

MAR-FCL 3

Military Aviation Requirements - Flight Crew Licensing Part 3 (Medical)

Guidance Material (GM)

STATUS PAGE

Issue date	Version	
12-4-2018	3.0C	External review. GM is extracted from MAR-FCL3.
01-08-2018	3.0D	Final internal MAA-NLD staffing
19-12-2018	3.0	Final version of the first separate publication of GM referring to MAR-FCL 3, version 3.0

INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS (details)

MAR-FCL 3

GUIDANCE MATERIAL TO FLIGHT CREW LICENSING (Medical)

INDEX

GM – GUIDANCE MATERIAL	6
GM MAR-FCL 3.015 Training course syllabus for Flight Surgeons	6
Basic training in aviation medicine (150 hours)	6
Refresher training in Aviation Medicine (20 hours in 3 years)	9
GM MAR-FCL 3.025 Military Medical Certificates (MMC)	10
Overview of duties and medical classes	10
Summary of minimum requirements	11
GM MAR-FCL 3.045 LIMITATIONS	12
Summary of the limitations	12
Explanation of the limitations	12
GM MAR-FCL 3.050 Secondary review procedure	15
GM MAR-FCL 3.075 Use of medication, drugs, other treatments and alcohol	15
Medication	15
Other Treatments	16
Alcohol	16
Psychotropic Drugs and Substance Abuse	17
GM MAR-FCL 3.235 Dental Fitness Classification	17
DF Criteria	17
Temporary flight restriction after dental treatment	18
GM MAR-FCL 3.520 Changes to organisations	20
GM MAR-FCL 3.535 Findings	20
GM MAR-FCL 3.550 Management system	20
Safety manager	20
Safety policy	20
Internal occurrence reporting scheme	21
Training and communication on safety	21
Organisation’s management system documentation	21
Compliance monitoring	21
GM MAR-FCL 3.700 Research	22

INTENTIONALLY LEFT BLANK

GM – GUIDANCE MATERIAL

GM MAR-FCL 3.015 Training course syllabus for Flight Surgeons (See MAR-FCL 3.015)

Basic training in aviation medicine (150 hours)

(See GM to MAR-FCL 3.015.d.1)

The Basic Flight Surgeon Course should minimally include the following subjects:

1. Introduction to Aviation Medicine (1 hour)
 - a. History of aviation medicine
 - b. Specific aspects of civil aviation medicine
 - c. Aspects of military aviation medicine and space medicine
2. Pilot working environment (minimal 2 hours)
 - a. Pressure cabin
 - b. Fixed wing
 - c. Helicopter
 - d. Single-pilot/multi-crew
3. Physics of Atmosphere and Space (minimal 1 hour)
 - a. Atmosphere
 - b. Space
 - c. Gas and vapour laws and their physiological significance
4. Basic aeronautical knowledge (minimal 3 hours)
 - a. Flight mechanisms
 - b. Propulsion
 - c. Instrumentation on board
 - d. Conventional instruments – ‘glass cockpit’
 - e. Professional airline operations
 - f. Military aviation
 - g. Air traffic control
 - h. Recreational flying
 - i. Simulator/aircraft experience
5. Aviation Physiology
 - a. Atmosphere
 1. Functional limits for humans in flight
 2. Divisions of the atmosphere
 3. Gas laws – physiological significance
 4. Physiological effects of decompression
 - b. Respiration (minimal 4 hours)
 1. Blood gas exchange
 2. Oxygen saturation
 - c. Hypoxia – signs and symptoms
 1. Average time of useful consciousness (TUC)
 2. Hyperventilation – signs and symptoms
 3. Barotrauma
 4. Decompression sickness
 - d. Acceleration (minimal 2 hours)
 1. G-Vector orientation
 2. Effects and limits of G-load
 3. Methods to increase Gz-tolerance
 4. Positive/negative acceleration
 5. Acceleration and the vestibular system
 - e. Visual disorientation (minimal 2 hours)
 1. Sloping cloud deck
 2. Ground lights and stars – confusion
 3. Visual autokinesis
 - f. Vestibular disorientation (minimal 3 hours)
 1. Anatomy of the inner ear
 2. Function of the semi-circular canals

3. Function of the otolith organs
4. The oculogyric and Coriolis illusion
5. 'Leans'
- g. Simulator illusion (minimal 2 hours)
 1. Forward acceleration illusion of 'nose up'
 2. Deceleration illusion of 'nose down'
 3. Motion sickness – causes and management
- h. Noise and vibration (minimal 1 hour)
 1. Preventive measures
6. Ophthalmology (minimal 9 hours including 2 hours demonstration and practical)
 - a. Anatomy of the eye
 - b. Clinical examination of the eyes
 - c. Function testing (visual acuity, refraction, colour vision, visual fields etc.)
 - d. Aspects of eye-pathology significant to aviation
 - e. MAA visual requirements
 - f. Implications of refractive and other eye surgery
 - g. Case review
7. Otorhinolaryngology (minimal 7 hours including 2 hours demonstration and practical)
 - a. Anatomy of the systems
 - b. Clinical examination in ORL
 - c. Functional hearing tests
 - d. Equilibrium testing
 - e. Aero-deafness
 - f. Barotrauma – ears and sinuses
 - g. Aeronautical ORL – pathology
 - h. MAA hearing requirements
 - i. Functional hearing tests
 - j. Case review
8. Cardiology and General Medicine (minimal 20 hours including 4 hours demonstration and practical)
 - a. Complete physical examination
 - b. Diagnostic steps in cardiology
 - c. General medicine
 1. Physical fitness and cardiovascular conditions
 2. Respiratory conditions
 3. Gastrointestinal disease
 4. Renal disorders
 5. Gynaecology
 6. Glucose tolerance
 7. Haematological disorders
 8. Orthopaedic disorders
 9. Pilots with disabilities
 - d. MAA requirements
 - e. Medication and flying
 - f. Clinical cases
9. Neurology (minimal 4 hours including 2 hours demonstration and practical)
 - a. Complete neurological examination
 - b. Physical fitness and neurological disorders
 - c. MAA requirements
10. Psychiatry in Aviation Medicine (minimal 8 hours)
 - a. Psychiatric exploration
 - b. Physical fitness and psychiatric conditions
 - c. Drugs and alcohol
 - d. MAA requirements
11. Psychology (minimal 4 hours)
 - a. Introduction to psychology in aviation
 - b. Behaviour
 - c. Personality
 - d. Flight motivation and suitability
 - e. Group social factors
 - f. Workload, ergonomics

- g. Psychological stress, fatigue
 - h. Psychomotor functions and age
 - i. Fear and refusal of flying
 - j. FS/Flight Crew relationships
 - k. Psychological selection criteria
 - l. MAA requirements
12. Human Factors in aviation (minimal 19 hours including 9 hours demonstration and practical)
- a. Long haul flight operations
 - 1. Flight time limitations
 - 2. Sleep disturbance
 - 3. Extended/expanded crew
 - 4. Jet lag/time zones
 - 5. Sleep disturbance
 - b. Human information processing and system design
 - 1. FMS, PFD, datalink, fly by wire
 - 2. Adaptation to the glass cockpit
 - 3. CCC, CRM, LOFT etc.
 - 4. Simulator training
 - 5. Ergonomics
 - 6. Flight experience
 - c. Crew commonality
 - 1. Flying under the same type rating, e.g. B737–300, –400, –500
 - 2. Flying under common type rating, e.g. B757/767, A320/340
 - d. Human factors in aircraft accidents
 - 1. Analysis by and consequences for airlines
 - 2. MAA requirements
13. Space medicine (minimal 2 hours)
- a. Radiation
 - b. Spacecraft
14. Dentistry (minimal 1 hour)
- a. Dental examination
 - b. Barodontalgia
 - c. MAA requirements
15. Accidents, Escape and Survival (minimal 4 hours)
- a. Injuries
 - b. Accident statistics
 - 1. General, recreational aviation
 - 2. Commercial aviation
 - 3. Military aviation
 - c. Aviation pathology, post-mortem examination, identification
 - d. Escape from aircraft in flight
 - 1. Aircraft on fire
 - 2. Aircraft in water
 - 3. By parachute
 - 4. By ejection
16. Tropical medicine (minimal 2 hours)
- a. Endemicity of tropical disease
 - b. Tropical pathology and aviation medicine
 - c. Vaccination of flight crew and passengers
 - d. International health regulations
17. Hygiene (minimal 4 hours including 2 hours demonstration and practical)
- a. Aircraft and transmission of diseases
 - b. Disinfection in aviation
 - c. Hygiene aboard aircraft
 - d. Catering
 - e. Crew nutrition
18. Legislation, Rules and Regulations (minimal 6 hours)
- a. ICAO Standards and Recommended Practices
 - b. MAA provisions (Requirements, Appendices, Guidance Material)
 - c. AMS, AeMC, Flight Surgeon
19. Air Evacuation (minimal 3 hours including 1-hour demonstration and practical)

- a. Organisation and logistics
 - b. Disabled passengers
 - c. Air ambulance flying
 - d. Patients in respiratory distress
 - e. Patients with cardiovascular disorders
 - f. Psychiatric emergencies
20. Medication and Flying (minimal 2 hours)
21. Concluding items (minimal 4 hours)
- a. Organisation, briefing
 - b. Final examination
 - c. De-briefing and critique

Refresher training in Aviation Medicine (20 hours in 3 years)

(See GM to MAR-FCL 3.015.e)

Agreed accreditation times for training:

- a. Attendance at International Academy of Aviation and Space Medicine Annual Congresses (all 4 days – 10 hours)
- b. Attendance at Aerospace Medical Association Annual Scientific Meetings (all 4 days – 10 hours)
- c. Attendance of NATO Flight Surgeons Conference at Ramstein AFB (all 2.5 days – 7 hours)
- d. Attendance of RTO technical course (all 2 days – 5 hours)
- e. Attendance of NLD Flight Surgeons meetings
- f. Attendance of Aeromedical Board
- g. Other scientific meetings, as organised or approved by AMS of other Aviation Authorities.
- h. Flight deck experience (a maximum of 5 hours credit per 3 years)
 - a. Jump seat
 - b. Simulator (4 hours – 1 hour credit)
 - c. Aircraft piloting (4 hours – 1 hour credit)

Note: All credited time must be agreed with the AMS.

Note: A minimum of 6 hours must be under the direct supervision of the AMS, for example attendance of Aeromedical Board.

GM MAR-FCL 3.025 Military Medical Certificates (MMC)
 (See MAR-FCL 3.025)

Overview of duties and medical classes

Duty	Flight Crew Member	Crew Member	Controller
Medical Certificate	Class 1	Class 2	Class 3
Duty	<ul style="list-style-type: none"> • Pilot • Co-pilot • Flight Engineer Students of all duties above	<ul style="list-style-type: none"> • Cabin Attendant • Purser • Sensor Operator (manned aircraft) • Boom Operator • Loadmaster • Observer • Flight Test Engineer • Flight Surgeon • Flight Nurse • Flight Psychologist • Hoist Operator • SAR Swimmer • SAR Physician • Aerial Photographer • Tactical Coordinator • Airborne Communication Operator • Door gunner • Airborne Surveillance Operator Students of all duties above	<ul style="list-style-type: none"> • Air Traffic Controller • Fighter Controller • Helicopter Direction Officer • RPAS operator Students of all duties above

Summary of minimum requirements

	Class 1	Class 2	Class 3
License	Flight Crew Member	Air Crew Member	Air Traffic Controller Fighter Controller
Initial examination (MAR-FCL 3.025)	AeMC	AeMC	AeMC
Issue of Medical Certificate (MAR-FCL 3.025)	AMS	AMS	AMS
Validity of Medical Certificate (MAR-FCL 3.030)	Under 40: 12 months 40 and over: 6 months (except for KDC-10 and G4)	12 months	Under 40: 24 months 40 and over: 12 months
Chest Radiography (MAR-FCL 3.155)	At initial examination	If indicated	If indicated
Electro-Encephalogram (MAR-FCL 3.210)	At initial examination	If indicated	If indicated
Haemoglobin (3.180, 3.300 and 3.425)	At initial and then every examination	At initial and then every examination	At initial and then every examination
Electrocardiogram (3.130, 3.250 and 3.375)	At initial and then every examination	At initial and then every examination	At initial and then every examination
Audiogram (3.235, 3.355 and 3.480)	At initial and then every examination	At initial and then every examination	At initial and then every examination
Comprehensive Otorhinolaryngological Examination (3.230, 3.350 and 3.475)	At initial examination by AeMC or ENT specialist At renewal on clinical indication	At initial examination by AeMC or ENT specialist At renewal on clinical indication	At initial examination by AeMC or ENT specialist At renewal on clinical indication
Ophthalmological Examination (3.215, 3.335 and 3.460)	At initial examination, then under 40: every 2 years 40 and over: every year	At initial examination, then every 2 years	At initial examination, then under 40: every 4 years 40 and over: every 2 years
Lipid Profile (3.130, 3.250 and 3.375)	At initial and then every examination	At initial and then every examination	At initial and then every examination
Pulmonary Function Tests (3.155, 3.275 and 3.400)	At initial and then every examination	At initial and then every examination	At initial and then every examination
Urinalysis (3.185, 3.305 and 3.430)	At initial and then every examination	At initial and then every examination	At initial and then every examination
Dental Fitness	At initial and then every examination	At initial and then every examination	At initial and then every examination
Radiography or MRI of the spine	At initial examination	If indicated	If indicated

This Table summarises the principal requirements. Full requirements are detailed in MAR-FCL 3 Subparts B, C and D and Appendices.

Note: Any tests may be required at any time if clinically indicated (MAR-FCL 3.105(f)).

Note: The validity of a Medical Certificate of a Fighter Controller, who is also a Crew Member is: 12 months.

GM MAR-FCL 3.045 LIMITATIONS*(See MAR-FCL 3.045)***Summary of the limitations**

CODE	LIMITATION	IMPOSED BY	REMOVED BY
TML	VALID ONLY FOR MONTHS	FS/AeMC/AMS	AMS
VDL	SHALL WEAR CORRECTIVE LENSES AND CARRY A SPARE SET OF SPECTACLES	FS/AeMC/AMS	AMS
VML	SHALL WEAR MULTIFOCAL LENSES AND CARRY A SPARE SET OF SPECTACLES	FS/AeMC/AMS	AMS
VNL	SHALL HAVE AVAILABLE CORRECTIVE SPECTACLES FOR NEAR VISION AND CARRY A SPARE SET OF SPECTACLES	FS/AeMC/AMS	AMS
OML	VALID ONLY AS OR WITH QUALIFIED COPILOT	AMS	AMS
OFL	CLASS 1 VALID FOR FLIGHT ENGINEER DUTIES ONLY	AMS	AMS
OCL	VALID ONLY AS CO-PILOT	AMS	AMS
OAL	RESTRICTED TO DEMONSTRATED AIRCRAFT TYPE	AMS	AMS
OPL	VALID ONLY WITHOUT PASSENGERS	AMS	AMS
AGL	VALID ONLY WITH APPROVED EYE PROTECTION	AMS	AMS
SSL	SPECIAL RESTRICTIONS AS SPECIFIED	AMS	AMS
SIC	SPECIAL INSTRUCTIONS – CONTACT AMS	AMS	AMS
AMS	RECERTIFICATION OR RENEWAL ONLY BY AMS	AMS	AMS
REV	MMC ISSUED AFTER REVIEW PROCEDURE, SPECIAL INSTRUCTIONS MAY APPLY, AMS MAY BE CONTACTED	AMS	AMS
RXO	REQUIRES SPECIALIST OPHTHALMOLOGICAL EXAMINATIONS	FS/AeMC/AMS	AMS
FWO	FLYING WITHOUT OXYGEN MASK	AMS	AMS
NDP	NOT DEPLOYABLE	AMS	AMS
LTG	LIMITED TO G	AMS	AMS

Explanation of the limitations

LIMITATION TML: 'VALID ONLY FOR MONTHS'

Explanation:

The period of validity of your MMC has been limited to the duration as shown above for the reasons explained to you by your Flight Surgeon. This period of validity commences on the date of your medical examination. Any period of validity remaining on your previous MMC is now no longer valid. You should present for re-examination when advised and follow any medical recommendations. (Reference MAR-FCL 3.030.f)

LIMITATION VDL: 'SHALL WEAR CORRECTIVE LENSES AND CARRY A SPARE SET OF SPECTACLES'

Explanation:

In order to comply with the vision requirements of your licence, you are required to wear those spectacles or contact lenses that correct for defective distant vision as examined and approved by a Flight Surgeon whilst exercising the privileges of your licence. You must also carry with you a similar set of spectacles. Should you wear contact lenses, you must carry a spare set of spectacles as approved by a Flight Surgeon. You may not wear contact lenses whilst exercising the privileges of your licence until cleared to do so by a Flight Surgeon. You must also carry a spare set of spectacles.

(Reference MAR-FCL 3.215.e, MAR-FCL 3.335.g and MAR-FCL 3.460.n)

LIMITATION VML: 'SHALL WEAR MULTIFOCAL SPECTACLES AND CARRY A SPARE SET OF SPECTACLES'

Explanation:

In order to comply with the vision requirements of your licence, you are required to wear those spectacles that correct for defective distant, intermediate and near vision as examined and approved by the Flight Surgeon whilst exercising the privileges of your licence. Contact lenses or full frame spectacles, when either correct for near vision only, may not be worn. You must also carry a spare set of spectacles.

(Reference MAR-FCL 3.215.e, MAR-FCL 3.335.g and MAR-FCL 3.460.n)

LIMITATION VNL: 'SHALL HAVE AVAILABLE CORRECTIVE SPECTACLES FOR NEAR VISION AND CARRY A SPARE SET OF SPECTACLES'

Explanation:

In order to comply with the vision requirements of your licence, you are required to carry with you those spectacles that correct for defective near vision as examined and approved by a Flight Surgeon whilst exercising the privileges of your licence. Contact lenses or full frame spectacles, when either correct for near vision only, may not be worn. You must also carry a spare set of spectacles.

(Reference MAR-FCL 3.215.e, MAR-FCL 3.335.g and MAR-FCL 3.460.n)

LIMITATION OML: 'VALID ONLY AS OR WITH QUALIFIED CO-PILOT'

Explanation:

This applies to crew members who do not meet the medical requirements for single crew operations, but are fit for multi-crew operations.

1. The limitation 'valid only as or with qualified co-pilot', known as an Operational Multi-crew Limitation (OML), is to be applied when the holder of a Military Pilot Licence does not fully meet the class 1 MMC requirements but is considered to be within the acceptable risk of incapacitation. This limitation can only be applied by the AMS in the context of a multi-pilot environment. An OML may only be issued or removed by the AMS.
2. In case of a pilot with an OML, the other pilot in the crew shall be qualified on the type, and may not be subject to an OML.

LIMITATION OFL for F/E: 'CLASS 1 VALID FOR FLIGHT ENGINEER DUTIES ONLY'

Explanation:

This applies to flight engineers (F/E) who do not fully meet the medical requirements for a Class 1 MMC, but are fit for F/E duties in multi-pilot operations.

LIMITATION OCL: 'VALID ONLY AS CO-PILOT'

Explanation:

This limitation is a further extension of the OML limitation and is applied when, for some well-defined medical reason, the individual is assessed as safe to operate in a co-pilot role but not in command.

LIMITATION OAL: 'RESTRICTED TO DEMONSTRATED AIRCRAFT TYPE'

Explanation:

This limitation may apply to a pilot who has a limb deficiency or some other anatomical problem which had been shown by medical flight test or flight simulator testing to be acceptable but to require a restriction to a specific type of aircraft.

(Reference MAR-FCL 3.195, MAR-FCL 3.315 and MAR-FCL 3.440)

LIMITATION OPL: 'VALID ONLY WITHOUT PASSENGERS'

Explanation:

This limitation may be considered when a pilot with a medical condition, may involve an increased element of risk to flight safety which might be acceptable to the pilot but which is not acceptable for the carriage of passengers.

LIMITATION AGL: 'VALID ONLY WITH APPROVED EYE PROTECTION'

Explanation:

This limitation requires the holder of the license to carry protective goggles and use them in any flying with a risk to eyesight, including negative/ zero G manoeuvres and flight in open cockpits.

(Reference MAR-FCL 3.210 and 3.215, MAR-FCL 3.330 and 3.335 and MAR-FCL 3.455 and 3.460)

LIMITATION SSL: 'SPECIAL RESTRICTIONS AS SPECIFIED'**Explanation:**

This limitation is for use in cases that are not clearly defined in MAR-FCL Part 3 (Medical) but where a limitation is considered to be appropriate by the AMS.

The Special Restrictions as Specified limitation (SSL) for Flight Engineers (F/E) is to be applied when the holder of an F/E licence does not fully meet the Class 1 Military MMC requirements but is considered to be within the acceptable risk of incapacitation. This limitation is applied by the AMS and can only be removed by the AMS.

LIMITATION SIC: 'SPECIAL INSTRUCTIONS – FS TO CONTACT AMS'**Explanation:**

This limitation requires the FS to contact the AMS before embarking upon renewal or recertification medical assessment. It is likely to concern a medical history of which the FS should be aware prior to undertaking the assessment.

LIMITATION AMS: 'RECERTIFICATION OR RENEWAL ONLY BY AMS'**Explanation:**

The AMS, as the duly empowered part of the Military Aviation Authority the Netherlands with overall responsibility for medical certification, has the right to determine that a certificate shall be issued by the AMS only and not by an AeMC or an FS, if the medical circumstances so require. (Reference MAR-FCL 3.050)

LIMITATION REV: 'MMC ISSUED AFTER REVIEW PROCEDURE, SPECIAL INSTRUCTIONS MAY APPLY, AMS MAY BE CONTACTED'**Explanation:**

If a pilot has been outside the limits of MAR-FCL 3, Section 1, Subparts B, C or D, but has been certified after review procedure by the AMS, this annotation allows any FS to be aware of the previous AMS review procedure and to contact the AMS for more information if deemed necessary. Special instruction(s) not mentioned on the MMC might apply. However, the holder of the MMC should present the written report of the AMS concerning the review procedure to the FS to allow quicker processing. (Reference MAR-FCL 3.050)

LIMITATION RXO: 'REQUIRES SPECIALIST OPHTHALMOLOGICAL EXAMINATIONS'**Explanation:**

Where specialist ophthalmological examinations are required for any significant reason, the MMC is to be marked with the limitation "Requires specialist ophthalmological examinations – RXO". Such a limitation may be applied by a FS but only be removed by the AMS. (Reference MAR-FCL 3.210.d, MAR-FCL 3.330.d and MAR-FCL 3.455.b)

LIMITATION FWO: 'FLYING WITHOUT OXYGEN MASK'**Explanation:**

This limitation may be considered when a pilot with a pulmonary problem, or some other medical condition, may involve an increased element of risk to flight safety when using an oxygen mask and being exposed to high oxygen pressure.

LIMITATION NPD: 'NOT DEPLOYABLE'**Explanation:**

This applies to crew member who do not (temporary) fully meet the medical requirements for a Class 1 or 2 MMC, but are fit for crew operations in non-hostile theatre operations, but may involve an increased element of risk to flight safety when being deployed to a hostile theatre.

LIMITATION LTG: 'LIMITED TO G'**Explanation:**

This limitation may be considered when a pilot with a musculo-skeletal problem, or some other medical condition, may involve an increased element of risk to flight safety when exposed to high G forces.

GM MAR-FCL 3.050 Secondary review procedure
(See MAR-FCL 3.050)

1. When a candidate applies for a secondary review to evaluate his or her case, the AMS will ask the Surgeon General of the Royal Netherlands Air Force to constitute a board of at least three independent medical advisors, experienced in the practice of aviation medicine. The Surgeon General can act as the chairman of the board, or he can appoint one of the members as the chairman.
2. The board shall review the case and produce a written report as an advice to the Director of the Military Aviation Authority.
3. The Director of the Military Aviation Authority takes the final decision about the contentious case and shall inform the candidate about his decision.

GM MAR-FCL 3.075 Use of medication, drugs, other treatments and alcohol
(See MAR-FCL 3.075)

Medication

1. Accidents and incidents have occurred as a result of pilots flying while medically unfit and the majority have been associated with what have been considered relatively trivial ailments. Although the symptoms of colds, sore throats, diarrhoea and other abdominal upsets may cause little or no problem whilst on the ground they become dangerous in the flying environment by distracting the pilot and degrading performance in the various flying tasks. The in-flight environment may also increase the severity of symptoms which may be minor while on the ground. The effects may be compounded by the side effects of the medication prescribed or bought over the counter for the treatment of such ailments. The following are some widely used medicines which are normally considered incompatible with flying.
2. Antibiotics such as the various Penicillins, Tetracyclines and others may have short term or delayed side effects which can affect pilot performance. More significantly, however, their use usually indicates that an infection is present and thus the effects of this infection will normally mean that a pilot is not fit to fly.
3. Tranquillisers, anti-depressants and sedatives. Inability to react due to the use of this group of medicines has been a contributory cause to fatal aircraft accidents. Again, as with antibiotics, the underlying condition for which these medications have been prescribed will almost certainly mean that a pilot's mental state is not compatible with the flying task.
4. Stimulants such as amphetamines (often known as "pep" pills) used to maintain wakefulness or suppress appetite are often habit forming. Susceptibility to different stimulants varies from one individual to another, and all may cause dangerous over confidence. Overdosage causes headaches, dizziness and mental disturbance. The use of "pep" pills while flying is not permitted. Where caffeine intake does not offer sufficient stimulation, then an individual is not fit to fly. Caffeine intake up to 300 mg is allowed. As an indication one could use the following comparison: 150 mg of coffee, instant coffee, tea or cola contains respectively 115, 65 and 20 mg of caffeine. 250 ml of Red Bull contains 80 mg of caffeine. Remember that excessive coffee drinking has harmful effects including disturbance of the heart's rhythm.
5. Classic anti-histamines can cause drowsiness. They are widely used in "cold cures" and in treatment of hay fever, asthma and allergic rashes. They may be in tablet form or a constituent of nose drops or sprays. In many cases the condition itself may preclude flying, so that, if treatment is necessary, advice from the AMS, an AeMC or a FS should be sought so that modern drugs, which do not degrade human performance, can be prescribed.
6. Certain drugs used to treat high blood pressure can cause a change in the normal cardiovascular reflexes and impair intellectual performance, both of which can seriously affect flight safety. If the level of blood pressure is such that drug therapy is required the pilot must be temporarily grounded and monitored for any side effects. Any treatment instituted should

be discussed with the AMS, an AeMC or a FS and a simulator assessment or line check may be appropriate before return to flying.

7. Following local, general, dental and other anaesthetics, a period of time should elapse before return to flying. The period will vary considerably from individual to individual, but a pilot should not fly for at least 12 hours after a local anaesthetic and for 48 hours after a general or spinal anaesthetic.
8. The more potent analgesics may produce a significant decrement in human performance. If such potent analgesics are required, the pain for which they are taken generally indicates a condition which precludes flying.
9. Many preparations are now marketed containing a combination of medicines. It is essential therefore that if there is any new medication or dosage, however slight, the effect should be observed by the pilot on the ground prior to flying. Although the above are the commonest medicines which adversely affect pilot performance, it should be noted that many other forms of medication, although not normally affecting pilot performance, may do so in individuals who are "oversensitive" to a particular preparation. Individuals are therefore advised not to take any medicines before or during flight unless they are completely familiar with their effects on their own bodies. In cases of doubt, pilots should consult a FS, an AeMC or the AMS.
10.
 - a. If the crewmember is taking any medicine, he / she should ask him / herself the following three questions:
 1. Do I feel fit to fly?
 2. Do I really need to take medication at all?
 3. Have I given this particular medication a personal trial on the ground of at least 24 hours before flight to ensure that it will not have any adverse effects whatever on my ability to fly?
 - b. Confirming the absence of adverse effects may well need expert advice and the assistance of the AMS, an AeMC or a FS.
 - c. If he / she is ill and need treatment it is vitally important that the doctor whom he / she consults knows that he / she is a member of air crew and whether or not he / she has recently been abroad.

Other Treatments

11. Alternative or complementary medicine, such as acupuncture, homeopathy, hypnotherapy and several other disciplines, is developing and gaining greater credibility. However, the (side) effects of most homeopathic substances have not been studied sufficiently, to make their use compatible with flying. It is also known that the quality of these substances varies greatly. There is a need to ensure that "other treatments", as well as the underlying condition, are declared and considered by the AMS, an AeMC or a FS when assessing fitness.

Alcohol

12.
 - a. Alcohol is a contributory factor in a number of aircraft accidents every year. It is now well established that even small amounts of alcohol in the blood produce a significant and measurable deterioration in the performance of skilled tasks. Research has shown that blood alcohol concentrations of 0.4 promille are associated with a highly significant increase in errors committed by both experienced and in-experienced pilots even in simple aircraft. This level may be produced after consuming two units of alcohol, e.g. 5 cl of whiskey or 0.5 L of beer.
 - b. The number of units in an alcoholic drink is given by the volume of the drink in centilitres (cl) multiplied by the strength in % weight/volume (%w/v).
Examples:
50 cl (0.5 L) of beer of 5%w/v contains 2.5 units. (5% of 50 = 2.5)
2.5 cl of whiskey of 40%w/v contains 1 unit. (40% of 2.5 = 1)
75 cl (1 bottle) of wine of 12%w/v contains 9 units. (12% of 75 = 9)
 - c. Alcohol is removed from the body at a relatively constant rate (0.15 promille each hour) regardless of the concentration present. Pilots should not fly for at least 10 hours after taking

small amounts of alcohol and proportionally longer if larger amounts are consumed. It should also be remembered that alcohol can have delayed effects on the blood sugar and the inner ear. The effects on the inner ear can be prolonged and increase susceptibility to disorientation and even motion sickness. It may be prudent for a pilot to abstain from alcohol at least 24 hours before flying.

d. It must be remembered that alcohol's effects can be enhanced or prolonged significantly if it is taken by an individual who is suffering from an illness or who is taking medication.

e. Attention is drawn to JAR-OPS 1.085(d) where a blood alcohol level of 0.2 promille is described as the upper limit for aircrew on duty as well as a 10-hour abstinence period prior to specified reporting time for flight duty.

Psychotropic Drugs and Substance Abuse

13. The use of such drugs or substances has a basic effect of detaching the person from reality as well as more complex short- and long-term effects. These effects are not compatible with the control of an aircraft and individuals using such drugs or substances are not fit to be members of flight crew. Further details are given in:
- MAR-FCL 3: Appendix 10 to Sub Part B, C & D
 - GM FCL A, B and C - The JAA Manual of Civil Aviation Medicine - Aviation Psychiatry Chapter.

GM MAR-FCL 3.235 Dental Fitness Classification

(See MAR-FCL 3.235 and 3.355)

The dental fitness classification system is based on the NATO system described in STANAG 2466. The four levels of dental fitness are:

1. DF Class 1: Optimal Oral Health
These applicants are dentally healthy and satisfied with their state of oral health. A recall period of 12 months may be assigned to these patients. Class 1 is the required class of dental health for all flight crew.
2. DF Class 2: Operational Dental Fitness
These applicants have a stable dental condition which is "unlikely" to result in a dental emergency within 12 months. These applicants however are not fit for deployment as flight crew. A recall period of 12 months is assigned to these patients. Dental treatment is required to lift their DF status to DF 1.
3. DF Class 3: Potential Dental Casualty
These applicants have an unstable dental condition that is likely to result in a dental emergency within 12 months. They are in a potential dental casualty state and unfit for flight. Once assigned as fitness class 3, applicants remain class 3 until the required treatment is completed. Then they are assigned to class 1 or 2.
4. DF Class 4: Unknown
The applicant's oral health status is undetermined and applicant is considered unfit for flight.

DF Criteria

Applicants are considered dentally fit class 1 when following conditions are satisfied:

- 1 Dental caries
There is no evidence of active (progressing) caries extending into the enamel and/or dentine. Arrested lesions do not progress into dentine. The determination of whether interproximal caries are active (progressing) is made by radiographic monitoring of the lesion. At least two radiographic images are necessary to make this determination.

2. Restorations
There are no defective permanent restorations (cracked, loose, or leaking) that are causing symptoms or tissue damage or cannot be maintained by the patient, no temporary restorations with interim material present, and no posterior teeth requiring immediate protective cuspal coverage to maintain the structural integrity of the tooth.
3. Pulp and periapical tissue
There are no teeth with symptoms and signs of irreversible pulpal damage or necrotic pulps, no teeth with incomplete endodontic treatment, and no endodontically treated teeth with symptoms or with a periradicular radiolucency that has increased in size 6 months after treatment. Direct pulp capping is unacceptable.
4. Tooth mobility
There is no significant tooth mobility, which interferes with speech, oral function, or occupational function, such as the wearing of oxygen masks.
5. Occlusion and Craniomandibular Dysfunction (CMD)
Occlusion is stable with speech and function uncompromised, para-functional activity is not excessive and the potential for long-term damage is considered to be minimal, CMD or occlusal dysfunction is being managed and the patient is asymptomatic, and orthodontic condition is stable.
6. Third molars
There are no unerupted, partially erupted, or malposed third molars with historical, clinical, or radiographic signs or symptoms of pathology that require extraction.
7. Teeth and roots
There are no unerupted, partially erupted, or mal positioned teeth with historical, clinical, or radiographic signs or symptoms of pathology that require extraction, no non-restorable teeth; and no functionless roots in communication with the oral cavity; and no symptoms of cracked tooth syndrome
8. Dental implants
Dental implants are functional and stable.
9. Pain, infection, and problems of probable dental origin
The applicant is free of pain, there are no chronic oral infections or pathological lesions, including pulp or periapical pathology and there is no history of recent unresolved problems diagnosed as of probable dental origin.
10. Periodontal diseases
There is no evidence of active periodontal diseases that are beyond control by primarily self-care. Professional care in the form of maintenance therapy may be required as a secondary measure to control the patient's condition and no periodontal involved teeth with associated apical involvement, which are untreated, and when treated do not show both clinical and radiographic signs of resolution.
11. Soft and bony tissue and radiographic anomalies
There is no evidence of any malignant lesion that requires long term therapy; tissues are free from abnormality and there are no suspicious lesions that require evaluation or biopsy. and there is no unrepaired cleft lip and/or palate; and there is no evidence of nerve damage.
12. Dental prostheses
Dental prostheses are retentive and stable. Dental prostheses permit adequate mastication and communication and no temporary fixed prostheses are present.

Temporary flight restriction after dental treatment

Flight restriction (Duty Not Including Flying) of a patient is required when interference in the flight capabilities of the aircrew member is suspected. Some medications can cause this interference and will lead to DNIF (See GM FCL 3.075 Medication).

Intra-oral pressure changes several hours after tooth extraction or other oral/periodontal surgery, can take out the blood clot and cause intra-oral bleeding, with obvious interference to normal functioning (especially clear speaking). Moreover, in a pressure-changing environment, the risk of (sub mucosal) emphysema can be increased as well. Another reason for grounding aircrew after dental extractions is that facial swelling can prevent jet and helicopter pilots from wearing helmets comfortably. In cases of oroantral communication, because pressure changes can interfere with such wound healing, DNIF should be advised until healing is evident.

Oral conditions and dental treatments in which grounding of aircrews should be considered are listed below. The usual restriction time is 12 to 24 hours after dental treatment or until symptoms subside, medication ceases, stabilisation of blood clot, etc. Since dental pain often interferes with sleeping, the dentist will advise the aircrew to be grounded until pain relief is achieved and the patient can sleep well. Routine dental restorative treatment does not require grounding unless the severity of the provided dental treatment requires otherwise. To avoid in-flight barodontalgia grounding of aircrews from time of diagnosing the need for endodontic treatment until the treatment is completed is recommended, especially in cases of infection with systemic symptoms. At the time of planning treatment, dentists will notify their aircrew patients and their Flight Surgeon about the post-operative flight consequences and restrictions.

Oral conditions and dental treatments in which aircrew will be temporarily grounded:

1. Disease:
 - a. Acute infection with systemic symptoms (e.g. elevated temperature, malaise)
 - b. Toothache (and toothache-related sleepless nights)
 - c. Dental-related weakness or dizziness
 - d. Grounding time: until symptoms subside
2. Dental treatment:
 - a. Local anaesthesia: DNIF for 12 hours
 - b. Tooth extraction: DNIF for 24-72 hours
 - c. Oral/periodontal surgery: DNIF for 24-72 hours
 - d. Restorative treatment without the use of local anaesthesia: DNIF for 0-8 hours
 - e. Endodontic treatment with acute infection with systemic symptoms: DNIF until completion of the endodontic treatment

The mentioned DNIF time is an average time, the dentist can advise the Flight Surgeon a shorter or longer period of DNIF based on the severity of the dental condition or provided dental treatment.

GM MAR-FCL 3.520 **Changes to organisations**
 (See MAR-FCL 3.520)

1. Typical examples of changes that may affect the certificate or the terms of approval are listed below:
 - a. the name of the organisation;
 - b. the organisation's principal place of business;
 - c. the organisation's scope of activities;
 - d. additional locations of the organisation;
 - e. the accountable manager;
 - f. the organisation's documentation as required by this Part, safety policy and procedures;
 - g. the facilities.

Change of name of the organisation

A change of name requires the organisation to submit a new application as a matter of urgency. Where this is the only change to report, the new application can be accompanied by a copy of the documentation previously submitted to the MAA-NLD under the previous name, as a means of demonstrating how the organisation complies with the applicable requirements.

GM MAR-FCL 3.535 **Findings**
 (See MAR-FCL 3.535)

1. Corrective action is the action to eliminate or mitigate the root cause(s) and prevent recurrence of an existing detected non-compliance or other undesirable condition or situation.
2. Proper determination of the root cause is crucial for defining effective corrective actions.

GM MAR-FCL 3.550 **Management system**
 (See MAR-FCL 3.550)

Safety manager

(See MAR-FCL 3.550.a.1)

1. Depending on the size of the organisation and the nature and complexity of its activities, the safety manager may be assisted by additional safety personnel for the performance of all safety management related tasks.
2. Regardless of the organisational set-up it is important that the safety manager remains the unique focal point as regards the development, administration and maintenance of the organisation's safety management system.

Safety policy

(See MAR-FCL 3.550.a.2)

1. The safety policy is the means whereby the organisation states its intention to maintain and, where practicable, improve safety levels in all its activities and to minimise its contribution to the risk of an aircraft accident as far as is reasonably practicable.
2. The safety policy should state that the purpose of safety reporting and internal investigations is to improve safety, not to apportion blame to individuals.

Internal occurrence reporting scheme

(See MAR-FCL 3.550.a.3)

1. The overall purpose of the scheme is to use reported information to improve the level of safety performance of the organisation and not to attribute blame.
2. The objectives of the scheme are to:
 - a. enable an assessment to be made of the safety implications of each relevant incident and accident, including previous similar occurrences, so that any necessary action can be initiated; and
 - b. ensure that knowledge of relevant incidents and accidents is disseminated, so that other persons and organisations may learn from them.
3. The scheme is an essential part of the overall monitoring function and it is complementary to the normal day-to-day procedures and 'control' systems and is not intended to duplicate or supersede any of them. The scheme is a tool to identify those instances where routine procedures have failed.
4. All occurrence reports judged reportable by the person submitting the report should be retained as the significance of such reports may only become obvious at a later date.

Training and communication on safety

(See MAR-FCL 3.550.a.4)

The safety training programme may consist of self-instruction via a media (newsletters, flight safety magazines), class-room training, e-learning or similar training provided by training service providers.

Organisation's management system documentation

(See MAR-FCL 3.550.a.5)

1. It is not required to duplicate information in several manuals. The information may be contained in any of the organisation manuals (e.g. operations manual, training manual), which may also be combined.
2. The organisation may also choose to document some of the information required to be documented in separate documents (e.g. procedures). In this case, it should ensure that manuals contain adequate references to any document kept separately. Any such documents are then to be considered an integral part of the organisation's management system documentation.

Compliance monitoring

(See MAR-FCL 3.550.a.6)

1. The organisational set-up of the compliance monitoring function should reflect the size of the organisation and the nature and complexity of its activities. The compliance monitoring manager may perform all audits and inspections himself/herself or appoint one or more auditors by choosing personnel having the related competence as defined in the ISO9001, either from within or outside the organisation.
2. Regardless of the option chosen it must be ensured that the independence of the audit function is not affected, in particular in cases where those performing the audit or inspection are also responsible for other functions within the organisation.
3. In case external personnel are used to perform compliance audits or inspections:
 - a. any such audits or inspections are performed under the responsibility of the compliance monitoring manager; and

- b. the organisation remains responsible to ensure that the external personnel has relevant knowledge, background and experience as appropriate to the activities being audited or inspected; including knowledge and experience in compliance monitoring.
- 4. The organisation retains the ultimate responsibility for the effectiveness of the compliance monitoring function in particular for the effective implementation and follow-up of all corrective actions.

GM MAR-FCL 3.700 Research

(See MAR-FCL 3.700)

If aero-medical research is conducted at an AeMC, its management system should include processes to conduct that research and publish the results.

Hoofddorp, 19 December, 2018

Director Military Aviation Authority – The Netherlands

J.P. Apon
Air Commodore

