1. The evidence of FAA's 43-plus years of deception and misinformation regarding the age 60 rule is irrefutable:
a). The historical record clearly indicates that this inappropriate regulation was prompted NOT by safety concerns but rather by one airline's desire to replace older pilots with younger ones, a desire to which the FAA acquiesced without holding public hearings. There was not one shred of evidence brought forth at any time showing that pilots aged 60 and older represented any safety risk whatsoever. When the FAA was challenged to identify the source material used in its decision to enact the rule, the Administrator revealed a list of 41 publications which constituted a reference source in the study and preparation of the rule. Examination of those references still available reveals them to constitute a highly questionable body of literature. In addtion to the very general, non-aviation, and non-pilot focus of the vast majority of these studies, NONE had been conducted specifically to compare the fitness or capability of pilots over age 60 to pilots in younger age groups.
b). The Age 60 Rule is codified in the FAA's regulations as 14 CFR 121.383(c). The "121" identifies it as residing in Part 121 of these regulations where certification criteria and operating rules for major air carriers are set forth. This authority derives from Section 601 of the Federal Aviation Act of 1958 (FAAct), the Agency's "enabling legislation" (24). Section 601 empowers the Administrator to set minimum standards and establish operating rules and regulations to promote the safety of flight in air commerce. By contrast, regulations governing pilot certification appear within 14 CFR 61 ("Part 61") and medical certification within 14 CFR 67 ("Part 67"), both of which are enacted under Section 602 of the FAAct. Section 602 empowers the Administrator to issue airman certificates (both pilot licenses and medical certificates) specifying the capacity in which holders thereof are authorized to serve. This difference - enactment under Section 601 versus Section 602 - is significant and deserves further emphasis in terms of the legal implications of operational versus medical or certification regulations. Any rule or order of the Administrator, except those enacted pursuant to Section 602, is reviewable only in the United States Courts of Appeal. In these appeals (including those enacted under Section 601, as is the Age 60 Rule) the burden of proof rests with the petitioner/appellant. Moreover, under Section 1006(a) of the FAAct, "findings of fact by the Administrator, if supported by substantial evidence, shall be conclusive." Under these deferential standards the courts will reverse an agency determination only upon showing that the agency's action was arbitrary, capricious, an abuse of discretion, or otherwise in violation of law. In contrast, petitioners challenging orders, rules, or regulations under Section 602 of the FAAct (dealing with issuance or renewal of airman certificates, where medical opinions of pilot health and fitness are pertinent) appeal not to the courts but rather to the National Transportation Safety Board (NTSB). In these appeals, unlike those in the courts, the burden of proof rests with the FAA rather than with the petitioner/appellant, and none of the FAA's prior rulings and/or findings are binding on the Board.In proposing, enacting, and later defending the Age 60 Rule, the FAA cited its authority under Section 601 to set "reasonable rules and regulations governing, in the interest of safety, the maximum hours or periods of service of airmen…of air carriers" and "such reasonable rules and regulations or minimum standards… necessary to provide adequately for…safety in air commerce." By justifying the Age 60 Rule using Section 601, rather than Section 602 where medical considerations bearing on the capacity of pilots to serve would logically belong, Administrator Quesada made certain that the Rule would be forever subject to deferential review in the circuit courts whose judgments would favor the previous "findings of fact" of the FAA, rather than subject only to NTSB evaluation where medical waivers and exemptions are frequently granted. By this mechanism alone, and affirmed by 40 years of struggle, Elwood Quesada and the FAA rendered the Age 60 Rule virtually

unassailable by the thousands of airline pilots who have since sought to maintain gainful employment upon reaching their 60th birthday.

c). Since 1960 the Age 60 Rule has been the subject of many medical studies. Among the major efforts to examine the question was the landmark 1981 Report of the National Institute of Aging Panel on the Experienced Pilot Study (48). After conducting an extensive review of the existing literature as well as reviewing public comments, the Panel stated that "the Age 60 Rule appears indefensible on medical grounds" and noted that "age 60 represents no medical 'breakpoint' in the progressive deterioration that comes with age." In addition, the Panel concluded that "there is no convincing medical evidence to support age 60, or any other specific age, for mandatory pilot retirement." However the Panel recommended that the Age 60 Rule be retained for pilots-in-command and for first officers in both Part 121 and Part 135 operations. These recommendations were based on 1976 morbidity and mortality data from the general white male population of the United States showing an increase in cardiovascular disease and mortality after the sixth decade, on studies indicating increasing risk of adverse health outcomes as with age, and on data from one study suggesting an increase in general aviation accidents among pilots after age 60 (17). However, this last study erroneously calculated age-based accident rates by including large numbers of extremely safe commercial air carrier flight hours in the denominator of the rate calculation. Due to the Age 60 Rule (the forced retirement of air carrier pilots at age 60), the effect of this simple data error severely depressed the apparent risk for all pilots under age 60, leaving those for ages 60 and above unaffected. This error thus resulted in the misleading appearance of an immediate and dramatic increase in accidents exactly at age 60. Noting a significant shortfall in data directly relevant to the Age 60 Rule, the Panel strongly recommended that "the FAA engage in a systematic program to collect the medical and performance data necessary to consider relaxation of the current age 60 rule." To that end, the Panel set forth a proposed "rational program for ongoing surveillance of older pilots while always keeping in mind the need to insure the highest level of safety…[providing] data that could serve as the basis for a decision on modification of the age 60 rule." The FAA tentatively proposed a program as recommended (5), but withdrew it less than two years later declaring that such a program would compromise safety (6), though no unsafe conditions were ever documented.

d). For the past 40 years, the FAA has maintained that the potential for the older pilot to experience the cognitive decline "known" to accompany old age could predispose to potentially dangerous errors in judgment, and that cognitive decrements cannot be reliably predicted. Indeed, research on aging has shown that the normal, healthy, successful aging process is accompanied by decreases in cognitive function over time in all population groups, though pilots consistently demonstrate superior task performance across all age groups when compared to age-matched non-pilots (55). Two important concepts, however, invalidate the government's concern regarding the potential for and recognition of mental debility of the over-60 pilot. First, research has documented that, even in non-pilot populations, decreased mental acuity is rarely manifest prior to the age of 70, and it is well established that high levels of education and training, and sustained good health - characteristics of the commercial airline pilot population - significantly enhance the retention of mental abilities (53, 54). Moreover, much of any cognitive decline noted in the middle years of life and formerly thought to be intrinsic to aging has been shown, rather, to be due to factors such as diabetes, cardiovascular disease, medication use, and other acute and chronic health problems (49). Airline pilots, selected for good health at the start of their careers and subjected to comprehensive medical examinations every six months thereafter, are among the most monitored and health-conscious of all employed individuals. Medical conditions that might lead to cognitive decline are subject to early detection and correction, or the

pilot is removed from the work force (22). Second, every airline pilot undergoes mandatory simulator testing at least on an annual basis. Consisting of one or more days of intense exposure to every programmable aviation scenario, simulator testing provides the ideal opportunity for exacting evaluation of the cognitive performance abilities of the pilot-in-command. The FAA considers its advanced simulators to be so complete and realistic that when an air carrier pilot transitions into a new aircraft (one in which he or she has never flown before) every aspect of the training flights can conducted in the simulator, with the pilot's actual first flight in that aircraft being in actual commercial operations with passengers on board (4). Further, in routine, day-to-day flight operations the behavior and capabilities of the pilot-in-command are under constant scrutiny by other flight officers, flight attendants, dispatchers, loadmasters, mechanics, and air traffic controllers, making it quite unlikely that cognitive impairment would go unnoticed. In addition, all pilots are subject to unannounced flight checks conducted by both FAA certified company check pilots and/or an FAA examiner. All of these examinations test and certify the ability of the commercial air carrier pilot to perform those tasks essential for piloting at the levels of competence and safety demanded by the FAA's own regulations, and all are denied to pilots aged 60 and older based on age alone.

e). The FAA has determined that there are conditions under which it is essential to go beyond its normal testing of piloting skills and evaluate an airline pilot's mental "reserve capacity" - the ability to handle unfamiliar situations where novel types of complex data must be processed rapidly. These conditions include such conditions as head injury, alcoholism, and infection with human immunodeficiency virus (HIV) (8, 39). When a pilot with one of these conditions is tested using a laboratory-based cognitive screening instrument, it is not known prospectively by the examiner whether any actual loss of mental functioning has occurred. Documentation of the level of cognitive ability (rather than diagnosis of specific disease) is the purpose of the test. The testing regimen examines whether the pilot's present level of mental functioning is sufficient, within the FAA's regulatory standards, to allow a return to flying status. Pilots under age 60 who have the possibility of brain injury secondary to trauma, alcohol abuse, or HIV infection are permitted not only to prove their ability through simulator and actual flight testing but also by valid and reliable laboratory-based cognitive screening tests. Healthy pilots age 60 are not permitted either option, simply because they are 60. Research has shown that decrements in performance measures presented by older test subjects are revealed in the same manner as decrements resulting from trauma or disease in younger subjects (56). There is no theoretical difference between testing a pilot who is 60 years of age or older and testing a pilot who has sustained possible cognitive impairment from head injury, is alcoholic, or has HIV infection. The FAA thus discriminates against otherwise healthy over-60 pilots by denying them access to performance and cognitive testing, simply because they are 60, while allowing the routine testing, and return to flying status, of potentially brain-injured or brain-diseased pilots under age 60.

f). The FAA also discriminates against over-60 pilots in terms of medical testing, as opposed to performance or cognitive testing, procedures. The 1981 NIH/NIA study asserting that no special medical significance could be attached to age 60 as a mandatory retirement age for airline pilots concluded also that no adequate appraisal system existed that would differentiate safe from unsafe pilots. In the twenty years since this study, however, significant advances in diagnostic technology have rendered the panel's concerns moot. Sophisticated yet commonly available diagnostic tests can, along with regularly scheduled aviation medical evaluations, adequately identify airmen either at risk for catastrophic events (16) or who have subtle decrements in cognitive performance (54). In fact, since the early 1980's, medical tests have been used routinely to justify the return to flying of thousands of pilots under age 60 who have

coronary artery disease, valvular heart disease, hypertension, alcoholism, psychological and neurological impairments, sensory perception deficits, and other conditions (23, 46, 57). Despite the common use of these diagnostic measures on behalf of arguably unhealthy younger pilots these same procedures are denied to healthy 60 year olds.

g). The FAA's discrimination against over-60 pilots is remarkable when juxtaposed against its mission as guardian of aviation safety. Actual flight performance data, the measure of greatest significance to public safety, demonstrate the highly satisfactory safety record of older pilots. The FAA's own 1993 Hilton Study (32) concluded that there was "no support for the hypothesis that the pilots of scheduled air carriers had increased accident rates as they neared the [mandatory retirement age] of 60." In addition, the Hilton study's analysis of pilots with Class II medical certificates showed that the accident rate for pilots aged 60-64 did not differ significantly from pilots aged 55-59. These findings were echoed in their similar analysis of pilots holding Class III medical certificates. In a further arm of that study, accident rates were examined year-by-year, rather than in five-year groups, for pilots age 50-69. An apparent linear trend between the ages of 63 and 69 (not significant in the post-hoc analysis) gave "a hint, and a hint only, of an increase in accident rate for Class III pilots older than 63 years of age." Rebok et. al. demonstrated that in general aviation crashes involving pilots aged 40-63, the percentage of accidents caused by pilot error was smallest in the age group 56-63 (47).

FAA data appearing in the Chicago Tribune in 1999 (52) indicated that pilot age was not a significant factor in airline incidents. Airline pilots in the 60 and older group had the lowest incident rate of any age group except for those pilots 20-24. Of note, this particular analysis included only air transport pilots, and included an important subset - commuter pilots aged 60 and over - some in their early 70's - who were granted exemption from the Age 60 Rule and who were permitted to fly beyond age 60 until December 1999. As Report Two of a four-part study released in 2000, the FAA reanalyzed the data presented in the Chicago Tribune (13), however they specifically excluded those pilots aged 60 and older from their analysis and focused only on pilots aged 20-59, aggregated by 10-year age groups. They found that there were no statistically significant differences in the accident/incident rates by age group. In addition, the proportion of 50-59 year old air transport pilots involved in accidents or incidents was significantly lower than the proportion for the 40-49 year old age group. As did the Hilton Study years before, this study affirmed that there was no increase in accident rates as pilots reached the mandatory retirement age of 60, and is consistent with McFadden's regression analysis model indicating that airline pilots are less likely to have pilot-error incidents as their experience and age increase (41). Report Three of the 2000 FAA study evaluated pilots aged 23-63 with an Air Transport rating and a Class I medical certificate who flew in Part 121 or Part 135 operations between the years 1988 and 1997. Specifically directed by the United States Senate to study pilots aged 60-63 and compare their accident rates with the accident rates of younger pilot groups, the investigators found no statistically significant difference in mean accident rates between any age group (14). This finding is all the more remarkable because the age 60-63 pilot cohort, not eligible for safe Part 121 operations because of the Age 60 Rule, flew in relatively less-safe Part 135 (commuter) operations during this time.

h). The literature is not without studies purporting to show an increase in accident rate among pilots aged 60 and over. These studies, however, are uniformly flawed by the lack of availability of appropriate data. The same error in accident rate calculation that invalidates the conclusion of the 1977 Booze study (17) also nullifies the 1983 FAA Flight-Time Study by Golaszewski (25), wherein the author not only used different numerators and denominators for

pilots under and over age 60 (thus comparing two entirely different pilot populations), but also failed to subject his data to standard statistical analysis. Though the FAA later acknowledged the "major data deficiencies" of the study (letter from Mr. Kenneth Chin, Executive Officer, Office of Aviation Safety, FAA to Mr. Samuel Woolsey, February 4, 1991), the data and the spurious conclusions - without any correction or further analysis - were given wide distribution by the FAA, being cited to the 7th Circuit Court of Appeals in defense of its rejection of petitions for exemption from the Rule, where it's conclusions were found to be "not credible" (9), and appearing as the foundation of the 1990 Office of Technology Assessment report (42). Report Four of the FAA's 2000 analysis expanded the study population to include pilots with a Commercial rating and a Class II medical certificate in addition to pilots with an ATP rating and a Class I medical certificate. The investigators found that a statistically significant increase in the accident rate existed for pilots in the 60-63 year old group (15). However, as in the 1983 FAA Flight-Time Study, these analyses are flawed because appropriate denominator data for calculating rates are not available. Pilots do not report their flight time separately for airline, commuter, and general aviation. Commercial crash rates, therefore, combine Part 121 and Part 135 crashes in the numerator and combine all categories of flight time in the denominator. Prior to age 60, Part 121 flight time dominates the denominator. After age 60, commercial crashes for the time period studied are limited to Part 135 operations. The much safer Part 121 flight hours are absent from the denominator, leading to artificially higher crash rates. Only for general aviation pilots can crash rates be calculated with flight time denominators that match the numerators, and general aviation crash rates do not increase at age 60 (32). In addition, as the examination requirements for the issuance of a Class I or Class II medical certificate differ, the pilots in these populations may not be comparable in terms of health and fitness, and it is not be appropriate to merge them into a single study group.

2. All false, misleading, and scientifically unsound material - including all recent and remote incorrect statistical information garnered from any FAA-related source - must be removed immediately from the FAA's archives as the minimum acceptable action if the FAA is to retain any credibility in any regulatory debate.

3. The FAA's 43-year record of deception and misinformation with regard to the age 60 rule make it imperative that the oversight of all FAA age-related statistical endeavors be given to another and more credible regulatory body. Having the FAA monitor its own age 60 rule research is indeed the fox guarding the henhouse, a classic example of conflict of interest, which in the case of the age 60 rule exerts a negative impact on public safety.

4. The FAA has, through dissemination false and misleading information to a world-wide audience, discredited the United States in the eyes of the international aviation community. The FAA should not only withdraw that information from the public arena, but should also acknowledge any and all inappropriate practices with regard to age-related aviation research.

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