

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Fort Worth, Texas 76193-0100

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In matter of the petition of *

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KAMAN AEROSPACE CORPORATION *

* Regulatory Docket No. 009SW

for an exemption from § 27.1(a) *

of Title 14, Code of Federal *

Regulations *

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GRANT OF EXEMPTION

By letter dated May 17, 1995, Kaman Aerospace Corporation, P.O. Box 2, Bloomfield, Connecticut 06002, petitioned for an exemption from § 27.1(a) of Title 14, Code of Federal Regulations (14 CFR), to the extent necessary to increase the maximum gross weight of the K-1200 from 6,000 pounds to 6,500 pounds while maintaining the original normal category rotorcraft certification.

The petitioner requests relief from the following regulations:

Section 27.1(a) prescribes, in pertinent part, that the maximum weight of a normal category rotorcraft is 6,000 pounds.

The petitioner supports its request with the following information:

The petitioner states that granting the request for exemption will have no adverse effect on public safety. The applicability of 14 CFR part 27 (part 27) is for normal category rotorcraft with maximum weights of 6,000 pounds or less. This limit was established in the late 1950's. At that time normal category helicopter maximum weights were in the 2,000 to 3,000 pound weight class. Over the past 35 years, operational and design trends have developed that have challenged this limit. Beginning in the 1970's,

manufacturers began certificating rotorcraft in the 4,000 to 6,000 pound range. Meanwhile, the FAA certification regulations have evolved, gradually adding more stringent safety requirements, that ultimately caused permanent increases in empty weight. These changes have resulted in an increased level of safety in the worldwide helicopter fleet; however, many new designs, such as the K-1200, which incorporate all of these features, are limited by the 6,000-pound gross weight ceiling.

The helicopter industry and airworthiness authorities have recognized that increasing the gross weight limit of part 27 may be appropriate. To that end, the FAA, Joint Aviation Authorities (JAA), Transport Canada Aviation (TCA), and U.S. and European helicopter manufacturers are participating in rulemaking activity to revise the current limit. Progress of the Aviation Rulemaking Advisory Committee (ARAC) Working Group tasked with this activity is such that parties agree that a gross weight limit of 7,000 pounds based on the current regulatory stringency of Joint Aviation Requirements (JAR) 27 and part 27 is acceptable with no compromise in safety.

The Kaman K-1200 has been specifically designed for external load missions, such as aerial fire fighting, heli-logging agricultural applications, and various construction missions. As such, the K-1200 has incorporated many design features to enhance the safety of the aircraft while performing these missions. Kaman's design of the K-1200 recognizes the unique environment in which these helicopters operate. The design incorporates the latest requirements for occupant protection, optimizes the cockpit for reduced pilot work load, and incorporates structural features that are specifically intended to withstand the demands of the repeated high load cycling of the external load mission. These enhancements represent an increased level of safety when compared to aircraft currently engaged in external loads work. The majority of the aircraft in this field are 20 to 25 year old transport category helicopters or military surplus helicopters adapted for external load use. The increase in gross weight further adds to the safety of the aircraft by allowing additional safety equipment, which could improve the operating margins of safety of the aircraft.

Additionally, during the initial type certification of the K-1200, flight tests were conducted at a gross weight target of 6,500 pounds (without external load). In most cases, particularly those that are critical for this condition (landings, H-V envelope, autorotation entries), data for flight strain and flying qualities at gross weights in excess of 6,500 pounds were submitted to the FAA.

Engineering substantiation of flight loading conditions of aircraft gross weights of 6,850 pounds (without external load), to a limit load factor of 3.5 G's, was also submitted during type certification. Engineering substantiation of the ground loading conditions to a maximum ground loads weight of 6,500 pounds was demonstrated through airframe drop and static testing as part of the K-1200 Type Certification program.

Fatigue life substantiation for the critical components certified under part 27 utilized the data for 6,500 pounds; therefore, the lives of the components would not be affected by operation at 6,500 pounds gross weight (without external load).

The petitioner states that § 36.1(a)(4) allows helicopters exclusively designated for agricultural operations, dispensing fire fighting materials, or carrying external loads to be excluded from the requirements of part 36. The petitioner states that the K-1200 qualifies in this category; therefore, no additional noise substantiation is required for operations to 6,500 pounds gross weight.

The petitioner also states that the granting of this exemption is in the interest of the public since the K-1200 is designed specifically to operate without support of a complex infrastructure. This capability enhances the ability to utilize natural resources, through heli-logging, and protect persons and property through aerial fire fighting all while minimizing the impact on the environment. The additional gross weight capability will enhance the operational capability to further promote these benefits.

A summary of this petition was published in the Federal Register (60 FR 54757) on October 25, 1995, and no comments were received.

The FAA's analysis/summary is as follows:

The FAA has reviewed the facts and data presented by Kaman Aerospace Corporation in support of this petition and has determined that a grant of the requested exemption is appropriate and justified.

Since 1956, as accurately described by the petitioner, the FAA has based the distinction between normal and transport category rotorcraft certification requirements on the maximum certified gross weight of the aircraft. At the time of rulemaking, there were two major weight groupings of civil helicopters: one group was in the 2,000 to 3,000 pound range; the other group was in the 7,000 to 8,000 pound range. The upper weight limit for normal category rotorcraft was set at 6,000 pounds based on the spectrum of existing and anticipated designs. Since safety-based design requirements and associated certification costs are dramatically higher for a transport category helicopter, the regulatory intent in 1956 was to establish a reasonable gross weight limit for normal category, which would permit growth of existing models while providing a stable set of weight-based design criteria for new models. The 6,000-pound weight threshold (and associated safety-based design standards) has served the industry well for over 35 years. However, several operational and design trends have developed over time that have prompted a reevaluation in the current 6,000-pound weight limit.

Meanwhile, the FAA certification regulations have evolved, gradually adding more stringent safety requirements that ultimately caused permanent increases in empty weight. However, in spite of the long standing 6,000-pound normal category regulatory weight limit, the high cost of certification in transport category and the trend toward modification of existing models have resulted in several normal category helicopters nearing the current 6,000-pound gross weight ceiling.

Until 1991, increasing the 6,000-pound weight limit for normal category had never been formally discussed with the FAA. However, in November 1991, a manufacturer petitioned for a regulatory exemption to allow a helicopter to exceed the 6,000-pound maximum weight limit specified for normal category rotorcraft. A summary of the petition was

subsequently published in the Federal Register (57 FR 4508) on February 5, 1992, for public comment. Formal responses from the industry were few and divided. While some respondents were in favor of the petition, others expressed the view that a weight change should not be permitted without considering increased regulatory stringency or a limit on the number of passengers.

While the FAA denied this petition for a variety of technical reasons, the FAA's Rotorcraft Directorate decided to investigate the general issue of a future rule change in more detail by asking interested parties to comment on the advisability of increasing the current 6,000-pound maximum weight limit. They were also asked to comment on safety-based design criteria that should be associated with such a change. Approximately 30 letters were received in response to the request. Although there were no specific objections to a future regulatory increase in the maximum allowable weight, the industry and other aviation authorities articulated a wide range of views regarding the scope of such a revision.

The FAA held a public meeting in February 1994 to determine a course of action that was in the best interest of the public and the aviation community. As stated by the petitioner, an ARAC Working Group was established with representatives from the FAA, JAA and TCA, as well as U.S. and European helicopter manufacturers. The Rotorcraft Gross Weight and Passenger Issues Working Group (GWWG) was established in February 1995 and tasked to recommend new or revised requirements for increasing the gross weight and passenger limitations for normal category rotorcraft. To date, the GWWG has met five times. The Working Group Representatives have tentatively agreed to increase the gross weight limitation of part 27 to 7,000 pounds. Although the petitioner states that the GWWG has agreed that this increase in weight, based on the current regulatory stringency of part 27, results in no compromise in safety, the GWWG is considering some increased stringency for helicopters certified with eight or nine passengers. This will not be of concern to the petitioner since the K-1200 has no passengers.

As stated in the Petition, the K-1200 has been shown to meet the requirements of part 27, as identified in the original

certification basis, at the proposed increased gross weight of 6,500 pounds. The K-1200 is a helicopter that meets later and more stringent regulations than many other helicopters performing the same mission. The design changes required to meet this increased level of safety have, in fact, driven the gross weight to the 6,000-pound limit. A 500-pound increase in gross weight will result in improved mission performance. This increase in gross weight would not cause a decreased level of safety to the pilot. (There are no passengers on the single seat helicopter.)

The petitioners statement that "no additional noise substantiation is required for operations to 6,500 pounds gross weight" is only partially correct. No additional testing is required if the Petitioner is willing to limit all operations above 6,000 pounds to agricultural operations, dispensing fire fighting materials, or carrying external loads. If these limitations are not acceptable, a part 36 Appendix H noise test must be conducted prior to increasing the gross weight above 6,000 pounds.

In consideration of the foregoing, I find that a grant of exemption would be in the public interest and would not have an adverse effect on safety. Therefore, pursuant to the authority contained in 49 U.S.C. §§ 40113 and 44701, formerly §§ 313(a) and 601(c) of the Federal Aviation Act of 1958, as amended, delegated to me by the Administrator (14 CFR § 11.53), Kaman Aerospace Corporation, is hereby granted an exemption from 14 CFR §§ 27.1(a) to the extent necessary to allow Kaman Aerospace Corporation to increase the maximum gross weight of the K-1200 from 6,000 pounds to 6,500 pounds while maintaining the original normal category rotorcraft certification. This exemption is subject to the following conditions and limitations:

1. The design of the helicopter cannot be changed to add passengers as part of the gross weight increase.
2. Prior to exercising the privileges of this exemption, each K-1200 helicopter (for which exemption is sought) and all modifications made to it, must meet the requirements established in the current certification basis, at the increased gross weight. This includes any special requirements for certification; i.e., equivalent levels of safety and special conditions that may have been issued to complete certification.

3. All operations above 6,000 pounds must be limited to agricultural operations (as defined in § 137.3, effective January 1, 1966), dispensing fire fighting materials, or carrying external loads (as defined in § 133.1(b) effective December 20, 1976); unless a part 36 Appendix H noise test is conducted prior to increasing the gross weight above 6,000 pounds. To ensure this limitation is adhered to, a statement to this effect must be placed on the Type Certification Data Sheet and in the Rotorcraft Flight Manual.

Issued in Fort Worth, Texas, on April 25, 1996.



Larry M. Kelly
Acting Manager, Rotorcraft Directorate
Aircraft Certification Service