

NASA

**NASA Aviation Medical Certification
Standards**

Office of the Chief Health and Medical Officer

November 2009

**National Aeronautics and Space Administration
Headquarters
Washington, DC**



NASA AVIATION MEDICAL CERTIFICATION STANDARDS
SIGNATURE PAGE

APPROVED BY:

Richard S. Williams, M.D.
NASA Chief Health and Medical Officer

Date

TABLE OF CONTENTS

1.0 Introduction

1.1 Document purpose

2.0 NASA Flight Medical Certification

2.1 General Considerations

2.2 Certification Requirements

3.0 Administrative Considerations

3.1 Qualifications for providing flight certification

3.2 Waivers

3.3 Appeal of Medical Disqualification or Waiver Denial

3.4 Roles and Responsibilities

4.0 References

Appendix A Flight Medical Clearance Form

Appendix B NASA Medical Flight Certification Form

1.0 INTRODUCTION

1.1 Document purpose

This document provides the standards and administrative procedures for the medical certification of NASA aviation flight personnel. It ensures that medical certification practices will be implemented consistently across the Agency and provides details on the criteria for NASA pilot and aircrew flight medical certification. These standards and processes complement the medical certification policies contained in NPR 7900.3B Aircraft Operations Management, and define an Agency aviation medical certification process, aviation medical standards, and medical evaluation requirements. This document is applicable to all civil servant and contractor pilots and aircrew who operate aircraft for NASA at all NASA Centers, including Component Facilities.

Flight personnel seeking NASA flight medical certification shall be governed by the standards and processes provided in this document.

2.0 NASA Flight Medical Certification

2.1 General Considerations

NPR 7900.3B, Aircraft Operations Management describes three possible pathways for NASA personnel to obtain aviation medical certification - Federal Aviation Administration (FAA), military, or NASA. This documents describes the NASA aviation medical certification standards and processes.

NASA adopts the medical standards policy and guidelines of the Office of Aerospace Medicine of the FAA as the initial basis of determining an individual's medical qualification for flight duty in NASA aircraft. These official policies and guidelines are defined in Part 67 of Subchapter D of Title 14 of the Code of Federal Regulations, the official Guide for Aviation Medical Examiners, and other official FAA publications. Additionally, a NASA flight surgeon/aviation medical examiner, if in their opinion the operational environment at their Center requires it, may impose additional medical certification requirements within their Center-wide procedures with the concurrence of the Center Director, the Center Chief of Flight Operations, and the NASA Chief Health and Medical Officer.

Once an employee is certified for flight, any significant changes of the individual's medical status (e.g., due to serious injury, illness and/or hospitalization) may result in a temporary suspension of medical flight certification (medical grounding action or Duties Not to Include Flying) until the individual's health can be evaluated. An employee will report any change in medical status to the appropriate Center aviation

medical authority immediately. Reportable medical conditions include, but are not limited to:

- 1) The initiation of any new medication (prescription or nonprescription),
- 2) Any visits to a physician's office or an Emergency Room as a patient, for any reason,
- 3) Any admissions to the hospital (as a patient)
- 4) Any medical procedures requiring anesthesia or conscious sedation
- 5) Any changes in vision, hearing, or other physical senses
- 6) Any injuries or illnesses that affect, or reasonably could affect, the individual's ability to perform flying duties

Any condition, treatment or medication that in the opinion of the cognizant NASA Flight Surgeon/Aviation Medical Examiner has a reasonable probability to present a significant risk to personal health, flying safety or mission completion shall be cause for medical disqualification from flying duties. (Note: In such instances the NASA Flight Surgeon/Aviation Medical Examiner must be prepared to explain to the affected individual, and to the NASA Aerospace Medicine Board the nature of the condition, treatment or medication, and the specific reasons it may pose a risk to personal health, flying safety or mission completion).

2.2 Certification Requirements

2.2.1 Pilots – NASA medical certification consists of fulfilling the examination requirements equivalent to a FAA Class I medical certificate examination, renewed annually.

2.2.2 Flight Engineers - NASA medical certification consists of fulfilling the examination requirements equivalent to a FAA Class II medical certificate examination, renewed annually.

2.2.3 Other Primary Aircrew - NASA medical certification consists of fulfilling the examination requirements equivalent to a FAA Class III medical certificate examination, renewed annually.

2.2.4 Qualified Non-Crewmember (QNC) - A QNC is an individual other than a member of the flight crew whose presence is required for, or is associated with, the mission or other Agency activities, the aircraft is supporting. If the individual does not have a valid FAA medical certificate, they can obtain clearance for flight by submitting a generalized medical questionnaire (Appendix A) to the local Occupational Health Clinic. In the event a local Occupational Health Clinic is unable to meet the mission demands for a specific mission, QNC clearance may be obtained by calling one of the following regional clearing authorities in order:

Chief Medical Officer / Senior Flight Surgeon
DFRC/NASA

FAX: (661) 276-2392
Phone: (661) 276-2258

Chief, Aerospace Medicine Board
Deputy Chief and Medical Director, Clinical Services Branch
JSC/NASA
O:281-483-7999
C: 281 221-4276

Medical Operations Manager and
Deputy Chief Medical Officer
KSC/NASA
Office: 321-867-6386
Fax: 321-867-3881

2.2.5 Unmanned Aircraft System (UAS) Pilots and Observers – For Radio Control pilots and Pilot-Operators, NASA medical certification consists of fulfilling the examination requirements equivalent to a FAA Class III medical certificate. Remote pilots require the equivalent of a FAA Class I medical certificate and Observers require the equivalent of a FAA II medical certificate.

2.2.6 High Performance Aircraft (i.e. includes high altitude, ejection seat, and sub-orbital aircraft) – Pilots, Flight Engineers, Other Primary Aircrew, and Qualified Non-Crewmembers seeking NASA medical certification to fly in high performance aircraft, in addition to meeting the requirements described above, shall also undergo these additional tests annually:

- 1) Electrocardiogram.
- 2) Pure Tone Audiometry.
- 3) Blood Work, to include:
 - Hematocrit (and/or Hemoglobin);
 - Lipid Profile: Total Cholesterol, Triglycerides (TG's), High Density Lipoprotein (HDL), and Low Density Lipoprotein (LDL);
 - Fasting Blood Sugar
 - Hemoglobin A1-C test
- 4) Field of vision and peripheral vision test.

2.2.6.1 High performance aircraft flight personnel will be examined by a NASA Flight Surgeon/Aviation Medical Examiner and the results of the additional testing assessed for any anomalies or conditions that could pose a health or safety threat to the individual or mission (e.g. anemia, diabetes, etc.). Additionally, cardiovascular status will be assessed by the Flight Surgeon/Aviation Medical Examiner using any standard cardiovascular risk assessment tool (e.g., Framingham, Reynolds Scoring System). If a risk equal to or greater than 10% in 10 years is obtained, an evaluation by a cardiologist is required. Any confirmed cardiovascular disease is disqualifying. A

complete cardiology evaluation may be submitted, for waiver consideration, to the NASA Aerospace Medicine Board. NASA Centers may require additional cardiovascular screening based on their local requirements.

2.2.6.2 Individuals seeking to participate in one or a limited number of familiarization high performance flights shall obtain NASA high performance aircraft medical certification by submitting a generalized medical questionnaire (Appendix A), which will be assessed by the local NASA medical authority, who may require additional evaluation or examination before providing certification for flight.

2.2.6.3 NASA high performance aircraft medical certification for NASA personnel age 55 and over are presumed valid for six (6) months only, unless in the judgment of the flight surgeon, the certification should be valid for 12 months. Medical certificates for other NASA aircrew members will be valid for 12 months.

2.2.6.4 Individuals on flying status who have had a medical condition or who are taking medication that has a reasonable probability of affecting personal health, flying safety, or mission completion when flying high performance aircraft must undergo review and obtain written approval from the NASA Flight Surgeon/Aviation Medical Examiner before he or she is allowed to participate in high performance flight operations.

2.2.7 Other Medical Certification Issues

2.2.7.1 Pregnancy – Any female pilot or aircrew member must report pregnancy to the NASA Flight Surgeon/Aviation Medical Examiner. Pregnancy is disqualifying for flight duty. Waiver may be considered for flight duty on a voluntary basis only during the second trimester, from 14-26 weeks gestation, and upon examination by a NASA Flight Surgeon/Aviation Medical Examiner. Pregnancy is a disqualifying condition for high performance aircraft duty for all personnel.

3.0 Administrative Considerations

3.1 Qualifications for providing flight certification

3.1.1. Medical examination for certification under the NASA Aviation Medical Certification System of a NASA pilot or aircrew member can only be accomplished by a NASA Flight Surgeon/Aviation Medical Examiner. A NASA Flight Surgeon/Aviation Medical Examiner must meet the following criteria:

- 1) Is a physician, either D.O. or M.D.;
 - 2) Holds a current and unrestricted U.S. based medical license;
 - 3) Is familiar with and maintains a copy of this standards document on file;
- and

4) Has successfully completed the FAA Aviation Medical Examiner basic course, or any Department of Defense flight surgeon training course.

3.1.2. Physicians at NASA Centers with appropriate qualifications will be designated as NASA Aviation Medical Examiners by the Chief Health and Medical Officer by letter upon application and verification of qualifications. NASA Flight Surgeon/Aviation Medical Examiners shall certify that pilots and aircrew meet NASA aviation medical standards by signing a NASA Medical Certification for Flying Duty form (Appendix B).

3.2 Waivers

3.2.1 General Policy

Waiver of the requirements for flight certification will be granted according to the policies in NPR 7900.3B which state:

“Flight crews shall report Special Issuances (FAA Waivers) and FAA Statements of Demonstrated Ability (SODA) to the Chief of Flight Operations for review by a NASA Aero-medical Physician.” (note – in this document referred to as NASA Flight Surgeon/Aviation Medical Examiner)

“Considerations for NASA-specific aero-medical waivers will be processed through the NASA Aerospace Medicine Board and the NASA Medical Policy Board as appropriate.”

An expiration date will be placed on waivers for conditions that may progress or require periodic reevaluation outside of the scope of periodic medical examinations. This will insure periodic review of waivers by the appropriate waiver authority. Waivers are valid for the specified condition only. Any exacerbations of the condition, or other changes in the individual’s medical status automatically invalidate the waiver and a new one must be requested. In some circumstances waivers may be conditional and individuals may receive waivers valid only for specific aircraft, missions, or flight crew configurations.

3.2.2 Waiver authority

The waiver authority for this guidance is the NASA Chief Health and Medical Officer who delegates that authority to the Chair, Aerospace Medicine Board (AMB) at the Johnson Space Center.

3.2.3. Waiver Procedures

Any flight personnel who do not meet NASA aviation medical standards should be referred to the AMB Chair for waiver consideration. The AMB Chair, in consultation with the AMB, then determines if a waiver is warranted and appropriate. When a

waiver is granted, a notation of waiver will be made by the attending NASA Flight Surgeon/Aviation Medical Examiner in the pilot's medical record and on the NASA Medical Certification for Flying Duty form. The expiration date of the waiver will likewise be noted.

3.2.4 Waiver Considerations

To be considered acceptable for flying duty, a medical condition, medication, or treatment must:

1. Not pose a risk of sudden incapacitation
2. Not interfere with the individual's ability to perform their flight duties.
3. Not impact the safe operation of the aircraft.
4. Not interfere with the usage or effectiveness of the personal safety equipment in the aircraft, including but not limited to oxygen supply equipment, pressure suits, and ejection seats.
5. Pose minimal potential for subtle performance decrement, particularly with regard to the higher senses, including but not limited to vision, level of alertness, or cognition.
6. Be resolved or be stable and be expected to remain so under the stresses of the aviation environment for the maximum duration of the waiver.
7. Not be exacerbated by nominal flight activities, including aircraft ingress/egress.
8. Not place the individual at significantly increased risk of injury during in-flight or ground emergency situations. This includes risk of injury during emergency egress procedures, including ejection.
9. Have first symptoms or signs that are easily detectable and not pose a risk to the individual or the safety of others, if the possibility of progression or recurrence exists.

3.3 Appeal of Medical Disqualification or Waiver Denial

Individuals who are medically disqualified from flying duty and denied waiver by the Chair, AMB have the right to appeal their case to the NASA Chief Health and Medical Officer. The decision of the Chair, AMB, is final unless and until it is overturned by the Chief Health and Medical Officer.

Appeal of waiver denials will be made in writing to the NASA Chief Health and Medical Officer within 30 calendar days of the recorded date of notification. The individual requesting the waiver will likewise be informed of the progress of his/her waiver considerations, as well as any additional requirements that might be needed.

3.4 Roles and Responsibilities

3.4.1 NASA Chief Health and Medical Officer shall:

- 1) Establish and maintain aviation medical standards for NASA medical certification of NASA pilots and aircrew.
- 2) Serve as the waiver authority for NASA aviation medical certification decisions.
- 3) Adjudicate appeals of flight disqualification or waiver denial decisions made as part of the NASA aviation medical certification process.

3.4.2 Aerospace Medicine Board shall:

- 1) Through delegation from the Chief Health and Medical Officer, consider and grant waivers or denials for NASA aviation medical certification.
- 2) Participate in the development of aviation medical standards for NASA medical certification of NASA pilots and aircrew.

3.4.3 Individuals on NASA active flight duty shall:

- 1) Supply complete and accurate information regarding any and all current and past medical conditions, medications, and treatments to the examining clinician. No individual may perform aircrew duties if the individual knows, or has reason to suspect, of any medical condition that would make him or her unable to meet established medical requirements. Also, no aircrew duties may be performed if a person is taking medication or receiving other treatment for a medical condition that results in the person being unable to meet the applicable requirements for the medical certification.
- 2) Immediately report any changes in their medical condition to the attending NASA Flight Surgeon/Aviation Medical Examiner.

3.4.4 NASA Flight Surgeon/Aviation Medical Examiner shall:

- 1) Perform a thorough medical evaluation that meets the NASA medical examination requirements.
- 2) Review any and all current and past medical conditions, medications, and treatments, and determine whether they are disqualifying or potentially disqualifying, according to NASA aviation medical standards.
- 3) Record all identified medical conditions and treatments in each individual flyer's medical record completely, accurately, and in a timely manner.
- 4) Report any change in an individual's flight status to the Center Chief Medical Officer.

a) In the case of Centers without a Chief Medical Officer, the NASA Flight Surgeon/Aviation Medical Examiner will report to the Chief Medical Officer at the geographically closest Center.

5) Defer any NASA pilot if they do not meet NASA aviation medicine standards to the NASA Aerospace Medicine Board Chair for waiver consideration.

3.4.5 Center Chief Medical Officers shall:

- 1) Serve as the reporting authority for all aviation medical issues at their Center and for Centers that are geographical close and do not have a Chief Medical Officer, and
- 2) Maintain records for all medically qualified and disqualified flight personnel at their Center and other Centers for which they are responsible.

3.4.6. Center Flight Crew Operations authority shall:

- 1) Communicate to the Center Chief Medical Officer, or NASA Aviation Medical Examiner at that Center, the names of the individuals requiring medical certification for flying duty.
- 2) Ensure that individuals with invalid or expired medical certification for flying duty are removed from the active flying duty roster.
- 3) Remove individuals who are medically disqualified from the active flying duty roster.

4.0 References

14 CFR §61.3, Requirement For Certificates, Ratings, And Authorizations.
14 CFR §61.53, Prohibition on Operations During Medical Deficiency.
14 CFR Part 67, Medical Standards and Certification.
NPD 1000.3, The NASA Organization
NPR 1800.1, Occupational Health Program Procedures
NPR 7900.3B, NASA Aircraft Operations Management

APPENDIX A FLIGHT MEDICAL CLEARANCE FORM

LAST NAME	FIRST NAME	MIDDLE NAME
STREET ADDRESS		CITY
		STATE
		ZIP
DAY PHONE # ()		PHONE # ()
		E-MAIL ADDRESS
DOB (MM/DD/YY)	Sex (CIRCLE) MALE FE MALE	WEIGHT (LBS)
		HEIGHT (INCHES)

PHYSICAL CAPABILITIES: Have you EVER HAD, or do you NOW HAVE, any of the following physical limitations? Answer "YES" for every limitation you have /ever had in your life..

YES	NO	CONDITION	YES	NO	CONDITION
		Do you use a cane or walker?			Is your vision uncorrectable to at least 20/40?
		Do you require any splints, braces, or prosthetics?			Do you require hearing aids?
		Are you unable to climb a ladder without assistance?			Are you afraid of heights?
		Are you unable to climb 2 flights of stairs without difficulty?			Are you afraid of confined or small spaces?
		Are you unable to walk for 30 minutes without resting?			Are you intolerant to heat?
		Are you unable to jump safely from a 5 foot height?			Are you intolerant to cold?
		Do you need to go to the bathroom more than every 2 hours?			Do you have problems at high altitude?
		Do you have urinary or fecal incontinence?			Are you incapable of wearing a tightly fitting respirator mask?

EXPLANATIONS: Explain any "YES" answer from above. Please describe the condition and/or the approximate date of occurrence. Use additional page if necessary.

MEDICAL CONDITIONS: Have you EVER HAD, or do you NOW HAVE, any of the following conditions? Answer "YES" for every condition you have ever had in your life. .

YES	NO	CONDITION	YES	NO	CONDITION
		any heart or lung problems?			any open wounds/sores requiring a dressing?
		a stroke (CVA) or TIA?			a colostomy or indwelling catheter?
		surgery?			a pacemaker or internal defibrillator?
		a blood clot (DVT or pulmonary embolism)?			having surgery within 6 weeks of your flight?
		ear/sinus trouble?			pregnant at the time of your flight?
		diabetes?			use a CPAP device?
		a persistent cough?			use inhalers and/or supplemental oxygen?
		seizures or fainting spells?			take insulin?

EXPLANATION OF MEDICAL CONDITIONS Explain any "YES" answer from above. Please describe the condition and/or the approximate date of occurrence. Use additional page if necessary.

DO YOU CURRENTLY USE ANY MEDICATION (prescription or non-prescription)? YES NO If yes, list name, purpose dosage & frequency of use. (Attach additional sheet if needed).

DO YOU HAVE ANY ALLERGIES? YES NO If yes, list the substance and/or /drug and describe allergic symptoms.

MEDICAL RECOMMENDATIONS Have you received any of the following medical recommendations, treatments, or dispositions? Answer "YES" for every condition you have /ever had in your life.

YES	NO	CONDITION	YES	NO	CONDITION
		Have you been medically rejected for military service?			Have you received treatment for drug/alcohol dependence?
		Have you been medically denied insurance coverage?			Have you been medically advised not to fly?
		Do you now, or have you, received medical disability?			Have you been medically advised not to scuba dive?

EXPLANATIONS: If you answered "yes" to any of the above items, describe the condition and the approximate date of occurrence. Use additional page if necessary.

SIGNATURE OF APPLICANT

DATE

APPENDIX B NASA Medical Flight Certification Form

NASA MEDICAL CERTIFICATION FOR FLYING DUTY		
<i>(This Form is Subject to the Privacy Act of 1974)</i>		
NAME (Last, First, Middle Initial)	EMPLOYER/SPONSOR	
THE ABOVE INDIVIDUAL HAS BEEN FOUND (Check appropriate boxes):		
	MEDICALLY RESTRICTED FROM FLYING OR SPECIAL OPERATIONAL DUTY (DNIF)	
	ESTIMATED RETURN TO FLYING DUTY	
	MEDICALLY CLEARED FOR FLYING OR SPECIAL OPERATIONAL DUTY FOLLOWING AN ILLNESS OR INJURY	
	MEDICALLY CLEARED FOR THE FOLLOWING FLYING DUTIES	
	HIGH PERFORMANCE PILOT-IN-COMMAND	
	HIGH PERFORMANCE <u>NOT</u> PILOT-IN-COMMAND	
	PILOT-IN-COMMAND	
	FLIGHT ENGINEER/PRIMARY AIRCREW	
	QUALIFIED NON-CREWMEMBER	
	UNMANNED AIRCRAFT SYSTEM (UAS) PILOT/OBSERVER	
	REQUIRED TO WEAR VISION CORRECTION DEVICES WHILE PERFORMING FLYING	
REMARKS		
DATE MEDICAL CLEARANCE EXPIRES		
TYPED OR PRINTED NAME OF FLIGHT SURGEON	SIGNATURE	DATE
I CERTIFY that I have been notified and understand the above actions and recommendations.		
SIGNATURE OF FLYER OR INDIVIDUAL		DATE

NASA AEROMEDICAL CLEARANCE CERTIFICATE