Exemption No. 6028

UNITED STATES OF AMERICA
DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
RENTON, WASHINGTON 98055-4056

In the matter of the petition of **Corning Incorporated** for an exemption from § 25.562(b) and (c) of the Federal Aviation Regulations	Regulatory Docket No. 27951

DENIAL OF EXEMPTION

By petition dated October 18, 1994, Mr. William J. Schultz, Manager, Aircraft Operations, Corning Incorporated, Aviation Department, 3414 Sing Sing Road, Horseheads, New York 14845, petitioned for exemption from performing the emergency landing dynamic tests required by §§ 25.562(b) and (c), for seating on Corning's Dornier 328-100 aircraft.

Sections of the FAR affected:

Section 25.562(b) defines the emergency landing conditions that crew and passenger seats intended for occupancy during takeoff and landing must be qualified for either by test or rational analysis. These conditions include 14g downward vertical loads, and 16g longitudinal loads with yaw and floor misalignment.

Section 25.562(c) defines the structural integrity and occupant protection success criteria associated with the conditions defined in § 25.562(b).

Related sections of the FAR:

Section 25.562(a) requires seats and restraints to be designed to protect occupants subjected to the loads prescribed in § 25.562(b).

The petitioner's supportive information is as follows:

"Pursuant [to] 14CFR 11.25, Corning Incorporated (Kal-Aero, Inc.) wishes to petition for exemption [from] 14CFR 25.562(b) and (c), Emergency Landing Dynamic Conditions, for an interior configuration proposed for Corning's Dornier 328-100.

"Corning Incorporated (Kal-Aero, Inc.) seeks relief from the anthropomorphic dummy dynamic test requirements prescribed in 14CFR 25.562(b) and (c). It is the position of Corning Incorporated (Kal-Aero, Inc.) that it is in the public interest; namely, there is an economic benefit and an equivalent level of safety that will be afforded by other considerations to be discussed in detail.

"The requirements of 14CFR 25.562(b) were adopted under Amendment 25-64, Improved Seat Safety Standards (53 FR 17640, May 17, 1988). The airframe, Type Certificate A45NM, is certificated to these standards. The seats, ERDA drawing number 150022, will be tested to TSO [Technical Standard Order] C127 standards. It is the responsibility of Corning Incorporated (Kal-Aero, Inc.) to ensure the arrangement of the seats in the aircraft, and other interior furnishings, comply with the requirements of 14CFR 25.562.

"As part of the TSO approval program for the seats, the manufacturer (ERDA, of Peshtigo, WI) will perform dynamic sled tests. For the purposes of the TSO program, the seats will be loaded with weighted dummies and subjected to the dynamic loading conditions specified by the TSO (SAE document AS8049). These tests are estimated to cost slightly over $100,000. The cost is broken down as $72,500 for six runs (three loading conditions, and two seat designs--single and double), $15,000 for test facility rental, and $3,300 for documentation. For the tests required in 14CFR 25.562, the test dummies must be instrumented for femur loads, pelvis compressive loads, and head injury criteria. This instrumentation would increase the cost of testing, perhaps doubling the cost. For the Corning interior configuration, there will be seven seat configurations.

"For a 14CFR 25.562 test program, seats will have to be purchased as test articles, and it is doubtful they could be re-used after testing, since one of the loading requirements involves misalignment of the seat rails. There are two loading conditions in 14CFR 25.562, downward (14CFR 25.562(b)(1)) and forward (14CFR 25.562(b)(2)), so the number of seats required as test specimens will be double the number above.

"In addition to the base price of the seats, the cost of upholstering to the test configuration must be included. This is priced at $5,858.89 per passenger.

"The conference tables are likely to be damaged during test, and the cost of the eight required as test articles is estimated to be $5,000 each for the single seats and $8,000 each for the double seats.

"The total required seats and their cost for preparation to the test configuration are given in the table below for each of the test conditions:

Seat Style	Seat Orient.	Table Config	Loading Condition[1]	Seat Frame Cost	Upholstery	Table	Total Per Run
double	aft	conf.	downward	$5,715	$11,717.78	$8,000	$25,432.78
double	fwd	conf.	downward	$5,275	$11,717.78	$8,000	$24,992.78
double	fwd	none	downward	$5,275	$11,717.71	$0	$16,992.78
single	aft	conf.	downward	$4,062	$5,858.89	$5,000	$14,920.89
single	aft	none	downward	$4,062	$5,858.89	$0	$9,920.89
single	fwd	conf.	downward	$3,732	$5,858.89	$5,000	$14,590.89
single	fwd	none	downward	$3,732	$5,858.89	$0	$9,590.89
double	aft	conf.	forward	$5,715	$11,717.78	$8,000	$25,432.78
double	fwd	conf.	forward	$5,275	$11,717.75	$8,000	$24,992.78
double	fwd	none	forward	$5,275	$11,717.78	$0	$16,992.78
single	aft	conf.	forward	$4,062	$5,858.89	$5,000	$14,920.89
single	aft	none	forward	$4,062	$5,858.89	$0	$9,920.99
single	fwd	conf.	forward	$3,732	$5,858.89	$5,000	$14,590.89
single	fwd	none	forward	$3,732	$5,858.89	$0	$9,590.99
					Total Test Articles Cost		$232,883.80

[1]downward in accordance with § 25.562(b)(1)
forward in accordance with § 25.562(b)(2)

"Using the ERDA TSO test costs, $72,500 for six runs, the 14 runs required for the interior configuration would be $169,166.67. This is multiplied by an estimated factor of two to account for the complexity of the dummy instrumentation. The test facility rental and documentation costs are also factored by two for the instrumentation. Thus, the total cost for the testing is $607,817.13 as broken down below:

Test articles	$232,883.80
Test runs	$338,333.33
Facility rental	$30,000.00
Documentation	$607,817.13

"Thus, for this one interior configuration, the additional cost per seat is $15,995.19, which is substantially more than the $62.00 per seat [stated] in Amendment 25-64, and 100 times more than the benefits of $159.00 per seat. This is a direct consequence of the few number of seats and low production volume.

"The amendment was most likely developed for air transport configurations, where the seats are all forward facing on a standard 31" pitch. The testing costs then can be spread over the 681,000 seats in that fleet. Also, the seat manufacturers include the interior arrangement considerations in their test program as a means to sell their product; because of the low production volume, the seat manufacturer (ERDA) cannot include testing for this installation. Also, the seat manufacturer cannot anticipate the interior configuration for a unique interior such as the one proposed.

"Amendment 25-64 is based on cost/benefit data derived from air carrier experience, however the amendment is implemented to cover corporate usage also. The Corning Dornier 328-100 will be operated in corporate usage only. No part 135 or 121 operations are envisioned. Corporate aviation traditionally has had a lower accident rate, and the number of enplanements per flight is less because [of the] lower passenger capacity of corporate aircraft. The proposed seating capacity of the Corning configuration is 19 seats.

"The Amendment (25-64) also uses enplanements as a statistical basis. This places corporate usage at a disadvantage since the trips are typically of a shorter length. Corning intends to use their aircraft primarily as a shuttle between their headquarters in Elmira and Newark airport. This factor should result in a lower potential accident rate because of crew familiarity with the route flown. The crew will also be intimately familiar with the aircraft as there will be only two similarly equipped aircraft. Corporate aviation also has a lower accident rate from maintenance related causes, and Corning's operation should be no different.

"Thus, equipment, operation, and maintenance factors are all more favorable than those based on Amendment 25-64.

"Design factors of the interior configuration must also be considered to determine the level of safety. The seats in this arrangement will be on a 35.2" pitch (minimum), which would mean that head impact might not occur. Also, the seats will be upholstered in accordance with industry standard methods, so cushioning for head impact, femur loads, and pelvis compressive loads will be provided. The generous size of the seats, in comparison to the standard transport seat, will provide for more favorable conditions in an emergency landing scenario.

"In support of the equivalent level of safety, the sensitivity analysis of Amendment 25-64 is used for data. The seven year life of a seat, the effectiveness of the seat in preventing fatalities, and the "value" of a life are not contested. The future accident rate, and the cost of the seat are discussed herein. The cost of the seat is examined only on the basis of sales price, and the cost of substantiating tests for this interior arrangement. The weight and associated fuel penalties are not examined here, though it should be noted that corporate operators pay more for fuel because of the smaller amounts purchased. Likewise, present values of annual costs are not included here.

"As mentioned previously, Amendment 25-64 uses data from air carrier experience. The benefits for the Amendment are based on 107 fatalities in 3,343 billion passenger enplanements between 1970 and 1983. A passenger enplanements basis disfavors corporate usage because the trip lengths are typically shorter...especially the Corning usage since the majority of the trips will be from Elmira to Newark, a direct distance of 157 nautical miles, with an annual boarding average [of] only 12,000. When combined with the anticipated improvement in the future accident rate, corporate usage alone provided a level of safety better than in the Amendment.

"In summary, Amendment 25-64 disfavors corporate usage because of difference in usage, the way accident rates are calculated, and the cost of the seat. Corning Incorporated (Kal-Aero, Inc.) intends to incorporate the same safety features (TSO-C127 seats, long seat pitch, padded surfaces, etc.) as would be present for other installations, but requests relief from the test requirements since the cost-benefit ratio for this installation does not warrant testing."

A summary of Corning's petition was published in the Federal Register on December 5, 1994 (59 FR 62441). No comments were received.

The FAA's analysis/summary is as follows:

The FAA does not disagree with the petitioner that corporate operations were not specifically considered in the formal cost/benefit analysis of Amendment 25-64. However, this omission should not be construed as grounds for relief for airplanes engaged in those operations. The cost/benefit analysis that was performed was based on the most prevalent data available, and is pertinent to the vast majority of the affected airplanes and operations. Notwithstanding any variations that may exist in safety records among different airplanes and types of operations, it is clear that the requirements of Amendment 25-64 were intended to be applied to all part 25 airplanes, regardless of airplane size or type of operations (ref. 53 FR 17640/17641, May 17, 1988), and that the goal was to foster an overall enhancement in transport category airplane safety (ref. Notice 86-11, 51 FR 25988, July 17, 1986). In order to provide for an increased equivalent level of safety for all occupants, it is further noted that airplanes certificated under part 23 have also been subject to similar, or even more stringent, requirements (Amendment 23-36, 53 FR 30802, August 15, 1988).

It is unclear whether the petitioner is seeking exemption from all requirements of § 25.562 for seats not already qualified to TSO-C127, or only from any additional installation-related requirements of § 25.562 that may be necessary for seats already qualified to TSO-C127. The FAA does not favorably consider either request for the reasons cited above; however, to address, to the extent possible, the issue of cost burden asserted by the petitioner, the FAA notes that the desired interior arrangement is characterized as unique. This uniqueness is taken to mean that there is very little, if any, commonality with any previously approved interior arrangements or installations. In choosing this approach, the petitioner has put itself in the

position of being unable to benefit from existing test data and approvals, and has thus voluntarily maximized the number of tests and attendant certification costs involved.

In addition, although the FAA does not consider it necessary to dissect the petitioner's estimated costs of testing, nor does it have the means to do so, it appears that some of these estimated costs may be overstated. Examples may include estimates associated with tables and anthropomorphic test dummy (ATD) instrumentation costs: structural equivalents are typically utilized in lieu of actual furniture, and instrumentation is normally already integral with the ATD. The FAA anticipates that upon a thorough examination of the actual costs incurred in accomplishing required testing, the cost burden could be considerably less than estimated, and consistent with that already absorbed by other entities similar to Corning.

Finally, the FAA notes that although Corning asserts that granting the petition would be in the public interest, no reasons for this view, as required by § 11.25, were offered.

In consideration of the foregoing, I find that a grant of exemption is not in the public interest. Therefore, pursuant to the authority contained in §§ 313(a) and 601(c) of the Federal Aviation Act of 1958, delegated to me by the Administrator (14 CFR 11.53), the petition of Corning Incorporated for an exemption from § 25.562(b) and (c) of the FAR for the Dornier 328-100 aircraft is hereby denied.

Issued in Renton, Washington, on February 16, 1955.

/s/ John J. Hickey, Acting Manager
Transport Airplane Directorate
Aircraft Certification Service, ANM-100