

seeking primary occupational vision care. It is the optometrist's responsibility to educate industry and safety personnel and bring to their attention the availability of Occupational Vision Care and Eye Protection Programs.

Industry attitudes, government legislation and appropriate clinical research has not progressed suffi-

ciently to fully demonstrate the need for effective and comprehensive optometric services. This realization will come. Optometry in Canada will most certainly benefit from responding to this very important and essential public service.

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## A Call for a more Formal and Coherent Structure for Evaluating the Vision of Pilots

### An Opinion:

**I**t is distressing to note that even though vision plays a most important role in the safe operation of an aircraft, very few pilots are seen by qualified eye care practitioners. The pilot can choose whomever he or she wants.

Commercial pilots are subjected to intensive physical examinations every six months. Private pilots must be examined yearly. These medical check-ups are usually conducted by physicians who are designated by the Ministry of Transport as Aviation Medical Examiners (AME). As a rule, commercial pilots are seen by physicians who have specialized in aviation medicine. Unfortunately, many of the physicians who are allowed to examine the private pilot have no such particular expertise.

In the early days of aviation, the pilot had to possess perfect distant vision. There wasn't much cockpit instrumentation so the more farsighted he or she was, the better. With the advent of more sophisticated aircraft, the information about the workings of various parts of the aircraft had to be incorporated into a bewildering array of dials, all at varying distances from one's eyes. This produced some visual discomfort for many people and, indeed, many of the pilots in their late forties and fifties could not easily read the

dials. The visual demands on the pilot have changed through the years, but the visual requirements for potential pilots, as set out by the authorities, have remained the same. The time has come for optometrists to take a new look at the whole question of vision as it concerns the pilot.

A tradition in visual testing is rating the patient's vision as related to a designated normal at a particular distance. Movement, lighting, letter quality and a person's position are all rigidly controlled in the examination room. It is practically impossible to relate this result with what the pilot will see when travelling at 485 km/h at night, in fog, with intense aircraft vibration.

Night myopia and space myopia are conditions that occur in flight. People will react differently with varying degrees of disability. At present, there is no routine testing of this phenomenon by the eye doctor to determine how, or if, this will change with age, and how dark adaptation may be affected.

Reaction time is almost never tested. A person's speed of reaction is affected by age and related conditions. For example, in the Cat II landing (see note end of text), the 52-year old pilot will react much more slowly, both physically and visually,

than his 35-year old first officer. There are no standards to define what constitutes a dangerously slow reaction. Shouldn't this be tested periodically as the pilot ages?

The power of the lenses prescribed for presbyopia is usually designed to give a focal distance of approximately 16 inches. The depth of field can range from 14 inches to 20 inches or less. A chart clipped on to the steering yoke is usually 13 inches away while some dials can be over 30 inches away. There is no one correction which will incorporate all of these distances. Therefore, multi-prescriptions are quite common. Imagine the chaos that would occur if a pilot's first pair of reading glasses are prescribed by a practitioner unfamiliar with the cockpit environment.

The International Civil Aviation Organization (I.C.A.O.) has designated the maximum power distance between the eyes that is acceptable for a commercial licence (+ or - 3 diopters). Young people, in many cases, can easily overcome this designated amount and register 6/6 with the poorer eye. But the breakdown can, and does, occur under stress conditions or when the pilot is fatigued.

I have personally examined three first officers this past year who fell into this category. Either they never had to undergo a professional eye examination, or it was simply missed. They continued to register perfect Snellen acuity with each eye at each medical check up. I was consulted because they started to complain of slightly blurry vision after extended periods of flight. Should these individuals be grounded? Should they be corrected with glasses or contact lenses immediately, or should we wait until acuity drops below 6/6? How will their depth perception be affected if corrected at this point? In order to make the proper decision, the eye specialist must have a combined expertise in both eye care and aviation.

One of aviation's most pressing problems is whether or not contact lenses should be used by flight



personnel. I had occasion recently to read a document written by a pilot who was either given the task of looking into the field of contact lenses or who took it upon himself to do so. (The article didn't make this clear). He recommends that the pilot interested in contact lenses be fitted by an ophthalmologist, not an optometrist, completely ignoring the fact that over 90% of the lenses fitted today were designed and perfected by optometrists. What kind of validity will his "findings" have?

This brief paper outlines only some of the reasons why a more logical policy must be formulated when it comes to the question of a pilot's eyesight.

1. Every pilot, whether commercial or private, should have his or her eyes examined yearly.
2. There should be specific, specialized testing procedures for flight

personnel. These procedures do exist today and can be incorporated quite inexpensively in an optometric office.

3. Pilots' visual examinations, whether performed by an ophthalmologist or an optometrist, should only be done by practitioners familiar with the flight environment.
4. A multidisciplinary group should be set up by the M.O.T. to periodically review: —
  - a) visual standards of flight personnel.
  - b) advances in the vision and eye care field relevant to the aviator.
  - c) a list of practitioners able to properly examine the pilot, according to pre-defined standards.

*Note:* Category II Landing (Cat II) Procedure.

General rules for a Category II landing come into effect when visibility is reduced to 100 ft. above the runway.

The first officer watches the instrument panel and calls out appropriate readings e.g. height, speed etc.

The Captain at all times looks out and watches for the runway.

At 100 ft. above the runway the first officer calls out "100 feet" and "decision". The Captain makes the decision whether to land if he sees the runway or to go around.

The Captain has approximately 3 seconds to make that decision. Obviously excellent vision and reflexes are essential.

A Category III landing is designated when 50 ft. visibility is present.

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