, and to identify any significant pathology.

8. Applicants who have undergone surgery affecting the refractive status of the eye shall be assessed as unfit unless they are free from those sequelae which are likely to interfere with the safe exercise of their licence and rating privileges.

9. The applicant shall have the ability to read, while wearing the correcting lenses, if any, required by (2), the N5 chart or its equivalent at a distance of 30-50 cm and the ability to read the N14 chart or its equivalent at a distance of 100 cm. If this requirement is met only by the use of near correction, the applicant may be assessed as fit provided that this near correction is added to the spectacle correction already prescribed in accordance with (2) ; if no such correction is prescribed, a pair of spectacles for near use shall be kept readily available during the exercise of the privileges of the licence. When near correction is required, the applicant shall demonstrate that one pair of spectacles is sufficient to meet both distant and near visual requirements.

10. An applicant who needs near correction to meet this requirement will require “look-over”, bifocal, or perhaps multifocal lenses in order to read the instruments and a chart or manual held in the hand, and also to make use of distant vision, through the windscreen, without removing the lenses. Single vision near correction (full lenses of one power only, appropriate for reading) significantly reduces distant visual acuity and is therefore not acceptable. Whenever there is a requirement to obtain or renew correcting lenses, an applicant is expected to advise the refractionist of reading distances for the visual flight deck tasks relevant to the types of aircraft in which the applicant is likely to function.

11. When near correction is required in accordance with the above paragraph, a second pair of near-correction spectacles shall be kept available for immediate use.

12. The applicant shall be required to have normal fields of vision.

13. The applicant shall be required to have normal binocular function.

14. Reduced stereopsis, abnormal convergence not interfering with near vision, and ocular misalignment where the fusional reserves are sufficient to prevent asthenopia and diplopia need not be disqualifying.

Dioptre limits

A need for corrective lenses for either eye within the range of plus or minus 5 dioptres (spherical equivalent) may be accepted, provided that the visual acuity without correction is not worse than 6/60 in each eye separately. Spectacle lenses outside this range are not routinely acceptable, but medical conclusion may

permit an applicant to be assessed as fit on production of satisfactory specialist reports. The medical certificate will be, where appropriate, endorsed with the following:

a. "Contact lenses only must be worn"; and

b. "Spare spectacles must be readily available".

Colour Vision Standards (Class I and II Pilots)

Colour perception standards Class III

1. Applicants are required to undergo the Ishihara Test (24 and 38 Plates) as per the Colour Vision Protocol.

2. Applicants who fail the Ishihara Plates are required to undergo Lantern Testing at the Institute of Aviation Medicine.

Note: Research for ATC for Colour Assessment Diagnosis (CAD) is still under investigation.

Colour perception standards (Class 4)

Not applicable.

Ear, nose and throat and hearing standards

9.16.4. Class I medical certificate

Ear, nose and throat and hearing standards

1. Applicants must have no established medical history or clinical diagnosis of the following:

   a. Any pathological process, acute or chronic, of the internal ear or middle ear cavities;

   b. Any unhealed (unclosed) perforation of the tympanic membranes, except that an applicant with a single dry perforation may be eligible for a certificate if the defect does not prevent compliance with the hearing standards;

   c. Any chronic or serious recurrent obstruction of the Eustachian tubes;

   d. Any serious or recurrent disturbance of the vestibular system;

   e. Any obstruction to free nasal air entry to both sides;

f. Any serious malformation, or serious acute or chronic condition of the buccal cavity or upper respiratory tract;

g. Any speech defect likely to interfere with the safe performance or duties in exercising the privileges of the licence.

2. Applicants must be free from any hearing defect, which would interfere with the safe exercise of the privileges of the licence.

3. Applicants for Class 1 medical certificate shall be tested by pure-tone audiometry at first issue of the assessment, not less than once every five years up to the age of 40 years, and thereafter not less than once every two years.

4. Alternatively, other methods providing equivalent results may be used.

5. Applicants shall demonstrate a hearing performance sufficient for the safe exercise of their licence and rating privileges;

6. At medical intervals prescribed in subsection (3), where audiometry is not performed, applicants shall be tested in a quiet room by a whispered and spoken voice test.

7. For the purpose of a hearing test, a quiet room is a room in which intensity of background noise is less than 35db(A).

8. For the purpose of a hearing test, the sound level of an average conversational voice at 1 m from the point of output (lower lip of the speakers) is c.60dB(A) and that of a whispered voice c.45dB(A), at 2 cm from the speaker, is 6 dB(A) lower.

9. The pure-tone audiometry shall be calibrated as per the standard of the current Audiometric Test Method.

10. Applicants who are unable to hear an average conversational voice in a quiet room, using both ears, at a distance of 2 m from the examiner and with the back turned to the examiner, shall be assessed as unfit.

11. When tested by pure-tone audiometry, an applicant with a hearing loss in either ear separately, of more than 35 dB at any of the frequencies 500, 1 000 or 2 000 Hz, or more than 50 dB at 3 000 Hz, shall be assessed as unfit.

12. An applicant with a hearing loss greater than the one prescribed in subsection (11) may be declared fit, provided that the applicant has normal hearing performance against a background noise that reproduces or simulates the masking properties of flight deck noise upon speech and beacon signals.

13. It is important that the background noise be representative of the noise in the cockpit of the type of aircraft for which the applicant's licence and ratings are valid.

14. In the speech material for discrimination testing, both aviation relevant phrases and phonetically balanced words shall be used.

15. Alternatively, a practical hearing test conducted in-flight in the cockpit of an aircraft of the type for which the applicant's licence and ratings are valid may be used.

Electrocardiography

Applicability

This protocol is applicable to classes I, II and III applicants.

Resting ECG

Resting ECG shall be performed at the following intervals: Class 1

a. at initial medical examination;

b. every 2 years between the age of thirty (30) and fifty (50);

c. annually after the age of fifty (50).

Resting ECG shall be performed at the following intervals Class 2

a. at initial medical examination;

b. first exam after the age of 40;

c. every 2 years after the age of fifty (50).

Resting ECG shall be performed at the following intervals Class 3

a. at initial medical examination;

b. every 2 years after the age of fifty (50).

Procedure for resting ECG

1. A resting ECG shall be recorded with the subject at rest in a warm environment.

2. The skin should be prepared with spirit or abrasive, or both.

3. A resting ECG is performed using a 12-lead standard ECG machine, and chest leads should be placed accurately.

4. Leads V1 and V2 should be placed in the fourth inter-costal spaces on either side of the sternum.

5. Lead V4 is placed at the position of the apex of the normal heart – the fifth inter-costal space in the mid-clavicular line.

6. Lead V3 is placed midway between V2 and V4. Leads V5 and V6 are placed at the same level as V4 in the anterior and mid-axillary lines, respectively.

7. The limb leads are placed on the right and left arms, and the right and left legs, respectively.

Interpretation

1. All ECGs are to be interpreted by a DAME trained in ECG reading who would refer to a cardiologist or specialist physician when in doubt.

Stress ECG:Indications for stress ECG

a. Stress ECG shall be performed in the following circumstances:

b. Any abnormal resting ECG;

c. The following risk indications should be considered in determining the necessity of a stress ECG: Hypertension, Smoking, Dyslipidaemia, Diabetes Mellitus, Raised BMI, waist circumference/abdominal obesity, family history of early onset of cardiovascular disease.

d. In accordance with the cardiovascular risk assessment algorithm: for all applicants classified as moderate, high or very high risk in accordance with the algorithm, provided that:

   i. Stress ECG for moderate risk applicants may be performed by a DAME; and

   ii. Stress ECG for high or very high-risk applicants shall only be performed by a cardiologist or a specialist physician.

Procedure for Stress ECG

1. Stress ECG is performed using a 12-lead standard ECG machine displaying at least three leads simultaneously and optimally filtered and damped. The leads should be placed as for a standard resting ECG, except that the limb leads are positioned on the shoulders and the iliac crests on each side.

2. Recordings should be made at rest in the erect and supine positions, and after hyperventilation for 10 seconds. The subject should be exercised to 85% of maximal heart rate or symptom limitation, whichever comes first, and be expected to complete at least three stages (nine minutes) of the Bruce Protocol or achieve an oxygen uptake equivalent to 11 metabolic equivalents (METs). The age-predicted maximum heart rate is calculated by subtracting the age in years from 220 beats per minute (bpm). The test is most sensitive when taken to symptom limitation rather than any percentage of the age-predicted maximum. If exercise needs to be terminated due to symptom development, the licence holder should be referred to a cardiologist (if stress is performed by DAME). The reason for discontinuing the test should be recorded together with the presence or absence of any symptom.

3. Immediately post-stress, while the license holder is in the upright position, twelve (12) second recordings should be made at the following intervals: 0, 3, 5 and 7 minutes. If there is any indication, recordings can be taken at two (2) minute intervals up to 11 minutes. Any abnormalities on stress ECG shall be referred to a cardiologist if the stress ECG is performed by a DAME.

4. A standardised protocol, such as the Bruce treadmill protocol 3 or equivalent, should be employed. The Bruce protocol is not the only one available, but it is the most widely used.

Intervals

1. Stress ECG shall be performed in accordance with the cardiovascular risk assessment algorithm.

2. Applicants classified as moderate, high, or very high risk shall have an annual stress-ECG (if some positive actions are taken to reduce or mitigate the risk of those classified as moderate, an annual stress-ECG is probably not necessary, assuming the first one was negative).

Chest Radiography Requirements: Class I medical certificates

1. Chest radiography, anterior-posterior, and lateral views must form part of the respiratory system assessment for the initial issue of a Class 1 medical certificate.

2. Periodic chest radiography is usually not necessary but may be a necessity in situations where asymptomatic pulmonary disease can be expected.

3. It is, however, understood that a degree of interpretation and flexibility must always be exercised at the discretion of the medical examiner and the medical assessor, taking into consideration not only medical but also operational and environmental factors of relevance for the overall aviation medical fitness of an applicant.

4. All licence holders who have a clinical indication for chest radiography may be required to submit chest radiography at more frequent intervals.

5. Licence holders may be referred to the relevant protocols.

Class II medical certificates

1. Chest radiography, anterior-posterior, and lateral views must form part of the respiratory system assessment for the initial issue of a Class 2 medical certificate.

2. Periodic chest radiography is usually not necessary but may be a necessity in situations where asymptomatic pulmonary disease can be expected.

3. It is, however, understood that a degree of interpretation and flexibility must always be exercised at the discretion of the medical examiner and the medical assessor, taking into consideration not only medical but also operational and environmental factors of relevance for the overall aviation medical fitness of an applicant.

4. All licence holders who have a clinical indication for chest radiography may be required to submit chest radiography at more frequent intervals.

5. Licence holders may be referred to the relevant protocols.

Class III medical certificates

1. Chest radiography, anterior-posterior, and lateral views, must form part of the respiratory system assessment for the initial issue of a Class 3 medical certificate.

2. Periodic chest radiography is usually not necessary but may be a necessity in situations where asymptomatic pulmonary disease can be expected.

3. It is, however, understood that a degree of interpretation and flexibility must always be exercised at the discretion of the medical examiner and the medical assessor, taking into consideration not only medical but also operational and environmental factors of relevance for the overall aviation medical fitness of an applicant.

4. All licence holders who have a clinical indication for chest radiography may be required to submit chest radiography at more frequent intervals.

5. Licence holders may be referred to the relevant protocols.

Flow-Volume Lung Function Test -Class I medical certificates

1. Flow-volume lung function testing must form part of the respiratory assessment for the initial issue of a Class I medical certificate under the age of 40 years.

2. The flow-volume lung function testing shall be done again at the first medical examination after the age 40, and again at the first medical examination after the age of 50.

3. For active smokers*, the requirement for flow-volume lung function testing shall be not less than every 24 months (biennially) for licence holders under the age of 40 and not more than every 12 months (annually) after the age of 40.

4. All licence holders who have a clinical indication for lung function testing will be required to submit a lung function test at more frequent intervals.

5. Licence holders may be referred to the relevant protocols.

Class II medical certificates

1. Flow-volume lung function testing must form part of the respiratory assessment for the initial issue of a Class 2 medical certificate under the age of 40 years.

2. The flow-volume lung function testing shall be done again at the first medical examination after the age 40, and again at the first medical examination after the age of 50.

3. For active smokers*, the requirement for flow-volume lung function testing shall be not less than every 24 months (biennially) for licence holders under the age of 40 and not more than every 12 months (annually) after the age of 40.

4. All licence holders who have a clinical indication for lung function testing will be required to submit a lung function test at more frequent intervals.

5. Licence holders may be referred to the relevant protocols.

Class III medical certificates

1. Flow-volume lung function testing must form part of the respiratory assessment for the initial issue of a Class 3 medical certificate under the age of 40 years.

2. The flow-volume lung function testing shall be done again at the first medical examination after the age 40, and again at the first medical examination after the age of 50.

3. For active smokers*, the requirement for flow-volume lung function testing shall be not less than every 24 months (biennially) for licence holders under the age of 40 and not more than every 12 months (annually) after the age of 40.

4. All licence holders who have a clinical indication for lung function testing will be required to submit a lung function test at more frequent intervals.

5. Licence holders may be referred to the relevant protocols.

Class IV medical certificates

1. Flow-volume lung function testing must form part of the respiratory assessment for the initial issue of a Class 4 medical certificate under the age of 40 years.

2. The flow-volume lung function testing shall be done again at the first medical examination after the age 40, and again at the first medical examination after the age of 50.

3. For active smokers*, the requirement for flow-volume lung function testing shall be not less than every 24 months (biennially) for licence holders under the age of 40 and not more than every 12 months (annually) after the age of 40.

4. All licence holders who have a clinical indication for lung function testing will be required to submit a lung function test at more frequent intervals.

5. Licence holders may be referred to the relevant protocols.

**Note: Active smoker refers to an individual who engages in the act of intentional inhalation of tobacco smoke from any tobacco product, including but not limited to, manufactured and hand rolled cigarettes, cigars, pipe tobacco and cigarillos. Active smoking does not refer to passive smoking which is the unintentional inhalation by non-smokers of tobacco smoke introduced into the atmosphere by smokers or smoking of any other substances such as herbal cigarettes or marijuana. The consumption of tobacco products by other means, such as chewing, is also excluded from this standard.*

10. SECTION 4: TECHNICAL STANDARDS (MEDICAL PROTOCOLS)

10.1. Neurological or Neuropsychological Protocols

a. Head injuries
b. Post-traumatic epilepsy (PTE)
c. The post-traumatic syndrome
d. Epilepsy
e. Syncope
f. Narcolepsy
g. Transient memory loss
h. Headache
    i. migraine
    ii. cluster
    iii. tension
    iv. other
i. Stroke
j. Brain tumours
k. Parkinson's disease

10.2. Cardiovascular Protocols

a. Hypertension
b. Coronary artery disease protocol
c. Atrial Flutter & Atrial Fibrillation
d. Incomplete Right Bundle Branch Block
e. Complete Right Bundle Branch Block
f. Partial Complete Left Bundle Branch Block
g. Left Anterosuperior and Left Anterosuperior Fascicular Hemiblocks
h. Antero-Ventricular Block
i. Mobitz Type 2 Atrioventricular Block and Complete Anterosuperior Block
j. Abnormal ECG Tracing
k. Brugada Syndrome
l. Brugada Pattern

m. Prolonged QT Syndrome
n. Ventricular Tachycardia & Supraventricular Tachycardia
o. Radio-Frequency Ablation
p. Uncorrected Aortic Stenosis
q. Corrected Aortic Stenosis
r. Uncorrected Aortic Incompetence
s. Corrected Aortic Incompetence
t. Rheumatic Mitral Stenosis /Mitral Valve Regurgitation
u. Non-Rheumatic & Non-Ischaemic Mitral Regugitation
v. Aortic Valve Replacement
w. Mitral Valve Replacement

10.3. Respiratory Protocols

a. Asthma
b. Spontaneous Pneumothorax
c. Traumatic Pneumothorax
d. Chronic obstructive airways disease
e. Thoracic Surgery
f. Obstructive Sleep Apnoe
g. Pulmonary tuberculosis
h. Obesity

10.4. Endocrinology

a. Diabetes mellitus
b. Addison's disease
c. Type 1 Diabetic Mellitus Class 2 & 3
d. Type 1 Diabetes Class 1

10.5. Oncology

a. Malignant melanoma
b. Oesophageal cancer
c. Colorectal cancer
d. Breast cancer
e. Testicular cancer

f. Prostate cancer
g. Renal carcinoma
h. Bladder cancer
i. Lymphomas
j. Leukaemia

10.6. Psychiatry

a. Mood disorder protocol

10.7. Others

a. Obstetrics and gynaecology
b. Single kidney protocol
c. HIV/AIDS protocol
d. Substance abuse
e. Warfarin protocol
f. Colour perception deficiency protocol
g. Lasik
h. Rheumatoid arthritis
i. The use of Plavix
j. Bone marrow transplant

11. SECTION 5

Protocol on Neurological or Neurosurgical Problems

11.1. Epilepsy

Applicability

Section 1 of this Schedule 1 Protocol is only applicable to classes I, II, III and IV medical certificates and it excludes cabin crew.

Aeromedical considerations

An applicant diagnosed with epilepsy is medical unfit to be granted a medical certificate to fly.

Important concepts

a. Diagnosis of a single epileptic attack means that the applicant is permanently unfit to fly.

b. No applicant who has had a convulsion after the age of 5 years shall be considered for pilot training.

c. Any inexplicable loss of consciousness (LOC) shall be regarded as epilepsy until otherwise diagnosed.

d. An applicant with a history of a single, uncomplicated febrile convulsion between the ages of one and five years shall be eligible for pilot training. If, however, the convulsion was complicated, the applicant shall no longer be eligible for pilot training under the following conditions:

   i. a convulsion before the age of one year. This holds the risk for mental retardation and epilepsy later in life;

   ii. multiple febrile convulsions;

   iii. duration of convulsions longer than 5 minutes; or

   iv. lateralising signs during febrile convulsions.

11.1.1. Epilepsy for Cabin Crew

Applicability
Section 2 of this Schedule 1 Protocol is applicable to cabin crew only.

General medical requirements

1. Any cabin crew member diagnosed with epilepsy is medical unfit to fly.

2. Cabin crew applicant may be considered for recertification by the Aeromedical Committee after a one (1) year period has lapsed following initiation of medication.

3. On application for recertification the applicant shall be required to submit the following:

   a. A neurologist report stating that he or she is adequately functional on acceptable medication without significant side effects;

   b. A brain CT scan film/MRI scan; and

   c. A 16 lead EEG.

4. If an applicant suffers a seizure while on medication, he or she is medically unfit to fly and shall be submit the reports referred in subsection 3).

5. If there is a change in medication, the applicant shall be grounded for six (6) months and shall be required to provide a neurologist report stating stability on the new medication.

Restrictions

The cabin crew with epilepsy is restricted to operate under the following conditions:

a. short haul flights only;

b. under supervision or in pairs.

11.1.2. Benign Rolandic Epilepsy of childhood

Applicability

This medical standard is applicable to classes I, II, III, and IV medical certificates.

Operational considerations

Diagnosis of Benign Rolandic Epilepsy is disqualifying for classes I, II, III and IV medical certification.

Operational restrictions

The following are applicable operational restrictions:

i. Class I: Multi-crew, or with a co-pilot;

ii. Class II: Safety pilot;

iii. Class III: With constant supervision; and

iv. Class IV and cabin crew: No restriction

General information on Benign Rolandic Epilepsy of childhood

a) Benign Rolandic Epilepsy with centro-temporal spike is another type of childhood seizure disorder. It is derived from the Rolandic area of the brain and common in children with a close family history of epilepsy.

b) This seizure disorder is benign with the average age of 6-8 years and most children outgrow it during adolescence. It typically involves twitching, numbness, tingling of the child's face or tongue occurring mostly during sleep.

c) The symptoms may interfere with speech and cause drooling, and they last no longer than two minutes. The child remains fully conscious with EEG spikes on motor and temporal lobes of the brain.

Medical Requirements

a) An applicant with Benign Rolandic Epilepsy with centro-temporal spikes may be considered for medical certification after a minimum observation period of five (5) years or more, as the condition is self-limiting.

b) An applicant shall be seizure free and not using medication for this period.

c) The applicant shall be required to submit a comprehensive neurologist report:

d) A 16 lead EEG with provocation;

e) Brain CT/MRI scan film; and

f) All cases shall be presented to the Aeromedical Committee for consideration.

Febrile Childhood Seizures/Convulsions

General

1) The occurrence of a single seizure is disqualifying for all classes of medical certification unless it is a proven febrile seizure of childhood.

2) One seizure under between the age of 1 to 5 years, clearly associated with an episode of febrile illness is acceptable.

3) The following complications shall render an applicant medically unfit to fly:

a) A seizure that occurred under the age of 1 year;
b) Multiple seizures;
c) A seizure that lasted more than 5 minutes; and
d) Lateralising signs associated with a seizure.

4)A neurologist report is mandatory for all cases with febrile childhood seizures/convulsions.

Operational implications

The occurrence of a single seizure is disqualifying for all classes of medical certification.

Aeromedical implications

Medical certification may be granted following a single uncomplicated febrile seizure when all studies are normal and there are no risk factors for recurrence.

Medical Requirements

1. An applicant with a history of febrile convulsions may be considered for certification provided it was a single uncomplicated seizure.

2. The applicant with a history of febrile convulsions shall provide the following:

a. A comprehensive neurologist report;
b. A 16 lead EEG; and
c. A brain CT/MRI scan film.

11.1.3. Single Seizure

Applicability

This medical standard is applicable to classes I, II, III and IV medical certificates.
Cabin crew with a single seizure may be considered by the Medical Assessor on a case-by-case basis.

Operational Implications

The occurrence of a single seizure is disqualifying for all classes of medical certification with the exception of cabin.

11.1.4. General information in relation to classification of seizures

Classification of Seizures

a) Cryptogenic seizures: These seizures were previously classified as idiopathic, and the aetiology is unknown with no associated previous brain insult. These applicants are known to have a high risk of developing epilepsy.

b) Symptomatic seizures: These are seizures that are caused by a previously known or suspected disorder of the brain known to increase the risk to develop epilepsy. It can be acute, following an acute disorder like metabolic disturbances (i.e. hypoglycemia, hypernatremia, infections, toxins and brain trauma).

c) It is subdivided into: Acute symptomatic (occurring less than a week after the brain insult) and remote symptomatic (occurring a week or more after the brain insult).

11.1.5. Risk factors for developing a Second Seizure or Epilepsy

a. Age younger than 16 years at first seizure presentation.
b. Remote symptomatic seizures following a stroke or lesion location.
c. Seizures occurring between midnight and 08:59 am.
d. Previous provoked seizures and previous febrile seizures.
e. Family history of epilepsy.
f. Status epilepticus or multiple seizures within 24 hours as the remote symptomatic seizures.
g. History of neurological deficit at birth, e.g. cerebral palsy or mental retardation.
h. EEG that shows epileptiform discharges.
i. Brain tumour on CT scan.

Requirements for consideration

1) An applicant shall be presented to the Aeromedical Committee for consideration on a case-by-case basis.

2) When an applicant suffers from his or her first ever seizure, a thorough search for cause and risk factor stratification is appropriate and the following information or medical record shall be required:

a. History of seizures in immediate family;
b. History of febrile seizures;
c. Prior acute symptomatic seizure;
d. History of remote neurological insult;
e. Neurologist report;
f. Cerebral imaging study (CT scan film); and
g. Abnormal EEG.

3) Applicant's recurrence risk shall be approximately 30% over five years.

4) In the case of an applicant with absence of recurrence without medication in five years (5), his or her risk may then become acceptable for medical certification and the applicant shall submit the following:

a) A comprehensive neurologist;
b) 16 channel EEG for 15 minutes, with provocation; and
c) An MRI/CT scan.

5) If a cause for a seizure is not found, the pilots or ATCs shall be temporarily taken off from their safety operations duties for a duration of not less than five years (5) years.

6) The medical certificate applied for by the applicant referred to in paragraph 5 above hall not be granted until the applicant is five-years seizure-free and a medication-free observation period has been achieved.

7) If a cause for a seizure is not found, the recreational pilot shall be temporarily taken off from his or her safety operations duties for a duration of not less than two (2) years and the medical certificate applied for shall not be granted until a two-year seizure-free and medication-free observation period has been achieved.

8) If a cause is found for the seizure, such a cause shall be treated, and the grounding period shall be determined by the cause of the seizure and the risks associated with the underlying cause by the aeromedical committee.

9) An applicant who complies with the requirements of section 5.3 may be declared medical fit to fly.

10) Such applicant shall be restricted to fly "As or with co-pilot" for two years.

11) An applicant shall be required to repeat all investigations referred to in subsection 4) after 5 years.

11.1.6. Follow-Up Requirements

1) The applicant shall submit the following reports for a follow-up:

2) A 6-monthly comprehensive neurologist report for the first two years;

i. A 16 lead EEG;

ii. A CT brain film;
iii. Any report on new symptoms or change in medical status immediately; and
iv. An annual neurologist report after the third year.

11.2. Migraines

Applicability

1. This medical standard is applicable to classes I, II, III and IV medical certificates.
2. Cabin crew with migraine may be considered on a case-by-case basis.

11.2.1. Classification of migraines

Migraine with aura (classic)

Focal neurological phenomena preceding or accompanying the attack 5-20 minutes lasting 60 minutes.

i. Visual aura:
ii. Photopsia;
iii. Geometric forms;
iv. Objects seem to rotate;
v. Macropsia;
vi. Scotomata; and
vii. Mosaic vision.

Sensory: Paraesthesia, often migratory, lasting for minutes and can be bilateral.

i. Motor: Weakness; and Ataxia.
ii. Language: Dysarthria or aphasia.
iii. Headache usually follows within 60 minutes.
iv. If the headache is delayed, most people do not return to normal/pre-aura state.
v. Migraine without aura (common)
vi. General information on migraine without headache or migraine equivalents
vii. Periodic neurologic phenomena not followed by headache;Must be differentiated from TIA and focal seizures;
viii. Transient visual disturbances with flickering and scotomata; and
ix. Generally associated with cerebrovascular embolic or thromboembolic disease.

Medical Requirements for Applicants with Migraines

1) Any applicant diagnosed with migraine shall be declared medically unfit to fly and shall provide the following upon diagnosis:

   i) A comprehensive neurologist report confirming the diagnosis and stating the frequency of attacks, type of aura, duration of prodromal period;

   ii) A brain CT scan; and

   iii) A 16 lead EEG.

2) Applicant may be considered for recertification by the Medical Assessor after a minimum of six (6) months' observation period.

3) On application for recertification the applicant shall provide a comprehensive neurologist report, stating the following:

   i. The applicant is stable on acceptable medication with documented effectiveness for prevention or treatment of migraine attack;

   ii. The applicant does not suffer from visual auras;

   iii. The applicant does not suffer from severe incapacitating headaches;

   iv. The frequency of headaches is low, featuring one to two migraine episodes a year with gradual onset; and

   v. The applicant does not need unacceptable medication to abort, treat or prevent the migraine.

11.2.2. Cluster Headache

Applicability

a) This medical standard is applicable to classes I, II, III and IV medical certificates.

b) Cabin crew with cluster headache may be considered on a case-by-case basis and may be fit for their duties

General information on Cluster Headache

The disorder is characterised by:

i. Severe, strictly unilateral pain, typically in the retro-orbital and fronto-temporal areas;

ii. Association with symptoms and signs of cranial autonomic dysfunction (tearing, conjunctival injection, rhinorrhea/nasal congestion, and Horner's syndrome), ipsilateral to the pain;

iii. A duration of 15-180 minutes if untreated;

iv. Pain of cluster headaches which may be intolerable and unpredictable; and

v. Anxiety and depression, which are common among people with cluster headaches, which may affect functioning and quality of life.

General information on two (2) variants:

i. Episodic cluster headache: at least two cluster periods lasting from seven days to one year, separated by a one-month remission period; and

ii. Chronic cluster headache: occurring without remission or remission of < one month for over a year.

Medical Requirement for Cluster Headache

1) An applicant diagnosed with cluster headache shall be declared medically unfit to fly and shall provide the following upon diagnosis:

   i. A comprehensive neurologist report stating the frequency of attacks, severity of attacks and medication used for the headache;

   ii. A brain CT Scan; and

   iii. A 16 lead EEG.

2) An applicant may be considered for recertification after a one-year observation period has lapsed.

3) The applicant shall be on acceptable medication for the treatment of the cluster headache attacks.

11.2.3. Mild Head Injury or Traumatic Brain Injury (TBI)

Applicability

1) The requirement for mild head injury or traumatic brain injury (TBI) shall be applicable to classes I, II, III and IV medical certificates.

2) General information on characteristics of mild head injury or traumatic brain injury

3) A mild head injury or traumatic brain injury (TBI) shall be characterised by the following features:

   i. Loss of consciousness: 0-30 minutes;

   ii. Alteration of consciousness: from a moment up to 24 hours;

   iii. Post-traumatic amnesia (PTA): 0-1 day;

   iv. Glasgow Coma Scale (GCS – best score in first 24 hours): 13-15; and

   v. No neurological deficits or skull fracture.

Medical Requirements

a) The applicant shall be grounded for seven days (7) following the head injury.

b) Any fleeting loss of consciousness or altered consciousness shall deem the applicant to be medically unfit and the applicant shall be grounded for six weeks (6) .

c) A mild traumatic brain injury with no alteration of consciousness and normal examination by a neurologist may be considered for medical recertification.

d) The applicant shall be required to submit a brain CT scan and may be certified by the Aeromedical Committee.

11.2.4. Moderate head injury or traumatic brain injury (TBI)

Applicability

a) This requirement is applicable to classes I, II, III and IV medical certificates.

b) Cabin crew with moderate head injury may be considered on a case-by-case basis.

General

Characteristics of moderate head injury or traumatic brain injury are as follows:

i. Loss of consciousness of between 30 minutes and 24 hours;

ii. Alteration of consciousness of more than 24 hours;

iii. Post-traumatic amnesia of more than one (1) day but less than seven (7) days; and

iv. Best Glasgow Coma Scale of nine to twelve (9-12) in 24 hours.

Medical Requirements

1) Upon diagnosis, the applicant is grounded and shall submit the following for consideration:

   i. A neurologist report;

   ii. A brain CT Scan film; and

   iii. A 16 lead EEG with provocation.

2) The applicant diagnosed with moderate traumatic head injury may be considered for recertification by the Aeromedical Committee, provided the observation period of at least two (2) years following injury has lapsed.

3) On application for recertification, the applicant shall provide the following:

   i. A comprehensive neurologist report stating that the applicant has been stable, and no seizures were reported;

   ii. A brain CT scan film; and

   iii. A 16 lead EEG with provocation.

11.2.5. Severe head injury or traumatic brain injury (TBI)

Applicability

a) This medical standard for severe head injury or traumatic brain injury (TBI) shall be applicable to classes I, II, III and IV medical certificates.

b) Cabin crew with severe head injury may be considered on a case-by-case basis.

General information for Severe Head Injury or Traumatic Brain Injury (TBI)

The characteristics of severe head injury or traumatic brain injury (TBI) shall be as follows:

i. Neurological and intellectual impairment;
ii. Loss of consciousness of more than twenty-four (24) hours;
iii. Alteration of consciousness of more than twenty-four (24) hours;
iv. Post-traumatic amnesia lasting more than seven (7) days; and
v. Best Glasgow Coma Scale of less than nine (9) in 24 hours.

Medical Requirements Head Injury

1) Upon diagnosis, the applicant will be deemed unfit, and the applicant will be required to submit the following:

   i. An MRI scan (brain)
   ii. A 16 lead EEG with standard provocation;
   iii. A neuropsychometric evaluation by a Clinical Psychologist; and
   iv. A neurologist report.

2) An applicant diagnosed with severe traumatic brain injury shall be deemed to be temporary unfit for a period of at least five (5) years;

3) The applicant may be considered for recertification by the Aeromedical Committee after a five-years observation period has lapsed

Follow-Up Reports following withdrawal of medical certificate

1) Following the five-years observation period, the applicant shall provide the following for recertification consideration:

   i. A neurologist report;
   ii. A 16 lead EEG with provocation;
   iii. A brain MRI scan film; and
   iv. A neuropsychometric evaluation from a clinical psychologist.

2) The applicant's cognitive function and risk of seizure shall not compromise aviation safety.

11.2.6. Post-Traumatic Syndrome (Concussion)

The requirements for post-traumatic syndrome (concussion) shall be applicable to classes I, II, III and IV medical certificates.

General

a) Each case in relation to post-traumatic syndrome (concussion) shall be considered on its own merits by the Aeromedical Committee.

b) An applicant with concussion without any neurological sequelae may be considered for recertification after one (1) month and shall provide the following:

i. A neurologist report;
ii. A brain CT scan film; and
iii. A 16 lead EEG report.

11.2.7. Syncope

1) The medical standard for syncope shall be applicable to classes I, II, III and IV medical certificates.

2) Cabin crew with syncope may be considered on a case-by-case basis.

General information on Syncope

a) Syncope is a loss of consciousness (usually fleeting) due to decreased cerebral perfusion.

b) Applicant who has a history of syncope shall be fully assessed, as there are many organic (cardiovascular, neurological) diseases that may cause syncope.

Medical Requirements following q diagnosis of Syncope

Applicant presenting with syncope shall comply with the following requirements:

i. The applicant shall declared be temporarily medical unfit upon diagnosis;
ii. The applicant may be considered by the Aeromedical Committee for recertification after a period of at least three (3) months has lapsed if there were two (2) or less attacks and after least six (6) months if there were multiple attacks;
iii. A comprehensive neurologist report with clinical history and the circumstances surrounding it and the cause of the syncope shall be fully investigated;
iv. A comprehensive cardiologist report with an ECG; and
v. Blood including, Full Blood Count (FBC), Urea and Electrolytes (U&E) and Pregnancy Studies.

11.2.8. Transient Memory Loss or Global Amnesia

Applicability

This medical standard for transient memory loss or global amnesia shall be applicable to classes I, II, II and IV medical certificates.

Cabin crew with transient memory loss or global amnesia shall be considered on a case-by-case basis.

Medical Requirements

a) The applicant presenting with Transient Global Amnesia shall comply with the following requirements:
b) An applicant shall be declared medical unfit for a minimum period of one (1) year;
c) The cause of the amnesia shall be investigated;
d) An investigation shall include an EEG and an MRI Scan of the brain and to exclude ischaemic brain injuries and epilepsy; and
e) An applicant may be declared medical fit to fly after one (1) year if all investigations are normal.

11.2.9. Brain Tumours

i. The medical standards for brain tumours shall be applicable to classes I, II, III and IV medical certificates.

ii. Cabin crew with brain tumours may be considered on a case-by-case basis.

Medical Requirements

Benign Supra-Tentorial Tumours (meningioma)

a) An applicant presenting with benign supra-tentorial tumours shall be declared temporary medical unfit upon diagnosis, for a period of two (2) years.

b) Following successful surgery, the applicant may be considered for recertification by the Aeromedical Committee after at least two (2) years of observation.

c) On application for recertification the applicant shall provide the following:

   i. A Brain MRI scan film;
   ii. A Neurologist report; and
   iii. An Oncologist report.

d) After successful recertification, the applicant must submit the following:

   i. An annual Neurologist report; and

ii. An annual Oncologist report.

e) Following radiation therapy, the Aeromedical Committee may review each case on its own merit and consider recertification after a ten (10) year observation period has lapsed, provided the therapy was focal radiotherapy.

Benign Infra-Tentorial Tumours

a) An applicant presenting with benign infra-tentorial tumours shall be declared temporary medical unfit upon diagnosis.

b) The applicant may be considered for recertification by the Aeromedical Committee after one (1) year, following successful removal, and the applicant shall provide the following:

i. A Brain MRI scan film;
ii. A Neurologist report; and
iii. An Oncologist report.

c) Follow-Up Requirements for Benign Infra-Tentorial Tumours

d) After successful recertification, the applicant shall submit the following:

e) The applicant shall be declared medical unfit upon diagnosis and shall provide the following:

i. A neurologist report confirming the diagnosis;
ii. A brain CT scan film; and
iii. An ophthalmologist report with comment on visual fields.

f) The applicant may be considered for recertification after six (6) months provided he or she has no headaches, is off medication or on acceptable medication and the visual fields are normal.

Follow-Up Requirements for Pseudo-Tumor Cerebri

On application for recertification, the applicant shall provide the following:

i. A Neurologist report; and
ii. An Ophthalmologist report.

Malignant Tumour of the Brain

An applicant diagnosed with malignant intra-cranial tumour is medically unfit to fly.

16.1.10 Multiple Sclerosis

a) The multi sclerosis (MS) medical standard shall be applicable to classes I, II, III and IV medical certificates.

b) General information on multiple sclerosis

c) It is an immune-mediated disease of the central nervous system characterised by multiple white matter plaques of demyelination that pose a major threat to neurological functions.

d) Symptoms vary widely depending on the nerve involved and the amount of nerve damage.

e) Some people may lose the ability to function independently while others may be on remission for long periods. Most diagnoses are made in the 20s and 30s.

f) The common presenting symptoms are optic neuritis or visual disturbances and/or sensory disturbances and sufferers may also present with tremor, ataxia, cognitive problems and bowel and bladder disturbances.

g) There is a relapsing-remitting course and new symptoms develop over days or weeks and remit for months.

h) Small increases in temperature may worsen the symptoms.

There are two types:

a) Primary progressive MS: This type has a gradual onset and steady progression of symptoms without relapse; and

b) Secondary progressive MS: relapsing remitting MS, eventually develop a steady progression of symptoms with some periods of remission.

c) Complications include muscle stiffness or spasms, paralysis, depression, epilepsy, mood and memory problems.

Operational Considerations

Any renewal applicant diagnosed with multiple sclerosis is declared temporarily unfit.

Aeromedical Considerations

a) The applicant may be considered for recertification by the Aeromedical Committee after an observation period of six (6) months has lapsed.

b) On application for recertification the applicant shall submit the following:

i. A neurologist report;

ii. Blood and cerebro-spinal fluid oligoclonal bands;

iii. An IGG index;

iv. A Brain and Spinal cord MRI scan film;

v. An Ophthalmologist report; and

vi. A Neuropsychologist report.

c) After successful recertification, the applicant shall provide a neurologist and ophthalmologist report every six (6) months.

d) The applicant shall be declared medically unfit on follow-up if the following develops:

i. Neurological deficit after exacerbation;

ii. Visual loss;

iii. Sensory disturbances on hands;

iv. Mood instability;

v. Vertigo; and

vi. Any convulsions.

vii. Infections

16.1.11 Meningitis and Encephalitis

Applicability

The medical standard for infections shall be applicable to classes I, II, III and IV medical certificates.

General

a) An applicant diagnosed with meningitis or encephalitis shall be declared medically temporarily unfit.

b) The applicant may be considered for recertification by the Aeromedical Committee after an observation period of six (6) month has lapsed.

c) Recertification shall depend on the degree of deficit or recovery and the risk of developing hydrocephalus.

d) On application for recertification the applicant shall provide a neurologist report.

11.2.10. Brain abscess

a) Each case shall be assessed on its merit considering the location of the abscess (infra-tentorial or supra-tentorial) and the nature of the neurological deficit.

b) There shall be a high incidence of seizures.

c) The decision to recertify shall be referred to the Aeromedical Committee after an observation period of at least six (6) months has lapsed.

d) On application for recertification the applicant must submit the following:

i. Neurologist report; and

ii. Brain MRI scan film

11.2.11. Neurosyphilis

a) Neurological deficits usually persist even after successful treatment.

b) An applicant shall be assessed for neurological deficit or degree of recovery.

c) Recertification shall depend on the functional capacity following treatment and shall be referred to the Medical Assessor.

d) Recertification may be considered after an observation period of six (6) months has lapsed.

e) On application for recertification the applicant shall submit the following:

i. A Neurologist report; and

ii. In the case of a specific occupation, a functional assessment report from the Occupational Therapist shall also be considered.

11.2.12. Dementia

Applicability

The medical standards for dementia shall be applicable to classes I, II, III and IV medical certificates.

General Requirements

i. An applicant with dementia shall be declared medically unfit to fly.

ii. In the small number of cases where the cause of the dementia is known and the condition has been resolved, the applicant may be considered for recertification.\

11.2.13. Stroke

16.1.15.1 Transient Ischaemic Attack (TIA)

Applicability

This protocol is applicable to classes I, II, III and IV medical certificates.

General Medical Requirement

1) Any applicant presented with symptoms of suggestive of a TIA shall be assessed thoroughly to exclude risk of sudden medical incapacitation.

2) The applicant may be considered for recertification by the Authority at least after at least six (6) months of observation.

3) The applicant shall be unfit upon diagnosis and shall provide the following for reconsideration of his or her medical fitness:

    i. A Comprehensive Neurologist report; and
    ii. A Brain CT Scan Film.

4) The diagnosis of a TIA may be difficult to be determined with certainty and an applicant who presents with symptoms suggestive of a TIA should be thoroughly assessed.

5) The presence of an asymptomatic bruit is associated with an increased risk for a stroke, and 6-monthly examinations shall be done thereafter. The following conditions are disqualifying –

    i. Cerebral infarct, embolism, or haemorrhage; and
    ii. Cerebral aneurysm or A-V malformation, and the applicant may be made fit after surgical repair (not proximal ligation or “packing”) if an angiogram done after 1 year shows successful repair.

6) The incidental discovery of an asymptomatic occlusion of a cerebral vessel shall not make an applicant unfit, but the applicant shall be fully assessed.

16.1.15.2 Ischaemic Stroke

Applicability

This medical standard is applicable to classes I, II, III and IV medical certificates.

General Requirements

1) An applicant diagnosed with ischaemic stroke shall be declared medically unfit.

2) The cause shall be addressed, and risk of recurrence shall be minimal.

3) There shall be no neurological deficit.

4) The applicant may be considered for recertification by the Authority after an observation period of two (2) years has lapsed.

5) Flexibility shall be applied by the Authority to the applicant with a history of ischaemic stroke who is applying for a cabin crew and Class 4 medical certificate: and

6) On application the applicant shall provide the following:

   i. A neurologist report;
   ii. A brain CT scan film;
   iii. A 16 lead EEG; and
   iv. A clinical psychologist report .

16.1.15.3 Haemorrhagic Stroke

Applicability

This technical standard is applicable to classes I, II, III and IV medical certificates.

General Requirements

1) An applicant diagnosed with a haemorrhagic stroke shall be declared medically unfit and shall provide the following upon diagnosis:

   i. A Neurologist report;
   ii. A Brain CT scan;
   iii. A 16 Lead EEG; and
   iv. A Clinical Psychologist report.

2) The applicant may be considered for recertification by the Authority after an observation period of two (2) years has lapsed;

3) An applicant with subarachnoid bleeding may be considered by the Authority after an observation period of at least one (1) year, following a successful isolation of the source with no neurological deficit.

4) Flexibility on the period of observation shall be applied by the Authority in respect of applicants with a history of ischaemic stroke who is applying for a cabin crew and Class 4 medical certificate.

11.2.14. Parkinson's Disease

Applicability

This medical standard is applicable to classes I, II, III and IV medical certificates.

General

a) An applicant diagnosed with Parkinson's disease shall be declared medically unfit upon diagnosis.

b) The applicant may be considered by the Authority after an observation period of six (6) months has lapsed and the applicant is stable on acceptable medication.

c) On application for recertification the applicant shall provide the following:

i. A Neurologist report;

ii. A Clinical Psychologist report on neurocognitive functioning; and

iii. An undertaking to undergo the Authority's supervised Simulator Test.

d) After successful recertification, the applicant shall provide a neurologist report to the Authority every six (6) months.

1. ATRIAL FIBRILLATION AND ATRIAL FLUTTER

Applicability

This protocol applies to Class 1, 2 and 3.

Initial Medical Requirements

On initial diagnosis, an applicant or a holder of a medical certificate shall:

(a) be declared as temporary medically unfit for at least 3 months post successful ablation.

(b) submit a Cardiologist assessment report'

(c) be required to submit a 24 Hour Holter (3 Holter's over 2 to 3 months showing no AF);

(d) submit Doppler Echocardiogram (The Left Atrial Internal Diameter shall be < 4.5cm);

(e) submit Stress ECG (walking time >10 min; Max HR <230bpm; longest pauses <3,5sec);

(f) submit biochemical profile: Liver function Test; Thyroid function studies, serum magnesium and potassium levels, fasting blood glucose (FBG); Mean Copular Volume (MCV) ; Haemoglobin (Hb) ;

(g) not have underlying structural heart disease.

(h) not have a history of Transient Ischemic Attack (TIA);

(i) be on acceptable medication with no side effects.

(j) be symptom free; and

(k) follow the Warfarin protocol or other suitable anticoagulant protocols where indicated.

Annual follow-up reports

An applicant or a holder of a medical certificate shall:

(a) submit 6 monthly Cardiologist review for at least 4 – 5 years (post ablation) and annually thereafter.

(b) submit 24-Hour Holter; and

(c) submit Echocardiogram annually

2. INCOMPLETE RIGHT BUNDLE BRANCH BLOCK ~~CONDITIONS~~

Applicability

This protocol is applies to Class 1, 2 and 3.

General Requirements

(1) An applicant or a holder of a medical certificate shall submit medical reports from a Cardiologist addressing the underlying cause of the Incomplete Right Bundle Branch Block and the treatment if applicable.

(2) Each case will be reviewed on its own merit"."

3. COMPLETE RIGHT BUNDLE BRANCH BLOCK

Applicability

This protocol applies to Class 1, 2 and 3

Class 1 Restrictions

i. Multicrew - If acquired > 40 years of age.
ii. Satisfactory Cardiological review at 12 months, - may apply for multicrew restriction to be removed

Class 2 Restrictions

i. Certification as or with co-pilot.
ii. Satisfactory Cardiological review at 12 months, - may apply for multicrew restriction to be removed.

Initial Medical Reports Requirements

An applicant or a holder of a medical certificate shall:

(a) Be declared temporary medically unfit on diagnosis of the complete right bundle branch block.

(b) submit a Cardiologist Report which must contain the underlying cause and treatment.

(c) submit Stress ECG (at least Stage 3 Bruce protocol).

(d) submit 24-hour Holter ECG (showing no significant rhythm or conduction disturbance apart from RBBB.

(e) submit an Echocardiogram (normal structure and LV, RV function; LVEF > 50%)

(f) submit an Electrophysiological study; and

(g) have at least two attempts on atrioventricular pathway ablation.

Follow -Up Requirements

Annual Cardiologist report

4. PARTIAL/COMPLETE LEFT BUNDLE BRANCH BLOCK

Applicability

This protocol applies to Class 1, 2, and 3.

Restrictions

i. Class 1 – Multicrew

ii. Class 2 – May need co-pilot restriction.

Initial requirements following diagnosis.

An applicant or a holder of a medical certificate shall:

i. be declared temporary medically unfit on diagnosis of the partial / complete Left Bundle Branch Block.

ii. submit Cardiologist's report.

iii. submit Stress ECG and must complete a stage 4 Bruce protocol);

iv. submit Echocardiogram (LVEF >50%)

v. submit 24-hour Holter ECG; and

vi. pharmacological stress thallium MPI or Coronary angiography – (<50% stenosis in any major untreated vessel/in any venous/arterial graft remote from any infarction; <30% if the proximal left anterior descending or left main stem vessels are involved).

Follow-Up Reports (Annual)

An applicant or a holder of a medical certificate shall undergo routine aviation medical examination and submit Cardiologist report annually".

5. LEFT ANTEROSUPERIOR AND LEFT ANTEROPOSTERIOR FASCICULAR HEMIBLOCKS

Applicability

This protocol applies to Class 1, 2, and 3.

Initial requirements following diagnosis

An applicant or a holders of a medical certificate shall:

(a) submit a Cardiologist report.
(b) submit Stress ECG which is compliant to (at least Stage 3 Bruce protocol).
(c) submit a Cardiologist reports 24-hour Holter ECG.
(d) submit a Cardiologist reports Echocardiogram; and
(e) submit a Cardiologist reports Coronary angiography if indicated.

Follow-Up Reports

Normal investigations (24-hour Holter, Echo, Coronary Angiography), with no symptoms – no further reviews"."

6. ATRIO-VENTRICULAR BLOCKS

Applicability

This protocol applies to Class 1, 2, and 3.

6.1 1ST DEGREE ATRIO-VENTRICULAR BLOCK

An applicant or a holder of a medical certificate shall:

(a) be declared temporary medically unfit on diagnosis.
(b) submit a Cardiologist Report; and
(c) submit a Resting and Stress ECG.

1) If the previous attempt on two episodes of ablation has failed, then an atrioventricular pacemaker shall be inserted.

2) Once declared medically fit, an applicant or a holder of a medical certificate shall be reviewed every 6 months.

6.3. 2ND DEGREE ATRIO-VENTRICULAR BLOCK

An applicant or a holder of a medical certificate diagnosed with a Second Degree Atrio-Ventricular Block shall:

(a) be declared temporary medical unfit on initial diagnosis.
(b) submit Cardiologist Reports.
(c) submit a 24 Hour Holter; and
(d) submit a Stress ECG.

(1) An applicant or a holder of a medical certificate with untreated heart blocks of 2:1 or > shall not be recertified for any class of medical certificate (risk of AV block and syncope).

(2) An applicant or a holder of a medical who meets the requirement shall be declared medically fit for not more than 12 months and shall be reviewed annually".

6.4 MOBITZ TYPE II -ATRIOVENTRICULAR BLOCK AND COMPLETE ATRIOVENTRICULAR BLOCK

Applicability
This protocol applies to Class 1, 2, and 3.

Initial requirements

Applicant or a holder of a medical certificate diagnosed with Mobitz type II, 2:1 atrioventricular block and complete atrioventricular block shall be declared medically unfit for all medical classes".

6.5 THIRD DEGREE HEART BLOCK

Applicability
This protocol applies to Class 1, 2, and 3.

General

a) An applicant or a holder of a medical certificate diagnosed with third degree heart block shall be declared medically unfit for all classes.

b) An applicant or a holder of a medical certificate may apply for recertification after successful pacemaker implant.

6.5.3 Initial medical requirements

(1) An applicant or a holder of a medical certificate diagnosed with a Third Degree Atrio-Ventricular Blocks may apply for recertification after successful intervention with pacemaker.

(2) An applicant or a holder of a medical certificate shall submit a Cardiologist Report.

(3) An applicant or a holder of a medical certificate shall submit a 24 Hour Holter.

(4) An applicant or a holder of a medical certificate shall submit a Stress ECG Report.

(5) An applicant or a holder of a medical certificates shall submit a Pacemaker interrogation report.

(6) The pacemaker is to be dual pacemaker with bipolar leads due to the unacceptable risk of electrical interference with pacemakers that have unipolar leads.

(7) Annual pacemaker is to have a technical check every 12 months.

6.5.4 Follow-Up Reports

(1) Applicant or a holder of a medical certificate shall submit 3 monthly Cardiologist reports for 6 months, then 6 monthly Cardiologist reports for a year, then annual Cardiologist review thereafter.

(2) An applicant or a holder of a medical certificate shall submit annual Pacemaker interrogation report".

7. 1 ABNORMAL ECG TRACINGS

Applicability

This protocol applies to Class 1, 2, 3, and 4.

Initial medical requirements

An applicant or a holder of a medical certificate:

(a) when presenting with an abnormal ECG tracing shall provide a Cardiology report.

(b) shall submit a stress ECG report

(c) shall submit a 24-hour Holter

(d) shall submit an Echocardiogram; and

(e) shall be assessed on a case-by-case basis".

7.2 BRUGADA SYNDROME

Applicability

This protocol applies to Class 1, 2, 3, and 4.

General

Fibrillation/ atrial flutter/ flutter fibrillation/ some other super-ventricular tachycardia with various degrees of block shall be declared medically fit provided an applicant or a holder of a medical certificate holder:

(a) is asymptomatic.
(b has a satisfactory Cardiology evaluation;
(c) has no family history of sudden Cardiac Death;
(d) has minimal ECG features seen only intermittently or following pharmacological provocation; and
(e) has no evidence of complex ventricular rhythm disturbances on regular Holter monitoring".

7.2 BRUGADA PATTERN

(1) An applicant or a holder of a medical certificate with symptomatic Brugada pattern Type 1 with evidence of tachyarrhythmia shall be declared medically unfit.

(2) An applicant or a holder of a medical certificate with asymptomatic Brugada pattern type 1 and 2 may be declared medically fit provided such an applicant or a holder of a medical certificate have satisfactory Cardiology evaluation and investigations (stress ECG, 24-hour Holter, Echocardiogram).

(3) An applicant or a holder of a medical certificate who is asymptomatic and has persistent or intermittent Brugada Pattern type 3 may be declared medically fit with no restriction provided have a satisfactory Cardiology evaluation and investigations (stress ECG, 24-hour Holter, Echocardiogram).

(4) An applicant or a holder of a medical certificate who is declared medically fit on initial assessment, must provide annual Cardiologist reports.

(5) An applicant or a holder of a medical certificate shall be reviewed on a case-by-case basis.

7.3 PROLONGED QT SYNDROME

(1) An applicant or a holder of a medical certificate diagnosed with prolonged QT syndrome shall be declared 'medically unfit for all classes due to the risk of sudden death.

(2) An applicant or a holder of a medical certificate shall be assessed on a case-by-case basis

7.4 VENTRICULAR TACHYCARDIA AND SUPRAVENTRICULAR TACHYCARDIA

(1) An applicant or a holder of a medical certificate with ventricular or supraventricular tachycardia shall be assessed on a case-by-case basis".

7.5 WOLFF-PARKINSON-WHITE SYNDROME

Applicability

This protocol applies to Class 1, 2, and 3.

General

(1) Following a diagnosis of Wolff-Parkinson-White syndrome an applicant or a holder of a medical certificate shall be declared temporary medically unfit.

(2) An applicant or a holder of a medical certificate may only apply for recertification 3 months after successful ablation.

Initial recertification reports

An applicant or a holder of a medical certificate shall:

(a) undergo annual routine aviation medical examination.

(b) submit a Cardiologist's assessment.

(c) submit a report indicating the successful ablation.

(d) submit a Stress ECG report.

(e) submit an Echocardiogram; and

(f) submit a 24-hour Holter.

Follow-Up Reports

An applicant or a holder of a medical certificate:

a) shall submit a Cardiologist review at the following intervals, 6 months and 12 months post successful radiofrequency ablation of aberrant conduction pathways.

b) shall submit Annual Cardiologist's review; and

c) if he or she did not experience a recurrence of abnormal conduction within 24 months of a successful radiofrequency ablation, further recertification without restriction shall follow the normal pattern for an applicant or a holder of a medical certificate's age and class of medical certificate".

7.6 **RADIO-FREQUENCY ABLATION**

Applicability

This protocol applies to Class 1, 2, and 3.

Restrictions

i. Multicrew Restriction

ii. Following an event-free period of 2 years, the restriction may be considered for removal subject to review.

Initial Recertification Reports

1) An applicant or a holder of a medical certificate shall be considered at least 3 months following successful ablation with demonstrated bidirectional block.
2) An applicant or a holder of a medical shall provide a Cardiologist report indicating that he or she have not had arrhythmias in at least 3 months post ablation.

Annual Follow-Up Reports

An applicant or a holder of a medical certificate shall:

a) submit a Cardiologist's Report.

b) submit a Cardiologist's 24-hour Holter; and

c) submit Echocardiogram".

7.6 PROTOCOL FOR VALVULAR HEART DESEASES

UNCORRECTED AORTIC STENOSIS

Applicability

This protocol applies to Class 1, 2, and 3.

Restrictions

An applicant or a holder of a medical certificate who presents with any evidence of valvular calcification shall be restricted to multicrew operation.

General
An applicant or a holder of a medical certificate diagnosed with uncorrected Aortic stenosis shall be declared temporary medically unfit on initial diagnosis.

General Medical Requirements

An applicant or a holder of a medical certificate shall submit:

(a) a Cardiologist reports.

(b) an ECG report;

(c) a Doppler Echocardiogram report; and

(d) submit a Chest X-Ray report; and

(1) The medical reports shall be considered satisfactory if they meet the following criteria for solo operation for a period of one (1) year when an applicant or a holder of a medical certificate :

i. is asymptomatic;

ii. have an Aortic valve calcification grade of 1 / 2.

iii. have a Valvular Doppler peak aortic velocity <3m/s; and

iv. have a Valve area > 1,0 cm sq.

Follow-Up Reports Annually

An applicant or a holder of a medical certificate shall submit:

(a) a Cardiologist reports.

(b) an ECG Report; and

(c) an Echocardiogram.

Disqualifying conditions for uncorrected Aortic Stenosis

An applicant or a holder of a medical certificate who present with:

(a) any evidence attributable symptoms.

(b) any evidence of any increase in LV wall thickness (>1,1cm) ;

(c) a history of cerebral embolic event; and

(d) aortic dilatation of >5 cm.

CORRECTED AORTIC STENOSIS

General

An applicant or a holder of a medical certificate diagnosed with a diagnosis of corrected aortic stenosis shall be declared temporary medically unfit on initial diagnosis for at least 6 months post operation.

General Medical Requirements

(1) An applicant or a holder of a medical certificate:

a) shall undergo annual aviation medical examinations.

b) shall submit a Cardiologist report.

c) shall submit an ECG Report;

d) shall submit an Echocardiogram Report.

e) who underwent tissue valve replacement and there is no requirement for anticoagulation therapy, certification may be issued for a period of one (1) year unrestricted to multicrew; and yearly thereafter if the annual reports are satisfactory.

f) who underwent mechanical valve replacement and there is evidence of clinically satisfactory, well-controlled anticoagulation, he or she may be issued with a Class 1 medical certification –restricted to multi-crew operations for a period of one (1) year; and

g) submit a yearly thereafter if the annual reports are satisfactory.

Follow-Up Reports

An applicant or a holder of a medical certificate shall submit a Cardiologist report annually"."

3. UNCORRECTED AORTIC INCOMPETENCE

Applicability

This protocol applies to Class 1, 2, and 3.

General

An applicant or a holder of a medical certificate diagnosed with uncorrected Aortic Incompetence shall be declared temporary medical unfit on initial diagnosis.

General medical requirements

An applicant or a holder of a medical certificate shall:

(a) submit a Cardiology Report; and

(b) submit an ECG submit a Doppler Echocardiogram.

(1) If the reports are satisfactory, an applicant or a holder of a medical certificate shall be declared medically fit for a period of one (1) year depending on the severity of the condition and the rate of the deterioration.

3.4. Disqualifying conditions for Uncorrected Aortic Incompetence

An applicant or a holder of a medical certificate with the following conditions shall be disqualified:

(a) significant increase in the LV End-Systolic Diameter (LVEDD) (>6,0cm);

(b) increase of (LVEDD) LV End-Systolic Diameter of >4,1cm.

(c) significant arrhythmia.

(d) abnormal effort performance.

(e) Aortic root diameter of >5,0cm; and

(f) significant increase in the end-systolic (>4,4cm) and/or end-diastolic (>6,5 cm) diameter of the Left ventricle, with or without evidence of impairment of systolic/diastolic function.

Follow-Up Reports (Annual)

(1) An applicant or a holder of a medical certificate shall submit an annual Cardiac Report.

(2) An applicant or a holder of a medical certificate shall submit an annual Echocardiogram".

4. CORRECTED AORTIC INCOMPETENCE

Applicability

This protocol applies to Class 1, 2, and 3.

General

(1) An applicant or a holder of a medical certificate diagnosed with a diagnosis of Corrected Aortic Incompetence will be declared temporary medically unfit on initial diagnosis for at least 6 months post operation.

(2) An applicant or a holder of a medical certificate cases shall be reviewed by the Aeromedical Committee.

General medical requirements

An applicant or a holder of a medical certificate:

(a) shall undergo routine medical examinations annually.

(b) shall submit a Cardiology Report.

(c) shall submit an ECG.

(d) shall submit a Doppler Echocardiogram.

(e) shall submit a Chest -X-Ray.

(f) shall declared medically fit for a period of 12 months if the reports are satisfactory and shall be reviewed annually.

(g) who underwent tissue valve replacement and there is no requirement for anticoagulation therapy, certification may be issued for a period of one (1) year unrestricted to multicrew; and yearly thereafter if the annual reports are satisfactory; and

(h) who underwent mechanical valve replacement and there is evidence of clinically satisfactory, well-controlled anticoagulation, they may be issued with a Class 1 medical certification – restricted to multi-crew operations for a period of one (1) year and yearly thereafter if the annual reports are satisfactory.

Follow-up reports (Annually)

(1) An applicant or a holder of a medical certificate shall submit an annual Cardiology report.

(2) An applicant or a holder of a medical certificate shall be required to submit an Echocardiogram".

5. RHEUMATIC MITRAL STENOSIS OR MITRAL REGURGITATION

Applicability

This protocol applies to Class 1, 2, and 3.

General

(1) An applicant or a holder of a medical certificate diagnosed with a Rheumatic Mitral Stenosis OR Rheumatic Mitral Regurgitation shall be declared medically unfit on initial diagnosis for all classes unless the condition is minimal and is in sinus rhythm.

(2) An applicant or a holder of a medical certificate shall be assessed by the Aeromedical Committee

(3) An applicant or a holder of a medical certificate shall:

(a) submit a Cardiology assessment report.
(b) submit an Echocardiogram.
(c) submit an ECG and
(d) submit a Chest X-ray".

6. NON –RHEUMATIC NON-ISCHAEMIC MITRAL REGURGITATION

Applicability

This protocol applies to Class 1, 2, and 3.

Restrictions

An applicant or a holder of a medical certificate who are declared medically fit, with the condition, shall be restricted to operate in a multicrew environment.

General

(1) An applicant or a holder of a medical certificate with a diagnosis of non –rheumatic non-Ischaemic mitral regurgitation shall be declared medically unfit on initial diagnosis for all classes.

(2) An applicant or a holder of a medical certificate shall be assessed on a case-by case basis.

(3) An applicant or a holder of a medical certificate shall submit:

(a) a Cardiologist reports.

(b) Resting and Stress ECG Report.

(c) an Echocardiogram report; and

(d) a 24-hour Holter report.

Disqualifying conditions following diagnosis of Non –Rheumatic Non-Ischaemic Mitral Regurgitation

An applicant or a holder of a medical certificate with the following conditions shall be disqualified:

(a) Left Ventricular systolic diameter >4,1 cm and/or an end-diastolic diameter > 6,0 cm.

(b) Atrial Fibrillation; and

(c) diagnosis of non –rheumatic non-Ischaemic mitral regurgitation will disqualify the applicants or holders of of a medical certificate from medical certification to fly. (Class I and II)

Follow-up reports (Annually)

An applicant or a holder of a medical certificate shall:'

(a) undergo annual aviation medical examination.

(b) submit a Cardiologist report.

(c) submit an ECG report; and

(d) submit an Echocardiogram".

"SCHEDULE 47: PROTOCOL FOR CARDIAC VALVE REPLACEMENT

1. AORTIC VALVE REPLACEMENT

Applicability

This protocol applies to Class 1, 2, and 3

General

(1) An applicant or a holder of a medical certificate who have undergone a Cadaver Homograft or possibly a Carpentier-Edwards or similar Xenograft may be considered for certification.

(2) Medical certification may be considered in the best risk subjects for an applicant or a holder of a medical certificate who have undergone aortic valve replacement with a bioprosthetic /mitral valve repair at least 6 months previously with the following conditions:

(a) an applicant or a holder of a medical certificate shall:

i) be free of symptoms and shall be in sinus rhythm and not require warfarin therapy.

ii) have no significant Left Ventricular Hypertrophy on Echocardiogram (>1,3vm, septum and free wall) or dilation (>6,0 cm End Diastole/ 4,1 cm end systole), nor dilatation of the aortic root (>4,5 cm);

iii) have no abnormality of wall motion on Echocardiography (except that due to LBBB)

iv) have no significant (un-grafted) coronary artery disease.

v) have no significant rhythm disturbance on Holter monitoring.

vi) shall be required to submit annual Cardiologist report; and

(b) an applicant or a holder of a medical certificate who is declared medically fit shall be restricted to multi-crew operations"."

2. MITRAL VALVE REPLACEMENT

Applicability

Class 1, 2, and 3

General Requirements

An applicant or a holder of a medical certificate:

(a) who have undergone mitral valve replacement shall be declared medically unfit on diagnosis.

(b) shall undergone mitral valve replacement may only be considered for recertification at least 6 months post operation; and

(c) shall be considered on a case-by-case basis.

Follow-up reports (Annual)

An applicant or a holder of a medical certificate shall:

(a) undergo annual aviation medical.
(b) submit a Cardiologist report.
(c) submit an ECG report; and
(d) submit an Echocardiogram

Disqualification conditions

An applicant or a holder of a medical certificate with the following conditions shall be disqualified:

(a) any history of associated thrombo-embolic is disqualifying.
(b) sinus rhythm may be considered for certification; and
(c) undergone amputation of the left appendage may be at an advantage; and

(1) An applicant or a holder of a medical certificate shall be considered on a case-by-case basis".

11.2.15. Protocols on Hypertension

A blood pressure which is consistently >160/100 mmHg disqualifies a person from all classes of medical certification. A person is deemed unfit, until such time as the person can prove control on acceptable medication.

Mild Hypertension

1) A person is considered to be having mild hypertension if his or her systolic BP is 140–159 or diastolic BP is 90–99.

2) In the case of a mild hypertension referred to in paragraph 1), a person shall –

i. Undergo regular three-monthly BP checks for a year;
ii. Undergo Lifestyle Modification (according to the National Guidelines on the Management of Hypertension);
iii. Adjust or alter medication if already on therapy;
iv. Undergo Cardiovascular Risk Assessment; and
v. May continue to fly, in the case of a pilot.

Moderate Hypertension

1) A person is considered to be having moderate hypertension if his or her systolic BP is 160-179 or diastolic BP is 100-109.

2) In the case of a moderate hypertension referred to in paragraph (1), a person shall –

3) Exclude reactive hypertension;

4) If hypertension is established, submit the following:

   i. Urine Dipstix for Microalbuminurea
   ii. Clinical examination
   iii. Blood tests:
   iv. Urea and Electrolytes
   v. Fasting Glucose
   vi. Fasting Total Cholesterol, and if Total Cholesterol is >5.00 a fasting Lipogram should be done;
   vii. Begin therapy with an acceptable agent;
   viii. Undergo cardiovascular risk assessment;
   ix. Be grounded for two weeks; and
   x. Undergo a clinical evaluation after one month.

Moderate/severe Hypertension

1) A person is considered to be having moderate/severe hypertension if his or her Systollic BP is 160-179 mmHg or Diastollic BP is 100-109 mm Hg (for moderate), or a Systolic BP of >180 or Diastolic BP of >110 (for severe).

2) In the case of a moderate/severe hypertension referred to in paragraph 1), a person shall –

   i. Review medication (therapy); and
   ii. Be considered medically fit and not exercise the privileges of his or her licence until hypertension is adequately controlled on acceptable medication.

Normotensive/Diagnosed reactive Hypertension

1) A person is considered to be normotensive if his or her Systolic BP is120-129 or Diastolic BP is 80-84.

2) Once the licence holder is normotensive or diagnosed to have reactive hypertension as per paragraph 1), a person shall –

3) be deemed fit to fly, with a 6-monthly follow-up for one year, consisting of –

4) Clinical examination

5) Resting ECG (<40 or falls into the Blue or Green Risk Categories – see Table 2)

6) Stress ECG (>40 or falls into the Yellow, Orange, or Red Risk Categories – see Table 2) See note* Blood tests:

   i. U & E including creatinine
   ii. Fasting glucose
   iii. Fasting lipogram

Note *Stress ECG for Yellow Risk Category to be done by AME. Stress ECG for Orange and Red Risk Categories to be done by a cardiologist. Risk categories as per Table 2.,undergo annual follow-up thereafter consisting of:

   i. Clinical examination
   ii. Resting ECG (<40 or falls into the Blue or Green Risk Categories – see Table 2)
   iii. Stress ECG (>40 or falls into the Yellow, Orange, or Red Risk Categories – see Table 2) See note*
   iv. Blood tests (U&E including Creatinine, Fasting Glucose, Fasting Lipogram).
   v. Note *Stress ECG for Yellow Risk Category to be done by AME. Stress ECG for Orange and Red Risk Categories to be done by a Cardiologist. Risk categories as per Table 2.

ii. Cardiovascular Risk Assessment

Cardiovascular risk assessment shall be done based on the South African Hypertension Guidelines. Cardiovascular risk assessment shall be done in accordance with the tables below.

Table 1: Major risk factors, target organ damage, and associated clinical conditions.

MAJOR RISK FACTORS, TARGET ORGAN DAMAGE, AND ASSOCIATED CLINICAL CONDITIONS		
MAJOR RISK FACTORS	TARGET ORGAN DAMAGE	ASSOCIATED CLINICAL CONDITIONS
Levels of systolic and diastolic BP	Left ventricular hypertrophy: based on ECG	Coronary heart disease
Smoking	Microalbuminuria: albumin/ creatinine ratio 3 -30 mg/mmol	Heart failure
Dyslipidaemia Total cholesterol >6.5 mmol/l, OR creatinine ratio >30 mg/mmol LDL >4 mmol/l, OR HDL men <1 and women <1.2 mmol/l	Slightly elevated creatinine Men 115-133 µmol/l Women 107-124 µmol/l	Chronic kidney disease: albumin creatinine ratio >30 mg/mmol
Diabetes mellitus Men >55 years Women >65 years		Stroke or transient ischaemic attack
Family history of early onset of: cardiovascular disease Men aged <55 years Women aged <65 years		Peripheral arterial disease
Waist circumference – abdominal obesity Men ≥102 cm Women ≥88 cm The exceptions are South Asians and Chinese: men >90 cm and women >80 cm		Advanced retinopathy Haemorrhages OR Exudates Papilloedema

Table 2: Stratification of risk to quantify prognosis

STRATIFICATION OF RISK TO QUANTIFY PROGNOSIS					
Other risk factors and disease history	BP (mmHg)				
	Normal SBP 120-129 or DBP 80-84	High-normal SBP 130-139 or DBP 85-89	Stage 1 Mild hypertension SBP 140-159 or DBP 90-99	Stage 2 Moderate hypertension SBP 160-179 or DBP 100-109	Stage 3 Severe hypertension SBP >180 or DBP >110
No other major risk Factors	Average risk	Average risk	Low added risk	Moderate added risk	High added risk
1-2 major risk Factors	Low added risk	Low added risk	Moderate added risk	Moderate added risk	Very high added risk
≥ 3major risk factors or target-organ damage or diabetes mellitus	Moderate added risk	High added risk	High added risk	High added risk	Very high added risk
Associated clinical conditions	Very high added risk	Very high added risk	Very high added risk	Very high added risk	Very high added risk

* Legend

Average Risk and Low Added Risk
Bloods (Fasting Glucose, Fasting Lipogram, U&E-including Creatinine)
Resting ECG: less than the age of 40 years
Stress ECG: 40 years of age and above (to be done by a DAME)

Moderate Added Risk
Annual Stress ECG (done by a DAME-Designated Medical Examiner)
Annual Bloods (U&E – including Creatinine, Fasting Glucose, Fasting Lipo-gram) for all Classes.
Applicable Protocol for Co-morbidity

High Added Risk
Stress ECG (to be done by a Cardiologist – minimum stress level should be 85%)
Annual Bloods (U&E – including Creatinine, Fasting Glucose, Fasting Lipo-gram)
Applicable Protocol for Co-morbidity

Very High Added Risk
Stress ECG (to be done by a Cardiologist – minimum stress level should be 85%)
Annual Bloods (U&E – including Creatinine, Fasting Glucose, Fasting Lipo-gram)
Cardiovascular risk assessment shall be done based on the South African Hypertension Guidelines. (Refer to Table 1: Major risk factors, target organ damage, and associated clinical conditions, and Table 2: Stratification of risk to quantify prognosis.)

iii. Coronary Artery Disease Protocol

General

Aviation medical standards as laid down in Annex 1 of the Convention on International Civil Aviation by the International Civil Aviation Organisation to which South Africa is a contracting State, have identified broad medical conditions that, on the basis of expected risk of incapacitation, disqualify aviation personnel from flying. South Africa is one of the countries that previously applied strict standards to initial applicants with a history of coronary heart disease who applied for a medical certificate. This previous protocol was also applied to aviation personnel regarding whom the risk of sudden incapacitation was reduced as a result of risk factor modification or rehabilitation, including therapeutic interventions.

The SACAA has since reviewed this protocol and is now making provision for aviation personnel with a history of coronary artery disease. Initial and experienced applicants may be considered for any class of medical certificate. This consideration will be based on the individual medical condition of the applicant and risk factor involved. This protocol applies to all applicants (initial and experienced) presenting with coronary artery disease (such as Myocardial Infarction, Angina Pectoris or asymptomatic coronary artery disease detected on investigation following assessment of risk factors). The protocol is applicable to isolated coronary artery disease and its risk factors only. The presence of ischaemia/inducible ischaemia remains an exclusion factor.

Operational Restrictions

CLASS I
ATPL Multi-crew – As/or with a co-pilot
Commercial pilots
Instructor – Student must have completed first solo flying
Game capturing – Applicant can fly solo only if there are no passengers.
Crop spraying – Applicant can fly solo if there are no passengers.
CLASS II – no restrictions
CLASS III – no restrictions
CLASS IV – no restrictions

General medical requirements applicable to all applicants

1) Applicants will be temporarily taken off flying or controlling duties for a duration of not less than six months following the index event.
2) Applicants must be asymptomatic for at least six months following adequate intervention; the medical certificate will be withdrawn during this period.

3) Applicants on medication will be considered only if the medication is approved by the Medicine Control Council of South Africa and is compatible with flying.

4) All initial medical reports must be submitted to a panel of specialists for consideration, and should include the following –

   a) Hospital admission summary (History and Physical).

   b) If catherisation and/or angiography have been performed, all reports and actual films/CDs must be submitted for review.

   c) A cardiothoracic report, in cases of CABG/PTCI, detailing the cardiac event and procedures, must be submitted.

   d) Applicants presenting with more than two stenoses of more than 30% within a vascular tree shall be assessed as unfit.

   e) An angiogram shall not reveal stenosis of greater than 50% in any major untreated vessel, in any vein/artery graft or at the site of an angioplasty/stent, except in a vessel supplying the infarct.

   f) The medical certificate of applicants presenting with any major vessel stenosis of 50% will be withdrawn, until appropriate intervention is undertaken.

Cardiovascular Evaluation

a) General physical and clinical cardiology assessment.

b) Family and medical history.

c) Functional capacity using New York Heart Association Functional Classification or Canadian Cardiovascular Score.

Prognosis of Incapacitation.

a) Treatment.

b) Blood chemistry (fasting Lipid Profile, Urea, Urate and Creatinine and Fasting Blood Glucose).

c) The following are major modifiable risk factor for ischaemic heart disease and should be under control:

d) Smoking: An applicant with known ischaemic heart disease who continues to smoke should be assessed as “medically unfit”.

e) Weight reduction: Weight reduction in obese and overweight patients should be encouraged. Applicants are theoretically encouraged to set a goal to achieve a body mass index (BMI) <25kg/m or a waist circumference <102cm in men and 88cm in women.

f) Abnormal lipid profile: Applicants are encountered to be aware of their serum cholesterol levels and to maintain a normal level. Statins are recommended early for all applicants with a history of Non-ST elevation acute coronary syndrome (NSTE-ACS) in the absence contraindications, irrespective of cholesterol levels, with the aim of achieving Low Density Lipoprotein (LDL) levels <2.6mmol\L.

g) Blood pressure control: Applicants are required to have a blood pressure control of <140/90, and <130/80 mmHg for those suffering from diabetes mellitus or renal dysfunction.

h) Maximal stress ECG:

i) Applicants are required to be symptom-free and must complete a minimum of Bruce Stage 3 or 8.5 metabolic equivalents (METS).

j) A minimum of 85% of the required target rate must be achieved

5) The applicant must be free from inducible myocardial ischaemia or significant rhythm disturbances during the study. A 24-hour Holter ECG tracing is necessary to assess any significant rhythm disturbances.

6) A stress Echocardiogram/Stress MRI/MIBI Scan or Coronary CT scan will be required six months after the incident.

7) If any of the above-mentioned tests show any significant abnormality, a Coronary Angiogram will be required; it must be within previously described limits.

8) The left ventricular ejection fraction as a measure of left ventricular function using echocardiogram or gated radionuclide scintigraphy should be 50% or more at rest and should not show a decrease of more than 5% with satisfactory exertion (85% predicted maximum heart rate or >8 (METS).

9) A threshold ejection fraction of 45% applies with the use of single proton emission computerised tomography (SPECT).

   i. In applicants with an ejection fraction of between 40% and 50%, restricted medical certification may be considered after review of a 24-hour Holter.

   ii. This should reveal no more 30 ventricular ectopic beats per hour in the absence of anti-arrhythmic medication, with no more than three consecutive beats and a cycle length that is not less than 500 msec.

   iii. A Myocardial Perfusion Scan shall be required at least six months after Angioplasty/Stenting, but not necessarily after other events (Myocardial Infarction or Coronary Artery Bypass Grafting), unless there is doubt about the diagnosis Myocardial Infarction or adequacy of Bypass Grafting.

   iv. Therapeutic considerations

   v. Only medication that is compatible with flying will be allowed.

Follow-up certification

i. An annual cardiologist's report, including –

ii. Resting and Maximal Stress ECG 12 lead ECG, symptom limited, with no evidence of myocardial ischaemia or ischaemia equivalent. (Some applicants will continue to have an "abnormal" stress test.

iii. A cardiologist's opinion should be sought for these cases and, if necessary, MIBI or stress ECHO may be required);

iv. A normal 24 -hour Holter ECG will be required.

Blood chemistry shall include –

i. Urea & Creatinine;

ii. Fasting Lipid Profile;

iii. Fasting Blood Glucose; and

iv. Haemoglobin & Platelets.

An angiogram will be required –

a) If there is any cardiac abnormality detected, including symptom relapse.

b) Chest pain –

c) Regardless of whether typical or atypical for ischaemic heart disease, precludes medical certification insofar as it indicates an elevated probability of significant coronary artery disease and an increased risk of an incapacitating cardiac event.

d) An applicant may be considered fit if diagnostic testing indicates that the chest pain is not due to myocardial ischaemia.

e) The initial assessment, including a review of the symptom history, must be without the effect of anti-ischaemic meditation that could possibly mark adverse findings; and

f) If coronary arteriography reveals normal coronary arteries, coronary vasospasm should be excluded.

Four-yearly – Follow-Up Requirements

i. A Stress Cardiolite/MIBI Scan/Stress MRI/Stress Echo or coronary scan will be required.

ii. If any of the tests show any abnormality, a repeat angiogram will be required.

PROTOCOLS FOR THE RESPIRATORY SYSTEM

Protocol on Asthma

ICAO Annex 1 – Personnel Licensing 6.3.2.8. states: "There shall be no acute disability of the lungs nor any active disease of the structures of the lungs, mediastinum or pleura."In the ICAO Guidelines on Medical Assessment of the Respiratory System – Chapter 2, the following is stated: "Applicants with bronchial asthma should in general be assessed as unfit unless the clinical course is extremely mild and drug treatment is not required." In South Africa there is a slightly more lenient approach. Although applicants who comply with the following protocols are able to fly, all cases that fall outside the minimum standards must be referred to the Aviation Medical Panel for certification.

Special Medical Requirements

a) Lung function tests –

b) Interval: Same as ECG or more frequently on indication.

c) Chest X-ray: PA and Lateral on initial examination. Subsequent CXRs on indication only.

Minimum lung function standards

FEV1 and FVC ≥ 70% of predicted values (to exclude restrictive lung disease). N.B. If one or both values are <70%, refer for X-ray and pulmonologists report.

FEV1/FVC ≥ 70% to exclude obstructive airways disease. N.B. Do not use % predicted values here.

Initial pilots

a) If FEV1/FVC ≤ 75%

b) Determine cause –

c) Infection (e.g. bronchitis):

d) Temporarily unfit. Repeat after 7 to 14 days when cured and off medication.

e) Reactive airways:

f) Any form of asthma in the last five years or previous hospitalisation due to asthma: Temporarily unfit. Pulmonologists report.

g) Exercise induced asthma only: Temporarily unfit. Inhaled steroids for 4 weeks. Re-examine with provocation test (e.g. stress ECG).

h) Acceptable lung function with –

i) History of asthma in past 5 years. Temporarily unfit. Pulmonologists report.

j) Use of bronchodilators. Unfit to fly with bronchodilators. Pulmonologists report.

Experienced Pilots

a) If FEV1/FVC ≤ 70%
b) Manage according to the cause:

c) Infection (e.g. bronchitis):

d) Temporarily unfit. Repeat after 7 to 14 days when cured and off medication

e) Reactive airways:

f) Treated for asthma in the last 5 years or previous hospitalisation due to asthma. Temporarily unfit. Pulmonologists report.

g) Exercise induced asthma:

h) Unless severe (e.g. FEV1/FVC ≤ 70%) provisionally fit. Inhaled steroids for 4 weeks. Re-examine after provocation test.

i) Acceptable lung function with:

j) History of wheezing in the absence of infection,not t taking medication and never admitted to hospital due to asthma.

k) Provisionally fit (if medication is taken – temporarily unfit), pending the pulmonologist's report.

l) Use of bronchodilators: Unfit to fly with bronchodilators. Pulmonologists report.

m) Any applicant who has had an FEV1/FVC ≤ 70% for reasons other than infections, should have an initial pulmonologists report followed by an annual lung function test.

n) The only medication that may be used in the management of asthma is –

o) Inhalation steroids (e.g. Becotide ™, Becloforte™, Becodisks™, Pulmicort™, Clenil™, Inflammide™, Flixotide™, Viarox™, Ventzone™, etc.)

p) Sodium cromoglycate (i.e. Lomudal ™) and Nedocromil (Tilade™) – are also acceptable.

Protocol on Pneumothorax

Traumatic Pneumothorax

a) Uncomplicated cases. Fit to fly six weeks after discharge from hospital. Confirmatory chest x-ray and lung function test required.

b) Complicated cases (e.g. empyema, chronic pneumothorax, other serious injuries, etc.) – refer to pulmonologist.

c) Case referred to Medical Assessor for specialists consideration

Spontaneous Pneumothorax

a) Initial pilots –

b) History of previous spontaneous pneumothorax. Temporarily unfit. Refer to pulmonologist.

c) Experienced pilots –

d) First episode –

e) May be considered for recertification six weeks after discharge from hospital. Confirmatory chest x-ray, lung function and pulmonologists report (stipulating state of recovery, chance of recurrence and underlying pathology) required.

f) More than one episode –

g) Temporarily unfit. May be recertified six to 12 weeks following successful pleurodesis.

CHRONIC OBSTRUCTIVE PULMONARY DISEASE

Applicability

This protocol is applicable to an applicant for a to Class 1,2,3 and 4 Medical Certificate.

General

All case requires medical assessor consideration if the applicant is taking steroid doses equivalent to more than 5 mg of prednisone per day.

1. **Initial certificate eligibility**

a) An applicant with Chronic Obstructive Pulmonary Disease should be assessed as Temporary Medically Unfit upon diagnosis until they have been worked up by a Pulmonologists/Physician.

b) An applicant with only minor impairment of pulmonary function may be assessed as medically fit by the Aeromedical Committee.

2. **Initial considerations for monitoring of applicant**

a) A Comprehensive Report from a treating specialist reporting on symptoms, cardiac assessment, and Lung Function Test .

b) Treating specialist is required to stage the disease.

c) An applicant presenting with stage 2 and above must submit an Oxygen Saturation and Diffusion Test.

d) An applicant must present with a 6 Minute Walk Test.

e) An applicant shall be required to submit a Pulmonologist/Physician if FEV1 or FEV1/FVC is less than 70%..

f) An applicant shall be required to submit a Chest X-Ray.

g) Medical fitness must be assessed when an applicant has developed an associated cardiac condition.

h) An applicant is taking steroid doses equivalent to more than 10 mg of prednisone per day is disqualifying on diagnosis.

i) A treatment regime and side effect profile shall be required.

j) (10)An applicant who is smoking shall be required to stop smoking.

3. Follow up Requirements

(1) An applicant shall be required to submit an Annual Pulmonologist Report.
(2) An applicant shall be required to submit Lung Function Test annually.

(a) the substitution of Schedule 9 of the following schedule

SPONTANEOUS PNEUMOTHORAX

Applicability

This protocol is applicable to an applicant for Class 1,2,3 and 4 medical certificates.

Initial certification eligibility

An application shall be assessed on a case-by-case basis and presented to the Medical Assessors for medical consideration.

(a) An applicant shall be declared Temporary Medical Unfit upon diagnosis and may be considered for issuance of a medical certificate 6 weeks after resolution of one episode.

(b) A Pulmonologist /Thoracic Surgeon report shall be required for the confirmation of the diagnosis (traumatic versus spontaneous, primary, or secondary) and clinical status; and

(c) All high-risk patients require surgical intervention (surgical pleurodesis) before they can be considered for recertification

INITIAL REQUIREMENTS

An applicant shall be required to :

1. Submit a High-Resolution CT Chest to rule out abnormalities.
2. Applicant to submit a follow-up of Chest Xray post pleurodesis.

a) Submit proof of cessation of smoking, a rapid nicotine test conducted by the treating doctor
b) Specialist report which t include follow-up recommendations and the risk of recurrence; and
c) Submit a Lung Function Tests (if clinically relevant).

Follow up Medical Requirements

a) An applicant shall be required to submit a Pulmonologist/ Physician/Thoracic Surgeon report one (1) year following the incident, and if satisfactory, follow-up may be stopped.

TRAUMATIC PNEUMOTHORAX

Applicability

This protocol is applicable to an applicant for Class 1,2,3 and 4 medical certificates.

General

a) An applicant may be declared medically Temporary Unfit upon diagnosis and may be considered for issuance of medical 6 weeks after an incident if one episode by the Medical Assessor Authority.

b) An applicant shall be required to submit a Pulmonologist /Thoracic Surgeon report, confirming the diagnosis (traumatic & clinical status).

c) An applicant shall be required to submit a Lung function test (if clinically relevant -) management.

d) An applicant shall be required to submit a Chest X-ray, not necessary if HRCT is available.

e) An applicant shall be required to submit a specialist report with follow-up recommendations and the risk of recurrence.

Follow up Medical Reports Requirements

An applicant shall be required to submit a Pulmonologist /Thoracic Surgeon report one (1) year following the incident, and if satisfactory, the follow-up required may be stopped”.”

SARCOIDOSIS

Applicability

This protocol applies an applicant for to Class 1,2,3 and 4 medical certificates.

General

(1) An application for this protocol shall be assessed on a case-by-case basis and presented by a Medical Assessors to ensure Accredited Medical Conclusion prior to initial certification.

(2) An applicant with active sarcoidosis shall be assessed and declared temporary medical unfit on diagnosis for a period of 3 months, and an investigation shall be undertaken with respect to the possibility of systemic, particularly cardiac, involvement.

(3) The disease shall be inactive clinically or until disease progression/stability has been demonstrated for a minimum of 3 months before consideration for a medical certificate by the Authority.

(4) Clinical activity is defined as worsening or new organ involvement within a system.

(5) A medical fit assessment may be considered if there is no medication is required, and the disease is investigated and shown to be limited to hilar lymphadenopathy and inactive.

(6) The need for treatment is normally disqualifying; however, up to 5mg of prednisone may, in individual cases, be acceptable following Medical Assessor /Panel case assessment

Initial considerations for monitoring of applicant

(1) An applicant shall be required to submit a Cardiology review which shall include a 12-lead resting ECG.

(2) An applicant shall be required to submit a 24-Hour Holter ECG and an Echocardiogram.

(3) An applicant who presents with any of the abnormalities of investigations referred to in subsection (2) will require further evaluation including Cardiac Magnetic Resonance Imaging.

(4) A Neurologist assessment shall be conducted to exclude neurological involvement of sarcoidosis.

(5) Review to include Chest Xray if clinically indicated.

(6) Lung Function Tests remains fit if (<10%/yr fall in FEV or <15% fall in gas transfer using diffusion studies and FEV1/FVC be no lower than 70% of predicted value)-Physician or Pulmonologist .

(7) The following blood test shall be required after 3 months in remission of angiotensin-converting enzyme (ACE):

Follow up Medical Requirements

(i) a 24-Hour Holter Electrocardiogram;

(ii) a comprehensive respiratory assessment including a Lung Function Test by either a Pulmonologist or a Physician;

(iii) a Chest X-Ray if clinically indicated;

(iv) a Clinical Psychologist, if clinically indicated; and

(v) Class 1 applicant with being required to do a follow-up shall be 6 monthly for the 1st 2 years after diagnosis, then annually follow-up for 3 years;

(vi) Class 2 applicant shall be required to submit annually; and

(vii) Following 3 years, compliance shall be based on organ involvement, and the applicant may be considered for removal of the Protocol by the Medical Assessor of the Authority"."

OBSTRUCTIVE SLEEP APNEA

Applicability

This protocol is applicable to an applicant for Class 1,2,3 and 4 medical certificates.

Initial certification and requirements

1. An application shall be assessed on a case-by-case basis and presented by the Medical Assessor prior to initial certification.

2. An applicant shall be declared temporary medical unfit upon diagnosis.

3. The following medical reports shall be submitted by an applicant for consideration of a medical certificate:

    i. Symptoms of Obstructive Sleep Apnea;
    ii. Body Mass Index > 40;
    iii. Epworth Sleep Score >10; and
    iv. Neck circumference >42cm for men and > 40cm in women.

4.An applicant shall be required to monitor side-effects of CPAP or surgical procedures and report them to the Aviation Medical Examiner.

5. An applicant shall submit:

(a) A sleep Physician report incorporating the following information: history of presenting symptoms, Epworth Sleep Scale result, clinical status, and investigations conducted (Sleep study / Maintenance of Wakefulness Test/Sleep Latency Test);

(b) A report on the progress and management of the condition from the treating specialist;

(c) A review of the Continuous Positive Airway Pressure (CPAP) download (usage statistics); CPAP should be utilized for at least 5 hours per night and for 6 nights per week) and it must be used during the sleep period just prior to flight;

(d) An objective measure of sleep apnea control (Apnea-Hypopnea Index (AHI)).

(e) Repeat sleep study following weight loss or surgery;

(f) A repeat sleep study following initiation of CPAP treatment or CPAP download; and

(g) A Clinical Psychologist report if clinically indicated.

Follow up Medical Requirements.

i. An applicant will be required to submit a copy of the cumulative annual CPAP device report, which shows actual time used.

ii. Target goal should show use for at least 75% of sleep periods and an average minimum of 5 hours per sleep period.

iii. An applicant shall after successful treatment by surgery, submit a statement attesting to the continued absence of Obstructive Sleep Apnea symptoms.

iv. An applicant will submit a signed Airman Compliance with Treatment form or equivalent from the airman attesting to the absence of Obstructive Sleep Apnea (OSA) symptoms and continued daily use of prescribed therapy.

v. An applicant shall submit a status report from the treating physician, indicating that OSA treatment is still effective".”

PROTOCOL ON OBESITY

Applicability

This protocol is applicable to an applicant for Class 1,2,3 and 4 medical certificates.

Initial certification and requirements

(1) Initial applicant for a medical certificate shall be referred for further assessment if his or her BMI is 35 or above.

(2) A pilot whose BMI exceeds 35 require investigation within 2 months.

(3) The following medical reports shall be submitted for consideration of a medical certificate:

(a) Medical history & risk factors to include,

(b) BMI, waist & neck circumference,

(c) lipid profile, blood glucose, urinalysis,

(d) blood pressure,

(e) Epworth score

(f) ECG (full cardiology report if abnormalities are found)

(g) Sleep studies if BMI exceeds 40; and

(h) Medical practical flight test if BMI above 35

(4) An applicant may be issued a medical certificate if he or she complies with all of the following:

(a) obesity is not complicated and is responding to diet and exercise; and

(b) if bariatric surgery is undertaken, the applicant/licence holder will be grounded for a minimum period of 3 months following the surgery. Upon submission of the surgeon's report which includes information pertaining to any complications that may have been experienced and the results of an updated BMI assessment, the grounding will be reviewed.

5) The use of all appetite suppressants is prohibited, unless prior approval to use a specific suppressant is obtained in writing from the medical assessor prior to the commencement of therapy. presenting with a Body Mass Index increased by 2.5 points since the last Medical Fight Test (MFT); the MFT shall be repeated; and shall be subjected to 6 monthly reviews until BMI is below 35.

Tuberculosis

Applicability & Restrictions

i. Class 1: May be assessed as fit as a multi-pilot (Class 1 'OML')

ii. Class 2: May be assessed as fit as a safety pilot (Class 2 'OSL')

iii. Class 3: May be assessed as fit as with or as second controller

iv. Class 4: May be assessed as fit in a multi-crew (cabin crew), and recreational pilots: no restriction

Medical Requirements

a) In case of an applicant undergoing treatment, a special waiver after three months may be given if:

b) The applicant does not have open cavitatory TB and the sputum is negative for TB;

c) He/she is on appropriate medication and demonstrates no drug resistance;

d) The medication exhibits no undesirable side effects that may impair flight safety;

e) The pulmonologist report is favourable; and

f) Underlying medical conditions are evaluated and appropriately managed.

g) Applicants with recurrent or re-activation tuberculosis, post TB-bronchiectasis with recurrent chest infections or large cavities and MDR and XDR TB shall be deemed unfit pending a pulmonologist report, and special waivers may be given on a case-to-case basis by the Aeromedical Committee and on re-certification will require a pulmonologist report.

Endocrinology System

Type 2 Diabetes Mellitus

General medical examination requirements applicable to all applicants

a) All initial applicants must submit their medical reports to the medical panel for assessment.

b) Applicants are required to monitor their blood glucose frequently, including daily fasting glucose measurements.

c) Extra snacks and glucagon should be readily available.

d) Applicants are required to test and record blood glucose levels before and during all flights and present the information to the SACAA on a six-monthly basis.

e) Protocol for Diabetes Mellitus Type II controlled by diet and exercise

f) A blood glucose test is not a routine part of the SACAA medical evaluation; however, the examination includes routine urine test.

g) Applicants with a history of diabetes mellitus controlled on diet alone are considered medically fit for all the classes of medical certificates, provided that they have no evidence of associated disqualifying cardiovascular, neurological, renal, or ophthalmological disease.

h) These applicants are required to submit an annual comprehensive endocrinologist/physician report.

Protocol for Diabetes Mellitus Type II controlled by oral medication

1. Applicants requiring oral hypoglycaemic agents to control their blood glucose may be assessed as fit for all categories of licence, provided they have no cardiovascular, neurological, ophthalmological or renal complications of diabetes, or any condition which could result in sudden or subtle incapacitation while exercising the privileges of their license.

2. Acceptable oral medication

    i. Biguinaides
    ii. Arcabose
    iii. Thiozolidenediones

Initial Follow up for Medical Certification

a) Following initiation of medication, the applicant's medical certificate will be withdrawn for a period of three (3) months;

b) this is to ensure stabilisation, adequate control, the absence of side effects, or complications from side effects.

c) Should the applicant's medication be changed, a comprehensive endocrinologist report indicating the reason to change the medication and stating the name of the new information will be required.

d) The following conditions must be adhered to –

    i. An initial report from a treating physician, confirming no complications of diabetes including cardiovascular, neurological, ophthalmological or renal complications of diabetes;

ii. A statement regarding medication used dosage, presence or absence of side effects or complications, clinical significant episode of hypoglycaemia and an indication of a satisfactory of the diabetes;

iii. The applicant must not experience any adverse symptoms or effects from the oral hypoglycemic agent; or

iv. The applicant may not use any medication interacting with the oral hypoglycemic agent;

v. Glucose: Fasting, Post-prandial peak <6.7 mmol/L <9.0 mmol/L;

vi. HbA1c <7.0% with risks, HbA1c <7.5% with no other risk factors.

vii. Cardiovascular assessment including:

viii. Symptom limited exercise ECG

ix. Clinical review by cardiologists

CVD risk factor profile; see the proposed optimal risk factor profile below:

Traditional CVD Risk Factors	Targets
Cigarette Smoking	Cessation
Dyslipidaemia	
Total Cholestrol	< 4,5 mmol/l
LDL Cholestrol	< 1,8 mmol/l
HDL Cholestrol	>1,0 mmol/l (men) > 1,2 mmol/l (women)
Triglycerides	< 1,7 mmol/l
Obesity	
Waist Circumference	< 94 cms (men) < 90 cms (men of South Asian Descent) < 80 cm (women)
Body Mass Index	< 25 kg/m2
Hypertension	
Systolic Blood Pressure	< 140 mm Hg
Diastolic Blood Pressure	< 80 mm Hg

A complete fasting Lipid Profile must be submitted. The ideal Lipid Profile for a patient with Diabetes is as above and should be strived for.

Protocol for Diabetes Mellitus Type II on Insulin Treatment

Applicability

Class I

Operational Restrictions

i. ATPL/CPL with a multi-crew – as/or with a co-pilot only, restricted to fly in the South African airspace only

ii. Class II

iii. Only applicable to cabin crew.

iv. This protocol is currently not applicable to Private Pilots and Student Pilots.

v. Class III :Air Traffic Controllers – Required to inform their supervisors of the medical condition.

vi. Class IV:Protocol not applicable to Class IV applicants

Initial follow-up for Medical Certification

1) The applicant must have been on insulin for a minimum of one (1) year and the dosage should have been stable for at least six months; this is to ensure stabilisation, adequate control, the absence of side effects, or complications from side effects.

2) An initial report from a treating physician, confirming no complications of diabetes including cardiovascular, neurological, ophthalmological, or renal complications of diabetes should be submitted.

3) The following considerations must be adhered to –

a) The applicant will be required to carry and use a blood glucose monitoring device with memory and report to the treating physician any hypoglycemic incidents.

b) The applicant must not have a history of hypoglycemic episode requiring intervention of another party, during the previous one year.

c) The applicant must have no history of recurrent (2 or more) hypoglycemic reactions resulting in a loss of consciousness or seizure within the past five years.

d) The applicant must have no evidence of hypoglycemic unawareness, and a good diabetes education and understanding.

e) The applicant is required to have a satisfactory HBA1c of 7–7.5% within the past 30 days.

f) The applicant should have a positive attitude and practise monitoring and self-care.

g) The applicant is required to have adequate blood glucose self-monitoring using a calibrated memory chip glucose meter.

h) The applicant is required to maintain 90% of blood glucose measurements >5.5mmo/L.

Annual follow-up for Medical Certification

1) The applicant will be required to carry and use a blood glucose monitoring device with memory and report to the treating physician any hypoglycaemic incidents.

2) Quarterly (three monthly) interval evaluation reports by treating physician for –

i. Physical examination
ii. HbA1c
iii. Review of daily blood glucose measurements
iv. Results of the quarterly evaluations must be accumulated and submitted annually to the medical panel.
v. Glucose: Fasting, Postprandial peak <6.7mmol/l <9.0mmol/l respectively.
vi. HbA1c <7.0% with risks, HbA1c <7.5% with no other risk factors.
vii. A complete fasting Lipid Profile must be submitted,the ideal Lipid Profile for a patient with diabetes is as above and should be strived for.

viii. An annual report from a treating physician must be provided to confirm no complications of diabetes including renal, neurological and visual complications.

Cardiovascular assessment including:

Traditional CVD Risk Factors	Targets
Cigarette smoking	Cessation
Dyslipidemia	
Total Cholestrol	< 4,5 mmol/l
LDL Cholesterol	< 1,8 mmol/l
HDL Cholestrol	>1,0 mmol/l (men) > 1,2 mmol/l (women)
Triglycerides	< 1,7 mmol/l
Obesity	
Waist Circumference	< 94 cms (men) < 90 cms (men of South Asian Descent) < 80 cm (women)
Body Mass Index	< 25 kg/m2
Hypertension	
Systolic Blood Pressure	< 140 mm Hg
Diastolic Blood Pressure	< 80 mm Hg

Monitoring and actions required during flight operations

a) A regularly calibrated glucometer with a memory chip and 10g portions of readily absorbable carbohydrate (cho) should be included on the treatment pack to cover duration of flight.

b) Applicants must measure blood glucose prior to flight, blood glucose must be >6.0mmol/L .

c) During flight, the applicants blood glucose should be monitored every 30-60 minutes, if the blood glucose <6.0mmol/l, then 10g absorbable carbohydrate should be ingested.

d) The frequency of glucose monitoring on flight duty periods over two hours may be reduced depending on the individual circumstances, in consultation with the endocrinologist and the designated Aeromedical Committee.

e) Applicants involved in short-haul operations are required to monitor their blood glucose at midpoint of flight. Blood sugar will fluctuate slightly over one to two hours.

f) For applicants presenting with blood glucose of >15mmol/l, appropriate corrective measures should be applied.

g) Blood glucose should be monitored 30-45 minutes prior to landing and should measurement reading fall <6.0mmol/l, 10g of cho should be consumed.

h) The crew members would need to be made aware of the potential for hypoglycaemic events because of insulin use and should be trained on management strategies.

i) Applicants are required to test and record blood glucose levels before and during all flights and present the information to the SACAA on a six-monthly basis.

Acceptable insulin

i. Basal Insulin
ii. Bolus Insulin

Diabetes Type 1 Protocol

Applicability

Class II:

Applicable to Private Pilots and Students Pilots (with operational Safety Pilot Limitation)

Class III

i. Air Traffic Controllers – with another ATC in close proximity.
ii. Required to inform their supervisors of the medical condition.

Class IV

Applicable to cabin crew.

Protocol not applicable to Class IV applicants (may be considered on a case by case basis)

Initial follow-up for Medical Certification

i. The following conditions must be adhered to: An initial report from a treating physician confirming:

ii. No complications of diabetes, including cardiovascular, neurological, ophthalmological or renal complications of diabetes;

iii. A statement regarding medication used, dosage, presence or absence of side effects or complications;

iv. Clinical significant episodes of hypoglycaemia; and

v. Indication of diabetes control being satisfactory.

Cardiovascular assessment must include :

i. Symptom limited exercise ECG

ii. Clinical review by cardiologists

iii. CVD risk factor profile; see the proposed optimal risk factor profile below:

Traditional CVD Risk Factors	Targets
Cigarette smoking	Cessation
Dyslipidaemia	
Total Cholestrol	< 4,5 mmol/l
LDL Cholesterol	< 1,8 mmol/l
HDL Cholestrol	>1,0 mmol/l (men) > 1,2 mmol/l (women)
Triglycerides	< 1,7 mmol/l
Obesity	
Waist Circumference	< 94 cms (men) < 90 cms (men of South Asian Descent) < 80 cm (women)
Body Mass Index	< 25 kg/m2
Hypertension	
Systolic Blood Pressure	< 140 mm Hg
Diastolic Blood Pressure	< 80 mm Hg

a) A complete fasting Lipid Profile must be submitted. The ideal Lipid Profile for a patient with diabetes is as above and should be strived for.

b) An opthalmologist report must be provided confirming the absence of clinically significant diabetic eye disease.

c) Applicants are required to have a satisfactory HBA1c of < 6, 5 to 8, 0 % within the past 30 days. If HBA1C < 6,5 then there should be no clinically significant hypoglycaemic events in the last year.

d) The following considerations must be adhered to:

e) The applicant will be required to carry and use a calibrated memory chip glucose meter and report to the treating physician any hypoglycaemic incidents.

f) The applicant must not have a history of hypoglycaemic episode requiring intervention of another party, during the previous one year.

g) The applicant must have no history of recurrent (two or more) hypoglycaemic reactions resulting in a loss of consciousness or seizure within the past five years.

h) The applicant must have no evidence of hypoglycaemic unawareness, and a good diabetes education and understanding.

i) The applicant should have a positive attitude and practise monitoring and self-care.

j) Acceptable glucose: Fasting < 7 mmol/l and Postpandrial Peak: < 10 mmol/l.

k) Applicants are required to maintain 90% of blood glucose measurements >5.5mmo/L.

Annual follow-up for medical certification

a) The applicant will be required to carry and use a blood glucose monitoring device with memory and report to the treating physician any hypoglycaemic incidents.

b) Quarterly (three monthly) interval evaluation reports by treating physician for –

i. Physical Examination
ii. HbA1c
iii. Review of daily blood glucose measurements
iv. Results of the quarterly evaluations must be accumulated and submitted annually to the medical panel.
v. Annual report from a treating physician as detailed above under initial certification.
vi. Annual cardiovascular assessment, including Lipogram, as detailed above under initial certification.
vii. Acceptable Glucose: Fasting < 7 mmol/l and Post pandrial Peak: < 10 mmol/l.
viii. Applicants are required to maintain 90% of blood glucose measurements >5.5mmo/L.

Monitoring and actions required during Flight Operations.

a) To ensure safe flight, the insulin-using diabetic aviator must carry:

b) Two recording devices during flight, a regularly calibrated glucometer with a memory chip and a backup glucometer;

c) Adequate supplies to obtain blood glucose samples (lancets, swabs, etc.); and

d) An amount of rapidly absorbable glucose, in 10g portions of readily absorbable carbohydrate (cho), which should be appropriate to the planned duration of the flight.

The following actions shall be taken in connection with flight operations:

a) Applicants must measure blood glucose prior to flight, at least 1 hour before reporting for flight/duty period or at least two hours before commencing flight/controlling.

b) Blood glucose must be >6.0mmol/L and glucose must be checked < 30 mins before flight duty period.

c) During flight, the applicants blood glucose should be monitored every 60 minutes, if the blood glucose <6.0mmol/l, then 10g absorbable carbohydrate must be ingested and a retest performed within 30 mins.

d) The frequency of glucose monitoring during flight duty periods over two hours may be reduced depending on the individual circumstances, in consultation with the endocrinologist and the designated aeromedical committee.

e) Applicants involved in short-haul operations, are required to monitor their blood glucose at midpoint of flight. Blood sugar will fluctuate slightly over one to two hours.

f) Blood glucose should be monitored 30-45 minutes prior to landing, should measurement reading fall <6.0mmol/l, 10g of cho consumed.

g) Applicants presenting with blood glucose of >15mmol/l, appropriate corrective measures should be applied. If >15 mmol/l, should not commence flight/controlling and/or cease carbohydrate ingestion until blood sugar reduces.

h) Episodes of severe hypoglycaemia must be reported to the SACAA.

i) The crew members would need to be made aware of the potential for hypoglycaemic events because of insulin use and should be trained on management strategies.

j) Applicants are required to test and record blood glucose levels before and during all flights and present the information to DAME on a three-monthly basis and to the SACAA on a yearly basis.

INSULIN DEPENDANT DIABETES MELLITUS (FOR CLASS 1)

Applicability

Class 1 Medical Certificate

1. General

a) An application shall be assessed on a case-by-case basis and presented to a Medical Assessor and Medical Expert prior to consideration of the initial and recurrent medical certification.

b) A holder of a Class 1 medical certificate for a Schedule 13A protocol (pilot) shall brief his or her co-pilot fully prior to the flight regarding:

i. nature of his or her diabetes;
ii. blood glucose testing protocol;
iii. timing and method of blood glucose testing;
iv. actions to ensure the blood glucose remains in the acceptable range;
v. medication that may be required during the flight;
vi. symptoms of high or low blood glucose; and
vii. actions to be taken in the event of incapacitation.

c) A holder of a Class 1 medical certificate for a Schedule 13A protocol (pilot) shall cross check his or her blood glucose test value with his or her co-pilot and shall always announce the blood glucose results aloud so that it is recorded on the cockpit voice recorder (CVR) if installed, or an alternative approved method.

2. Restrictions to be applied

OML: Operational Multi-pilot Limitation

3. Initial certification eligibility

a) An applicant may be considered for an initial certification after a period of one (1) year has elapsed after the diagnosis of Type I Diabetes Mellitus.

b) An applicant shall have successfully completed solo flight training (i.e., towards a PPL or a higher license) and already be in possession of at least a Class 2 medical certificate.

c) An applicant is required to have in his or her possession a Continuous Glucose Monitoring device (CGM) approved by the South African Health Products Regulatory Authority (SAHPRA) or CE marked (Europe) or FDA (US) approved or ISO 9000 certified or device approved by other relevant authorities).

d) The CGM device referred to in section 4.3 shall not interfere with the aircraft avionics and a report shall be submitted to a DAME or Medical Assessor of the Authority.

e) An applicant who utilises an insulin pump delivery system shall submit details of his or her 'back-up' non-pump regimen in the event of pump failure.

f) An applicant shall demonstrate evidence of hands-on training by the diabetic team regarding insulin pump use which shall be submitted to the Authority at time of initial application.

g) An applicant shall demonstrate low risk of hypoglycaemia as evidenced by:

a. previous hypoglycaemic events requiring emergency medical intervention including assistance from non-medically trained bystanders.

b. a stable glucose control as measured by HbA1C 6% - 7.5%.

c. submission of an Ambulatory Glucose Profile (AGP) and Time-In-Range (TIR) data over a three (3) month period preceding initial certification that reflects the following blood glucose control criteria:

- CGM Sensor Wear: at least 90% of the time or greater:
- Time in Range (TIR) of 4,5-10 mmol/L: 70% or greater;
- Overall glucose readings 3,9 - 13,9 mmol/L: 90% or greater;
- Glucose readings < 3,9 mmol/L: less than 4%;
- Glucose readings < 3,0 mmol/L: less than 1%;
- Glucose readings > 13,9 mmol/L: less than 5%;
- Coefficient of Variation (CV): < 33%, but will consider 33 - 36%;
- Glucose Management Index (GMI);

g) an applicant shall demonstrate adequate glucose monitoring with the Continuous Glucose Monitoring (CGM) device;

h) an applicant shall demonstrate good diabetes education and understanding as evidenced by hands on training by a diabetic team as well as a practical flight test demonstrating compliance with the Authority blood glucose testing protocol);

i) an applicant shall not demonstrate evidence of hypoglycaemia unawareness;

j) an applicant shall have a positive attitude towards monitoring and self-care as reported by his or her treating physician;

k) the CGM device shall be checked pre-flight and confirmed to be in a working condition. A spare finger prick glucose monitoring device shall be carried by an applicant;

l) a holder of a Class 1 medical certificate for a Schedule 13A protocol (pilot) with a confirmed diagnosis of a Type 1 Diabetes Mellitus medical certification shall have a validity period of one (1) year if the holder thereof is under the age of 40 years, alternatively the requirements of regulation 67.00.6 relating to period of validity of aviation personnel shall apply;

m) a holder of a Class 1 medical certificate for a Schedule 13A protocol (pilot) shall ensure that blood glucose monitoring is pre-planned, and alerts/reminders are set up for testing as per the relevant schedule;

n) due to the lag in interstitial readings when blood glucose is either rising or falling rapidly, a finger prick blood glucose measuring method shall be available on all flights;

o) a holder of a Class 1 medical certificate for a Schedule 13A protocol shall ensure that there is adequate quantity of insulin and rapidly absorbing glucose available on every flight; and

p) a holder of a Class 1 medical certificate for a Schedule 13A protocol (pilot) shall ensure that a Glucagon pen (hypokit) is available on every flight in case of a serious hypoglycaemic event with a loss of consciousness.

Disqualifying conditions for initial medical certification

1) An applicant who presents with any history within the past two (2) years of hypoglycaemia attack requiring the intervention of another person.

2) An applicant who presents with hypoglycaemia in the absence of warning symptoms (hypoglycaemic unawareness).

3) An applicant who presents with inadequate blood glucose control as indicated by Ambulatory Glucose Profile (AGP), Time-in-Range (TIR) data and glycated haemoglobin results.

4) An applicant who presents with significant visual, neurological or cardiovascular complications.

Initial considerations: medication and blood glucose control

1) An applicant who presents for consideration shall be stable for a minimum of six (6) months.

2) An applicant's insulin pumps for drug delivery may be authorised with a precaution for the risk of over delivery in the event of a rapid decompression.

3) An applicant shall carry a finger prick glucose monitoring device and non-pump insulin delivery system for use during in-flight emergencies.

4) An applicant shall carry a back-up insulin delivery method in the event of pump failure.

5) An applicant shall submit an Endocrinologist assessment to a Medical Assessor and DAME with the following information:

   i. documentation of any history of being symptomatic; or
   ii. biochemical hypoglycaemia in the preceding 12 months is required along with details of any ensuing intervention.

6) An applicant shall provide evidence of stable blood glucose control for at least 3 months as measured by:

   a) HbA1C (Generally between 6% and 7.5%);
   b) the submission of an Ambulatory Glucose Profile (AGP) and Time-In-Range (TIR) data reflecting the blood glucose control criteria as per subpart 4.6 (c) of this schedule; and

c) having in his or her possession a CGM device approved by the South African Health Products Regulatory Authority (SAHPRA) and/or CE marked (Europe) and/or FDA (US) approved or ISO 9000 certified or device approved by other relevant authorities).

Specialists reports and complications of Type 1 Diabetes Mellitus

1) An applicant shall have no neurological or renal complications of diabetes mellitus that may result in sudden or subtle incapacitation.

2) Measurements of renal function such as eGFR > 90 and Albumin to Creatinine ratio < 30.

3) An Endocrinologist shall assess the neurology and renal system. If possible diabetic complications exist, a nephrology or neurology assessment is required.

4) An applicant shall have no evidence of significant diabetic retinopathy and an Ophthalmologist assessment is required.

5) An applicant shall have an initial cardiovascular assessment conducted by a cardiologist.

6) An applicant shall do an exercise electrocardiogram and shall reach 8.5 METS on the Bruce protocol.

7) An applicant over 40 years of age shall be screened for cardiovascular disease, unless there is a co-morbid cardiovascular risk factor, then it shall be done annually.

Cardiovascular risk factor control

The following cardiovascular risk control measures shall be under control.

Lipid profile:

a) Total Cholesterol: < 4,5 mmol/1;

b) LDL Cholesterol: < 1,8 mmol/1;

c) HDL Cholesterol: > 1,0 mmol/1 (men), > 1,2 mmol/1 (women); and

d) Triglycerides: < 1,7 mmol/1.

Blood pressure:

The systolic blood pressure < 135 mm Hg, Diastolic Blood Pressure < 85 mm Hg

Smoking status:

An applicant shall have a history of never smoking or smoking cessation if he or she is a former smoker. If currently smoking, initial certification shall only be considered after cessation.

Obesity:

An applicant is required to have a Body Mass Index: < 28kg/m2

Blood glucose testing protocol

1. Pre-flight monitoring

(a) a holder of a Class 1 medical certificate for a Schedule 13A protocol (pilot) shall conduct a glucose test two (2) hours before commencing flight;

(b) One (1) hour before reporting for flight; and

(c) less than 30 minutes before take-off.

2. During flight monitoring

(a) a holder of a Class 1 medical certificate for a Schedule 13A protocol (pilot) shall conduct a blood glucose test at least every hour whilst flying;

(b) in the event of experiencing any diabetic symptoms; and

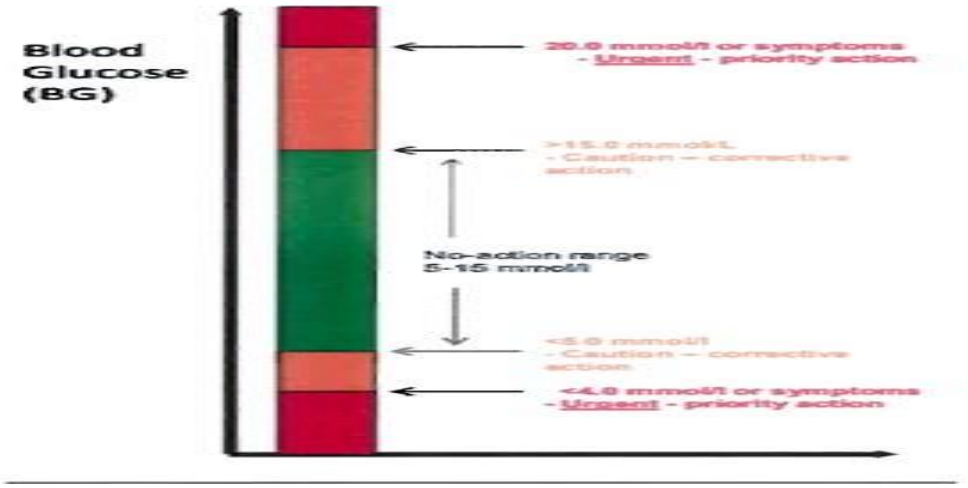
(c) prior to resuming flying after a period of rest or period after corrective action was taken for an out-of-range blood glucose result.

3. On approach flight approach monitoring

A holder of a Class 1 medical certificate for a Schedule 13A protocol (pilot) shall within 30 minutes of anticipated landing time conduct a glucose test.

4. Corrective actions in the event of an out-of-range blood glucose:

The corrective actions indicated in the diagram and notes below shall be taken in the event of an out of range blood glucose level.



High readings	
Priority action (>20.0mmol/l)	**Corrective action (>15.0mmol/l)**
1.Check continuous glucose monitoring system 2.Shall hand over duties 3.take appropriate insulin and/or modify carbohydrate intake 4.Resume full duties when blood glucose <20.0mmol/l	1.Check continuous glucose monitoring system 2.If still >15.0mmol/l review insulin dosing and/or modify planned carbohydrate intake
Low readings:	
Priority action (<4.0mmol/l)	**Corrective action (<5.0mmol/l)**
1.Check continuous glucose monitoring system 2.If still <4.0mmol/l shall hand over duties 3.Ingest 10-15g readily absorbed carbohydrate and retest after 15mins 4.Review insulin dosing and/or modify carbohydrate intake 5.If test after ingestion is still <4.0 then ingest further 10-15g carbohydrate and retest after 15 min 6.Wait for 45 mins after the blood glucose returns to the 'green' range before resuming duties.	1.Check continuous glucose monitoring system 2.If still <5.0mmol/l ingest 10-15g readily absorbed carbohydrate and retest after 30 mins 3.Review insulin dosing and/or modify carbohydrate intake

Insulin delivery in pumps functionality

1. An insulin pump system shall have an automatic function suspending insulin delivery if a rapid decrease in blood glucose value is anticipated by the CGM device and insulin pump system (also known as a "suspend before low" feature).

2. In the event of a rapid decompression for a pilot using insulin pump delivery systems:

    a. atmospheric pressure reduction causes unpredictable, unintended insulin delivery in pumps by bubble formation and expansion of existing bubbles;

    b. therefore, the insulin pump shall be disabled (disconnected) immediately and 15g readily absorbed carbohydrate ingested as soon as possible, within 15 minutes of the decompression;

    c. more frequent blood glucose monitoring shall be carried out thereafter;

    d. the insulin pump may be enabled (reconnected) after landing or when blood glucose levels and stability of glycaemic control can be verified; and

    e. a similar procedure shall be followed for all other emergency situations.

Issues of consideration

1. In the unlikely event of any symptoms of cognitive impairment a pilot shall not resume duties for the duration of the flight.
2. If crew assistance is required or a pilot becomes incapacitated, then an incidence report shall be completed and submitted to the Authority and the pilot shall be certified temporary unfit by a Medical Assessor and the pilot's medical fitness status shall be reviewed by the Aeromedical Committee to determine an applicant's medical fitness.
3. A holder of a Class 1 medical certificate for a Schedule 13A protocol (pilot) who hasto take action for a high or low reading shall always record an entry in his or her logbook, documenting the action taken.
4. The blood glucose data shall be periodically reviewed by a DAME and such data shall be submitted to the Medical Assessor against the flying/controlling log to ensure protocol compliance.
5. Failure to demonstrate compliance with the schedule of testing may result in suspension of the medical certificate.
6. A holder of a Class 1 medical certificate for Schedule 13A protocol (pilot) shall adhere to the fail-safe position which is to always take rapidly absorbed carbohydrate if unable to test.

Medical certification renewal requirements

A holder of a Class 1 medical certificate for a Schedule 13A protocol (pilot):

1. shall submit an endocrinologist report every six (6) months.

2. shall submit an HbA1C review every three (3) months for the first two (2) years, then six (6) monthly thereafter.

3. is required to submit a cardiologist review every five (5) years if a pilot is under the age of 40 years and annually if a pilot is over 40 years.

4. has cardiovascular risk factors in addition to diabetes, an annual cardiology report shall be submitted.

5. shall submit the ophthalmology report annually.

Requirements for change in the medical status

A holder of a Class 1 medical certificate for a Schedule 13A protocol (pilot) with changes in his or her medical status falling outside the required criteria shall be required to submit medical reports to a Medical Assessor for consideration and these changes include, but not limited to the following:

a) an HbA1C between 8.5% -10% should trigger a diabetes review and review of treatment and a period of unfitness may be required to re-stabilise treatment;

b) an HbA1C of greater than 10% indicates poor control and shall normally entail an unfit assessment;

c) change of insulin regimen (including new use of pump) shall result in a pilot being declared temporary medically unfit for a minimum period of one (1) month;

d) a medical report by an endocrinologist detailing stability, symptoms, satisfactory blood glucose and monitoring is required before return to flying;

e) episodes of severe hypoglycaemia shall be reported and such occurrences including but not limited to severe hypoglycaemia requiring the assistance of another person shall normally entail an unfit assessment;

f) the development of any retinopathy requires ophthalmological assessment and is likely to result in further restriction or medical unfitness if there is any field loss or reduction in visual acuity;

g) the presence of significant nephropathy significantly increases cardiovascular risk and is likely to entail unfitness; and

h) non-declaration of symptoms, medical history or provision of incomplete testing records/flying logbook is likely to entail unfitness. [Schedule 13A inserted by the Director of Civil Aviation through SA-CATS 1/2023 w.e.f. 1 March 2023.]

Protocol on diagnosed Addison's disease.

Before an applicant for a pilot licence may be considered, he/she must comply with the following standards:

a) Normal physical examination.

b) The following blood test results must be normal before exercise:

c) Urea and electrolyte

d) Blood glucose (random)

e) Serum cortisol

f) Liver function test

g) Exercise must then be undertaken, and a series of blood samples must be taken, both during and after the exercise.

h) The exercise must be on a treadmill, with the applicant running until he/she is exhausted, or until a heart rate equivalent to a 100% stress ECG is achieved.

i) The blood test results required during exercise are the following:

i. Urea and electrolyte screen (X 1)
ii. Blood glucose (X 3)
iii. Serum cortisol (X 1)
iv. The blood tests must be repeated after exercise.
v. The blood pressure and pulse rate must be monitored throughout the exercise, and any changes must be appropriate for the intensity of the exercise.

Restriction

1. If all the above standards are achieved, the applicant may be certified, but with the following restrictions:

i. May only fly with or as a co-pilot; and
ii. May not fly when suffering from any infection, or when pyrexial. Must be re-examined following resolution of the infection before he/she can resume flying.

2. All surgical procedures will result in the applicant becoming unfit, until cleared by the designated body or institution. Will remain unfit for at least six weeks following surgery.

3. Must always wear a Medic Alert disk specifying that he/she has Addison's Disease.

4. Must always carry an emergency supply of Cortisone when flying.

5. The following blood tests must be performed at least three times a year:

i. Urea and electrolyte;
ii. Blood glucose (random);
iii. Serum cortisol;
iv. Liver function test; and
v. Serum renin determination.

6. The applicant must be fully informed as to the disease, its treatment, and possible complications.
7. The applicant is required to submit an annual specialist physician's report to the designated body or institution.

Oncology Protocols

1. Aeromedical consideration

Impairment or sudden or subtle incapacitation:

i. Applicants must be free from any risk factor, disease or disability which renders them either unable, or likely to become suddenly unable, to perform assigned duties safely.

ii. These may include effects and/or adverse effects from the treatment of any condition and drugs or substances of abuse.

2. Medical Deficiency

a) Applicants must be free from any of the following, should these result in a degree of functional incapacity likely to interfere with the safe operation of an aircraft of with the safe performance of their duties:

b) Congenital or acquired abnormality;

c) Active, latent, acute or chronic disability, disease or illness; and

d) Wound, injury, or outcome of operation.

e) Every applicant who has been treated for malignant disease will need an individual assessment before exercising licence privileges. Recovery from surgery or radiotherapy should be assessed.

f) Current curative or adjuvant chemotherapy is incompatible with certification, and recovery from the effects of such treatments will demand a period of unfit assessment after the treatment.

g) If the pilot has recovered from the primary treatment and, as far as can be assessed with available techniques, there is no residual tumour, then the level of certification will depend on the likelihood of recurrent disease.

h) In addition to ensuring that treatment has been effective, pre-requisites for certification after treatment for malignant disease include satisfactory haematological parameters and no on-going side effects from therapy.

i) Treatment modalities available for cancer

Surgery

Surgery is the commonest primary treatment for malignant disease and is frequently the only treatment. A return to flying, from the purely surgical aspect, depends on the extent of the surgical operation.

Radiotherapy

a) This is usually given as an intensive course.

b) The aim of radiotherapy may be curative, for example when given to an isolated group of lymph nodes which have proved by biopsy to contain lymphoma; or as adjuvant treatment, for example to the abdominal nodes following orchidectomy for a seminoma of the testis, on the assumption that they may contain metastatic tumours.

c) Many patients undergoing radiotherapy suffer non-specific systemic effects (tiredness, malaise and nausea), which make it inadvisable for any pilot to fly whilst receiving such treatment.

Chemotherapy

a) Pilots, ATC's, CCM's and other aviators should be assessed as unfit during any period of treatment with cytotoxic chemical agents.

b) The only exception to an unfit assessment during adjuvant treatment for malignancy is endocrine therapy.

c) Certain adjuvant hormone and anti-hormone treatments following (for example) breast or prostate cancer treatment may be acceptable if there are no side effects.

d) Stem cell transplantation

e) It is possible to return to flying after stem cell transplantation if there is sustained remission.

Complementary and alternative medicine

i. Where such treatments are used in the presence of continued active disease, the applicant is assessed as unfit.

ii. Where the treatment is used to prevent onset of malignancy or recurrence, the treatment will be considered on a case-by-case basis, with regard to the individual's overall health and the potential effect of the treatment.

Hormonal Therapy

Endocrine therapy is used as part of the treatment of some cancers (such as hormone and anti-hormone treatment following breast and prostate cancer). Pilots, ATCs, CCM's and other aviators may be returned to flying or controlling if there are no side effects from their hormonal therapy.

Acceptable aviation risk

The primary treatment, be it surgery, radiotherapy, chemotherapy, or a combination of these, should have removed all signs of tumour/malignancy when measured clinically or by investigation. Thus, the risk to flight safety is the possibility that local or metastatic recurrence will cause sudden or insidious incapacitation whilst

the pilot is flying. After treatment of malignancy, the prognosis improves with recurrence-free time after the original episode.

Following "successful" primary treatment, the risk that tumour/malignancy will cause an insidious or sudden incapacitation depends on two factors:

a) The actual risk of recurrence, which will depend on the pathological stage of the tumour or its TNM classification; and

b) The site of that recurrence and this will depend on the primary tumour type.

c) Principle of Aeromedical Certification of Pilots, ATC's, CCM's and other aviators with malignancy

d) When considering the aero-medical risk (and therefore the risk to aviation safety) posed by a pilot, CCM or ATC suffering from a malignancy, the SACAA will evaluate the following:

e) Cancer specific issues: This includes the type of cancer (tissue and histological diagnosis), the likelihood of recurrence, site of recurrence, presence of any para-neoplastic syndromes, potential for a recurrence to cause overt or subtle in-flight incapacitation.

f) Issues related to the treatment of the cancer: When assessing the aero-medical risk of a pilot, ATC, or CCM with a malignancy, accurate tissue diagnosis of the malignancy is essential.

g) Complications of malignancy: The common complications of the malignancy are usually pain, wasting, neuropathy, nausea, anorexia, seizures, hypercalcaemia, hyperuricaemia, viscus obstruction, organ failure, and para-neoplastic syndromes.

Likelihood of recurrence: The overall survival curve for individuals diagnosed with a theoretical malignancy must be considered. For most cancer types, annual recurrence rates can be calculated from survival curves. (As cure following recurrence is rare, overall survival approximates recurrence).Staging: Recurrence rates are greatly influenced by the stage of disease when primary treatment occurred. Many cancers are staged using a TNM (Tumour, Node, and Metastasis) classification. The variation in survival rates for a theoretical cancer according to the degree of spread evident at diagnosis.Site of recurrence: Each tumour has a characteristic pattern of recurrence. Thus for a theoretical tumour, metastases might occur according to the distribution.
Risk of particular metastasis causing incapacitation: Several assumptions are made when assessing the risk of a particular metastasis causing incapacitation (either subtle or overt). For a theoretical cancer, recurrence in a regional lymph node carries a relatively small risk of incapacitation. On the other hand, brain metastasis has a near-100% potential for incapacitation (whether sudden due to a fit or bleed, or subtle as a result of pressure effects or headache, etc.).Tumour markers: The relapse or active progression of certain tumours may be effectively followed by measuring tumour markers.

ii. Protocol for specific cancers

The following cancers/malignancies are discussed for the purpose of this protocol:

The rest of the cancers not discussed here will be considered by the Aeromedical Committee on a case-by-case basis using the similar principles of certification.

Malignant Melanoma

A diagnosis of Malignant Melanoma is disqualifying and upon diagnosis, and applicants shall be deemed medically unfit to exercise the privileges of the class of the licence they hold.

PROTOCOL ON DIAGNOSED ADDISON'S DISEASE

1.Before an applicant for a pilot licence may be considered, he/she must comply with the following standards :

i. Normal physical examination.

2.The following blood test results must be normal before exercise –

i. Urea and electrolyte screen.
ii. Blood glucose (random).
iii. Serum cortisol.

3.Liver Function Test screen (this is necessary in order to ensure that the applicant is not abusing alcohol, which would predispose him to developing hypoglycaemia).

4.Exercise must then be undertaken, and a series of blood samples must be taken, both during and after the exercise. The exercise must be on a treadmill, with the applicant running until he/she is exhausted, or until a heart rate equivalent to a 100% stress ECG is achieved.

5.The blood test results required during exercise are the following:

i. Urea and electrolyte screen (X 1).

ii. Blood glucose (X 3).

iii. Serum cortisol (X 1).

6.The blood pressure and pulse rate must be monitored throughout the exercise, and any changes must be appropriate for the intensity of the exercise.

7 .If all the above standards are achieved, the applicant may be certified, but with the following restrictions –

1) May only fly with or as a co-pilot.

2) May not fly when suffering from any infection, or when pyrexial (including "flu" or a common cold). Must be re-examined by the designated body or institution following resolution of the infection before he/she can resume flying.

3) All surgical procedures, operations or use of medication, whatever the reason, will result in the applicant becoming unfit, until cleared by the designated body or institution. Will remain unfit for at least 6 weeks following surgery.

4) Must always wear a Medic Alert disk specifying that he/she has Addison's Disease.

5) Must always carry an emergency supply of Cortisone when flying.

6) The following blood tests must be performed at least 3 times during the year (i.e. approximately every 4 months) in order to determine whether the applicant is complying with treatment –

i. Urea and electrolyte screen.

ii. Blood glucose (random).

iii. Serum cortisol.

iv. Liver Function Test screen.

v. Serum Renin determination.

7) The applicant must be fully informed as to the disease, its treatment and possible complications.

8) The applicant is required to submit an annual specialist Physician's report to the designated body or institution.

Oesophageal Cancer

A diagnosis of oesophageal cancer is disqualifying, and upon diagnosis, the applicant shall be deemed medically unfit to exercise the privileges of the class of the licence they hold. Oesophageal cancer is uncommon but is not rare. It is more common over the age of 55, with the average age of diagnosis being 72. Oesophageal cancer does not usually cause any noticeable symptoms until the cancer has spread beyond the oesophagus and into nearby tissue. Therefore, the outlook for oesophageal cancer is poor compared with other types of cancer. On average, 30% of people with oesophageal cancer will live for one year after diagnosis. An average of 8% will live for five years after the diagnosis. Even with early diagnosis an estimation of 34% to 42% of people will live for two years after the diagnosis.

Two main types of oesophageal cancer are:

i. Squamous cell carcinoma (90%-95%) – upper part of the oesophagus; and
ii. Adenocarcinoma of the oesophagus (50%-80%) – lower part of the oesophagus.

Medical Requirements Oesophageal Cancer

1) Recertification is possible as most patients return to their regular level of activities within two months after surgery.

2) The following examinations and procedure reports are required before the applicant's case can be considered regarding medical certification/recertification:

i. Specialist report including Staging and/or with Tumour Grading
ii. Histology report
iii. Radiological reports: Barium swallow, CXR, CT/MRI/PET scan (PET scan is the preferred investigation)
iv. Bloods: e.g. FBC, LFT, U&E (Creat), Ca2+

Stage 1 & 2 Oesophageal Cancer

a) Patients without lymph node involvement have a significantly better prognosis and five-year survival rate compared to patients with involved lymph nodes.

b) Follow-up treatment may include evaluation with CT scans and upper endoscopy to watch for possible recurrence. In stage 0, the cancer is confined to the superficial lining of the oesophagus.

c) In stage I, the cancer has not invaded the outer muscle layer of the oesophagus and surgery to remove the tumour offers the best chance for cure.

d) If the disease is caught early, the five-year survival rate is much higher – 75% for patients diagnosed in stage 0 and 50% for those diagnosed in stage I.

Follow-Up Requirements Oesophageal Cancer

i. Six-monthly specialist report
ii. Six-monthly radiological reports for three years, then annually till year five
iii. Barium swallow, CXR, CT/MRI/PET scan (PET scan is a preferred investigation)
iv. Endoscopic examination at six-monthly to yearly intervals as per clinical indication
v. Bloods, e.g. FBC, LFT, U&E (Creat), Ca2+
vi. Restriction Applicable to the Medical Certificate
vii. Licence holders will be required to operate under a multi-crew environment, as or with co-pilot, or under supervision (depending on their environment) etc., until the aeromedical risk has been assessed and deemed favourable for a restriction to be lifted.

Stage 3 Oesophageal Cancer

i. Stage 3 oesophageal cancer is generally disqualifying.
ii. The five-year survival rate is about 20% to 30%.
iii. Recertification may be considered on a case-by-case basis if the cancer is operable, there is no lymph node involvement, and the applicant is at least six months post treatment.
iv. Follow-Up Requirements Oesophageal Cancer
v. Six monthly specialist report
vi. Six monthly radiological reports for three years, then annually till year five
vii. Barium swallow, CXR, CT/MRI/PET scan (PET scan is a preferred investigation)
viii. Endoscopic examination at six-monthly to yearly intervals as per clinical indication
ix. Bloods e.g. FBC, LFT, U&E (Creat), Ca2+
x. Restriction in the Medical Certificate
xi. Licence holders will be required to operate under a multi-crew environment, as or with co-pilot or under supervision (depending on their environment) etc., until the aeromedical risk has been assessed and deemed favourable for the restriction to be lifted.

Stage 4 Oesophageal Cancer

i. Stage 4 lesions are associated with a 5-year survival rate of less than 5% and is disqualifying.

Colorectal Cancer

A diagnosis of colorectal cancer is disqualifying and upon diagnosis, the applicant shall be deemed medically unfit to exercise the privileges of the class of the licence they hold.

Medical Requirements for Colorectal Cancer

i. The following examinations and procedure reports are required before the applicant's case can be considered regarding medical certification/recertification:

ii. Specialists' reports, which must include clinical staging, and /or with tumour grade, colonoscopy findings and an indication whether adjuvant therapy is indicated or not;

iii. Histology report including Duke's/TNM Staging;

iv. Blood test results: FBC, ESR; LFT including LDH & ALP;

v. Tumour markers, e.g. CEA;

vi. Presence of occult blood in the faeces – Haemoccult;

vii. Radiological reports: CXR; and

viii. If clinically indicated according to the colonoscopy and CEA findings, a CT scan of the abdomen, lungs and brain will be required.

ix. A minimum period of three months is required following colectomy before an applicant can be considered for recertification.

x. If Dukes A/Stage 1, requiring no adjuvant therapy- Colorectal Cancer

xi. Recertification is possible after three months (3) post-surgery and the following medical requirements must be submitted:

a) The applicant must submit six-monthly specialist's reports for two years, thereafter annually for five years;
b) Radiological assessments: Annual CXR/CT chest, CT Abdomen and Pelvis for five years (stage 1, 2, 3);
c) Colonoscopy to be done one year after completion of treatment and repeated annually if new polyps are noted or every three years if no polyps are noted; and
d) Six-monthly laboratory tests; FBC, and ESR; LFT including: LDH & ALP; and tumour markers, i.e. CEA.

Restriction for Colorectal Cancer

Licence holders will be required to operate under a multi-crew environment, as or with co-pilot, or under supervision (depending on their environment) etc., until the aeromedical risk has been assessed and deemed favourable for the restriction to be lifted.

Dukes B&C/Stage 2&3 Requirements- Colorectal Cancer

1) The applicant is required to complete full course of chemotherapy and radiotherapy.

2) Recertification is possible after three months(3) post-surgery and the following information will be required :

i. The applicant is clinically disease free and fully recovered from all treatments; and
ii. The applicant has no side effects including cardiac side effects.

Follow-Up Reports Colorectal Cancer

Licence holders will be required to operate under a multi-crew environment, as or with co-pilot, or under supervision (depending on their environment) etc., until the aeromedical risk has been assessed and deemed favourable for the restriction to be lifted.

i. Must submit six-monthly detailed specialists' reports (surgeon, radiologist, oncologist, etc.);
ii. Must do a faecal occult blood test six monthly;
iii. Report from radiation oncologist specifying exposure areas and any sequalae;
iv. CXR, CT/MRI scan; colonoscopy or adequate air-contrast Ba Enema annually; and
v. Six-monthly Bloods: FBC, ESR, LFT including LDH, Serum CEA.
vi. Restriction on the Medical Certificate - Colorectal Cancer

Duke's D/Stage 4- Colorectal Cancer

Stage 4 Colorectal Cancer is Disqualifying.

Breast Cancer

1) A diagnosis of breast cancer is disqualifying, and upon diagnosis, the applicants shall be deemed medically unfit to exercise the privileges of the class of the licence they hold.

2) Clinical management of patients with early breast cancer is determined on an individual basis, taking into account many factors, including the risk of cancer recurrence.

3) The clinical management of breast cancer is directly linked to pathological assessment of the cancer. So, accurate pathological assessment of the breast cancer specimen is vital.

4) Common factors have been identified for predicting the risk of recurrence in patients with breast cancer.

5) Node negative status at diagnosis has commonly been associated with a favourable outcome.

6) But the risk of recurrence still exists for women with early breast cancer regardless of nodal status, oestrogen receptor status, age, chemotherapy regimen, time on Tamoxifen or time from initial diagnosis.

7) Adjuvant Tamoxifen therapy has significantly improved patient outcomes.

8) However, even with adjuvant therapy, more than 20% of node-negative patients had their disease recur within 15 years after diagnosis.

9) Recurrences can occur after five years of being disease free, even with the successfully treated early breast cancer.
10) Risk of recurrence is greatest during the first two years following surgery. After two years, there is a steady decrease in the risk of recurrence until five years.

11) After five years, the risk of recurrence averages 4.3% per year.

12) Up to at least 12 years, the risk of recurrence remains appreciable and even some patients considered low risk have some risk of the cancer coming back.

Medical Requirements

1) The following examinations and procedure reports are required before the applicant's case can be considered regarding medical certification/recertification:

a) Specialist reports including clinical staging;
b) Histology reports;
c) Radiological assessment: CXR, CT/MRI/PET scan/mammograms;
d) Nodal assessment: lymph node biopsies;
e) Bloods, e.g. FBC, LFT, U&E (Creat); and
f) Tumour markers such as HER2.

Restriction on the Medical Certificate

Licence holders will be required to operate under a multi-crew environment, as or with co-pilot, or under supervision (depending on their environment) etc., until the aeromedical risk has been assessed and deemed favourable for the restriction to be lifted.

Testicular Cancer

A diagnosis of testicular cancer is disqualifying, and upon diagnosis, the applicants shall be deemed medically unfit to exercise the privileges of the class of the licence they hold.

Medical Requirements- Testicular Cancer

a) An orchidectomy must have been performed successfully, without complications.
b) The following examinations and procedure reports are required before the applicant's case can be considered regarding medical certification/recertification:
c) A specialist report from an oncologist or urologist, including staging;
d) Radiological reports: CXR and/or CT/MRI/PET scan reports (if considered necessary by the specialist); and
e) Tumour marker levels: α fetoprotein; Lactate dehydrogenase (LDH); Human chorionic gonadotropin (HCG).
f) The applicant is temporarily unfit to fly while on chemotherapy (and for at least one week after cessation of medication).

Stage 1 (Non-metastatic disease): Testicular Cancer

a) Certification will be considered after full recovery and cure rates of 100% are possible.
b) Follow-Up Requirements - Testicular Cancer
c) Due to the great differences in the management of the multiple types of testicular carcinomas, the follow-up requirements will be as per the oncologist/urologist plan.
d) The applicant will be required to submit:

e) Specialist's reports (oncologist or urologist) along with tumour marker levels 3 to 4 monthly or as per specialist follow-up plan for two years, then six monthly for three years thereafter, with annual submissions submit util year 10.

Restriction on the Medical Certificate

Licence holders will be required to operate under a multi-crew environment, as or with co-pilot, or under supervision (depending on their environment) etc., until the aeromedical risk has been assessed and deemed favourable for the restriction to be lifted.

Stage 2 (Pelvic and Abdomen L/N spread): Testicular Cancer

Certification will be after full recovery; survival rates of 97% are possible.

Follow-Up Requirements - Testicular Cancer

a) Due to the great differences in the management of the multiple types of testicular carcinomas, the follow-up requirements will be as per oncologist/urologist plan.
b) The applicant will be required to submit specialist's reports (oncologist or urologist) along with tumour marker levels 3 to 4 monthly or as per specialist follow-up plan for two years, then six monthly for three years thereafter annually until year 10.

Restriction on Medical Certificate

Licence holders will be required to operate under a multi-crew environment, as or with co-pilot, or under supervision (depending on their environment) etc., until the aeromedical risk has been assessed and deemed favourable for the restriction to be lifted.

Stage 3/4 (local and distant metastatic disease)

Certification will be after full recovery; Prognosis remains good (65%-85% cure rates).

Follow-Up- Testicular Cancer

a) Due to the great differences in the management of the multiple types of testicular carcinomas, the follow-up requirements will be as per the oncologist plan.
b) The applicant will be required to submit Specialist's reports (oncologist or urologist) along with tumour marker levels 3 to 4 monthly or as per specialist follow-up plan for two years, then six monthly for three years thereafter annually until year 10.
c) Applicants on will not be considered while recertification while on chemotherapy

Restriction on Medical Certificates

Licence holders will be required to operate under a multi-crew environment, as or with co-pilot, or under supervision (depending on their environment) etc., until the aeromedical risk has been assessed and deemed favourable for the restriction to be lifted.

Prostate Cancer

a) A diagnosis of prostate cancer is disqualifying, and upon diagnosis, the applicants shall be deemed medically unfit to exercise the privileges of the class of the licence they hold.

b) The outcome of prostate cancer varies greatly.

c) It is mostly affected by whether the cancer has spread outside the prostate gland and how abnormal the cancer cells are (the Gleason score) upon diagnosis.

d) Many patients with prostate cancer that has not spread can be cured, as well as some patients whose cancer has not spread very much outside the prostate gland.

e) Even for patients who cannot be cured, hormone treatment can extend their life by many years.

Medical Requirements- Prostate Cancer

a) Cancer of the prostate has a generally good prognosis and tends to metastasize locally or to bone. Once primary treatment has been completed, unrestricted certification will be possible where:

b) There is no evidence of metastatic spread;
c) PSA has returned to acceptable limits; and
d) There are no significant consequences of treatment, such as incontinence.
e) The following examinations and procedure reports are required before the applicant's case can be considered with regard to medical certification/recertification:

a) Specialist report, which must include clinical staging and/or with Gleason score;
b) Histology report;
c) Blood test results: PSA (usually every three months to one year); and
d) Initial radiological reports, CXR/bone scans/CT/MRI (done during diagnosis or staging).
e) Should there be metastatic spread which has been controlled and PSA has returned to less than 10, certification may also be considered.
f) Should the medical waiver be granted in cases of metastatic spread mentioned above, the follow-up medical examinations and reports must be accompanied by:
g) A six-monthly progress report from a urologist or oncologist for 3 years; and
h) Annual PSA level for three years.
i) If the applicant shows no signs of recurrence after three years from initial diagnosis, no further follow-up is required.

Restriction on the Medical Certificate

Licence holders will be required to operate under a multi-crew environment, as or with co-pilot, or under supervision (depending on their environment) etc., until the aeromedical risk has been assessed and deemed favourable for the restriction to be lifted.

Renal Cancer

A diagnosis of renal cancer is disqualifying, and upon diagnosis, the applicants shall be deemed medically unfit to exercise the privileges of the class of the licence they hold.

Medical Requirements- Renal Cancer

1) As the outcome of renal cancer is unpredictable, and as cerebral metastases are common, the SACAA will determine aero-medical disposition on a case-by-case basis.

2) There would at least be a six-month grounding period following completion of treatment.

3) The following examinations and procedure reports are required before the applicant's case can be considered regarding medical certification/recertification:

a) Detailed specialist's reports including staging;
b) Radiological reports;
c) CXR, Abdominal CT/MRI /PET scan reports, renal arteriography, bone scan, U/S;
d) Bloods: FBC, LFT, U&E, GFR; and
e) Urine tests.

Restriction on the Medical Certificate

Licence holders will be required to operate under a multi-crew environment, as or with co-pilot, or under supervision (depending on their environment) etc., until the aeromedical risk has been assessed and deemed favourable for the restriction to be lifted.

Bladder Cancer

1) A diagnosis of bladder cancer is disqualifying and upon diagnosis, the applicants shall be deemed medically unfit to exercise the privileges of the class of the licence they hold.

2) Impairment to flying may result from urinary frequency/urgency and tumour(s) or clots causing urinary tract obstruction with resultant pain. Metastatic disease could cause any number of symptoms, including sudden incapacitation or subtle decrement of higher cognitive function.

3) The clinical course of bladder cancer carries a broad spectrum of aggressiveness and risk. Low grade, superficial bladder cancers have minimal risk of progression to death. However, high-grade non-muscle invasive cancers frequently progress to death. Muscle-invasive cancers are often lethal.

4) Upon presentation, 55%-60% of patients have a low-grade non-invasive disease, which is usually treated conservatively with transurethral resection and periodic cystoscopy.

5) The remainder of patients have a high-grade disease, of which 50% is muscle invasive and is typically treated with radical cystectomy.

6) Carcinoma in situ is managed by instilling chemotherapeutic or immunotherapeutic agents.

7) Bladder cancer has the highest recurrence rate of any malignancy, thus creating a great need for accurate and diligent surveillance. Because of a fairly high risk of recurrence for both invasive and non-invasive disease, there will always be a need for scheduled follow-up evaluation.

8) Early after treatment, the patient may be required to undergo urologic evaluation (urinalysis, cytology, cystoscopy, imaging, and additional labs) every three months.

9) After two years without recurrence, indefinite annual examinations are usually recommended.

Medical Requirements- Bladder Cancer

a) A minimum of a six-month (6) grounding period is applicable to an applicant.
b) The following examinations and procedure reports are required before the applicant's case can be considered regarding medical certification/recertification:
c) Specialist reports including staging;
d) Bladder exams every three to six months after treatment;
e) Urological evaluation;
f) Urinalysis (if bladder not removed);
g) Cytology (urine cytology);
h) Cystoscopy; and
i) IVP.

After two years without recurrence, indefinite annual examinations are required along with the following:

a) Histology reports;
b) Radiological and imaging;
c) CXR, Bone scans/CT; and
d) Lab tests; FBC.

Stage 1 & 2 Bladder Cancer

The outlook for stage 1 or 2 cancers is fairly good. Although the risk of the cancer returning is high, most bladder cancers that return can be surgically removed and cured.

Follow-Up- Bladder Cancer

a) Applicant will be required to submit a three- to six-monthly Urologist

b) After two years without recurrence, indefinite annual examinations are required along with the following:
c) Annual radiological reports; and
d) CXR, bone scans/CT.

Restriction on Medical Certificate

Licence holders will be required to operate under a multi-crew environment, as or with co-pilot, or under supervision (depending on their environment) etc., until the aeromedical risk has been assessed and deemed favourable for the restriction to be lifted.

3 Bladder Cancer

The cure rates for people with stage 3 tumours are less than 50% and patients with stage IV bladder cancer are rarely cured. Stage 3 and 4 are disqualifying.

Renal Transplantation

Applicability

This protocol is applicable to classes I, II, III and IV medical certificates.

Medical Requirement

Requirements for consideration of a medical certificate following renal transplantation:

1) An applicant shall be declared medically unfit following renal transplantation.
2) An applicant shall be referred to an Aeromedical Committee 12 months post-transplantation for recertification, and each case shall be considered on its own merit.
3) An applicant may be considered for medical certification if he or she submits a nephrologist's report with the following information:
a) Renal function is stable, with no underlying systemic disorder likely to cause sudden change;
b) Blood pressure is well controlled on approved medication;
c) Steroid dosage is below 10mg/day;
d) Anti-rejection drugs levels are within therapeutic ranges, to minimise side effects; and
e) Cardiovascular risk has been assessed by a cardiologist as minimal.

Protocol on Renal Cell Carcinoma

Applicability

This protocol is applicable to classes I, II, III and IV medical certificates.

Requirements for consideration of a medical certificate:

1) An applicant who is asymptomatic and has no other conditions may be declared medically fit subject to the

following conditions:

a) The primary lesion (tumour) shall be monitored with six-monthly CT scans for two years; and

b) An applicant with a lesion not demonstrating growth after two years (threshold 4 cm) shall be monitored with annual CT scans.

2) An applicant who is symptomatic or with lesions (tumour) > 4cm:

a) Shall be declared medically unfit for a period of two years; a recommended treatment is nephrectomy;

b) When presenting himself or herself for recertification after two years, an applicant shall be required to submit a urologist's report which is not older than three months with the following:

(i) Disease-specific history such as symptom-free period, surgery complications, further anticipated treatment;

(ii) Function of the remaining kidney;

(iii) CT reports, mainly on brain and abdomen; and

(iv) Confirmation that the applicant is off all medication.

3) An applicant with early recertification with multi-crew limitation may be declared medically fit if a specialist's advice indicates an acceptable low risk.

Follow-Up Reports Renal Cell Carcinoma

An applicant shall be required to submit the following urologist report:

a) One report every three months in the first year;
b) Two reports in the second year; and
c) One report annually after the second year for an indefinite period.

Protocol on Benign Prostatic Hyperplasia

Applicability

This protocol is applicable to the classes I, II, III and IV medical certificates.

Requirements for consideration of a medical certificate

1) An applicant presenting with benign prostatic hyperplasia who is asymptomatic may be declared medically fit provided that he or she has submitted the required medical reports.

2) An applicant presenting with benign prostatic hyperplasia who is asymptomatic shall be required to submit a six-monthly urologist's report, including a Prostate Specific Antigen (PSA) blood test.

3) An applicant presenting with benign prostatic hyperplasia who is symptomatic shall be declared medically unfit up to a period of three months post-commencement of medical treatment.

4) An applicant presenting with benign prostatic hyperplasia who is symptomatic shall be medically unfit from the time of diagnosis up to a period of six weeks post-surgery.

5) An applicant may be considered for medical certification only if no treatment or surgery complications and symptoms are completely resolved.

Follow-up Reports

An applicant shall submit a six-monthly urologist's report which shall include Prostate Specific Antigen (PSA) values and a disease-specific history such as any deterioration of symptoms, any complications and planned future treatment.

Kidney Diseases

Chronic Kidney Disease

Applicability

This protocol is applicable to classes I, II, III and IV medical certificates.

Requirements for consideration of a medical certificate

1) An applicant presenting with chronic kidney disease shall have ongoing surveillance with a physician to prevent deterioration and development of complications.

2) An applicant with a diagnosis of chronic kidney disease, with Creatinine < 200 micromol/L, shall be declared medically unfit if symptomatic, until he or she is treated and is stable.

3) An applicant presented with chronic kidney disease, with Creatinine < 200 micromol/L, may be considered for recertification if a physician's report provides the following:

a) An applicant has been treated fully or has recovered with no current illness likely to cause instability;

b) Renal function is stable with normal electrolytes; and

c) Underlying chronic medical conditions are well controlled on current medication.

4) An applicant with a diagnosis of chronic kidney disease, with Creatinine 200-500 micromol/L, shall be considered on a case-by-case basis after recovery.

5) An applicant shall submit a six-monthly physician's report, which shall not be older than three months and shall include results for:

a) Urea, Creatinine and Electrolytes;
b) Haemoglobin; and
c) Urinalysis.

6)An applicant considered for recertification shall submit a physician's report which shall not older than three months, and shall include the following information:

a) Normal Electrolytes;

b) Haemoglobin is at least 10g/dL;

c) Confirmation that the underlying chronic medical conditions are well controlled; and

d) Conformation that an applicant condition is asymptomatic and stable on current treatment.

7) An applicant presenting with chronic kidney disease, with Creatinine > 500 micromol/L, shall be declared medically unfit.

8) An applicant presenting with chronic kidney disease, with Creatinine > 500 micromol/L, may be referred to a medical assessor to be considered for recertification.

9) An applicant who requires dialysis shall be declared medically unfit.

HIV/AIDS PROTOCOL-Class 1,2 & 3

General and Medical Requirements

1) Following an initial diagnosis of HIV seropositivity, the applicant will be assessed as temporarily unfit for a period of three months, pending submission of the following favourable reports –

a) HIV specialist* review with following –

b) History of infection and current and previous symptoms;

c) Stability of condition and history of opportunistic infections or associated illnesses;

d) History of CD4+ T cell counts ;

e) History of viral load measurements;

f) Medication history (including “over-the-counter” medications and alternative medicines);

g) Report concerning side effects of medications;

h) Laboratory testing to include –

i) Hepatitis B and C, cytomegalovirus, toxoplasma, tuberculosis;

j) Full blood count, urea, creatinine and electrolytes, liver function tests, fasting glucose, lipogram.

2.Neurological review – can be undertaken by a neurologist or specialist or physician.

3.Assessment for neurological sequelae including assessment of primitive reflexes because of their association with cognitive decline.

a) Neuropsychological review.

b) Baseline neuropsychological assessment.

4.Tests should include timed psychomotor tasks and memory tasks requiring attention, learning, active monitoring and retrieval of information.

5.Psychiatric review (only if clinically indicated)

6.Assessment for psychiatric sequelae related to HIV seropositivity and antiretroviral treatment.

7.Cardiologist review (only if indicated) and Cardiologist review is recommended if the following exist –

8.Lipodystrophy or metabolic syndrome (dyslipidaemia - raised total cholesterol, low high density lipoprotein cholesterol and raised triglycerides or insulin resistance with hyperglycaemia);

i. Cardiac risk factors are present, including –

ii. Hypertension, evidence of left ventricular hypertrophy, smoking, raised lipids, diabetes and age over 40 years.

2. **Medications include –**

a) Acceptable medications abacavir, didanosine, emtricitabine, lamivudine, tenofovir, zidovudine, atazanavir, fosamprenavir, lopinavir/ritonavir, nelfinavir, saquinavir, nevirapine.

b) Unacceptable medications include enfuvirtide, zalcitabine, indinavir, efivarenz and stavudine.

c) Recently available medication, e.g. tipranavir, darunavir, raltegravir and maraviroc, may be acceptable on an individual basis.

d) Particular attention needs to be given to the toxicity and side effect profile of such medications.

e) A “temporary unfit” assessment should be made when initiating, modifying, or discontinuing ART.

f) When stable, recertification after three months of monitoring may be permitted providing that –

i. There has been an acceptable serological response (as evidenced by increase CD4 count and a decrease in the viral load)

ii. No on-going side effects

iii. Full blood count (FBC), liver function tests (LFTs), lipids and fasting blood glucose are within normal limits.

iv. Reviews should take account of any over-the-counter medications and alternative therapies being taken.

v. Applicants whose condition is stable, asymptomatic, with an acceptable CD4+ count of > 350, viral load of < 1000 copies per millilitre of plasma and acceptable co-infection can be considered for any class of the medical certificate.

9.All cases will be assessed individually taking into consideration a favourable clinical and serological response.

Regular follow-up is required, to include:

a) 3-monthly CD4 count and viral load measurements

b) 6-monthly neurological assessment (by HIV specialist or neurologist including consideration of the need for psychiatric evaluation – for follow-up assessment a specialist physician may conduct the neurological examination).

c) If taking ART: 6-monthly LFTs, FBC with minimum Haemoglobin of 12g/dl, Renal Function, Lipogram and Fasting glucose.

Annual cognitive function assessment.

a) Impaired performance will require further neuropsychological assessment to be compared with baseline testing, and any deficits will require that the pilot is declared temporarily unfit.

b) Neuropsychological assessment should be undertaken if there are any clinical concerns about cognitive impairment.

c) Further co-infection testing should be undertaken where clinically indicated and those with new positive tests must be deferred for further evaluation.

d) If an applicant develops new symptoms and/or fails to achieve the nominal levels listed above he must be declared temporarily unfit and referred to the Aeromedical Committee.

7. Withdrawal of the medical certificate

The medical certificates of applicants presenting with the following complications/side effects will be withdrawn if there is –

a) Presence of acute or serious opportunistic infection
b) The use of any substance or medication that is not compatible with flying
c) Safety threatening side effects of any medication
d) Co-existing disqualifying medical conditions or disease
e) Very low CD4 count of 350 or less and Viral load of more than 5 000 copies per millilitre of plasma.*
f) HIV Specialist is any medical practitioner with training in HIV Medicine

Protocol on Lymphomas

Applicability

This protocol shall be applicable to classes I, II, III and IV medical certificates.

Hodgkin's lymphoma

Requirements for consideration of a medical certificate

a) Class I applications may be considered after six months post-treatment for an operational multi-crew environment and an applicant may apply for the removal of restriction after two years.

b) Class II applications may be considered after six months post-treatment for an unrestricted medical certificate.

c) Class III and Class IV applicants may be considered by a medical assessor upon submission of the required medical reports.

Requirements for medical certification

1) An applicant shall complete a minimum of six weeks of radiotherapy for consideration. If radiotherapy treatment has been conducted to the chest and cardiac tissue, cardiac evaluation shall be considered as satisfactory.

2) An applicant shall be required to complete a minimum of two months of chemotherapy (excluding anthracyclines) before being considered for a medical certificate.

3) An applicant shall be considered for a medical certificate upon completing a minimum of six months of anthracycline chemotherapy after presenting a cardiac evaluation report relating to the side effects of the medication.

4) An applicant shall submit satisfactory haematological parameters >12g/dl (male) or >11.5g/dl (female) and platelets.

5) An applicant shall demonstrate continuing clinical remission without symptoms of potential flight safety importance.

6) An applicant shall not have a history of central nervous system involvement.

7) An applicant shall not have continuing side-effects from treatment.

8) An applicant shall submit the following medical reports which shall not be older than three months:

i. A current status report and all pertinent medical reports such as a haematologist/oncologist report;
ii. Blood results for FBC & ESR, U&E and LFT;
iii. A medical report which includes past and present treatment(s);

iv. Chest X-ray.
v. ECG;
vi. Lung function test; and
vii. Any other report that may be requested.

Requirements for regular follow-ups

1) An applicant shall submit a six-monthly haematologist /oncologist report, which shall include a full blood count, white cell count (WCC) and differential, and a biochemical profile including a liver function test, for the first five years.

2) After five years, an applicant shall be required to submit a haematologist/oncologist report annually.

3) Bone marrow transplantation

4) An applicant may apply for medical recertification after a bone marrow transplantation.

5) Autologous stem cell transplantation

6) An applicant for medical recertification after one year of autologous stem cell transplantation shall be restricted to Class I OML (valid only as or with qualified co-pilot).

7) An applicant for medical recertification after two years of autologous stem cell transplantation may apply for an unrestricted medical certificate.

8) An applicant for medical recertification after one year of autologous stem cell transplantation for Class II shall be eligible to apply for unrestricted medical certificate.

Allogeneic Transplantation

1) An applicant applying for medical recertification after two years of allogeneic transplantation shall be eligible to apply for a restricted to Class I OML (valid only as or with qualified co-pilot) and after three years for an unrestricted Class I.

2) An applicant applying for medical recertification after one year of an allogeneic transplantation for a Class 2 medical certificate shall be eligible to apply for a restricted to Operational Safety Pilot medical certificate and after two years for an unrestricted medical certificate.

3) Lack of adverse prognostic features and the underlying diagnosis shall be important and, in the case of allogeneic transplantation, the lack of continuing graft-versus-host disease or immunosuppression.

General

1. An applicant with an active Hodgkin's disease or an applicant undergoing therapy for Hodgkin's disease shall be declared medically unfit due to the risk of sudden incapacitation.

2. An applicant with Stage I and II-A with no evidence of the disease for two years after completion of treatment may be declared medically fit.

3. An applicant with Stage II-B through to IV-B shall be free of the disease after completion of therapy for at least five years before consideration of being declared medically fit and shall be re-evaluated every six months for 10 years.

4. Numerous long-term complications of treatment for Hodgkin's disease include the development of acute leukaemia and second malignancies of other types, radiation-related heart disease, pulmonary fibrosis, and hypothyroidism.

5. Subsequent to frequent re-evaluation after 10 years, an applicant shall be subjected to annual. appraisals.

Non-Hodgkin's lymphoma

a) Requirements for consideration of a medical certificate

b) Applicants with well-differentiated and poorly differentiated lymphocytic lymphoma, mixed lymphocytic lymphoma and histiocytic lymphoma of either nodular or diffuse type, are usually not curable, and these applicants should be disqualified permanently.

c) B-cell, diffuse histiocytic lymphoma, particularly in the early stages, may be cured by radiation therapy and/or chemotherapy and, if applicants are free from disease without therapy for at least three years, they may be certified with re-evaluation to occur every three months for three years and then every six months.

d) Applicants with T-cell, diffuse histolytic lymphoma, including immunoblastic lymphoma and T-cell lymphoblastic sarcoma, should not be certified because of their unpredictability. Burkitt's lymphoma should not be certified.

Plasma-cell dyscrasia

Requirements for consideration of a medical certificate

1) Applicants with multiple myeloma, Waldenstrom's macroglobulinemia or multiple plasmacytomas should not be certified.
2) These disorders are not curable, require frequent therapy that is toxic, and are associated with sick effects such as neurological impairment that may lead to sudden incapacitation.
3) Applicants with a single plasmacytoma may be cured and, if they are free of disease for more than three years after therapy has been discontinued, they may be considered for certification with frequent follow-up.

4) Applicants with benign monoclonal gammopathy with a monoclonal spike comprising less than 2 g/dl of protein, with fewer than 55 plasma cells in the bone marrow, and with a haematopoietic compromise or osteolytic lesions may be certified if they have no evidence of progression of the disease for three years; they should be recertified every six months.
5) The major risks of monoclonal gammopathy are progression to multiple myeloma and an increase in serum viscosity leading to neurological impairment.
6) Applicants with amyloidosis associated with plasma cell dyscrasia should not be certified because of the high incidence of organ infiltration and the risk of sudden impairment.
7) Applicants with gammopathy of alpha chain disease should not be certified. The median survival is approximately 12 months for gamma heavy chain disease, and the alpha chain disease is often associated with abdominal lymphoma, which is a progressive and fatal disorder.
8) Applicants with cold agglutinin disease should not be certified because of the risk of sudden haemolysis. Applicants with cryoglobulinemia syndrome should not be certified because of the risk of sudden vascular incidents and neurological dysfunction.

Protocol on previously diagnosed Acute Leukaemia

Applicability

This protocol shall be applicable to classes I, II, III and IV medical certificates.

Requirements for consideration of a medical certificate

1) Any applicant who has a previous history of having had any type of acute leukaemia in the past will be required to comply with the following requirements before recertification may be considered –
2) The applicant must comply with the criteria for complete remission, i.e.:
3) Clinical: the disappearance of any abnormal clinical findings due to the leukaemia and return to good physical health.
4) Haematological:
5) The peripheral blood must have returned to normal, with reference to:
6) Haemoglobin (Hb);
7) Total, and differential, white cell count; and
8) Platelet count.

9) Recognisable leukaemia cells may not be present in a bone marrow preparation, and there may have been not more than 5% normal blast cells present in a marrow preparation of normal cellularity.
10) The applicant must have completed his/her last treatment at least two years before submitting his/her application to the designated body or institution. (This includes all modalities of treatment for leukaemia.)
11) The applicant must have undergone at least six-monthly medical follow-ups in an appropriate specialised unit. A report detailing the follow-up programme and the applicant's medical record must be submitted with the application to the designated body or institution.
12) During the initial post-remission period of two years the applicant's blood picture should have been closely monitored. Although the specific results are unlikely to be required by the designated body or institution, it is necessary that the applicant has been monitored as follows:
13) During the first year after treatment has been stopped –
14) A six-weekly blood profile;
15) A 12-weekly bone marrow evaluation; and
16) A 12-weekly lumbar puncture.
17) During the second year after treatment has been stopped –
18) An eight-weekly blood profile; and
19) A 16-weekly bone marrow evaluation.
20) After two years of documented remission, the applicant may submit an application for certification. If the results of the above tests are within acceptable limits, the applicant may be granted certification, with the following restrictions –
21) Must continue with follow-up at a suitable specialist unit, and submit six monthly reports to the designated body or institution;
22) Must continue to have blood profile monitored at 8-12 weekly intervals (for a year, then six monthly);
23) Must undergo an Aviation Medical Examination at least annually (or more frequently if indicated); and
24) Must do an ECG and stress ECG with each aviation medical examination.

Protocol for Obstetrics and Gynaecology

General requirements

The provision for aviation personnel with obstetrics and gynaecology medical conditions to obtain a medical certificate may be considered for any class of medical certificate based on the individual medical condition of the applicant and risk factor management.

Background

Approximately thirty per cent of pregnant women experience nausea and vomiting, and this can result in dehydration and malnutrition. Approximately fifteen per cent of embryos will abort in the first trimester. Cardiac output rises in early pregnancy, accompanied by an increase in stroke volume, heart rate, and plasma volume. Haemoglobin (and haematocrit) begins to fall between the third and fifth month of pregnancy and is lowest by the eighth month. Adequate diet with supplementary iron and folic acid is necessary, but self-medication and prescribed medicine should be avoided. The incidence of venous varicosities is three times higher in females than males and deep venous thrombosis and pulmonary embolism are among the most common serious vascular diseases occurring during pregnancy.

As the uterus enlarges, it compresses and obstructs the flow through the vena cava. Progressive growth of the foetus, placenta, uterus and breasts, and the vasculature of these organs, leads to an increased oxygen demand; and increased blood volume and oxygen demands produce a progressive increase in workload on both the heart and lungs. Hormonal changes affect pulmonary function by lowering the threshold of the respiratory centre to carbon dioxide, thereby influencing the respiratory rate.

In order to overcome pressure on the diaphragm, the increased effort of breathing leads to greater consciousness of breathing and possibly greater cost in oxygen consumption. The effect of hypoxia at increased altitude further increases the ventilatory effort required to provide for increasing demands of oxygen in all tissue.Aviation personnel must inform their Designated Aviation Medical Examiner (DAME) if they become aware of any medical condition that would make them unable to meet the requirements of the licence they are applying for or if they are taking medication that is not compatible with flying. The medical examiner should consider the important physiological changes associated with pregnancy, which might interfere with the safe operation of an aircraft at any altitude throughout a prolonged or difficult flight –

Factors which may considerably reduce flight safety and classify an “abnormal” pregnancy include:

a) A history of multiple pregnancies;
b) Previous pre-term deliveries;
c) Cervical incompetence;
d) Bleeding, increased uterine activity;
e) Reduced oxygen carrying capacity in the blood (anemia);
f) Reduced placental respiratory reserve such as intrauterine growth retardation;
g) Post maturity;
h) Pre-eclampsia;
i) Chronic hypertension;
j) Placental infarction; and
k) Flight during pregnancy increases the risk for oedema (swelling) and blood clot formation due to obstruction of the vena cava from uterine compression and lack of mobility.

6.6.1 **Menstrual Disturbances**

1) Applicants for all classes of medical assessments, with gynaecological disorders that are likely to interfere with the safe exercise of their licence and rating privileges shall be assessed as unfit to fly.

2) Dysmenorrhea is a common condition with symptoms ranging from mild discomfort to severe abdominal pain, headache and backache, nausea and vomiting, diarrhea, dizziness and fatigue. Usually, the condition is limited to 24-48 hours around the onset of the menstrual flow, and fitness for aviation duties is rarely reduced to a significant degree. Treatment with oral contraceptives and NSAIDs (non-steroidal anti-inflammatory drugs) is very efficient and is generally well tolerated.
3) The use of oral contraceptives is acceptable in the aviation environment, but when medication with a NSAID is first used, an initial off-duty trial should take place so that the medical examiner can ascertain that there are no significant side effects such as gastro-intestinal symptoms, visual disturbances, and drowsiness. In severe cases, especially when an underlying disease such as endometriosis or pelvic inflammatory disease is suspected (secondary dysmenorrhea), appropriate diagnostic evaluation is important and specialist opinion should be sought.
4) Premenstrual syndrome (PMS) may occur during the week before the onset of menstruation. The symptoms are partly mental such as mood swings, anxiety and depression, and partly physical such as bloating, headache and poor coordination. Because of the broad spectrum of symptoms and their varying severity and the many different kinds of medication usually prescribed, each case has to be assessed on its own merits. In most cases pharmaceutical therapy will prove unsatisfactory, and fitness for aviation duties is often reduced for a number of days every month.

6.6.2 **Endometriosis**

Endometriosis can cause quite severe discomfort such as lower abdominal or suprapubic pain, usually just before or during the first days of the menstruation period. There are several medical and surgical treatment options. If symptoms are well controlled by oral contraceptives or mild analgesics, this condition is usually compatible with aviation duties. Those who undergo surgical treatment with a successful outcome will normally be cured and able to fly safely after a suitable period of recovery.The middle group, consisting of patients with moderate symptoms but on medication and with decreased fitness several days per month, is more difficult to evaluate and assess. Usually, the final decision should be deferred to the medical panel for further evaluation. The medical panel, in consultation with a gynaecologist, should weigh all relevant factors carefully before making a recommendation.

6.6.**3 Genitourinary system**

1) Applicants for all classes of medical assessments with sequelae of disease of or surgical procedures on the kidneys or the genito-urinary tract, in particular obstructions due to stricture or compression, shall be assessed as unfit to fly unless the applicant's condition has been investigated and evaluated in accordance with the best medical practice and is assessed not likely to interfere with the safe exercise of the applicant's licence or rating privileges.

2) Major gynaecological surgery will normally entail unfitness to fly for a period of two to three months and some procedures such as hysterectomy may require more extensive periods of recovery.

3) Applicants who are pregnant shall be assessed as unfit to fly, unless obstetrical evaluation and continued medical supervision indicate a low-risk uncomplicated pregnancy.

4) Once pregnant, a report from a gynaecologist and an aviation medical examiner to confirm the pregnancy.

5) It is advisable that a treating obstetrician is aware of the type of flying the applicant intends to carry out. Common complications of pregnancy can be detected and treated, by careful prenatal evaluation, observation, and care.

6) Low-risk uncomplicated pregnancy must be evaluated and supervised. Pregnancy is considered a normal, uncomplicated and low risk, if there is supporting medical information from her obstetrician, family physician and/or midwife supporting that the applicant may continue to exercise the privileges of her licence.

7) Close medical supervision must be established for the part of the pregnancy where the applicant continues to carry out their duties, and all abnormalities should be reported to the medical examiner.

Pregnancy

Applicability

Medical requirements for pregnancy for classes I, II & IV medical certificates

a) Applicant may continue to exercise the privileges of her licence from the end of the 12th week (first trimester) until the end of the 26th week of the gestational period –
b) Applicant will be declared to be medically fit to fly if her pregnancy is considered normal, uncomplicated and low risk.
c) A medical report from a treating obstetrician, family physician and/or midwife will be required.
d) Close medical supervision where the pilot continues flying, and all abnormalities should be reported to the medical examiner.
e) Medical requirements for pregnancy for Class III medical certificate
f) During the gestational period, precautions should be taken for the timely relief of an air traffic controller in the event of early onset of labour or other complications –
g) The fit assessment should be limited to the period until the end of the 34th week of gestation.
h) Once pregnancy is confirmed, the pregnant air traffic controller should report to the medical examiner. If declared fit, she may continue to exercise the privileges of her licence.

Medical requirements following confinement or termination of pregnancy

1) Miscarriage (spontaneous abortion) occurs in about fifteen per cent of all pregnancies and is terminated spontaneously. Observation for a few days to ensure that bleeding has stopped may be all

that is needed, but vacuum suction or dilatation and curettage to ensure completion of the abortion is frequently performed.

2) Induced abortion, usually by vacuum suction or by dilatation and curettage, will in the majority of cases entail unfitness for less than a week as these procedures are generally very safe, the rate of serious complications is <1% and the mortality rate is <1 in 100 000 cases. Complication rates increase as gestational age increases. Although uncommon, post abortion bleeding and pelvic inflammation, peritonitis and septicemia may occur.

3) The "abortion pill" (mifepristone, a progesterone-receptor blocker) is used within the first seven weeks of pregnancy. A second drug (prostaglandin) is given two days later to start uterine contractions and complete the abortion. This method is very safe, and unfitness is limited to a few days.

4) For most women, abortion has no adverse mental sequelae but for those who have a desired pregnancy terminated for medical reasons (maternal or fetal) or who have considerable ambivalence, the mental sequelae may be pronounced. The medical examiner should therefore pay particular attention to the psychological effects of induced abortion before allowing return to aviation duties.

5) The applicant shall not be permitted to exercise the privileges of her licence, until she has undergone re-evaluation in accordance with best medical practice and it has been determined that she is able to safely exercise the privileges of her licence and ratings.
6) Uncomplicated pueperium and full recovery: able to resume aviation duties six weeks after confinement.

Protocol on Warfarin Anticoagulant Drug

General

Aviation personnel presenting with coagulation disorders should be disqualified if there is a history of a serious bleeding episode and factor replacement.

The provision of medical certification for aviation personnel on Warfarin may be considered for any class of medical certificate based on the individual medical condition of the applicant and risk factor management.

Applicants on Warfarin may not take part in aerobatic activities.

Applicability

Class I ATP:

The applicant will only be considered with a restriction as a part of a multi-crew, with or as a co-pilot.
Class I COMM:

A. An applicant may fly solo if they comply with the following restrictions:

i. The applicant must not have associated co-morbidities; and

ii. Proof of INR control, 80% of the time in three months after initiation of Warfarin, while grounded.

B. An applicant may fly with a safety pilot if:

The applicant has associated co-morbidities that are poorly controlled;

There are no restrictions other than for corrective lenses or glasses; and

Proof of INR control is provided, 80% of the time in three months after initiation of Warfarin, while grounded.

Class II:

A. An applicant may fly solo if:

There are no associated co-morbidities; and

Proof of INR control is provided, 80% of the time in three months while grounded.

B. An applicant may fly with a safety pilot if:

i. The applicant has associated co-morbidities that are poorly controlled;
ii. There are no restrictions other than corrective lenses/glasses; and
iii. Proof of INR control is provided, 80% of the time in three months after initiation of Warfarin, while grounded.

Class III: Applicants will be considered if they meet the prescribed criteria.

Class IV: Applicants will be considered if they meet the prescribed criteria.

General medical examination requirements applicable to all certificate holders

i. All initial medical reports will be submitted to the panel of specialists for approval.
ii. Applicants will be required to submit the initial baseline INR and a cardiologist report before the initiation of Warfarin, and thereafter he/she will submit a weekly INR report after initiation of Warfarin until there is proof of stability; the applicant can then submit one monthly INR reports.
iii. The applicant will submit his/her INR reports to the DAME on a monthly basis.
iv. The applicant will submit a full medical examination report, including INR and a cardiologist report to the medical panel on a six-monthly basis.
v. Medication must be well-tolerated by the aviation personnel for a three-month observation period (during which the applicant will be grounded to ensure safety).
vi. All applicants must submit proof of stability of the INR, 80% of the time in three months, prior to consideration for medical certification.
vii. Licensed aviation personnel presenting with INR outside the required range will be grounded for a four-week observation period, in which he/she will be required to submit four reports separately (weekly) to prove INR stability to the panel.

viii. Applicants should not take any other medication without approval, either by the DAME, or by the specialist managing his condition.

ix. Applicants who present with an acute illness will be grounded until they are fully recovered, and their INR re-assessed.

x.

General Medical Conditions

A. Deep Vein Thrombosis

i. Certification should be denied for the period of the episode, and for three months post initiation of anticoagulation therapy

ii. The applicant will be grounded for a three-month observation period, in which he/she will be required to submit three months' INR reports (baseline INR reports, weekly INR report until stability is reached, then one monthly reports) the levels of which must be between 2 and 3, 80% of the time.

iii. The applicant will submit his/her monthly INR reports to the DAME.

iv. Underlying contributing factors such as malignancies must be evaluated according to the guidelines set for those conditions.

B. **Atrial fibrillation**

i. Certification should be denied for the initial period of the episode, while the condition is being investigated

ii. The applicant will be grounded for a three-month observation period, in which he/she will be required to submit three months' INR reports (baseline INR reports, weekly INR report until stability is reached, then one monthly reports) the levels of which must be between 2 and 3, 80% of the time.

iii. The applicant will submit his/her monthly INR reports to the DAME.

iv. Underlying contributing factors must be evaluated according to the guidelines set for those conditions.
C. Valvular replacement

v. Certification should be denied for the period of the episode.

vi. The applicant will be grounded for a three-month observation period, in which he/she will be required to submit three months' INR reports (baseline INR reports, weekly INR report until stability is reached, then one monthly reports) the levels of which must be between 2 and 3, 80% of the time.

vii. The applicant will submit his/her monthly INR reports to the DAME.

viii. Underlying contributing factors must be evaluated according to the guidelines set for those conditions.

D. Pulmonary Embolism

i. Certification should be denied for the initial period of the episode, while the condition is being investigated.

ii. The applicant will be grounded for a three-month observation period, in which he/she will be required to submit three months' INR reports (baseline INR reports, weekly INR report until stability is reached, then one monthly reports) the levels of which must be between 2 and 3, 80% of the time.

iii. Underlying contributing factors must be evaluated according to the guidelines set for those conditions.

iv. Recurrent atrial emboli is disqualifying under any circumstances.

v. A single episode of pulmonary embolism, not associated with chronic deep venous thrombosis, should be considered disqualifying from the date of the embolisation and for at least three months after anti-coagulation treatment has been initiated.

vi. More than one episode of pulmonary embolisation documented by a CT scan method should be denied certification permanently.

vii. The applicant will submit his/her monthly INR reports to the DAME.

Bone Marrow Protocol

The holder of a medical certificate is to be grounded from the date of harvesting.

The date of harvesting is calculated from the date of when the first injection of Granulocyte-Colony Stimulating Factor (G-CSF) is given.

The holder of a medical certificate shall submit a full blood count two weeks after completion of the procedure.

If the full blood count is normal, the holders of a medical certificate may be considered to exercise the privileges of their license they are applying for; if the full blood count is abnormal, the holder of a medical certificate will remain grounded until all abnormalities have been corrected.

Protocol on Plavix Prescription Drug

General

The provision of medical certificate for aviation personnel on Plavix may be considered for any class of medical certificate based on individual medical condition of the applicant and risk factor management.

Applicants on Plavix may not take part in aerobatic activities.

Applicability

Class I ATP

Any restrictions placed on the pilot would be in keeping with the underlying condition for which Plavix was prescribed.

Class I Comm

Any restrictions placed on the pilot would be in keeping with the underlying condition for which Plavix was prescribed.

Class II PPL

Any restrictions placed on the pilot would be in keeping with the underlying condition for which Plavix was prescribed.

Class III and Class IV

Any restrictions placed on the pilot would be in keeping with the underlying condition for which Plavix was prescribed.

General medical examination requirements

i. All initial medical reports should be submitted to the Panel of Specialists for approval.
ii. Medication must be well tolerated by the aviation personnel for a three-month observation period (during which the applicant will be grounded to ensure safety).
iii. Each case can be dealt with on a case-to-case basis.
iv. If any severe side effects develop, the relevant Specialist Report will be required (i.e. Neurology/Psychiatry for CNS/Psychiatric S/E).

Protocol on Mood Disorder (Depressions)

General

i. Aviation medical standards as laid down in Annex 1 of the convention on International Civil Aviation by the International Civil Aviation Organisation, to which South Africa is a contracting State, have identified broad medical conditions that, on the basis of expected risk of incapacitation, disqualify aviation personnel from flying.

ii. South Africa is one of the countries that previously applied strict standards to applicants with a history of depression.

iii. The previous protocol did not take into consideration new therapeutic interventions, risk factor modification or rehabilitation, all of which may reduce the risk of sudden incapacitation.

iv. The SACAA has since reviewed this protocol and is now making provision for aviation personnel with a history of depression to apply for the privileges of the license they wish to apply for.

v. This consideration will be based on the individual medical condition of the applicant and risk factors involved.

Background

Depression is a disorder that defines a certain component of psychopathology that is grouped as “Mood Disorders”. Mood disorders are psychopathologic states in which a disturbance of mood is either a primary determinant or constitutes the core manifestation of the condition. These conditions, especially the depressive forms, are heterogeneous and are common in both psychiatry and general medicine. These conditions are becoming even more common as the stigmata associated with such a diagnosis are having less impact in the social spectrum of life. The methods used to treat patients suffering from mood disorders have improved over recent years, and individuals that require pharmacotherapy may apply, or re-apply, for a license to fly or to undertake air traffic control work.The key areas of concern in certification of aircrew with mood disorders are the risk of suicidal ideation, suicide, lack of concentration, chronic tiredness, insomnia/hypersomnia, and general malaise, with all the ramifications resulting in a detrimental effect on global functioning of an individual. Estimated incapacity risk The lifetime prevalence of major depression in males is about 5% to 12% and in females about 10% to 25%. There is no specific association with ethnicity, social status, income or marital status. The risk for a second episode after remission is 60%, 70% for a third episode and 90% for a fourth episode.

This leads to the clinical conclusion that for the purpose of risk management in the aviation industry, a person should be treated optimally and permanently with the appropriate pharmacologicals, thereby reducing the risk of recurrence. During the initial phase of therapy there may be a higher incidence of suicidal tendencies brought on by the appropriate therapeutic interventions.Without diligent care by the professional therapist and adequate protocol parameters disallowing the privileges of execution of an aviation-related license in the initial phase of treatment, the incapacity risk would be unacceptably high.

Mood Disorder

Class Applicability

Any class of certification may be applied for, subject to the following requirements:

Class I

i. Commercial passenger air transport operations – multi-crew restriction
ii. Flight instruction – student must have completed first solo flight
iii. Class II – no restriction
iv. Class III – may operate under supervision
v. Class IV – no restriction

General medical requirements applicable to all applicants for initial consideration

i. All symptoms of the psychiatric condition for which treatment is indicated must be eliminated by the single medication and the applicant must be symptom-free for four weeks prior to application for certification.

ii. An applicant must have no aeromedically significant side effects of the prescribed medication for a period of four (4) weeks.

iii. Applicants will be required to submit psychiatrist and clinical psychologist reports to the Aeromedical Committee for consideration.

iv. A consultation status report from the treating psychiatrist must attest to and describe the applicant's diagnosis, length and course of treatment, type and dosage of the antidepressant medication taken, Hamilton Scale (HAMD 17) score (must be consistently below 7) and presence of any side effects from the antidepressant the applicant takes or has taken in the past.

v. Any additional information that may be required by the Aeromedical Committee.

vi. Applicants who meet the requirements prescribed above will be required to submit a monthly psychiatrist report for a period of six (6) months following initial certification.

vii. A follow-up psychiatrist report will be required at nine (9) months, and then at twelve months (12) post-certification.

viii. Should other co-morbidities exist or develop after the issuing of a certificate of fitness, then certification will not be granted (in the case of existing) or will be withdrawn by the Aeromedical Committee without re-assessment.

F. **Diagnostic inclusions**

The following mood disorders are acceptable for the purpose of this protocol:

Major depressive disorder (mild to moderate degree), either single episode or recurrent episode before commencement of therapy;

Dysthymic disorder;

Adjustment disorder with depressed mood.

G. **Disqualifying conditions**

Any history of depressive disorder of a severe degree is disqualifying.

The following conditions will, by virtue of their risk profile, exclude a person from obtaining a certificate of aviation medical fitness:

History of psychosis;

Impairment of arousal;

History of electro-convulsive therapy;

Concurrent treatment with multiple antidepressant medications;

History of multi-agent drug use (prior use of other psychiatric drugs in conjunction with antidepressant medications);

History of discontinuation of acceptable medication and then a subsequent onset of depression; and

Any other manifestation of mood disorder as specified at the time of promulgation, or at the discretion of the treating psychiatrist.

H. Acceptable oral medication

Fluoxetine
Sertraline
Citalopram
Escitalopram
Other oral medication deemed acceptable by the Director.

I. Annual follow-up for medical certification

After twelve (12) months, the applicant will be required to submit a psychiatrist report at six-monthly intervals to the Aviation Medical Department, until the time of cancellation of his/her license.

b. Protocol on Rheumatoid Arthritis

All pilots suffering from rheumatoid arthritis need a rheumatologists report stating whether or not the disease is in remission or controllable on acceptable medication.

The only acceptable medication at present is MethotrexateTM in dosages not exceeding 5 mg per day.

Gold salts, NSAID's, anti-malarials (in anti-rheumatic dosages), etc. are not compatible with flying.

The DAME must determine whether the arthritic damage already incurred would compromise the pilot's flying safety.

c. Protocol on Coagulation and Thrombotic Disorders

General

Inherited disorders of coagulation should be disqualified if there is any history of factor replacement or serious bleeding episodes.

Haemophilia:

Factor VIII deficiency should be denied certification.

Von Willebrand's disease, as well as other specific factor deficiencies, should be denied certification if there is a history of factor replacement or serious bleeding episodes.

Haemorrhagic platelet abnormalities

Decreased circulating platelet count due to any cause may result in debilitating haemorrhagic episodes.

Haemorrhage can also occur when platelet counts are normal but platelet function is abnormal.

Congenital/Genetic Disorders, e.g. Protein S or Protein C Deficiency will render applicants medically unfit.

d. Monocular/Amblyopic Protocol

To be applicable if optimally corrected vision in the weak eye is 6/12 or worse.

Preconditions:

There must be no active ocular pathology.

Vision (uncorrected or corrected) in the better eye must be 6/6 or better (distance vision) and 6/9 or better (near vision).

Initial applicants: In addition to the required standards, initial applicants must pass a practical flight test by a CAA-approved instructor before being declared fit according to the protocol.

e. Colour Vision Protocol

Applicability

This technical standard is applicable to the following categories:

Class I

Air Transport Pilots

Commercial Pilots

Class II

Private Pilots with the following:

Night Flying

IF Rating

Flying a Glass Cockpit Aircraft

Ishihara test

All applicants will be required to submit themselves for an Ishihara test;

Applicants must be able to demonstrate ability to perceive readily those colours the perception of which is necessary for the safe performance of duties;

The use of tinted lenses to obtain adequate colour perception is not permitted;

The medical examiner shall instruct the person being tested to report the number on a plate they can see and warns the subject that on some occasions they may not see a number;

Ishihara test to be conducted as per manufacturer's instructions test at a distance 75 cm with plane of plates at right angles to line of vision under daylight or daylight simulated light;

Applicants should see this number with a viewing time of about three seconds allowed for each plate, undue hesitation on the part of the subject may be the first indication of colour deficiency;

Ishihara plates should be updated periodically or if showing any signs of fading;

The SACAA will only allow a 24 or 38 plates test version to be used for screening of colour vision;

The Ishihara test is to be considered passed for the 24 plates, if the 1st to the 15th is identified correctly, with no errors, presented in a random order;

The Ishihara test is to be considered passed for the 38 plates, if the 1st to the 24th are identified correctly, with no errors presented in a random order.

Class II medical certificate applicants who fail to obtain a satisfactory score of the Ishihara tests may nevertheless be assessed as fit.

A medical certificate may be issued if medical conclusion indicates that the applicant has a colour perception defect which is compatible with the safe exercise of the privileges of the license, provided the certificate is endorsed with the following limitations and the applicant meets the following conditions:

"For private pilot licence privileges only";

Not valid for night flying;

Not valid for IFR flying or flying of EFIS-equipped aircraft where the EFIS is the primary flight instrument;

Meet visual criteria for a Class II Medical Certificate: and

The applicant shall submit a satisfactory report from an ophthalmologist every 2 years if the if < 40 years of age and every year if > 40 years of age.

Applicants who fail to pass the Ishihara test and who wish to apply for a Class II PPL without restrictions and a Class I medical certificate shall undergo further colour perception testing to establish whether they are colour safe using the Colour Assessment Diagnosis (CAD).

For Class I and Class II PPL without restrictions

CAD tests should be conducted under CAA protocols as indicated below.
The CAD test will only pass those individuals as colour safe who perform as well as individuals with colour vision in the normal range on the most difficult aviation colour vision tasks.

Ishihara test requirements

The definitive CAD will assess red/green colour vision and yellow/blue colour vision. The test can be done simultaneously or individually but will run somewhat faster if you only assess one type of colour vision at a time. The CAD will establish class of colour vision loss and whether pass (colour safe) or fail (colour unsafe).
Applicants will be required to produce identity documents prior to examination.
Applicants may not wear coloured contact lenses.
A report from an ophthalmologist that confirm that there are no visual defects must be submitted, which must include:
Refraction errors
Peripheral vision
Exclusion of any acute or chronic eye disease
Lens abnormality
Absence of any medication that may cause colour vision defect

The procedure for testing for colour deficiency using the Colour Assessment and Diagnosis (CAD) shall be as follows:
The applicant's eye will be positioned at display height and at a distance of 1.4 meters.
The illumination in the room will be arranged such that no light falls directly on the display.
The ambient illumination on the display surface will not exceed 1 lux.
During this test, the applicant will see a coloured target moving diagonally across a central square in one of four possible directions (top-right, top-left, bottom-right, or bottom-left).
The response box has four buttons laid out to form a square.
The applicant's task is to press the appropriate button to indicate the corresponding direction of movement.
When unsure, the applicant must make their best guess.

For best results, the applicant will be instructed to maintain fixation on the centre of the square and not to track the moving target.

The applicant can request for representation of the current presentation if, for any reason, the subject failed to attend to the task, but not more than twice.

The applicant will start with the learning mode to familiarise him/herself with the fools before being exposed to the definitive test.

Interpretation of the CAD results

In the case of Class 1 medical certificates, applicants shall have normal perception of colours or be colour safe.

Colour Assessment and Diagnosis (CAD) test is considered passed if the threshold is equal to or less than 6SU for deutan deficiency, or equal or less than 12 SU for protan deficiency;

A threshold greater than 2 SU for tritan deficiency will be disqualifying;

A threshold greater than 2 SU for tritan deficiency indicates an acquired cause which should be investigated.

Applicants who fail further colour perception testing shall be assessed as unfit.

A medical certificate may be issued if medical conclusion indicates that the applicant has a colour perception defect which is compatible with the safe exercise of the privileges of the license, provided the certificate is endorsed with the following limitations and the following conditions are met:

“For private pilot license privileges only”;

Not valid for night flying;

Not valid for IFR flying or flying of EFIS-equipped aircraft where the EFIS is the primary flight instrument;

The applicant meets the visual criteria for a Class II medical certificate; and

The applicant shall submit a satisfactory report from an ophthalmologist every two years if the if < 40 years of age and every year if > 40 years of age.

Operational colour vision test and medical practical flight test

Applicability

Class I – Commercial Pilots only

Class II – with no colour vision restrictions on the medical certificate

Operational colour vision test (OCVT)

An applicant for a Class I (Commercial) or Class II who has defective colour vision must demonstrate the the ability to pass an OCVT, which includes:

The ability to read and correctly interpret in a timely manner aeronautical chart and Jeppesen chart legends: Including print in various sizes, colours, and typefaces; conventional markings in several colours; and terrain colours.

Aeronautical chart reading may be performed under any light condition where the chart will normally be read.

Medical practical flight test (PMFT)

The Director may require applicants to demonstrate their ability to perceive colour in a EFIS-equipped aircraft or EFIS Cockpit Simulator with the panel lighting set to the comfort of the applicant day and night and must include the interval from dawn to dusk;

The medical practical flight test shall be conducted in a Level C or D simulator, or such lessor device as determined by the Director .

The test shall be conducted by a panel of specialists appointed by the Director and will be coordinated by authorised officers (medical assessors) of the SACAA;

The panel shall comprise of the following:

A representative authorised officer from the CAA;

A designated aviation medical examiner, preferably with experience in flying;

An ophthalmologist;

A designated flight examiner as determined by the Director; and

The procedure for the medical practical flight test shall be approved by the Directors.

Applicants must have the ability to demonstrate the following:

Must read and correctly interpret in a timely manner aviation instruments or displays, particularly those with coloured limitation marks;

Must read and interpret coloured instrument panel lights, especially marker beacon lights, warning or caution lights, weather displays, etc.;

Must recognise terrain and obstructions in a timely manner, have the applicant select several emergency landing fields, preferably under marginal conditions, and describe the surface;

Must visually identify in a timely manner the location, colour and significance of aeronautical lights.

An applicant may be issued a medical certificate with operational limitations should the panel appointed by the Director deem it for safety.

Applicants will be afforded a single opportunity for a medical practical flight test.

Operating limitations required by physical deficiencies may restrict holders to certain aircraft types, special equipment or control arrangements, or special operating conditions.

16.14.4 Considerations for applicants with Class I Comm who fail a CAD and pass the OCVT and PMFT tests

To fly as CPL in a multi-crew environment by day and night as a deuteranope with the following restrictions:

The holder does not meet the ICAO medical standard as per Annex 1 and is therefore restricted to fly within the South African borders on a South African registered aircraft only.

Applicants who fail the CAD will not qualify for Air Transport Pilot Licence operations.

Annual ophthalmological assessment will be required to determine any refractory, visual field or lens translucency change every two years if < 40 years and annually if > 40 years.

The applicant must inform his/her employer and cockpit crew members of his/her red-green colour deficiency.

The holder is restricted to a cabin altitude of maximum 8000 ft AMSL at night or during IFR conditions.

The holder may not perform any CAT II approaches.

A minimum required flight hours as prescribed in SA-CARS/CATS Part 61 will be applied before allowing the applicant as PIC with CPL.

The decision and restrictions will be reviewed, should there be a change in the applicant's condition or new evidence becomes available regarding deuteranopia and flight safety.

16.14.5 Radial Keratotomy/PRK/Lasik protocol

General

Applicants contemplating refractive surgery must take cognisance of the risks involved and shall be aware that having the surgery might result in a delay in return to duties as aircrew or air traffic controller or, if complications occur, that it may result in the permanent loss of medical certification.

The visual acuity result meets the visual requirements of technical standard 67.00.3 and the assessment must be based on measurements made by an ophthalmologist.

An applicant presenting with a pre-operative refractive error of up to 10.00 D spherical equivalent at initial application will be considered medically unfit for the periods prescribed below:
An applicant who has undergone a Radial Keratotomy (RK) procedure, for a period of six months;
An applicant who has undergone a Photorefractive Keratectomy (PRK) procedure, for a period of six months;
An applicant who has undergone a laser-assisted in situ Keratomileusis (LASIK) procedure, for a period of two months.
An applicant with pre-operative refractive error greater than 10.00 D spherical equivalent will be considered medically unfit for the periods prescribed below:
An applicant who has undergone a Radial Keratomy (RK) procedure, for a period of six months;
An applicant who has undergone a Photorefractive Keratectomy (PRK) procedure, for a period of six months;
An applicant who has undergone a laser-assisted in situ Keratomileusis (LASIK) procedure, for a period of six months.
An applicant who has had refractive surgery and who is considered for medical certification or recertification shall meet the following criteria:
The surgery must have been without complications;
The vision must be stable; and
There must be no corneal haze or complaints of glare, halos or “ghosting”.
Follow-up requirements: An applicant shall submit a post-operative assessment report by an ophthalmologist at the following intervals:
At six (6) weeks after the procedure;
At six (6) months after return duty; and
Annually, thereafter.

f. Substance Abuse

General

These technical standards are based on the general principles that have been established internationally and are designed to ensure that the entire drug and alcohol testing process is conducted to give accurate and reliable information about a donor's drug and alcohol use.

6.15.1 Procedure for substance and alcohol testing

1. Specimens must be collected by suitably trained personnel (collecting officers) who have a thorough understanding of the principles of chain of custody.
2. Collecting officers must be able to provide evidence of their training, and/or the instructions that they must follow during the collection process.
3. The following restrictions apply:
4. The immediate supervisor of a donor may not serve as the collector when that donor is tested, unless there is no feasible alternative.
5. A co-worker who is in the same testing pool or who works with a donor on a daily basis may not serve as a collector when that donor is tested, unless there is no feasible alternative.
6. An individual who has a personal relationship with the donor (e.g., spouse, ex-spouse, relative, close personal friend) may not serve as the collector, unless there is no feasible alternative.
7. The collector should have identification with his/her name address, and telephone number and be able to provide it upon request of the donor.
8. The following items should be available to the collecting officer before specimen donation occurs:
9. Chain-of-Custody form:
10. The original copy accompanies the sample to the confirmatory laboratory and all persons involved in the transport and receiving of the sample should record their name and signature on the chain- of-custody form; and
11. A copy should be handed to the licence holder, the medical review officer (MRO) and the collecting officer.
12. A link between the chain-of-custody form and collection cup;
13. A demonstrably clean and unused collection cup which can hold a minimum of 50 mL;
14. At least two collection cups for split specimen collection;
15. Each cup must be able to hold a minimum of 20 mL;
16. In the case of single specimen collection, the cup must be able to hold a minimum of 40 mL;

NOTE: In case of the use of immunoassay integrated test cup kits (also referred to as an “integrated split specimen cup”), the collection cup and sample bottle is integrated into the same device, hence a single specimen collection may be performed.

1. Blueing agent that must be added to toilet bowl water/tank before donor enters the collection area;
2. Temperature measurement device able to determine temperatures between 32-38°C;
3. Secure tamper-evident seal for each bottle;

4. Leak-resistant plastic bag;
5. Disposable gloves for collector when handling donor specimens; and
6. Packaging components that satisfy current mail and courier regulations.
7. Collection site requirements
8. A collection site is a permanent or temporary facility where a donor provides a urine specimen for a drug test.
9. The site must have all necessary personnel, supplies, equipment, facilities, and supervision to provide for specimen collection, security, and temporary storage.
10. A urine specimen collection site must provide for donor privacy while he or she provides the urine specimen.
11. An observed collection must only be performed when required (e.g. as part of a recollection in adulteration suspicion).
12. The following facilities provide adequate privacy for urine collections:
13. A single-toilet restroom with a full-length door.
14. A multi-stall restroom with partial-length doors.
15. A mobile restroom (e.g. a vehicle with an enclosed toilet stall).
16. A source of water for washing hands must be provided.
17. The water source should be external to the restroom where urination occurs.
18. If the only source of water available is inside the restroom, the collector must secure the water source before the collection, and restore the water source to allow the donor to wash his or her hands after the collection.
19. If a water source is not available, providing moist towelettes outside the restroom is a suitable alternative.
20. A suitable clean surface for the collector to use as a work area must be available.
21. The collector work area may be located outside the restroom or inside the restroom, only if the donor can have privacy while providing the urine specimen.
22. The collector must maintain line-of-sight custody or provide for the secure temporary storage of specimens from the time the specimen is collected until it is sealed in a shipping container prior to transfer to an express carrier or courier for shipment to a laboratory.
23. Either the collection officer or the donor, with both of them present, must unwrap or break the seal of the collection container.

24. During the collection process the collection site must be dedicated solely to drug testing and comply with all local health and safety requirements.
25. The collection officer and the donor must be present throughout all the procedures outlined in the paragraphs of this section and the entire process must be transparent.
26. When a donor arrives at the collection site, the collection officer will request that the donor presents photographic identification (passport, national identity document, driver's licence, SACAA licence, etc).
27. If the donor does not have proper photographic identification, the collection officer will obtain a positive identification of the donor by an authorised supervisor or manager within the parent organisation.
28. If the donor's identity cannot be established, the collection officer will not proceed with the collection and notify an authority.
29. The collection officer will ask the donor to provide voluntary written informed consent before the collection commences.
30. The following minimum precautions shall be taken to ensure that unadulterated specimens are obtained and correctly identified:

31. To deter the dilution of specimens at the collection site, toilet water colouring agents should be placed in toilet tanks wherever accessible or in the toilet bowl, so the reservoir of water in the toilet bowl always remains coloured.
32. Any other sources of water in the enclosure where urination occurs (e.g. taps, shower) will be secured prior to collection.
33. The collection officer will ask the donor to remove any unnecessary outer garments that might conceal items or substances that could be used to tamper with or adulterate the donor's urine specimen
34. The donor will be instructed to wash and dry his or her hands prior to urination with inspection of the hands afterwards by the collection officer.
35. After washing hands, the donor will remain in the presence of the collection officer and will not have access to any unregulated source of water, soap dispenser, cleaning agent, or any other materials that could be used to adulterate the specimen.
36. The collection officer will give the donor a clean specimen collection cup.
37. The donor will be instructed not to flush the toilet until the specimen is handed to the collection officer.
38. The collection officer will note any unusual behaviour of the donor on the chain of custody form.
39. Upon receiving the specimen from the donor, the collection officer shall comply with the following:

40. Check the volume of urine in the specimen container and check the temperature of the urine specimen.
41. The temperature-measuring device used must accurately reflect the temperature of the specimen and not contaminate the specimen.
42. If a thermometer is used it may only be done on the residual urine in the collection cup after the specimen has been transferred to the sample bottles earmarked and secured for possible confirmatory analysis (split or single).
43. The thermometer may under no circumstances be brought into contact with the urine that is designated for possible confirmatory analysis.
44. The time from urination to temperature measurement should not exceed four minutes.
45. Inspect the specimen to determine its colour and appearance for any signs of contaminants.
46. Any unusual findings will be noted on the chain of custody form.
47. A re-collection may be performed and both specimens forwarded for testing by a laboratory with special notice on the chain of custody form.
48. For a split specimen collection, the volume must be approx. 50 millilitres (mL) or more and the temperature within the acceptable range of 32°C-38°C, the collection officer may then proceed with step
49. If the volume is less than 50 ml, the specimen will be discarded, and a second specimen will be collected.
50. For a single specimen collection, the volume must be approx. 20 millilitres (mL) or more and the temperature within the acceptable range of 32°C-38°C, the collection officer may then proceed with step
51. The donor may be offered a reasonable amount of liquid to drink for the purpose of re-collection (e.g. 250ml of water every 30 min, but not to exceed a maximum of 1 litre).
52. If the temperature of the urine specimen is outside the acceptable range of 32°C-8°C, a second specimen will be collected (as above).
53. If there is any reason to believe (temperature outside of range, visible contamination, etc.) that a donor may have adulterated, diluted, altered or substituted the specimen, another specimen will be obtained as soon as possible and both specimens will be forwarded to the laboratory for testing.
54. Both the donor and the collection officer will keep the specimen container/specimen bottles in view at all times prior to the urine specimen being sealed and labelled.

55. For a split collection, the specimen is split into a minimum of two specimen bottles (Sample A and Sample B).
56. When the specimen is transferred from the specimen container to the specimen bottles, it will be poured and the collection officer will request the donor to observe the transfer of the specimen and the attachment of the tamper-evident seal/tape on the bottles.
57. The sealed specimens together with the corresponding chain of custody documentation in a tamper evident container must be dispatched to the laboratory.
58. In split collections one bottle will be used for the drug test (Sample A) while the second bottle (Sample B) will remain sealed at the analytical laboratory in case the donor wishes to challenge a positive confirmation result.
59. In single collections (including integrated test cups) the specimen is split immediately after reception at the laboratory, before any testing, into a sample for analysis (Sample A) and a stored challenge specimen (Sample B)
60. At an appropriate time after the urine specimen has been collected and sealed into the transport bottles the collection officer will invite the donor to wash his/her hands.
61. The specimen bottle will have an identification label that contains at a minimum the date, the donor's specimen number and the donor’s signature/initials.
62. The collection officer will enter all information on the chain of custody form to identify the origin of the specimen.
63. Specimen bottles and all pages of the chain of custody will be labelled at the time of collection with a unique identifier.
64. The donor will be asked to read and sign a statement on the chain-of-custody form certifying that the specimen identified on the form was in fact the specimen provided by the donor and giving informed consent. The collection officer will complete the specimen chain-of-custody form and package with the urine specimen ready for dispatch as soon as possible.
65. Packaging and storage of specimens
66. Specimens should be stored at 4°C (do not freeze).
67. The specimens will be placed in containers designed to minimise the possibility of damage during shipment.
68. The collection officer will keep a register of the transfer of the specimens to the courier from the collector.

Laboratory urine analysis: Specimens are received at the laboratory where initial checks on the chain of custody documents and sample appearance are done.

The following specimens will be deemed invalid:

1. No chain of custody documentation accompanied the sample.
2. Chain of custody documentation incomplete (collector/donor details not filled in, donor consent absent).
3. Identification parameters (name/ID/barcode/numerical) mismatched on sample and documentation.
4. No seals on specimens or seals broken/tampered with on any sample bottle.
5. Insufficient sample volume.
6. After the initial checks are complete samples may be placed in temporary storage at 2°C-10°C before further analysis.
7. Upon reception of a split specimen (Sample A and Sample B) samples are separated and one sample is placed in long term storage at -20°C (only Sample B) for possible challenges to results by the donor.
8. Upon reception of a single specimen (only Sample A) the sample is documented on the chain of custody and opened for a split performed by the laboratory before any further analysis.
9. The sample is poured from Sample A into a clean sample bottle (Sample B) containing the unique identifier of Sample A, sealed and placed in long term storage at -20°C for possible challenges to results by the donor.
10. NOTE: The basic protocol of specimen collection, sample validity testing, initial drug screen test (on-site or laboratory) and confirmation of all non-negative results must be followed.
11. Analysis performed by the laboratory is done utilising separate aliquots from the testing sample (Sample A).
12. Aliquots are taken in a manner to exclude contamination of the sample.

The following validity tests must be performed to ensure the collected specimen is unadulterated urine:

1. Temperature
2. pH
3. Specific gravity/creatinine
4. Nitrite
5. Oxidants (e.g. halogens, chromium (VI), pyridinium chlorochromate)

6. Gluteraldehyde
7. Surfactants (e.g. benzalkonium chloride)
8. Any result that indicates adulteration (non-negatives) should be reported to the customer who may request additional confirmatory testing for adulterants.
9. All preliminary drug tests must fulfil the following minimum requirements:
10. All preliminary test results must be reviewed with regard to the validity of the results.
11. All assays must be calibrated against appropriate analytical standards.
12. Where the assay has significant cross-reactivity or selectivity to related compounds, the assay must be calibrated against one named standard, and, where necessary, the sensitivity to other compounds must be indicated.
13. The SACAA must be informed of the expected sensitivity and specificity to assayed compounds of interest.
14. Suitable cut-offs from Substance Abuse and Mental Health Services Administration (SAMHSA) are to be employed (Table 1).
15. Additional drug classes may be included at cut-offs established in scientific literature as long as the above-mentioned minimum criteria are applied.

Table 3: SAMHSA recommended cut-off concentrations for preliminary drug tests

Screening drug class	Cut-off (ng/mL)
Cannabis metabolites	50
Opiate metabolites	2000
Cocaine metabolites	300
Amphetamines	1000
Phencyclidine	25
Prescription medication (Benzodiazepines, Barbiturates etc) See NOTE	Therapeutic ranges

NOTE: All prescription medication needs to be declared at all times by the licence holder and it is then the prerogative and responsibility of the employer to withdraw him/her from any safety sensitive duties. Prescription medication should be declared upfront before a drug test commences and should be noted on either of the “voluntary informed consent form” or the “chain-of-custody form”.

1. All non-negative results from initial drug screen tests (on-site and laboratory) must be confirmed by a reference method such as Gas Chromatography-Mass spectrometry (GCMS).
2. Immunoassay and enzymatic assays (automated or point-of-care testing devices) are not regarded as confirmatory techniques for ethanol in blood but rather as preliminary testing techniques.
3. The confirmatory drug test must provide a quantitative result from laboratory established standard operating procedures (SOP) that are in line with international standards and quality assurance programs.
4. These include, but are not limited to, the use of pure analytical standards, calibrators and quality control samples.
5. Suitable cut-off concentration values established by the Substance Abuse and Mental Health Services Administration (SAMHSA) are to be employed (Table 2).
6. Additional drugs/metabolites may be included at cut-off concentration levels established in scientific literature as long as they are closely associated with cut-off concentration levels utilised in preliminary testing.

Table 4: SAMHSA recommended cut-off concentrations for confirmatory drug tests

1 6-Acetylmorphine as evidence for heroin use is better associated (reduced false-negatives) within the unconjugated fraction of opiate metabolites. Analysis of un-conjugated morphine and codeine allows better discernment between codeine and morphine usage (from scientific literature).

2 Positive confirmation of methamphetamine use at this cut-off requires amphetamine concentration greater or equal to 200 ng/mL.

Confirmation drug or metabolite	Cut-off (ng/mL)
Cannabis metabolites	
11-Nor-Δ^9-Carboxy-THC	15
Opiate metabolites	
Morphine (Total)	2000
Codeine (Total)	2000
Morphine (Free)[1]	100
Codeine (Free)[1]	100
6-Acetylmorphine (Free/Total)[1]	10
Cocaine metabolites	
Benzoylecgonine	150
Amphetamines	
Amphetamine	500
Methamphetamine[2]	500
Phencyclidine	25
Prescription medication (Benzodiazepines, Barbiturates etc) See NOTE	Therapeutic ranges

1. Only drugs which have been confirmed by a recognised confirmation test (like GC-MS) can be reported as positive.
2. Before any laboratory test result is released, the results are reviewed and certified as accurate by an authorising scientist.
3. The laboratory must report all non-negative test results for a specimen. For example, a specimen can be positive for a specific drug in addition to being adulterated.
4. An analytical positive result may be due to medication (prescribed or over-the-counter) or to dietary causes.
5. Interpretation is best carried out by a qualified toxicologist who may consult with the MRO, the donor, and the donor's GP.
6. The toxicologist cannot issue a negative report for a positive analytical result even if the test result is likely to be due to the use of declared medication.
7. Results are reported to the MRO within a maximum of five working days.
8. The laboratory report must include:
9. The specimen identification number;
10. The quantitative result/s for each sample submitted as well as the 99% confidence interval; and
11. The limit of detection (LOD) and the limit of quantitation (LOQ).

12. Challenges to results by the donor for re-testing must be made within 72 hours of reporting results to the MRO.
13. The stored sample (Sample B) should be released for analysis to a drug-testing laboratory able to demonstrate that they can accurately determine the concentration of a drug or metabolite at 50% of the confirmation cut-off concentration employed.
14. The release must be supported by a chain of custody that can withstand legal scrutiny and requires authorisation from the customer and the donor.
15. Long-term frozen storage (-20°C or below) ensures that positive urine samples will remain suitable for a retest.
16. Unless otherwise authorised in writing by the SACAA, the laboratory will retain all samples confirmed positive in properly secured long-term frozen storage for a minimum of one year.
17. Within this one-year period the SACAA may request the laboratory to retain the sample for an additional period of time.
18. If no such request is received, the laboratory may discard the sample after the end of one year, except that the laboratory shall be required to maintain any samples known to be under legal challenge for a further agreed period.
19. The laboratory will maintain and make available for an agreed period (minimum two years), documentation of all aspects of the testing process involved in the generation of a positive result including the following:
20. Chain-of-custody forms
21. Quality assurance records
22. Computer generated data
23. Breath specimen collection for alcohol testing
24. The SST or the BAT who administers the alcohol must have qualification training and demonstrated proficiency in the alcohol testing device he or she will be using.
25. The qualification training for BAT's and STT's must contain the following elements:
26. In depth knowledge in the operation of the alcohol testing device to be used. Their responsibility for maintaining the integrity and credibility of the testing process, ensuring privacy of the donors being tested, and avoiding conduct or statements that could be viewed as offensive or inappropriate.
27. Trainers should provide their students with certificate of completion.
28. The BAT student should successfully demonstrate that he/she can:
29. Respond to the device's messages and commands or displays;

30. Take appropriate actions when an error message or malfunction occurs within the device;
31. Recognise that an air blank has been conducted;
32. Identify and explain actions the technician will take when the device does not function properly;
33. Explain when an external calibration check is required, if applicable to the device being used, and identify the procedures used to perform the check;

Mock tests:

1. After completion of training, the student must complete at least seven consecutive error-free mock tests for initial BAT qualification and at least five consecutive error-free mock test for initial STT qualification.
2. The mock tests must be conducted on the same device(s) the BAT/STT will use.
3. If the device involves colour changes, contrasts, or colour readings, the technician must demonstrate that he/she can see the changes.
4. The mock tests must portray a real event conducted with someone acting as the test subject
5. The BAT and STT should go for refresher training every three years to remain eligible to conduct alcohol tests.
6. The content of the refresher training must include material equivalent to the initial training but updated as needed.
7. The refresher training includes conducting error-free mock tests monitored by the trainer.
8. Error correction training:
9. A BAT or STT who makes an error causing a screening test/confirmatory test to be invalid or cancelled must undergo correction training within 30 days of notification of the error. (He/she may continue with the normal testing duties; however, the goal is to complete the error correction training as soon as practical after the error occurred).
10. The employer or agent designated by the SACAA should be responsible for notifying the alcohol testing site of the error and the retraining requirement and for ensuring that the training takes place.
11. Error correction training is not required for errors related to equipment failure, unless the failure is related to the BAT's failure to maintain EBT.
12. Error correction failure is also required if, in the event of equipment failure, the BAT does not try to accomplish the test using another, alternative device, provided that the device is reasonably available.
13. Error correction training should focus on the mistake(s) made and must include three error-free mock collections (at least two of which are related to the area in which the error was made.

14. Breath and blood specimens for legally defensible alcohol testing need to be collected under circumstances which respect the dignity of the individual.
15. Suitable records must be made when the specimen is collected to prove that:
16. Breath alcohol test result can be traced back to the donor.
17. The blood specimen collected and the sample received by the blood alcohol testing laboratory is one and the same.
18. This is the first link in the chain of custody process which, when reconstructed at a later date, can be used to prove that the final result belongs to the specimen collected.
19. The following restrictions apply to collecting officers:
20. The immediate supervisor of an employee may not serve as the collector when that employee is tested, unless there is no feasible alternative.
21. A co-worker who is in the same testing pool or who works with an employee on a daily basis may not serve as a collector when that employee is tested, unless there is no feasible alternative.
22. An individual who has a personal relationship with the employee (e.g., spouse, ex-spouse, relative, close personal friend) may not serve as the collector, unless there is no feasible alternative.
23. The collector should have identification with his/her name and his/her employer's name, address, and telephone number and be able to provide it upon request of the donor.
24. A breath alcohol test site requires setup to an extend that ensure the testing devices are fully functional.
25. Each alcohol test should be conducted with reasonable visual and auditory privacy so that bystanders cannot know or infer the results.
26. A breath alcohol technician (BAT) is authorised to perform both screening and confirmation test.
27. A screening test technician (SST) is authorised only to perform screening tests for alcohol.
28. When a donor arrives at the collection site, the collection officer will request that the donor presents photographic identification (passport, national identity document, driver's licence, etc).
29. If the donor does not have proper photographic identification, the collection officer will obtain a positive identification of the donor by an authorised supervisor or manager within the parent organisation.
30. If the donor's identity cannot be established, the collection officer will not proceed with the collection and notify an authority.
31. The collection officer will ask the licence holder to provide voluntary written informed consent before the collection commences.
32. Only one donor is tested at a time.

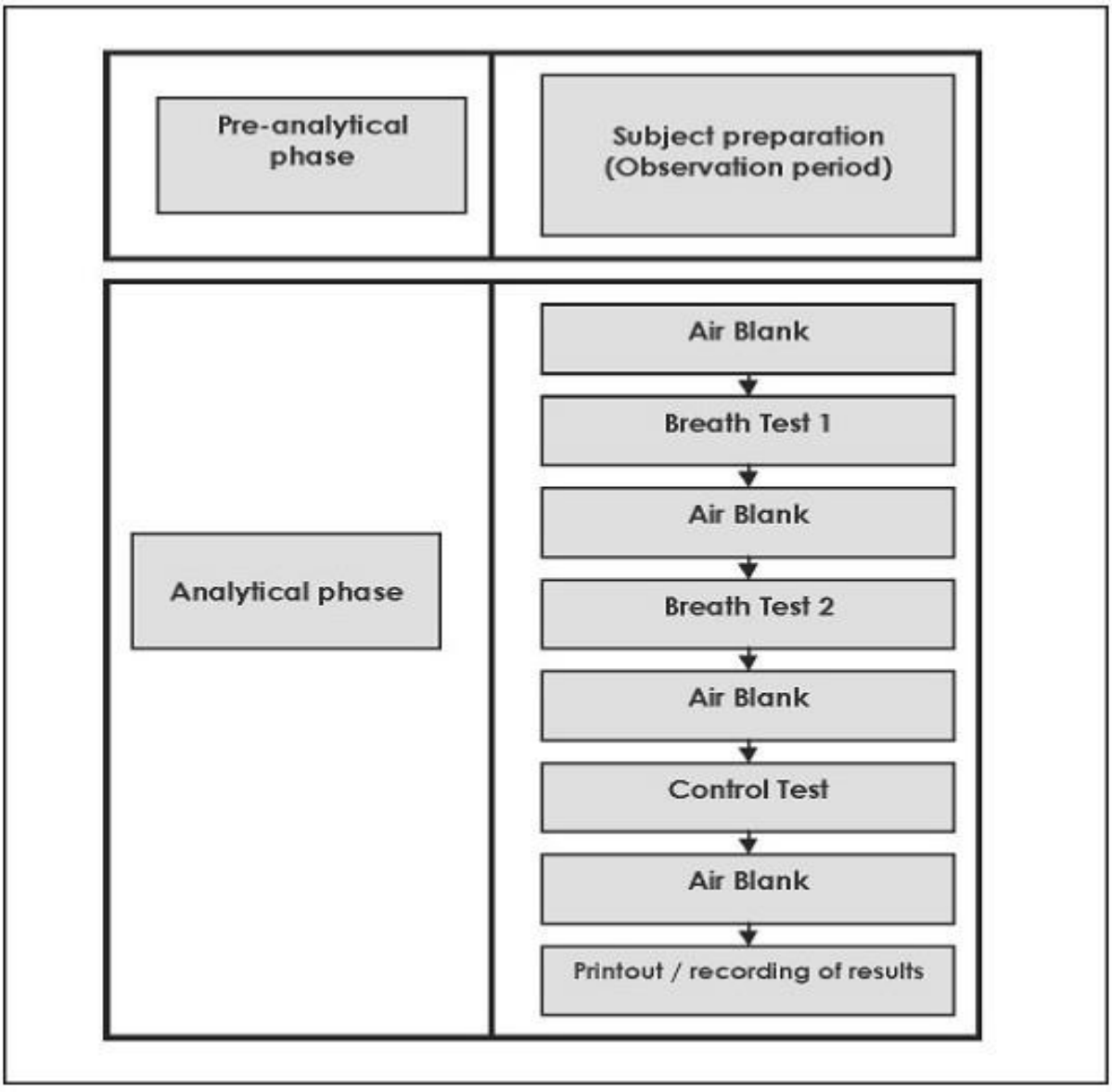
33. The BAT explains the procedure and shows the donor the instructions on the back of the alcohol testing form.
34. The BAT completes Step 1 of the ATF and asks the donor to complete Step 2.
35. If the donor refuses to sign Step 2 this is a refusal to test and the BAT documents the refusal to test on the ATF, then notify the SACAA.
36. The alcohol test is initially performed with an ASD or EBT.
37. If the initial concentration is at or above 0.10 mg ethanol/1000 mL exhaled breath, the test is repeated 15-30 minutes later using an EBT.
38. During the 15-20-minute interval, the BAT tells the donor to not eat, drink or belch, and to wait nearby within view of the BAT or another employer representative who will watch the donor to help ensure he or she complies.
39. Prior to the confirmation test the BAT must ensure that an air blank reading zero is displayed, demonstrating that no alcohol is present in the EBT.
40. The BAT should complete the confirmation test prior to collecting a urine specimen or conducting other tasks in which the donor cannot remain under direct observation of the BAT.
41. If circumstances delay confirmatory testing beyond 30 minutes, the BAT still performs a confirmation test and not another screening test and notes why the delay occurred.
42. The breath sample may be screened (preliminarily tested) for the presence of alcohol with an alcohol screening device (ASD).
43. If the screen results are negative no further analysis is necessary.
44. If the screen/preliminary test resulted to be non-negative for the possible presence of alcohol above a predefined cut-off level, a confirmation test to obtain the exact breath alcohol concentration must be carried out utilizing an evidentiary breath testing device (EBT).
45. Oral fluid preliminary testing may also be performed for preliminary testing purposes:
46. If the screen results are negative no further analysis is necessary.
47. The BAT shows the donor the result as displayed on the EBT and the EBT then prints the test result.
48. The BAT ensures that the results are affixed or directly printed on all three copies of the ATF, preferably in the designated space on the front of the ATF.
49. Fixing of the result printout can take place by means of:
50. A label that is tamper evident;
51. Affixing the printout to the ATF with tamper evident tape;
52. The BAT signs and dates Step 3 of the ATF; and

53. Expressing the result on these copies as a number, rather than as positive or negative.
54. If the confirmation test is at or above 0.10 mg ethanol/1000 mL exhaled breath, the BAT must ask the donor to sign Step 4 of the ATF.
55. If the donor refuses to sign Step 4, the BAT makes a note of the refusal on the ATF (but this is not a refusal to test).
56. The BAT then immediately sends/faxes the ATF to the SACAA.
57. The donor may ask for a blood alcohol test that should be performed by a recognized confirmatory analytical technique like HS-GC-FID.
58. If the result is at or above 0.10 mg ethanol/1000 mL exhaled breath, the BAT should instruct the donor to remain at the testing site until the employer arranges transportation for the donor.

Analytical procedure:

1. An evidential breath test device (EBT) must be able to print the result on triple ply paper or on three labels after an analysis.
2. EBT devices to be utilised should be listed in the National Road Traffic Act, 1996 (Act No. 93 of 1996).
3. The manufacturer of each ASD or EBT should have a quality assurance plan (QAP) that describes the accuracy checks, 95% confidence intervals or tolerance ranges, maintenance requirements and quality control procedures according to ISO 17025 guide.
4. Each EBT's QAP should include external calibration checks for accuracy.
5. An accuracy check is performed with known alcohol standards in a liquid solution or compressed dry gas.
6. These standards should originate from laboratories complying to ISO 17025 for calibration.
7. The EBT's measured value when analysing the standards must be within the tolerance limits designated by the manufacturers QAP, which is typically ± 0.005mg / 1000ml exhaled air. The site should perform an accuracy check once a month and as soon as conveniently possible after every positive test.
8. If the EBT fails a check, it should be taken out of service according to the manufacturer's QAP.
9. Every result of 0.01mg/ 1000ml or above obtained on the EBT since the last valid check will be declared invalid.
10. A logbook of calibration records needs to be kept with each device for a minimum of two years.

Table 5: Scheme of a breath alcohol analysis with integral scientific safeguard steps



Shy-Lung

The term “Shy-Lung” refers to a situation where the donor does not provide a sufficient amount of breath to permit a valid breath test.

The donor must be given a minimum of two attempts to provide an adequate sample.

If the donor does not provide an adequate sample based on the EBT requirement, the BAT should:

Repeat the procedure if the BAT believes there is a strong likelihood of success with additional attempts.

Try to conduct the test in annual mode if the EBT has this capability.

Consider using an oral fluid device if the donor fails after two attempts, and the BAT is also a qualified STT.

Breath will still be required if confirmation testing is necessary.

Records the circumstances on the ATF and immediately informs the SACAA.

If the BAT believes the donor is purposefully not blowing adequately or forcefully into the breath testing device, then the BAT notes in Step 3 “Refusal to Test”.

Alternatively, a blood alcohol test may be performed as confirmation, after an elevated screening result.

The donor shall be sent for a Shy-Lung assessment to be conducted by a Specialist Physician or experienced MRO.

The evaluating physician will communicate his/her determination directly to the SACAA.

If the physician states that there was a valid medical condition for the insufficient amount of breath, the test is deemed invalid.

If the physician identifies no valid medical reason, the donor is deemed to have refused testing.

6.15.5 Alcohol test errors

1. If a BAT or STT becomes aware of an event that will cause the test to be deemed invalid, he/she must try to correct the problem promptly, if practicable.
2. This may require repeating the test, using a new ATF and, if needed, a new alcohol screening device or different EBT.
3. Some errors cannot be corrected, and some errors are potentially correctable by amending the ATF.
4. If a valid test cannot be performed, the BAT or STT cancels the test and immediately informs the SACAA.
5. If the error is a fatal flaw, the test must be deemed invalid and the SACAA must be informed within 48 hours of the cancellation.
6. An invalid test is neither positive nor negative and does not count toward any required random rate or number of follow-up tests.
7. All results are to be communicated to the donor and to the SACAA.
8. The BAT should notify the SACAA within 48 hours of any test that had a fatal flaw.
9. If the alcohol testing result is confirmed to be at or above 0.1 mg/1000 mL:
10. The licence holder shall be removed from all duties.
11. The BAT should instruct the licence to remain at the testing site until transportation for the donor is arranged.

6.15.6 Blood specimen collection

12. The collecting officer must be a medical/health professional registered at the Health Provisions Council of South Africa (HPCSA), including a medical doctor, phlebotomist, nursing sister, etc.

13. The collector should have identification with his/her name and his/her employer's name, address and telephone number and be able to provide it upon request of the donor.
14. The following restrictions apply to collecting officers:
15. The immediate supervisor of an employee may not serve as the collector when that employee is tested, unless there is no feasible alternative.
16. A co-worker who is in the same testing pool or who works with an employee on a daily basis may not serve as a collector when that employee is tested, unless there is no feasible alternative.
17. An individual who has a personal relationship with the employee (e.g. spouse, ex-spouse, relative, close personal friend) may not serve as the collector, unless there is no feasible alternative.
18. The collection site must have the following:
19. All necessary personnel, supplies, equipment, facilities, and supervision to provide for specimen collection, security and temporary storage.
20. A blood specimen collection site must provide for donor privacy while the blood is drawn.
21. A suitable clean clinically sterile surface for the collector to use as a work area must be available.
22. A bed for the donor to lie down.
23. For the collection of blood specimens for alcohol analysis:
24. Blood is collected from the cubital veins of the forearm.
25. Needles should be clean and dry and not contaminated in any manner, including water (as per standard clinical practice).
26. The disinfectant used to clean the arm should not contain ethanol, isopropanol, or other volatile compounds.
27. Sodium fluoride (1%) is effective as preservative.
28. Alcohol testing should be performed in whole blood.
29. Potassium oxalate or EDTA will suffice as an anticoagulant.
30. After properly labelling the two (2) tubes with all the required information, the specimen, a laboratory request form, and a chain-of-custody form should be sealed in an appropriate container.
31. The samples must be stored in a fridge as soon as possible (2-4ºC) until collection by the courier.
32. The collector must maintain line-of-sight custody or provide for the secure temporary storage of specimens from the time the specimen is collected until it is sealed in a shipping container prior to transfer to an express carrier or courier for shipment to a laboratory.
33. Suitable records must be made when the specimen is collected to prove that:

34. The blood specimen collected and the sample received by the blood alcohol testing laboratory is one and the same.
35. This is the first link in the chain of custody process which, when reconstructed at a later date, can be used to prove that the final result belongs to the specimen collected.
36. The original copy accompanies the sample to the confirmatory laboratory and all persons involved in the transport and receiving of the sample should record their name and signature on the chain-of-custody form.
37. One of three carbon copies of the chain-of-custody forms should be handed to each of the following:
38. The licence holder;
39. The medical review officer (MRO); and
40. The collection officer.
41. Requirements for dispatch of collected blood specimens:
42. The specimens and accompanying documents should be sent to the laboratory as soon as possible.
43. On receipt by the laboratory, specimens should be stored in a fridge by the laboratory and after analysis kept in a frozen or refrigerated state
44. Collection officers will arrange to dispatch the collected specimens to the drug-testing laboratory.
45. The specimens will be placed in containers designed to minimise the possibility of damage during shipment.
46. Transfer of the specimens to the courier from the collector, and in turn from the courier to the laboratory, should be documented on the chain of custody.
47. Laboratory analysis of a blood specimen:
48. If the screen results are negative no further analysis is necessary.
49. Preliminary blood alcohol testing may be performed by immuno-assay and enzymatic assays.
50. If the screen/preliminary tests are non-negative, a confirmation test to obtain the exact alcohol concentration must be carried out on another portion of the same blood sample.
51. A screening/preliminary test is not required if the client prefers the blood sample to be subjected to the confirmatory analytical procedure directly.
52. The confirmatory test should not involve a repetition of the same analytical technology as was employed for the preliminary testing, but has to be performed by an internationally recognised confirmatory technique (typically head-space gas chromatography with flame ionisation detection, HS-GC-FID).
53. Positive results are only reported after laboratory confirmation and may require further interpretation.

NOTE: It is of prime importance to note that immune-assay and enzymatic assays are not regarded as confirmatory techniques for ethanol in blood but rather as preliminary testing techniques.

54. Requirements for blood alcohol test results higher than 0.02 g ethanol/100 mL:
55. If a laboratory performs the analysis (e.g. blood testing), the result may be reported to the MRO or directly to the SACAA if the test results is higher than 0.02 g ethanol/100 mL blood.
56. If the MRO receives the result, he/she relays it to the SACAA without interpretation.
57. Challenges to results by the licence holder for re-testing must be made within 72 hours of reporting results to the MRO or the SACAA.
58. The stored sample (Sample B) should be released for analysis to a drug-testing laboratory able to demonstrate that they can accurately determine the concentration of a drug or metabolite at 50% of the confirmation cut-off concentration employed.
59. The release must be supported by a chain of custody and requires authorisation from the customer and the donor.
60. Suitable records must be made during the analytical process to prove that the sample received by the laboratory and the sample, about which the final report is written, are one and the same.
61. All blood samples which prove positive above the cut-off concentration of 0.02 g/100mL and all records of the analytical process must be kept as follows:
62. One year – Records of alcohol tests with a concentration of less than the company cut-off concentration and cancelled alcohol tests.
63. Two years – Documentation of the inspection, maintenance, and calibration of EBT's.
64. Five years – Alcohol test results for both blood and breath at or above the SACAA cut-off, and documentation of refusals and follow-up alcohol tests.
65. If the customer requires an independent toxicological review, the laboratory must make available, if requested, the analytical data upon which it based its final report.
66. Long-term frozen storage of samples will be at 0°C-4°C or below.
67. The laboratory will retain all samples confirmed positive in properly secured long-term cold storage for a minimum of three months.
68. Within this three-month period the SACAA or licence holder may request the laboratory to retain the sample for an additional period of time.
69. If no such request is received, the laboratory may discard the sample after the end of three months, except that the laboratory shall be required to maintain any samples known to be under legal challenge for a further agreed period.

Class VI Medical Standards-Protocols -Cabin Crew and Recreational Pilots

4.1.18 Class IV medical certificates

Physical and mental standards

Applicants must have no established medical history or clinical diagnosis of –

Psychiatric

1) Any of the following conditions that are of a severity which renders the applicant incapable of safely exercising the privileges of the licence, or makes it likely that within two years of the assessment the applicant will be unable to safely exercise the privileges of the licence, will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation:

a) a psychotic disorder, unless the psychosis was of toxic origin and there has been complete recovery;
b) alcohol or other psychoactive substance abuse or dependence;
c) character or behaviour disorder, severe enough to have resulted in an overt act;
d) any other psychiatric disorder;
e) an organic mental disorder;
f) a mental or behavioural disorder due to use of psychoactive substance; this includes dependence syndrome induced by alcohol or other psychoactive substances;
g) schizophrenia or schizotypal or delusional disorder;
h) a mood (affective) disorder;
i) a neurotic, stress related or somatoform disorder;
j) a behavioural syndrome associated with physiological disturbance or physical factors;
k) a disorder of adult personality or behaviour, particularly if manifested by repeated overt acts;
l) mental retardation;
m) a disorder of psychological development;
n) a behavioural or emotional disorder with onset in childhood or adolescence, or
o) a mental disorder not otherwise specified.

An applicant who has a history of psychoactive substance abuse or dependence may apply for an

1. exemption to the designated body or institution if the following circumstances exist –
2. The applicant has been under medical treatment for psychoactive substance abuse and the medical practitioner concerned, approved by the designated body or institution, certifies that the applicant is free from the effects of psychoactive substance abuse;

3. the applicant provides the name of a sponsor who is prepared to certify that the applicant no longer takes a psychoactive substance in any form. Such a sponsor must be a person acceptable to the designated body or institution for this purpose;
4. the applicant signs an undertaking not to take any psychoactive substance while holding a valid licence.
5. Any of the following conditions that are of a severity which renders the applicant incapable of safely exercising the privileges of the licence, or makes it likely that within two years of the assessment the applicant will be unable to safely exercise the privileges of the licence, will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation:
6. A psychotic disorder, unless the psychosis was of toxic origin and there has been complete recovery;
7. Alcohol or other psychoactive substance abuse or dependence;
8. Character or behaviour disorder, severe enough to have resulted in an overt act;
9. Any other psychiatric disorder.

Neurological

Any disease, injury or abnormality of the nervous system, the effects of which, according to medical conclusion, are likely to interfere with the safe exercise of the privileges of the licence or cause sudden or subtle incapacitation, will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation. In particular, the following are not acceptable:

1. Epilepsy;
2. Any seizure disorder;
3. Any disturbance of consciousness without satisfactory medical explanation of the cause;
4. Migraine; and
5. Incapacitating headaches.

Musculoskeletal

Any active disease of the bones, joints, muscles, or tendons, or any significant functional limitation from any previous congenital or acquired disease or injury will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation.

Functional abnormalities affecting the bones, joints, muscles, or tendons, compatible with the safe exercise of the privileges of the licence, may be assessed as fit.

An appropriate demonstration of ability via a practical test may be required.

Gastrointestinal

Any disease or abnormality, or result of disease or surgical operation, affecting the digestive tract and its attachments, including the biliary system and hernial orifices, of a severity likely to cause obstruction, significant functional disorder or infection, or sudden or subtle incapacitation, will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation. An applicant who has undergone a major surgical operation on the biliary passages or the digestive tract or its adnexa with a total or partial excision or a diversion of any of the organs should be assessed as medically unfit until such time as the medical assessor, having access to the details of the operation concerned, considers that the effects of the operation are not likely to cause incapacitation in flight.

The relevant protocol is contained in Schedule 5.

Respiratory

Any disease or abnormality, or result of disease or surgical operation, affecting the lungs, mediastinum, pleura, chest wall or respiratory passages of a severity likely to cause infection, functional disorder or sudden or subtle incapacitation at altitude, will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation.

Cardiovascular

Any disease or abnormality, or result of disease or surgical operation, which affects the heart or circulatory system and is of a severity likely to cause functional disorder or sudden or subtle incapacitation. Evidence of myocardial infarction, or significant hypertension, will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation. Disorders of cardiac rhythm requiring a pacemaker will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation. Applicants with an abnormal cardiac rhythm shall be assessed as unfit unless the cardiac arrhythmia has been investigated and evaluated in accordance with the best medical practice and is assessed as not likely to interfere with the safe exercise of the privileges of the applicants' license or ratings.

Applicants with evidence strongly suggestive of coronary artery disease, including the presence of excessive cardiovascular risk factors, will be assessed as unfit unless adequate myocardial perfusion can be demonstrated and reversible risk factors controlled.

Metabolic, nutritional and endocrine

Any metabolic, nutritional or endocrine disorders likely to interfere with the safe exercise of the privileges of the licence, or to cause sudden or subtle incapacitation, will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation.

Any applicant with a diagnosis of metabolic, nutritional or endocrine disorder will generally be assessed as unfit but may be considered for special certification by the SACAA Aeromedical Committee.

Haematologic and immunologic

Any active disease of the lymphatic system or of the blood will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation. Those with chronic diseases of these systems in a state of remission may be assessed as fit, provided appropriate specialist reports permit medical conclusion that the condition is not likely to affect the safe exercise of the privileges of the licence. Applicants with any infectious diseases, the effects of which are likely to impede the safe exercise of the privileges of the licence or cause sudden or subtle incapacitation, must be assessed as unfit until such time as effective and acceptable treatment has removed such effects.

Applicants with sickle-cell trait or other haemoglobinopathic traits are usually compatible with flying provided they submit a favourable Haematologist report and their condition is unlikely to cause sudden or subtle incapacitation. Splenic infarctions have repeatedly been reported occurring due to sickling of red blood cells.

Sickle-cell disease, which includes sickle-cell anemia (SS), sickle-cell haemoglobin C disease (SC), sickle-cell thalassemia (STh), sickle-cell haemoglobin D disease (SD) and other pathological genotypes involving haemoglobin S with other genetic variants, is disqualifying for flying. A clear distinction must be made between sickle-cell disease (SS, SC, SD and STh) and sickle-cell trait (AS). The diagnosis of sickle-cell trait should be based on the following findings (including results from sickling tests): the patient should not be anaemic, and should have normal red cell morphology, normal levels of haemoglobin F, and a haemoglobin electrophoretic pattern of haemoglobins A and S in which A predominates for example the concentration of Hb S is less than 45% of total haemoglobin.

The relevant protocols are contained in Schedules 15, 16, 17 and 18.

Genitourinary

Any active disease or abnormality, or result of disease or surgical operation, affecting the kidneys, urine, urinary tract, menstrual function or genital organs, to a degree likely to impede the safe exercise of the privileges of the licence, or cause sudden or subtle incapacitation such that the applicant will be unable to safely exercise the privileges of the licence will be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation. Urine examination shall form part of the medical examination and abnormalities shall be adequately investigated.

Ophthalmology

All cases should be referred to the SACAA Aeromedical Committee for consideration. Refer to the relevant protocols.

Physical and mental standards

An applicant shall have no established medical history or clinical diagnosis of –

5.1.1 Psychiatric

Any of the following conditions that are of severity which render an applicant incapable of safely exercising the privileges of the licence or makes it likely that within two years of the assessment an applicant shall be unable to safely exercise the privileges of the licence, shall be disqualifying unless acceptable and effective treatment has controlled any additional risk of functional disorder or sudden or subtle incapacitation.

I. a psychotic disorder, unless the psychosis was of toxic origin and there has been complete recovery;
II. alcohol or other psychoactive substance abuse or dependence;
III. character or behaviour disorder, severe enough to have resulted in an overt act;
IV. any other psychiatric disorder;
V. an organic mental disorder;
VI. a mental or behavioural disorder due to use of psychoactive substance; this includes dependence syndrome induced by alcohol or other psychoactive substances;
VII. schizophrenia or schizotypal or delusional disorder;
VIII. a mood (affective) disorder;
IX. a neurotic, stress related or somatoform disorder;
X. a behavioural syndrome associated with physiological disturbance or physical factors;

XI. a disorder of adult personality or behaviour, particularly if manifested by repeated overt acts;
XII. mental retardation;
XIII. a disorder of psychological development;
XIV. a behavioural or emotional disorder with onset in childhood or adolescence; or
XV. a mental disorder not otherwise specified.

Brief Psychotic Disorder

1) An applicant who is presented with psychotic symptoms shall be declared medically unfit while the underlying causes are being identified. An applicant with a brief psychotic disorder shall be assessed on case-by-case basis.

An applicant who applied for medical recertification shall submit a comprehensive psychiatric report detailing the following –

I. the presence and severity of symptoms;
II. the duration shall be less than one month;
III. full return to the premorbid level of functioning; and
IV. the use of any medication.
V. Adjustment Disorder
VI. An applicant with adjustment disorder shall be assessed on a case by case basis.
VII. An applicant shall be deemed temporarily medically unfit while suffering from symptoms.
VIII. Applicant is required to submit a comprehensive psychiatrist's report detailing the following –
IX. the applicant is currently asymptomatic; and
X. the applicant is not on any medication that is not compatible with flying.

Personality Disorders

An applicant with a confirmed diagnosis of personality disorder shall be considered medically unfit.

Attention deficit hyperactivity disorder.

An applicant with attention deficit hyperactivity disorder may be considered medically fit, if the applicant submits the following –

a favourable comprehensive psychiatric report detailing the signs, symptoms and diagnosis of the applicant; and a favourable comprehensive clinical psychologist assessment.

2)An applicant showing evidence of persisting deficiencies in cognitive ability or behavioural aberrancy shall be declared medically unfit.

3) An applicant shall be required to be on medication for a minimum of one month off therapy and clinically stable.

(4) An applicant who continually use amphetamine medication shall be declared medically unfit.

Substance Abuse or Substance Dependence

1)An applicant who has a history of psychoactive substance abuse may be declared medically fit if –

I. an applicant has been under medical treatment for psychoactive substance abuse and the DAME or a medical practitioner concerned certifies that the applicant is free from the effects of psychoactive substance abuse;

II. an applicant provides the name of a sponsor who is prepared to certify that the applicant no longer takes a psychoactive substance in any form and such a sponsor shall be a person acceptable to the Medical Assessor for this purpose; and

III. an applicant declares under oath not to take any psychoactive substance while holding a licence.

2)An applicant with a history of alcohol dependency may be assessed as fit provided that he or she meets the following requirements –

I. applicant abstained from alcohol for at least 6 months;

II. applicant submit blood parameters (MCV- Mean Corpuscular Volume, GGT- Gamma Glutamyl Transpeptidase and CDT- Carbohydrate deficient Transferrin) normalised;

III. applicants submit normal urine drug screening samples; and

IV. applicant submit a report detailing successful completion of an in-patient rehabilitation.

V. The requirements prescribed in subsection (2) are applicable to an applicant who is presenting with the first episode of alcohol dependency.

VI. An applicant who presents two episodes of alcohol dependency shall be required to meet the requirements prescribed in subsection (2) and comply with the following –

VII. applicant shall be subjected to random drug testing for a 2 years period; and

VIII. applicant who relapse after the second episode shall be declared medically unfit.

IX. Applicant presenting with a second episode shall be restricted to operating without carrying passengers or operating in multi crew environment for a minimum period of 6 months.

(6)The restriction referred in subsection (4) may be lifted after two years of proven sobriety.

I. Alcohol related seizure

II. Applicant presenting with an alcohol-related seizure shall be assessed as medically unfit for a minimum period of two (2) years, and until such time that freedom from substance use has been established and can be demonstrated.

An applicant may be considered after two (2) years and shall be restricted to the following operations restrictions –

I. may not carry passengers; and

II. shall operate in a multi-crew environment.

An applicant shall be required to submit the following favourable reports:

I. a report stating proven attendance of a rehabilitation programme and quarterly after-care reports;

II. a comprehensive clinical psychologist report;

III. a comprehensive neurologist's report;

IV. an EEG report with provocation; and

V. a CT scan or MRI report.

VI. An applicant shall be subjected to random alcohol testing.

The limitations prescribed in subsection (3) may be lifted in 5 years after the seizure, provided sobriety is proven and an applicant has been free from seizures.

I. Anxiety Disorders

II. Generalised Anxiety Disorder

III. Applicant with generalised anxiety disorders shall be assessed on a case-by-case basis by the Medical Assessor.

IV. Applicant shall be required to submit a comprehensive psychiatrist report containing the following information –

V. diagnosis and prognosis;

VI. presence and severity of symptoms;

VII. medication and side effects is any experienced; and

VIII. applicant shall be required to be asymptomatic without medication for a minimum of 6 months.

IX. Post-traumatic Stress Disorder.

Applicant with post-traumatic stress disorder shall be assessed on a case-by-case basis by the Medical Assessor.

Applicant shall be required to submit a comprehensive psychiatrist report containing the following information –

I. diagnosis and prognosis;

II. presence and severity of symptoms;

III. applicant shall be symptom free; and

IV. medication used and side effects if any.

C. Mild to Moderate Anxiety

Applicant with a history of mild to moderate anxiety may be assessed as medically fit if he or she meet the following criteria –

I. if the psychiatrist's and the psychologist's reports are favourable;

II. is well and stable for a minimum of period one month; and

III. the medication used is acceptable for flight duties.

Mild to Moderate Depression

1. Applicant with a history of mild to moderate depression shall comply with the Mood Disorder Protocol prescribed in the SA-CATS-MR Schedule 30:
2. Hypomania and bipolar mood disorder II
3. Applicant presented with a diagnosis of hypomania and bipolar mood disorder II shall be declared medically unfit for period of 3 years.
4. Applicant may be considered after three years if a psychiatrist report indicates that the applicant has been well and stable for a period of 3 years.
5. If the psychiatrist's report states that the applicant has experienced a full level of functional recovery with insight into the illness and fully adheres to the agreed treatment plan.
6. If a Clinical Psychologist report finds no alertness, concentration and motor performance deficits.
7. An applicant use medication that is compatible with flight duties.

Requirements for renewal of the medical certificates are as follows –

an applicant shall be required to submit a 6-monthly Psychiatric and Psychological report, with a YMRA (Young mania rating scale); and an applicant shall be required to submit a 6-monthly biochemical profile including drug levels.

Bipolar Mood Disorder Type 1

Applicant with a confirmed diagnosis of Mania with or without major depression shall be declared medically unfit.

Bipolar mood disorder type 2

(1) Applicant with a confirmed diagnosis of Hypomania with Major Depression shall be declared medically unfit

1. Para-Suicide
2. Applicant presenting with a diagnosis of para-suicide shall be referred to the Medical Assessor for consideration.
3. Applicant shall be required to submit a comprehensive Psychiatrist report indicating the following:
4. multi-axis diagnosis; and presence or absence of substance and alcohol dependent/abuse

Organic Mental Disorders

Applicant presented with a diagnosis of organic mental disorders shall be declared temporary medically unfit and referred to the Medical Assessor for consideration.

Applicant shall be required to submit a comprehensive Psychiatrist report indicating the following –

I. the underlying cause;
II. the diagnosis and prognosis;
III. the presence and severity of symptoms;
IV. stipulate whether the underlying cause has been identified and remedied; and
V. indicate whether the client has reached full recovery to baseline acceptable level of functioning.

Delirium

Applicant presenting with a diagnosis of Delirium shall be declared temporary medically unfit and referred to the Medical Assessor for consideration on a case-by-case basis.

Applicant shall be required to submit a comprehensive Psychiatrist report indicating the following –

I. the underlying cause;
II. the diagnosis and prognosis;
III. stipulate whether the underlying cause identified and remedied;
IV. the presence and severity of symptoms;
V. full recovery from the delirious state; and
VI. examination done to confirm the underlying cause and a prognosis or likelihood of recurrence.

Dementia

Applicant with a confirmed diagnosis of dementia shall be declared medically unfit. However; in the small number of cases where the cause of dementia is known and the condition has been resolved, the applicant may be considered for recertification.

Applicant shall be required to submit a comprehensive Psychiatrist report indicating the following –

I. the presence and severity of symptoms;
II. full recovery from the delirious state;
III. examinations done to confirm the underlying cause and a prognosis likelihood of recurrence; and
IV. stipulate whether the underlying cause has been identified and remedied.

Schizophrenia

Applicant presenting with a diagnosis of schizophrenia shall be declared medically unfit.

Delusional Disorder

Applicant presenting with a diagnosis of delusional disorder shall be declared medically unfit

Neurology system

An applicant shall have no established medical history or clinical diagnosis of any disease, injury or abnormality of the nervous system that –

is of a severity that renders the applicant incapable of safely exercising the privileges of the licence; or makes it likely that within the specified period of time of the assessment an applicant is unable to safely exercise the privileges of the licence; or if an acceptable and effective treatment has any additional risk of functional disorder or sudden or subtle incapacitation.

Malignant Brain Tumours

Applicant presenting with a diagnosis of malignant brain tumours shall be declared medically unfit.

Hereditary, degenerative and demyelinating disorders. Applicant presenting with a diagnosis of hereditary, degenerative and demyelinating disorders shall be declared temporary medically unfit and be referred to the Medical Assessor for consideration on a case-by-case basis.

Applicant presenting with progressive or disabling shall be declared medically unfit.

Applicant considered shall be required to submit the following comprehensive report –

I. a neurological report;
II. a neuro-ophthalmological report;
III. an MRI of the brain and the spinal cord; and
IV. a clinical psychologist report.

Primary and Central Hypersomnia

Applicant presenting with a diagnosis of primary and central hypersomnia shall be declared temporary medically unfit and be referred to the Medical Assessor for consideration.

An applicant to considered medically fit shall be required to submit the following –

I. a comprehensive neurological report; and
II. a Polysomnogram from an HPCSA accredited practitioner.

Epilepsy

Applicant may be declared medically fit if he or she has been free from epileptic attacks for at least 10 years without anticonvulsant medication during that time.

Specific self-limited conditions such a Benign Rolandic Seizure with centro-temporal spikes shall allow medical certification after 5 years.

Epilepsy for Cabin Crew

Medical Requirements

A cabin crew member who is diagnosed with epilepsy is medically unfit to fly. Cabin crew member may be considered for recertification by the Medical Assessor after a year period has lapsed following initiation of medication.

On application for recertification an applicant shall be required to submit the following reports which are not older than 3 months –

I. a Neurologist report stating that he or she is adequately functional on acceptable medication without significant side effects;
II. a Brain CT scan film/MRI scan; and
III. a 16 Lead EEG.

If an applicant suffers a seizure while on medication, he or she is deemed to be medically unfit to fly and shall submit the reports referred to in subsection (3). If there is a change in medication, an applicant shall be grounded for 6 months and shall be required to provide a Neurologist report stating that an applicant is stable on the new medication.

Restrictions on Medical Certificate

A cabin crew member with epilepsy is restricted to operate under the following conditions –

I. short haul flights which are not more than 3 hours; and
II. operate under supervision or in pairs.

Single Seizure

An applicant presented with a diagnosis of single seizure shall be declared temporary medically unfit and referred to the Medical Assessor for consideration.

An applicant shall be deemed medically fit pending a favourable neurological report that stipulates that –

applicant has had no further episodes of a seizure for the past four years preceding the application; and

clinical examination and supporting medical reports quantify the risk of seizure to be at 2% per annum.

Solitary loss of consciousness or loss or altered awareness likely to be cardiovascular in origin

Applicant presenting with a diagnosis of solitary loss of consciousness or loss or altered awareness likely to be cardiovascular in origin shall declared medically unfit for period of one year;

Applicant may be deemed temporarily medically unfit for a minimum of three months if the underlying cause is identified and treated.

Applicant to be considered medically fit shall be required to submit the following comprehensive reports for consideration –

I. a Cardiologist's report;
II. an Echocardiography;
III. a resting and exercise ECG; and
IV. a Tilt-table test.

Cardiovascular System

The applicant shall have no current cardiovascular conditions likely to interfere with the safe operation of an aircraft.

The resting ECG shall form part of the examination –

I. at the initial examination;
II. after the applicant has attained the age of 40 years;
III. after the applicant has attained the age of 50 years;
IV. after the attainment 50 years, the applicant shall submit four yearly; and
V. when clinically indicated.

Blood Pressure

Applicant presented with a blood pressure at examination consistently exceeds 160 mmHg systolic and/or 95 mmHg diastolic, with or without treatment shall be declared medically unfit.

I. The initiation of medication to control blood pressure requires a period of at least two weeks' temporary medical suspension of the medical certificate to establish control and the absence of side effects.
II. Applicant presented with hypertension shall be assessed for potential risk factors.
III. Applicant with symptomatic hypotension shall be declared as medically unfit.

Applicant shall be required to use a medication which is compatible with flying and shall be required to submit the following reports –

I. a comprehensive report from the treating Doctor or DAME; and
II. applicant required to submit the following blood tests;
III. U&E and Creatinine Fasting glucose;
IV. Random Lipogram; and
V. resting and stress ECG.

Coronary Artery Diseases

Acute Myocardial Infarctions

Applicant shall not have a confirmed diagnosis of an Acute Myocardial Infarctions within the preceding 6 weeks.

Applicant who have had a satisfactory cardiological evaluation, including an exercise or equivalent test that is negative for ischemia, may be declared as medically fit pending submission of the following favourable reports-

I. a resting and maximal stress ECG;
II. a 24-Hour Holter ECG;
III. an Angiogram (initial);
IV. an Echocardiogram;
V. a Stress MRI/MIBI Scan or Coronary CT Scan; and
VI. bloods (FBC, U&E, Lipogram, Fasting Glucose).

Coronary Artery Bypass Graft

An applicant shall not be assessed if he or she has undergone coronary artery bypass graft within the preceding 3 months.

Applicant who had a satisfactory cardiological evaluation, including an exercise or equivalent test that is negative for ischemia may be assessed as medically fit pending submission of the following favourable reports-

I. a resting and maximal stress ECG;
II. a 24-Hour Holter ECG;
III. an Angiogram (initial);
IV. an Echocardiogram;
V. a stress MRI/MIBI Scan or Coronary CT Scan; and

VI. bloods (FBC, U&E, Lipogram, Fasting Glucose).
VII. Elective Angioplasty

Applicant shall not be considered for medical certification if he or she have had an elective Angioplasty within the preceding 6 weeks.

Applicant with a satisfactory cardiological evaluation, including an exercise or equivalent test that is negative for ischemia, may be declared medically fit pending submission of the following favourable reports –

I. a resting and maximal stress ECG;
II. a 24-Hour Holter ECG;
III. an Angiogram;
IV. an Echocardiogram;
V. a Stress MRI/MIBI Scan or Coronary CT scan; and
VI. loods (FBC, U&E, Lipogram, Fasting Glucose).

Angina

Applicant who has been free from angina for 6 weeks with or without treatment and who had a satisfactory cardiological evaluation, including an exercise or equivalent test that is negative for ischemia, may be declared medically fit. The tests shall be determined by treating specialist and the Medical Assessor.

Rhythm and Conduction Disturbances

Applicant with a significant disturbance of cardiac rhythm shall be declared medically unfit unless the rhythm disturbance is assessed by a Physician or Cardiologist and is not likely to interfere with the safe exercise of the privilege of the licence the applicant is applying for.

Applicant shall be required to submit the following reports:

I. an exercise ECG;
II. a 24-Hour Holter ECG; and
III. an Echocardiogram.

Rate and Rhythm Disturbances

Applicant presented with the diagnosis above may be considered medically fit only if the arrhythmia has been controlled for 3 months and the LV ejection fraction is >40%.

Pacemaker Implant

Applicant who has undergone a pacemaker implant may be considered medically fit 3 months following the pacemaker implantation. Applicant shall be required to submit a satisfactory cardiologist including pacemaker interrogation report.Applicant to be referred to the Medical Assessor for consideration.

Successful Catheter Ablation

Applicant who has undergone a Catheter Ablation may be considered medically fit 3 months following the ablation pending a favourable cardiologist report.

Left Bundle Branch Block

Applicant with a Left Bundle Branch Block may be considered medically fit following submission of a satisfactory Cardiologist evaluation, which shall include an exercise or equivalent test. The tests shall be determined by treating specialist and a Medical Assessor on a case-by-case basis. Applicant who do not meet the exercise test requirement may be declared medically fit with the OPL limitation to operate only without passenger or in a multi crew environment.

Pre-Excitation

Applicant may be considered medically fit subject to a satisfactory cardiological evaluation, unless if the Pre-excitation associated with an arrhythmia.

Applicant with any of the following conditions shall be assessed as medically unfit or have his or her privileges limited to operations without carrying passengers or operating in a multi crew environment –

I. a left ventricular ejection fraction known to be less than 40%;
II. applicant Blood Pressure (with or without treatment) at examination consistently exceeding 160 mmHg systolic and/or 95 mmHg diastolic;
III. an unsatisfactory exercise test;
IV. an aortic aneurysm in the range of 5,5 cm to 6,5 cm';
V. pre-excitation associated with a significant arrhythmia;

VI. aneurysms greater than 6,5 cm; and

VII. symptomatic Hypertrophic Cardiomyopathy.

Respiratory System (Check the other requirements)

Chest radiography requirements

Chest Radiography, anterior, posterior and lateral view, shall form part of the respiratory system assessment for the initial issue of a Class 4 medical certificate. Periodic chest radiography is usually not necessary, but may be a necessity in situations where asymptomatic pulmonary disease can be expected.A licence holder who has a clinical indication for chest radiography may be required to undergo chest radiography at more frequent intervals.

Flow-Volume Lung Function

Flow-volume lung function testing shall form part of the respiratory assessment for the initial issue of a Class 4 medical certificate under the age of 40 years. The flow-volume lung function testing shall be done again at the first medical examination after the age 40, and again at the first medical examination after the age of 50. For an applicant who is an active smoker, the requirement for flow-volume lung function testing shall be not less than every 24 months (biannually) for licence holders under the age of 40 and not more than every 12 months (annually) after the age of 40. A licence holder who has a clinical indication for lung function testing may be required to submit a lung function tests at more frequent intervals.

Class IV medical certificates

Chest radiography, anterior-posterior, and lateral views, must form part of the respiratory system assessment for the initial issue of a Class 4 medical certificate. Periodic chest radiography is usually not necessary but may be a necessity in situations where asymptomatic pulmonary disease can be expected. It is, however, understood that a degree of interpretation and flexibility must always be exercised at the discretion of the medical examiner and the medical assessor, taking into consideration not only medical but also operational and environmental factors of relevance for the overall aviation medical fitness of an applicant.

All licence holders who have a clinical indication for chest radiography may be required to submit chest radiography at more frequent intervals. Licence holders may be referred to the relevant protocols.

Asthma

1)An applicant with a history of pre-existent asthma may be declared medically fit if he or she complies with the following –

I. submit a Lung Function Test which demonstrates FEV1 / FVC Ratio >= 70% of predicted value;
II. applicant does not present with bronchospasm on clinical examination or associated with mild respiratory infection;
III. applicant has not in the 3 months preceding the examination required treatment with an oral corticosteroid or a short acting beta-2-agonist;
IV. applicant has not visited an emergency room or healthcare centre for symptoms of asthma in the preceding 3 months;
V. treatment is limited to medication compatible with flight safety; and
VI. the applicant has submitted a favourable DAME or Specialist Physician report.

An applicant may be declared temporarily medically unfit in the following cases –

I. the FEV1 / FVC Ratio <=70% of predicted value, and there is a determined cause;
II. the applicant currently has lung infection;
III. applicant presenting with acute bronchospasm shall be declared temporarily medically unfit until appropriate management is instituted and, on review, licence holder demonstrates acceptable lung function test (FEV1 / FVC ratio >= 70% of predicted value) and absence of bronchospasm (wheezing) on clinical examination;
IV. this means reversibility on a pre and post lung function test shall be less than 12% and/or 200ml;
V. any form of asthma attack requiring emergency room treatment in the past 2 years, shall be declared temporarily unfit pending pulmonologist's report; and
VI. use of short-acting beta-2-bronchodilators, subject to pulmonologist's report.

Exercise-Induced Asthma

Applicant presenting with a diagnosis of exercise-Induced Asthma shall be declared temporary medically unfit until appropriate management is instituted. Applicant shall be required to submit a provocation test such as a Stress Lung Function Test, and he or she shall be required to demonstrates acceptable lung function test (FEV1/ FVC ratio >= 70%) and there is absence of bronchospasm (wheezing) on clinical examination.

Applicant to provide a Pulmonologist /Physicians report.

Chronic Obstructive Airway Disease

Applicant with COAD is assessed according to the minimum lung function standards.

Applicant presented with irreversible airways obstruction outside the minimum standard shall be referred to a pulmonologist for assessment of –

I. vital capacity reduction;
II. increased residual volume;
III. presence of bullae;
IV. diffusion capacity;
V. oxygen saturation and carbon dioxide retention.

Applicant shall be required to submit a CXRs Biennially or as frequent as stated in the pulmonologist's report if the applicant continues smoking. Applicant presenting with acute symptoms or requiring continuous medication to relieve symptoms shall be deemed medically unfit. Applicant declared medically unfit may apply to the Medical Assessor for a special waiver.

Applicant with inter-current infections shall be deemed temporarily medically unfit until the appropriate treatment is instituted. Applicant presenting with mild disease may be declared medically fit if –

I. the lung impairment is mild;
II. the applicant is asymptomatic;
III. the applicant does not require treatment; and
IV. the Chest- X-ray has no evidence of bullae.
V. Pulmonary Tuberculosis

An initial applicant with active tuberculosis or undergoing treatment shall be declared as temporarily medically unfit for a minimum period of 3 months from the date of confirmation of disease and initiation of treatment.

The applicant may be declared medically fit following completion of treatment and if the following reports are favourable –

I. a lung function tests is normal;
II. the chest radiograph shows no significant lung damage;
III. a recognised course of medication has been completed; and
IV. a favourable physician report;

V. the applicant does not have open cavitatory TB and the sputum is negative for TB;
VI. the applicant is on appropriate medication and demonstrates no drug resistance;
VII. the medication provokes no undesirable side effects that may impair flight safety;
VIII. the pulmonologist's report is favourable; and
IX. the underlying medical conditions are evaluated and appropriately managed.

Applicant with recurrent or re-activation tuberculosis, post TB bronchiectasis with recurrent chest infections or large cavities and MDR and XDR TB shall be declared medically unfit pending a pulmonologist's report.
Special waiver may be granted on a case-to-case basis by the Medical Assessor.
For recertification of an applicant, a pulmonologist's report shall be required.

Pulmonary Sarcoidosis

Applicant with a diagnosis of active Sarcoidosis symptomatology shall be declared as medically unfit. Applicant with a history of multisystem Sarcoidosis shall be declared as medically unfit.

Applicant with a history of Sarcoidosis confined to hilar lymphadenopathy may be declared as medically fit provided that –

I. a full clinical evaluation is normal; tests shall include a chest x-ray, resting and exercise ECG, 24-hour ambulatory ECG monitoring and, if needed, myocardial scintigraphy or perfusion scanning;
II. a normal pulmonary function tests are demonstrated;
III. the applicant has no evidence of other organ or parenchymal involvement;
IV. the applicant is not on treatment;
V. OPL limitation for 6 months; and
VI. applicant submit a favourable specialist physicians report.

These investigations shall be repeated annually, and provided regression has occurred a fit assessment without limitation may be permitted after 2 years' observation. Blood tests (ESR- erythrocyte sedimentation rate, Angiotensin Converting Enzyme, Ca2+, uric acid) and any necessary examinations shall be at the discretion of the treating Physician. Applicant who has recovered from Multisystem Sarcoidosis with no detectable cardiac involvement may be considered by the Medical Assessor.

I. Applicant with known Cardiac Sarcoidosis shall be declared as medically unfit.
II. Applicant with evidence of Neuro Sarcoidosis shall be declared as medically unfit.

Pneumothorax

Traumatic Pneumothorax

Applicant with a history of Traumatic Pneumothorax may be declared as medically fit if he or she meets the following requirements:

I. six weeks shall have elapsed since full recovery;
II. full respiratory examination shall be normal;
III. acceptable lung function tests shall be demonstrated, i.e. FEV1/ FVC ratio >=70%; and
IV. chest radiograph changes shall have resolved.
V. Initial and experienced applicant with a history of recurrent episode(s) of traumatic or spontaneous pneumothorax which is complicated shall be assessed as medically unfit unless the applicant has undergone a bilateral pleurodesis, depending on the procedure.

Applicant may apply to the Medical Assessor for a waiver consideration and the following reports shall be required,

I. Pulmonologist's;
II. Cardiothoracic surgeon; and
III. Other supporting investigation reports.
IV. Spontaneous Pneumothorax

Initial applicant with a history of a single episode may be assessed as fit, provided that they submit the following:

I. a period of 6 months has elapsed since full recovery after the episode and the applicant shall have had bilateral pleurodesis, the applicant may be declared medically fit 12 weeks after the surgery subject to the thoracic surgeon's report;
II. a full respiratory examination and tests are normal;
III. there shall be no bullae shown on the CXR, CT scan or any other image; and
IV. applicant presenting with any bullae present shall have been treated by surgery and a no-smoking status has been confirmed.

Applicant presenting with second episode of the spontaneous pneumothorax, may be medically declared unfit.

A fit assessment at renewal may only be considered by the Medical Assessor following submission of a satisfactory surgical treatment and full convalescence, usually three months.

I. Applicant shall be restricted to OPL for one year from the original occurrence.
II. Applicant may be declared as medically fit for certification provided that:
III. a full re-expansion of the lung has taken place;
IV. a full respiratory evaluation is normal; and
V. there shall be no bullae shown on the CXR, CT scan or any other image.

Acute Lower Respiratory Disease

Any acute active infectious disease of the respiratory system of any nature shall result in temporary unfitness until –

I. the condition has fully resolved without sequelae;
II. there is no further medication is required;
III. the lung function tests are within normal range;
IV. the chest radiograph changes have resolved; and
V. the treating physician's report is favourable.

Pulmonary Embolism

Applicant presenting with a confirmed diagnosis of Pulmonary embolism may be declared as medically fit if he or she demonstrates, upon recovery with the following –

I. the lung function tests and diffusion test is normal;
II. the blood gases are acceptable after 10 minutes of exercise;
III. submission of favourable Pulmonary Angiogram/Pulmonary CT Angioqram/Pulmonary VQ Scan report;
IV. coagulation studies are acceptable;
V. a satisfactory Physician report.

The applicant to be referred to the Medical Assessor for consideration on a case-by-case basis.

Post-Operative effects of Thoracic Surgery

Applicant who has had thoracic surgery shall be declared as temporarily medically unfit for a period of 6 months.

Unrestricted certification shall be considered where –

I. there is full recovery from the underlying condition(s) and supporting reports are submitted;
II. the surgery has no sequelae;
III. a full respiratory examination and chest radiological imaging are acceptable and minimum lung function standards are met; and
IV. the specialists' reports (pulmonologist and cardiothoracic surgeon) are favourable.

Visual System

An applicant may not have any condition or congenital abnormality of either eye or its attachments likely to impede the safe exercise of the privileges of the licence. An applicant's visual acuity and visual fields shall be examined.

Acuity

An applicant's visual acuity with or without corrective lenses shall be 6/12 binocularly and 6/18 in each eye.

Amblyopia or Monocularity

An applicant with Amblyopia or Monocular may be declared as medically fit, if the visual acuity in the unaffected eye with or without correction is 6/6 or better.

Visual Field Defects

Applicant shall have a normal binocular visual field or a normal monocular visual field.

ENT System

Applicant shall have no established medical history or clinical diagnosis of the following –

I. any pathological process, acute or chronic, of the inner ear middle ear cavities or external ear canal;
II. any unhealed (unclosed) perforation of the tympanic membranes, except that an applicant with a single dry perforation may be eligible for a certificate if the defect does not prevent compliance with the hearing standards;
III. any chronic or serious recurrent obstruction of the Eustachian tubes;
IV. any serious or recurrent disturbance of the vestibular system;
V. any obstruction to free nasal air entry on both sides;

VI. any serious malformation, or serious acute or chronic condition of the buccal cavity or upper respiratory tract; or any speech defect likely to interfere with the safe performance of duties in exercising the privileges of the licence;

VII. profound deafness may be considered medically fit if there is proven ability to communicate in the event of an emergency by speech or by using a device;

VIII. applicant unable to communicate with assisted devices shall be considered medically unfit;

IX. the applicant shall be able to hear a whispered voice in a quiet room; and

X. applicant to be referred to the Medical Assessor for consideration on a case-by-case basis.

Genitourinary System

Applicants with renal or genitourinary disease shall be assessed as medically unfit, unless an adequate examination shows that their condition is unlikely to interfere with the safe exercise of their licence and rating privileges. Urine examination shall form part of the medical examination and abnormalities shall be adequately investigated.

Applicant with sequelae of disease of, or surgical procedures on the kidneys or the genitourinary tract, in particular obstructions due to stricture or compression, shall be assessed as medically unfit unless the applicant's condition has been investigated and evaluated. Applicant who has undergone nephrectomy shall be declared as medically unfit unless the condition is well compensated. Applicant to be referred to the Medical Assessor for consideration on a case-by-case basis.

Nephrectomy

Applicant who has undergone a nephrectomy shall be assessed as medically unfit for a minimum period of 3 months or until such time as they are free from any abnormality, disability and/or sequelae from the operation that is likely to interfere with the safe operation of an aircraft or with the safe performance of duties.

Requirements for medical certification –

I. upon recertification the condition shall be well compensated;

II. the treating specialist's report detailing the underlying cause of the removal of the kidney; and

III. any other examinations deemed necessary by treating specialist shall be submitted.

3) Renal function testing includes the following –

I. Urea and electrolytes (U&E, Uric Acid);
II. Glomerular filtration rate (GFR); and
III. 24-hour urine creatinine clearance;
IV. the remaining kidney's function and anatomy shall be normal.

Urinary Calculi

Single renal stone (passed or removed)

A medically fit assessment may be made with successful passage or removal of the stone.

I. Urologist report.
II. Follow-up: annual urine dipstix.
III. Modifiable risk factors are controlled.

Recurrent renal stones (passed or removed)

May be recertified if –

I. an applicant is proven to be free of all stones in kidney or renal tract;
II. the renal function is normal;
III. modifiable risk factors are controlled; and
IV. Urologist report.
V. Follow-up: annual urine dipstix and urate level.

Retained renal stones (asymptomatic)

Assessment shall be done on a case-by-case basis. An applicant shall be declared medically unfit while suffering from any acute symptoms or complications.

An applicant may be assessed as medically fit if –

I. stones are located such that they are unlikely to pass into the calyx;
II. urinary studies do not reveal any underlying risk factors for recurrent stone formation;
III. annual urine dipstix and urate levels are normal;
IV. modifiable risk factors are controlled; and
V. favourable Urologist report.

HIV/AIDS Protocol for Cabin Crew and Recreational pilot

Applicability

This protocol shall be applicable to the cabin crew and recreational pilot.

General and medical requirements

1) All cases shall be assessed on a case-by-case basis, taking into consideration a favourable clinical and serological response.

2) Subsequent to an initial diagnosis of HIV seropositivity, an applicant shall be declared temporarily medically unfit.

3) An applicant shall submit the following reports, which are not older than three months, for recertification:

I. HIV specialist or a physician review with the following:
II. History of infection;
III. Current and previous symptoms;
IV. Full neurological examination to assess sequelae, including primitive reflexes;
V. Stability of condition;
VI. History of opportunistic infections or associated illnesses;
VII. History of CD4+ T cell counts;
VIII. History of viral load measurements;
IX. Medication history, including “over-the-counter” medications and alternative medication; and
X. A report concerning side effects of medications.
XI. The laboratory testing reports shall include the following:
XII. Hepatitis B and C, syphilis and tuberculosis screening;
XIII. Full blood count (minimum Hb of 12g/dL), urea, creatinine and electrolytes, liver function tests (LFTs);
XIV. Fasting glucose and lipogram, which may be required on clinical indication; and
XV. Cytomegalovirus and toxoplasma, which may be required when clinically indicated.
XVI. A clinical psychologist report with baseline cognitive assessment, including the following tests:
XVII. Timed psychomotor tasks and memory tasks requiring attention, learning, active monitoring and retrieval of information.
XVIII. Other specialist reports as may be required on clinical indication.

Medication

1)An applicant shall use acceptable medication referred to on SA-CATS 67.00.9

2)If an applicant is using medication which is not on the acceptable list, he or she may apply for a waiver.

3)An application for a waiver referred to in paragraph 1) shall be accompanied by a treating physician's report stating the duration of treatment, and the side effects and profile specific to an applicant.

Requirements for regular follow-ups

1)Regular follow-ups shall include:

I. CD4 count and viral load measurements which shall be required initially at three months, six months and then annually;
II. FBC (with minimum Hb of 12g/dL), Urea, Creatinine and Electrolytes, LFTs at three months and six-monthly thereafter, with submission of reports; and
III. Fasting glucose and fasting lipogram may be required when clinically indicated.

2)A medical assessor may request that medical examinations or tests be performed at shorter intervals or require additional examinations or tests to be performed when clinically indicated.

Medically unfit applicant

An applicant presenting with the following complications or side effects, shall be declared medically unfit:

I. presence of acute or serious opportunistic infection;
II. the use of any substance or medication that is not compatible with flying;
III. safety threatening side effects of any medication;
IV. evidence of resistance to antiretroviral treatment;
V. co-existing disqualifying medical conditions or disease; and
VI. any other medical condition which may be deemed unsafe for practice of aviation duties

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6.17 Pharmacology-Acceptable Medication

General

This subsection outlines the general principles for the use of medications in flying.

Any intake of medicine or narcotic substance must be declared in the formal declaration signed by aviation personnel and handed to physicians in charge of the evaluation of flying fitness at each medical examination. In principle, pilots taking medication either prescribed or obtained 'over the counter' have to be regarded as unfit unless a DAME/IAM/SACAA have been contacted and endorsed resumption of flying duties.

The use of herbal medication and alternative treatment modalities requires particular attention to possible side effects and should also be reported to the DAME/IAM and the SACAA. The decision as to whether an aviation personnel member is medically fit for the privileges of the licence they apply for whilst taking medication has always to be taken in conjunction with knowledge of the applicant's clinical situation and the dosage and side effects associated with the medication.

The consumption of such substances may have consequences on qualification for three reasons:
The disease requiring treatment may be cause for disqualification;
Flight conditions may modify the reactions of the body to a treatment (e.g. jet lag, dehydration, moderate hypoxia): and Most importantly, medication may cause adverse side effects that impair flight safety. It should be noted that the effects of medication do not necessarily immediately appear when treatment is started or disappear when the treatment is stopped, and that the subject may be temporarily disqualified during the withdrawal period.

Flying personnel should nevertheless not be deprived of an efficient treatment because of their professional occupation. What is important is to find a compromise between flying fitness requirements, medical treatment and illness that is the most suitable, both for the patient and flying safety. Flying personnel must be declared fit by their DAME according to the circumstances and not by their medical practitioner. One of the goals of the DAME must be to make flying personnel aware of the problems caused by treatment so that they refrain from taking unreported medication whose side effects may not have been assessed.

It is possible that new therapeutic agents will become available that offer significant treatment advantages. If such agents are considered by the SACAA to be appropriate for use by aircrew, with due consideration given to aero medical and safety aspects, their use may be approved. However, as a general rule, medication shall only be endorsed by the DAME if the applicant has taken the respective medication whilst not on flying duty for an appropriate period of time (temporary disqualification) with proven efficacy and without any side effects that could interfere with flying duties.

Guidelines

The medical condition is the primary concern, and a clinical assessment of being unfit to exercise aviation-related tasks will determine the period of unfitness.

The class of medical fitness determines which medical conditions will be allowable for the exercise of the aviation licence, or how it may be waivered. Knowledge of existing criteria and protocols as produced by SACAA is mandatory for proper interpretation of aviation medical fitness.

All drugs not published in the SA-CATS 67 need to be verified by SACAA before prescribing.

Central acting drugs generally are unacceptable and unsafe as medication for aviation personnel.

I. The side effect profile needs careful attention to determine acceptability.
II. The applicant's co-morbidities may cause medical unfitness.
III. The applicant's possible adverse reactions to the medication must be monitored before a decision regarding fitness may be made.
IV. The period of being unfit after the use of unacceptable medications largely depends on the manner and time of elimination of the drug.

Table 6: List of medication

CENTRAL NERVOUS SYSTEM STIMULANTS			
Name	Acceptable	Unacceptable	Comments
Benzodiazepines	Tamazepam		No flying within 72 hours; this drug is addictive and should not be used with alcohol at the same time.
Other	Zopiclone Zolpidem Zaleplon		Applicants must wait 24-48 hours before flying after these medications have been taken. These drugs must not be used more than twice a week to avoid habituation.
Food supplement	Melatonin (not generally recommended for flight crew and cabin crew)		If considered, it should be given a 'ground trial' during a period when the crew member will not be

			engaged in flying duties and any unwanted side effects can be assessed.
SSIR	Fluoxetine Sertraline Citalopram Escitalopram Paroxetine		Selected non-sedating selective serotonin re-uptake inhibitors (SSIR) require a minimum of three (3) months grounding period. The SACAA will evaluate affected applicants on a case-by-case basis and will issue medical certificates based on medical findings. Refer to the protocol.
Barbiturates		These agents are unacceptable	
Anxiolytics		These agents are unacceptable	
Anti-psychotics		These agents are unacceptable	
Anti-epileptics		These agents are unacceptable to Pilots and ATC, including Gabapentin which is used for conditions other than epilepsy	These medications may be considered for cabin crew, on a case-by-case presentation. A three-month stabilisation period is required. Refer to the protocol.
Anti-Parkinson agents		These agents are unacceptable	

Anti-vertigo and anti-emetics		These agents are unacceptable	
Anti-migraine agents	Triptans	Triptans Maxalt	The underlying condition is disqualifying. The Authority will evaluate affected applicants on a case-by-case basis and will issue medical certificates based on the medical findings. Applicants allowed on these medications may not fly for 24 hours after being treated with these medications. Beta-blockers may be considered acceptable for prophylaxis. Refer to the protocol.
Agents for Alzheimer's disease		These agents are unacceptable	
Anaesthetics	Acceptable		A minimum of 24 hours following local or regional (including dental) anaesthetics. (The condition for which the anaesthetic has been administered must also be considered prior to returning an individual to flying or controlling

			duties). A minimum of 72 hours following general, spinal or epidural anaesthetic. This proscription includes drug-induced sedation. (The condition for which the anaesthetic has been administered must also be considered prior to returning an individual to flying or controlling duties).
ANALGESICS AND ANTI-INFLAMMATORIES			
Central nervous system agents	Acceptable	Unacceptable Morphine Codeine Codethyline Cocaine Cannabis	Central acting analgesics and narcotics morphine opioid/analgesics are strictly incompatible with flying status.
		Doxylamine Promethazine Meprobamate Orphenadrine Propoxyphene Diphenhidramine Tramadol	
NSAIDS Peripheral analgesics	Acetyl Salicylic Acid		
Non-Selective Cox-Inhibitors	Acceptable	Unacceptable	

Acetaminophen	Paracetamol	Sulindac Phenlybutazone	These substances, prescribed for short periods at moderate doses may be compatible with flying status if the condition which justifies their prescription is itself compatible with flying status.
Salicylates	Acetyl Salicylic Acid		
Propionic acid derivatives	Ibuprofen Naproxen Fenoprofen Ketoprofen Flurbiprofen Indomethacin		
Acetic acid derivatives	Ketorolac Diclofenac		
Enolic acid (Oxicam)	Diclofenac Nabumetone Piroxicam Meloxicam Tenoxicam Lornoxicam		
Fenamic acid derivatives	Mefenamic Acid Meclofenamic Acid Flufenamic Acid Tolfenamic Acid		
COX Inhibitors	Meloxicam		
SelectiveCOX2 inhibitors	Celecoxib Etoricoxib Parecoxib		
MUSCULOSKELETAL AGENTS			

Anti-Gout	Allopurinol	Colchicine	This medication may be acceptable, each application will be considered on a case-by-case basis Flying prohibited while on colchicine. Stable GIT must be demonstrated after discontinuation of colchicine.
Topical agents	These agents are acceptable		
Gold		These agents are unacceptable	
Osteoporosis	Biphosphonates Alendronate Risedronate Calcium and Vit D supplements Other drugs: Selective oestrogen receptor Modulators –Raloxifene Parathyroid hormone Teriparatide		Reserved on a case-by-by case basis

Autonomic		Sympathomimetic Sympatholytics Cholinergic Anti-cholinergics	All centrally acting agents are unacceptable.
AUTOCOIDS			

Antihistamines	Ebastine Loratadine Desloratadine Acrivastine Fexofenadine		Sedating oral antihistamines are not authorised for flying personnel and incompatible with flying status. New generation, non-sedating oral (e.g. fexofenadine) and topical antihistamines may be acceptable.
Serotonin antagonists		All agents in this group are unacceptable Methysergide Cyproheptadine Pizotifen Ondansetron Grinesatron	
Neurokinin1 (NK1) Antagonists		All agents in this group are unacceptable Aprepitant Casopitant	Novel class of medications that possesses unique antidepressant, anxiolytic, and antiemetic properties.
CARDIOVASCULAR AGENTS			
Positive Inotropic Agents		All agents in this group are unacceptable	
Anti-Arrhythmic			Case-by case presentation, individual medical may be considered.
Anticoagulants	Rivaroxabin Dabigatran		The underlying condition should be assessed on a case-by-case basis.
ANTI-HYPERTENSIVE			
Central acting sympathetic nervous		All agents in this group are unacceptable	

system inhibitors			
Alpha-receptor blockers	Tamsulosin – e.g. Tamsul	All agents in this group are unacceptable	All L.U.T.S cases – cases presentation, individual medication will be considered. Applicants on Tamsulosin should be monitored for postural hypotension with every medical as per underlying condition protocol requirements.
Beta-receptor blockers	Atenolol Metoprolol Bisoprolol	Non-selective drugs are unacceptable	Cardio-selective beta blockers are acceptable, but no longer first line or choice.
Sympathetic nervous blockers		These drugs are unacceptable as they may impair alertness	
Direct-acting vasodilators		Dihydralazine Prazozine Uradipil	These drugs are unacceptable because they frequently have adverse side effects such as orthostatic hypotension.
Calcium channel blockers	Diltiazem Verapamil Nicardipine Nitrendipine Long-acting Nifedipine	Short acting Nifedipines are unacceptable	These medications may be compatible with flying status. They may induce peripheral oedema or headache, but they are generally well tolerated. Preference shall be given to medications with the most flexible use. If used for angina these

			medications are not compatible with flying status.
ACE inhibitors	Captopril Enalapril Lisinopril Benazepril Fosinopril Perindopril Quinapril Ramipril		
Angiotensin Receptor Antagonists	Candesartan Eprosartan Irbesartan Losartan Telmisartan Valsartan		
Anti-Angina Agent			Angina pectoris per se is disqualifying.
Diuretics	Hydrochlorothiazide (< 25 mg/day) Potassium/ magnesium sparing diuretics such as amiloride and spironolactone	Furosemide Bumetanide Torasemide Acetazolamide Eplerenone	Low dose diuretics are acceptable. High dose kaliuretic diuretics (> 25 mg hydrochlorothiazide or equivalent) are unacceptable.
Other vasodilators			The indications for use are disqualifying.
Vasoconstrictors			The indications for use are disqualifying.
HYPOLIPIDAEMIC AGENTS Dyslipidaemia in flying personnel should be treated in conjunction with an appropriate diet and weight			

reduction if appropriate.			
Fibrates			Treatment with fibric acids (e.g. fenofibrate or gemfibrozil) should be discontinued in the case of gastrointestinal side effects or elevated transaminase concentration.
Statins	Cholestyramine] All except exclusions	Fluvastatin Lovastatin Combined formulas e.g. Ezetimibe & Statins	HMG-CoA reductase inhibitors are acceptable with preference for hydrophilic molecules such as pravastatin rather than lipophilic substances such as simvastatin, which may induce sleep disorders.
Others	Acipimox (niacin derivative) used in low doses and accepted on a case-by-case basis		
Plasma Expanders		All agents in this group are unacceptable	
Blood and Haemopoeitic	Anticoagulants-Warfarin – refer to the protocol – acceptable	Haemostatics, the indications for use are disqualifying	

Platelet aggregation Haematological agents Platelet aggregation inhibitors, Injectables	Disprin/Aspirin in low-dose (≤100mg/day) acceptable	All agents in this group are unacceptable	
Sclerosing		All agents in this group are unacceptable	
Haematinics	Prophylactics in pregnancy are acceptable		Anaemia has to be corrected before consideration.
Haemoglobin-based Oxygen carrier		This medication is not considered	
RESPIRATORY SYSTEM			
Coughs and Cold	Drugs containing only carbocysteine, guaifenesin or acetylcysteine without an alcohol base are accepted	Tripolidine Pseudoephedrine Ephedrine Codeine & modifieds Theophylline Dextromethorphan Diphenhydramine Promethazine Noscapine Phenyltoloxamine Methadone	
Bronchodilators	Spiriva		Sympathomimetics: The use of Short-acting Beta Agonists (SABA)/Long-acting Beta Agonists (LABA) should be restricted to eight (8) hours or more prior to flying, but may

			be used in an unusual asthmatic attack in flight to allow the safe completion of the flight.
Methylxanthines and combinations		All agents in this group are unacceptable	
Anticholinergics		All agents in this group are unacceptable	
Combinations	Only acceptable combinations are: Salmeterol Fluticasone Budesonide Formoterol.		
Mucolytics	Carbocysteine Acetylcysteine Bromhexidine		
Anti-Asthmatics	Inhaled Glucocorticoids Leucotrine receptor Antagonists		
Chromones	Cromolyn Sodium Nedocromil Sodium		The drugs are also called cromoglycates. They are alternative choices when initiating regular controller therapy in patients with mild asthma, although inhaled corticosteroids (ICS) are the preferred agents. They have the advantage of having a lower side effect profile than ICS.

Other Anti-asthmatics		All agents in this group are unacceptable	
Surfactants		This medication is not compatible with flying	
EAR, NOSE AND THROAT			
Topical nasal preparations	These medications are acceptable		
Ear drops and ointments	These medications are acceptable		
Mouth and throat preparations	These medications are acceptable		
GASTRO-INTESTINAL TRACT			
Digestants	These medications are acceptable		
Appetite suppressants		All agents in this group are unacceptable	
Anti-Spasmodics	Mebeverine Alverine Peppermint Oil	Hyoscine Diphenhidramine Alcohol substrates Belladonna Chlordiazepoxide Propantheline Methixene	Antimuscarinics (e.g. dicyclomicine, mepenzolate, pipenzolate, poldine and propatheline) are used to reduce smooth muscle spasm in non-ulcerative dyspepsia, irritable bowel syndrome and diverticular disease. They all have atropine-like side-effects of confusion, dry mouth, reduced power of accommodation, difficulty with micturition and constipation, which preclude their use.
ACID REDUCERS			

Antacids		Magnesium as a single drug is unacceptable	
Antacids and combinations		Dicyclomine Magnesium dominant drugs Oxethazaine	
Bronchodilators	Spiriva		Sympathomimetic: The use of Short-acting Beta Agonists (SABA)/Long-acting Beta Agonists (LABA) should be restricted to eight (8) hours or more prior to flying, but may be used in an unusual asthmatic attack in flight to allow the safe completion of the flight.
H2 receptor antagonists	Cimetidine allowable if taken more than 8 hours before aviation activity Ranitidine allowable if taken more than 12 hours before aviation activity		
Proton pump inhibitors	Omeprazole		
Cycloprotective		Misoprostol	
Motility Enhancers		All agents in this group are unacceptable	
Laxatives		Magnesium salts	
Antidiarrhoeals	Loperamide not to be	Codeine phosphate	

	taken less than 6 hours before aviation activity	[Cophenotrope] Co phenotrope Morphine Atropine (Lomotil) Aminopentamide	
Liver, gall bladder and bile		These agents are unacceptable due to disease profile	Treatment for the dissolution of gallstones is not compatible with flying status as it may cause diarrhoea and cholecystitis.
Suppositories and anal ointments	These agents are acceptable		Soothing preparations containing bismuth subgallate, zinc oxide and haemamelis, often mixed with a small dose of corticosteroid, may be acceptable in short courses for topical application.
Others	Sulfasalazine enteric coated may be used with 6 monthly ophthalmology reporting, FBC, UKE, and urinalysis	Sibutramine Budesonide Infliximab Orlistat	
Anti-inflammatory agents for Bowel Disease	Mesalazine Asacol: (5-aminosalicylic acid)	Humira Salofalk	Case-by-case presentation, individual medication may be considered. Sulfasalazine enteric coated may be used with 6-monthly ophthalmology reporting, FBC, UKE, and urinalysis. The use of sulfasalazine in

			inflammatory bowel disease has declined due mainly to the fact that it yields the metabolite sulfapyridine which gives rise to side-effects such as agranulocytosis and hypospermia. However, the other metabolite of sulfasalazine, 5-aminosalicylic acid (5-ASA) is credited with causing the drug's therapeutic effect. Therefore, 5-ASA and other derivatives of 5-ASA, are now usually preferred and given alone (as mesalazine), despite their increased cost, due to their more favourable side-effect profile. Sulfasalazine, and its metabolite 5-ASA, are poorly absorbed from the small intestine. Its main mode of action is therefore believed to be inside the intestine. Approximately one third of a dose of sulfasalazine is absorbed from the small intestine. The remaining two thirds pass into the colon where it is split by bacteria

			into 5-ASA and SP. SP is well absorbed from the colon (estimated bioavailability 60%); 5-ASA is less well absorbed (estimated bioavailability 10% to 30%).
ANTHELMINTICS			
Anthelmintics	Mebendazole Albendazole Praziquantel	Piperazine	
Dermatological			
Anti-bacterial antiseptic agents	These medications are acceptable		
Anti-parasitics	These medications are acceptable		
Fungicides	These medications are acceptable		
Cortico-steroids	These medications are acceptable		
Psoriasis		Systemic Etretinate Acitretin	Systemic etretinate for psoriasis may cause serious drying of the skin and mucosa and particularly of the conjunctival tissues, intensified by flying conditions. It is not recommended for aircrew.
Acne		Tretinoin Isotretinoin Cyproterone acetate	

		Minocycline	
Melanin inhibitors and stimulants		These medications are unacceptable	
Emollients and Protectives	These medications are acceptable		
Others		Imiquimod Minoxidil	
OPTHALMICS Aviation activities only to commence once all visual normality is regained			
Anti-infective and antiviral	Chloramphenicol Ciprofloxacin Olfloxacin Oxytetracycline Fusidic Acid Moxyfloxacin Acyclovir		Anti-infective and anti-inflammatory eye preparations are usually not compatible with flying status due to the underlying condition. The SACAA should be consulted if there is any doubt.
Corticoids	These medications are acceptable		
Combinations		All treatment containing Aminoglycosides are unacceptable	
Decongestants		These medications are unacceptable	
Mydriatics		These agents are unacceptable	
Others		Injectables Verteporfin	
Urinary System			
Anti-diuretics		This medication is not compatible with flying	

Urinary alkalinizes		The chronic use of this medication is not compatible with flying	
Urinary antiseptics		Pipemidic Acid Nalidixic Acid Tamsulosin Lanthanum Flavoxate	
Others	Tamsulosin	Lanthanum Flavoxate	
GENITAL SYSTEM			
Contraceptives	These medications are acceptable		
Vaginal Preparations	These medications are acceptable		
Oxytocics		These agents are unacceptable	
Uterine Antispasmodics		These agents are unacceptable	
Sexual dysfunction			Temporary colour vision disturbance have been reported after the use of phosphodiesterase-type-5 inhibitors (e.g. vardenafil, sildenafil). 72 hours should elapse after use prior to flying.

ANTI-VIRAL AGENTS			
Anti-Viral Agents	Acyclovir		Anti-Retroviral – case-by

			-case management, refer to protocol

ANTI-MICROBIALS			
Anti-Microbials	Beta-lactams Erythromycin (short course) Azithromycin (short course) Other Macrolides Chloramphenicols Sulphonamides and combinations Quinolones Clindamycin (short course) Na-Fusidate Fosfomycin Doxycyclin	Telithromycin Roxithromycin Aminoglycosides Tetracycline	All antibiotics should be used for 48 hours without any side effects before commencing aviation activities. Injectables are not acceptable.
ANTI-FUNGAL AGENTS			
Anti-Fungal Agents	Fluconazole Itraconazole Nystatin Terbinafine Griseofulvin Ketoconazole		
ANTI-PROTOZOA AGENTS			
Anti-Protozoa Agents	Metronidazole Atovaquone Chloroquine	Pirimethamine Tinidazole Halofantrine Mefloquine	

Anti-retroviral agents					
Nucleoside Reverse Transcriptase Inhibitors (NRTIs)	Zizovudine Retrovir Lamivudine Didanosine Abacavir Emtricitabine Tenofovir		Efavirenz		Initially monthly FBC for 6 months
Non-Nucleoside Reverse Transcriptase Inhibitors	Nevirapine				Initially ALT & AST – 2 weeks, 6 weeks
Proteases Inhibitors (PI)	Atazanavir Lopinavir/Ritonavir Saquinavir Nelfinavir		Indinavir		
Others	Raltegravir Darunavir Etravirine Maraviroc Amprenvir		Tipranavir		
	Fosamprenavir				
Fusion Inhibitors	Fuzeon				
ENDOCRINE SYSTEM					
Anti-Diabetic agents	Oral Metformin Thiazolidenediones Pioglita Rosiglitazone Acarbose	Insulin Glargine Detemir Glulisine Lispro	Oral Glipizide Tolbutamide Gliclazide Glibenclamide Glimepiride Chlorpropamide	Insulin Neutral protamine Hagedorn Premix analogues (biphasic)	Refer to Diabetic Protocol.

			Repaglinide Nateglinide		
Thyroid	Thyroxine		Neo-Mercazole		Refer to Protocol.
Parathyroid	Corticosteroids, only low dose Prednisone is acceptable		Calcitonin		Refer to Protocol.
HORMONES					
Androgens and Anabolic steroids	Testosterone Mesterolone Oestrogens Progestogens Tibolone		Metenolone Nandrolone		
Tropic Hormones	Clomiphene		Injectables and implants		
Hormone Inhibitors	Tamoxifen Anastrazole				Case-by-case basis and 3-months stabilisation period required.
VITAMINS, TONICS, MINERALS AND ELECTROLYTES					
Vitamins	These agents are acceptable				In general, pilots, cabin crew, and ATCs should not exceed the Recommended Daily Allowances for these products.
Tonics			Alcohol based combinations unacceptable		
Minerals and electrolytes	These agents are acceptable				In general, pilots, cabin crew, and ATCs should not exceed the

			Recommended Daily Allowances for these products.
Amino-Acids	These agents are acceptable		In general, pilots, cabin crew, and ATCs should not exceed the Recommended Daily Allowances for these products.

CYTOSTATICS			
Immunological Immunosuppressants Immunostimulants			
CHELATING AGENTS, ION EXCHANGE PREPARATIONS			
Chelating agents, Ion exchange preparations		These agents are unacceptable	
BIOLOGICAL			
Biological	Immunisation regimens are acceptable		No aviation-related duties for 24 hours after receiving the following vaccinations (primary and boosters): Adult diphtheria and tetanus Poliomyelitis Hepatitis A & B Measles, mumps, rubella Yellow fever Typhoid

			Tuberculosis (Mantoux Test or Bacille Calmette-Guerin) Influenza Varicella Meningococcal Pneumococcal Cholera. After receiving the following immunisations (primary and boosters) there should be no aviation-related duties for a minimum of 72 hours: Japanese Encephalitis.
Biologics		Revellex Humira	

ENZYMES			
Enzymes		These agents are unacceptable	
POISON ANTIDOTES			
Poison Antidotes		Bupropion is unacceptable	
Others			
Others	Nicotine adjuvants are acceptable	Bupropion is unacceptable	
Biological	Immunisation regimens are acceptable		No aviation-related duties

			for 24 hours after receiving the following vaccinations (primary and boosters): Adult diphtheria and tetanus Poliomyelitis Hepatitis A & B Measles, mumps, rubella Yellow fever Typhoid Tuberculosis (Mantoux Test or Bacille Calmette-Guerin) Influenza Varicella Meningococcal Pneumococcal Cholera. After receiving the following immunisations (primary and

			boosters) there should be no aviation-related duties for a minimum of 72 hours: Japanese Encephalitis.

The history section on the examination form has to be completed by the applicant in the presence of the medical examiner. Alternatively, the medical examiner has to verify the information with the applicant prior to performing the physical examination. The examiner must ask direct questions and must make use of this opportunity to provide advice to the applicant.

Remarks such as "previously documented" or "refer to previous records", will not be accepted. The document will be considered as incomplete. Incomplete forms will not be accepted and will be sent back to the medical examiner.

The information on the following two pages should be considered carefully when completing the history section:

Question	Description
1 – 17	Self-explanatory
15	Only class i.e. class 1 or 2 or 3 or 4 (do not specify ATP, Comm, etc.)
18	♦ Provide details of previous restrictions/protocols ♦ Include date of implementation
17	Hours must be provided by pilot
18	♦ This refers to the ultimate intention and not short-term goal ♦ State present licence type, i.e. ATP, Comm, etc.
19	Applicant must present previous medical certificate to DAME to confirm
17	All types of medication must be noted, whether it is prescription medication, OTC drugs, herbs, vitamins, etc.

22 (1-5)	When recording family history, details of the family member, age and details of disease should be supplied
22 (6-9)	These questions should be answered to determine latent medical problems that may have an effect on medical fitness
22 (10)	The following should be noted: ♦ Number and type of cigarettes smoked daily ♦ Number of years that has elapsed since applicant started smoking ♦ If the applicant has stopped smoking, number of years since cessation should be noted
22 (11+19)	♦ Dates, frequency and type of drugs should be noted ♦ If applicant is still using drugs recreationally, he/she must be found temporary unfit and be referred
22 (12-42)	A detailed explanation must be provided with all affirmative questions
22 (20)	The following should be noted: ♦ Number and type of alcohol used on a weekly basis ♦ Number of years that has elapsed since applicant started using alcohol ♦ If the applicant has been abusing alcohol, number of years since abuse has stopped should be noted
22 (43)	♦ Make use of the opportunity to provide education to the applicant related to the disease and the possible effects it might have on aviation safety ♦ Hand the applicant the document related to encouraging voluntary testing and disclosure as well as a copy of the present HIV protocol ♦ Provide counselling or refer for counselling and testing if so requested by the applicant ♦ At this point in time, the applicant is not legally bound to disclose a positive HIV status ♦ However, it is important to remind the applicant that he/she may not fly while aware of any
22 (44-46)	These questions should be answered to determine latent medical problems or forgotten facts that may have an effect on medical fitness
23 + 24	♦ Any affirmative answer must be documented fully by the aviation medical examiner in the space provided ♦ If there is insufficient space, the examiner must attach a separate sheet to the examination form

25 and 26	♦ The DAME must bring the contents of these two paragraphs to the attention of the applicant ♦ The applicant should be aware that it is an offence to knowingly make a false declaration ♦ The declaration made by the applicant is a legal declaration that the applicant has supplied complete and accurate information ♦ It also releases information to the Director of Civil Aviation for Civil Aviation
27 - 29	♦ The applicant must read, date and sign the declaration and the signature must be witnessed ♦ The DAME must sign as witness

Physical examination

A comprehensive physical examination must be performed. Any finding on the physical examination must be documented fully by the aviation medical examiner in the space provided. If there is insufficient space, the examiner must attach a separate sheet to the examination form.

Remarks such as "previously documented" or "refer to previous records", will not be accepted. The document will be considered as incomplete. Incomplete forms will be sent back to the medical examiner.Should the examiner decide that more tests are indicated, he/she should obtain informed consent and perform the test or refer the applicant for further evaluation. The details must be provided on the form in the space provided.

The information on the following 2 pages should be carefully considered when completing the examination section:

Question	Description
31	♦ BMI is calculated by dividing the weight of the applicant by the square of the height of the applicant ♦ Underweight – less than 18,5 ♦ Normal – 18,5 to 25 ♦ Overweight – 25 to 30
33	Pulse rate and rhythm must be noted

45	♦ The gynaecological examination and the rectal examination may be performed by the applicant's gynaecologist, urologist or general practitioner ♦ Should this be the case, it should be remarked as such on the examination form ♦ The applicant should be made aware of the importance of these examinations
46	♦ It is essential not to rush the examination and to engage the applicant in discussions to enable the examiner to evaluate the applicant psychologically ♦ The medical examiner should inspire confidence in the applicant, create a trusting and friendly environment and should get to know the applicant well to enable him/her to identify possible problems or changes in behaviour during future examinations
63	If applicant has been referred for further evaluation, the name of the person as well as the reasons for the referral should be provided
64-66	♦ Distant and near vision for each eye separately as well as for binocular vision must be determined ♦ Criteria for intermediate vision has not yet been determined, but may be required in future
67	♦ Details of colour vision determination must be provided ♦ If a Lantern test has been performed on the applicant, the date and result of the test must be provided as well
70	♦ CVD risk factor assessment must be completed ♦ The result of this assessment may be used in future to determine the necessity for a stress-ECG ♦ Medical examiners must make use of this assessment to educate the applicant about a healthy lifestyle
71-75	All 4 columns must be completed even if test is marked as not applicable for this specific examination date
76	♦ Any finding must be documented fully by the aviation medical examiner in the space provided ♦ If there is insufficient space, the examiner must attach a separate sheet to the
77	♦ In this section the medical examiner must document his/her findings and decisions ♦ It also serves as a summary of the aviation medical examination

78	The declaration made by the medical examiner is a legal declaration that the examiner ♦ Has personally reviewed the history ♦ Has personally examined the applicant ♦ Has supplied complete and accurate information The medical examiner must supply all the details as requested in this section as this is a legal document. Incomplete documents will not be accepted
79	This section should not be completed by the medical examiners. This is for official use by the designated institution only

Operational restrictions and medical requirements

Examination form

The medical examiner must indicate all operational restrictions and medical requirements in detail on the examination form.

Medical certificate

Operational restrictions should be documented clearly on the medical certificate according to the table below.

In order to maintain confidentiality of information, the medical examiner may not provide details of any medical condition, requirement or protocol on the medical certificate. If medical reports are required for future examinations, the following restriction must be documented:

"Medical reports to be submitted with next medical examination".

If the medical examiner has found the applicant to be temporary unfit, the following restriction must be documented:

"Medical reports to be submitted before medical certificate can be issued".

Examination reminder

The medical examiner must issue the applicant with a separate document detailing the tests required for the next aviation medical examination. This will be the property of the applicant and need not be presented to anyone unless the applicant chooses to do so. The document will serve as a reminder to the applicant or as an information sheet to a different aviation medical examiner, should the specific medical examiner be unavailable.

	Operational restrictions
1	With or as co-pilot only
2	With safety pilot only
3	Daylight flying only
4	Valid as PPL only
5	Suitable corrective lenses must be worn
6	A spare pair of lenses must be readily available
7	Monocular restrictions: a. If flying open cockpit aircraft, protective goggles not restricting visual field must be worn b. Any accompanying pilot must be made aware of the holder's monocular vision c. Not valid for flight as pilot-in-command by day or night until a satisfactory flight test has been completed with a
8	Restricted to demonstrated aircraft type
9	Valid only with approved prosthesis
10	Hearing aid required
11	Altitude restricted to 10 000 feet maximum
12	Not to fly within 24 hours of using medication
13	No aerobatic flight
14	Valid only when another air traffic controller available to assume duties
15	Not valid for aircraft equipped with toe brakes
16	Valid for air traffic controller only
17	Valid for simulator instruction only
18	Medical reports to be submitted with next medical examination
19	Medical reports to be submitted before medical certificate can be issued

Practical flight tests

In some cases, it will be necessary to perform a practical medical flight test with an applicant to determine medical fitness and ability to control the aircraft, e.g. pilots with monocular vision, disabled pilots, etc. In these cases, the medical examiner must refer the case to the SACAA medical department of the SACAA to arrange for a practical flight test with a SACAA flight inspector. Borderline medical conditions should first be referred to a specialist for a thorough investigation as outlined in the following chapters of this manual. This should include an evaluation of whether or not the condition is progressive, to what extent functions is impaired, and whether there is any risk of future deterioration or sudden incapacitation. If the applicant fails to meet the medical requirements but the condition, in the examiner's opinion, does not affect the regular and safe performance of duties, the SACAA might wish additionally to assess any skill and experience demonstrated during practical flight tests, in order to make certain that the applicant is capable of performing duties without endangering flight safety.

A practical flight test is usually most appropriate for assessing static physical conditions, and not for those with normal physical function but who have an increased risk of rapid incapacitation. It is likely to be undertaken mainly for private pilots, for whom the medical standards are less rigorous and where modification to aircraft controls may be feasible, although professional pilots may also require practical testing for certain conditions. Special medical flight testing, appropriate to the applicant's deficiencies, is conducted to help the SACAA to estimate the applicant's ability to perform under normal as well as adverse flight conditions.

Therefore, testing of the applicant could include marginal or simulated marginal conditions such as might be encountered in emergency operations, in adverse weather, in twilight or at night, in haze or cloudiness, and in flight towards the sun as appropriate to the condition being assessed. The flight test report should comment on the conditions under which tests were given. Reasonable simultaneous tasks should be introduced during medical flight testing (such as map reading and navigation, operation of flight equipment, maintenance of communications, and even equipment or engine malfunction) to estimate the applicant's ability to perform more than one task simultaneously. Specifications for such special medical flight tests provide guidelines to help in determining the applicant's abilities and limitations.

The SACAA medical department is currently in consultation with the relevant stakeholders to review the practical flight test for the following conditions, however; in the meantime below is a guideline from ICAO:

Deformity or absence of extremities

An applicant might be assessed as fit if able to demonstrate: ability to reach readily and operate effectively all controls that would normally require use of the deficient extremity (or extremities), noting any unusual body position required to compensate for the deficiency; ability to perform satisfactorily emergency procedures in flight, such as recovery from stalls and power-off control, as well as on the ground, including evacuation of the aircraft.

Defective hearing

Defects in hearing need not normally necessitate tests under actual flight conditions since all pertinent factors may be simulated. Whether conducted on the ground or in-flight conditions, the main considerations to be assessed in such cases are:

ability to hear radio voice and signal communications;

ability to understand ordinary conversational voice on the ground, in the cockpit with engine on and engine off. (The examiner should guard against the applicant lip-reading.)

Speech defects — stammering, stuttering

An applicant might be assessed as fit, if able to demonstrate ability to converse and be clearly understood in direct conversation and over the radio.

END