Exemption No. 6742

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

In the matter of the petition of	*	
SINO SWEARINGEN AIRCRAFT COMPANY	*	Regulatory Docket No. 142CE
for exemption from § 23.3(d) of Title 14 Code of Federal Regulations	*	

GRANT OF EXEMPTION

By letter dated September 19, 1997, Mr. Donald Trompler, Sino Swearingen Aircraft Company, 1770 Sky Place Boulevard, San Antonio, Texas 78216 petitioned for an exemption from § 23.3(d), Title 14, Code of Federal Regulations, to permit type certification of the Sino Swearingen SJ30-2 airplane in the commuter category. The SJ30-2 airplane is a six-to-eight place business jet powered by twin turbofan engines.

The petitioner requires relief from the following regulation:

> Section 23.3(d), in pertinent part, limits the commuter category to propeller-driven, multiengine airplanes.

The petitioner supports the request with the following information:

> (NOTE: Following is verbatim from petitioner's letter of September 19, 1997.)
>
> "Sino Swearingen Aircraft Company proposes to certify its pending SJ30-2 business jet to the higher level of safety required of airplanes certified in the commuter category.

"Affect on Safety

A favorable ruling on this petition would allow Sino Swearingen Aircraft Company to offer the public a turbofan business aircraft built to a level of safety exceeding that stipulated in the existing FAR 23 regulations for the normal category. This aircraft—the SJ30-2—would, in fact, be built to a level of safety consistent with the technical requirements appropriate to aircraft in the 12,500 to 19,000 pound weight category and carrying up to 19 passengers, as recognized with the creation of the commuter category.

"The planned certification basis for the SJ30-2 (FAR 23 Amendment 52, and proposed special conditions as published in the Federal Register dated February 21, 1997) already includes special conditions establishing a level of safety equivalent to or better than the commuter category in certain areas. These include special conditions for Subpart B (Flight) and G (Operating Limitations and General Information), which were developed to incorporate the current amendment level requirements of FAR 25 Subparts B and G into the certification basis of the SJ30-2. The SJ30-2 will comply with fire protection regulations that are more stringent than those required in the commuter category, as well as the most recent requirements of HIRF and lightning protection. Granting this exemption would in no way alter the current SJ30-2 special conditions. Instead, it would bring the remainder of the SJ30-2's certification basis into alignment with the higher level standards of the commuter category.

"While 14 CFR 23.3(d) clearly states that commuter category only applies to 'propeller driven, multiengine airplanes,' in practice the application of the commuter category requirements to Sino Swearingen Aircraft Company's SJ30-2 aircraft, with its current special conditions, would have no impact on the powerplant installation of the aircraft. The current FAR 23 rules clearly cover turbine powered installations, including turboprop, turbojet and turbofan engines.

"There is no technological reason to eliminate turbofan-powered aircraft from certification in the commuter category, and in fact there is substantial reason to permit their inclusion. A turbofan is an inherently simpler mechanical device than a turboprop, having neither propellers nor gear boxes and their related mechanical and electrical controls, actuators, and sensors.

"From the pilot's perspective, the turbofan is simpler and less work-intensive to operate because there are fewer systems to master and controls to manage. Therefore it can be postulated that turbofans are inherently safer than turboprops because of their reduced mechanical and operational complexity and resultant reduced potential for mechanical failure or crew error.

“This assertion is supported by the operational record of turbofans and turboprops over the past 32 years—while both have demonstrated extraordinary safety, what margin exists clearly favors the turbofan.

“In the five-year period from 1992 to 1996, the U.S. fleet of business jet aircraft experienced an accident rate of 0.59 per 100,000 hours of operation, and a fatal accident rate of 0.15 per 100,000 hours of operation. During the same period, the U.S. fleet of business turboprop aircraft experienced an accident rate of 1.93 accidents per 100,000 hours of operation, and a fatal accident rate of 0.77 fatal accidents per 100,000 hours of operation. The turboprop accident rate is 227 percent greater and the fatal accident rate is 413 percent greater than the turbofan rates.

“A look at a longer period presents the same picture. During the 32 years from 1964 to 1996, the U.S. fleet of business jet aircraft experienced an accident rate of 1.49 accidents per 100,000 hours of operation, and a fatal accident rate of 0.44 fatal accidents per 100,000 hours of operation. By comparison, during the same period, the U.S. fleet of business turboprop aircraft experienced an accident rate of 2.68 accidents per 100,000 hours of operation, and a fatal accident rate of 0.95 fatal accidents per 100,000 hours of operation. The turboprop accident rate is 80 percent greater and the fatal accident rate is 116 percent greater than the turbofan rates. (These data were compiled by Robert E. Breiling and Associates, in a study unrelated to this petition, and is attached.).” NOTE: The data are available in public Docket No. 142CE.

“Clearly these data support the conclusion that the substitution of turbofan engines for turboprop engines on otherwise comparably certificated aircraft would in no way degrade safety, and in fact might well enhance it.

“There is one area where turbofan equipment offers a sharp safety advantage over propeller driven equipment, and that is in the realm of rotor burst failure versus catastrophic failure of a propeller blade. Turbofan aircraft have well defined criteria for rotor burst protection. By contrast, the challenge of developing a (propeller) blade containment strategy has been largely held to be technologically unfeasible. The loss of a propeller blade or segment presents two safety issues: one related to the potential for human injury from uncontained debris, and the second to airframe integrity in the wake of an unbalanced propeller condition. The turbofan is largely free of these issues. The SJ30-2 is particularly strong in this area because its engines are mounted well behind the pressure vessel.

“It should be further noted that turbofans are inherently safer than propeller driven aircraft in ground operations, where the whirling disc of a propeller creates a substantial hazard to people in nearby proximity to the aircraft. An idling turbofan, by contrast, presents a greatly reduced hazard environment.

"Current regulations permit certification of turbofan business aircraft to a level generally acknowledged to be less stringent than commuter category—the existing FAR 23 regulations—as well as the comparably stringent FAR 25 requirements, which are tailored to the technology of large transport category aircraft. It is therefore entirely consistent with existing policy to grant an exemption to Sino Swearingen Aircraft Company to permit certifying the SJ30-2 to commuter category.

"In considering this exemption, it should be further noted that the nonexistence of commuter category regulations pertaining to turbofan aircraft is not an indication of any regulatory intent to exclude such aircraft designs at the time the regulation was created. To the contrary, in a study of the proceedings and documents that led to the development of the commuter category regulations and in discussions with individuals who participated in the proceedings, it is clear that the inclusion of turbofan powered aircraft in the regulations was initially being favorably considered.

"In the final analysis, however, the issue of turbofan-powered airplanes in the commuter category was temporarily set aside to help expedite creation of the final regulation at a time when there were no potential turbofan aircraft in this category pending in development and no logical turbofan engine in existence or in development to power them. It is plain that the exclusion of turbofan equipment from commuter category certification was not a technically-based decision.

"Public Interest

"Granting this petition is very much in the public interest. The technological development of new smaller turbofan engines has created the potential for simple, low-cost aircraft with greater utility and a higher level of safety than ever before. The SJ30-2 is just such an aircraft, featuring advanced aerodynamics and advanced engine efficiency. While the commuter category was initially created as a means to certify aircraft intended for regional airline operations, almost immediately after its creation it took on a second and equally important role. The first two aircraft ever certified to commuter category, the Beech Starship and the Beech King Air 350 (B300), were not designed as regional airliners, but for use as business aircraft and the on-demand-charter segment of FAR 135.

"The fact that the first two commuter category airplanes certified were not intended to be regional airliners demonstrates clearly that commuter category is a term used to define a level of certification and safety, not the end use of the airplanes. Based on these facts, it is our opinion that the SJ30-2's intended mission, not as a regional airliner, is not germane to consideration of this exemption.

"Moreover, it should be noted that both the Beech Starship and the Beech B300 have performed successfully and safely in their roles throughout the decade of the

1990's, demonstrating the appropriateness of this application for commuter category aircraft. These aircraft have benefited the public by serving ably in the roles of business transport and on-demand-charter. Had the Starship and the Beech B300 been limited to the normal category, they could not have given the public service that these airplanes provide today. Because of the commuter category these airplanes have been able to provide services otherwise unavailable at comparable cost—largely because of their expanded capabilities, owing to being certified in the commuter category. Granting this petition would give the public access to turbofan powered aircraft in this category, whereas previously there have been available only propeller-driven equipment.

"Notwithstanding technological arguments to the contrary, the traveling public in the United States has increasingly come to view aircraft equipped with propellers as less desirable and less safe than turbofan-powered aircraft. Approval of this request for exemption would give consumers the option of choosing a turbofan-powered airplane when their travel needs call for an aircraft in the weight and performance category encompassed by the commuter category. The vast majority of the traveling public would regard this as a significant benefit.

"Sino Swearingen Aircraft Company is currently building an assembly factory for the SJ30-2 at Martinsburg, West Virginia, in the Rockefeller Technology Center of the Eastern West Virginia Regional Airport.

"A further public benefit that would flow from the approval of this exemption will be the creation of additional employment in this area of the United States.

"Granting of this petition for exemption would enhance the value and marketability of the SJ30-2 aircraft, creating a resultant increase in employment of personnel at this facility. Sino Swearingen Aircraft company is projecting that demand for an SJ30-2 certified to commuter category will generate employment at the Martinsburg facility of as many as 250 people by mid 1999."

Comments on published petition summary:

A summary of the petition was published, for public comment, in the FEDERAL REGISTER on November 24, 1997. The comment period closed December 15, 1997. Three comments were received. All three comments favored granting the exemption.

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) of Title 14, Code of Federal Regulations, that: (1) granting the exemption is in the public interest, and (2) granting the exemption will not adversely affect safety, or that a level of safety will be provided that is equal to that provided by the regulation from which exemption is sought.

The FAA has reviewed the petitioner's supporting information and provides the following:

While not agreeing with the petitioner's every detail, the FAA agrees with the substance of the supporting information and finds no reason to deny the petition. In the interest of efficiency, this analysis addresses substantive issues only.

On October 9, 1995, Sino Swearingen applied for type certification of the SJ30-2 in the normal category. Type certification basis was 14 CFR Part 23 (part 23) through Amendment 23-52, 14 CFR Parts 34 and 36, and special conditions (62 FR 58875, October 31, 1997) effective December 1, 1997. Those special conditions mainly addressed airplane performance and powerplant fire protection. With the sole exception of powerplant fire protection, powerplant airworthiness standards for part 23 normal category airplanes are adequate for turbofan-powered business jets. Those special conditions addressing performance were a relevant combination of certain airworthiness standards from part 23 commuter category and part 25 transport category. The special conditions in conjunction with part 23 normal category standards provide a level of safety for the SJ30-2 that is above part 23 normal category and is appropriate to a turbofan-powered business jet type certificated in the part 23 normal category.

On September 19, 1997, Sino Swearingen petitioned for exemption to permit type certification of the SJ30-2 in the part 23 commuter category. Type certification basis remains as discussed above for the SJ30-2 in part 23 normal category. By applying the foregoing special conditions to existing part 23 commuter category airworthiness standards, the FAA is ensuring a level of safety appropriate to a turbofan-powered business jet type certificated in the commuter category. The SJ30-2 will not be used for carrying fare-paying passengers in scheduled service.

Regarding public interest the FAA believes that granting the exemption helps realize the potential public benefit created by the advent of newer smaller turbofan engines. The resultant simpler, lower-cost business jets having weights up to 19,000 lb. provides the public with greater utility and an extended range of choices.

In consideration of the foregoing, I find that a grant of exemption is in the public interest and will not adversely affect safety. 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), Sino Swearingen Aircraft Company is granted exemption from 14 CFR § 23.3(d), to the extent necessary to permit type certification of the SJ30-2 airplane in the Part 23 commuter category. This exemption is subject to the following conditions and limitations.

<u>Conditions</u>:

1. The SJ30-2 shall not be eligible for operations under 14 CFR part 121. A note to this effect will be placed on the type certificate data sheet.

2. The SJ30-2 maximum certificated takeoff weight shall not exceed 19,000 pounds.

3. The SJ30-2 shall have a seating configuration, excluding pilot seats, of 19 or fewer.

Issued in Kansas City, Missouri on March 23, 1998.

Signed

Marvin Nuss
Assistant Manager
Small Airplane Directorate
Aircraft Certification Service