The medical Requirements laid-down in this manual are in-conformity with standards and recommended practices of ICAO Annex-I, duty adopted by CAA. While these requirements are worded to indicate the minimum levels acceptable, it is therefore understood that a degree of interpretation must be exercised as per laid-down specifications in INS manual, like age, experience privileges of the license applied for and environmental conditions under which the license holders are going to exorcise these privileges.

Nevertheless, on initial issue of license, it will be inadvisable to encourage an applicant to pursue flight training if the minimum requirements of medical Standards of relevant class are barely met, specially in cases where further deterioration might be expected or is likely to occur while exercising such privileges. In most of the medical conditions guidance material is provided in ICAO Manual of Civil Aviation medicine and various SARPS of Annex-I (Personnel Licensing) besides guidance may be obtained from FAA & JAA medical manuals while assessing medical fitness of flying personnel. However these requirements have no concern with any conditions of employment or for social considerations for which CAA will not be responsible. Nevertheless, in the course of decision making, it will be necessary to resort to other sources of information such as contributions from Flight managers, employers, family members, family Physicians etc. Further recourse to special practical testing such as medical flight tests, simulator test etc. may also be carried-out if need arises.

The medical examination should, to the extent practicable, must determine that no subtle condition exists which may have a down-grading effects upon the applicant's fitness during the entire validity period of license.

As knowledge and techniques are advancing rapidly bone in medicine and aviation, them medical requirements can he amended by DGCAA periodically when it is clearly necessary to do SO in 010 interest of flight safety. While these requirements are enforced, they must he adhered to, unless candidate is considered safe, to exercise "flexibility clause" as laid down in appropriate chapters, bearing in mind fully, the flight safety requirement of the flight. However flexibility clause if authorized must be exercised only in exceptional cases and not as a routine procedure.

This flight crew medical requirement hand-book has been prepared in consultation and coordination with Representatives of PALPA and FENA, DLS & Legal Officers of Legal Directorate of CAA, Medical Advisors of all Airlines including CFS PIAC. Besides OC CMB, Masroor and OC, AMI PAF Base, Masroor have also extended fullest cooperation and assistance in preparation of this Manual. Above all, this manual has been prepared with consensus views of all above medical authorities including PALPA & FENA Representatives.

CHIEF OF AVIATION MEDINCE 
CIVIL AVIATION AUTHORITY
DEFINITIONS

1. **AMEs:** Aviation Medical Examiners are physicians licensed in the practice of medicine designated by DGCAA Ira conduct medical examination of aircrew members for issuance/renewal of requisite licences on appropriate medical formats. The designated medical examiners shall be qualified in Aviation Medicine from recognized Aero-Medical Institutes The Medical Examiners shall acquire knowledge and experience of the conditions in which the licence holders carry-out their duties The AMEs shall be designated on the basis of work-load requirements at each location.

2. **CAMBs:** Civil Aviation Medical Boards are constituted by DGCAA at various locations to conduct medical examinations of flight crew members for initial issue of particular class of licences and their subsequent renewals two yearly on appropriate formats. CAMB is envisaged to conduct medical examination of aircrew with medical problems requiring prolonged treatment/hospitalization and medical examination of aircrew referred by DGCAA, Chief of Aviation Medicine and AMEs far accredited medical conclusion on any ailment/disability/strong/suspicion of having intoxicated by drugs/substances The Civil Aviation Medical Boards shall comprise of Physician, ENT Specialist kill[1] Eye Specialist and a cu-opted Cardiologist where-ever necessary. The above specialists shall acquire knowledge of aviation medicine and the conditions in which the licence holders carry-out their flying duties; the President CAMB may desirably be qualified in Aviation Medicine.

3. **Competent Medical Authority:** The authority conferred to chief of Aviation Medicine (CAM) by DGCAA under this Air Navigation Order to carry-out such duties and responsibilities on medical matters as deemed necessary while interpreting the laid-down aircrew medical requirements so as to ascertain their medical fitnesses for flying duties without compromising flight safety.

4. **Airline Aviation Medical Advisors (AAMA):** Airline Aviation Medical Advisors are doctors qualified and licensed in the practice of medicine designated by DGCAA. These doctors shall inculcate awareness amongst flying personnel to maintain their "continued medical fitness" so that flight safety is not compromised while exercising their licence privileges. The designated airline doctors shall be qualified in aviation medicine from recognized Aero-medical Institutes and shall acquire knowledge and experience of the conditions in which the licence r+ holders carry-out their duties.

5. **Accredited Medical Conclusion:** The conclusion reached by one or more medical experts acceptable to the licencing authority for the purposes of the case concerned in consultation with flight operations or other experts as necessary.

6. **Medical Assessment:** It is the evidence issued by medical authorities of CAA that the licence holder meets the specific requirements of medical fitness. It is issued following an assessment carried-out by the licencing authorities of CAA on the medical fitness submitted by the Chief of Aviation Medicine for the applicant who has applied for such licence.
7. **Licensing Authority**: The Authority designated by a contracting state as responsible for the licensing of personnel.

8. **Flight Time**: 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-1**

Flight time as here defined 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.

9. **Flight duty period**: The total time from the moment a flight crew member commences duty, immediately subsequent to a rest period, and prior to making a flight or a series of flights, to the moment he/she is relieved off all the duties having completed on such flight or series of flights.

10. **Rest period**: It is a period of time on the ground during which a flight crew member is relieved off all duties by the operator including stand-by duties.

11. **Night duty**: The period between the end of evening civil twilight and the beginning of morning civil twilight, or such other period between sunset and sunrise as may be prescribed by the appropriate authority.

12. **Multicrew operational aircrafts**: Aeroplanes certified for operations with three members cockpit crew led by the pilot-in-command or with a minimum of at least two pilots according to the type of the aeroplane in which one pilot assume the duties of pilot-in-command.

13. **A Special Medical Board**: means a board constituted by DGCAA, as and when deemed fit, for reassessment of holder of a licence.

14. **Fitness of flight crew member**: The pilot-in-command of multi-crew aircrafts shall be responsible for ensuring that a flight –

(a) will not be commenced if any flight crew member is incapacitated for performing his/her duties by any cause such as injury, sickness f fatigue, the effects of alcohol or drugs

(b) will not be continued beyond the, nearest suitable aerodrome when flight crew member's capacity to perform functions is significantly reduced by impairment of faculties from cases such as fatigue, sickness, lack of oxygen etc.
SECTION-I

1.0 AUTHORITY

These medical requirements are made under authority of DGCAA in pursuance of powers vested in him by Federal Government under Section-9 of Pakistan Civil Aviation Ordinance 1982 read with current Civil Aviation rules.

1.1 APPLICABILITY

This part of Air Navigation Order specifies the general administrative medical requirements necessary for issuance and renewal of Flight Crew, Air Traffic Controllers, Aircraft Maintenance Engineer's licences and cabin-crew competency certificates. These orders shall be applicable at all the locations within the territory of Islamic Republic of Pakistan on the aircrafts registered in Pakistan. Subsequent parts will be supplemented as and when need arises.

1.2 MEDICAL ASSESSMENT DOCUMENTS

The medical examination will be conducted on such forms set-out in the appendices to these orders, as may be applicable and duly amended by DGCAA from time to time keeping in view the advancement in aviation medicine based on ICAO recommendations. Fees for the initial issue, renewal, special medical examinations and for other associated paper work shall be paid as and when notified by DGCAA to these orders and same shall form part of these orders. Other necessary documents will be supplemented as and when need arises as part of separate orders.
1.3 MEDICAL REQUIREMENTS

1.3.1 A person applying for the grant or renewal of a licence to act as a member of the operating crew of an aircraft or an authorization to act as an Air Traffic Control Officer / Aircraft Maintenance Engineer shall be required to undergo a medical examination of appropriate class to ascertain whether his / her physical and mental condition conforms with the standards of fitness as laid-down in the particular Class of Medical Assessment applicable to the case, as specified in subsequent chapters. The examination will be based upon the requirements specified in such formats as notified in the relevant appendices.

1.3.2 Cabin attendants’ medical assessment should be left with the medical authorities of concerned airlines who will conduct such examination according to "Class-II medical standards" under intimation to Medical Authorities of CAA.
1.4 ASSESSMENT OF MEDICAL FITNESS

1.4.1 Standards contained in this part cannot include sufficient detailed specifications to cover all conditions and of necessity, will leave many decisions relating to the assessment of medical fitness to the judgement of the examiner. The assessment of medical fitness shall therefore be made as a result of complete medical examination conducted throughout in accordance with laid-down standards of this manual and having due regard to the requirements of the licence applied for and the conditions in which an applicant will have to carry-out his duties and the privileges under the licence applied-for.

1.4.2 Except to the extent permitted below, an applicant for the initial issue of a Medical Assessment shall meet, the standards detailed in this part, appropriate to the Medical Assessment applied-for. The requirements for a renewal are the same as for the initial issue unless specifically stated by the competent medical authorities due to any authenticated information received from a reliable source regarding decrease in medical fitness of licence holder.

1.4.3 The licence holder shall not exercise the privileges of his licence and related ratings during any period in which his medical fitness has, from any cause, decreased to the extend that would have prevented the issue or renewal of his licence which might have rendered him unable to safely exercise his licence privileges.
1.5 DISPENSATIONS

1.5.1 An applicant who does not satisfy the specified medical requirements, may, at the discretion of licensing authority of CAA in consultation with Chief of Aviation Medicine be accepted as eligible for the grant of renewal of a licence, so far as medical requirements are concerned under such conditions/restrictions as may be considered appropriate with the evidence that the applicant has already acquired and demonstrated ability, skill and experience which could compensate for a failure to meet the prescribed medical standards without adversely influencing the safe performance of his duties besides. the accredited medical conclusion indicates that the condition of the applicant is not such as to introduce any hazard either of incapacity or of inability to perform his duties safely during the validity period of the licence, However this provision will be applied with certain limitations/restrictions and will not be considered as routine procedure or right of the candidate.

1.5.2 Aviation medical examiner shall report to licencing authority through Chief of Aviation Medicine any individual case, where, in his judgement, an applicant's failure to meet any requirement, whether numerical or otherwise, is such that exercise of the privileges of line licence being applied-for, or held, is not likely to jeopardize flight safety. Such cases will invariably be referred to Board of Examiners for accredited medical conclusion to ascertain flying status of licence holders.

1.5.3 If an applicant for the renewal of a licence is for the time being on duty as a member of the operating crew on an aircraft in a region, distant from official medical centers, the medical examination which the applicant should normally pass to obtain renewal of the licence may exceptionally, at the discretion of the Director General in consultation with medical authorities of Civil Aviation Authority or his nominee:-

(i) be deferred once for a period of six months in the case of a member of the operating crew of a private aircraft. or

(ii) be deferred for two consecutive periods of three months each in the case of a member of the operating crew of public transport or aerial work aircraft, on condition that such member obtains locally
in each case and forwards to the Director General, Civil Aviation Authority, a medical certificate from a registered practitioner in modern medicine declaring his medical fitness in accordance with the prescribed medical standards.
ICAO PROPOSED VALIDITY PERIOD VALIDITY OF LICENCES/CERTIFICATES

Since the assessment of an applicant's fitness or re-validation of a licence is normally restricted to the period of validity of the licence, the normal validity periods are listed below:

| i)          | Airline Transport Pilot, Senior Commercial/Commercial Pilots | Class-I | 06-months above the age of 40 years. 12 months below the age of 40 years. |
| ii)         | Flight-Engineers, Flight Navigators                          | Class-I | 06 months above the age of 40 years. 12 months below the age of 40 years. |
| iii)        | Private Pilots, Student Pilots, Glider Pilots, Free Balloon Pilots, Flight Radio-Telephone Operators | Class-II | 24 months above the age of 40 years. 48 months below the age of 40 years. |
| iv)         | Cabin Attendant’s competency certificates.                   | Class-II |                                                |
| v)          | Air Traffic Controllers                                      | Class-III | 24 months above the age of 40 years. 48 months below the age of 40 years. |
| vi)         | Ultra-Light Aircraft Operators                               | Special |                                                |
| vii)        | Aircraft Maintenance Engineers                                | Special | -                                               |

1.6.2 For ATPL, the minimum age of licence holders shall not be less than 21 years, for CPL, RE and FIN licences, the minimum age of the candidate shall not be less than 18 years and for PPL, GPL, Free Balloon Pilot licences and Student Pilot Licences the minimum age shall not be less than 17 years, However candidates for ultra-light aircrafts, the minimum age shall not be less than 16 years and those for aircraft Maintenance Engineers, the minimum age shall not be less than 18 years respectively.

1.6.3 An applicant shall be granted the highest assessment possible at the time of initial issuance of licence on the basis of the finding recorded during the medical examination. An applicant desiring a medical category higher than the necessary for the type of licence requested, he must inform the AME or CAMB of his such requirement, This is particularly important in the case of initial examination when applicant is interested in adopting aviation as his career. In such circumstances, applicant has to provide all the medical/surgical intervention documents and the results of any previous medical examinations.
disqualification's, clef deferments or denials so that medical examiner is aware of such dispensations while taking the decision.

1.6.4 A licence holder who has been granted specified certificate and makes application for an instrument rating, shall be required to satisfy "Hearing Standards" applicable to Class-1 Medical Assessment. Where an applicant for renewal of a licence or for the inclusion in the licence or the renewal of a rating for which hearing standards Class-I is required, but fails to satisfy that standard, the licence or rating may nevertheless be granted or renewed as the case may be, if the applicant -

(a) has satisfied hearing Standard, as applicable to Class-II Medical Assessment and

(b) has a hearing performance in each ear separately equivalent to that of a normal person against n background noise that will simulate the masking properties of flight deck noises upon speech and beacon signals, and the CAM is satisfied that the applicant by reason of his experience in radio-reception, can competently perform the duties for which a licence or rating is desired.
1.7 **CONDUCT -OF MEDICAL EXAMINATION**

1.7.1 The medical examination for the initial issue of all aircrew licences, except Private Pilot's Licence, Glider Pilot's Licence, cabin/crew attendants competency certificates and their periodical renewals shall be carried-out by a Board of Medical Examiners approved by the Director General. Initial issue of PPL/GPL, ATCO licences and their periodical renewals including single renewals of CPL/ATPL & FE licences shall be carried-out by Aviation Medical Examiners approved by DGCAA.

1.7.2 The AME may at his discretion, call for any test, specialist opinion or accredited medical conclusion, whenever it is considered necessary, to determine the fitness of a flight crew member.

1.7.3 All flight crew-members holding professional licences shall appear before the Board of Medical Examiners, approved by the Director General, for the renewal of their licences after every two years, and when considered necessary by DGCCA / medical authorities of CAA due to decrease in their medical fitness necessitating with examinations so that flight safety is not jeopardized.

1.7.4 Medical Examinations shall be conducted using the Forms specified by the licensing authority as applicable and the original forms duly completed, shall be forwarded, by the Aviation Medical Examiner or by the Board of Medical Examiners, as the case may be, to the Chief of Aviation Medicine, Civil Aviation Authority immediately but not later than 10 days for his evaluation and recommendations to licensing authorities of CAA whereas a copy thereof may be retained by AME/CAMB for record purposes.

1.7.5 Medical Assessment Forms can be obtained by medical examiner from, Civil Aviation Authority as and when need arises. After evaluation of medical assessment either by Medical Examiner or by Board of Medical Examiners, medical certificate of particular class will be issued to the candidates if they meet the required medical standards of licences applied-for. If DG CAA is not satisfied with the findings of AME / CAMB, he shall inform the AME / CAMB and the candidate that the certificate issued is considered in-valid with an advice
to report to CAMB for re-assessment. In no case, the re-assessment proceedings should take more than 30 days.

1.7.6 DG CAA might not approve the findings and observations of AMEs or Board of Medical examiners when he is satisfied under para 1.7.5 that medical standards as applicable have not been met in issuance of medical fitness certificates. In such cases opinion, will be obtained from referees / consultants approved by DGCAA who will form a "Special Medical Board" to determine such departures/variations as soon as possible but not later than 45 days.

1.7.7 The medical certificate shall contain full personal data, limitations, conditions and / or variations, signature of AME / President CAMB and requirement of subsequent ECG, Audiogram, X-Ray and other relevant investigations/evaluations as determined by the AME or Board of Examiners. The duration of the period of currency of a medical assessment shall be in accordance with the provisions laid-down in the subsequent paragraphs. The period of currency of medical certificate shall begin on the date the medical assessment is issued. The medical fitness certificates shall be renewed according to the period specified under various classes of certifications. However in case the period has lapsed beyond 90 days without submitting any medical fitness to DGCAA as specified under above paragraphs and the candidate desires to exercise such licences, he shall appear before AME/CAMB to determine his medical fitness as required under specified class of licence.
1.8  **MEDICAL HISTORY AND DECLARATION OF TRUTH**

1.8.1 Aircrew shall sign and furnish to the AME or to CAMB, a declaration stating whether he has undergone previously such medical examination and if so, with what results and medical status thereafter. He shall also inform any medical illness, disability or history pertaining to his medical fitness during his preceding validity period.

1.8.2 Having made such a statement, the applicant will be required to make a declaration, as to its truth, and shall do so by signing in the appropriate place in the prescribed form which shall be witnessed by AME / President CAMB as may be applicable.

1.8.3 A false declaration made by an applicant to the Aviation Medical Examiner or to President CAMB must be reported to the Director General for such actions as may be considered appropriate by him as per CAA rules.

1.8.4 AMEs/CAMB, CAM and airline Aviation Medical Advisors shall keep the medical record/medical information, reports etc of flying personnel in close custody and in strict confidence. Release of medical information records, reports etc of aircrew to concerned authority shall only be made if consent/authorization of concerned aircrew for release of such documents is available in writing duly signed.
1.9 **DETERIORATION IN MEDICAL FITNESS**

1.9.1 If the holder of a licence is aware, or has reasonable grounds to believe that, his physical aural or visual condition has deteriorated in any manner, even if only temporarily, as the result of a common minor ailment or by a period of fasting so that it may be below the standard of medical fitness required for the grant of such a licence, he shall not act in any capacity for which he is so licenced until he is satisfied that his condition has improved/recovered to meet the required standards as laid-down in this ANO.

1.9.2 If the holder of a licence:

(i) suffers any personal injury as a result of an accident occurring while exercising his licence privileges.

(ii) Suffers any personal injury involving incapacity to work as a result of an accident occurring otherwise while he is acting in any capacity for which he is licenced;

(iii) Suffers from any illness involving incapacity to work exceeding 21 days.

He shall inform such occurrences to the DG CAA, as soon as possible. However in case of above referred accident, in-flight incapacitation due to any reason and hospitalization, such information shall be sent by the holder of licence to DG CAA as soon as possible.

1.9.3 The holder of a licence, may after suffering from such personal injury or illness, be required to undergo a single or Board medical examination as determined by DGCAA. He shall not, therefore resume acting in any capacity for which he is licenced until he has arranged for a medical report, detailing the nature of the injury or illness, the treatment received, the progress made whilst under treatment and the nature of his present condition to Chief of Aviation Medicine, Civil Aviation Authority and awaits instructions for any examination required before resuming flying.

1.9.4 Pregnancy shall be regarded as a cause of temporary unfitness for the holder of a licence from carrying-out flying duties. As soon as the condition
has been diagnosed, the holder of a licence shall so inform the DGCAA, as soon as possible & cease flying and shall not again fly until she has, in due course, been examined and pronounced fit by Medical Board.

1.9.5 Holder of licences provided in the subsequent paragraphs shall not exercise the privileges of their licences and related ratings while under the influence of any psycho-active substances and/or under the influence of intoxicating liquor/drugs, which might render them unable to safely and properly exercise these privileges. The licence holders shall also not engage in any problematic use of substances / illicit drugs which have down-graded effects on their capacity to exercise licence privileges.

1.9.6 Holder of licences found under influence of above conditions, shall be declared temporary unfit and shall not be allowed to exercise licence privileges till such candidates are considered fit to perform flying duties after successfully completion of treatment or in cases where no treatment is necessary, after cessation of the problematic use of substances and upon determination by the medical Board that the candidate's continued performance of the function is unlikely to jeopardize safety.
2.0 CIVIL AVIATION MEDICAL BOARDS

2.1 DGCAA may constitute CAMBs based of Karachi, Lahore and Islamabad and other places for assessing all the aircrew. Each board shall consist of 03 members namely Physician, ENT Specialist and Eye Specialist and co-opted cardiologist wherever necessary having experienced and knowledge of aviation medicine and conditions in which licence holders carry-out their flying duties. The senior most member will act as President of the CAMB under authority of DGCAA. The President LAMB may desirably be qualified in Aviation Medicine but such requirement is not mandatory.

2.1.1 The medical examination for initial issue of all the aircrew licences, except for PPL, GPL and Cabin Attendants shall be carried-out by CAMB. Besides all flight crew holding Class-I licences shall appear before CAMB after every two years for renewal of their licences.

2.1.2 The aircrew members having low-medical category, sickness cases and having other medical problems/disability shall also be assessed by Board of Medical Examiners through accredited medical conclusion as and when they are referred to CAM by relevant airline medical authorities.

2.1.3 Apart from this, DGCAA, Airline Aviation Medical Advisors, CFS PIAC, Aviation Medical Examiner or Chief of Aviation Medicine may refer any flight crew member to CAMB for accredited medical conclusion on any ailment, disability, suspicion of being under the influence of drugs or psychoactive substances etc as and when information on such account is available based on authenticated medical evidence with reliable witness.

2.1.4 CAMB will be competent to give recommendations on such cases at its own. However, a flight crew member will be referred to such Specialists as the CAMB may decide for obtaining accredited medical conclusion in most difficult and complicated cases in assessing the aircrew for flying duties.

2.1.5 In case of controversial specialists reports or when Aircrew obtain reports from their own consultants without prior approval of CAMB, in such cases opinion of board shall take precedence over any other medical advice obtained while assessing the medical fitness of concerned aircrew.
2.1.6 The medical examination, shall be conducted in accordance with specific medical standards on appropriate formats and the 'Examination Form' so completed shall be forwarded by the President of Medical Boards directly to Chief of Aviation Medicine within period of 10 days for the evaluation of Board's observations I recommendations to the licensing authorities of CAA so that aircrew licenses are validated.

2.1.7 The Board of examiners will be paid their professional charges as determined by CAA from time to time. However CAA will got its share for utilizing its premises, equipment and other services available to board members where-ever it is applicable.

2.1.8 The DGCAA shall change any member of the board including President of the Board if it is in the interest of flight safety and having known that lower medical standards have been accepted or exercised against specified medical standards.
2.2 APPROVED MEDICAL EXAMINERS & MEDICAL EXAMINATION PROCESS

2.2.1 DGCAA shall designate Aviation Medical Examiners qualified and licensed in the practice of medicine as and when the same is required for conducting medical examination of aircrew members for issuance / renewal of requisite Licences based on appropriate medical formats as per relevant appendices, The AMEs shall be designated on the basis of work load requirements at each location.

2.2.2 An approved medical examiner shall have or had training in aviation medicine from recognized Aero-Medical Institute, with requisite experience in aviation medicine He shall also acquire current practical knowledge and sufficient experience of the conditions in which the holders of the licences and ratings carry-out their duties.

2.2.3 The responsibilities of the AME with regard to the Flight Safety is very dear They shall make to the best of their knowledge, experience. ability and appropriate assessment of physical and mental fitness of all the applicants for the licences, giving due regard to the operational and environmental conditions in which these licence holders perform their duties.

2.2.4 Whenever possible, the AME shall properly indoctrinate licence holders, the medico-biological aspects of Civil Aviation Operations as well Since the importance given to the study of human-factors in the prevention/ investigations of accidents is increasing, the medical examiner is an essential element of flight safety; the possibility of incapacitation due to medical reasons and / or decrease in performance to the medical / human-factors is indicative of his importance.

2.2.5 While assessing applicants for aviation duties, the AME shall consider not only these factors related to the individual but other factors such as age, the presence of clinical symptoms (of then significant recent history and personality traits as well as the operational and environmental conditions encountered in Civil Aviation Operations.

2.2.6 A very important aspect which will permit AME to fulfill his duties with efficiency and with due regard for flight safety, is the development of a
good personal rapport with the licence holders and an insight into the physical and mental demand imposed by their duties.

2.2.7 For this purpose, the practical knowledge and experience of aviation medical examiner shall include, wherever possible, actual flight deck experience in the operational working conditions of aircrew members. This is an effective way to promote the medical examiner’s understanding of the practical demands both physiological and psychological, that the licence holders task and duties impose upon. An accumulated total of preferably 20 hours per year of flight deck-time might be considered desirable for achieving above task.

2.2.8 Besides, medical examiners shall be responsible for the following duties:

(a) Having completed the medical examination of applicants in accordance with specified medical standards, AME shall issue the fitness certificate of appropriate medical class duly signed and shall forward the Examination Forms to CAM for his evaluation and recommendations to licensing authorities of CAA. CAM, may, if he so finds any departure from the laid-down practices, may not accept such assessment and shall notify about it to the examinee and the AME within 30 days. If no correspondence by CAM is made within above period, the medical certificates shall be deemed to be approved for validation.

(b) The applicant for a medical assessment shall provide AME with a personal certificate of medical statement of medical facts concerning his personal, familial and hereditary history. The applicant shall be made aware of the necessity for giving such statement i.e. as complete and accurate as his knowledge permits and any false statement shall he dealt with in accordance with appropriate CAA rules which may likely to cancel/suspend his certification.

(c) The AME shall immediately report to Chief of Aviation Medicine any individual case, where, in his judgement, an applicant's failure to meet any requirement, whether numerical or otherwise, is to an
extent that the exercise of the privileges of the licence being applied-for, or held. is likely to jeopardize flight safety.

(d) The requirement to be made for the renewal of the medical assessment shall be the same as those from the initial assessment except when otherwise, specially stated.

(e) The AME, on his clinical judgement, based upon the careful review of medical history and thorough medical examination may need further investigations, specialized reports on his discretion to conclude the medical examination process in best of his clinical judgement, However when applicant fails to meet medical requirement or his previous medical condition deteriorates to the extent that the flight safety is likely to be jeopardized, in such cases, AME shall deny / defer licenses and the case shall be notified to Chief of Aviation Medicine for his accredited medical conclusion.

(f) The period to act as designated AME shall be 02 years so that check and balance is maintained in the conduction of medical examination of aircrew members. Nevertheless DGCAA, may in the interest of flight safety change or de-designate AME as and when it is confirmed that lower medical standards have been practiced and applied by a particular Aviation Medical Examiner.

(g) Aviation Medical Examiners in the interest of flight and ground safety, shall carry-out medical tests of an aircrew and other members of aviation industry to detect List’ of psycho-active substances/problematic substances. or any other substances likely to impair his / her performance while exercising the privileges of his / her licences or duties of their aviation working places when authenticated information to such effects is available subject to prior approval of Chief of Aviation Medicine.

(h) The interval between routine medical examination and board examination for the purpose of renewal medical assessment are specified in the appropriate paragraphs
(i) The medical examination conducted by aviation medical examiner should, to the extent determine that no conditions exist which may have a down-grading affect upon the applicants medical fitness during the validity of the licence.

(k) The requirement of medical standard are not concerned with the medical conditions for employment or social considerations. Nevertheless, on initial issue of licence, it would be in-advisable to encourage an applicant to pursue flying training if the minimum medical requirement are barely met, especially in cases where further deterioration might be expected or is likely to occur. Under such situation, information must be passed to licensing authority through Chief of Aviation Medicine for his consideration and disposal.

(l) Medical information related to decrease in the medical fitness or any information that would provide clarification of previously noted conditions must be made a part of the periodic re-assessment for renewal of licences as specified in appropriate medical standards and the same must be notified to licensing authority through Chief of Aviation Medicine.
2.3 ROLE OF CHIEF OF AVIATION MEDICINE

2.3.1 A senior most Medical Officer trained in Aviation Medicine with sufficient practical experience in practicing aviation medicine may be approved by DGCAA to perform the duties of Chief of Aviation Medicine.

2.3.2 In all matters pertaining to Aviation Medicine, the Chief of Aviation Medicine shall be responsible to DGCAA/licensing authority for following duties:

(a) To select Specialists for Aviation Medical Boards for Karachi, Lahore and Islamabad and AMEs for other locations after due satisfaction that all these doctors / AMEs possess adequate training in aviation medicine with requisite experience in aviation medicine. He shall recommend participation of AMC s. Airline Aviation Medical Advisors and CAMB specialists at various international seminars, meetings, courses etc to acquire advance knowledge / training in the practice of aviation medicine through appropriate channels. Such courses must be attended within 03 years and a report to this effect shall be forwarded to licensing authorities of CAA for record purposes.

(b) Shall periodically review aviation medical regulations: in consultation with DI-S and in-consonance with Civil Aviation Rules, ICAO standards and initiate any changes to be incorporated therein. The medical standards will be interpreted by Chief of Aviation Medicine for licensing authority in order to ensure that no low-medical category cases are considered at any stage by CAMB or by Aviation Medical Examiners. The interpretation of such medical standards shall be done in the best interest of flight crew, operators and in line with the regulatory authorities of other countries with the approval of DGCAA.

(c) Shall evaluate medical assessment conducted by all the regular aviation medical boards/AMEs with a view to analyze/evaluate various medical reports submitted to him for assessment of general,
physical and physiological conditions of aircrew so as to enhance the healthy operational conditions necessary for flight safety.

(d) Shall arrange and ensure Special Medical Boards comprising of various consultants to deal with the appeals filed against the decision of any medical authorities with approval of DGCAA and make appropriate recommendations therein.

(e) Shall deal with all the correspondences, summaries and queries of insurance companies with a view to facilitate settlement of insurance claims of aircrew declared permanently unfit due to loss of their licences as and when so desired by concerned air crew.

(f) Shall participate in the aircraft accident investigations so as to assess human-factor, physical and physiological aspects of aircrew and make appropriate recommendations to DGCAA. In such events, Chief of Aviation Medicine shall arrange to carry-out post-mortem, blood and tissue tests and other biological/chemical tests, if required, to complete the investigation process.

(g) Shall evaluate the medical certification process conducted by AME/CAMH of any flight crew and in case, the flight crew is declared unfit by LAMB, CAM shall refer such licence holders for Special Medical Board as specified in the subsequent paragraphs.

(h) Shall refer such flight crew member to CAMB for assessment of medical fitness for such duties, if it appears that flight crew member is causing flight safety problem due to medical reasons while exercising the privileges of licence.

(j) Shall arrange flight medical test of aircrew for accredited medical conclusion when necessary having low-medical category provided such flight crew has adequate skills and experience with the view to ascertain that the aircrew is capable of performing his duties without jeopardizing flight safety. He will also review the flight crew cases having borderline medical problems to recommend for grant of waiver/flexibility, if it is considered safe to do so.
(k) Will recommend to DGCAA/licensing authorities international local consultants of repute to act as referee in giving expert opinion on the medical categorization of a crew member as and when such a need arises while assessing the crew members during special medical boards or obtaining accredited medical conclusion for re-certification on case to case basis.

(l) Will initiate and indoctrinate any anti-drug seminars/lectures for personnel engaged in aviation activities so as to ascertain that licence holders are not involved in psycho-active substances or under the influence of intoxicating liquor or problematic substances / drugs.

(m) Will be responsible in the preparation, organization and implementation of Airport Emergency / Disaster Plan at all the international airports in collaboration with other Airport functionaries and will conduct mock exercises thereafter to prepare the airport to handle emergencies.

(n) Shall ensure an organized, immediate responsive staff with the facilities of first aid attendance at all the major airports in Pakistan to deal-with any sick / injured airline passengers and to arrange adequate means of transportation for expeditious referral of such cases to pre-arranged medical authorities.

(p) In case the CAME has recommended medical unfitness of holder of licences, while evaluating such recommendations for DGCAA, he shall offer an opportunity to the holder of such licences to provide any other material / evidence in his support, if, so available for reconsideration of his case through "Special Medical Board".

2.4 DEFERMENT / DENIAL OF MEDICAL CERTIFICATE

2.4.1 Aviation Medical Examiners or CAMB shall defer medical fitness certificates in case the licence holder:-
(i) suffers any personal injury affecting his capacity to function as a member of flight crew or ATCO

(ii) suffers an illness affecting his capacity to function as or member of flight crew I ATCO throughout a period of 21 days or more

(iii) is a women who is pregnant

(iv) is found under the influence of problematic use of substances I illicit drugs or psycho-active substances

(v) has failed to maintain continuous medical fitness due to any medical 1 surgical dispensation or by a period of Fasting even of temporary nature

(vi) any residual disability or requirement for long-term treatment arising from illness or injury;

2.4.2 In such cases, medical fitness shall be deemed to be suspended on the occurrence of any of the above conditions and shall not again become fit until holder has undergone such medical examination or tests as the medical examiner or board of medical examiners may specify and till such time; licence holder shall not exercise his licence privileges.
2.5.1 An applicant who is recommended permanently until by Board of Medical Examiners for a grant or renewal of any licence, shall be given an opportunity by competent medical authority of CAA to provide any other material/evidence in his support, if so available within period of 45 days for reconsideration of his case through Special Medical Board. On receipt of such material/evidence, DGCAA/licensing authorities, if satisfied, may constitute "Special Medical Board" comprising AAMA with reputed consultants of relevant special field of medicine other than specialists of CAME under competent medical authority of CAA.

2.5.2 DGCAA/licensing authority may refer such cases to "Special Medical Board" for conducting such examinations/tests/procedures which are considered essential to ascertain the genuineness of the ailment or otherwise. However, it is mandatory for such person to submit all the material/evidence on the basis of which he had submitted his case to DGCAA.

2.5.3 On the basis of recommendations of Special Medical Board, the DGCAA shall decide whether such person is fit on until for the grant or renewal of licence and his decision shall be final unless he has filed an Appeal for Board of Review under Civil Aviation rules.

2.5.4 The Director General may require any flight crew member to undergo a special medical examination to establish the "continued medical fitness" of such holder of licence by medical examiner or by board of medical examiners at any time, if in his opinion, such examination is necessary in the interest of flight safety and the flight crew member shall not refuse such checks so notified to him.

2.5.5 The fees for the Special Medical Board and thereafter on any investigations shall be paid in such a manner as may be notified by DGCAA from time to time.
2.5.6 **BOARD OF REVIEW**

In case, grant or renewal of aircrew licence is refused by DGCAA on account of medical disqualification, the aggrieved aircrew may request DGCAA within a period of 14 days for constitution of "Board of Review" by the Federal government as specified under appropriate Civil Aviation rules.

On receipt of such a request, the DG shall transmit it to the Federal Govt. with all the documents with a request that the "Board of Review" be constituted. The Board will comprise of a chairman and two members of relevant specialty. The members other than the chairman shall possess knowledge and experience of flight operations or of aeronautical engineering or other special knowledge or experience whichever is appropriate to the matter to be reviewed, and no more than one shall be a member or an employee of the authority. In such cases, the DG shall make available all the documents and information relevant to the matter to be reviewed by the Board. The board of review thereafter shall make a thorough investigations of the matter and shall consider and give due weight to any evidence including evidence if any not considered by the DG, which is relevant to the matter. The Board may inform itself on the matter in such it manner as it thinks fit without being bound by legal rules of the evidence The DG or the person requesting the review medical board may be represented by counsel, or agent, who may examine witnesses and address the board, unless the chairman otherwise directs, the hearing shall be open to the public. The other procedures shall be determined by the Chairman of the Beard of Review as deemed fit under CAA rules.
2.6 **AGE-60 RULE**

2.6.1 The holders of a commercial pilot licence, or a senior commercial pilot licence, or an airline transport pilot licence who has attained his sixtieth birth day shall not act as a pilot-in-command, or as copilot of:-

   (a) regular public transport aircraft on any flight, or

   (b) a charter aircraft on an international flight

2.6.2 The applicant who desires medical fitness certificate for any reasons, may be issued appropriate class of medical fitness certificate provided candidate fulfills medical requirement applied-for.

2.7 **MEDICAL DEFICIENCY COMPENSATION AND FLIGHT SAFETY**

Where a medical deficiency exists, the extent to which air safety is affected is the vital factor, rather than the extent to which failure to attain the medical requirement 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 inability to carry-out physically a required task. In other cases, the ability to compensate, for example, for an orthopedic dysfunction may be an important factor in the over-all assessment of the effect on flight and public safety. Previously acquired skill and experience may similarly be irrelevant or important to the overall assessment of the safety risk.
2.8 ROLE OF AIRLINE DOCTORS

2.8.1 It is proven fact that the maintenance of health and hygiene of aircrew is the sole responsibility of airline doctors. The airline doctors must give them due importance in resolving not only aircrew sickness problems but psychological problems as well so that aircrew are able to perform their flying duties without stress and strain on long haul flights.

2.8.2 Aero-medical studies reveal that flying personnel do age faster than other professionals. Thus a good and timely preventive medicare programme organized by airline doctors shall greatly help in slowing down this aging process which is vital for the airline operations from financial and safety point of view.

2.8.3 Since medical assessment process is viewed by pilot group as most threatening influence on their careers, thus it is the responsibility of airline doctors to develop a good personal rapport among aircrew and the regulatory medical authorities so that proper and effective coordination and confidence is established. In such circumstances, the best way to handle aircrew problems by the airline doctors is to fly with them oftenly so as to understand their surroundings, difficulties, stresses, cockpit work-load, in-flight fatigue besides their diet and accommodation, rest and recreation, flight patterns with time zone changing effects.

2.8.4 It is emphasized that when a flight crew is advised medical evaluation, cardiac or metabolic assessment or any Investigations, the airline doctors must ensure that such assessment /evaluation is carried-out properly without affecting the morality of flight crew. In fact all medical problems & treatment procedures are looked-after by the airline doctors in close coordination with Chief of Aviation Medicine.

2.8.5 It is also responsibility of airline doctors to inculcate awareness amongst flying personnel to maintain their “continued medical fitness so that flight safety is not compromised while exercising such licence Privileges”. For this, airline doctors must familiarize aircrew through lectures and brochures so that their minor ailment problems are rectified without fear of being grounded.
2.8.6 The airline doctors should invariably work with the roster making authorities so as to ensure that flight crew with restrictions of OML or waivers are not grouped together in pairs, thus compromising the flight safety. For this, CAM will conduct meetings with airline doctors / aircrew representatives so as to update them on Aviation Medicine issues/problems in order to build better relations.

2.8.7 The duty of airline Aviation Medical Advisors is to maintain aircrew sickness records which are essential documents required in case of pilot in-flight incapacitation or in case of aircraft accidents.

2.8.8 Airline Aviation Medical Advisor shall ensure that proper food is supplied to airline passengers and similar food items are not supplied to all crew members at the same time so that flight safety is not compromised.
2.9 PILOT INFLIGHT INCAPACITATIONS

2.9.1 In-flight pilot incapacitation is a valid air safety hazard and is known to have caused accidents. Such incapacitation occurs more frequently than many other emergencies. Incapacitation can occur in many forms, ranging from sudden death to a not easily detectable partial loss of function, and it has occurred in all pilot age groups and during all phases of flights.

2.9.2 It is important to recognize not only the strictly clinical aspects of on-duty sudden incapacitation but also the air safety aspects and operational ramifications. Instruction and training of flight crew concerning action in the event of in-flight pilot incapacitation should thus include early recognition of incapacitation as well as the appropriate actions to be taken by other flight crew members.

2.9.3 A continued assessment of on-duty crew incapacitation as a flight safety hazard requires collection of related data. Reporting of incapacitation incidents is an integral part of on-board incident reporting system which airlines have to laid-down so as to take remedial actions in operating manual. Cases in which pilot incapacitation is suspected typically falls into one of four categories having the following features:-

(a) A hypothesis of pilot incapacitation is compatible with the general circumstances, but both positive medical and circumstantial evidence is lacking.

(b) The accident pattern strongly suggests pilot incapacitation as the cause, but no corroborative medical evidence (historical or pathological) is available.

c) A potentially lethal or acutely incapacitating lesion is discovered during post-mortem in the body of the pilot, and / or a medical history of such a condition has been uncovered, but other circumstantial evidences or witnesses are lacking.
Positive autopsy findings, or alternatively an unequivocal medical history, and corroborative witness or other circumstantial evidence co-exist

2.9.4 Thus, it appears that pilot on-duty incapacitation, of some order, is a more frequent occurrence than has been generally recognized. Conversely, it appears that the hypothetical operational consequences of such incapacitation have been over-stated in some quarters by both medical and regulatory authorities. It must be stressed that presently available data apply only to multiple professional flight crew operations. In the latter, context it is also evident that incapacitation occurring during the approach and take-off phases of flights re-presents a most serious operational risk.

2.9.5 Transient pilot incapacitation, typically due to a variable cause, difficult if not impossible in a practical sense to predict or control, may clearly result in equipment mal-functions or unfavorable operational factors. The result may be, at best, an unusually high task load for the remaining crew or, at worst, demands beyond the capability of the depleted system. There are on record a significant number of cases in which transient airline pilot incapacitation has contributed to reportable incidents involving severe degradation of flight safety.

2.9.6 One of the two major purposes of medical examination and assessment of medical fitness of flight crew, as determined by regulatory authorities, is to assess the probability of a medical condition resulting in inflight incapacitation. Based upon such an assessment, the licensing authority can objectively consider certification that is compatible with generally accepted flight safety standards.

2.9.7 Aviation Medical Examiner is in many cases handicapped in making such an assessment, because adequate predictive epidemiological data is not available for the condition itself or else it cannot be readily applied to the flight environment. Some guidance might be found from other Manuals, while considering the medical conditions that are generally agreed to present unacceptable risk of incapacitation. One obvious example is an aircrew with satisfactory recovery rehabilitated after myocardial infarction. It might
therefore be stated that if the probability of recurrence of any potentially incapacitating condition is considered to be the same as, or higher than recurrence of coronary artery event, an aircrew with such a condition should be assessed as unfit.

2.9.8 In making such an assessment of probability, the aviation medical examiner is bound to consider the extent of exposure to the risk of sudden incapacitation, and any known factors in the flight environment which may aggravate the condition. It should be remembered that a condition that the airline pilot may consider trivial in respect to his own environment, might prove very dangerous, to the solo private pilots.

2.9.9 However, more demanding medical requirements cannot alone reduce the incapacitation hazard to an acceptable minimum level, even by incurring an extra-ordinarily high price in terms of sacrifice of pilot expertise. Obviously, this is not to say that refinements in aero-medical examination and certification techniques should not be pursued.
3.0 THE FAIL-SAFE CREW CONCEPT

The object of a "fail-safe crew" concept arrangement is firstly to provide an adequate number of crew members to cope-with flight deck work-loads, and-secondly to make it possible fully to 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 and experienced pilot at the controls. Ideally the actions of each crew member should continuously be monitored by his fellow crew members. This is referred to as the "fail-safe crew" concept. It aims at achieving maximum safety in the operation of the aircraft and equitable distribution of cockpit work-loads, and guarantees the ability of the crew to cope-with all requirements including peak demands in adverse weather or under emergency conditions including in-flight pilot incapacitation.
3.1 VALIDATION OF FOREIGN LICENCES

3.1.1 A validation by the DGCAA of a licence Issued by another contracting state shall be subject to the medical requirement prescribed in the subsequent section or unless holder can demonstrate to the satisfaction of the DGCAA that he has complied with equivalent requirements in the state of issue of his licence.

3.1.2 In case licence holder is to be engaged on an aircraft which is not registered in the issuing state, the licence holder must obtain a validation of the licence from the state of Registry of aircraft or alternatively obtain a new licence from the state of Registry on the basis of the original licence. As an alternative validation of foreign licence, CAA may issue a new licence which is based on the Foreign licence held by the aircrew under bilateral agreements with the state of Registry of aircrafts to be in line with ICAO requirements.

3.1.3 Nevertheless DGCAA may at any time direct to conduct such examinations or tests of licence holder, as may be considered necessary, to ascertain his continued Medical fitness or the proficiency of the licence holder in the capacity so authorized by the licensee and the holder shall not refuse to undergo such examinations / tests.
SECTION-II

4.0 **APPLICABILITY**

This section of Air Navigation Order specifies the medical requirements to be met by the applicants for issue and renewal of flight crew licences, ATCOs, Flight Attendants and Aircraft Maintenance Engineer's authorization I certification.

4.1 **GENERAL CRITERIA FOR MEDICAL ASSESSMENT- ALL CLASSES**

4.1.1 An applicant for a Medical Assessment issued in-accordance with the terms of this section shall undergo a medical examination based on the following requirements:

(a) physical and mental;

(b) visual and colour perception, and

(c) hearing

4.1.2 **PHYSICAL AND MENTAL REQUIREMENTS**

An applicant for any class of Medical Assessment shall be required to be free from:

(a) any abnormality, congenital or acquired, or

(b) any active, latent, acute or chronic disability, or

(c) any wound injury or sequelae from operations, or

(d) any effect or side effects of any prescribed or non-prescribed therapeutic medication taken or

(e) Under the influence of any psychoactive substances or problematic use of substances / drugs,
such as would entail a degree of functional incapacity which is likely to interfere with the safe operations of an aircraft or with the safe performance of duties.

4.1.3 **VISUAL ASSESSMENT REQUIREMENTS**

For measurement of visual acuity the following methods shall be adopted for tests of visual acuity.

(a) Visual acuity Test, should he conducted in an environment with a level of illumination which corresponds to ordinary office illumination (30-60 cd/m²).

(b) Visual acuity should be measured by means of a series of Landolt rings or similar optotypes, placed at a distance from the applicant appropriate to the method of testing adopted.

4.1.4 **COLOUR PERCEPTION PROCEDURE:**

(a) The applicant shall be required to demonstrate his ability to perceive readily those colours, the perception of which, is necessary for the safe performance of his duties.

(b) The applicant shall be tested for his ability to correctly identify a series of pseudoisochromatic plates in daylight or in artificial light of the same colour temperature such as that provided by CIE Standard illuminants C or Dₖ, as specified by the International Commission on illumination (CIE).

(c) An applicant obtaining a satisfactory result as prescribed by the licencing authority shall be assessed as fit. An applicant failing to obtain a satisfactory result in such a test shall be assessed as unfit unless he is able to readily distinguish the colours used in air navigation and correctly identify aviation coloured lights. If an applicant fails to meet these criteria. shall be assessed as unfit except for Class-2 assessment with the following restrictions: - - "Valid day time only".
(d) Sun-glasses worn during the exercise of privileges of the licences or rating held should be non-polarizing and of a neutral gray tint.

4.1.5 HEARING REQUIREMENTS

(i) Hearing requirements are established in addition to the ear examinations conducted during the medical examination for the physical and mental requirements.

(ii) The applicant shall be required to be free from any hearing defects which would interfere with the safe performance of his duties in exercising the privileges of his licence.

(iii) The reference zero for calibration of pure tone audiometers used for applying Hearing Requirements for Class-I Medical Assessment will be that of the International Organization for Standardization (ISO) Recommendations.

(iv) The frequency composition of the background noise referred-to in subsequent paras of Hearing Requirements for Class-I Medical Assessment is defined only to the extent that the frequency range 600 to 4800 Hz is adequately represented.

(v) In the choice of speech material, aviation type material is not to be used exclusively for the above tests Lists of phonetically-balanced words may be used.

(vi) A quiet room for the purposes of testing the hearing requirements is a room in which the intensity of the background noise is less than 50 dB when measured on 'slow' response of an 'A'-weighted sound level meter.

(vii) For the purpose of hearing requirements the sound level of an average conversational voice at pond of output ranges from 85 to 95 Db.
4.1.6 SERUM CHOLINESTRASE ESTIMATION REQUIREMENTS

4.1.6.1 Serum Cholinestrase Estimations amongst pilots of Plant Protection/other agencies are vital for detection of adverse effects of chemical re-agents of insecticides and pesticides amongst pilots who are involved in spraying of such substances during spraying season. In order to protect such pilots from harmful effects of such re-agents, Serum Cholinestrase estimation shall be carried-out as under:-

(i) At the start of spraying season.

(ii) Thereafter at monthly intervals through-out the spraying season.

(iii) At the end of the spraying season.

4.1.6.2 In case of positive results of such tests, pilots shall be grounded temporarily and shall be referred to CAMB for accredited medical conclusion.
4.2 **CLASS-I MEDICAL ASSESSMENT**

These requirements are applicable for initial and renewal medical examinations of Personnel holding ATPL, CPL, Flight Engineer and Flight Navigator's Licences.

4.2.1 **PHYSICAL AND MENTAL REQUIREMENTS**

The medical examination shall be based on the following requirements:

(a) The applicant shall not suffer from any disease or disability which could render him or her likely to become suddenly or subtly incapacitated to the extent that the applicant is unable either to operate an aircraft safely or to perform his assigned duties safely.

(b) The applicant shall have no established medical history or clinical diagnosis of:

   i) a psychosis;
   
   ii) alcoholism;
   
   iii) drug dependence;
   
   iv) any personality disorder, particularly if severe enough to have repeatedly resulted in over-acts; or
   
   v) a mental abnormality, or neurosis of a significant degree; such as might render the applicant unable to safely exercise the privileges of the licence applied for or held, unless accredited medical conclusion indicates that in special circumstances, the applicant's failure to meet the requirement is such that exercise of the privileges of the licence applied for is not likely to jeopardize flight safety.
(c) The applicant should have no established medical history or clinical diagnosis of any mental abnormality, personality disorder of neurosis which, according to accredited medical opinion, makes it likely that within two years of the examination, the applicant will be unable to safely exercise the privileges of the licence or rating applied for or held.

(d) A history of acute toxic psychosis need not be regarded as disqualifying provided that the applicant has suffered no permanent impairment.

4.2.2 EXAMINATION OF NERVOUS SYSTEM

The applicant shall have no established medical history or clinical diagnosis of any of the following:-

(a) A progressive or non-progressive disease of the nervous system, the effects of which according to accredited medical conclusion are likely to interfere with the safe exercise of the applicant's licence and rating privileges;

(b) Epilepsy; or

(c) Any disturbance of consciousness without satisfactory medical explanation of the cause and which may recur.

4.2.3 INJURIES TO THE HEAD

Cases of head Injury and neurological procedures, the effects of which, according to accredited medical conclusion, are likely to interfere with the safe exercise of the applicant's licence and rating privileges shall be assessed as unfit.

4.2.4 GENERAL SURGICAL EXAMINATION

The applicant should not have suffered from any wound/injury nor have undergone any operation, nor possess any abnormality, congenital or
acquired, which is likely to interfere with the safe operation of an aircraft, or with the safe performance of his duties and privileges of his licence:

(a) The applicant shall be required to be completely free from those hernias that might give rise to incapacitating symptoms during flights.

(b) The applicant shall be free from any residual effects of general vascular and orthopaedic surgeries.

(c) The applicant shall not use any implants, prosthesis which are likely to interfere with safe operations of aircraft or with the safe performance of his licence privileges.

4.2.5 **LOCOMOTOR SYSTEM**

Any active disease of the bones, joints, muscles or tendons and all serious functional sequelae of the congenital or acquired disease shall be assessed as unfit. On issue or renewal of a licence, functional after-effects of lesions affecting the bones, joints, muscles or tendons and certain anatomical defects compatible with the safe exercise of the applicant’s licence and rating privileges may be assessed as fit.

4.2.6 **DIGESTIVE AND METABOLIC DISORDERS**

(i) Any sequelae of disease or surgical intervention of any part of digestive tract and its adnexae, likely to cause incapacity in flight, particularly any obstructions due to stricture or compression shall be assessed as unfit.

(ii) An applicant who has undergone a major surgical operation on the biliary passages or the digestive tract or its adnexae, which has involved a total or partial excision or a diversion of any of these organs should be assessed as unfit until such time as the Chief of Aviation Medicine, Civil Aviation Authority having access to the details of the operation procedures undertaken,
considers that the effects of such operation are not likely to cause his incapacity in the flight.

(iii) Cases of disabling disease with important impairment of functions of gastro-intestinal tract or its adnexae shall be assessed as unfit.

(iv) Cases of metabolic, nutritional or endocrine disorders likely to interfere with the safe exercise of the applicants licence and rating privileges shall be assessed as unfit.

(v) Proven cases of Diabetes mellitus shown to be satisfactorily controlled, without the use of any anti-diabetic drug, may be assessed as fit. Blood sugar testing shall form part of the medical examination for initial issue of licence and shall be included in the re-examinations at the age of 40 and subsequently at 02 yearly intervals, if indicated Glycosolated Hemoglobin test may be carved-out in suspected cases or as and when clinically indicated.

4.2.7 URINARY SYSTEM

(i) Any sequelae of disease or surgical procedures on the kidneys and the urinary tract likely to cause incapacity, in particular any obstructions due to stricture or compression in general shall be assessed as unfit Compensated nephrectomy without hypertension or uremia may be assessed as fit after obtaining accredited medical opinion.

(ii) An applicant who has undergone a major surgical operation on the urinary system, which has involved a total or partial excision or a diversion of any of its organs shall be assessed as unfit until such time as the Chief of Aviation Medicine, Civil Aviation Authority, having access to the details of the operation performed, considers that the effects of such operation are not likely to cause any incapacity in the flight.
(iii) Cases presenting any signs of organic disease of kidneys shall be assessed as unfit, those due to transient condition may be assessed temporarily unfit till cleared by CAMB. The urine shall contain no abnormal elements considered by the AME / CAMB to be of pathological significance. Cases of affections of urinary passages and of genital organs shall be assessed as unfit, those due to transient condition may be assessed as temporary unfit for which accredited medical opinion will be required.

(iv) An applicant for the first issue of licence who has a personal history of syphilis shall be required to furnish evidence, satisfactory to the CAMB, that the applicant has undergone adequate treatment and is likely to be cleared within next 02 years.

(v) An applicant showing any clinical signs of active syphilis should be assessed as temporarily unfit for a period of not less than three months front the date of the medical examination. At the end of the three months period, provided the applicant furnished proof, satisfactory to the medical examiner, that the applicant has undergone adequate treatment in the interim and that the serological reaction for syphilis is negative, the applicant may be assessed as fit; but where a licence is issued or renewed in these circumstances it should be valid only for a period of three months in the first instance. Thereafter, provided serological reactions for syphilis to be negative, the validity of the licence should be restricted to consecutive periods of three months. When the applicant has been under observation under this scheme for a total period of at least three years and the serological reactions have continued to be negative, the restrictions on the period of validity of the licence may be removed. In case where the serological reaction for syphilis remains persistently positive, examinations of the cerebrospinal fluid at the end of each period of six months, with negative results, may be accepted in lieu of
negative serological reactions at the end of each period of three months.

4.2.8 GYNECOLOGICAL EXAMINATION

(i) Applicants who have a history of severe menstrual disturbances that have proved unamenable to treatment and that are likely to interfere with the safe exercise of the applicant's licence and rating privileges shall be assessed as unfit.

(ii) Applicants who have undergone gynecological operations should be considered individually on case to case basis.

(iii) Pregnancy shall be a cause of temporary unfitness. However in the absence of significant abnormalities, accredited medical opinion may indicate fitness during the middle months of pregnancy. Following confinement or termination of pregnancy, the applicant shall not be permitted to exercise the privileges of her licence until she has undergone re-examination and has been assessed as fit by the competent medical authority.

4.2.9 CARDIOVASCULAR SYSTEM

(i) The applicant shall not possess any abnormality of the heart, congenital or acquired, which is likely to interfere with the safe exercise of the applicant's licence and rating privileges. A history of proven myocardial infarction shall be disqualifying. Suspected cases of ischaemic heart disease and CAD shall be investigated and assessed as per criteria laid-down in the subsequent paragraphs. Such commonly occurring conditions as respiratory arrhythmia, occasional extrasystoles which disappear on exercise, increase of pulse rate from excitement or exercise, or a slow pulse not associated with auriculoventricular dissociation may be regarded as being within 'Normal' limits. The cases of treated myocardial infarction, coronary angioplasty and CABGS
shall be assessed according to the criteria laid-down to the subsequent paragraphs.

(ii) Electrocardiography shall form part of the heart examination for the first issue of a licence and shall be included in re-examinations of applicants between the ages of 30 and 40 no less frequently than every two years, and thereafter, no less frequently than annually, and in re-examination and in all doubtful cases when clinically indicated.

(iii) The systolic and diastolic blood pressures shall be within normal limits as per appendix-O8. The use of drugs for control of high blood pressure is disqualifying, except for those drugs, the use of which, according to accredited medical conclusion, is compatible with the safe exercise of the applicant's licence and rating privileges.

(iv) There shall be no significant functional nor structural abnormality of the circulatory tree.
4.3 RESPIRATORY SYSTEM

(i) There shall be no acute disability of the lungs nor any active disease of the structure of the lungs, mediastinum or pleurae. Radiography shall form a part of the medical examination in all doubtful clinical cases as and when indicated. However during initial issuance of licences, radiography shall form a part of the chest examination. Radiography shall be repeated thereafter every 02 years and when clinically indicated.

(ii) Cases of pulmonary emphysema should be assessed as unfit only if the condition is causing symptoms and is likely to interfere in the safe performance of licence and rating privileges.

(iii) Cases of active pulmonary tuberculosis, duly diagnosed, shall be assessed as unfit. Cases of quiescent or healed lesions which are known to be tuberculous, or, are presumably tuberculous in origin, may be assessed as fit after obtaining accredited medical opinion.

(iv) However in case of doubts about the activity of a lesion, where symptoms of activity of the disease are lacking clinically, should be assessed as temporarily unfit for a period of not less than three months from the date of the medical examination. At the end of the three months period, a further radiography record should be made and compared carefully with the original. If there is no sign of extension of the disease and there are no general symptoms nor symptoms referable to the chest, the candidates may be assessed as fit for three months. Thereafter, provided there continue to be no sign of extension of the disease as shown by radiographic examinations carried out at the end of each three months period, the validity of the licence should be restricted to consecutive periods of three months. When the candidate has been under observation under this scheme for a total period of at least two years and comparison
of all the radiographic records show no changes or only retrogression of the lesion, the lesion should be regarded as 'quiescent' or 'healed'.

(v) Any extensive multilation of the chest wall with collapse of thoracic cage and sequelae or surgical procedures resulting in decreased respiratory efficacy at all altitudes shall be assessed as unfit.

4.3.1 RETICULO-ENDOTHELIAL SYSTEM

(i) Cases of severe and moderate enlargement of the spleen persistently below the costal margin shall be assessed as unfit.

(ii) Cases of significant localized and generalized enlargement of the lymphatic glands and or diseases of the blood shall be assessed as unfit, except in cases where accredited medical opinion indicates that the condition is not likely to affect the safe exercise of the applicant's licence and rating privileges. Cases due to a transient condition should be assessed as only temporarily unfit.

(iii) Possession of the sickle cell trait should not be a reason for disqualification unless there is positive medical evidence to the contrary.

4.3.2 EAR EXAMINATION

There shall be

(a) no active pathological process, acute or chronic, of the internal ear or of the middle ear:

(b) no unhealed (unclosed) perforation of the tympanic membranes. A single dry perforation need not render the applicant unfit Licences shall not be issued or renewed in these circumstances unless the appropriate hearing requirements as specified in subsequent paras are complied with;

(c) no permanent obstruction of the Eustachian tubes; and
(d) no permanent disturbances of the vestibular apparatus. However transient conditions may be assessed as temporarily unfit.

4.3.3 **NOSE, THROAT AND MOUTH EXAMINATION**

(a) There shall be free nasal air entry on both sides.

(b) There shall be no serious malformation nor serious, acute or chronic affection of the buccal cavity or upper respiratory tract.

(c) Cases of Speech defects and stuttering shall be assessed as unfit.

4.3.4 **HEARING REQUIREMENTS**

The medical examination shall be based on the following requirements:

(a) The applicant, tested on a pure tone audiometer at first issue of licence, not less than once every 05 years up to the age of 40 years, and thereafter not less than once every 03 years, shall not have a hearing loss, in either ear separately, of more than 35 dB at any of the frequencies 500, 1000 or 2000 Hz, or more than 50 dB at 3000 Hz. However an applicant with a hearing loss greater than the above may be declared fit provided that:

(i) the applicant has a hearing performance in each ear separately equivalent to that of a normal person, against a background noise that will simulate the masking properties of flight deck noise upon speech and beacon signals, and

(ii) The applicant has the ability to hear an average conversational voice in a quiet room, using both ears, at a distance of 02 meters (6 feet) from the examiner, with the back turned to the examiner.
(b) Alternatively, other methods providing equivalent results to those specified in para (a) above shall be used.

**NOTE**

The use of hearing aids may be acceptable under some circumstances. If the applicant is unable to pass any of the above tests without the use of hearing aids, he/she may be Tested using hearing aids. If the applicant meets the standards with the use of hearing aids, the certificate may be issued with restrictions.

**4.3.5 VISUAL REQUIREMENTS**

4.3.5.1 The medical examination shall he based on the following requirements:-

(a) The function of the eyes and their adnexa shall he normal. There shall be no active pathological condition, acute or chronic, nor any sequelae of surgery or trauma of the eyes or their adnexa likely to reduce proper visual functions to an extent that would interfere with the safe exercise of the applicant's licence and rating privileges

(b) Distant visual acuity with or without correction shall be 6/9 or better in each eye separately and binocular visual acuity shall be 6/16 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:-

(i) Such correcting lenses are worn during the exercise of the privileges of the licence or rating applied for or held: and

(ii) In addition, a pair of suitable correcting spectacles is kept readily available during the exercise of the privileges of the applicant's licence.

4.3.5.2 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 Out discretion of Chief of Aviation Medicine subject to conditions laid-down in this ANO. Cloth 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:

(i) a substantial decrease in the uncorrected visual acuity, and
any decrease in best corrected visual acuity, and
the occurrence of eye disease, eye injury or eye surgery.

4.3.5.3 Applicants may use contact lenses to meet their visual requirements provided that:-
(i) the lenses are monofocal and non-tinted
(ii) the lenses are well tolerated, and
(iii) a pair of suitable correcting spectacles is kept readily available during the exercise of the licence privileges.

**Note:**
Applicants who used contact lenses may not need to have their uncorrected visual acuity measured at each re-examination provided the history of their contact lenses prescription is known.

(iv) Applicants with a large refractive error shall use contact lenses or high index spectacle lenses.

**Note:**
If spectacles are used, high index lenses are needed to minimize peripheral field distortion.

4.3.5.4 Applicants whose uncorrected distant visual acuity in either eye is more than 6160, shall be required to provide a full ophthalmic report prior to initial Medical Assessment and every Five years thereafter.

**Note:**
The purpose of the required ophthalmic examination is:
(i) to ascertain normal visual performance and
(ii) to identify any significant pathology.

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

4.3.5.6 The applicant shall have the ability to read, while wearing the correcting lenses, if any. required under para 4.3.5.1, the N5 chart or its equivalent at a distance selected by that applicant in the range of 30 to 50 centimeters (12 to 20 inches) and the ability to read the N14 chart or its equivalent at a distance of 100
centimeters (40 inches). If this requirement is met only by the use of near correction, the applicant may be assessed as fit provided that his near correction is added to the spectacle correction already prescribed in accordance with para 4.3.5.1, if no such correction is prescribed, a pair of spectacles for near use shall be kept readily available during the exercise of 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.

4.3.5.7 An applicant who needs near correction to meet his requirement will require ‘lookover’, 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 distance visual acuity and is therefore not acceptable.

**Note:**
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 he is likely to function.

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

4.3.5.9 The applicant shall be required to have normal fields of vision and shall be required to have normal binocular functions. However, defective stereopses, abnormal convergence not interfering with near vision and colour misalignments where the fusional reserves are sufficient to prevent asthenopia and diplopia may not be assessed as disqualifying conditions unless accredited medical conclusion indicates otherwise.
4.4 **CLASS-II MEDICAL ASSESSMENT**

These requirements are applicable for initial and renewal medical examinations of Personnel holding PPL, SPL, GPL, Free Balloon Pilots, Flight Radio Telephone Operators. Ultra Light Aircraft Operators and Cabin Crew Attendants.

4.4.1 **PHYSICAL AND MENTAL REQUIREMENTS**

The medical examination shall be based on the following requirements:

(a) The applicant shall not suffer from any disease or disability which could render him or her likely to become suddenly or subtly incapacitated to the extent that the applicant is unable either to operate an aircraft safely or to perform his assigned duties safely.

(b) The applicant shall have no established medical history or clinical diagnosis of:
   (i) a psychosis;
   (ii) alcoholism
   (iii) drug dependence;
   (iv) any personality disorder, particularly if severe enough to have repeatedly resulted in over-acts; or
   (v) a mental abnormality, or neurosis of a significant degree; such as might render the applicant unable to safely exercise the privileges of the licence applied for or held, unless accredited medical conclusion indicates that in special circumstances, the applicant's failure to meet the requirement is such that exercise of the privileges of the licence applied for is not likely to jeopardize flight safety.
such that exercise of the privileges of the licence applied for is not likely to jeopardize flight safety.

(c) The applicant should have no established medical history or clinical diagnosis of any mental abnormality, personality disorder of neurosis which, according to accredited medical conclusion, makes it likely that within two years of the examination, the applicant will be unable to safely exercise the privileges of the licence or rating applied for or held.

(d) A history of acute toxic psychosis need not be regarded as disqualifying provided that the applicant has suffered no permanent impairment.

4.4.2 EXAMINATION OF NERVOUS SYSTEM

The applicant shall have no established medical history or clinical diagnosis of any of the following--

(a) A progressive or non-progressive disease of the nervous system, the effects of which according to accredited medical conclusion are likely to interfere with the safe exercise of the applicant's licence and rating privileges;

(b) Epilepsy; or

(c) Any disturbance of consciousness without satisfactory medical explanation of the cause and which may recur.

4.4.3 INJURIES TO THE HEAD

Cases of head injury and neurological procedures, the effects of which, according to accredited medical conclusion, are likely to interfere with the safe exercise of the applicant's licence and rating privileges shall be assessed as unfit.
4.4.4 GENERAL SURGICAL EXAMINATION

The applicant shall neither suffer from any wound/injury nor have undergone any operation, nor possess any abnormality, congenital or acquired, which is likely to interfere with the safe operation of an aircraft, or with the safe performance of his duties and privileges of his licence:-

(a) The applicant shall be required to be completely free from those hernias that might give rise to incapacitating symptoms during flights.

(b) The applicant shall be free from any residual effects of general vascular and orthopedic surgeries.

(c) The applicant shall not use any implants, prosthesis which are likely to interfere with safe operations of aircraft or with the safe performance of his licence privileges.

4.4.5 LOCOMOTOR SYSTEM

Any active disease of the bones, joints, muscles or tendons and all serious functional sequelae of the congenital or acquired disease shall be assessed as unfit. On issue or renewal of a licence, functional after effects of lesions affecting the bones, joints, muscles or tendons and certain anatomical defects compatible with the safe exercise of the applicant's licence and rating privileges may be assessed as fit.

4.4.6 DIGESTIVE AND METABOLIC DISORDERS

(i) Any sequelae of disease or surgical intervention of any part of digestive tract and its adnexae, likely to cause incapacity in flight, particularly any obstructions due to stricture or compression shall be assessed as unfit.

(ii) An applicant who has undergone a major surgical operation on the billiard passages or the digestive tract or its adnexae, which has involved a total or partial excision of a diversion of any of these organs should be assessed as unfit until such time as the
Chief of Aviation Medicine, Civil Aviation Authority having access to the details of the operation procedures undertaken, considers that the effects of such operation are not likely to cause his incapacity in the flight

(iii) Cases of disabling disease with important impairment of function of gastro-intestinal tract or its adnexae shall be assessed as unfit.

(iv) Cases of metabolic, nutritional or endocrine disorders likely to interfere with the safe exercise of the applicant's licence and rating privileges shall be assessed as unfit.

(v) Proven cases of Diabetes mellitus shown to be satisfactorily controlled, without the use of any anti-diabetic drug, may be assessed as fit. The use of anti-diabetic drugs for the control of diabetes is disqualifying except for those oral drugs administered under conditions permitted by accredited medical conclusion which are compatible with the safe exercise of applicant's licence and rating privileges. Blood sugar testing shall form part of the medical examination for initial issue of licence shall be included in the re-examinations at the age of 40 and subsequently at 02 yearly intervals, if indicated. Glycosolated Hemoglobin test may be carried-out in suspected cases or as and when clinically indicated.

4.4.7 URINARY SYSTEM

(i) Any sequelae of disease or surgical procedures on the kidneys and the urinary tract likely to cause incapacity, in particular any obstructions due to stricture or compression in general shall be assessed as unfit. Compensated nephrectomy without hypertension or uremia may be assessed as fit after obtaining accredited medical opinion.

(ii) An applicant who has undergone a major surgical operation on the urinary system, which has involved a total or partial excision or a diversion of any of its organs shall be assessed as unfit until
such time as the Chief of Aviation Medicine, Civil Aviation Authority having access to the details of the operation performed, considers that the effects of such operation are not likely to cause any incapacity in the flight.

(iii) Cases presenting any signs of organic disease of kidneys shall be assessed as unfit, those due to transient condition may be assessed temporarily unfit till cleared by CAMB. The urine shall contain no abnormal element considered by the AME / CAMB to be of pathological significance. Cases of affections of urinary passages and of genital organs shall be assessed as unfit. Those due to transient condition may be assessed as temporary unfit for which accredited medical opinion will be required.

(iv) An applicant for the first issue of licence who has a personal history of syphilis shall be required to furnish evidence, satisfactory to the CAMB, that the applicant has undergone adequate treatment and is likely to be cleared within next 02 years.

(v) An applicant showing any clinical signs of active syphilis should be assessed as temporarily unfit for a period of not less than three months from the date of the medical examination. At the end of the three months period, provided the applicant furnished proof, satisfactory to the medical examiner, that the applicant has undergone adequate treatment in the interim and that the serological reaction for syphilis is negative, the applicant may be assessed as fit, but where a licence is issued or renewed in these circumstances it should be valid only for a period of three months in the first instance. Thereafter, provided serological reactions for syphilis to be negative the validity of the licence should be restricted to consecutive periods of three months. When the applicant has been under observation under this scheme for a total period of at least three years and the serological reactions have continued to be negative, the restrictions on the period of validity of the licence may be
removed. In case where the serological reaction for syphilis remains persistently positive, examinations of the cerebrospinal fluid at the end of each period of six months, with negative results, may be accepted in lieu of negative serological reactions at the end of each period of three months.

4.4.8 **GYNECOLOGICAL EXAMINATION**

(i) Applicants who have a history of severe menstrual disturbances that have proved unamenable to treatment and that are likely to interfere with the safe exercise of the applicant's licence and rating privileges shall be assessed as unfit.

(ii) Applicants who have undergone gynecological operations should be considered individually on case to case basis

(iii) Pregnancy shall be a cause of temporary unfitness. However in the absence of significant abnormalities, accredited medical opinion may indicate fitness during the middle months of pregnancy. Following confinement or termination of pregnancy, the applicant shall not be permitted to exercise the privileges of her licence until she has undergone re-examination and has been assessed as fit by the competent authority.

4.4.9 **CARDIOVASCULAR SYSTEM**

(i) The applicant shall not possess any abnormality of the heart, congenital or acquired, which is likely to interfere with the safe exercise of the applicant's licence and rating privileges. A history of proven myocardial infarction shall be disqualifying. Suspected cases of ischaemic heart disease and CAD shall be investigated and assessed as per criteria laid-down in the subsequent paragraphs. Such commonly occurring conditions as respiratory arrhythmia, occasional extrasystoles which disappear on exercise, increase of pulse rate from excitement or exercise, or a slow pulse not associated with auriculoventricular dissociation may be regarded as being within 'Normal' limits. The
cases of treated myocardial infarction, coronary angioplasty and CASGS shall be assessed according to the criteria laid-down in the appendices.

(ii) Electrocardiography shall form part of the heart examination for the first issue of a licence and shall be included in re-examinations of applicants after the age of 30 and thereafter, no less frequently than every 05 years, and in re-examinations of all doubtful cases when clinically indicated.

(iii) The systolic and diastolic blood pressures shall be within normal limits. The use of drugs for control of high blood pressure is disqualifying, except for those drugs, the use of which, according to accredited medical conclusion, is compatible with the safe exercise of the applicant's licence and rating privileges.

(iv) There shall be no significant functional nor structural abnormality of the circulatory tree.
4.5 RESPIRATORY SYSTEM

(i) There shall be no acute disability of the lungs nor any active disease of the structure of the lungs, mediastinum or pleurae. Radiography shall form a part of the medical examination in all doubtful clinical cases as and when indicated. However during initial issuance of licences, radiography shall form a part of the chest examination. Radiography shall be repeated thereafter every 02 years and when clinically indicated.

(ii) Cases of pulmonary emphysema should be assessed as unfit only if the condition is causing symptoms and is likely to interfere in the safe performance of licence and rating privileges.

(iii) Cases of active pulmonary tuberculosis, duly diagnosed, shall be assessed as unfit. Cases of quiescent or healed lesions which are known to be tuberculous, or, are presumably tuberculous in origin, may be assessed as fit after obtaining accredited medical opinion.

(iv) However in case of doubts about the activity of a lesion, where symptoms of activity of the disease are lacking clinically, should be assessed as temporarily unfit for a period of not less than three months from the date of the medical examination. At the end of the three months period, a further radiography record should be made and compared carefully with the original. If there is no sign of extension of the disease and there are no general symptoms nor symptoms referable to the chest, the candidates may be assessed as fit for three months. Thereafter, provided there continuous to be no sign of extension of the disease as shown by radiographic examinations carried out at the end of each three months period, the validity of the licence should be restricted to consecutive periods of three months. When the candidate has been under observation under this scheme for a total period of at least two years and comparison
of all the radiographic records shows no changes or only retrogression of the lesion, the lesion should be regarded as ‘quiescent’ or ‘healed’.

(v) Any extensive mutilation of the chest wall with collapse of thoracic cage and sequelae or surgical procedures resulting in decreased respiratory efficacy at all altitudes shall be assessed as unfit.

4.5.1 RETICULO-ENDOTHELIAL SYSTEM

(i) Cases of severe and moderate enlargement of the spleen persistently below the costal margin shall be assessed as unfit.

(ii) Cases of significant localized and generalized enlargement of the lymphatic glands and or diseases of the blood shall be assessed as unfit, except in cases where accredited medical opinion indicates that the condition is not likely to affect the safe exercise of the applicant's licence and rating privileges. Cases due to a transient condition should be assessed as only temporarily unfit.

(iii) Possession of the sickle cell trait should not be a reason for disqualification unless there is positive medical evidence to the contrary.

4.5.2 EAR EXAMINATION

There shall be:

(a) no active pathological process, acute or chronic, of the internal ear or of the middle ear;

(b) no unhealed (unclosed) perforation of the tympanic membranes. A single dry perforation need not render the applicant unfit. Licences shall not be issued or renewed in these circumstances unless the appropriate hearing requirements as specified in subsequent paras are complied with;
(c) no permanent obstruction of the Eustachian tubes; and

(d) no permanent disturbances of the vestibular apparatus. However transient conditions may be assessed as temporarily unfit.

4.5.3 **NOSE, THROAT AND MOUTH EXAMINATION**

(a) There shall be free nasal air entry on both sides.

(b) There shall be no serious malformation nor serious, acute or chronic affection of the buccal cavity or upper respiratory tract.

(c) Cases of Speech defects and stutteiing shall be assessed as unfit.

4.5.4 **HEARING REQUIREMENTS**

4.5.4.1 The medical examination shall be based on the following requirements:

(a) The applicant, tested on a pure tone audiometer at first issue of licence, not less than once every 05 years up to the age of 40 years, and thereafter not less than once every 03 years, shall not have a hearing loss, in either ear separately, of more than 35 dB at any of the frequencies 500, 1000 or 2000 Etz, or more than 50 dB at 3000 Hz. However an applicant with a hearing loss greater than the above may be declared fit provided that:

(i) the applicant has a hearing performance in each ear separately equivalent to that of a normal person, against a background noise that will simulate the masking properties of flight deck noise upon speech and beacon signals; and

(ii) the applicant has the ability to hear an average conversational voice in a quiet room, using both ears, at a
distance of 0.2 meters (6 feet) from the examiner, with the back turned to the examiner.

(b) Alternatively, other methods providing equivalent results to those specified in para (a) above shall be used.

4.5.4.2 The use of hearing aids may be acceptable under some circumstances. If the applicant is unable to pass any of the above tests without the use of hearing aids, he/she may be tested using hearing aids. If the applicant meets the standards with the use of hearing aids, the certificate may be issued with restrictions.

4.5.5 **VISUAL REQUIREMENTS**

4.5.5.1 The medical examination shall be based on the following requirements:-

(a) The function of the eyes and their adnexa shall be normal. There shall be no active pathological condition, acute or chronic, nor any sequelae of surgery or trauma of the eyes or their adnexa likely to reduce proper visual functions to an extent that would interfere with the safe exercise of the applicant's licence and rating privileges.

(b) 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-

(i) Such correcting lenses are worn during the exercise of the privileges of the licence or rating applied for or held; and

(ii) In addition, a pair of suitable correcting spectacles is kept readily available during the exercise of the privileges of the applicant's licence.

4.5.5.2 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 Chief of Aviation Medicine subject to conditions laid-down in this ANO. 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

(i) a substantial decrease in the uncorrected visual acuity, and
(ii) any decrease in best corrected visual acuity, and
(iii) the occurrence of eye disease, eye injury or eye surgery.

4.5.5.3 Applicants may use contact lenses to meet their visual requirements provided that:-

(i) the lenses are monofocal and non-tinted.
(ii) the lenses are well tolerated, and
(iii) a pair of suitable correcting spectacles is kept readily available during the exercise of the licence privileges.

**Note:-**

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

(iv) Applicants with a large refractive error shall use contact lenses or high index spectacle lenses.

**Note:-**

If spectacles are used, high index lenses are needed to minimize peripheral field distortion.

4.5.5.4 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.

**Note:-**

The purpose of the required ophthalmic examination is:

(i) to ascertain normal visual performance and
(ii) to identify any significant pathology.
4.5.5.5 Applicants who have undergone surgery affecting the refractive status of the eyes shall be assessed unfit unless they are free from those sequelae which are likely to interfere with the sale exercise of their licences and rating privileges.

4.5.5.6 The applicant shall have the ability to read, while wearing the correcting lenses, if any, required under para 4.5.5.1, the N5 chart or its equivalent at a distance selected by that applicant in the range of 30 to 50 centimeters (12 to 20 inches) and the ability to read the N14 chart or its equivalent at a distance of 100 centimeters (40 inches). If the requirement is met only by the use of near correction, the applicant may be assessed as fit provided that his near correction is added to the spectacle correction already prescribed in accordance with para 4.5.5.1, if no such correction is prescribed, a pair of spectacles for near use shall be kept readily available during the exercise of 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.

4.5.5.7 An applicant who needs near correction to meet this requirement will require 'lookover', 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 distance visual acuity and is therefore not acceptable.

**Note:**

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 he is likely to function.

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

4.5.5.9 The applicant shall be required to have normal fields of vision and shall be required to have normal binocular functions. However, defective stereopses, abnormal convergence not interfering with near vision and colour misalignments where the fusional reserves are sufficient to prevent asthenopia and diplopia may not be assessed as disqualifying conditions unless accredited medical conclusion indicates otherwise.
4.6 **CLASS-III MEDICAL ASSESSMENT**

These requirements are applicable for initial and renewal medical examinations of Personnel holding Air Traffic Controllers Licences/Authorizations.

4.6.1 **PHYSICAL AND MENTAL REQUIREMENTS**

The medical examination shall be based on the following requirements:-

(a) The applicant shall not suffer from any disease or disability which could render him or her likely to become suddenly or subtly incapacitated to the extent that the applicant is unable either to operate an aircraft safely or to perform his ATC assigned duties safely.

(b) The applicant shall have no established medical history or clinical diagnosis of:

(i) a psychosis;
(ii) alcoholism;
(iii) drug dependence;
(iv) any personality disorder, particularly if severe enough to have repeatedly resulted in over-acts, or

(v) a mental abnormality, or neurosis of a significant degree; such as might render the applicant unable to safely exercise the privileges of the licence applied for or held, unless accredited medical conclusion indicates that in special circumstances, the applicant's failure to meet the requirement is such that exercise of the privileges of the licence applied for is not likely to jeopardize flight safety.
(c) The applicant should have no established medical history or clinical diagnosis of any mental abnormality, personality disorder of neurosis which, according to accredited medical opinion, makes it likely that within two years of the examination, the applicant will be unable to safely exercise the privileges of the licence or rating applied for or held.

(d) A history of acute toxic psychosis need not be regarded as disqualifying provided that the applicant has suffered no permanent impairment.

4.6.2 EXAMINATION OF NERVOUS SYSTEM

The applicant shall have no established medical history or clinical diagnosis of any of the following:

(a) A progressive or non-progressive disease of the nervous system, the effects of which according to accredited medical conclusion are likely to interfere with the safe exercise of the applicant's licence and rating privileges;

(b) Epilepsy; or

(c) Any disturbance of consciousness without satisfactory medical explanation of the cause and which may recur.

4.6.3 INJURIES TO THE HEAD

Cases of head injury and neurological procedures, the effects of which, according to accredited medical conclusion, are likely to interfere with the safe exercise of the applicant's licence and rating privileges shall be assessed as unfit.

4.6.4 GENERAL SURGICAL EXAMINATION

The applicant shall neither suffer from any wound/injury nor have undergone any operation, nor possess any abnormality, congenital or acquired which is likely to interfere with the safe operation of an aircraft or with the safe performance of his duties and privileges of Iris licence -
(a) The applicant shall be required to be completely free from those hernias that might give rise to incapacitating symptoms during flights.

(b) The applicant shall be free from any residual effects of general vascular and orthopaedic surgeries.

(c) The applicant shall not use any implants, prosthesis which are likely to interfere with safe operations of aircraft or with the safe performance of his licence privileges.

4.6.5 **LOCOMOTOR SYSTEM**

Any active disease of the bones, joints, muscles or tendons and all serious functional sequelae of the congenital or acquired disease shall be assessed as unfit. On issue or renewal of a licence, functional after effects of lesions affecting the bones, joints, muscles or tendons and certain anatomical defects compatible with the safe exercise of the applicant's licence and rating privileges may be assessed as fit.

4.6.6 **DIGESTIVE AND METABOLIC DISORDERS**

(i) Any sequelae of disease or surgical intervention of any part of digestive tract and its adnexae, likely to cause incapacity in flight, particularly any obstructions due to stricture or compression shall be assessed as unfit.

(ii) An applicant who has undergone a major surgical operation on the biliary passages or the digestive tract or its adnexae, which has involved a total or partial excision or a diversion of any of these organs should be assessed as unfit until such time as the Chief of Aviation Medicine, Civil Aviation Authority having access to the details of the operation procedures undertaken, considers that the effects of such operation are not likely to cause hrs incapacity in the flight or during his assigned duties.
(iii) Cases of disabling disease with important impairment of function of gastro-intestinal tract or its adnexae shall be assessed as unfit.

(iv) Cases of metabolic, nutritional or endocrine disorders likely to interfere with the safe exercise of the applicant's licence and rating privileges shall be assessed as unfit.

(v) Proven cases of Diabetes mellitus shown to be satisfactorily controlled, without the use of any ant-diabetic drug, may be assessed as fit. The use of anti-diabetic drugs for the control of diabetes is disqualifying except for those oral drugs administered under conditions permitting accredited medical conclusion on compatible with the safe exercise of applicant's licence and rating privileges. Blood sugar testing shall form part of the medical examination for initial issue of licence shall be included in the re-examinations at the age of 40 and subsequently at 02 yearly intervals if indicated. Glycosolated Hemoglobin test may be carried-out in suspected cases or as and when clinically indicated.

4.6.7 URINARY SYSTEM

(i) Any sequelae of disease or surgical procedures on the kidneys and the urinary tract likely to cause incapacity, in particular any obstructions due to stricture or compression in general shall be assessed as unfit. Compensated nephrectomy without hypertension or uremia may be assessed as fit after obtaining accredited medical opinion.

(ii) An applicant who has undergone a major surgical operation on the urinary system, which has involved a total or partial excision or a diversion of any of its organs shall be assessed as unfit until such time as the Chief of Aviation Medicine, Civil Aviation Authority, having access to the details of the operation performed, considers that the effects of such operation are not
likely to cause any incapacity in the flight or during his assigned duties.

(iii) Cases presenting any signs of organic disease of kidneys shall be assessed as unfit, those due to transient condition may be assessed temporarily unfit till cleared by CAMB. The urine shall contain no abnormal element considered by the AME / CAMB to be of pathological significance. Cases of affections of urinary passages and of genital organs shall be assessed as unfit; those due to transient condition may be assessed as temporary unfit for which accredited medical opinion will be required.

(iv) An applicant for the first issue of licence who has a personal history of syphilis shall be requited to furnish evidence, satisfactory to the CAMB, that the applicant has undergone adequate treatment and is likely to be cleared within next 02 years.

(v) An applicant showing any clinical signs of active syphilis should be assessed as temporarily unfit for a period of not less than three months from the date of the medical examination. At the end of the three months period, provided the applicant furnished proof, satisfactory to the medical examiner, that the applicant has undergone adequate treatment in the interim and that the serological reaction for syphilis is negative, the applicant may be assessed as fit; but where a licence is issued or renewed in these circumstances it should be valid only for a period of three months in the first instance. Thereafter, provided serological reactions for syphilis to be negative the validity of the licence should be restricted to consecutive periods of three months. When the applicant has been under observation under this scheme for a total period of at least three years and the serological reactions have continued to be negative, the restrictions on the period of validity of the licence may be removed. In case where the serological reaction for syphilis remains persistently positive, examinations of the cerebrospinal
fluid at the end of each period of six months, with negative results, may be accepted in lieu of negative serological reactions at the end of each period of three months.

4.6.8 GYNECOLOGICAL EXAMINATION

(j) Applicants who have a history of severe menstrual disturbances that have proved unamenable to treatment and that are likely to interfere with the safe exercise of the applicant's licence and rating privileges during their assigned duties shall be assessed as unfit.

(ii) Applicants who have undergone gynecological operations should be considered individually on case to case basis.

(iii) Pregnancy shall be a cause of temporary unfitness However in the absence of significant abnormalities, accredited medical opinion may indicate fitness during the middle months of pregnancy. Following confinement or termination of pregnancy, the applicant shall not be permitted to exercise the privileges of her licence until she has undergone re-examination and has been assessed as fit by the competent authority.

4.6.9 CARDIOVASCULAR SYSTEM

(i) The applicant shall not possess any abnormality of the heart, congenital or acquired, which is likely to interfere with the safe exercise of the applicant's licence and rating privileges. An applicant indicated by accredited medical conclusion to have made a satisfactory recovery from myocardial infarction may be assessed as fit. Suspected cases of ischaemic heart disease and CAD shall be investigated and assessed as per criteria laid-down in the subsequent paragraphs. Such commonly occurring conditions as respiratory arrhythmia, occasional extrasystoles which disappear on exercise, increase of pulse rate from excitement or exercise, or a slow pulse not associated with auriculoventricular dissociation may be regarded as being within
'Normal' limits. The cases of treated myocardial infarction, coronary angioplasty and CABGS shall be assessed according to the criteria laid-down in the appendices.

(ii) Electrocardiography shall form part of the heart examination for the first issue of a licence and shall be included in re-examinations of applicants after the age of 30 and thereafter, no less frequently than every 05 years, and in re-examinations of all doubtful cases when clinically indicated.

(iii) The systolic and diastolic blood pressures shall be within normal limits. The use of drugs for control of high blood pressure is disqualifying, except for those drugs, the use of which, according to accredited medical conclusion, is compatible with the safe exercise of the applicant's licence and rating privileges.

(iv) There shall be no significant functional nor structural abnormality of the circulatory tree.
4.7 RESPIRATORY SYSTEM

(i) There shall be no acute disability of the lungs nor any active disease of the structure of the lungs, mediastinum or pleurae. Radiography shall form a part of the medical examination in all doubtful clinical cases as and when indicated. However during initial issuance of licences, radiography shall form a part of the chest examination. Radiography shall be repeated thereafter every 02 years and when clinically indicated.

(ii) Cases of pulmonary emphysema should be assessed as unfit only if the condition is causing symptoms and is likely to interfere in the safe performance of licence and rating privileges.

(iii) Cases of active pulmonary tuberculosis, duly diagnosed, shall be assessed as unfit. Cases of quiescent or healed lesions which are known to be tuberculous, or, are presumably tuberculous in origin, may be assessed as fit after obtaining accredited medical opinion.

(iv) However in case of doubts about the activity of a lesion, where symptoms of activity of the disease are lacking clinically, should be assessed as temporarily unfit for a period of not less than three months from the date of the medical examination. At the end of the three months period, a further radiography record should be made and compared carefully with the original. If there is no sign of extension of the disease and there are no general symptoms nor symptoms referable to the chest, the candidates may be assessed as fit for three months. Thereafter, provided there continue to be no signs of extension of the disease as shown by radiographic examinations carried out at the end of each three months period, the validity of the licence should be restricted to consecutive periods of three months. When the candidate has been under observation under this scheme for a total period of at least two years and comparison
of all the radiographic records shows no changes or only retrogression of the lesion, the lesion should be regarded as 'quiescent' or 'healed'.

(v) Any extensive mutilation of the chest wall with collapse of thoracic cage and sequelae or surgical procedures resulting in decreased respiratory efficacy at all altitudes shall be assessed as unfit.

4.7.1 RETICULO-ENDOTHELIAL SYSTEM

(i) Cases of severe and moderate enlargement of the spleen persistently below the costal margin shall be assessed as unfit.

(ii) Cases of significant localized and generalized enlargement of the lymphatic glands and or diseases of the blood shall be assessed as unfit, except in cases where accredited medical opinion indicates that the condition is not likely to affect the safe exercise of the applicant’s licence and rating privileges Cases due to a transient condition should be assessed as only temporarily unfit.

(iii) Possession of the sickle cell trait should not be a reason for disqualification unless there is positive medical evidence to the contrary.

4.7.2 EAR EXAMINATION

There shall be:

(a) no active pathological process, acute or chronic, of the internal ear or of the middle ear,

(b) no unhealed (unclosed) perforation of the tympanic membranes. A single dry perforation need not render the applicant unfit Licences shall not be issued or renewed in these circumstances unless the appropriate hearing requirements as specified in subsequent paras are complied with:
no permanent obstruction of the Eustachian tubes, and no permanent disturbances of the vestibular apparatus. However, transient conditions may be assessed as temporarily unfit.

### 4.7.3 NOSE, THROAT AND MOUTH EXAMINATION

(a) There shall be free nasal air entry on both sides.

(b) There shall be no serious malformation nor serious, acute or chronic affection of the buccal cavity or upper respiratory tract.

(c) Cases of Speech defects and stuttering shall be assessed as unfit.

### 4.7.4 HEARING REQUIREMENTS

4.7.4.1 The medical examination shall be based on the following requirements:

(a) The applicant, tested on a pure tone audiometer at first issue of licence, not less than once every 05 years up to the age of 40 years, and thereafter not less than once every 03 years, shall not have a hearing loss, in either ear separately, of more than 35 dB at any of the frequencies 500, 1000 or 2000 Hz, or more than 50 dB at 3000 Hz. However an applicant with a hearing loss greater than the above may be declared fit provided that:

(i) the applicant has a hearing performance in each ear separately equivalent to that of a normal person, against a background noise that will simulate that experienced in a typical Air Traffic Control working environment; and

(ii) the applicant has the ability to hear an average conversational voice in a quiet room, using both ears, at a distance of 02 meters (6 feet) from the examiner, with the back turned to the examiner.
(b) Alternatively, other methods providing equivalent results to those specified in para (a) above shall be used.

4.7.4.2 The use of hearing aids may be acceptable under some circumstances. If the applicant is unable to pass any of the above tests without the use of hearing aids, he/she may be tested using hearing aids. If the applicant meets the standards with the use of hearing aids, the certificate may be issued with restrictions.

4.7.5 VISUAL REQUIREMENTS

4.7.5.1 The medical examination shall be based on the following requirements:

(a) The function of the eyes and their adnexa shall be normal. There shall be no active pathological condition, acute or chronic nor any sequelae of surgery or trauma of the eyes or their adnexa likely to reduce proper visual functions to an extent that would interfere with the safe exercise of the applicant's licence and rating privileges.

(b) 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 (6/6) can be obtained only with correcting lenses, the applicant may be assessed as fit provided that:

(i) such correcting lenses are worn during the exercise of the privileges of the licence or rating applied for or held;

(ii) in addition, a pair of suitable correcting spectacles is kept readily available during the exercise of the privileges of the applicant's licence.
4.7.5.2 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 Chief of Aviation Medicine subject to conditions laid-down in this ANO. 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:

(i) a substantial decrease in the uncorrected visual acuity, and,

(ii) any decrease in best corrected visual acuity, and

(iii) the occurrence of eye disease, eye injury or eye surgery.

4.7.5.3 Applicant may use contact lenses to meet his visual requirements provided that:-

(i) the lenses are monofocal and non-tinted.

(ii) the lenses are well-tolerated, and

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

Note:

However 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 lenses prescription is known. Besides, the use of contact lenses or high index spectacle lenses is recommended for applicants with a large refractive error.

4.7.5.4 Applicants whose uncorrected distant visual acuity in either eye is more than 6/60, shall be required to provide a full satisfactory ophthalmic report prior to initial Medical Assessment and every five years thereafter.
4.7.5.5 Applicants who have undergone surgery affecting the refractive status of the eyes shall be assessed unfit unless they are free from those sequelae which are likely to interfere with the safe exercise of their licences and rating privileges.

4.7.5.6 The applicant shall have the ability to read, while wearing the correcting lenses, if any, required under para 4.7.5.1, the N5 chart or its equivalent at a distance selected by that applicant in the range of 30 to 50 centimeters (12 to 20 inches) and the ability to read the N14 chart or its equivalent at a distance of 100 centimeters (40 inches). If the requirement is met only by the use of near correction, the applicant may be assessed as fit provided that his near correction is added to the spectacle correction already prescribed in accordance with para 4.7.5.1. If no such correction is prescribed, a pair of spectacles for near rise shall be kept readily available during the exercise of 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.

4.7.5.7 An applicant who needs near correction to meet this requirement will require 'lookover', bifocal or perhaps multifocal lenses in order to read radar screens, visual displays and written or printed material and also to make use of distant vision through the windows without removing the lenses. Single-vision near correction (full lenses of one power only, appropriate for reading) may be acceptable for certain air traffic control duties. However it should be realized that single vision near correction significantly reduces distant visual acuity.

**Note:**

Whenever there is a requirement to obtain or renew correcting lenses, an applicant is expected to advise the refractionist of reading distances for the air traffic control duties, the applicant is likely to perform tasks relevant to the type of environment which he is likely to exercise such functions.

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

4.7.5.9 The applicant shall be required to have normal fields of vision and shall be required to have normal binocular functions. However, defective stereopses, abnormal convergence not interfering with near vision and colour misalignments where the fusional reserves are sufficient to prevent asthenopia and diplopia may not be assessed as disqualifying unless accredited medical conclusion indicates otherwise.
4.8 PROCEDURE FOR ISSUANCE OF WAIVERS

4.8.1 An applicant who does not satisfy the appropriate medical requirement may, at the discretion of DGCAA, can be accepted as eligible for the grant or renewal of licences so far as his medical requirements are concerned under such conditions and restrictions that may be considered, appropriate, in the particular case, if DGCAA has satisfactory evidence that the applicant had already acquired and demonstrated ability, skill and experience which could compensate for a failure to meet the prescribed medical standards without adversely influencing the said performance of his duties while exercising the privileges of licences and the accredited medical conclusion indicates that the conditions of the applicant is not such as to introduce any hazards either of sudden incapacity or of inability to perform his duties safely during the validity period of the licences. In issuing a medical certificate under this provision, DGCAA/licensing authority in consultation with CAM may do any or all of the following:

(i) Limit the duration of the certificate.

(ii) Condition the continued effect of the certificate on the results of subsequent medical tests, examination or evaluations through CAMB.

(iii) Impose any operational limitations on the certificate needed for safety reasons.

(iv) Condition the continued effect of a second and third class medical certificate on compliance with a statement of functional limitations issued to the applicant in coordination with Chief of Aviation Medicine and Chief Operation Manager of concerned airlines.

(v) Flight crew who being considered for special issuance of medical certificate shall not refuse any or all above restrictions / examinations / evaluations as determined by competent authority.
(vi) The Chief of Aviation Medicine if authorized by DGCAA/licensing authority may exercise powers under this provision.

4.8.2 Whenever DGCAA finds that additional medical information or history is necessary to determine whether an applicant or holder of licence does not meet the medical standards, in such circumstances, applicant or licence holder shall furnish any medical information or authorize any clinic, hospital, doctor or other person to release to the DGCAA/CAM any available information or records concerning his past, present medical history/treatment received or involved in psycho-active substances/illicit drugs.

4.8.3 If the applicant, or holder of licence, refuses to provide requisite medical information or history of medical dispensation or release of medical documents so requested, the DGCAA shall suspend, deny or revoke medical certificate that he holds or may, in the case, refuse to issue him a medical certificate.

4.8.4 DGCAA may authorize a special medical flight test, practical test, simulator tests or medical evaluation tests for this purpose on the lines as specified in previous chapters.

4.8.5 DGCAA may authorize application of waiver under flexibility rules to any flight crew or applicants on similar lines as specified in appropriate sections. However in case of Flight Engineers, such restrictions shall be limited to Flight Engineers duties only.
4.9 FLEXIBILITY/WAIVER IN THE APPLICATION OF MEDICAL REQUIREMENTS

4.9.1 The range of variations between individuals is such that if medical standards are laid-down in rigid terms, they will inevitably exclude number of pilots, who, though, not meeting the medical standards in all respects, might nevertheless be considered capable of performing duties safely in the aviation environments. Thus provision has to be made in the medical requirements for exercising degree of flexibility / waiver in the application of medical standards.

4.9.2 Nevertheless the flexibility clause must not lead to a situation where its use becomes "the rule" rather than exception. This flexibility clause must be exercised only in the exceptional cases keeping in view the flight safety requirements. Thus, when decision to exercise the flexibility / waiver is backed by accredited medical conclusion, it indicates that these decisions have not been regarded as a routine measures but have been taken following close examinations and assessment of all the medical factors and their relationship to personal performances. However the degree and the intensity of investigations lying behind each decision accurately measures compliance with the principles behind the flexibility clause.

4.9.3 The flexibility clause therefore must be approved by DGCAA with the following conditions:

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

(b) Relevant ability, skill and experience of the applicant and operational conditions have been given due consideration.

(c) The licence is endorsed with any special limitations / restrictions when the safe performance of the licence holders duties are dependent on compliance with such limitations periodically.
(d) The flexibility clause is applied either on the same class of licence or even lowering the licence category based on accredited medical conclusion. Such licence holders shall be allowed on multiple crew operational aircraft's as or with qualified co-pilot or as determined by CAMB.

**NOTE**

Guidance material on application of Flexibility / Waiver in respect of cardiovascular, visual and hearing problems is available in the Manual of Aviation Medicine and JAAR. Some of the medical conditions and certification which can be cleared under flexibility clause and should be applied on the discretion of DGCAA are mentioned in the subsequent paragraphs and will be supplemented from time to time by Chief of Aviation Medicine as separate supplements.
5.0 RISK FACTORS FOR ISCHAEMIC HEART DISEASE

A number of recommendations have been made regarding major primary and secondary risk factors for ischaemic heart diseases.

5.1 SMOKING

Trends to prohibit smoking on aircraft in both the cockpit and the cabin are strongly supported. A pilot with known ischaemic heart disease who continues to smoke should be disqualified from flying till he is evaluated through CAMB.

5.2 INCREASED SERUM CHOLESTEROL LEVELS

Flight crew pilots are encouraged to be aware of their serum cholesterol level and to maintain a normal level. Higher cholesterol levels, as determined from two consecutive assessments 01 month, apart, should disqualify a pilot with known coronary artery disease from flying till cholesterol level falls below required limits.

5.3 HYPERTENSION

5.3.1 Flight crew with known coronary artery disease, should have adequate control of blood pressure through such non-pharmacologic interventions such as dietary changes, weight loss, moderation of alcohol and salt consumption, relaxation and exercises etc.

5.3.2 A pilot should not be considered as having hypertension unless the diastolic blood pressure is higher than 90 mm Hg on at least three recordings on each of three or more occasions over 06 months. A systolic blood pressure higher than 140 mm Hg will require such confirmation. Confirmed elevation of blood pressure above certain age-specific levels should disqualify a pilot from flying. Guidance is available in the Manual of Civil Aviation Medicine. The permissible systolic and diastolic blood pressure according to age is specified in appendix-08.
5.3.3 Treatment of hypertension does not disqualify a pilot from licensure unless the subsequent blood pressure measurements exceed than the permissible or unless medication or combinations of medication that are unacceptable for flying are used. An established diagnosis of hypertension should be followed by screening for evidence of end-organ damage that is, resting electrocardiographic or, preferably, echocardiographic evidence of left ventricular hypertrophy; infarction; a history or clinical evidence of stroke; a history of intermittent claudication; or a serum creatinine level higher than 150 mol/L. In a pilot with target organ damage who smokes, even mild hypertension (diastolic blood pressure 90 to 99 mm Hg) will result in disqualification from flying based on accredited medical conclusion.
5.4. MEDICAL CONDITIONS & CERTIFICATION

5.4.1. ANGINA PECTORIS

(a) Angina Pectoris that is typical for ischaemic heart disease, regardless of whether medical therapy has been instituted, disqualifies a pilot from flying. Angina pectoris that is a typical for ischaemic heart disease, will also disqualify a pilot from flying if a non-cardiac cause cannot be established.

(b) A pilot's licence to fly may be reinstated, if coronary arteriography reveals normal coronary arteries, normal left ventricular function and if coronary vasospasm has been excluded and thallium scintigraphy reveals no evidence of ischaemia even in the presence of continuing symptoms of chest pain and, such symptoms must not be incapacitating in any way causing flight incapacitation. In such circumstances CAMB may allow such pilots to fly as or with co-pilot on multi crew flight operations till such time the board consider the pilot safe for single flight operations.

5.4.2. MYOCARDIAL INFARCTION

5.4.2.1 Acute myocardial infarction is incompatible with active flying in any class. However, disqualifying is not necessarily permanent, and reinstatement with restriction to multi-crew operations may be considered 09 months after the event if the following criteria are met:

(i) There are no symptoms of ischaemia in the absence of medication indicating normal resting ECG tracings.

(ii) Major modifiable risk factors for recurrence of infarction, including high blood pressure, diabetes mellitus and increased serum cholesterol level, are controlled, and the pilot is a nonsmoker.

(iii) The result of an exercise test to at least 85% of the predicted maximum heart rate with the Bruce protocol or equivalent is
normal in all respects. Cardiac medications must be stopped for an appropriate time before such test.

(iv) Left ventricular function, measured by the ejection fraction with gated radionuclide scintigraphy, is better than 50% at rest and increased by at least 10% with exertion.

(V) The heart rhythm during rest and exercise is shown by Holter monitoring to be free of repetitive ectopic beats and to have less than 10 ventricular ectopic beats per hour in the absence of anti-arrhythmic medication.

(vi) There should be no clinical history of complications such as shock, congestive heart failure or arrhythmia's after the recovery of myocardial infarction.

(vii) The applicant must be normotensive, have normal kidney functions, normal body weight and good physical examination, electrocardiography at rest and a review of modifiable risk factors. A spect thallium should be done every 02 years until the pilot is 50 years of age and subsequently at yearly intervals.

(viii) These criteria apply regardless of whether the patient was treated for acute thrombosis (e.g., with angioplasty or bypass surgery) or the infarction occurred in the absence of significant coronary artery disease as demonstrated by arteriography.

5.4.3 CABG SURGERY

5.4.3.1 Treatment of symptomatic or asymptmatic ischaemic heart disease with bypass surgery (in the absence of a history of acute myocardial infarction including preoperative infarction) disqualifies a pilot from flying for at least 09 months. Relicensure may be considered with restriction of flying on multi-crew operations only (i.e. as or with co-pilot) provided the following criteria are met:

(i) The current clinical evaluation indicates no cardiovascular symptoms, a normal cardiovascular examination, the absence of
coronary risk factors, and no requirement for disqualifying medications.

(ii) Normal 24-hours ambulatory monitoring with no arrhythmia's.

(iii) Normal functional capacity by exercise stress testing, and no evidence of ischaemia or electrical instability.

(iv) Normal myocardial perfusion by radionuclide scans under stress.

(v) Normal wall motion and ejection fraction at rest and no wall motion abnormalities under stress and normal ejection fraction response.

(vi) Major risk factors, including high blood pressure and increased blood glucose and serum cholesterol levels, are absent, and the pilot is a non-smoker and nor-motensive.

(vii) Results of cardiac catheterization performed 09 months after surgery demonstrate:

(a) no un-bypassed functionally significant obstructive coronary artery diseases;

(b) anatomic patency of bypass grafts;

(c) normal wall motion on ventriculography;

(d) normal ventricular haemodynamics.

5.4.3.2 Selected cases such as those fulfilling the above criteria might be considered for licensing, provided that the applicant is re-evaluated no less frequently than every six months and that continued stability is confirmed by an accredited medical conclusion annually thereafter. The following assessment every 12 months should include thorough history-taking and physical examination, electrocardiography at rest and a review of modifiable risk factors. A spect thallium should be done 02 yearly until pilot is 50 years
of age and subsequently at yearly intervals. Angiography be repeated not more than 05 years after re-certification. However in case of Flight Engineers such restrictions shall be limited to Flight Engineers duties only.

5.4.4 **CORONARY ANGIOPLASTY**

Pilots with symptomatic or asymptomatic coronary artery disease but no history of acute myocardial infarction who have been treated by coronary angioplasty may be reconsidered for licensure 09 months with restrictions to multi-crew operations as or with co-pilot except for Flight Engineers who shall perform Flight Engineers duties only after the procedure if the following criteria are met:

(i) Successful dilation is maintained and there is no progression of disease, as demonstrated by repeated angiography 09 months after the initial procedure.

(ii) Rest and exercise thallium scans show no perfusion defects.

(iii) The current clinical evaluation indicates no cardiovascular symptoms, a normal cardiovascular examination, the absence of coronary risk factors, and no requirement for disqualifying medication.

(iv) Normal 24-hours ambulatory monitoring by Holter monitor.

(v) Normal functional capacity by exercise stress testing and no evidence of ischaemia or electrical instability thereafter.

(vi) Normal wall motion and ejection fraction at rest and no wall motion abnormalities under stress and normal ejection fraction response on echocardiography.

(vii) Follow-up assessment every 12 months should include thorough history taking, physical examination, rest and exercise electrocardiography. If there is no clinical deterioration after 02 years, spect thallium should be done every 02 yearly until the pilot is 50 years of age and subsequently at yearly intervals.
5.4.5 DYSRHYTHMIAS

5.4.5.1 SUPRAVENTRICULAR DYSRHYTHMIAS

Supraventricular tachydysrhythmias may accompany self-limited illness like pneumonia or treatable conditions like hyperthyroidism. In such cases the need for restricted flying will be only temporary. Even an isolated episode of atrial fibrillation for which no cause can be established by cardiovascular assessment shall not necessarily restrict a pilot's flying provided there are no recurrences. Indeed, pilot's whose treatment with an antiarrhythmic agent is successful (e.g., as in an isolated episode of fibrillation treated with digoxin) need not be restricted from flying.

5.4.5.2 WOLFF-PARKINSON-WHITE SYNDROME

Not all cases of Wolff-Parkinson-While syndrome are associated with incapacitation dysrhythmias. The risk of incapacitating symptoms in people who have never had tachycardia is low but is not known with any precision. Asymptomatic pilots may qualify for licensure if their response to a treadmill exercise test is normal in all response and if electrophysiological studies during atrial fibrillation have demonstrated conduction at rates under 200 beats per minute. Asymptomatic bouts of tachycardia may be acceptable in pilots who have never experienced disability symptoms and who meet the above criteria with respect to treadmill exercise testing and atrial fibrillation. Restricted licensure may be considered 06 months after a symptomatic episode of tachycardia has been controlled with medication. Pilots in whom accessory pathway connections have been surgically corrected and who are subsequently free of tachy-dysrhythmias may be considered for relicensure for unrestricted flying for limited period.

5.4.5.3 VENTRICULAR DYSRHYTHMIAS

The main concern with ventricular dysrhythmias is the underlying condition to the myocardium. A careful assessment should be done to determine the presence of structural heart disease. If the myocardium is normal, ventricular ectopy should be judged on the basis of the disability
produced and, to a lesser extent, in the presence or absence of complex forms. Although the complexity of premature ventricular beats is poorly correlated with risk in the presence of normal myocardial tissue, the appearance of multiform or repetitive forms of ventricular ectopy (i.e. couplets, runs) should indicate the need for a thorough cardiac examination since these and other high-grade forms of ectopy are more commonly seen in the structural heart disease. Re-certification be considered after getting accredited medical opinion with some restrictions.

5.4.6 CARDIAC PACEMAKERS

The reliability and safety of implantable cardiac pacemakers is well established. Conditions in which there is a structural heart disease and for which the requirements for a pacemakers are intermittent, need not disqualify a pilot from flying. Each case will need to be considered individually and not before 03 months after successful implantation. However in doubtful cases, accredited medical opinion shall be obtained.

5.4.7 CONDUCTION DISORDERS

(a) First-and second-degree (Type-1) atrioventricular conduction delay can be seen during rest (particularly sleep) in healthy people who engage in vigorous exercises. Atrioventricular block should be investigated to rule-out heart disease. A licence to fly need not be restricted for an otherwise healthy pilot with no other cardiac problems.

(b) The presence of fascicular blocks, particularly those of recent onset, indicates the need for a thorough cardiovascular examination to rule out structural, particularly ischaemic heart disease. The result of a maximal treadmill exercise test must be normal in all respects.
5.4.8 VALVULAR HEART DISEASE

The significance of valvular heart diseases depends primarily on the hemodynamic consequences of functional status with relevant cause. Rarely surgical correction will reduce the risk of sudden incapacitation to acceptable levels. However in some cases it may even increase the risks of incapacitation. Thus re-certification should be assessed on the basis of accredited medical opinion through CAMB:

5.4.8.1 MITRAL STENOSIS

In view of its progressive nature and its propensity for thromboembolic complications, mitral stenosis of any severity disqualifies a pilot from flying in any class based on accredited medical conclusion.

5.4.8.2 AORTIC STENOSIS

Moderate or severe aortic stenosis is unacceptable for unrestricted flying. Pilots with mild stenosis of the aortic valve can be considered for licensure with restrictions if the following conditions are met. The mean systolic pressure gradient across the aortic valve is shown to be less than 30 mm Hg by echocardiography or Doppler imaging or less than 20 mm Hg by invasive hemodynamic studies with following criteria.

(a) There are no symptoms of underlying disease.

(b) Holter monitoring reveals no dysrhythmias.

(c) The result of maximal treadmill exercise test is normal in all respects.

Because of the increased risk of endocarditis in people with aortic stenosis, prophylaxis with antibiotics must be strictly adhered to. Follow-up should include a yearly assessment with at least two-dimensional echocardiography to monitor any progression.
5.4.8.3 **AORTIC REGURGITATION**

Pure isolated regurgitation is uncommon; therefore, assessment of a pilot with aortic regurgitation will likely include consideration of any associated disorder. Only mild, asymptomatic aortic regurgitation can be considered acceptable in pilots only if the following criteria are met.

(a) The pulse pressure is less than 55 mm Hg, and the diastolic pressure is greater than 65 mm Hg

(b) The end-diastolic internal diameter of the left ventricle is less than 55 mm Hg, as measured by two-dimensional echocardiography.

(c) Exercise-induced ventricular tachycardia can occur in healthy people. These events are invariably self-terminating, and, even with electrophysiologic provocation, sustained ventricular tachycardia is not seen. Most people have one episode only. A licence to fly need not be restricted in such cases unless there are recurrent episodes which have to be investigated and licence is issued on the basis of accredited medical conclusion.

5.4.9 **CARDIOMYOPATHY**

5.4.9.1 Hypertrophic cardiomyopathy poses a significant risk for sudden incapacitation and therefore disqualifies a pilot from flying regardless of whether there has been surgical treatment. Pilots with minor degrees of symmetric hypertrophy should be considered individually keeping in view the other underlying factors effecting heart and its vasculature.

5.4.9.2 Non-hypertrophic cardiomyopathies (e.g., dilated or congestive in their active phase) disqualify a pilot from flying. However, relicensure may be considered after recovery if the following conditions are met.

(a) Cardiac symptoms are absent.

(b) There is no need for medication and monitoring.
(c) The results of cardiovascular examination are normal in all respects.
5.5 **HYPERTHYROIDISM**

(a) This condition usually occurs in connection with toxic adenoma of the thyroid and has an immunological basis. Medication is by antibodies of the TSH receptor which stimulates the autonomous over-production of thyroid Hormone. Toxic nodular goiter or toxic adenoma also over produces thyroid Hormone but not on an auto-immune basis.

(b) Hyperthyroid pilots are unfit for flying and must remain so until a stable enthyroid state has been attained. Certification may be considered through CAMB in any category when they are enthyroid. The individual must be annually reviewed to guard against recurrence or the development of hypothyroidism. The continued use of anti-thyroid drugs, if well tolerated, is consistent with restricted certification.

5.6 **HYPOTHYROIDISM**

(a) The failure of the thyroid gland to produce sufficient thyroid Hormone may be due to interference with the hypothalamic production of thyroid releasing Hormone or the pituitary production of thyroid stimulating hormone. However much more frequently the condition is caused by inflammation or destruction of the thyroid gland, and may be a sequel of surgery or radioiodine treatment of hyperthyroid state the destruction of the gland through an auto-immune mechanism may lead to apparent spontaneous cessation of function which may be an extremely chronic process.

(b) Florid hypothyroidism requires a temporary unfit assessment. The candidate may be considered for re-certification in any capacity while they are enthyroid and are taking prescribed medication. Annual endocrinological supervision is required by the Board. However some hypothyroid candidates cease
medication because they feel entirely well but recurrence of the condition may not be obvious and the typical apathy may lessen the chance of recognition. Annual review is therefore essential through CAMB.

5.7 POLYCYTHAEMIA

Applicants with a haematocrit greater than 55% must be denied certification. Further investigation is needed to establish the actiology. If successfully treated with a haematocrit below 55%, a certificate can be issued. However annual review is required through CAMB. Polycythaemia vera is disqualifying due to its thromboembolic complications and rapid and unpredictable progression.
5.8 HEPATITIS

Hepatic conditions may be acute, chronic, infective or obstructive in nature. Any active inflammation for whatever reason, requires a temporary unfit assessment and may be re-assessed for certification when asymptomatic, non-infectious and with normal liver function tests. Certification for other types of Hepatitis is determined as under:-

(a) Hepatitis associated with drugs or alcohol abuse will require this condition to be treated before certification can be considered by CAMB.

(b) Chronic hepatitis must be assessed individually but if associated with cirrhosis and reduced liver function, should be assessed as disqualifying.

(c) Gilbert's disease is acceptable for certification as may be minor liver function test abnormalities which are not supported by a clinical history.

Such cases shall be decided on the basis of accredited medical conclusion and have to be assessed periodically till repeated liver function tests are negative for 01 year.
5.9 **BRONCHIAL ASTHMA**

5.9.1 Asthma is defined as a disorder characterised by obstruction of the intrapulmonary airways, such obstruction varying widely in short periods of time. It has a wide clinical spectrum varying from a single short-lived episode requiring no medication to that of a constant disabling condition. Its course and severity are unpredictable and sudden incapacitation is uncommon but potential hazard for all diagnosed asthmatics are always there.

5.9.2 Initial applicants who give a history of recent acute attacks of asthma shall be assessed as unfit for both Class-I and Class-II.

5.9.3 Initial Class-I applicants with a history of pre-existent asthma may be assessed as fit provided that:

(i) Minimum period of five years since last acute attack have lapsed.

(ii) Acceptable pulmonary function tests.

(iii) Treatment limited to inhaled chromoglycate and/or inhaled corticosteroid.

(iv) Absence of bronchospasm on clinical examination.

(v) Absence of bronchospasm associated with mild respiratory infection.

(vi) Acceptable personal and family history with regard to asthma and other atopic states.

(vii) Acceptable personal childhood history of asthma with regard to age of onset, frequency and severity of attacks, hospital admissions, loss of schooling and requirement for medication.

5.9.4 Class-I certificate holders who develop bronchospasm require detailed evaluation. Those whose symptoms are easily controlled by inhaled
chromoglycate and/or inhaled corticosteroid may be assessed as fit for Class-I but restricted to multi-crew duties and reviewed as indicated by a respiratory physician through CAMB.

6.0 SPONTANEOUS PNEUMOTHORAX

(i) A spontaneous pneumothorax occurs when there is escape of air from the lung into the pleural space with consequent partial or complete collapse of the lung. An episode may be asymptomatic but the presentation is often that of sudden severe chest pain and dyspnoea. Such an occurrence in flight, though rare, could result in sudden incapacitation. A reduction in ambient pressure in flight will cause an increase in size of the pneumothorax and may lead to a tension pneumothorax as of development of a flap valve.

(ii) Another major problem with spontaneous pneumothorax in an aviation context is the recurrence rate, about 30% following an initial episode, 50% following a second and 80% following a third. There is also a risk of a contralateral pneumothorax of about 10%. Most recurrences usually occur within twelve months of the original episode.

(iii) Spontaneous pneumothoraces occur most commonly in two peak groups. Firstly, the young, healthy individual with usually no underlying lung pathology. The leak of air into the pleural space arising from a sub pleural bleb and, secondly, the middle aged - usually with established chronic airway obstruction and bullous lung disease.

(iv) Applicants for initial certification with a history of a single spontaneous pneumothorax may be assessed as fit provided that:-

(a) Full recovery has taken place.

(b) One year has elapsed since full recovery.
(c) Full respiratory evaluation is normal.

(d) No bullae are discovered on chest radiography or CT Scans.

(v) Certificate holders who develop a spontaneous pneumothorax must be assessed as 'temporary unfit' until resolution has occurred. They may be assessed as fit for re-certification provided that:

(a) Full re-expansion of the lung has taken place.

(b) A minimum of six weeks has elapsed since the occurrence.

(c) Full respiratory evaluation is normal.

(d) No bullae are discovered on chest radiography or CT scan.

(e) Restriction to multi-crew duties for one year from the original occurrence.

(vi) Following a second pneumothorax, certification must be denied in view of the recurrence rate. Re-certification may only be considered by the CAM following satisfactory surgical treatment (thoracotomy, over-sewing of apical blebs and parietal pleurectomy) and full convalescence, usually three months. "Medical" pleurodesis is followed by a high recurrence rate and is no longer an acceptable form of treatment.
6.1 REFRACTIVE SURGERY

6.1.1 RADIAL KERATOTOMY

(a) During the latest decades, several different surgical procedures have been introduced in order to alter the refractive properties of the eye. The aim of these operations is to change the anterior curvature of the cornea. Most of them are complicated, demand a very high experience of the surgeon and are used on a limited number of patients. One of the methods, the so-called radial keratotomy, easier to perform and has gained a considerable interest. In this operation, a limited number of radial incisions are made through the corneal stroma whereby the anterior surface is flattened. The method is used to reduce or eliminate myopia.

(b) Large numbers of myopic subjects have been operated with this method. Experiences so far show that the myopia is reduced, and to a greater degree, in patients with large amount of near-sightedness. It is not possible to predict the effect; some patients end up with hyperopia. Although complications due to the incisions are few, infections occur and have caused blindness. From the functional point of view, two problems are most relevant to aircraft personnel. One is that in some patients the refractive state is not stable and can vary more than 1-dioptre during the day. Another is an increased glare sensitivity due to the corneal scars. This knowledge has led to the conclusion that subjects operated with radial keratotomy should not be considered fit for aviation duties since the function of the eyes is not normal. Subjects with myopia exceeding 0.3 or 0.5 dioptres should be warned against this way of fulfilling the visual requirements.

6.1.2 PHOTOREFRACTIVE KERATECTOMY

(a) In photorefractive keratoplasty, laser radiation is used to alter the anterior curvature of the cornea by ablation of stromal substance. So far, subjects with myopia and astigmatism have
been treated; the experience is greatest for lower degrees of myopia. The results are far more predictable and stable than with radial keratotomy and there seems to be few complications. A corneal haze during some months after surgery is, however, common. Increased glare sensitivity has been recorded post-operatively also in patients without visible haze and may be an objection to certification to aircrew.

(b) **CERTIFICATION**

In cases where the pre-operative refractive error was less than 05 dioptres a return to flying duties may be possible after 12 months, provided that post-operative stability of refraction and visual function has been achieved and glare sensitivity is not increased and there is no variations. Certification is issued with some restrictions.

6.1.3 **APHAKIA**

Aphakia means 'loss of lens', i.e. the lens has been removed from the eye, in most cases because of cataract. Often cataract is simultaneous with, or caused by, other eye disease; a fact that should be considered in each case. The refractive power of the lens must be replaced in the aphakic eye and there are three current methods to do this.

6.1.4 **APHAKIA WITH SPECTACLE CORRECTION**

Aphakia gives rise to hyperopia of the order of 11 dioptres. There are significant optical disadvantages with glasses of this power: a large ring scotoma, peripheral distortions, a 'jack-in-the-box' phenomenon, and image enlargement. These preclude the use of aphakia spectacles in aviation personnel.

6.1.5 **APHAKIA WITH CONTACT LENS CORRECTION**

Compared to the normal eye, the aphakic eye corrected with a contact lens has a somewhat narrower visual field. The optical properties of this
correction are otherwise of minor significance. Because it takes time for the eye to heal after a cataract operation, a waiting period of six months following surgery is recommended.

6.1.6 **APHAKIA CORRECTED WITH AN INTRAOCULAR LENS**

(a) The optical properties of the aphakic eye with an intraocular lens are comparable to those of the presbyopic normal eye. In some cases, a large spherical or astigmatic error remains or is induced by the operation and should be duly paid attention to.

(b) After an operation with the surgical experience and technique present today, the visual result is usually good and the condition stable after about three months. Immediate post-operative complications should, of course, not be present.

(c) **RE-CERTIFICATION**

In selected cases a return to flying duties may be possible after 03 months, provided that post-operative stability of refraction and visual function has been achieved and that the visual requirements are met either with acceptable contact lenses or with intraocular lenses in combination with spectacles. The use of spectacles as a sole means of correction (aphakia spectacles) is not acceptable. The certificates are issued on the basis of accredited medical conclusion.

6.2 **AMBLYOPIA**

In amblyopia exanopsia, the visual acuity of one eye is decreased without the presence of organic eye disease, usually because of strabisuns or anisometropia in childhood. In amblyopia exanopsia, the visual acuity loss is determined in accordance with the visual requirement standards as defined in above section. No certification is allowed if the visual acuity loss falls below the visual standards prescribed above.

6.3 **CONTACT LENSES**
Experience has indicated that no significant risk to aviation safety in the use of contact lenses for Distant vision correction. As a consequence, no special evaluation is required provided such lenses are issued within visual standards prescribed for appropriate classes without complications. Contact lenses that correct near visual acuity only or that are bifocal are not considered acceptable for aviation duties. Similarly, use of contact lenses in one eye or distant visual acuity and a lens in the other eye for near visual acuity is not acceptable for certification of any class. The examiner’s careful evaluation of each eye is of major importance. In such cases, issuance of certificate by deferred in the examiner finds evidence of lens irritation or a tinted lens that causes significant diminution of transmitted light. In such cases, accredited medical opinion must be obtained.

6.4 **GLAUCOMA**

The medical examiner / CAMB should defer issuance of medical certificate to an applicant if there is evidence of loss of visual fields, a significant change in visual acuity, a diagnosis of or treatment for glaucoma, or intraocular hypertension. In such cases, accredited medical opinion must be obtained to ascertain nature of the disease, treatment received and chance of recurrence of such disease in the subsequent period before issuance of renewal of certification is considered.
6.5 HEAD TRAUMA ASSOCIATED WITH:

(a) Unconsciousness or disorientation of more than 1 hour following
(b) Focal neurologic deficit
(c) Depressed skull fracture
(d) Post-traumatic headache
(e) Subdural or epidural hematoma.

6.5.1 Complete neurological evaluation with appropriate laboratory and imaging studies will be required to determine an applicant's eligibility. A period of stabilization will usually be required to confirm that an applicant has adequately recovered from any of the above conditions before he or she is considered for medical certification based on accredited medical conclusion.

6.6 HEADACHE

This includes:

(a) Migraine
(b) Migraine equivalent
(c) Cluster headache
(d) Chronic tension headache
(e) Conversion headache
(f) Trigeminal neuralgia
(g) Atypical facial pain

6.6.1 Pain, in above conditions, may be acutely incapacitating. Chronic recurring headaches or pain syndromes often require medications for relief or prophylaxis, and, in most instances, the use of such medications is disqualifying because they may interfere with a pilot's alertness and functioning. The CAMB may issue a medical certificate to an applicant with a long standing history of headaches if mild, seldom requiring more than simple analgesics, occur infrequently, and is not incapacitating, and is not associated with neurological stigmata after investigating such applicants on the basis of accredited medical opinion.
6.7 Vertigo or disequilibrium

6.7.1 A Meniere’s disease and acute peripheral vestibulopathy.

(a) Alternobaric vertigo
(b) Hyperventilation syndrome
(c) Orthostatic hypotension
(d) Nonfunctioning labyrinths

Numerous conditions may affect equilibrium, resulting in acute incapacitation or varying degrees of chronic recurring spatial disorientation. Prophylactic use of medications also may affect pilot performance. In most instances, further neurological evaluation will be required to determine eligibility for medical certification, therefore, issuance of a medical certificate should be deferred till such conditions are investigated and accredited medical opinion is obtained.

6.8 CEREBROVASCULAR DISEASE (INCLUDING THE BRAIN STEM)

This includes:

(a) Transient ischaemic attack (TIA)
(b) Brain infarction
(c) Intracerebral or subarachnoid hemorrhage
(d) Intracranial aneurysm or arteriovenous malformation

Complete neurological evaluations supplemented with appropriate laboratory and imaging studies are required of applicants with the above conditions. Cerebral arteriography may be necessary for review in cases of subarachnoid hemorrhage. In such cases certification may be deferred till investigations are completed and the cases are decided on the basis of AMC.

6.9 INTRACRANIAL TUMOR

A variety of intracranial tumors, both malignant and benign, are capable of causing incapacitation directly by neurologic deficit or indirectly through recurrent symptomatology. Potential neurologic deficits include weakness, loss of sensation, ataxia, visual deficit, or mental impairment
Recurrent symptomatology may interfere with flight performance through mechanisms such as seizure, headaches, vertigo, visual disturbances, or confusion. A history or diagnosis of an intracranial tumor necessitates a complete neurological evaluation with appropriate laboratory and imaging studies before a determination of eligibility for medical certification can be established. An applicant with a history of benign suprarentinal tumors may be considered favorably for medical certification by the CAME and returned to flying status after a minimum satisfactory convalescence of 1 year provided there is no residual effects and chances of recurrence are minimal.

7.0 DEMYELINATING AND AUTOIMMUNE DISEASE

This includes

(a) Multiple sclerosis
(b) Acute optic neuritis
(c) Myasthenia gravis
(d) Landry-guillain-Barre syndrome

Allergic encephalomyelitis

7.1 COLLAGEN DISEASE

Lupus erythematosus
Periarteritis nodosa
Acute polymyositis
Dermatomyositis

Because of the variability and unpredictability of involvement and course of the above conditions, the CAMB must consider each applicant's case to determine eligibility for medical certification. Factors used in determining eligibility will include the medical history, neurological involvement and persisting deficit, period of stability without symptoms, type and dosage of medications used, and general health. A neurological and/or general medical consultation will be necessary in most instances. The CAMB should defer issuance of a medical certificate till accredited medical opinion is obtained based on neurological evaluation.

7.2 INFECTIONS OF THE NERVOUS SYSTEM

This includes:
(a) Meningitis
(b) Brain abscess
(e) Encephalitis
(d) Neurosyphilis
(e) ADIS

Many different types of infection of the nervous system exist, and post-infectious complications and degree of recovery may differ widely. The most significant factors to be considered include the possibility of a seizure disorder or mental impairment. A complete neurological evaluation with appropriate laboratory and imaging studies will be required to determine eligibility for medical certification. The CAMB should defer issuance of a medical certificate till accredited medical opinion is obtained based on appropriate investigations and evaluation.
PSYCHIATRIC DISORDERS

Psychiatric disorders likely to be met amongst aircrew are limited to adult psychiatry. A childhood psychiatric illnesses will usually have resolved by the age of 17, the minimum at which a licence to pilot powered aircrafts is issued. Childhood neurotic traits are evidence of predisposition to neurosis which should be carefully considered before allowing an applicant to commence flying. A history of childhood psychosis should be a bar to flying. Mental defect or significant backwardness should be identified at the initial interview from a discussion of academic achievement. In doubt, I Q assessment may be helpful. However even with a normal I Q, applicants with a serious lack of elementary mathematics will take longer than average in learning flying. While psychiatric diseases are uncommon in aviation personnel, yet pre-senile dementia's associated with old age may be encountered occasionally in elderly licence holders. Some of the conditions are mentioned below but over all assessment should be based on the guidelines laid-down in Manual of Aviation Medicine:-

7.3.1 THE NEUROSIS

Anxiety is the chief characteristic of the neurosis, depression, mild or moderate in degree, also occurs in some neurosis. There are various types of neurosis:

- (a) Anxiety neurosis (tension state).
- (b) Hysterical neurosis.
- (c) Phobic neurosis (phobia)
- (d) Obsessive, compulsive neurosis.
- (e) Depressive neurosis (re-active depression).
- (f) Hypochondrial neurosis.
- (g) Neurasthenic neurosis.
- (h) Depersonalization neurosis (depersonalization syndrome)
7.3.2.1 FLIGHT CREW APPLICANTS

(i) Aviation is a specialized profession, the skills of which have little earning potential in other careers. A pilot who loses his licence, loses almost all his earning capacity. The cost to the pilot of learning to fly may be considerable and the investment by the airline in his advanced training is vast. For these reasons, the AEMICAMB has a great responsibility in evaluating an applicant's fitness for commercial flying. The examiner has to decide not only the "here and now" fitness to fly but he must also try to give advice about the likelihood of the applicant remaining fit to fly for some years to come; otherwise the applicant and the sponsoring airline are unlikely to get a reasonable return for their investment.

(ii) At the initial interview the applicant is unlikely to have current psychiatric illness, but if he has, he should be rejected permanently. or, in the case of very mild psychiatric illness, for at least six months. A decision about psychiatric fitness for flight crew training is based on the history of the applicant and his family. A history of childhood neurotic traits or a family history of psychosis should lead to careful scrutiny. If the applicant has suffered a psychiatric illness of significant severity, especially one requiring admission to a psychiatric hospital or prolonged out-patient psychiatric care, he will normally be rejected for commercial flying. An applicant for private flying may be passed if considered fit by a psychiatric consultant.

(iii) It is common to ask for a psychiatric assessment in a physical illness with atypical features. If the consultant considers psychiatric treatment necessary, the applicant should usually be considered unfit for aviation duties.
(iv) The applicant should be questioned about the indicators of predisposition to psychiatric illness as discussed earlier. If two or more of these indicators are admitted, the opinion of a psychiatric consultant experienced in aviation psychiatry should be sought.

7.3.2.2 TRAINED FLIGHT CREW

When a pilot has proved himself competent by successfully completing his flying training, the mental fitness requirement for continuing to hold his licence may be applied less stringently than in the case of the applicant who wants to embark on a flying career. Accredited medical conclusion should give due consideration to the following factors in reaching a decision involving such an individual:

(a) During the acute phase of neurotic illness, the excess of anxiety or depression is likely to interfere with decision making so that the sufferer is unfit to follow his profession.

(b) Medication used to treat psychoneurotic illnesses usually affects mental alertness. Its use is incompatible with aviation duties. Patients treated temporarily by psychotropic drugs must remain off flying for a week after the last dose.

(c) A single neurotic illness which clears completely in less than three months should be considered compatible with return to flying. Protracted neuropsychiatric illness with poor response to treatment or characterized by relapse may suggest that the patient is developing a nervous disposition. Such patients may make a wrong decision. Those licence holders should be assessed as permanently unfit.
7.4 MENTAL FITNESS ASSESSMENT OF AIR TRAFFIC CONTROLLERS

Air traffic control (ATC) personnel have considerable responsibility for aircraft safety, although they are not subject to the stresses of flying. The mental health requirements of ATC personnel are similar to those for flight crew and accredited medical conclusion should be sought in assessing borderline cases.

7.5 PERSONALITY DISORDERS

(i) The great majority population learn to conform to society's laws by means of examples set by parents and teachers, by religious precepts and by fear of punishment. However a small number fail to integrate one or more of their antisocial tendencies and retain their childhood selfishness, aggression, timidity or sexual deviation. Punishment or persuasion does not seem to help such individuals to conform society This condition is called a personality disorder, and differs from neurotic reactions by being a steady state dating from early life while neurotic illness may have a more definite and identifiable onset and termination.

(ii) The important personality disorders concerning to licensing authorities are appended below:-

(a) Sociopathic personality disorders: This includes explosive personality disorders, inadequate personality disorders, anti-social personality disorders and sexual deviant disorders.

(b) Certification: Since flight crew members take responsibility for other people's lives, thus they are considered responsible members of society. Nevertheless the aircraft safety greatly depends upon strict adherence to the rules of air traffic controls which demand strict obedience and often great patience.
For these reasons, an aircrew with severe sociopathic personality disorder is unfit for aviation duties. The great majority of personality disorders will not respond to treatment so that once an applicant is deemed unfit because of severe personality disorder, the embargo should be permanent. Significant indicators of above disorder may be found in a family or personal history of repeated clashes with the law, drug dependence, alcoholism, gross immorality or serious psychiatric illnesses. Evidence of a significant and persistent personality disorder duly evaluated by a psychiatrist should be a permanent bar to aviation duties:
7.6 **DRUG DEPENDENCE**

(i) Substances which alter the mental state in a pleasurable way, alleviate physical or mental pain or contract boredom are important drugs having some effect on the flight safety for which AMEs pay special attention. This group includes: alcohol, opium and its derivatives which if not identified in time are likely to cause dependency.

(ii) Psychic dependence is a condition induced by repeated use of such drugs as morphine, alcohol, barbiturates, amphetamines etc which are characterized by an urge or need to continue taking the drugs, some of which may cause a physical dependence as well with resultant withdrawal symptoms on sudden cessation of such drugs.

(iii) **Certification**: A history of drug dependence should be a bar to any form of aviation licence as such drugs not only alter mental state but judgement is also impaired. However some cases of drug dependence should be carefully investigated and accredited medical opinion regarding their treatment/ rehabilitation is carried out must be obtained before they are disqualified.

7.7 **ALCOHOLISM**

(a) Drug dependence of the alcohol type should be diagnosed if an individual's consumption of alcohol exceeds the amount culturally permitted or if he habitually drinks at times which are outside the accepted licencing hours or if he injurs his health or his social relationship by repeated excessive alcohol consumption. Drug dependence of alcohol type is very difficult to cure and may be a great hazard to flight safety because judgement is impaired by alcohol and reaction time is showed during the hangover phase. For this reason, alcoholism is a bar to hold a flying licence unless
the applicant abstain completely and then if accredited medical conclusion considers the prognosis good.

(b) There are factors in the life of a flight crew which increase temptation to drink. One factor is sleep difficulty due to alteration in flight patterns while other temptation to drink portains to "slip crew system" where flight crew is lonely in the Hotels and feels boredom away from home life affairs. The fatigue of a long flight is considerably lessened by a glass or two of beer on landing which is a very conformable way for crew to discuss the difficulties of trip and plans for the next trip before retiring to bed.

(c) There are some of the pressures that predisposes a flight crew to problem drinking which are as under:

NOTE

Excess social drinking is probably the most common pattern. A typical example is a licence holder, aged 37, a bachelor who had flown 15000 hours. An examination revealed ascites, leading to a liver biopsy which confirmed the diagnosis of alcoholic hepatitis. This licence holder had never broken the company's regulations on drinking and flying. He flew regularly one day in six; on the evening of his flight and the other four days of the six he consumed regularly 8 to 10 pints of beer. There was never the slightest suggestion of inefficiency or clinical evidence of excessive drinking until the ascites developed. Such candidates have to be investigated before medical fitness is issued.

7.7.1 Recurrent affective disorder: A senior pilot, aged 45, with 15000 hours flying to his credit made headlines by haranguing an official gathering of international aviation authorities while he was obviously extremely drunk. He had been suffering from recurrent short-lived bouts of depression lasting 48 hours and recurring every three months. It had always been possible for him to avoid flying on these occasions and he had found that if he stayed at home and consumed an excess of alcohol he got relief from his severe depression. The unfortunate coincidence of a civic function with one of these periods of
excessive drinking led to his discovery. Consequently he was disqualified and was referred for accredited medical conclusion after treatment.

7.7.2 Personality disorders in aircrew give rise to two fairly common patterns of problem drinking:-

(i) Aggressive psychopaths who normally manage to keep their aggressive tendencies under control may, under the influence of alcohol, exhibit extreme disorders of behaviour which bring them to their employer's attention.

(ii) Severely obsessional, meticulous people often alleviate their anxiety with alcohol. A typical example of this is that of a senior pilot who had become an administrator. He was able to deal with his own personal responsibilities and the personal risks involved in flying but when he was put in charge of a large airport and expected to be responsible for all the administration, accounts, etc., his obsessional tendencies quickly led to insomnia which he learned could be controlled by alcohol. He knew that vodka would not leave the tell-tale smell of alcohol on his breath and within 12 months his consumption had risen to the point where he developed an epileptic seizure.

(iii) The incidence of alcoholism among crew members is nevertheless as infrequent as might be expected in a profession requiring high degrees of technical skill coupled with great personal responsibility. The rate of loss of professional licences due to problem drinking is less than one in 5000 per annum. The true incidence may be somewhat higher because of the natural disinclination by patient and employer alike to face up to the reality of dependence upon alcohol.

(iv) Alcoholism is difficult to diagnose, as the great majority of sufferers have no insight into their illness and such patients rarely ask for help. Sometimes a clue to the diagnosis is provided by the smell of alcohol on the applicant's breath during routine medical
examination. An obvious tremor of the outstretched hands, chronic pharyngitis, a blotchy red face, chronic conjunctivitis, an enlarged liver, absence of deep reflexes or other findings should prompt the designated medical examiner to look for evidence of alcoholism.

(v) In making the diagnosis of drug dependence of alcohol type, information must be obtained from all possible sources. In addition to taking the patient's history the examiner should insist upon seeing a close relative, usually the wife, to get the domestic picture. A report should be obtained from the patient's family doctor in addition to the referral letter by the airline's own medical officer. The opinion of the training captain is invaluable if it can be discreetly obtained without prejudging the issue by suggesting to the employer that the patient is a problem drinker.

(vi) In established cases of drug dependence of alcohol type, assessment of an applicant for licensing should not be performed until an observation period of 12 months has elapsed. If an applicant wishes to regain his licence he must abstain from all alcohol containing beverages completely for one-year period, during which he is seen by the airline doctor or his family doctor at fortnightly intervals and by his psychiatrist at tuee-month intervals. The psychiatrist should have at each interview a note from the family doctor and from the relative to confirm that the patient has remained completely abstentious.

(vii) After 12 months' complete abstinence, the applicant may be allowed to resume professional flying on the condition that he is interviewed by a psychiatrist every six months for the next two years with the same evidence of complete abstinence. By this time, the patient may have developed insight into the severity of his illness and may stand a reasonable chance of remaining free from relapse in the future. A single relapse should lead to permanent withdrawal of his licence.
7.7.3 The system utilizes.

(a) Peer group, consisting of fellow workers, union or association members and family members, reinforced by exposure to recovering pilot alcoholics and alcoholics anonymous.

(b) Management and supervisors, including the flight operations manager, supervisory and check pilots, simulator and other course instructors.

(c) Medical consultants. The airline medical officer gathers valuable data for early recognition, out-patient counseling, evaluation and referral to a psychologist. Residential treatment in a recognized rehabilitation centre and psychiatric assessment is followed by a full medical review and "tripartite" debriefing of the pilot.

(d) Regulatory agencies. The medical and Licensing Authorities review each case on its individual merits and may recommend relicensing with continued close follow up monitoring by the airline medical officer, peers, flight operations and regulatory agencies for two years.

The initial process takes approximately one month of clinical evaluation, one month of residential treatment and one month of rehabilitation. Provided the full protocol is followed, successfully treated pilots have been returned to flying in three to four months. This has had the effect of overcoming a "conspiracy of silence" among other affected pilots.

Admonition on the use of intoxicating liquor, narcotics and drugs is provided in CAR,94 which specifies that no person shall pilot an aircraft, or act as a flight crew member of an aircraft, while under the influence of intoxicating liquor or any narcotic or drug, by reason of which his capacity so to act is impaired.
7.8 **PSYCHO PHYSIOLOGICAL (PSYCHOSOMATIC) DISORDERS**

(a) Psycho-physiological or psychosomatic disorders are organic ailments which may be caused in part by psychological factors and must be distinguished from conversion Hysteria where there is a loss of function without organic disease. The type of stress endured probably does not decide the personality of the sufferer on some organ inferiority.

(b) The psycho physiological disorders includes:

(i) Psycho-physiological respiratory disorders
(ii) Psycho-physiologic respiratory disorders.
(iii) Psycho-physiologic cardiovascular disorders
(iv) Psycho-physiologic gastro-intestinal disorders

(c) **Certification:** In assessing the aircrew to continue in aviation, it is important to try to determine how much emotional factors contribute to the illness and to see if they can be eradicated. Even with careful evaluation, it is very difficult to be sure that such disorders will not recur. Thus a significant history of any of above illnesses should be a bar to flying. However in trained flight crew, the severity of the organic disease and the nature and reversibility of the stress must both be evaluated before deciding if the candidate is fit to be re-licenced.

7.81 **THE FUNCTIONAL PSYCHOSIS**

(a) By definition, a psychosis severely disrupts mental life so that power to make decisions is lost, a psychotic candidate is permanently unfit for all aviation duties. Some psychosis permanently damage the personality, so that even if the psychotic process remits, the patient remains permanently unfit for flying by reason of the personality damage. The functional psychosis may recur without warning and for this reason, a history of even one attack of psychosis should be a permanent bar to aviation duties. An exception to this rule, may be considered in the
case of single depressive psychosis in a previously robust personality when the illness seems to follow a unique and exceptionally severe stress.

(b) The psychotic slates which are considered permanent ban to flying duties includes.-

(i) Schizophrenia.
(ii) Affective disorders (Affective psychosis)
(iii) Paranoids states
(iv) Functional mental illness in later life.
7.9 **MEDICAL FLIGHT TEST FOR BORDERLINE MEDICAL PROBLEMS**

(i) Borderline medical conditions of pilots must initially be assessed by CAMB with thorough investigations based on accredited medical conclusion as outlined in the appropriate medical standards. This should include evaluation of whether such conditions are progressive and to what extent physiological functions are impaired and whether there is any risk of sudden in flight incapacitation.

(ii) If the applicant fails to meet the requisite medical requirements but the conditions in the opinion of the board do not affect the regular and safe performance of flying duties, licensing/medical authorities of CAA shall assess the skills and experience of pilots demonstrated during practical flight test with a view to ascertain that applicant is capable of performing his duties without jeopardizing flight safety, even if, he is having borderline medical problems.

(iii) In such cases Chief of Aviation Medicine will put up the summaries based on clinical assessment, investigations and accredited medical conclusion to DGCAA licensing authorities of CAA for obtaining approval to undertake such flight medical test by an examiner or board of examiners as may be deemed necessary.

(iv) For this, reasonable simultaneously tasks have to be introduced during medical flight testing to ascertain the applicants susceptibility to distractions. These special medical flight checks provide AMEs guidelines so as to help in determining the applicants abilities and thereby any limitation/restrictions to be imposed by the licensing authorities in clearing such pilots. The flight test will be conducted in accordance with the prescribed procedures as envisaged under these rules.
(v) Besides this, aviation medical examiner under authority of Chief of Aviation Medicine shall undertake to determine flight deck workload to check aircrew in-flight fatigue/stress so as to improve working condition of aircrew with suggestion of adequate rest requirements.

(vi) Aviation Medical Examiners authorized under This role, shall be provided with accommodation on the aircraft as per appropriate Civil Aviation rules.

(vii) The medical flight test shall be conducted on the conditions which have been assumed, by accredited medical conclusion, as borderline problems confronted by pilots who are otherwise competent to perform their professional duties.

(viii) The conditions where medical flight test is mostly required are as under:-

7.9.1 DEFECTIVE HEARING

Defects in hearing would not normally necessitate tests under actual flight conditions since all pertinent factors may be readily simulated. Whether conducted on the ground or in flight conditions, the main considerations to be assessed in such cases are:-

(i) Ability to hear radio-voice and signal communications.

(ii) Ability to understand ordinary conversational voice on the ground, in the cockpit with engine on and engine off (The examiner shall guard against the applicant lip-reading).

(iii) Ability (if the applicant requires a private pilot licence to operate a light aircraft) to recognize approaching stall by a change in sound incident to a change in speed.
7.9.2 **VISUAL DEFECTS**

The following circumstances represent some of the typical conditions defining the visual abilities required by a pilot. Possession of these abilities by an applicant, or the applicant's inability to comply with them, may be established by simulation or, more realistically, in actual flight conditions. In either cases, the ability of an applicant to perform specified tasks in a practical requirement which are not easily established by a conventional test. In such cases, the testing procedures may determine the following parameters:-

(i) Ability to select emergency landing fields from a distance, preferably over unfamiliar terrain and from high altitude.

(ii) Ability to simulate forced landings in difficult fields. Note the manner of approach, rate of descent, and comparative distance at which obstructions (stumps, boulders, ditches) are recognized.

(iii) Ability to recognize other aircraft approaching on a collision course (possibly by pre-arrangement), especially aircraft approaching from the far right or far left.

(iv) Ability to judge distances (compared with the examiner's judgement) and to recognize landmarks at the limit of the examiner's vision.

(v) Manner in which landings are made.

(vi) Ability to reach aeronautical maps in flight and to tune radio on a predetermined station accurately and quickly.

(vii) Ability to read instrument panels quickly and correctly (including overhead panel, if any).
DEFECTIVE COLOUR VISION

An applicant might be assessed as fit if able to demonstrate:-

(i) Ability to distinguish colours used on aviation charts, including coloured prints in various sizes, conventional markings in several colours from an inverted map at a distance of 03 meters.

(ii) Ability to read flight instruments, especially those with cockpit, especially marker beacon lights, warning lights, and lights of varying intensities and hues.

(iii) Ability to recognize terrain and obstructions. While in flight, the applicant should be asked to select several emergency landing fields, preferably, under somewhat marginal conditions, and describe their surfaces, e.g. so, stubble, ploughed field. The applicant should be asked to identify obstructions such as ditches, fences, terraces, low spots, rocks. stumps and especially grey, tan or brown objects in green fields.

(iv) In addition an applicant for privileges to fly at night should be tested at twilight or at night to determine their ability to see coloured lights of other aircraft in the vicinity; runway approach lights; red warning lights on TV towers, high buildings, stacks, etc.; conventional signal light from the tower and all colour signal lights are normally used in air traffic controls.

BIFOCAL FIXATION AND VERGENCE-PHORIA

(i) Bifocal fixation and vergence-phoria relationship in sufficient to prevent a breakdown in fusion under conditions, that may reasonably occur, in performing aircrew duties in flight Test for these factors are not required except for applicants found to have more than 1 PD of hyperphoria. 6 PD of exophoria or exophoria or breakdown of bifocal fixation.
(ii) If these values are exceeded to an extent that accredited medical opinion of Eye specialist recommends, grant of waiver after flight medical test to ascertain the performance of aircrew on particular flight patterns, in such cases Flight Medical test be undertaken to determine the extent of error and hence certification.

7.9.5 **INTRAOCULAR PRESSURE CHANGES**

The difference between the intraocular pressure in two eyes must not be greater than 5 mm Hg. If intraocular pressure measures greater than 25 mm Hg in either eye, or if the intraocular pressure difference between the two eyes is greater than 5 mm Hg, ophthalmological evaluation is necessary so as to rule out glaucoma or any underline eye diseases. If the applicant is otherwise qualified and is entitled for medical certification with no any evidence of glaucoma or eye disease, such applicants can be reviewed after medical flight test on case to case basis keeping in view the severity of pressure differences.
7.9.6 **RESPIRATORY PROBLEMS**

The evaluation of respiratory system is based on two general principles:

(i) There should be maintenance of adequate oxygenation throughout the flight.

(ii) Retention of Carbon dioxide should be avoided. Since direct measurement of arterial oxygen and carbon dioxide level is impractical in AMEs office, the medical history and clinical assessment is such that the applicants may need special assessment to rule out any chronic hypoxemia, hypercapnia by undertaking medical flight test so as to review / re-certify licensure in otherwise.

(iii) normal aircrew members under normal circumstances.

7.9.7 **DEFORMITY OF EXTREMITIES**

An applicant might be assessed as fit if able to demonstrate:-

(i) Ability to reach readily and operate effectively all controls that would normally require use of deficient extremity (or extremities). nothing any unusual body positron required to compensate for the defect and the resulting effect on the applicant's field of vision.

(ii) Ability to perform satisfactorily emergency procedures in flight such as recovery from stalls and power-off control system.
MEDICAL FLIGHT TEST REPORTS

All results of special medical flight tests should be reported to medical authorities of CAA. The report should include information about:-

(a) defect, test and recommendations;

b) any additional procedures deemed necessary by the examiner;

c) any physical attributes of the examiner relevant to comparison of the examiner's abilities with those of the applicant;

d) marginal or simulated marginal conditions for the test.

e) the applicant's susceptibility to distractions caused by simultaneous tasks;

f) any necessary operating limitations for the pilot certificate concerned or, alternatively, the fact that no limitations are required.
8.0 MEDICAL ASSESSMENT FOR AIRCRAFT MAINTENANCE ENGINEERS

8.1 Physical and Mental Fitness of AMEs.

CONTENTS

i) General
ii) Fitness Criteria
iii) Proof of Physical/Mental fitness
iv) Authority

8.1.1 GENERAL

An Aircraft Maintenance Engineer shall be free from physical or mental disabilities which can cause any hindrance in discharge of his duties regarding maintenance of aircraft.

8.1.2 FITNESS CRITERIA

The AME shall be in sound health in order to properly perform Aircraft Maintenance functions, specially in respect of:

i) Hearing
ii) Eye sight
iii) Colour perception
iv) Any abnormality, congenital or acquired, or any active, latent, acute or chronic disability. or any wound, injury or sequelae from operation, such as would entail a degree of functional incapacity which is likely to interfere with the safety of an aircraft or with the safe performance of duties as an AME.
ICAO recommendations, for General Medical assessment, as contained in ICAO Annex-I (para 6.2) will be followed as standard for Physical / Mental fitness of an AME.

8.1.3 **PROOF OF PHYSICAL / MENTAL FITNESS**

(i) At the time of issue / renewal of an AME licence the applicant shall submit a Medical fitness/colour vision certificate (Appendix to this ASC). The medical certificate is to be issued by the company Doctor where the AME is employed or by a Registered Medical Practitioner holding at least MBBS degree in case the company is not having a doctor in its employment.

(ii) The above referred medical certificates will be generally accepted by Chief of Airworthiness for issue/renewal of AME licence. However, in case of any doubt the matter may be referred, by Chief of Airworthiness to Chief of Aviation Medicine CAA for second opinion at the cost of the applicant. In case of rejection of the applicant by Chief of Aviation Medicine CAA, renewal / issue of AME licence shall be refused. However, the affected applicant may appeal to DGCAA for Special Medical Board.
(To be given by Registered Medical Practitioner holding at least MBBS degree)

8.2 MEDICAL CERTIFICATE FOR AIRCRAFT MAINTENANCE ENGINEERS

Mr / Mrs ____________________________________________________________________ whose signature is given below, has been medically examined by me.

He / She has the following physical disabilities.

________________________________________________________
no physical disabilities

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<thead>
<tr>
<th>Signature of the Applicant</th>
<th>Signature of Doctor</th>
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MEDICAL CERTIFICATE FOR COLOUR VISION

I, Dr. __________________________........hereby certify that I have examined Mr / Ms ____________________________________________________________________whose signature is appended below, and certify that his colour vision is Normal / Defective safe / Defective unsafe. (Strike off which is not applicable).

The colour vision has been tested with.

(1) Pseudo - Isochromatic plates
(2) Approved Lantern test
(3) Any other test applicable
(Strike off which is not applicable)

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<th>Signature of the Applicant</th>
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9.0 MEDICAL ASSESSMENT & PREGNANCY

(i) Pregnancy shall be regarded as incapacitating condition and shall disqualify aircrew temporarily until flight crew has in due course been examined and pronounced fit by CAME. However, following confinement or termination of pregnancy, the applicant shall not be permitted to exercise the privileges of her licence until she has undergone re-examination and has been assessed as fit.

(ii) In an uncomplicated pregnancy, most organ systems adapt to the increased demand placed upon a healthy young female in such a way that the expectant mother can carry on with routine activities in her usual environment until close to the time of labor and delivery.

(iii) However, a pilot applicant who is pregnant, faces an unusual and hostile air environment, in which organ adaptation can be affected. Once she believes that she is pregnant, she should report to her own doctor, an aviation medical examiner. This is advisable not only for her own protection, but also to ensure that her obstetrician is aware of the type of flying she intends or desires, particularly as the common complications of pregnancy can be detected and treated by careful prenatal evaluation, observation, and care.

(iv) The aviation medical examiner should consider the following physiological changes associated with pregnancy, which might interfere with the safe operation of an aircraft at any altitude throughout a prolonged or difficult flight.

(a) nausea and vomiting of early pregnancy which occur in 30 percent of all pregnancies, and can cause dehydration and malnutrition;
(b) approximately 15 percent of embryos will abort in the first trimester; if the candidate is not restricted for flying;

(c) cardiac output rises in early pregnancy, and accompanies by an increase in stroke volume, heart rate, and plasma volume;

(d) hemoglobin (and haematocrit) begins to fall between the third and fifth month and is lowest by the eight month;

(e) adequate diet and supplementary iron and folic acids are necessary, but self-medication and prescribed medicine should be avoided;

(f) the incidence of venous varicosities is three times higher in females than males and venous thrombosis and pulmonary embolism are among the most common serious vascular diseases occurring during pregnancy;

(g) as the uterus enlarges, it compresses and obstructs the flow through the vena cava;

(h) progressive growth of the fetus, placenta, uterus and breasts, and the vasculature of these organs, leads to an increased oxygen demand;

(j) increased blood volume and oxygen demands produce a progressive increase in work-load on both the heart and lungs;

(k) hormonal changes affect pulmonary function by lowering the threshold of the respiratory centre to carbon dioxide, thereby influencing the respiratory rate;

(l) in order to overcome pressure on the diaphragm, the increased effort of breathing any hyperventilation leads to greater consciousness of breathing and possible greater cost in oxygen consumption;
(m) The effect of hypoxia at increased altitude further increases the ventilation required to provide for increasing demands for oxygen in all tissues.

NOTE

The certification, thus must not be issued unless such conditions are taken care based on accredited medical conclusion.
9.1 PRINCIPLES OF DRUG TREATMENT & FLIGHT SAFETY

9.1.1 In considering whether a pilot should remain on flying status while on drug therapy, certain questions should be asked:

(a) Is the disease process for which drug therapy is necessary, in itself is disqualifying for flying?

(b) What are the usual and expected pharmacological actions of the drug in question and what is the duration of these effects?

(c) What are the possible side-effects and their duration, where 'side effects' refers to undesired responses to drug therapy.

9.1.2 If the answer to the first question is in the affirmative then the question of drug therapy is only academic since the pilot would be disqualified by the medical disorder as per specifications. If the disorder to be treated does not preclude flying, then question (b) and (c) become paramount.

9.1.3 While there are many therapeutic drugs in use today and while the pharmaco-physiology of drugs is a complex science, one can approach the problem of drug therapy in the pilot by considering the problem from the aspect of undesirable (i.e. unsafe) responses to therapy. Virtually all drugs not accepted for flying duties, regardless of the nature of the disorder being treated, have at least one or all of the following effects:

(a) central nervous system depression;

(b) autonomic nervous system disorder

(c) disorder in equilibrium

9.1.4 That is, unless a therapeutic drug has one or more of these properties it could probably be taken while flying, provided the disease being treated is not in itself disqualifying. There are a few exceptions to this principle pertaining to the central and autonomic nervous systems and these will be considered later.
9.2 USE OF PSYCHACTIVE SUBSTANCE / DRUGS

9.2.1 The use of psychoactive substances / drugs by aviation personnel constitutes a direct hazard to the users besides endangers the lives, health of others, and/or causes or worsens an occupational, social, mental or physical problems. The psychoactive substances comprises of - alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine and other psychostimulants, hallucinogens and volatile solvents. The use of these substances is considered incompatible for flying due to their uniformity harmful effects resulting psychological, mental, social and personality disorder. Thus the holder of licences shall not exercise the privileges of their licences and related ratings while under the influence of any above psychoactive / drugs which might render them unable to safely exercise such privileges.

9.2.2 Apart from this, holder of licences shall also not involve themselves in any problematic use of substances which are likely to affect their performance while exercising such privileges. Thus it must be ensured, as far as practicable, that all licence holders who are engaged in any kind of psychoactive or problematic substances must be identified and timely removed from the safety critical functions. However their return to the safety critical functions may nevertheless be re-considered after a course of successful treatment or, in case, when no treatment is necessary, after cessation of the use of such substance and upon determination that their continued performance of functions is unlikely to jeopardized flight safety.

9.2.3 The use of psychoactive / substances usually alters the mental state, interferes with the judgement, alertness, vision and coordination and where abuse or dependence upon such psychoactive substance is strongly suspected in the light of 9.2.1, aircrew must immediately be assessed as temporary unfit and should be referred to the concerned airline medical authorities for further assessment under close supervision. When dependence of such drug substance is confirmed, temporarily unfitness assessment shall be continued until adequate treatment has successfully been completed and individual remains free from medication and the accredited medical conclusion indicates that such person is not showing signs and symptoms of any relapses / remissions and has fully been rehabilitated. The period of
treatment with rehabilitation in such cases varies from 06 months to 02 years depending upon the course of the treatment given with no chances of relapses and remissions.

9.2.4 The treatment of flying personnel involved using such psychoactive substances depends upon the modality of use in response to specific symptoms and behaviour of the person. The treatment may include pharmacotherapy, psycho-therapy and various social measures depending upon the conditions of the person and the clinician's determination of conducting appropriate course of therapy. The treatment and rehabilitation in such cases shall be undertaken by airline doctors in close coordination with the relatives of the person involved and the treatment is carried-out on the following lines:

(i) Detoxification
(ii) In-patient treatment
(iii) Out-patient treatment
(iv) Pharmaco-therapy
(v) Psycho-therapy
(vi) Behaviour-therapy

9.2.5 After the completion of above course of treatment under supervision of Psychiatrist and Psychologist, rehabilitation programme may be started. The goal of rehabilitation is to establish and maintain a new substance free life in a normal social environment along-with optimal health, mental functions and social well-beings. The treatment and rehabilitation often overlap in a way that makes differences, difficult to realize for non-specialist and sometimes the terms of rehabilitation may be used for all therapeutic activities following detoxification. Some of the most important elements of rehabilitation are:

(i) After care and long treatment follow-ups.
(ii) Self help / support groups.
(iii) Vocational rehabilitation.

9.3 PROCEDURE FOR DETECTION OF SUBSTANCES/DRUG ABUSE AMONGST FLYING PERSONNEL
9.3.1 To ensure safety of flight, use of psychoactive substances/drugs amongst flight crew are of particular concern in the aviation industry where high level of performance is mandatory. It is proven fact that alcohol impairs judgement and memory in the brain, impairs discrimination and perception in the visual and auditory system. Besides, it slows, reaction-time and lowers inhibitions and increases recklessness. Similarly, there are certain psychoactive drugs/substances which are considered incompatible for flying due to their uniformly harmful effects resulting psychological, mental, social and personality disorders.

9.3.2 To prevent in-flight incapacitation there is urgent need to identify and segregate flying personnel who are occasionally involved in alcohol and substance abuse through a procedure involving physical checkup and collection of urine for laboratory analysis during their periodical medical examinations for issuance/renewal of their licences. The procedure is appended in the subsequent paragraphs which will give some guideline to the examining doctors.

9.4 SIGNS OF PHYSICAL APPEARANCE OF PERSONNEL INVOLVED IN PSYCHOACTIVE/DRUG ABUSE

PHYSICAL APPEARANCE OF FLIGHT-CREW

This includes:-

(a) Heavy use of perfume to disguise smell of drugs.
(b) Wearing of sun-glasses at inappropriate times just to hide dilated or constricted pupils.
(c) Unusual outbursts of temper without provocation's.
(d) Disregard for physical appearance at work and at home.
(e) Change in pattern of work and decrease in work performance.
(f) Slow-speech and reaction-time.
(g) Loss of weight and appetite recently.

(h) Spending long-hours in toilets, sudden craving of food and frequent fluctuation in mood and behaviour.
(j) Skin puncture marks on arms, legs, thighs.
(k) Pin-pint pupil and dropping eye lids.

**9.5 COLLECTION OF URINE SAMPLES PROCEDURE**

One urine sample shall be collected and sealed in a bottle provided by laboratory with signature of concerned aircrew. The sample so collected will be sent by CAA Medical Authorities to pre-designated laboratory for testing according to the testing procedure laid-down by such reputable lab. In case the sample turns out to be positive for illicit drug/psychoactive substance, the licence of concerned flight crew shall immediately be suspended and he will be grounded temporarily and will be referred to the concerned airline for further urine / blood samples so as to ascertain authenticity and genuineness of such positive test. In case the test is verified to be positive, such aircrew shall be subjected to clinical evaluation including psychiatric assessment and treatment / rehabilitation on the lines specified in the subsequent paragraphs. However, cases of drug/substance dependents duly assessed by specialists shall be considered permanent unfit for flying duties. In case his clinical evaluation and blood samples turn-out to be negative, he shall be allowed to exercise licence privileges.
9.6 SUBSTANCES / DRUG DEPENDENCE

9.6.1 Substances / drug dependence is a condition in which a person is dependent on a substance I drug other than tobacco and caffeine as evidenced by, increased tolerance, manifestation of withdrawal symptoms, impaired control of their use or continued use of such substances despite damage to physical health or impairment of social, personal, or occupational functioning, The use of substance / drugs have been hallowed by tradition and when such drugs are used for other than the medical reasons, are likely to constitute a condition called "Drug Abuse". The drug abuse results to psychic dependence followed by drug addiction as under:-

(i) Psychic Dependence - is a condition induced by repeated use of such drugs as morphine, alcohol, barbiturates, amphetamines etc. It is characterized by an urge or need to continue taking such drugs without any medical reasons. The opioid group, barbiturates and alcohol may cause, in addition to psychic dependence, a physical dependence with resultant withdrawal symptoms on sudden cessation of such substance / drugs as well.

(ii) Psychic dependence and physical dependence occurring together shall lead to amore profound craving for compulsion to continue taking the drugs to the extent that the person is totally dependent upon taking such drugs/substance irrespective of his surrounds. This condition is known as drug addiction.

9.6.2 Since drug dependence affects the mental stress, interferes with the judgement, alertness, vision and coordination, thus taking of substance/drugs of such nature shall be considered as a permanent bar to aviation because in such cases the habit is so much more among the unstable and criminal fringe of society that it raises serious doubts about the mental stability of the addicts and the urge for continued taking such drugs / substance which make the sufferer more unreliable. Since the cure of drug dependence is extremely difficult and be devilled by relapses / remissions, therefore a history of drug dependence shall be a permanent bar for grant I issuance of any form of (lying licences to such person.
MEDICAL EXAMINATION OF CANDIDATES FOR ULTRA LIGHT VEHICLE OPERATIONS

(i) Medical Assessment of the candidates applying for the certificate of competence for ultra-light vehicle operators for recreational purposes shall be conducted by the Chief of Aviation Medicine or a doctor designated by him. In such assessment in accordance with the medical assessment proforma specified under appendix -21.

(ii) In case of unfitness, such candidates shall be referred to Chief of Aviation Medicine, CAA for Accredited Medical Conclusion.

(iii) Ultra-light vehicle operators shall not commence flying training for any type of recreational flying activity until he has attained the age of 17 years.
HEADQUARTERS
CIVIL AVIATION AUTHORITY
AFRO MEDICAL CENTRE
QIAP

REF. HQCAA/1803// AMC Dated:

To

________________________
________________________
________________________

Sub: NAME NO._____ DEPTT: _______

Dear Sir,

The above aircrew reported for Medical Assessment for Initial / Renewal / Medical Board. On

The following observations are made by _______________________

The concerned crew is referred In you for the following tests/investigations:-

The aircrew may be referred to CAME with your reports/comments along-with results of tests/investigations in confidence as suggested.

MEDICAL ASSESSMENT IS DEFERRED PENDING MEDICAL RESULTS

Yours Sincerely,

C.A.M./PRESIDENT CAMB/SMO/AME

CC to:
CRITERIAL FOR EXERCISE TOLERANCE TEST (ETT)

Exercise stress testing is desirable:

a) at the time of medical assessment for the first issue of a professional pilot licence, and

b) at the age of 40 and periodically thereafter as might be considered appropriate.

c) In the evaluation of applicants with chest pain, suspected angina, a history of arrhythmia or conduction disturbance.

d) In the evaluation of applicants with known cardiovascular defects as part of the assessment before first issue of a licence and thereafter if indicated, in order to determine and follow the functional consequences of the defect.

e) As part of the general evaluation of applicants with hypertension, diabetes mellitus, arteriosclerosis of circulatory beds, other than the coronary, and in any general evaluation of the cardio-pulmonary system.

f) In electrical instability cases, observed during or after exercise ECG testing according to the nature of the disturbance found and its relationship to aviation safety. Which may be the sole indicator of myocardial ischaemia.

Certification:

(i) An abnormal ‘ischaemic response’ to exercise stress testing refers to an isoelectric or horizontal ST segment of 0.80 to 0.12 seconds duration which is depressed 1.0 millimeter (0.10
millivolts) or which demonstrates a negative slope below a P-R segment or Q-Q baseline of consecutive QRS complex. An ST depression of 0.5 to 1.0 millimeters should be considered borderline. These criteria apply to exercise stress testing at the level of 70 percent of age-predicted maximum heart rates, such as the Master test.

(ii) A licence holder who demonstrates an ischaemic response to exercise stress testing should be assessed as temporarily unfit for aviation duties. A complete review of his medical status is recommended at the time the defect appears with special reference to the cardiovascular system and to factors of risk. It is recommended that a suitable interval of time - 90 days is suggested for an otherwise healthy subject - to allow for the correction of any detected factors of risk and for a programme of physical conditioning A return to aviation duties may be recommended in certain circumstances.

(iii) Adequate medical facilities must exist to ensure the continued health status of the individual. Efforts must be sustained to eliminate the various coronary risk factors. Repeated stress testing must demonstrate that cardiac reserve exceeds the stress demands of the pertinent aviation duties without evidence of strain. A favorable medical recommendation based upon the existence of these circumstances should be subsequently reviewed at least bi-annually.
CRITERIA FOR ANGIOGRAPHY

This special procedure performed at the discretion of a cardiological consultant may be involved in the following cases;

(a) in subjects over the age of 40 with paroxysmal or persistent supraventricular tachycardias who have no evidence of cardiomegaly or ventricular hypertrophy and no apparent valvular defects or other obvious cause for dysrhythmia and in whom the aetiology of the rhythm problem is otherwise unexplained;

(b) in subjects with significant conduction defects, especially acquired right and left bundle branch block in whose the aetiology is uncertain. The differential diagnosis in such cases, especially in adult males over the age of 40, usually involves distinguishing cardiomyopathy and coronary artery disease;

(c) in subjects with 'non-specific' ST and T-Wave changes on electrocardiography, when appropriate cardiovascular evaluation by other means has failed to elucidate the aero medical significance of these changes;

(d) in subjects whose medical examination poses differential diagnosis of pericarditis and coronary artery diseases.
CRITERIA FOR CABG SURGERY

Treatment of symptomatic or asymptomatic ischemic heart disease with bypass surgery (in the absence of a history of acute myocardial infarction including preoperative infarction) disqualifies a pilot from flying for at least 09 months. Relicensure may be considered with restriction of flying on multicrew operations only (i.e. as or with copilot) provided the following criteria are met.

(i) The current clinical evaluation indicates no cardiovascular symptoms, a normal cardiovascular examination, the absence of coronary risk factors, and no requirement for disqualifying medications.

(ii) Normal 24- hours ambulatory monitoring with no arrhythmia's.

(iii) Normal functional capacity by exercise stress testing, and no evidence of ischaemia or electrical instability.

(iv) Normal myocardial perfusion by radiomIclide scans under stress.

(v) Normal wall motion and ejection fraction at rest and no wall motion abnormalities under stress and normal ejection fraction response.

(vi) Major risk factors, including high blood pressure and increased blood glucose and serum cholesterol levels, are absent, and the pilot is a non-smoker and normotensive.

(vii) Results of cardiac catheterization performed 09 months after surgery demonstrate:

(a) no unbypassed functionally significant obstructive coronary artery diseases;

(b) anatomic patency of bypass grafts;

(c) normal wall motion on ventriculography;

(d) normal ventricular haemodynamics

Selected cases such as those fulfilling the above criteria might be considered for licensing, provided that the applicant is re-evaluated no less frequently than every six months and that continued stability is confirmed by an accredited medical conclusion annually thereafter. The following assessment every 12 months should include thorough history-taking and physical examination, electrocardiography at rest and a review of modifiable risk factors. A spec thallium should be done 02 yearly until pilot is 50 years of age and subsequently at yearly intervals. Angiography be repeated not more than 03 years after re-certification. However in case of Flight Engineers such restrictions shall be limited to Flight Engineers duties only.
CRITERIA FOR CORONARY ANGIOPLASTY

Pilots with symptomatic or asymptomatic coronary artery disease but no history of acute myocardial infarction who have been treated by coronary angioplasty may be reconsidered for licensure 09 months with restrictions to multi-crew operations as or with co-pilot except for Flight Engineers who shall perform Flight Engineers duties only after the procedure if the following criteria are met:

(i) Successful dilation is maintained and there is no progression of disease, as demonstrated by repeated angiography 09 months after the initial procedure,

(ii) Rest and exercise thallium scans show no perfusion defects.

(iii) The current clinical evaluation indicates no cardiovascular symptoms, a normal cardiovascular examination, the absence of coronary risk factors, and no requirement for disqualifying medication.

(iv) Normal 24-hours ambulatory monitoring by Hotter monitor.

(v) Normal functional capacity by exercise stress testing and no evidence of ischaemia or electrical instability thereafter.

(vi) Normal wall motion and ejection fraction at rest and no wall motion abnormalities under stress and normal ejection fraction response on echocardiography.

Follow-up assessment every 12 months should include thorough history taking, physical examination, rest and exercise electrocardiography. If there is no clinical deterioration after 02 years, spect thallium should be done every 02 yearly until the pilot is 50 years of age and subsequently at yearly intervals.
CRITERIA FOR MYOCARDIAL INFARCTION

Acute myocardial infarction is incompatible with active flying in any class. However, disqualification is not necessarily permanent, and reinstatement with restrictions to multi-crew operations may be considered 09 months after the event if the following criteria are met:

(i) There are no symptoms of Ischaemia in the absence of medication indicating normal resting ECG tracings.

(ii) Major modifiable risk factors for recurrence of infarction, including high blood pressure, diabetes mellitus and increased serum cholesterol levels, are controlled, and the pilot is a non-smoker.

(iii) The result of an exercise test to at least 85% of the predicted maximum heart rate with the Bruce protocol or equivalent is normal in all respects. Cardiac medications must be stopped for an appropriate time before such test.

(iv) Left ventricular function, measured by the ejection fraction with gated radionuclide scintigraphy, is better than 50%/a at rest and increased by at least 10% with exertion.

(v) The heart rhythm during rest and exercise is shown by Holter monitoring to be free of repetitive ectopic beats per hour in the absence of anti-arrhythmic medication.

(vi) There should be no clinical history of complications such as shock, congestive heart failure or arrhythmias after the recovery of myocardial infarction.

(vii) The applicant must be normotensive, have normal kidney functions, normal body weight and good physical examination, electrocardiography at rest and a review of modifiable risk factors. A treadmill exercise test should be done every 02 years until the pilot is 50 years of age and subsequently at yearly intervals.

(viii) These criteria apply regardless of whether the patient was treated for acute thrombosis (e.g. with angioplasty or bypass surgery) or the infraction occurred in the absence of significant coronary artery disease as demonstrated by arteriography.
CRITERIA FOR SATISFACTORY CONTROL 
OF DIABETES

(a) The urine must be free of albumin and ketones and show no more than a trace (1+) of Sugar.

(b) Body weight should remain within close limits.

(c) Two hours post-prandial blood sugar level should be within acceptable limits.

(d) The findings on routine medical examination should be acceptable, including BP reading, ECG changes, lab. Investigations and ophthalmoscopic and neurological examination.

(e) Blood sugar control of 30 days period prior to the examination be within acceptable limits by (glycosolated Haemoglobin (Hb AIC) Test).

(f) Submission of control data to licensing authorities at prescribed intervals and at the discretion of licensing authorities.
### List of Compatible Medications for Control of Hypertension

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<tr>
<th>Acceptable</th>
<th>Not Acceptable</th>
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<tr>
<td>ACEBUTOLOL</td>
<td>CAPTOPRIL (IN COMBINATION WITH A DIURETIC)</td>
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<td>AMIPIRDF (IN COMBINATION WITH HYDROCHLOROTHIAZIDE)</td>
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**APPENDIX-08**

*MAXIMAL READINGS PERMITTED (mm Hg)*

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<th>AGE GROUP</th>
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<th>DIASTOLIC</th>
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<tr>
<td>&gt;50</td>
<td>160</td>
<td>98</td>
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* Provided that aircrew is free from coronary artery risk factors besides cardiac, metabolic, hepatic and renal dysfunction.