

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
KANSAS CITY, MISSOURI 64106

In the matter of the petition of

AIR TRACTOR, INC.

for exemption from § 23.3(a) of Title 14
of the Code of Federal Regulations (CFR)

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Regulatory Docket No. 137CE

DENIAL OF EXEMPTION

By letters dated November 27, December 14, December 21, and December 27, 1996, and April 14, 1997, Mr. Leland Snow, Air Tractor Inc., Post Office Box 485, Olney, Texas 76374, petitioned for an exemption from compliance with § 23.3(a) of Title 14, Code of Federal Regulations (14 CFR) to permit the Air Tractor 10 (AT-10), a normal category airplane, to exceed the 12,500 pound limitation for this category of airplane.

The petitioner requires relief from the following regulations:

Section 23.3(a) requires, in part, that an airplane type certificated to the normal category will have a maximum certificated gross weight of less than 12,500 pounds.

The petitioner supports the request with the following information:

By letter dated November 27, 1996, Air Tractor Inc., announced plans to develop a line of freight-carrying airplanes. The first model proposed will be the AT-10. This model will be powered by two Pratt & Whitney PT6A-65B engines driving a single propeller by means of a Soloy-designed gearbox. Since the AT-10 will be designed as purely a freight-carrying airplane, there will not be any passenger windows or seats except

for two crew and the possibility of a jump seat for a loading supervisor. The gross weight of the airplane is envisioned to be near 22,000 pounds.

On December 14, 1996, Air Tractor Inc. amended their initial proposal by substituting the two PT6A-65B turboprop engines with a combined Soloy gearbox with a single Pratt and Whitney 100 series turboprop engine.

By letter dated December 21, 1996, Air Tractor Inc. redesigned the airplane to have a more conventional fuselage, and the single Pratt and Whitney PW123 was selected as the powerplant for the airplane.

Further design changes were noted by letter dated April 14, 1997, which included the following: a reduction in engine size from a Pratt and Whitney PW123 to a PW121, widening of the main landing gear track, enlargement of the vertical tail and a revised aileron and flap design.

The petitioner envisions the AT-10 as an airplane as easy to fly as a primary trainer, with low landing speed, good visibility from the cockpit, a wing with forgiving stall characteristics, and fixed landing gear.

The petitioner states that it would be in the public interest for the FAA to grant this exemption because it would benefit business to have low cost, next day delivery of critically needed parts or documents. Inflation drives up the cost of doing business and many companies turn to larger equipment as a means of offsetting rising costs. The AT-10 would meet this challenge by being able to carry containerized freight and by being flown by one pilot instead of the two that are currently being used in airplanes of similar service, like the Fairchild F27.

In addition, the petitioner believes that the AT-10 would feature a new fuel-efficient engine with lower maintenance and overhaul costs. A large fleet of AT-10s carrying priority freight would result in a continuation of present economical next day delivery of packages and letters for the public. Manufacturing a large number of AT-10s would create many jobs and greatly benefit small communities where the work would be carried out.

The petitioner refers to a previous exemption that was granted to certificate the Air Tractor 802 (AT-802) at a gross weight of 16,000 pounds in the normal category as an example of how the public has benefited greatly from the FAA's decision to allow a single-engine airplane to be certificated above the 12,500 pound gross weight limit.

The petitioner then states that the weight limits that were set in § 23.3 were done so as a means of measuring the complexity of a new design.

Usually, the heavier an airplane is the more complex it is and the more need there is for additional pilot training or for more pilots to operate the airplane. The AT-802 proved that size and complexity do not necessarily go together. Furthermore, Air Tractor was able to petition successfully to waive the requirement for a type rating for AT-802 pilots based on the FAA's finding that the AT-802, while large, had docile handling characteristics and was as easy to land as any of the smaller Air Tractors.

Comments on published petition summary:

A summary of this petition was published in the FEDERAL REGISTER for public comment on February 19, 1997 (62 FR 7492). Initially, the comment period was to close on March 11, 1997, but at the request of commenters it was extended to April 11, 1997. The FAA received responses from twenty different commenters. All of the commenters were in favor of the exemption.

Seven commenters described the economic benefits of operating a single-engine airplane instead of a multiengine airplane. The FAA agrees with the hypothetical argument, but a more realistic argument would be based on a comparison of operating costs with other cargo-carrying airplanes that are close to the gross weight of the AT-10. This type of data was not included in any of the comments received.

Nine commenters argued that the reliability of modern single-engine turboprop powerplants is better than that of single or multiengine piston powerplants that are currently being used in the commercial fleet. The FAA disagrees. The commercial fleet does not contain any normal category single-engine piston airplanes that have a gross weight greater than 12,500 pounds. Furthermore, the commenters have not presented any data to substantiate their claim. Based on information presented to the FAA by the petitioner, the accident rate per 100,000 hours due to power loss (Based on Commercial and Air Carrier Operations Data) is slightly lower for multiengine piston-powered airplanes than for single-engine turboprop-powered airplanes. In addition, when comparing the accident rate per 100,000 hours of a single-engine turboprop airplane to a multiengine turboprop airplane, the accident rate for a multiengine turboprop airplane per 100,000 hours is significantly less than a single-engine turboprop airplane.

Five commenters state that the 12,500 pound limit, which was set more than 30 years ago, is based on a false assumption that heavier airplanes are automatically more complex and would, therefore, require different certification rules. Airplanes have, in fact, become larger without

becoming more complex; thus, lending doubt to the criterion upon which the limit has been based in the past.

The FAA disagrees. For many years, the FAA has required an increased level of safety that is associated with two pilots and two or more engines for commercial flights carrying more than nine passengers or exceeding 12,500 pounds. The Federal Aviation Act charges the FAA with the duty of promoting safety of flight of civil aircraft and empowers the FAA to prescribe minimum standards as may be required in the interest of safety. In prescribing these standards, the FAA must make classifications of such standards as appropriate to maintain an equivalent level of safety for operations with varying levels of complexity and varying degrees of risk to the public. The nine passenger, 12,500 pound gross weight limit was established by the FAA for normal category airplanes. At the time that the 12,500 pounds weight limitation on small airplanes was established in 1953, civil airplanes were well below or well above that weight. This limit was the result of a decision to provide a higher level of safety for airplanes carrying more than nine passengers or exceeding 12,500 pounds gross weight.

Six commenters cite the precedent set by the FAA in granting an exemption for the single-engine AT-802 to be certificated at 16,000 pounds gross weight as a reason to grant the petition for the AT-10. The FAA disagrees. The reasons for granting the exemption for the AT-802 are not applicable to the AT-10. The AT-802 is a restricted category, agricultural/ firefighting airplane. Unlike the AT-10, which is proposed to be a normal category airplane, the AT-802 is used only for special purpose operations over sparsely populated isolated areas.

Four commenters state that if the certification rules of 14 CFR Part 25 were used for the AT-10, the airplane would be required to have multiple engines, and the costs involved would make the price of the airplane operation and maintenance costs too prohibitive. The FAA agrees production, operation, and maintenance costs would be higher for a twin engine airplane as compared to a single-engine airplane at the same gross weight, as would the final cost to the consumer. However, a number of airplanes that are used in cargo operation, in the range of 12,500 to 60,000 pounds gross weight, have been certificated to higher levels of safety than the Part 23 normal category. If cost savings were the only criterion for the FAA to grant this exemption, it would do so. However, the FAA's highest priority is to provide for aviation safety. Certification standards for any Part 23 airplane above 12,500 pounds gross weight require multiengine designs that offer continued safe flight capability in the event of engine failure. This requirement not only gives more protection to the traveling public in the air, but also to people on the ground.

Fourteen commenters believe the benefits of the AT-10 to the American Public to be immense, by providing a larger, economical airplane that has lower operational costs and better fuel economy. The FAA agrees that the public does benefit when lower operational costs and better fuel economy costs result in lower costs to the customer. However, this type of data for the AT-10 has not been presented to the FAA, and the AT-10 needs to be compared with the fleet of airplanes it will compete against. If this statement is to be acceptable, the data needs to be normalized to show the cost involved with shipping a standard weight increment, whether it is one pound or one thousand pounds.

One commenter states that Federal Express has, likewise, demonstrated with their Caravan Fleet that the single pilot, turbine powered, single-engine airplanes can safely and efficiently move freight. The FAA agrees. The Cessna Caravan is a good example of a Part 23, normal category airplane that efficiently moves freight and transports people, and is able to do so even though its gross weight is limited to less than 12,500 pounds.

One commenter states that, from experience, it is much safer to fly a single-engine turbopropeller Air Tractor than a twin engine reciprocating airplane. Another commenter states that all turboprop Air Tractors have the same handling characteristics regardless of size and that it would be logical to expect the 22,000 pound AT-10 to have the same handling characteristics as one with a 12,500 pound gross weight. Since the AT-10 has not yet been certificated and Air Tractor has never type certificated an airplane out of the restricted category, the FAA assumes the commenters are addressing special purpose, restricted category Air Tractor airplanes and their handling characteristics. Neither of these comments are the subject of this exemption.

Two commenters state that military aviation is not encumbered by category limits based on airplane gross weight. Also, the 12,500 pound limit of Part 23 for normal category airplanes is archaic and is not in step with the strides of the equipment manufacturers and the capabilities of the airplane industry. Their solution is to establish a new category, cargo airplane, in Part 23 with a gross weight to be established in concert with industry. Until then, it is not reasonable to require a cargo-only airplane to go through the certification process of Part 25, which is written with the assumption that the airplane will be carrying people.

The FAA agrees. Military airplanes are not encumbered by category limits based on gross weight, but they are designed to different standards and, unless they are surplused and are shown to comply with § 21.27, they do not receive FAA type certificates. The FAA also agrees that the 12,500 pound limit is a well-established regulation. This limit can be considered a demarcation with a well-documented history of safety. In the interest of safety, any demarcation is independent of the state of technology, which is constantly changing, and must

exist whether the demarcation is established at 12,500 pounds or some other limit. Since the commenters do not present the FAA with any data or documented proof that a more beneficial weight limit exists, the present limit will remain. Therefore, until the FAA has sufficient reason to change the gross weight limit for normal category airplanes, or regulations are adopted for the type certification of airplanes specifically designed to carry cargo, airplanes designed with gross weights in excess of 12,500 pounds will be required to comply with the commuter category regulations of Part 23 or the transport category regulations of Part 25.

The Small Aircraft Manufacturers Association (SAMA) states that the Federal Aviation Act provides support for distinguishing between all-cargo operations and passenger-carrying operations and for encouraging all cargo operations. The Act contains a specific policy section regarding All Cargo Air Transportation Considerations that establishes the policy of encouraging and developing an expedited all-cargo air transportation system responsive to the present and future needs of shippers. The Act also defines and distinguishes between air carriers, which provide air transportation as a common carrier, and air commerce for the operation of aircraft in furthering a business.

The FAA agrees that the Federal Aviation Act makes these provisions. The Act also assigns and maintains safety as the highest priority in air commerce. Before authorizing new air transportation services, the FAA evaluates the safety implications of those services and prevents deterioration of established safety procedures. The Act recognizes the clear intent, encouragement, and dedication of Congress both to further the highest degree of safety in air transportation and air commerce and to maintain the safety vigilance that has evolved in air transportation and air commerce.

It is a longstanding requirement that airplanes in excess of 12,500 pounds must have one engine inoperative climb performance, which has been provided by multiengine installations. This requirement reduces the risk of exposure to a forced landing. A single-engine airplane that has an engine shutdown will be making a forced landing. The forced landing of an aircraft in excess of 12,500 pounds is considered very hazardous and exposes the public to a higher risk than the forced landing of a small airplane because of the increased mass, greater volume of fuel, and greater kinetic energy. The public now expects this degree of safety. In this respect, the FAA has no assurance that the AT-10 can be safely certificated at 22,000 pounds gross weight with a single-engine using the normal category certification requirements of Part 23.

SAMA further states that there is a precedent in Part 23 for a different certification treatment within Part 23 normal category for airplanes limited

to all-cargo operations only by design and use. Before Part 23, airplane airworthiness standards distinguished between cargo-only and passenger-carrying airplanes. Aeronautics Bulletin No. 7-A had different performance requirements for airplanes neither designed nor used to carry passengers. In CAR 4a, a distinction was made between air carrier and non-air carrier airplanes regarding required equipment.

The FAA agrees. Prior to recodification, a distinction was present between passenger and cargo-carrying airplanes. Upon recodification, this distinction was dropped in favor of a set of regulations that were inclusive of both designs. The normal category, thereby, inherently contains a certification treatment for airplanes designed to carry cargo, up to a limit of 12,500 pounds gross weight.

SAMA states that Part 25 is intended to provide airworthiness standards for the largest transport category airplane carrying hundreds of passengers. It contains many requirements that are not necessary for the appropriate level of safety certitude for a 22,000 pound all-cargo airplane. Compliance with these requirements would impose a substantial cost burden on the airplane yet provide no commensurate safety benefit. Compliance would, therefore, be against the Federal Aviation Act policy of encouraging and developing an expedited all-cargo air transportation system. Numerous exceptions from the requirements of Part 25 would be appropriate for the AT-10 and would be required to avoid an unnecessary burden on the airplane.

The FAA disagrees. Part 25 is intended to provide airworthiness standards for a full range of airplanes that are designed for varied commercial and private use. These standards are the same for part 25 cargo and passenger airplanes with the exception of passenger cabin safety regulations. Regulation of the operation of these airplanes is covered in other CFR subchapters, which are dependent upon the service the airplane is providing. Since recodification, all civil airplanes with gross weights above 12,500 pounds, independent of the criteria to which they were designed, were certified to a higher level of safety than that required of Part 23 normal category airplanes. The gross weight limit of 12,500 pounds, and not 22,000 pounds, was set at a time when there were very few airplanes built close to the 12,500 pound gross weight limit. The FAA did not envision certification standards for single-engine normal category airplanes with gross weights in excess of 12,500 pounds at the time the limit was set.

In 1977, the FAA/Industry Commuter Aircraft Weight Review Committee submitted a petition to amend the regulations to allow certain small airplanes to be type certificated at maximum certificated takeoff weights

greater than the 12,500 pound limitation without complying with the requirements of Part 25. Responding to the petition, the FAA initiated a three-phase program. The first phase was the issuance of revised Part 135, which aligned the rules for those operations more closely with those of Part 121.

The second phase was initiated by issuance of Notice No. 78-14, which proposed temporary rules for additional airworthiness requirements to provide for increased takeoff gross weight and passenger seating capacity of certain existing small propeller driven multiengine airplanes. The outcome of this notice was the adoption of Special Federal Aviation Regulation (SFAR) No. 41. SFAR No. 41 was designed to fill the gap between Part 23 and Part 25 certification standards until airplanes could be developed and certificated under the proposed Part 24.

The third phase was the establishment of the Light Transport Airplane Airworthiness Review, which resulted in proposed Title 14 CFR, Part 24 for multiengine airplanes with a maximum gross weight up to 35,000 pounds and a seating capacity up to 30 passengers. The Part 24 project was terminated because the economic benefits at that time for a new lightweight transport airplane airworthiness regulation could not be realized.

Regarding the comment made that the requirements of Part 25 would impose a substantial cost burden and yet provide little commensurate safety benefit, the FAA has not received any data to support this statement. The subject of this exemption is not whether numerous exceptions to the requirements of Part 25 would be appropriate and would be required to avoid an unnecessary burden on the airplane design.

SAMA comments that the proposal is consistent with policy established by the FAA's Small Airplane Compliance Program. This program identified a segment of Part 23 airplanes that could be certificated using methods of compliance that were lower cost than Part 23 generally could be interpreted to require because of the non-complex systems and non-demanding speed and altitude environment of the airplane in the program and their limitations on seats to no more than four. The same principle should apply to the AT-10.

The FAA disagrees. The applicability of the Small Airplane Compliance Program is intended for airplanes that had gross weights less than 12,500 pounds. The AT-10 has a gross weight almost twice that amount. In addition, the program's benefits were meant to apply to many manufacturers unlike this petition for exemption.

SAMA adds that the proposal is consistent with the Challenge 2000 recommendations under which the FAA would reexamine its certification system and consider both operational and airplane certification requirements when establishing the correct level of certitude for an airplane design. This level would be determined according to the hierarchy of customers based on their expectations of safety oversight by the FAA, which, in turn, is based on their degree of control of the airplane's operation. Using this approach, SAMA states that when an airplane is limited by design and use to all cargo operations, the level of regulatory oversight appropriate to the airplane is that of a Part 23 airplane not a Part 25 airplane.

The FAA disagrees. The Challenge 2000 recommendations were the result of an initiative to review and improve current processes, and to identify redundant and low-value practices as well as those safety regulatory functions that could be significantly enhanced by organizational change. Aviation safety must be held at existing or improved levels while Challenge 2000 changes are being implemented over a period of several years. The recommendations that resulted from the initiative are as follows:

1. Shift roles and responsibilities of the Office of Certification and Regulation (AVR) and industry.
2. Deploy functional resources through centers of excellence.
3. Empower rulemaking and evolve to performance based regulations.
4. Resize and restructure AVR for the new mission and operating model.

The integration of the roles of certification and operation are included in the recommendations and will have some regulatory impact in the future. However, at this point in time, the FAA does not agree that the regulations of the Part 23 normal category would be the appropriate certification basis for an airplane with a gross weight of 22,000 pounds designed for cargo operations.

One commenter states that the Air Tractor AT-10 is not more complex than a lighter single-engine airplane and is intended for freight operations. Also, the commenter believes that the reduced complexity of this single-engine airplane, when compared to similar multiengine airplanes, gives a safer, more reliable vehicle for transport of priority freight.

The FAA can only assume that the comment made is accurate. However, the issue of complexity has little bearing on continued safe flight after an engine failure for all airplanes with gross weights exceeding 12,500 pounds. This limit has provided safety not only for the traveling public but also for the public on the

ground. In addition, the complexity of an airplane is not the reason the FAA chose the existing 12,500 pound gross weight limit for normal category airplanes.

One commenter states that a single-engine airplane like the AT-10 will have a smaller impact on the environment than a multiengine airplane. The FAA agrees. If a comparison is made between two airplanes at the same gross weight, the single-engine airplane will most likely have the smaller impact on the environment. However, a more realistic approach would be to compare, on a normalized basis, the environmental impact of the AT-10 with an airplane it would replace in the existing fleet.

Two commenters use the example of the Boeing 777 compared to the Boeing 747 as one in which increased safety or greater payload does not always mean more engines. The FAA disagrees. In the example given, both the 777 and the 747 have the same level of safety. In the event of an engine failure, both airplanes are capable of continued safe flight. The FAA agrees with the second part of the statement; a greater payload does not always require more engines.

The Federal Aviation Administration's (FAA) analysis is as follows:

To obtain the exemption, the petitioner must show, as required by § 11.25(b)(5), that: (1) granting the request is in the public interest, and (2) the exemption would not adversely affect safety, or that a level of safety will be provided that is equal to that provided by the rule from which the exemption is sought.

In a review of the FAA's exemption files, a similar petition was found that closely parallels this petition. On September 19, 1979, the FAA denied a petition for exemption from Hawk Industries, Inc., Exemption No. 2822. The petitioner requested the FAA to permit the certification of its single-engine GAF-Hawk #125 airplane, which had a maximum takeoff weight of 14,500 pounds under Part 23. The petitioner supported its request with the following: the GAF-Hawk #125 will be: (1) a single engine, turboprop, all-freight airplane with a useful load of 8,000 pounds, (2) the engine used will be a very reliable one having 25,000,000 flying hours documented, (3) the wing loading, a modern camber airfoil, and full-span flaps provide excellent short field capability, (4) the airplane will be more fuel efficient than any current twin or piston-powered aircraft and (5) the current rule appears arbitrary and obsolete. The petitioner also proposed to restrict the airplane use to freight only as a compensating safety factor for the increased takeoff weight.

At the time of the denial, the FAA stated that the additional features and characteristics of the GAF Hawk #125 by themselves did not prevent the potentially catastrophic results of a forced landing. Furthermore, the

petitioner had not shown that a grant of the requested exemption would provide a level of safety equal to that provided by the rule from which the exemption was sought.

The FAA has carefully reviewed the information contained in the petitioner's request for exemption. The petitioner states that granting the petition would be in the public interest and supports the statement by providing the FAA with cost data for the operation of the AT-10 based upon single-engine or twin-engine turboprop design. The petitioner also says that the AT-10 would feature a new fuel efficient engine with lower maintenance and overhaul costs. The FAA agrees with the hypothetical analysis, but the comparison is not a realistic approach. The petitioner should have provided data to show a comparison of his design with other existing cargo-carrying twin turboprop or twin reciprocating engine airplanes operating at the same approximate gross weight of 22,000 pounds. If this approach is not possible or the data is not available, normalized cost data based on the petitioner's design should be compared to other cargo-carrying airplanes operating in commercial service.

The petitioner provides the FAA with a copy of the Robert E. Breiling Associates study "Powerplant Reliability Comparative Data" and then uses this data to show that a single-engine turboprop airplane is 1.46 times safer than a twin-engine piston-powered airplane. The FAA disagrees. The data the petitioner uses has not been normalized and is based on twin-engine piston-powered airplanes used in general aviation. The more representative data would be the data based on commercial and air carrier operations.

The petitioner refers to the previous exemption that was granted to certificate the model AT-802 at 16,000 pounds gross weight, in the normal category. The FAA disagrees. The AT-802 is certificated as a restricted category, special purpose agricultural/ firefighting airplane, which complies with § 21.25 of Part 21. All restricted category airplanes are required to meet the airworthiness requirements of an airplane category except those requirements that the Administrator finds inappropriate for the special purpose for which the airplane is to be used. In the case of the AT-802, appropriate normal category requirements of Part 23 were used for the certification basis of this airplane. However, this does not mean the AT-802 is a normal category airplane. Part 23 normal category airplanes are not restricted to areas of operation like the AT-802. The AT-802 is restricted, to be used only for its intended special purpose operation in geographic areas that are isolated or sparsely populated.

The petitioner states the weight limits set in § 23.3 were a means of measuring the complexity of new designs. Furthermore, the heavier an

airplane is the more complex it is and the more need there is for additional pilot training or for more pilots to operate the airplane. The petitioner then states that the AT-802 proved that size and complexity do not go together. Air Tractor was able to petition successfully to waive the requirement for a type rating for AT-802 pilots based on the FAA's finding that the AT-802, while large, had docile handling characteristics.

The FAA disagrees. A similar question regarding weight and complexity was raised by some of the commenters. As stated previously, the FAA established the nine passenger, 12,500 pound gross weight limit for normal category airplanes. The FAA was aware that the limit provides a higher level of safety for airplanes carrying more than nine passengers or exceeding 12,500 pounds gross weight. This decision not only provides safety to the flying public but also to those people on the ground, which becomes more important as population density increases. Since the AT-10 will operate from different sized airports and over densely populated areas, and since the AT-10 does not have the capability for continued safe flight after an engine failure, this raises a safety risk to people on the ground. Furthermore, the case that the petitioner makes regarding the superior reliability of the turboprop engine that will be used for the AT-10 becomes a moot point since there is no FAR 23 regulation that requires an overall minimum reliability level for the engine installation and secondary owners/operators of the AT-10 could replace these engines with less reliable engines. In addition, the AT-802 is not a normal category airplane, it is a restricted category airplane that is used for agricultural/ firefighting special purposes in geographical areas that are isolated or sparsely populated.

Although a great deal of information has been submitted with this petition for exemption the petitioner has not established how a level of safety would be provided equivalent to the applicable regulations from which an exemption is sought, and has failed to offer any reason why the petitioner is different from the same general class of operator who is also subject to the same regulations.

In consideration of the foregoing, and based on the analysis of the material submitted with the petition, I find that a grant of the petition for exemption would not provide an equivalent level of safety to that provided by the applicable Code of Federal Regulations and would not be in the public interest. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, as amended, delegated to me by the Administrator (14 CFR § 11.53), the petition of Air Tractor, Inc., for exemption from 14 CFR § 23.3(a) is hereby denied.

Issued in Kansas City, Missouri on December 31, 1997.


Michael J. Gallagher
Manager, Small Airplane Directorate