



DEPARTMENT OF THE NAVY
BUREAU OF MEDICINE AND SURGERY
WASHINGTON 25, D. C.

IN REPLY REFER TO


BUMED-1
25 June 1959

MEMORANDUM FOR THE ADMINISTRATOR, FEDERAL AVIATION AGENCY

Subj: Briefing at the 3 June 1959 Conference at the Federal Aviation Agency

Encl: (1) Memorandum for the Federal Aviation Agency (Civil Air Surgeon) of 24 June 1959

1. Enclosure (1) is forwarded herewith for information and retention by Doctor Smith, embodying the thoughts of the Bureau of Medicine and Surgery.
2. After consultation with the Aviation Medicine Section of this Bureau, conversation with responsible senior flying officers in the Navy, and the Navy's experience over a number of years, I would highly recommend that the cut-off age for transitional training be limited to age 50 and below.


E. W. HOGAN
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Surgeon General

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24 June 1959

MEMORANDUM FOR THE FEDERAL AVIATION AGENCY (CIVIL AIR SURGEON)

Subj: Briefing at the 3 June 1959 Conference at the Federal Aviation Agency

1. Background Information. This problem of the aging pilot is a many-headed monster. The senior airline pilots are usually over 50 years of age. In view of their seniority they can "bid in" or insist on having the elite hops, even to the point of "bumping" other pilots. Likewise, at present, they can insist that they be given Jet transition training and thus take over the most elite routes. This means an increase in pay of approximately \$4,000-\$5,000 (\$27,000 for best Props to \$33,000 for Jet trans-ocean hops). The companies have, however, found that it takes the older pilot longer, thus costing more money, to transition to Jet aircraft. Doctor Smith will present charts to support this. Also, after a pilot has reached a desirable age to retire from active flying, there are few opportunities for him in the administrative section of the airlines. (We are faced with this same problem in the Navy when our 1300 officers are placed in an 1100 category because of having been placed in a Service Group inappropriate to their age, and thus grounded by BUPERS.)

2. Support Data that a problem does exist in the Aging Pilot area.

I. As early as 1943 the aging pilot problem was faced by Pan American Airways System. They had a study conducted by McFarland of Harvard.¹ He discussed the physiologic aging of all men past 45 to 50 years. His report states that it is the accumulation of many minor unfavorable factors that result in this physiological aging, which begins to impair the performance of airmen over the age of 50. He further states that some pilots may be able to fly until they reach 50 to 55 years of age.

II. USAF, SAM, Randolph Field Report "Age and Behavior--A Study of the Effects of Aging on Aircrew Performance" (Feb. 1953).

"The Critical Incident Technique was used to collect reports by aircrewmembers on the effects of aging which they had observed in their own performance and in the performance of other active flying personnel.

¹"Keeping Fit for Flying", Chap. 10, PAA Report of 1943--by A.A. Priester, Vice President and Chief Engineer, PAA.

The data, when analyzed and classified, indicate that impairment due to age occurs in the following five major areas. (1) Physical abilities necessary for effective performance are affected, in particular the ability to resist fatigue and excessive demands upon the organism. (2) Ability and motivation to improve in skill and technique tend to decline with age. (3) Actual job performance deteriorates particularly with respect to speed and accuracy of work and corrective action, retention of control in emergency situations, and retention of a proportionate degree of caution. (4) There is some indication that relationships with co-workers tend to become poorer. (5) Finally, motivation and adjustment with respect to the job are in general negatively affected by age."

III. "MOTOR RESPONSE--Men of 50 years were, on the average, significantly inferior in output to those of 30 years; the 20-year and 40-year age groups were also somewhat inferior to the 30-year group." (Smith, K.R. "Age and Performance of a Repetitive Manual Task." J. Appl. Psychol., 1938, 22, 295-306.)

IV. "LEARNING--As a person gets older, his learning performance decreases. Older age group shows significant deficit when compared with the other age groups on both direct vision and mirror vision learning tasks. Greater deficit appears on the mirror vision task, due perhaps to conflict with firmly established habits." (Ruch, F.L. "The Differentiative Effects of Age Upon Human Learning." J. Gen. Psychol., 1934, 11, 261-286.)

V. "MEMORY--A completely reliable difference is shown between memory scores for young and old groups, giving evidence of an actual decrease in the functioning of memory process with age. There is unevenness of decline with least loss on materials where meaning is not involved and severe loss beyond simple memory span. Greatest loss occurs in formation and recall of new associations, particularly if interference between previously formed associations and the new ones is present." (Gilbert, J.G. "Memory Loss in Senescence." J. Abnorm. Soc. Psychol., 1941, 36, 73-86.)

VI. Further support of a physiological age for actual control of aircraft is found in Chapter 8 of "Human Factors in Air Transportation" by McFarland (1953). His conclusion in general is that 50 years \pm 5 years seems a reasonable age range for retirement for pilots.

VII. In 1955, Doctor H. K. Edwards, Medical Director of Eastern Airlines, published an article in the Journal of Aviation Medicine, Vol. 26, on "The Aged and Retiring Pilot". This study covered a survey of their pilots from 1942 to 1954. This airline feels that, as a result of this study, their retirement plan allowing pilots to voluntarily retire at age 55 and forced retirement at age 60 is most realistic.

VIII. Mr. Simpson, Actuary of Acacia Mutual Life, gave me the following figures on the disablement per 1000 of the general public (1958 figures).

Age 40 - 1.64/1000
Age 45 - 2.21/1000
Age 50 - 3.47/1000
Age 55 - 7.12/1000 (2 times that of 50 years)
Age 59 - 11.44/1000 (3 times that of 50 years)

IX. Captain Glenn Williams (SUPERS Aviation Policy) furnished the following data to us concerning forced retirement (other than for medical reasons) at age 62 for naval officers:

- a. "This age (62-64) has been used by the Navy as far back as the Civil War".
- b. "The vast majority of officers retire by age 55 to 56."
- c. "The Army uses age 60."
- d. "The 1958 FY figures for forced retirements (other than physical) because of inability of pilots to successfully carry out their duties were:

Age 40-44 - 1 officer
Age 45-49 - 24 officers
Age 50-54 - 60 officers
Age 55-60 - 13 officers
Age 61-62 - 16 officers
Total 114 officers"

X. The Naval Air Arm with approximately 50 years' experience has used the following Service Groups with great success. These Service Groups were primarily based on age at first, but our experience medically has proved that they are basically correct. In other words, when a pilot reached age 40 to 50 he had sufficient physical disability (visual acuity of less than 20/30--defective hearing, defective accommodation, etc.) present to preclude his assignment to unlimited flight duties. Service Groupings are as follows:

- Service Group I: Age 20-50 - Unlimited flying .
- 20/30 Vision (minimum)
 - 15/15 Hearing
 - Normal Depth Perception.
 - Normal Accommodation.
 - No cardio-respiratory defects.
 - No musculo-skeletal defects.
 - Aeronautical adaptability.

- Service Group II: Limited to non-carrier aviation duty.
Age 35-50 (at least 10 years' aviation experience).
- Vision 20/50 correctable to 20/20) Glasses worn
 - Accommodation correctable) while flying
 - 7/15 Hearing
 - Depth perception correctable to 16/16.
 - No cardio-respiratory defects.
 - No musculo-skeletal defects.
 - Aeronautical adaptability.

- Service Group III: Limited to Co-Pilot Only.
Age 50 and above.
- Vision 20/60 - 20/100 correctable to 20/20 and lenses worn.
 - Hearing - functional test for tower communications
 - Accommodation correctable to 2.5 diopters.
 - Depth perception correctable to 8/8.
 - Minor cardio-respiratory defects.
 - Minor musculo-skeletal defects.
 - Aeronautical adaptability.

Any pilot who is not able to pass a flight physical examination commensurate with his Service Group age is immediately reclassified by DUPERS on BUMED's recommendation to a non-pilot billet. In the case of Reserve officers, if found not physically qualified for flying duty appropriate with their age, they are released to inactive duty. If under 35 years of age a pilot develops a permanent defect, he is taken out of aviation and placed in another occupation. If over 35 years of age a pilot develops a permanent defect, he is transferred to a non-pilot aviation billet such as aerologist, aviation maintenance officer, aviation ordnance officer, etc. He loses flight pay but may qualify for observers pay.

The above classification--actually by age--proves to be realistic from the following FY 1959 figures of the Navy Pilot Population of approximately 23,000 officers. In other words, these pilots in the given ages were considered physically qualified in the several Service Groups.

	Service Group I	Service Group II	Service Group III
Under age 30	8,719	21*	15*
Age 30 - 34	3,685	30*	11*
Age 35 - 39	6,451	107	26*
Age 40 - 44	2,595	164	17*
Age 45 - 49	369	247	24*
Age 50 - 54	28	91	120
Age 55 - 59	3** 6***	5	25
Age 60 and over	0	1	9
TOTAL	21,865	666	247

GRAND TOTAL: 22,782 officers in Flying Status

- * Temporary due to illness or accident
- ** Marine officers qualified to solo
- *** Navy officers qualified to solo

It seems important from the above to note that in an aviation population of over 22,000, only 298 pilots are still in a flying status above age 50. Also only 10 pilots in our total aviation population are in flight status in the age group of 60 to 62.

Secondly it is of interest to note that of our flying population over 50 years of age numbering 289, only 9 (6 Navy and 3 Marine) officers were found physically fit for unrestricted flying, except for Carrier landings.

3. In summary, the Navy's ground rules for aviation are much the same as the proposal of the Federal Aviation Agency for airline pilots, but our experience is that age 50 should be the cut-off age for transitional training.

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24 June 1959

NAVY	PROPOSED FAA RULES
Retirement - Age 62	Retirement - Age 60
Service Group III (Age 50) Co-Pilot Only	Age 55 Not to transition any pilots to Jets.

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