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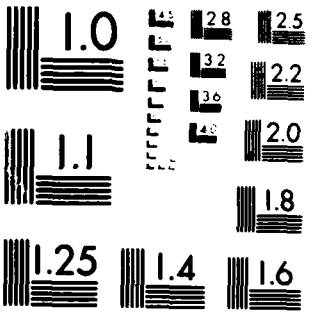

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REGULATORY AVIATION MEDICINE
THE FELLOWSHIPS AND LEGISLATORS

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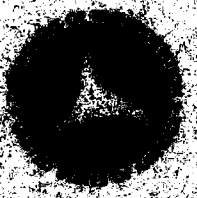

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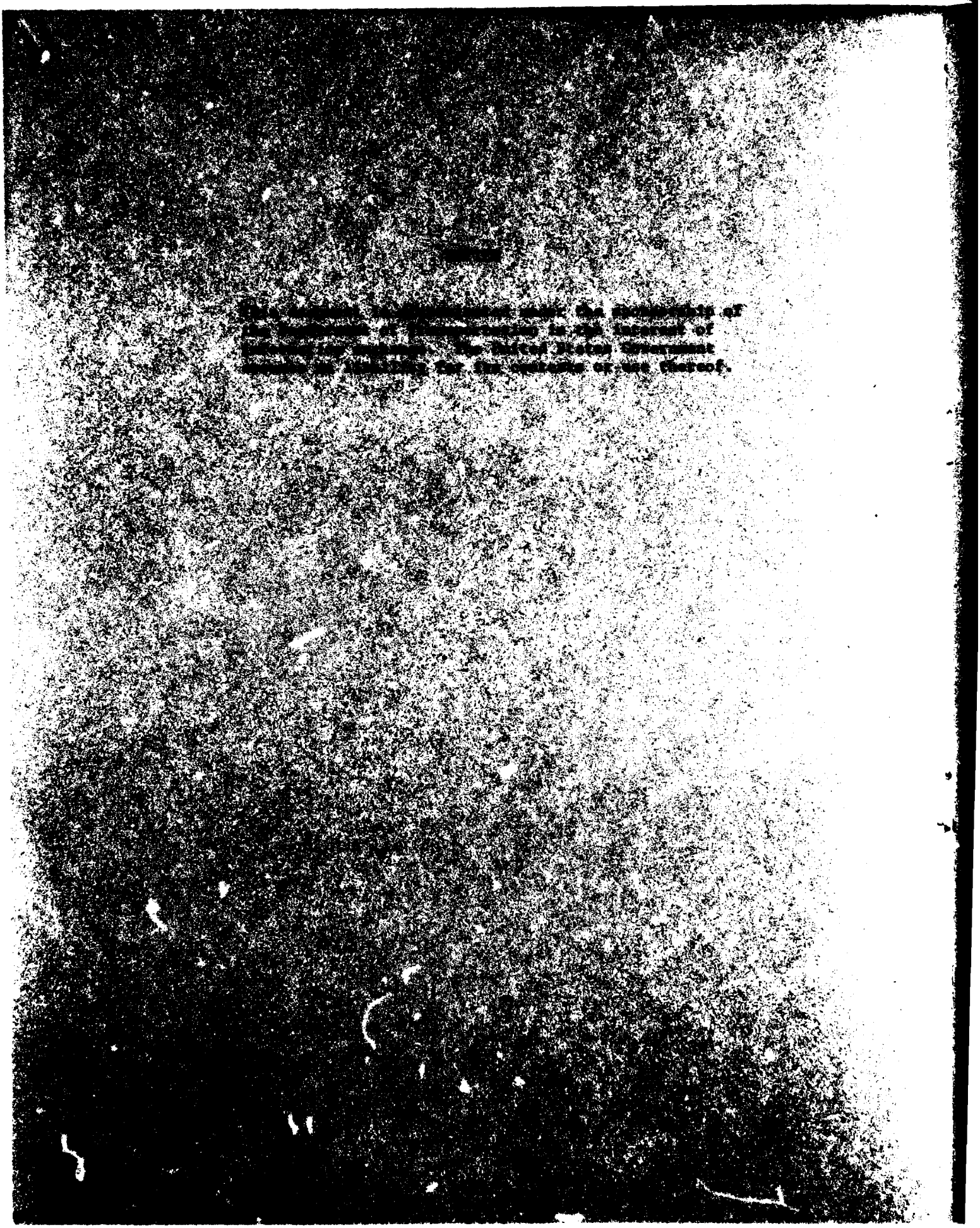

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16. Abstract

The application of aviation medicine is relatively standardized throughout the world, both in civil and military operations. Substantial differences exist, however, in the way different countries, or even different agencies in the same country, determine the medical qualifications of persons who wish to operate aircraft. As a rule, the medical certification policies of the Federal Aviation Administration (FAA) are more liberal than those imposed by the U.S. Department of Defense and by many foreign countries.

Understanding the reasons for these differences requires an awareness of the characteristics of FAA's regulatory policy. Specifically, we must consider three aspects of that policy: (1) the certification system and its overall effects, (2) the philosophy of medical certification and standards, and (3) the limitations of the system.

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REGULATORY AVIATION MEDICINE
ITS PHILOSOPHIES AND LIMITATIONS

The application of aviation medicine is relatively standardized throughout the world, both in civil and military operations. Substantial differences exist, however, in the way different countries, or even different agencies in the same country, determine the medical qualifications of persons who wish to operate aircraft. As a rule, the medical certification policies of the Federal Aviation Administration (FAA) are more liberal than those imposed by the U.S. Department of Defense and by many foreign countries.

Understanding the reasons for these differences requires an awareness of the characteristics of FAA's regulatory policy. Specifically, we must consider three aspects of that policy: (1) the certification system and its overall effects, (2) the philospophy of medical certification and standards, and (3) the limitations of the system.

The Medical Certification System and its Overall Effects

For purposes of civil medical certification, the term "airman" includes pilots, certain other flight crew members, and air traffic control tower operators who are not employed by the FAA. The FAA issues pilot certificates based on demonstrated skill, knowledge, and experience. Pilots may use their certificates to perform airman duties if they obtain periodically required medical examinations and receive the appropriate medical certificate.

There are three classes of medical certificates:

1. First-class certificates are necessary for performing duties that require an airline transport pilot certificate. To maintain first-class certification, examinations are required at 6-month intervals.

2. Second-class certificates are necessary for performing duties that require a commercial pilot certificate. To maintain second-class certification, examinations are required at 12-month intervals.

3. Third-class certificates are necessary for performing duties that require a student pilot or private pilot certificate. To maintain third-class certification, examinations are required at 24-month intervals.

In 1927, the first full year of Federal certification of airmen, 4,200 medical certificates were issued in the United States; in 1980 530,000 were issued, or an average of about 1,450 for each day of the calendar year. Over 100,000 new airmen come into the system each year.

Designated Aviation Medical Examiners (AME) perform all medical certification examinations. AME's are physicians in private practice. The FAA selects these practioners on the basis of their interest in aviation medicine, experience and expertise, and the need for examiners in a given locality.

The airman pays the physician's fees. The FAA does not regulate these fees; it does, however, ask AME's to charge fees that are commensurate with current rates in their communities for similar examinations.

There are over 8,000 AME's in the United States, including 500 military and 300 international. Almost 45 percent are pilots and some 18 percent are former military flight surgeons.

The AME's role is unique. The AME is the only FAA designee or representative with whom every pilot has a regular and required contact. He or she is, therefore, ideally situated to participate in grass roots aviation and to contribute to the ongoing education of airmen. Moreover, in practicing preventive medicine, the AME can be instrumental in preserving the careers, health, and well being of America's airmen. This may be achieved through the early detection of conditions which, unless vigorously treated, will become disqualifying.

The FAA designates only a limited number of physicians as AME's. There are good reasons for limiting the number of AME's, even though it means that some family physicians are excluded from the medical certification process. Many physicians have no special interest in aviation medicine and are not inclined to become involved in the administrative details of certification. Others simply do not have the time to perform the type of examination required by the FAA and are unwilling to obtain the necessary training to become an effective link in the medical certification process.

The AME not only conducts medical examinations of airmen applicants, but also is authorized to issue or deny medical certificates. These certificates are required by everyone performing airman duties.

An airman should be aware that in the event of an aircraft accident or operational incident, Federal authorities will automatically check to determine whether he or she holds a current medical certificate and whether the certificate is appropriate for the airman duties that were being performed. In addition, it is likely that the validity of insurance will be contingent upon proper certification.

AME's submit airman medical reports to the FAA's Aeromedical Certification Branch in Oklahoma City, where they are reviewed for completeness and for conformity with agency policy and procedures. Information from the reports is fed into a computer for screening. If a report fails the computer screening, it is reviewed manually.

Problems that go beyond simple clerical error are referred to an FAA physician. The physician may ask the airman for additional information, such as hospital records or a specialty examination. Aeromedical flight testing to determine an individual's competency may also be required. After all the information is received, eligibility for medical certification is decided and the computer record is updated, creating a data bank for special studies.

Since AME failure means system failure, the computer is also used to survey the work of all AME's. This assures that each AME is performing careful examinations and issuing medical certificates in keeping with agency standards, policies, and procedures.

Under the medical standards, 10 conditions are disqualifying on the basis of history alone. They are an established medical history or clinical diagnosis of (1) myocardial infarction, (2) angina pectoris, (3) coronary heart disease that has required treatment or, if untreated, has been symptomatic or clinically significant, (4) psychosis, (5) a personality disorder manifested by overt acts, (6) epilepsy, (7) a disturbance of consciousness without satisfactory medical explanation of the cause, (8) drug dependence, (9) diabetes mellitus that requires hypoglycemic medication for control, and (10) alcoholism, unless there is established clinical evidence, satisfactory to the Federal Air Surgeon, of recovery, including sustained total abstinence from alcohol for not less than the preceding 2 years.

An airman with a history or clinical diagnosis of any of these disorders, as well as any other disqualifying medical condition may, however, be considered for certification by FAA medical personnel under the special issuance ("waiver") provisions of Section 67.19 of the Federal Aviation Regulations (FAR). This type of reconsideration often requires special medical or practical tests. The applicant may be required to submit special followup medical reports. After careful evaluation, most applicants are allowed to fly, but the operational use of the certificates may be limited. For example, an applicant who has a problem distinguishing colors may be prohibited from engaging in night flying or flight requiring color signal control. The use of limitations allows the certification of airmen who would not otherwise be certificated; at the same time, the level of risk to safety is controlled. Less than 1 percent of applicants are denied all airman privileges. New airmen receive a disproportionate share of denials. They comprise only 20 percent of all applicants, yet they receive approximately 50 percent of all denials.

In any 1 year, about 1,000 airmen will appeal their denials to the Federal Air Surgeon. Of those persons who appeal to the Federal Air Surgeon, approximately 400 will be certificated. It might be asked whether aviation safety is endangered by so few denials. Special followup medical evaluations, however, control the risk assumed.

Airmen who receive a final denial from the FAA can appeal to the National Transportation Safety Board (NTSB) for a "rules of evidence" hearing to determine if the regulations were appropriately applied. The airman may appear at the hearing on his or her own behalf or may be represented by legal counsel. The FAA is always represented by legal counsel. Testimony is presented to an Administrative Law Judge, who issues an initial decision. Either party may appeal that decision to the full Board. Legal briefs are prepared for the appeal, but no further testimony is required.

The Philosophy of Medical Certification and Standards

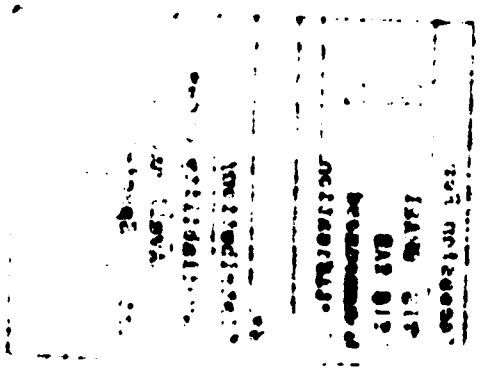
The FAA's medical certification philosophy is governed by the FAA's mission. That mission, in a nutshell, is to promote aviation while assuring safety in the air and on the ground. Clearly, that mission would not be well served if people with performance-impairing medical conditions are allowed to perform airman duties. Accordingly, FAR Part 61.53 provides:

> No person may act as pilot-in-command, or in any other capacity as a required pilot flight crewmember, while he has a known medical deficiency, or increase of a known medical deficiency, that would make him unable to meet the requirements for his current medical certificate.

What medical deficiencies are likely to cause an airman to fail to meet "the requirements for his medical certificate?" Unpredictable, sudden, or insidious incapacitation are the primary medical criteria applied by the FAA. The FAA is interested in those organ systems most likely to be associated with incapacitation--namely, the special senses, the cardiovascular system, the nervous system, and the respiratory system. Obviously, then, the FAA places special emphasis on disease or habits that affect these systems--arteriosclerotic heart disease, hypertension, diabetes, epilepsy, mental disorders, and indiscriminate use of drugs and alcohol. Medication can affect these systems too, by producing incapacitating side effects. The FAA's aim is to correlate pathology and its treatment with performance. By performance, the FAA means not only motor skills, but judgment as well.

In deciding whether to issue a certificate under the special issuance ("waiver") provisions of the regulations, the FAA must balance the needs and desires of the applicant against the risks to society. The FAA recognizes that individuals should be allowed the maximum freedom, consistent with safety in air commerce, in deciding the extent to which their exercise of airman privileges should be limited by their personal health.

On the other hand, safety in air commerce demands that an individual with a potentially incapacitating medical condition not be allowed to operate aircraft under circumstances in which there would be a significant risk of injury to other persons in the air or on the ground, or of substantial damage to the property of others. The commercial or airline transport pilot, in virtually every circumstance, has the life or property of another individual in his or her care. For this reason, if there is a significant risk that such a pilot may experience an incapacitating medical event, he or she should not be permitted to perform airman duties. When transportation by an air carrier is involved, the Federal Aviation Act requires the Administrator, on whose behalf the Federal Air Surgeon acts, "to consider the duty resting upon air carriers to perform their services with the highest possible degree of safety in the public interest."



Limitations of the System

With this philosophy as background, we can now examine how the FAA goes about developing and implementing safety rules, regulations, and standards.

The Federal Aviation Act directs the FAA to promote safe flight by prescribing minimum standards governing the issuance of airman certificates and the design, materials, workmanship, construction, and performance of aircraft. The Act does not define these standards; it merely authorizes the establishment of standards, which the FAA does in the FAR.

FAR Part 11 sets out the procedures the FAA must follow in making rules. These procedures assure that the public and those people subject to new or amended rules have an opportunity to be heard and, hence, participate in the rulemaking process. This is not to say that the FAA passes the responsibility for rulemaking to others or that regulations are adopted by popular vote. The final rulemaking determination still rests with those individuals who have a statutory responsibility for representing the public interest.

All rules must stand the test of review by the courts. That means they must be within the statutory power of the agency, must not infringe upon constitutional rights, must not be arbitrary or capricious, and must not abuse discretionary authority. The role of the FAA's Office of Aviation Medicine in air safety is predominately regulatory. In prescribing reasonable minimum medical standards, the Office practices regulatory medicine.

The need for standards is clear. The uncontrolled diabetic or epileptic should not be permitted to operate an aircraft. On the other hand, the general application of medical standards must be flexible. Exceptions to the rules are granted when it is clear that the risk to aviation safety is not significant. Difficult cases require individualized consideration. The only stipulation is that the final decision must be made by persons who are in the full-time practice of aviation medicine and who have the ultimate responsibility for ensuring safety.

It may seem irresponsible to some people to talk of costs in the same breath with safety. Yet in the real world such considerations must be made. People accept calculated risks as part of their general attitude toward life, because they know that absolute safety, if it could be attained, would have economically intolerable consequences. Therefore, the FAA's goal is not absolute safety; it is, rather, to maintain the highest level of safety that can be achieved with the expenditure of a reasonable amount of resources.

The earliest aeromedical standards were more rigid than today's. During World War I, many people who had been rejected by the infantry became pilots. The U.S. Army soon realized that airmen with physical defects had a much higher accident rate than airmen without defects. This realization led to the first medical standards for pilots and to the development of aviation medicine as a specialty. But with no one having prior experience in the aeromedical field, the first standards by and large were arbitrary or geared to the equipment and the type of flying--namely, goggles and open-cockpit aircraft.

At the time, goggles could not be ground to prescription, and vision had to be normal without correction. The standards were fairly rigid, and a pilot, when grounded, had no established avenues of appeal. Since the first civil standards, established in 1926 by the Department of Commerce, grew out of the military's experience, they, too, were empirical in origin; moreover, they bore the same rigid characteristics as the military standards. And they retained these characteristics for many years.

With the advent of the FAA a new philosophy toward aeromedical standards emerged. Years of accumulated experience had made it apparent that with some compensation for deficiencies--e.g., using glasses or taking special training--pilots could perform safely. Hence, certain standards were relaxed, "waivers" were issued, and an appeal system was established.

Today's standards are not highly detailed. On the other hand, during any given physical examination, there are almost no limits to historical detail or to the number of tests that might be employed. The procedures chosen will depend on the examining physician's clinical judgment. At the same time, the FAA's medical regulations must be--and are--directed toward those relatively few areas where discovery of disease or risk to safety is likely.

It goes without saying that AME's must apply the FAA's standards to documented medical evidence. But in the daily practice of medicine, practical limitations and compromises in data accumulation and interpretation lead to some professional differences of opinion. There is a fundamental difference, moreover, between the private practice of medicine, where physician-patient relationships are paramount, and the practice of regulatory medicine, where the public interest must be the foremost consideration. It is often because this fundamental difference is not appreciated by airmen or physicians that misunderstandings arise between equally dedicated and competent physicians. Basic to both types of practices is the fact that we must depend upon what the individual reveals by history and what is found on examination.

Many pilots share a basic mistrust of flight surgeons and AME's. They are required to undergo a physical examination at regular intervals and to pay for something they often do not want or think is necessary. AME's are a potential threat to their career as pilots or to the pleasure and the investment they have in flying. But the AME is also an influence on the formation or suppression of these attitudes. Knowing they exist, an AME can be more alert to the evasiveness of some applicants. A carefully documented history and examination is fundamental to the reliability of the certification system and in assuring safety. Without reliable medical information obtained from a conscientious airman by a thorough physician, the medical standards are impotent. The certification decision made must be consistent with the evidence in the written record of the individual. Unfortunately, not only are there pilots who have and conceal serious medical conditions, but there are also physicians who know and withhold the information by omission, and occasionally, by commission.

Flight instructors commonly intercede on behalf of applicants, confusing skill and knowledge with health factors. Physicians occasionally express strong opinions about the eligibility of an airman with a pathologic condition that they would normally consider outside the range of their expertise. They argue that, as examining physicians, they are in the best position to know. They criticize the FAA for making "arm-chair" decisions.

The FAA recognizes that these criticisms have some validity, but contends that there are other factors to consider:

1. Extensive medical records may be on file with the FAA that were not available to the examining physician.

2. The agency often obtains specialty reports not available to the AME.

3. The specialist in aviation medicine may know of factors that the busy practitioner may not have considered.

It is necessary, therefore, for the examining physician to keep the channels of communication open and to confer with agency personnel when appropriate. If the AME is in doubt about what to do, he or she is instructed not to issue a medical certificate.

In looking at the pitfalls and limitations of rules, it is understandable that education is preferred to regulation. The FAA has neither the inclination nor the resources to keep America's civilian pilots under constant surveillance. Much will depend upon the knowledge and honesty of the individual pilot. The pilot must be advised of the physiological consequences of illness, fatigue, drugs, and alcohol. Written FAA pilot examinations contain questions related to such knowledge and many safety meetings include lectures in aviation physiology.

There is a continuing need for AME education. Short 3-day seminars are held each year throughout the United States. Longer, more advanced seminars are held at the Civil Aeromedical Institute in Oklahoma City. AME's are also provided with further assistance through the Guide for Aviation Medical Examiners. The Guide and the seminars are designed to assist in using a set of regulations that allow latitude in interpretation.

Summary

The medical certification system has been sketched to explain the role of the AME and the processing of applications by the FAA. The overall effects of the system have been portrayed to reflect the rather liberal modes of appeal available to the airman. To better understand these effects, the philosophy of certification and standards was reviewed. While incapacitation is of primary concern to safety, promotion of aviation leads to other considerations, including individual rights, levels of concern, and differing responsibilities. In considering system limitations, the manner in which new regulations are developed, the empirical origins of the regulations, their brevity, the need for documentation, and education were touched upon.

Much has not been covered that pertains to the FAA medical certification system. Much could be said about the man-machine aspects of our total aviation system, with the present imbalance heavily weighted toward the machines. Much could also be said about the human maintenance concept as applied to civil airmen.

Of fundamental concern is that each AME strive to practice good, sound medicine consistent with the state of the art and as it relates to the special environment of flying. All persons involved in aviation medicine have responsibilities to the pilot and his or her reliability; to the air traffic controller, who at times must be the eyes and ears of the pilot; to the passengers, who want to fly in safety; and to the general public, who are concerned not only with safety, but also the noise and the pollution problems of the modern day airport.

* U.S. Government Printing Office : 1982 - 384-387/8741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