Appendix 5

Medical Provisions for Licensing; Deferment and Limitation.

General

In cases where the applicant does not fully meet the medical requirements and in complicated and unusual cases, the evaluation may have to be deferred and the case submitted to the medical assessor Aeromedical center, the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand, Board of Aeromedical Specialist BAS of CAAT for final evaluation. In such cases due regard must be given to the privileges granted by the license applied for or held by the applicant for the Medical Assessment, and the conditions under which the license holder is going to exercise those privileges in carrying out assigned duties.

5.1 The exercise of flexibility

5.1.1 Basic safety management principles, when applied to the medical assessment process, can help ensure that aeromedical resources are utilized effectively.

5.1.2. The purpose of the medical examination is to determine that no physical or mental condition exists which may reduce the applicant's medical fitness to a significant degree during the period of validity of the Medical Assessment.

5.1.3. While the Standards and Recommended Practices lay down as precisely as possible the minimum levels considered acceptable, it is understood that a degree of interpretation must often be exercised at the discretion of the Authorized Medical Examiner or Medical Assessor. The important non-medical factors which should be taken into consideration in such cases are the age and experience of the applicant, the privileges of the particular license or rating applied for or held, and the environmental conditions in which these are to be exercised

5.1.4. The Authorized Medical Examiner shall report to or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand the any individual case where, in the examiner's judgement, an applicant's failure to meet any requirement, whether numerical or otherwise, is such that exercise of the privileges of the license being applied for or held, is not likely to jeopardize flight safety

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

limitation or limitations.

5.1.6. The exercise of flexibility base on ICAO Annex 1 Personnel Licensing, ICAO Doc 8984 Manual of Civil Aviation Medicine, EASA Easy Access Rules for Medical Requirements (IR + AMC/GM), EASA Easy Access Rules for ATCO (IR + AMC/GM) และ FAA Guide for Aviation Medical Examiners

5.2 Cardiovascular System

5.2.1. Perform Exercise electrocardiography on:

5.2.1.1 Symptoms, significant vascular risk (including age),

5.2.1.2. Possibly significant ECG changes

5.2.1.3. Under supervision of cardiologist.

5.2.2. Serum lipid estimation is case finding and significant abnormalities should require review, investigation and supervision by the AME in consultation with Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. An accumulation of risk factors (smoking, family history, lipid abnormalities, hypertension, etc.) should require cardiovascular evaluation by the AME in consultation with the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.2.3. The diagnosis of hypertension should require cardiovascular review to include potential vascular risk factors. Traditionally, the systolic blood pressure is taken to be the pressure at which the first Korotkoff sound is first heard and the diastolic blood pressure is the pressure at which the fourth Korotkoff sound is just barely audible. Measure blood pressure for two times after 10-15 minutes the applicant is relaxed by allowing 5 minutes to relax before the first reading. The applicant should sit upright with their upper arm positioned so it is level with their heart and feet flat on the floor. Taking a reading with both arms and averaging the readings. To check the pressure again for accuracy, wait about five minutes between readings.

5.2.4. Anti-hypertensive treatment should be agreed by the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Acceptable medication may include:

5.2.4.1. The sartans (angiotensin receptor blocking agents - ARB's) — e.g.

losartan, candesartan

5.2.4.2. The angiotensin converting enzyme (ACE) inhibitors — e.g. enalapril, lisinopril,

5.2.4.3. The slow channel calcium blocking agents (CCB's) — e.g. amlodipine, nifedipine

5.2.4.4. The beta-blocking agents — e.g. atenolol, bisoprolol

5.2.4.5. The diuretic agents — e.g. bendroflumethazide, indapamide

Applicants with hypertension and treated with the alpha 1 blocking agents i.e. doxazosin, prazosin and the centrally acting products clonidine, moxonidine and methyldopa shall be assessed as unfit.

Following initiation of medication for the control of blood pressure, applicants should be re-assessed to verify that the treatment is compatible with the safe exercise of the privileges of the license held.

5.2.5. Chest pain of uncertain cause should require full investigation. In suspected asymptomatic coronary artery disease, exercise electrocardiography should be required. Further tests may be required, such as Scintigraphy or stress echocardiography and/or coronary angiography which should show no evidence of myocardial ischemia or significant coronary artery stenosis.

5.2.6. Evidence of exercise-induced myocardial ischemia should be disqualifying. At least 6 months from the ischemic myocardial event, including revascularization, the following investigations should be completed (equivalent tests may be substituted):

5.2.6.1. Exercise ECG to stage IV of the Bruce treadmill protocol can be achieved without evidence of myocardial ischemia, significant rhythm disturbance or symptoms.

5.2.6.2. An echocardiogram showing satisfactory left ventricular function with no important abnormality of wall motion (such as dyskinesia or akinesia) and a left ventricular ejection fraction of 50 % or more;

5.2.6.3. Holter monitoring, if indicated, shows no significant rhythm disturbance.

5.2.6.4. Coronary angiography carried out at or around the time of the index event demonstrates < 50 percent stenosis in any major untreated vessel or in any venous/arterial graft remote from any infarction; < 30 per cent if the proximal the left anterior descending or left main-stem vessels are involved.

5.2.6.5. Follow-up should be annually (or more frequently, if necessary) to ensure that there is no deterioration of the cardiovascular status. It should include a review by a cardiologist, exercise ECG and cardiovascular risk assessment. Additional investigations may be required by the AME in consultation with Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.2.6.6. After index even, a myocardial perfusion scan or equivalent test should be performed if there is any indication, and in all cases within 5 years from the procedure.

A fit assessment.

Applicants who have undergone therapy should be assessed as unfit. A fit assessment may be considered by the AME in consultation with Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Should require, Assessment to fly as/with a suitably qualified copilot OML) for medical license class 1, Valid only with safety pilot and in aircraft with dual controls for medical license class 2 and Valid only when another air traffic controller available and competent to assume your duties for medical license class 3 or Air traffic controller. Successful completion of the 6-month or subsequent review will allow a fit assessment with a multi-pilot limitation.

5.2.7. An applicant who has undergone coronary bypass grafting or angioplasty (with or without stenting) or other cardiac intervention or who has a history of myocardial infarction or who suffers from any other potentially incapacitating cardiac condition shall be assessed as unfit unless the applicant's cardiac condition has been investigated and evaluated in accordance with best medical practice and is assessed not likely to interfere with the safe exercise of the applicant's license or rating privileges.

5.2.7.1. Exercise ECG to stage IV of the Bruce treadmill protocol can be achieved without evidence of myocardial ischemia, significant rhythm disturbance or symptoms.

5.2.7.2. An echocardiogram showing satisfactory left ventricular function with no important abnormality of wall motion (such as dyskinesia or akinesia) and a left ventricular ejection fraction of 50 % or more;

5.2.7.3. Holter monitoring, if indicated, shows no significant rhythm disturbance.

5.2.7.4. Coronary angiography carried out at or around the time of the index event demonstrates < 50 per cent stenosis in any major untreated vessel or in any venous/arterial graft remote from any infarction; < 30 percent if the proximal the left anterior descending or left main-stem vessels are involved.

5.2.7.5. Follow-up should be annually (or more frequently, if necessary) to ensure that there is no deterioration of the cardiovascular status. It should include a review by a cardiologist, exercise ECG and cardiovascular risk assessment. Additional investigations may be required by the AME in consultation with Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.2.7.6. After coronary artery vein bypass grafting, a myocardial perfusion scan or equivalent test should be performed if there is any indication, and in all cases within 5 years from the procedure. Additional investigations may be required by the AME in consultation with Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

Applicants who have undergone therapy should be assessed as unfit. A fit assessment may be considered by the AME in consultation with Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Should require, Assessment to fly as/with a suitably qualified copilot OML) for medical license class 1, Valid only with safety pilot and in aircraft with dual controls for medical license class 2 and Valid only when another air traffic controller available and competent to assume your duties for medical license class 3 or Air traffic controller. Successful completion of the 6-month or subsequent review will allow a fit assessment with a multi-pilot limitation.

5.2.8. Rhythm/Conduction disturbances.

5.2.8.1. Any significant rhythm or conduction disturbance should require evaluation by a cardiologist in consultation with Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand and appropriate follow-up in the case of a fit assessment. Such evaluation should include:

5.2.8.1.1. Exercise ECG to the Bruce protocol or equivalent. Bruce stage 4 should be achieved and no significant abnormality of rhythm or conduction, or evidence of myocardial ischemia should be demonstrated. Withdrawal of cardioactive medication prior to the test should normally be required;

5.2.8.1.2. 24-hour ambulatory ECG which should demonstrate no significant rhythm or conduction disturbance;

5.2.8.1.3. 2D Doppler echocardiogram which should show no significant selective chamber enlargement or significant structural or functional abnormality, and a left ventricular ejection fraction of at least 50 %.

5.2.8.1.4. Coronary angiography carried out at or around the time of the index event demonstrates < 50 per cent stenosis in any major untreated vessel or in any venous/arterial graft remote from any infarction; < 30 per cent if the proximal the left anterior descending or left main-stem vessels are involved.

5.2.8.1.5. Low risk for Incapacitation on Electrophysiological investigation

5.2.8.2. Applicants with frequent or complex forms of supra ventricular or ventricular ectopic complexes require full cardiological evaluation by a cardiologist in consultation with Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Applicants who have undergone therapy should be assessed as unfit. A fit assessment may be considered by the AME in consultation with Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Should require, Assessment to fly as/with a suitably qualified copilot OML) for medical license class 1, Valid only with safety pilot and in aircraft with dual controls for medical license class 2 and Valid only when another air traffic controller available and competent to assume your duties for medical license class 3 or Air traffic controller. Successful completion of the 6-month or subsequent review will allow a fit assessment with a multi-pilot limitation.

5.2.8.2.1. Applicants with significant disturbance of supraventricular rhythm, including sinoatrial dysfunction, whether intermittent or established, should be assessed as unfit. A fit assessment may be considered by the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand if cardiological or Aeromedical center evaluation is satisfactory.

5.2.8.2.2. Ventricular pre-excitation, a fit assessment may be considered by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand: Asymptomatic initial applicants with pre-excitation may be assessed as fit; if an electrophysiological study, including adequate drug-induced autonomic

stimulation reveals no inducible re-entry tachycardia and the existence of multiple pathways is excluded. Asymptomatic applicants with pre-excitation may be assessed as fit at revalidation with a multi-pilot limitation.

5.2.8.2.3. Complete right bundle branch block. Applicants with complete right bundle branch block should require cardiological evaluation on first presentation and subsequently: for initial applicants under age 40, a fit assessment may be considered by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Initial applicants over age 40 should demonstrate a period of stability of 12 months; for revalidation, a fit assessment may be considered if the applicant is under age 40. A multi-pilot limitation should be applied for 12 months for those over age 40.

5.2.8.2.4. Applicants who have undergone ablation therapy should be assessed as unfit. A fit assessment may be considered by a fit assessment may be considered by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand ; licensing following successful catheter ablation and should require a multi-pilot limitation for at least one year, unless an electrophysiological study, undertaken at a minimum of 2 months after the ablation, demonstrates satisfactory results. For those whose long-term outcome cannot be assured by invasive or non-invasive testing, an additional period with a multi-pilot limitation and/or observation may be necessary.

5.2.8.3. Pacemaker; Applicants with a sub endocardial pacemaker should be assessed as unfit. A fit assessment may be considered at revalidation by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand no sooner than 3 months after insertion and should require:

5.2.8.3.1. No other disqualifying condition;

5.2.8.3.2. A bipolar lead system, programmed in bipolar mode without automatic mode change of the device;

5.2.8.3.3. That the applicant is not pacemaker dependent;

5.2.8.3.4. Exercise ECG to the Bruce protocol or equivalent. Brucestage 4 should be achieved; regular follow-up, including a pacemaker check;

5.2.8.3.5. A 2D Doppler echocardiogram which should show no significant selective chamber enlargement or significant structural or functional abnormality, and a left ventricular ejection fraction of at least 50 %.

5.2.8.3.6. Holter monitoring, if indicated, shows no significant rhythm disturbance.

5.2.8.3.7. Successful completion of the 6-month or subsequent review will allow a fit assessment with a multi-pilot limitation by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.2.8.3.8. Assessment to fly as/with a suitably qualified copilot OML) for medical license class 1, Valid only with safety pilot and in aircraft with dual controls for medical license class 2 and Valid only when another air traffic controller available and competent to assume your duties for medical license class 3 or Air traffic controller.

5.2.9. Applicants with an aneurysm of the infra-renal abdominal aorta may be assessed as fit with a multi-pilot limitation by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Follow-up by ultra-sound scans or other imaging techniques, should be done every 6 months, should be determined by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Applicants may be assessed as fit by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand after surgery for an infra-renal aortic aneurysm with a multi-pilot limitation at revalidation if the blood pressure and cardiovascular assessment are satisfactory. Regular cardiological review should be required.

5.2.10. Cardiac valvular abnormalities

5.2.10.1. Applicants with previously unrecognized cardiac murmurs should undergo evaluation by a cardiologist and assessment by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. If considered significant, further investigation should include at least 2D Doppler echocardiography or equivalent imaging.

5.2.10.2. Valvular Abnormality

5.2.10.2.1. Applicants with a bicuspid aortic valve may be assessed

as fit, if no other cardiac or aortic abnormality is demonstrated. Follow-up with echocardiography, as necessary, should be determined by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.2.10.2.2. Applicants with aortic stenosis require Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand review. Left ventricular function should be intact. A history of systemic embolism or significant dilatation of the thoracic aorta is disqualifying. Those with a mean pressure gradient of up to 20 mmHg may be assessed as fit. Those with mean pressure gradient above 20 mmHg but not greater than 40 mmHg may be assessed as fit with a multi-pilot limitation. A mean pressure gradient up to 50 mmHg may be acceptable. Follow-up with 2D Doppler echocardiography, as necessary, should be determined by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Alternative measurement techniques with equivalent ranges may be used.

5.2.10.2.3. Applicants with trivial aortic regurgitation may be assessed as fit. A greater degree of aortic regurgitation should require a multi-pilot limitation. There should be no demonstrable abnormality of the ascending aorta on 2D Doppler echocardiography. Follow-up, as necessary, should be determined by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.2.10.2.4. Applicants with rheumatic mitral stenosis should normally be assessed as unfit.

5.2.10.2.5. Asymptomatic applicants with an isolated mid-systolic click due to mitral leaflet prolapse may be assessed as fit.

5.2.10.2.6. Applicants with uncomplicated moderate mitral regurgitation may be considered as fit with a multi-pilot limitation if the 2D Doppler echocardiogram demonstrates satisfactory left ventricular dimensions and satisfactory myocardial function is confirmed by exercise electrocardiography. Periodic cardiological review should be required, as determined by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.2.10.2.7. Applicants with evidence of volume overloading of the left ventricle demonstrated by increased left ventricular end-diastolic diameter or evidence of systolic impairment should be assessed as unfit.

5.2.10.2.8. Follow-up, as necessary, should be determined by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.2.10.3. Valvular Surgery

5.2.10.3.1. Applicants with cardiac valve replacement/repair should be assessed as unfit. A fit assessment may be considered by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.2.10.3.2. Asymptomatic applicants with a tissue valve or with a mechanical valve who, at least 6 months following surgery, may be considered for a fit assessment with a multi-pilot limitation by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Investigations which demonstrate normal valvular and ventricular configuration and function should have been completed as demonstrated by:

5.2.10.3.2.1. A 2D Doppler echocardiogram showing no significant selective chamber enlargement, a tissue valve with minimal structural alteration and a normal Doppler blood flow, and no structural or functional abnormality of the other heart valves. Left ventricular fractional shortening should be normal.

5.2.10.3.2.2. A satisfactory symptom limited exercise ECG. Myocardial perfusion imaging/stress echocardiography should be required if the exercise ECG is abnormal or any coronary artery disease has been demonstrated.

5.2.10.3.2.3. Investigations which demonstrate normal valvular and ventricular configuration and function should have been completed.

5.2.10.3.2.4. Applicant are taking no cardioactive medication may be considered for a fit assessment with a multi-pilot limitation by the Aeromedical center or the

Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.2.10.3.2.5. Follow-up with exercise ECG and 2D echocardiography, as necessary, should be determined by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.2.11. Where anticoagulation is needed after valvular surgery, a fit assessment with a multi-pilot limitation may be considered after review by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. The review should show that the anticoagulation is stable. Anticoagulation should be considered stable if, within the last 6 months, at least 5 INR values are documented, of which at least 4 are within the INR target range. Arterial or venous thrombosis or pulmonary embolism are disqualifying whilst anticoagulation is being used as treatment. After 6 months of stable anticoagulation as prophylaxis, a fit assessment with multi-pilot limitation may be considered after review by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Anticoagulation should be considered stable if, within the last 6 months, at least 5 INR values are documented, of which at least 4 are within the INR target range. Pulmonary embolus should require full evaluation. Following cessation of anti-coagulant therapy, for any indication, applicants should require review by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.2.12. Applicants with a primary or secondary abnormality of the pericardium, myocardium or endocardium should be assessed as unfit. A fit assessment may be considered by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand following complete resolution and satisfactory cardiological evaluation which may include 2D Doppler echocardiography, exercise ECG and/or myocardial perfusion imaging/stress echocardiography and 24-hour ambulatory ECG. Coronary angiography may be indicated. Frequent review and a multi-pilot limitation may be required after fit assessment.

5.2.13. Applicants with a congenital abnormality of the heart, including those who have undergone surgical correction, should be assessed as unfit. Applicants with minor abnormalities

that are functionally unimportant may be assessed as fit by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand following cardiological assessment. No cardioactive medication is acceptable. Investigations may include 2D Doppler echocardiography, exercise ECG and 24-hour ambulatory ECG. Regular cardiological review should be required.

5.2.14. Applicants with a history of recurrent vasovagal syncope should be assessed as unfit. A fit assessment may be considered by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand after a 6-month period without recurrence provided cardiological evaluation is satisfactory. Such evaluation should include:

5.2.14.1. A satisfactory symptom limited 12 lead exercise ECG to Bruce Stage IV or equivalent. If the exercise ECG is abnormal, myocardial perfusion imaging/stress echocardiography should be required;

5.2.14.2. A 2D Doppler echocardiogram showing neither significant selective chamber enlargement nor structural or functional abnormality of the heart, valves or myocardium;

5.2.14.3. A 24-hour ambulatory ECG recording showing no conduction disturbance, complex or sustained rhythm disturbance or evidence of myocardial ischemia.

5.2.14.4. A tilt test carried out to a standard protocol showing no evidence of vasomotor instability may be required Neurological review. A multi-pilot limitation should be required until a period of 5 years has elapsed without recurrence. The Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand may determine a shorter or longer period of multi-pilot limitation according to the individual circumstances of the case. Applicants who experienced loss of consciousness without significant warning should be assessed as unfit.

5.2.15. Applicants with heart or heart/lung transplantation shall be assessed as unfit:

5.2.16. Applicants shall undergo satisfactory oncological evaluation before a fit assessment can be made.

5.3. Respiratory system

5.3.1. An FEV1/FVC ratio less than 70 % at initial examination should require evaluation by a specialist in respiratory disease for applicant of medical license class 1. The peak flow

measurement is found to be less than 80% of predicted normal value, then further evaluation by a pulmonary physician is required for applicant of medical license class 2 [The Peak Flow Meter is no adequate tool for pulmonary function testing,]

5.3.2. Applicants with chronic obstructive airways disease should be assessed as unfit. Applicants with only minor impairment of their pulmonary function may be assessed as fit.

5.3.3. Initial applicants who give a history of recent acute attacks of asthma shall be assessed as unfit

5.3.3.1. Initial applicants for Class 1 Class 2 and Class 3 certification with a history of pre-existent asthma may be assessed as fit with multi-pilot limitation [by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand] provided that the applicant demonstrates: acceptable pulmonary function tests (FEV1/FVC ratio >75% and normal home peak flow monitoring); treatment limited to [medication compatible to flight safety (inhaled corticosteroid or inhaled beta agonist or any combination of two, or inhaled cromoglycate, but no systemic steroids)];

5.3.3.2. Initial applicants for Class 4 certification with a history of preexistent asthma may be assessed as fit with multi-pilot limitation [by the Authorized Medical Examiner] provided that the applicant demonstrates: acceptable pulmonary function tests (FEV1/FVC ratio >75% and normal home peak flow monitoring); treatment limited to [medication compatible to flight safety (inhaled corticosteroid or inhaled beta agonist or any combination of two, or inhaled cromoglycate, but no systemic steroids];

5.3.4. Applicants with active sarcoidosis should be assessed as unfit. A fit assessment may be considered by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.3.4.1. Investigation should be undertaken with respect to the possibility of systemic, particularly cardiac, involvement. A fit assessment may be considered if the disease is investigated and shown to be limited to hilar lymphadenopathy and inactive.

5.3.4.2. No medication is required

5.3.5. When assessing an applicant suffering from, or undergoing treatment for, pulmonary tuberculosis, the medical examiner should keep in mind that any doubt about the activity of a lesion (where symptoms of activity of the disease are clinically lacking) must lead

to an assessment as unfit for a period of not less than three months from the date of the medical examination. At the end of the three-month period, a further radiographic record should be made and compared carefully with the original. If there is no sign of extension of the disease and there are neither general symptoms nor symptoms referable to the chest, the applicant may be assessed as fit for three months. Thereafter, provided there continues to be no sign of extension of the disease as shown by radiographic examinations carried out at the end of each three-month period, the validity of the license 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 two years and comparison of all the radiographic records shows no changes or only regression of the lesion, the lesion should be regarded as “quiescent” or “healed.”

5.3.6. Applicants with a spontaneous pneumothorax should be assessed as unfit. A fit assessment may be considered if respiratory evaluation is satisfactory:

5.3.6.1. 1 year following full recovery from a single spontaneous pneumothorax;

5.3.6.2. At revalidation, 6 weeks following full recovery from a single spontaneous pneumothorax, with a multi-pilot limitation;

5.3.6.3. Following surgical intervention in the case of a recurrent pneumothorax provided there is satisfactory recovery. A recurrent spontaneous pneumothorax that has not been surgically treated is disqualifying.

5.3.7. Applicants requiring major thoracic surgery should be assessed as unfit for a minimum of 3 months following operation or until such time as the effects of the operations are no longer likely to interfere with the safe exercise of the privileges of the applicable license(s). A fit assessment following lesser chest surgery may be considered by the licensing authority after satisfactory recovery and full respiratory evaluation.

5.3.8. Applicants shall undergo satisfactory oncological evaluation before a fit assessment can be made.

5.4 Digestive system

5.4.1. Applicants with disorders of the gastro-intestinal system including: recurrent dyspeptic disorder requiring medication; shall be assessed as unfit. A fit assessment may be considered if digestive evaluation is satisfactory: Pilots with uncomplicated peptic ulcer should be considered as unfit for all aviation duties during any period of clinical activity sufficient to

warrant treatment beyond simple dietary control. The general criteria for medical fitness are that an applicant with a history of uncomplicated peptic ulcer be symptom-free on a suitable diet and that there is endoscopic evidence of the ulcer healing. Irregular work schedules and eating habits of flight crews on duty need to be considered as a complicating factor. Applicants suffering from ulcers complicated by chronicity, obstruction or hemorrhage should generally be considered unfit for aviation duties, with the following exceptions. An applicant with a history of one episode of recurrence might be assessed as fit if symptom-free on a normal (suitable) diet and provided there is evidence of clinical recovery. More than one episode of recurrence calls for comprehensive medical investigation and evaluation. Should such an applicant undergo surgery and the postoperative follow-up indicates complete recovery and virtual elimination of the excess risk associated with complications, the condition may be regarded as an uncomplicated (peptic) ulcer in remission which should require action as outlined above before return to flying duties. Medical certification of applicant with Gastro-esophageal reflux disease (GERD) may be considered in cases where the frequency and intensity of episodes are low, where complications such as esophagitis, esophageal ulcer, strictures, bleeding, and Barrett's esophagus is absent, and where the medication prescribed has no significant side effects. Alcohol abuse as a causative factor should always be explored. Applicants with a history of pancreatitis should be assessed individually, and the aeromedical decision should be made in consultation with the medical assessor and based on a thorough investigation and evaluation in accordance with best medical practice. Close follow-up is essential.

5.4.2. Applicants with a single asymptomatic large gallstone discovered incidentally may be assessed as fit if not likely to cause incapacitation in flight. An applicant with asymptomatic multiple gallstones may be assessed as fit with a multi-pilot limitation.

5.4.3. The primary symptoms of ulcerative colitis are abdominal pain, bloody diarrhea and weight loss. The course of the disease is characterized by frequent exacerbations and many, often severe, complications including anemia, and a high frequency of colonic carcinoma. Medical treatment is often unsatisfactory, and many patients will require surgery (colectomy). Crohn's disease is usually more severe with a poor quality of life for most patients regardless of treatment. For both conditions, an assessment as unfit is the rule, although rare cases with mild and infrequent symptoms and without need for long-term treatment may be considered fit

under close monitoring. Irritable colon is not an uncommon condition among aviation personnel. It may be aggravated by change of environmental and working conditions, e.g. operating routes, and might lead to incapacitating conditions of varying severity. The condition should generally be disqualifying if medication is necessary for control of symptoms. Often the condition can be controlled by a diet rich in fiber, fruits and vegetables. If the symptoms are mild and regular use of psychotropic or cholinergic medication is unnecessary, it may not be disqualifying

5.4.4. Abdominal surgery is disqualifying for a minimum of 3 months. An earlier fit assessment may be considered if recovery is complete, the applicant is asymptomatic and there is only a minimal risk of secondary complication or recurrence. Applicants who have undergone a surgical operation on the digestive tract or its adnexa, involving a total or partial excision or a diversion of any of these organs, should be assessed as unfit for a minimum period of 3 months or until such time as the effects of the operation are no longer likely to interfere with the safe exercise of the privileges of the applicable license(s)

5.4.5. Applicants shall undergo satisfactory oncological evaluation before a fit assessment can be made.

5.4.6. Infectious hepatitis is disqualifying. A fit assessment may be considered after full recovery.

5.5 Metabolic, Nutritional and Endocrine disorder.

5.5.1. Applicants with metabolic, nutritional or endocrine dysfunction may be assessed as fit if the condition is asymptomatic, clinically compensated and stable with or without replacement therapy, and regularly reviewed by an appropriate specialist.

5.5.2. Glycosuria and abnormal blood glucose levels require investigation. A fit assessment may be considered if normal glucose tolerance is demonstrated (low renal threshold) or impaired glucose tolerance without diabetic pathology is fully controlled by diet and regularly reviewed.

5.5.3. Type 2 diabetics fully controlled on diet alone may be [assessed as] fit [for] Class 1 and Class 2 [without limitations], subject to detailed follow-up at periodic medical examinations or at least annually. Those requiring [treatment with] biguanide [glitazones, the combination of glitazones with biguanides] or alpha-glucosidase inhibitors in addition may be acceptable [with a multi-pilot (Class 1 ‘OML’) limitation for Class 1 applicants] and [without

limitation for] Class 2 [applicants,] but the follow-up would need to be more stringent, namely 6 monthlies, Valid only when another air traffic controller available and competent to assume your duties for medical license class 3 or Air traffic controller. The use of sulphonylureas, [Repaglinide or Nateglinide] is unacceptable except for Class 2, 3 and 4 [with a safety pilot (Class 2, 3and 4'OSL') limitation]

Diagnostic criteria	
Condition	**Blood glucose level**
Diabetes	fasting blood glucose: 7.0 mmol/L (126 mg/dL) and above Or 2 hours after glucose load: 11.1 mmol/L (200 mg/dL) and above
Impaired glucose tolerance	fasting blood glucose: less than 7.0 mmol/L (126 mg/dL) and 2 hours after glucose load: 7.8 mmol/L (140 mg/dL) and above and less than 11.1 mmol/L (200 mg/dL)
Impaired fasting glucose	fasting blood glucose: 6.1 mmol/L (110 mg/dL) and above and less than 7.0 mmol/L (126 mg/dL) and 2 hours after glucose load: less than 7.8 mmol/L (140 mg/dL)
Modified from Definition, diagnosis and classification of diabetes mellitus and its complications. Report of a WHO consultation (WHO, Geneva, 1999) and the International Diabetes Federation	

Their metabolic control should be good and should not focus solely on blood glucose. Inorder to decrease cardiovascular risk, a holistic approach should be taken. The targets for the relevant parameters are shown

Metabolic targets

Good control	
Glucose: Fasting Post-prandial peak	 < 6.7 mmol/L < 9.0 mmol/L
HbA1c	< 7.0%
Blood pressure	130/80 mmHg
Total cholesterol	< 4.8 mmol/L
LDL-C	< 2.5 mmol/L
Triglycerides	< 2.3 mmol/L
HDL-C	> 1.0 mmol/L

The key to returning diabetic flight crew members to aviation duties safely is to use evidence-based medicine to avoid incapacitation in the aviation environment.

5.5.4. Addison's disease is disqualifying. A fit assessment may be considered, provided that cortisone is carried and available for use whilst exercising the privileges of the license(s). Applicants may be assessed as fit with a multi-pilot limitation.

5.5.5. Applicants with hyperthyroidism may be considered for medical assessment in any class when they have been euthyroid for at least two months. The continued use of anti-thyroid drugs is usually well tolerated; side effects are rare and should not preclude safety-sensitive duties. A condition of the medical certificate should be lifelong follow-up by an endocrinologist to ensure no recurrence of the hyperthyroidism and no insidious onset of late hypothyroidism, may be assessed as fit with a multi-pilot limitation.

5.5.6. Applicants may be considered for medical assessment in any class provided they remain euthyroid. It should be a condition that there is a regular supervision by an endocrinologist, may be assessed as fit with a multi-pilot limitation.

5.5.7. Applicants shall undergo satisfactory oncological evaluation before a fit assessment can be made.

5.6. Hematology

5.6.1. Applicants with anemia demonstrated by a reduced hemoglobin level or hematocrit less than 32 % should be assessed as unfit and require investigation. A fit assessment may be considered in cases where the primary cause has been treated (e.g. iron or B12 deficiency) and the hemoglobin or hematocrit has stabilized at a satisfactory level. Anemia

which is unamenable to treatment is disqualifying. Applicants with a haemoglobinopathy should be assessed as unfit. A fit assessment may be considered where minor thalassemia or other haemoglobinopathy is diagnosed without a history of crises and where full functional capability is demonstrated. The hemoglobin level should be satisfactory.

Applicants with sickle cell disease should be assessed as unfit. Splenic infarctions have repeatedly been reported occurring in flight due to sickling of red blood cells. Sickle-cell disease, which includes sickle-cell anemia (SS), sickle-cell hemoglobin C disease (SC), sickle-cell thalassemia (STh), sickle-cell hemoglobin D disease (SD) and other pathological genotypes involving hemoglobin S with other genetic variants, is disqualifying for flying.

There is no reason to impose any limitations on applicants with sickle-cell trait

5.6.2. Applicants with significant localized and generalized enlargement of the lymphatic glands and diseases of the blood should be assessed as unfit and require investigation. A fit assessment may be considered in cases of an acute infectious process which is fully recovered. Some antineoplastic medicines are known to be cardiotoxic, especially anthracyclines like doxorubicin and daunorubicin. Particular attention therefore needs to be paid to applicants with a previous history of successful leukaemia treatment to exclude the long-term consequences of such treatment, which can include subtle cardiac abnormalities, pulmonary fibrosis, cataracts, and endocrine dysfunction (including hypothyrodism).

Applicants with lymphoma should be considered on an individual basis. Lymphomas in remission, especially Hodgkin's Disease, may be considered for restricted certification after a disease-free period of at least two years after completion of treatment. Certification should be dependent on regular annual specialist's reports. Applicants may be assessed as fit with a multi-pilot limitation.

5.6.3. Applicants with chronic leukemia should be assessed as unfit. After a period, of demonstrated stability a fit assessment may be considered. Applicants may be assessed as fit with a multi-pilot limitation. Applicants with a history of leukemia should have no history of central nervous system involvement and no continuing side-effects from treatment of flight safety importance. Hemoglobin and platelet levels should be satisfactory. Regular follow up is required. Applicants may be assessed as fit with a multi-pilot limitation. Some antineoplastic medicines are known to be cardiotoxic, especially anthracyclines like doxorubicin and daunorubicin. Particular attention therefore needs to be paid to applicants with a previous

history of successful leukaemia treatment to exclude the long-term consequences of such treatment, which can include subtle cardiac abnormalities, pulmonary fibrosis, cataracts, and endocrine dysfunction (including hypothyrodism).

Applicants with acute leukemia should be assessed as unfit. Once in established remission, applicants may be assessed as fit. Applicants may be assessed as fit with a multi-pilot limitation.

An applicant with a confirmed diagnosis of Chronic myeloid leukaemia (CML) should normally not be considered for certification. In the early stages of the disease, restricted certification may sometimes be possible, provided there is no haemolytic anaemia and no requirement for chemotherapy or corticosteroids. Frequent review by an haematologist is necessary.

Applicants with Chronic lymphocytic leukaemia (CLL) may be assessed as fit provided, they remain well and do not need any medication although periodic review by a haematologist would be indicated.

5.6.4. Applicants with splenomegaly should be assessed as unfit and require investigation. A fit assessment may be considered when the enlargement is minimal, stable and no associated pathology is demonstrated, or if the enlargement is minimal and associated with another acceptable condition.

5.6.5. Applicants with polycythemias should be assessed as unfit and require investigation. A fit assessment with a multi-pilot limitation may be considered if the condition is stable and no associated pathology is demonstrated. It is important to distinguish between primary erythrocytosis which is a myeloproliferative disease and secondary erythrocytosis due to other conditions.

People living at high altitude (e.g. Mexico City, 2,238 m (7,342 ft.) must be expected to have secondary erythrocytosis with an elevated hemoglobin and hematocrit. In cases of secondary erythrocytosis due to lung disease or cyanotic heart conditions, the underlying pathology would have a greater bearing on the final assessment than the erythrocytosis per se.

Primary erythrocytosis, in particular polycythemias rubra vera, should normally be considered disqualifying owing to its propensity to thromboembolic complications, cerebro-vascular accidents and its rapid, unpredictable progression. Depending on the results of a specialist's report and response to treatment, primarily venesection, aspirin and cyto-reductive medication, selected cases may be considered for restricted certification.

5.6.6. Applicants with a coagulation disorder should be assessed as unfit. A fit assessment may be considered if there is no history of significant bleeding episodes. Applicants with a hemorrhagic disorder require investigation. A fit assessment with a multi-pilot limitation may be considered if there is no history of significant bleeding. Applicants with an inherited coagulation disorder or any history of factor replacement should normally be considered unfit for certification. However, bleeding disorders are classified as severe, moderate and mild according to the level of the deficient factor. Severe and moderate cases of factor VIII deficiency (classical hemophilia) entails unfitness for professional flying. Mild cases of hemophilia may be considered if there is no history of significant bleeding episodes. Also, mild cases of von Willebrands disease may be compatible with certification. A history of deep vein thrombosis requires a full hematological investigation for underlying pathology before certification. A history of pulmonary embolism entails unfitness until at least six months after the completion of the anticoagulant therapy. Applicants with recurrent pulmonary embolism are unfit.

The use of oral anticoagulant medicines such as coumarin and warfarin is incompatible with certification in many Contracting States. The use of low molecular weight heparin in low dose may be considered acceptable by the medical assessor. The use of antiplatelet agents such as acetylsalicylic acid (Aspirin®) in low dose is not disqualifying whereas use of other anti-platelet agents may be considered after review by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.6.7. Applicants with a thrombocytopenia under 75,000/mm^3 (75×10^9/L) are unfit for certification. The condition may be temporary, e.g. in persons with iron deficiency anemia or alcoholic bone marrow suppression, and in such cases a fit assessment is possible once the thrombocyte count is normalized. Applicants with idiopathic thrombocytopenic purpura, treated by splenectomy and with stable platelet counts for six months, may be considered for certification after cessation of therapy. Platelet counts should be repeated every six months.

5.6.8. Applicants shall undergo satisfactory oncological evaluation before a fit assessment can be made.

5.7. Urinary System

5.7.1. Abnormal urinalysis. Investigation is required if there is any abnormal finding on urinalysis

5.7.2. Applicants with an asymptomatic calculus or a history of renal colic require investigation.

The pain of renal colic can be severe and is likely to be incapacitating in flight. All treatment including conservative management aimed at encouraging the natural passage of the stone, surgery, and extracorporeal shock wave lithotripsy will necessitate grounding until recovery.

Of these procedures, extracorporeal shock wave lithotripsy and percutaneous nephrolithotomy have lower morbidity and permit a quicker return to flying status than open procedures.

The most common morbidity associated with both procedures is bleeding, which is usually self-limiting. Infection may occur with percutaneous nephrostomy. Interestingly, and ironically, some studies have shown reduction in ureteral peristalsis following fluid administration, which may inhibit further passage of stone in spite of increased diuresis.

Luckily, the majority of calculi smaller than 4 to 5 mm spontaneously pass. Recovery of all stone fragments is necessary for further analysis.

Cases of recurrent renal colic should be regarded with considerably more suspicion and may entail long-term unfitness for aviation duties. Prior to issuance of a license or permitting a license holder to return to aviation duties, a comprehensive urological examination should be performed. The assessment should be based on the presumptive risk of in-flight incapacitation. In some cases, a license may be issued with certain operational limitations such as a commercial pilot being allowed to operate “as or with co-pilot only.” Follow-up with renal function tests and radiology procedures should be performed at regular intervals as required by the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. The risk of recurrence in these patients is an important aeromedical consideration. For first-time stone formers, the risk ranges from 20 to 50 per cent over the first ten years with an overall lifetime recurrence rate of 70 per cent.

Luckily, however, most smaller stones and even stones up to 8–10 mm diameter will pass spontaneously in less than two weeks, despite the often-incapacitating pain they produce.

Retained asymptomatic stones pose some risk for future renal colic. However, if the stones are located such that they are unlikely to pass into the calyx, the risk for incapacitation during flight is low. If the urinary studies do not reveal any underlying risk factors for recurrent stone formation, then medical certification for aviation duties may be considered. However,

environments that predispose to dehydration may encourage renal stone formation without other underlying factors.

5.7.3. Hematuria by itself in this setting is unlikely to be aero medically significant. Hematuria must be fully evaluated. Calculi can cause extreme pain, lead to urinary tract infection, and obstruction. Urinary neoplasms are often slow growing but they must be diagnosed and treated early to optimize survival and function. Glomerular disease must be evaluated and renal function assessed to determine proper treatment and to address worldwide aviation duty (e.g. renal reserve, ability to tolerate dehydration).

Although most sources recommend evaluation for those greater than 3–5 RBC/hpf3, any red cells found in the license holder's urine should be the cause of a complete workup

5.7.4. Incapacitation secondary to incontinence will warrant suspension from flight until definitive diagnosis and treatment are performed. Most incontinence is not of a degree in itself to warrant aeromedical disqualification and may be conservatively managed in many patients. If the condition requires surgical correction, the operative surgeon must document complete resolution and recovery prior to return to aviation duties. Pharmacological treatment may require further aeromedical review depending upon the drugs used. Anticholinergic medications are used for their direct relaxing effects on the smooth detrusor muscle of the bladder (m. detrusor vesicae). These medications are usually well tolerated by most but they may worsen an existing myopia. They may also cause dry mouth, fatigue, constipation and even, on rare occasions, supraventricular tachycardia. Finally, anticholinergic medications will exacerbate closed-angle glaucoma and is an absolute contraindication in such patients. Since these side effects are of concern in the aviation environment, a ground trial is necessary. For similar reasons, any medications or herbal preparations used to treat this malady should be administered in carefully controlled settings and in consultation with the medical assessor of the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.7.5. The acute scrotal process precludes aviation duties. Testicular torsion and epididymitis can become rapidly incapacitating. Consequently, torsion, infection and malignancy (see "Urological malignancy" below) are incompatible with flying duty until they are resolved. Urological consultation in all of these cases is mandatory to prevent surgery, if possible, and to ensure testicular salvage. Hydrocele, spermatocele and hernia disease may be managed

conservatively when asymptomatic. However, all pilots are required to be completely free of those hernias that might give rise to incapacitating symptoms during flight, so surgical consultation and remediation of inguinal hernia disease must be the rule. Especially during flight, because of the decrease in ambient pressure, this condition may suddenly result in bowel incarceration and strangulation, even when previously asymptomatic and reducible, causing an aeromedical emergency

5.7.6. All urological infections should be considered disqualifying for aviation duties during acute disease. Medical assessment should not be entertained until a number of criteria are met:

- Assurance of no idiosyncratic reaction to appropriate culture-driven antimicrobial therapy.
- Complete hemodynamic stability after acute treatment has been initiated.
- Culture-specific antimicrobial coverage for a minimum of 14 days except in cases of simple cystitis in a female patient.
- Repeat cultures revealing complete eradication of any organism.
- In complicated infections, full urological consultation for any anatomical or other aberrations.
- Assurance that recurrent urinary infection has been completely eradicated or suppressed.
- A patient with a urological condition that has a high likelihood of causing recurrent urinary infections with rapid onset of symptoms should be disqualified from aviation duties until that condition is resolved.

5.7.7. Many of the cystic and congenital abnormalities are disqualifying for aviation duties. Simple cystic disease is compatible with flight as long as the cysts do not result in mechanical compromise to the kidney, collecting system or renal vasculature. It is important to differentiate cystic abnormalities from renal tumors.

5.7.8. Medullary sponge kidney is of aeromedical significance because of the disease complications. Pyelonephritis and nephrolithiasis are common, with potential sequelae including septicaemia and renal failure in symptomatic patients. For these reasons, it is disqualifying for aviation duties.

5.7.9. Adult polycystic kidney disease may threaten the safety of flight and so should only be considered with limitation to multi-crew operations. Any aeromedical disposition of an applicant or aviator with polycystic kidney disease should be done in consultation with a specialist and the medical assessor of the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

A single kidney with normal renal function studies, absence of symptoms, and no evidence of infectious, obstructive or congenital disease are signs of a good prognosis. In such cases, unilateral agenesis and hypoplasia are of no clinical significance and are not at increased risk to interfere with aviation duties.

5.7.10. Temporary aeromedical disqualification may be necessary in the patient with symptomatic obstruction secondary to benign prostatic hyperplasia (BPH). Judgment must be used in determining the aeromedical significance of minimal or mild symptoms. As a general rule, if the license holder is concerned enough to mention the symptoms, then they are probably operationally significant.

Due to their side effects, alpha-antagonists are the least flight compatible medications of those mentioned. Selective alpha-antagonists may be useful in the aviation environment after an uneventful ground trial period. Even after ground trial, these medications should be considered unacceptable for high g-force environments (aerobatics).

Finasteride's minimal side effects require a ground trial, but it should be acceptable for most aviation duties.

TURP usually results in complete resolution of urinary symptoms, although up to 20 per cent may require a second resection. The morbidity and mortality of this procedure is low but significant complications may include retrograde ejaculation, impotence and urinary incontinence. If the procedure resolves the obstructive symptoms without morbidity, the individual will normally be qualified for aviation duties

5.7.11. Applicants who have undergone a major surgical operation on the urinary tract or the urinary apparatus involving a total or partial excision or a diversion of any of its organs should be assessed as unfit for a minimum period of 3 months or until such time as the effects of the operation are no longer likely to cause incapacity in flight.

After other urological surgery, a fit assessment may be considered if the applicant is completely asymptomatic and there is minimal risk of secondary complication or recurrence.

5.7.12. Applicants who have undergone renal transplantation may be considered for a fit assessment if it is fully compensated and tolerated with only minimal immunosuppressive therapy after at least 12 months. Applicants may be assessed as fit with a multi-pilot limitation.

Applicants who have undergone total cystectomy may be considered for a fit assessment if there is satisfactory urinary function, no infection and no recurrence of primary pathology. Applicants may be assessed as fit with a multi-pilot limitation.

5.7.13. Sildenafil is commonly used in the medical treatment of erectile dysfunction and is not to be used for 24 hours prior to anticipated flight.

Testosterone replacement should not preclude a pilot from flying and is typically well tolerated with minimal side effects when taken for hypogonadal states. Of course, the individual must undergo a full work-up to rule out the pituitary gland as the cause.

Appropriate evaluation for pituitary conditions includes ensuring normal follicular stimulating, luteinizing and prolactin levels. An MRI of the pituitary gland and sella turcica is required for patients with any abnormalities of these hormones.

5.7.14. Urological Malignancy Fortunately, recurrent low-grade superficial urothelial carcinoma is unlikely to result in sudden incapacitation. However, recurrence may also present as metastatic disease, which can result in significant and potentially sudden impairment. Brain metastases of urological malignancy can result in significant unrecognized cognitive impairment. Ongoing treatment also poses risks to flight safety. For these reasons, the recommendation for a pilot to return to flying duties should occur only after the individual has been disease-free for two years. An earlier return may be contemplated if specialist advice indicates the risk is acceptably low.

5.8. Sexually transmitted diseases and other infections

5.8.1. HIV positivity is disqualifying. A fit assessment with a multi-pilot limitation may be considered for individuals with stable, non-progressive disease. Frequent review is required.

5.8.2. A fit assessment with a multi-pilot limitation may be considered for individuals with stable, non-progressive disease. Frequent review is required.

On receipt of satisfactory reports, applicants who are asymptomatic, stable, without significant opportunistic infection may be considered for certification, if their CD4* count is above the minima stated below. Once diagnosed HIV positive, solo

operation as a pilot should not be accepted for Class 1 or Class 2 applicants.

Table 1 — Applicants not established on combined antiretroviral therapy (cART)

Age (yr)	Minimum CD4+ count
20 – 39	350
40 – 59	400
60 +	500

Applicants over 40 years of age with CD4+ counts below these levels but above 350/mm3 may be considered for certification on an individual basis.

A "temporary unfit" assessment should be made when initiating, modifying or discontinuing ART. When stable, recertification after 3 months of monitoring may be permitted providing that there has been an acceptable serological response, no ongoing side-effects and FBC, LFTs, lipids and fasting glucose are acceptable. Regular follow-up is required, to include:

- 3 monthly CD4* and viral load measurements
- 6 monthly neurology assessment (by HIV specialist or neurologist including consideration of the need for psychiatric evaluation)
- If taking ART: 6-monthly LFTs, FBC, lipids and fasting glucose.
- Annual cognitive function assessment
    - Evidence of having passed a License Proficiency Check (LPC) or the report from a medical flight test (MFT) with a Flight Instructor Examiner (FIE) may be considered in lieu of this where disease stability and the risk of disease progression is acceptable. Impaired performance will require further neuropsychological assessment to be compared with baseline testing and any deficits will require that the pilot is declared temporarily unfit. Neuropsychological assessment should be undertaken if there are any clinical concerns about cognitive impairment.
    - Further co-infection testing should be undertaken where clinically indicated and those with new positive tests must be deferred for further assessment

5.8.3. Acute syphilis is disqualifying. A fit assessment may be considered in the case of those fully treated and recovered from the primary and secondary stages.

5.8.4. Infectious hepatitis is disqualifying. A fit assessment may be considered after full recovery.

5.8.5. Applicants shall undergo satisfactory oncological evaluation before a fit assessment can be made.

5.9. Gynecology and Obstetric

5.9.1. Once pregnancy is confirmed, the pregnant pilot should report to the medical examiner. If declared fit, i.e. if her pregnancy is considered a normal, uncomplicated and low-risk pregnancy and medical information from her obstetrician, family physician and/or midwife supports this. A pregnant license holder may be assessed as fit with a multi-pilot limitation during the first 26 weeks of gestation. For applicants of Air Traffic Control (ATC) with a low-risk uncomplicated pregnancy, the fit assessment should be limited to the period until the end of the 34th week of gestation.

5.9.1.1. A pregnant license holder may be assessed as fit by the AME in consultation with the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Should require, Assessment to fly as/with a suitably qualified copilot OML) for medical license class 1, Valid only with safety pilot and in aircraft with dual controls for medical license class 2 and Valid only when another air traffic controller available and competent to assume your duties for medical license class 3 or Air traffic controller.

5.9.1.2. Close medical supervision must be established for the part of the pregnancy where the pilot continues flying, and all abnormalities should be reported to the medical examiner. Provided the puerperium is uncomplicated and full recovery takes place, she should be able to resume aviation duties two to six weeks after confinement.

5.9.1.3. Mothers and child relationship policies must be concern.

5.9.2. Dysmenorrhea Because of the broad spectrum of symptoms and their varying severity and the many different kinds of medication usually prescribed, each case has to be assessed on its own merits. In most cases, pharmaceutical therapy will prove unsatisfactory, and fitness for aviation duties is often reduced for a number of days every month.

5.9.3. Endometriosis If symptoms are well controlled by oral contraceptives or mild analgesics, this condition is usually compatible with aviation duties. Those who undergo surgical treatment with a successful outcome will normally be cured and able to fly safely

after a suitable period of recovery. The middle group, consisting of patients with moderate symptoms but on medication and with decreased fitness several days per month, is more difficult to evaluate and assess. Usually the final decision should be deferred to the medical assessor of the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. The medical examiner, in consultation with a gynecologist, should weigh all relevant factors carefully before making a recommendation.

5.9.4. Major gynecological surgery will normally entail unfitness for a period of two to three months and some procedures such as hysterectomy may require more extensive periods of recovery.

5.9.5. Applicants shall undergo satisfactory oncological evaluation before a fit assessment can be made.

5.10. Musculoskeletal Requirements

5.10.1. Abnormal physique, including obesity, or muscular weakness may require medical flight or flight simulator testing. Particular attention should be paid to emergency procedures and evacuation. A limitation to specified aircraft type(s) may be required. License holder may be assessed as fit by the AME in consultation with the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Should require, Assessment to fly as/with a suitably qualified copilot OML for medical license class 1, Valid only with safety pilot and in aircraft with dual controls for medical license class 2 and Valid only when another air traffic controller available and competent to assume your duties for medical license class 3 or Air traffic controller.

5.10.2. The applicant shall not possess any abnormality of the bones, joints, muscles, tendons or related structures which is likely to interfere with the safe exercise of the applicant's license and rating privileges. Any sequelae after lesions affecting the bones, joints, muscles or tendons, and certain anatomical defects will normally require functional assessment to determine fitness. Amputation of any part of an upper limb should be disqualifying for a professional pilot's license unless a sufficient thumb-grip function is present on each hand enabling the applicant to manipulate the aircraft controls safely. Consideration might be given to whether or not a prosthesis may be acceptable under special circumstances. For Class 2 and Class 3 Medical Assessments an applicant may be considered fit if fitted with a satisfactory

prosthesis. In the case of lower extremity amputation, an applicant may be considered fit for a Class 1 Medical Assessment if fitted with a satisfactory prosthesis and adequate skill is demonstrated using it. Restriction to a specific aircraft type is likely to be required.

5.10.3. When assessing the medical fitness of an applicant with a history of arthritis, the medical examiner should give consideration to:

- Severity of the disease;
- Rate of progression;
- Musculoskeletal function with special regard to any significant restrictions of motion;
- Any complications that might cause sudden incapacity in flight

5.10.4. An applicant with any significant sequela from disease, injury or congenital abnormality affecting the bones, joints, muscles or tendons with or without surgery requires full evaluation prior to a fit assessment.

5.10.5. Cervical Spine**.** A neck motion of 45° (side to side) will in most cases provide enough lateral vision for flight safety; it is unlikely that a pilot with less motion ability will move shoulders and torso in flight sufficiently to compensate for lack of neck motion.

5.10.6 Lumbar Spine. Lower back pain is a common complaint among flight crew members. It may be accompanied by pain radiating to the legs in the distribution of the sciatic nerve. Medical fitness for aviation duties should be based on the degree of functional recovery and risk of recurrence that might cause sudden incapacity.

5.10.7. Applicants shall undergo satisfactory oncological evaluation before a fit assessment can be made.

5.11. Aviation Psychiatry.

5.11.1. Psychotic disorder A history, or the occurrence, of a functional psychotic disorder is disqualifying unless a cause can be unequivocally identified as one which is transient, has ceased and will not recur.

5.11.2. (Organic Mental Disorder) An organic mental disorder is disqualifying. Once the cause has been treated, an applicant may be assessed as fit following satisfactory psychiatric review.

5.11.3. The most common dementia is Alzheimer's Disease, which usually has a slow, insidious onset after age 65 to 70. It is not unusual that older persons with disturbed cognition

are given a diagnosis of Alzheimer's Disease without the benefit of a full psychiatric examination. It is imperative to rule out the presence of a depressive illness or indeed any reversible medical conditions, which may present with symptoms of dementia before deciding on a diagnosis.

5.11.4. The applicant shall have no medical history or clinical diagnosis of: schizophrenia or a schizotypal or delusional disorder;

5.11.4.1. Schizophrenia or a Schizotypal; Because of their recurring nature and because of the pervasiveness of the disruptions, Schizophrenia or a Schizotypal are disqualifying for medical certification.

5.11.4.2. Delusional disorders may present without perceptual disturbances. Usually the delusions are relatively restricted and may follow only one theme, such as delusions of infidelity. The risk associated with a delusional disorder is that the person will act out behavior to deal with the delusional belief without consideration of the effect of such action or behavior on others. Delusional disorders are disqualifying for medical certification.

5.11.4.3. A "brief psychotic disorder" may involve all the symptoms of schizophrenia, but it lasts less than one month and is followed by a full return to the premorbid level of functioning. This disorder is usually secondary to severe external stressors ("brief reactive psychosis"). If there is stability for at least one year without the need for anti-psychotic medication, this disorder need not preclude medical certification.

5.11.5. A mood (affective) disorder;

5.11.5.1. Because depressive mood disorders are recurring disorders, it is imperative that the "recovered" patient be monitored closely for signs of recurrence for a period of time following recovery. There is evidence that recurrence is most likely to happen during the first two years. An educative approach may help the individual recognize the earliest signs and thus facilitate early intervention. Ordinarily pilots should not be allowed to return to flying unless they have been off medication for at least some months after having returned to their euthymic state of health. In recent years, the use of SSRI (selective serotonin re-uptake inhibitors) has become widespread and there is indication that such treatment, aimed at preventing a new depressive episode, may be compatible with flying duties in carefully selected and monitored cases. An applicant with depressive mood disorders may be assessed as fit with a multi-pilot limitation.

5.11.5.1.1. The applicant should be under the care of a medical practitioner experienced in the management of depression

5.11.5.1.2. The applicant should: be stable on an established and appropriate dose of medication for at least four weeks before returning to flying/ATC duties and exhibiting:

5.11.5.1.3. Minimal acceptable side-effects

5.11.5.1.4. No medication interactions or allergic response

5.11.5.1.5. Have an absence of other significant psychiatric co-morbidities

5.11.5.1.6. Require no other psychoactive medications

5.11.5.1.7. Symptoms of depression being well controlled, without evidence of psychomotor retardation.

5.11.5.1.8. An absence of suicidal ideation or intent.

5.11.5.1.9. No history of psychotic symptoms.

5.11.5.1.10. An absence of features of arousal (e.g. irritability or anger)

5.11.5.1.11. The presence of a normal sleep pattern.

5.11.5.1.12. Resolution of any significant precipitating factors of the depression.

Ongoing cognitive-behavioral, rational-emotive or similar therapy is desirable, but not necessarily required for certification.

Pilots or ATCs authorized to fly or perform duties when taking SSRIs or related antidepressant medications must cease exercising the privileges of their licenses if their antidepressant medication is altered or if the dose changed. Their supervising medical practitioner may return them to duty when they are assessed as stable and without unacceptable side effects.

Pilots and ATCs whose medication is being reduced with a view to cessation should stop exercising the privileges of their licenses for the entire period during which they are weaned off medication, plus an additional period of two weeks. Their supervising medical practitioner may return them to duty when they are assessed as stable and without unacceptable side effects or evidence of withdrawal syndrome.

The use of objective assessment tools in the monitoring of these certificate holders is encouraged. The Hamilton ratings scale is one such tool and formal neuropsychological testing

is another option. Simulator or other functional based testing can also be utilized to assess performance. States should provide guidance on preferred medications with lower side effect profiles such as sertraline, citalopram, and escitalopram.

5.11.5.2. A history of mania, whether occurring in isolation or as part of a bipolar disorder, should lead to long-term disqualification.

5.11.5.3. Persons with hypomanic episodes have unstable moods and are prone to developing frank manic episodes and/or depressions. Consequently, they should be considered unfit for licensing.

5.11.6. Any mental disorder with anxiety (Neurotic, stress-related or somatoform disorder;) is disqualifying until the person has been asymptomatic without the use of psychotropic medicines for a period of at least six months. Since many of these disorders are of a chronic nature, it is important that in a new applicant, the natural history of his disorder should be part of the evaluation. Unless the disorder is likely to be resolved without long-term use of medication, an aviation career should be discouraged.

5.11.7. Behavioral syndrome associated with physiological disturbances or physical factors. Persons with impulse control disorders are particularly unsuitable for careers in aviation. The inability to control an impulse when the adverse consequences are obvious is a major concern in someone accepting the responsibilities of a safety-sensitive function within aviation. Moreover, persons with these disorders are also usually at odds with their environment, which is an added stressor and may lead to further inability to focus on the task at hand and detract from the attention required in aviation. Applicants with disorders of behavior (for example regarding habit, gender identity, sexuality) should be assessed on the basis of their ability to put aside the disorder (or any conflicts related to the disorder) in order to attend to the aviation task at hand. These persons may have significant conflicts with their environment, leading to further difficulties, which may become an impediment for them to hold an aviation license.

5.11.8. A single self-destructive action or repeated overt acts are disqualifying. A fit assessment may be considered after full consideration of an individual case and may require psychiatric or psychological review. Neuropsychological assessment may also be required.

5.11.9. Sleep disorders. Occasional sleeplessness may be managed with small doses of short-acting sedatives with the proviso that no aviation related activity may be undertaken until

the effects of the medication have passed. With short-acting medications such as temazepam (Restoril®), zolpidem (Ambien®), or zopiclone (Imovane®), there should be a period of 8 to 12 hours after intake of a single dose of the medicine before undertaking aviation related tasks. Such medicines should only be taken under the direct supervision of a physician having specialist knowledge of aviation.

Changes in circadian rhythm may also lead to periods of insomnia. This rhythm disruption may be related to travel over several time zones or night duty and rotating-shift schedules at the place of work. There is some evidence that the use of melatonin may be helpful by accelerating the resynchronization of the circadian rhythm, but because this substance is not an approved pharmaceutical medicine and its safety, purity and effectiveness have not been established by any government agency, its use in aviation is not recommended.

5.11.10. Flying and Psychoactive Medicine. With each passing year, physicians and patients are inundated with an ever-wider range of psychoactive medicines which all promise better clinical response and fewer side effects**.** Because most psychiatric illnesses affect the ability to process information, to make a decision after the information processing, and then to undertake a course of action, any decrement in functioning could have a serious impact in an environment where events usually occur at a swift pace and where human beings are far from their natural habitat. It is for these reasons that psychoactive medicines may be used in the aviation environment only with the greatest degree of judiciousness and caution. Aviation examiners must also be aware that their patients will not always volunteer information about taking medicine. As some of these medicines have few side effects, it may at times be difficult to detect their use. Medical examiners should therefore educate license holders about the risks of psychoactive medicines.

5.11.11. Disorders due to alcohol or other substance use. Mental or behavioral disorders due to alcohol or other substance use, with or without dependency, are disqualifying. Drugs, in the context of this chapter, refer to those non-prescription mood-altering substances that are ingested for the purpose of changing one’s mental state, for non-medical purposes. The purpose of taking these substances may be to induce pleasure or to reduce pain or suffering. Problematic used of Substances are sedatives and hypnotics, barbiturates, anxiolytics, opioids, central nervous system stimulants such as cocaine, amphetamines and similarly acting sympathomimetics, hallucinogens, phencyclidine or similarly acting arylcyclohexylamines,

cannabis, inhalants and other psychoactive drugs or substances. The treatment of substance abuse and dependence is difficult and recurrences of use after treatment are common. A history of abuse or dependence should be the basis for withholding a Medical Assessment unless there is clear evidence that the condition has been adequately treated and that there is a comprehensive follow-up plan that would uncover any relapses. A fit assessment may be considered after a period of two years documented sobriety or freedom from substance use. At revalidation or renewal, a fit assessment may be considered earlier with a multi-pilot limitation. Depending on the individual case, treatment and review may include:

5.11.11.1. In-patient treatment of some weeks followed by:

5.11.11.2. Review by a psychiatric specialist; and

5.11.11.3. Ongoing review including blood testing and peer reports, which may be required indefinitely.

5.12. Neurological Requirement

5.12.1. Neurological disease. Any stationary or progressive disease of the nervous system which has caused or is likely to cause a significant disability is disqualifying. However, in case of minor functional losses associated with stationary disease, a fit assessment may be considered after full evaluation.

5.12.2. Applicants with migraine may be considered for medical certification if the disorder can be controlled. When determining medical fitness in migraine, the medical assessor should consider:

1. Prodrome:

2. Precipitating factors:

3. Aura:

4. Rapidity of onset:

5. Frequency:

6. Severity:

7. Therapy:

5.12.2.1 Applicants with migraine may be considered for medical certification if the disorder can be controlled. In some, simple avoidance of precipitating factors may be

sufficient. The aura must be assessed. Loss of vision in one half of the visual field would not be acceptable, whereas in-flight occurrence of a minor scintillation in the far periphery of the visual field might not cause significant functional impairment. Slow onset over many hours might allow countermeasures, while rapid onset in minutes would be unacceptable. A frequency of one or two migraines annually may not be disqualifying, whereas several per month would bar certification. Severe migraine can be incapacitating, whereas mild migraine may be inconsequential. Satisfactory documentation of successful treatment with acceptable medications may allow medical certification. Beta-adrenergic and calcium channel blocking agents are among acceptable medications, whereas antidepressants, anticonvulsants, narcotic analgesics and several others are unacceptable. License holder may be assessed as fit by the AME in consultation with the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand. Should require, Assessment to fly as/with a suitably qualified copilot (OML) for medical license class 1, Valid only with safety pilot and in aircraft with dual controls for medical license class 2 and Valid only when another air traffic controller available and competent to assume your duties for medical license class 3 or Air traffic controller.

5.12.2.2. Cluster headache is disqualifying for all classes of medical certification, since the headaches are incapacitating and medical treatment commonly precludes safety-sensitive duties. Headache clusters may be separated by months or years, and it is appropriate to consider medical certification when the cluster has cleared and treatment has ceased. Frequency of prior clusters is an important consideration in this evaluation.

5.12.2.3. Chronic daily headache of significant severity and requiring treatment is disqualifying for all classes of medical certification. Medical certification may be possible when freedom from prohibitive medication and resolution of psychological factors have been achieved. A three- to six-month observation period to document resolution of symptoms is appropriate to the issue of chronic daily headache.

5.12.3. A diagnosis of Transient Global Amnesia is disqualifying for all classes of medical certification because of risk of sudden impairment. Absent the precipitating circumstances, medical certification is appropriate following a symptom-free observation period of one year or more. Restriction to multi-crew operations and non-safety-sensitive air traffic control duties can provide an additional measure of risk mitigation.

5.12.4. Syncope should be considered disqualifying for all classes of medical certification until the cause for syncope is identified and the risk for recurrence has been determined. Fortunately, syncope is mostly benign and often situational. Medical certification is appropriate when the benign nature of the event has been identified and potentially serious mechanisms of syncope have been considered and excluded. If treatment or other countermeasures are employed, an observation period ranging from three months to one year might be appropriate. A three-month period might be appropriate when one or two fully explained benign events have occurred over time, whereas multiple recurrent episodes requiring treatment may warrant a six- to twelve-month period of observation before medical certification is considered. Restriction to multi-crew operations and non-safety-sensitive air traffic control duties, at least for a period, may further mitigate the risk.

5.12.5. The existence of or history of a seizure disorder is disqualifying for all classes of medical certification. Medical certification is appropriate only in very specific circumstances in which the subject has been fully evaluated and permanent remission has been assured. A history of febrile seizures does not portend long-term seizure potential. Specific self-limited conditions such as Benign Rolandic Epilepsy with Centro-temporal Spikes will allow medical certification after an observation period of five years or more. Acute symptomatic seizures (e.g. related to hyponatremia) do not portend chronic seizure potential and allow medical certification. Thorough neurological evaluation is warranted in all individuals with a history of seizure disorder. Additionally, recurrence risk must be assessed; if greater than one percent per year, medical certification is not appropriate.

5.12.6. Electroencephalography is required when indicated by the applicant's history or on clinical grounds. Epileptiform paroxysmal EEG abnormalities and focal slow waves requires full evaluation prior to a fit assessment.

5.12.7. Episode of disturbance of consciousness in the case of a single episode of disturbance of consciousness, which can be satisfactorily explained, a fit assessment may be considered, but a recurrence should be disqualifying.

5.12.8. Medical certification is appropriate following a single seizure when all studies are normal and there are no risk factors for recurrence. Consideration should not be given until a four-year seizure-free and medication-free observation period has been achieved. With normal

studies and no risk factors, recurrence risk after four years approximates that of the normal population. Medical certification may be appropriate at this juncture. Restriction to multi-crew operations and non-safety-sensitive air traffic control duties, at least for a period, may further mitigate the risk.

5.12.9. Cerebrovascular disease

5.12.9.1. A recurrence-free observation period is appropriate prior to medical certification following ischemic stroke, and this will vary dependent upon mechanism and risk factors. Stroke in the young with known mechanism (e.g. patent foramen ovale with paradoxical embolism and successful closure) may allow medical certification after one year. If an individual with arterial dissection has no recurrence in one year, risk recurrence thereafter is less than one percent per year. Lacunar stroke associated with hypertension related small blood vessel disease may allow medical certification after one year, whereas stroke due to atherothrombotic disease with risk factors might allow medical certification after two years. Restriction to multi-crew operations and non-safety-sensitive air traffic control duties, at least for a period, may further mitigate the risk. In some instances, medical certification may never be appropriate.

5.12.9.2. Hemorrhagic stroke is disqualifying for all classes of medical certification. If the cause of the hemorrhage can be identified and addressed satisfactorily, medical certification may be possible once the recurrence risk has been evaluated. The recurrence risk will depend upon the underlying mechanism. A one- to two-year observation period is appropriate following hemorrhagic stroke. A full neurological evaluation indicating satisfactory recovery and freedom from relevant risk factors may allow medical certification at that time. Restriction to multi-crew operations and non-safety-sensitive air traffic control duties, at least for a period, may further mitigate the risk.

5.12.9.3. Subarachnoid hemorrhage is disqualifying for all classes of medical certification due to risk of sudden incapacitation. Successful isolation of the hemorrhagic source from the circulation and freedom from significant deficit should allow medical certification after one year, during which risk of complications including seizures declines. Restriction to multi-crew operations and non-safety-sensitive air traffic control duties, at least for a period, may further mitigate the risk. Partial obliteration of an aneurysm with

residual lumen may present an unacceptable risk. For subarachnoid hemorrhage of unknown cause, a one-year observation period is also warranted. The presence of a vascular malformation (cavernous angioma, arteriovenous malformation) requires individual evaluation. Residual malformation, hemosiderin deposition and other factors will affect risk for recurrent hemorrhage or seizure, and medical certification may not be possible.

5.12.10. Head injury. An applicant with a head injury which was severe enough to cause loss of consciousness or is associated with penetrating brain injury such as Skull fracture, Meningeal rupture, Cerebral injury, should be reviewed by a consultant neurologist. A fit assessment may be considered if there has been a full recovery and the risk of epilepsy is sufficiently low. Restriction to multi-crew operations and non-safety-sensitive air traffic control duties, at least for a period, may further mitigate the risk.

5.12.10.1. Post-concussion syndrome is characteristically self-limited, and medical certification may be considered within 3 to 6 months of symptom-free observation. Depending upon severity, focal neurological deficit may warrant a six month to two years' period of observation for maximal neurological recovery in individuals with neuropsychological residual changes, usually indicating significant traumatic brain injury, a one to five-year observation period is warranted depending upon severity of cognitive impairment. Careful cognitive evaluation for permanent impairment should then precede medical certification. Restriction to multi-crew operations and non-safety-sensitive air traffic control duties, at least for a period, may further mitigate the risk.

5.12.10.2. Post-traumatic epilepsy is a major concern following traumatic brain injury. The presence of blood (hence iron) in the brain parenchyma is thought to play an etiological role in the development of post-traumatic epilepsy. Simple uncomplicated epidural hematoma without parenchymal blood might allow medical certification following a one to two-year observation period. Subdural hematoma is often associated with underlying cortical contusion, increasing risk of post-traumatic epilepsy. Significant risk is present in the first two years post injury, though it declines with time. Medical certification may be appropriate after two years. With intraparenchymal hematoma, a two-year period of observation is warranted due to the presence of parenchymal blood. Seizure risk also exists with diffuse axonal injury, and a period of one to two years of observation is appropriate. Restriction to multi-crew operations

and non-safety-sensitive air traffic control duties, at least for a period, may further mitigate the risk.

5.12.11. Spinal or peripheral nerve injury, myopathies. An applicant with a history or diagnosis of spinal or peripheral nerve injury or myopathy should be assessed as unfit. A fit assessment may be considered if neurological review and musculoskeletal assessments are satisfactory.

5.12.12. Neoplasms

5.12.12.1. The presence of a benign intracranial neoplasm is disqualifying for all classes of medical certification. Successful removal of a benign intracranial neoplasm with uneventful recovery will allow medical certification following one year of observation, primarily related to seizure risk. Posterior fossa neoplasms, which characteristically do not lead to seizures, are an exception. Ordinarily limitations have to be imposed, with certification being conditional on periodic evaluation for tumor recurrence.

5.12.12.2. Malignant intracranial neoplasms are disqualifying for all classes of medical certification due to of sudden or insidious incapacitation.

5.12.13. Familial and essential tremor is ordinarily not disqualifying unless significant functional impairment is present. In many individuals' tremor is mild without need for treatment. Identification of the disorder, exclusion of other potentially serious conditions, and determination of functional impairment may allow immediate medical certification. In more severe cases with an element of functional impairment, treatment (e.g. propanolol) may warrant a three-month observation for effectiveness prior to medical certification.

5.12.14. A diagnosis of Parkinson's disease in itself is not disqualifying for any class of medical certification. A diagnosis of Parkinson's disease should lead to a thorough neurological evaluation, exclusion of related conditions, and evaluation of need for treatment. Medical certification may be appropriate immediately in mild conditions. Medication must also be considered. Levodopa agents may be allowed, but dopamine agonists are prohibited due to their potentially sedating effects. If certification is granted following medical evaluation, it should be conditioned upon periodic re-examination and reevaluation. If disease progression presents a risk to aviation safety, the Medical Assessment should be revoked.

5.12.15. A diagnosis of multiple sclerosis is disqualifying for all classes of medical certification. Some individuals with multiple sclerosis experience rapid progression of disease, and others have lesions in areas causing severe functional impairment (e.g. brain stem lesion with diplopia and vertigo). Others experience a benign course with little or no deficit. Treatment with immuno-modulatory agents (glatirimer acetate, beta-1a and beta-1b interferon) does not preclude certification. When recovery from an exacerbation has occurred and stability under observation has been documented, medical certification may be appropriate. With minor occurrences, a three-month period of observation may be sufficient, whereas six to twelve months may be more appropriate when more significant disease is present.

5.13. Ophthalmology

5.13.1. Eye examination. A comprehensive eye examination by an eye specialist is required at the initial examination. All abnormal and doubtful cases should be referred to an ophthalmologist.

5.13.2. At each aero-medical revalidation examination, an assessment of the visual fitness should be undertaken and the eyes should be examined with regard to possible pathology.

5.13.3. Applicants shall undergo satisfactory oncological evaluation before a fit assessment can be made.

5.14. Visual requirement

5.14.1. 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, in the case of Class 2 medical certificates, 6/12 (0,5) or better in each eye separately and visual acuity with both eyes shall be 6/9 (0,7) or better. An applicant with substandard vision in one eye may be assessed as fit in consultation with the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand subject to satisfactory ophthalmic assessment; 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: such correcting lenses are worn during the exercise of the privileges of the license or rating applied for or held; and an addition, a pair of suitable correcting spectacles is kept readily available during the exercise of the privileges of the applicant's license.

5.14.2. Applicants may use contact lenses to meet this requirement provided

that: the lenses are monofocal and non-tinted; the lenses are well tolerated; and a pair of suitable correcting spectacles is kept readily available during the exercise of the license privileges

5.14.3. It must be emphasized that applicants who have had refractive surgery and are being considered for medical certification or recertification should meet the following criteria:

- The surgery is uncomplicated.
- Vision is stable.
- There is no corneal haze and no complaints of glare, halos or "ghosting"
- The result meets the visual requirements of Annex 1, and the assessment must be based on measurements made by a qualified vision care specialist acceptable to the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.
- There should be follow-up examinations by a qualified vision care specialist six months after return to duty and yearly thereafter. Applicants who have undergone surgery affecting the refractive status of the eye shall be assessed as unfit unless they are free from those sequelae which are likely to interfere with the safe exercise of their license and rating privileges.

5.14.4. The recovery rate, predictability and regression rate following refractive surgery depend to some extent on the pre-operative refractive error and on the type of surgery. The following is suggested as a guide to the minimum interval between withdrawal of eye drops after refractive surgery and the resumption of duties:

- Pre-operative refractive error of up to 6.00 D spherical equivalent:

  PRK 3 months
  LASIK 3 months

- Pre-operative refractive error 6.00 to 10.00 D spherical equivalent:

  PRK 6 months
  LASIK 3 months

- Greater than 10.00 D spherical equivalent:

PRK 6 months

LASIK 6 months

5.14.5. Applicant with monocular should be assessed as unfit for medical class 1 and medical class 3. with a multi-pilot limitation. Medical class 2 may be assessed as fit if there is no significant ocular pathology; and a medical flight test is satisfactory

5.14.6. Applicants with reduced central vision in one eye may be assessed as fit if the binocular visual field is normal and the underlying pathology is acceptable according to ophthalmological assessment. A satisfactory medical flight test and a multi-pilot limitation is required.

5.14.7. An applicant with acquired substandard vision in one eye may be assessed as fit with a multi-pilot limitation if: the better eye achieves distant visual acuity of 6/6 (1.0), corrected or uncorrected; the better eye achieves intermediate visual acuity of N14 and N5 for near; in the case of acute loss of vision in one eye, a period of adaptation time has passed from the known point of visual loss, during which the applicant should be assessed as unfit; there is no significant ocular pathology; and a medical flight test is satisfactory.

5.14.8. Abnormal convergence not interfering with near vision and ocular misalignment where the fusional reserves are sufficient to prevent asthenopia and diplopia may be acceptable.

5.14.9. Tint Sunglasses worn during the exercise of the privileges of the license or rating held should be non-polarizing and of a neutral grey tint.

5.15. Color perception

5.15.1. The Ishihara test (24 plate version) is considered passed if the first 15 plates, presented in a random order, are identified without error.

5.15.2. Those failing the Ishihara test should be examined either by:

5.15.2.1. Anomaloscopy (Nagel or equivalent). This test is considered passed if the color match is trichromatic and the matching range is 4 scale units or less; or by

5.15.2.2. Lantern testing with a Spectrolux, Beynes or Holmes-Wright lantern. This test is considered passed if the applicant passes without error a test with

accepted lanterns.

5.15.2.3. In the case of Class 1 medical certificates, applicants shall have normal perception of colors or be color safe. Applicants who fail further color perception testing shall be assessed as unfit. In the case of Class 2 medical certificates, when the applicant does not have satisfactory perception of colors, his/her flying privileges shall be limited to daytime only.

5.16. Otorhinolaryngologically requirements

5.16.1. A comprehensive ear, nose and throat examination shall be undertaken for the initial issue of a Class 1 medical certificate.

5.16.2. A comprehensive ear, nose and throat examination shall be undertaken for the periodically thereafter when clinically indicated.

5.16.3. Applicants with: unhealed perforation or dysfunction of the tympanic membrane(s); shall undergo further medical examination and assessment to establish that the condition does not interfere with the safe exercise of the privileges of the license held.

5.16.4. Applicants for a Class 1 medical certificate with: disturbance of vestibular function (Spontaneous or positional nystagmus); shall undergo further medical examination and assessment to establish that the condition does not interfere with the safe exercise of the privileges of the license held.

5.16.5. Post-surgical assessment

5.16.5.1. After an uncomplicated simple myringotomy and simple mastoidectomy, if the applicant is free of vertigo and his hearing is in accordance with Annex 1 requirement, there should be no restrictions.

5.16.5.2. The medical examiner will face the problem as to whether an applicant who has had ear surgery for otosclerosis may be assessed as fit. Applicants should not fly for a period of one to three months following stapes surgery to allow complete healing to take place. Thereafter, a specialized ENT assessment should be made to ascertain Eustachian tube patency and the absence of vertigo, past pointing, nystagmus or unsteadiness during the Valsalva maneuver and while blowing the nose forcibly. An applicant who, after this three-month period, has not had vertigo and has post-operative acceptable hearing may be allowed to fly only under operational restrictions such as flying

with or as a co-pilot only or with a safety pilot for a two-year observation period. The final decision to remove these restrictions should then be considered.

5.16.5.3. A surgical reconstruction referred to as tympanoplasty has been known since 1956. The aims are twofold —firstly to improve hearing and secondly to close small or large perforations of the tympanic membrane and rebuild the middle ear structures. Once again, a careful history must be obtained. If the hearing is within Annex 1 provisions, there is no vertigo, and the new tympanic membrane is intact and free of disease, there should be no restrictions on the applicant's ability to fly.

5.16.6. Applicants shall undergo satisfactory oncological evaluation before a fit assessment can be made.

5.17. Hearing requirements

5.17.1. The applicant should understand correctly conversational speech when tested with each ear at a distance of 2 meters from and with the applicant 's back turned towards the AME.

5.17.2. Applicants for Class 1 Medical Assessments shall be tested by pure-tone audiometry at first issue of the Assessment, and be undertaken periodically, A number of frequencies in the range 250, 500, 1,000, 2,000, 3,000, 4,000, 6,000, and 8,000 Hz are tested by presenting a tone loud enough for the applicant to hear distinctly, and then the threshold level for each frequency is determined.

5.17.2.1. When tested on a pure-tone audiometer, initial applicants shall not have a hearing loss of more than 20 dB at any of the frequencies 500, 1,000 or 2,000 Hz, or more than 35 dB at 3,000 Hz, in either ear separately. Hearing loss of more than 5 dB at two frequencies should be unfit.

5.17.2.2. The applicant, when tested on a pure-tone audiometer, shall not have a hearing loss, in either ear separately, of more than 35 dB at any of the frequencies 500, 1,000 or 2,000 Hz, or more than 50 dB at 3,000 Hz. Applicants for revalidation or renewal, with greater hearing loss shall demonstrate satisfactory functional hearing ability.

5.17.3. General

5.17.3.1. An applicant with hypoacusis may be assessed as fit if a speech discrimination test or functional cockpit hearing test demonstrates satisfactory hearing ability. An applicant for an instrument rating with hypoacusis should be assessed in consultation

with the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.17.3.2. The frequency composition of the background noise is defined only to the extent that the frequency range 600 to 4,800 Hz (speech frequency range) is adequately represented. An applicant for an instrument rating with hypoacusis should be assessed in consultation with the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.17.4. The use of personal hearing aids is usually not accepted during flight performance of professional flight crews.

5.18. Psychological requirement

5.18.1. Where there is suspicion or established evidence that an applicant has a psychological disorder, the applicant should be referred for psychological opinion and advice. Established evidence should be verifiable information from an identifiable source which evokes doubts concerning the mental fitness or personality of a particular individual. Sources for this information can be accidents or incidents, problems in training or proficiency checks, delinquency or knowledge relevant to the safe exercise of the privileges of the applicable license.

5.18.2. The psychological evaluation may include a collection of biographical data, the administration of aptitude as well as personality tests, psychomotor domain, cognitive domain and psychological interview.

5.19. Dermatology.

5.19.1. Applicants shall have no established dermatological condition likely to interfere with the safe exercise of the privileges of the applicable license(s) held.

5.19.2. Systemic effects of radiant or pharmacological treatment for a dermatological condition should be considered before a fit assessment can be considered.

5.19.3. Malignant conditions of the skin.

5.19.3.1. Applicant with Malignant Melanoma, Squamous Cell Epithelioma, Bowen Disease and Pagets Disease may be assessed as fit if the biopsy shows complete excision, if excision is not complete, further surgery is required. [However, all cases of squamous cell epithelioma in pilots require an unfit assessment. The AMS may consider a fit assessment, depending on size and depth of the lesion, provided the lesion is totally

excised and there is an adequate follow-up]

5.19.3.2. Applicant with Basal Cell Epithelioma or rodent ulcer, keratoacanthoma and actinic keratoses may be assessed as fit if the biopsy shows complete excision. If excision is not complete, further surgery is required. The AMS may consider a fit assessment, depending on size and depth of the lesion, provided the lesion is totally excised and there is an adequate follow-up]

5.19.4. Applicants with an established history or clinical diagnosis of:

5.19.4.1. Acute eczema exogenous and endogenous

5.19.4.2. Skin Reticulosis

5.19.4.3. In cases where a dermatological condition is associated with a systemic illness full consideration should be given to the underlying illness before a fit assessment may be considered.

5.19.5. Applicants shall undergo satisfactory oncological evaluation before a fit assessment can be made.

5.20. Oncology.

5.20.1. Applicants who underwent treatment for malignant disease may be assessed as fit by the licensing authority if:

5.20.1.1. There is no evidence of residual malignant disease after treatment;

5.20.1.2. Time appropriate to the type of tumor has elapsed since the end of treatment;

5.20.1.3. The risk of inflight incapacitation from a recurrence or metastasis is sufficiently low;

5.20.1.4. There is no evidence of short or long-term sequelae from treatment. Special attention should be paid to applicants who have received anthracycline chemotherapy;

5.20.1.5. Satisfactory oncology follow-up reports are provided to the Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand.

5.20.2. A multi-pilot limitation should be applied as appropriate.

5.21. Limitation

In cases where a fit assessment can only be considered with a limitation, the AME, SAME or Aeromedical center, the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand, Board of Aeromedical Specialist BAS of CAAT should evaluate the medical condition of the applicant in consultation with flight operations and other experts, if necessary.

5.21.1. OML - Class 1 only (Operational multi-pilot limitation)

The holder of a medical certificate with an OML shall only operate an aircraft in multi-pilot operations when the other pilot is fully qualified on the relevant class and type of aircraft, is not subject to an OML and has not attained the age of 60 years.

The OML for class 1 medical certificates shall be initially imposed and only removed by the Senior Authorized Medical Examiner (SAME), Aeromedical Center (AMC), Aeromedical center or the Aeromedical Division (MD.) Personnel licensing department of The Civil Aviation Authority of Thailand, Board of Aeromedical Specialist (BAS).

5.21.2. OSL – class 2 (Operational safety pilot limitation)

The holder of a medical certificate with an OSL shall only operate an aircraft if another pilot fully qualified to act as pilot-in-command on the relevant class and type of aircraft is carried on board, the aircraft is fitted with dual controls and the other pilot occupies a seat at the controls.

5.21.3. Valid only when another air traffic controller available and competent to assume your duties.

The holder of a medical certificate with “Valid only when another air traffic controller available and competent to assume your duties.” shall only operate their duties when another air traffic controller available and competent to assume their duties.

5.21.4. VDL (Valid only with correction for defective distant vision)

Correction for defective distant vision: whilst exercising the privileges of the license, the holder of the medical certificate should wear spectacles or contact lenses that correct for defective distant vision as examined and approved by the AMC, AME. Contact lenses may not be worn until cleared to do so by the AMC, AME. A spare set of spectacles, approved by the AMC, AME, should be readily available.

5.21.5. VML (Valid only with correction for defective distant, intermediate and near vision)

Correction for defective distant, intermediate and near vision: whilst exercising the privileges of the license, the holder of the medical certificate should wear spectacles that correct for defective distant, intermediate and near vision as examined and approved by the AMC, AME. Contact lenses or full frame spectacles, when either correct for near vision only, may not be worn. A spare set of spectacles, approved by the AMC, AME, should be readily available.

5.21.6. VNL (Valid only with correction for defective near vision)

Correction for defective near vision: whilst exercising the privileges of the license, the holder of the medical certificate should have readily available spectacles that correct for defective near vision as examined and approved by the AMC, AME. Contact lenses or full frame spectacles, when either correct for near vision only, may not be worn. A spare set of spectacles, approved by the AMC, AME, should be readily available.

5.21.7. CCL (Correction by means of contact lenses)

Correction for defective distant vision: whilst exercising the privileges of the license, the holder of a medical certificate should wear contact lenses that correct for defective distant vision, as examined and approved by the AMC, AME. A spare set of similarly correcting spectacles, approved by the AMC, AME, should be readily available for immediate use whilst exercising the privileges of the license.

5.21.8. VCL (Valid by day only)

This limitation allows holders of a class 2 or class 4 medical certificate with varying degrees of color deficiency, to exercise the privileges of their license by daytime only.

5.21.9. AHL (Valid only with approved hand controls)

This limitation applies to the holder of a medical certificate who has a limb deficiency or other anatomical problem which had been shown by a medical flight test or flight simulator testing to be acceptable but to require the aircraft to be equipped with suitable, approved hand controls.

5.21.10. SSL (Special restriction(s) as specified)

This limitation may be considered when an individually specified limitation, not defined in this Medical Provisions for Licensing, is appropriate to mitigate an increased level of risk to flight safety. The description of the SSL should be entered on the medical certificate or in a separate document to be carried with the medical certificate.