June 18, 1998

Federal Aviation Administration
Office of the Chief Counsel
Attn.: Rules Docket (AGC-200)
Docket No. 29145/Room 915G
800 Independence Avenue, SW
Washington, DC 20591

RE: Advance Notice of Proposed Rulemaking (ANPRM) No. 98-2, Child Restraint Systems

Dear Sir or Madam:

On behalf of the Association of Flight Attendants (AFA), I am submitting the following comments on the notice for rulemaking on Child Restraint Systems. AFA represents 43,000 flight attendants at 27 U.S. carriers.

The Association of Flight Attendants has for many years advocated elimination of the rule allowing children under two years of age as the only passengers to be unrestrained on an aircraft. AFA wholeheartedly supports the conclusion of the White House Commission on Aviation Safety and Security with regard to the restraint of all occupants during taxi, takeoff, landing, and for protection against turbulence.

The Association of Flight Attendants offers the following comments in response to the ANPRM request for information.

(1) General

There have been problems with the fit of existing child restraint devices. Some of these devices cannot be properly secured in some aircraft seats. This problem generally occurs in bulkhead rows in coach seats that have in-armrest tables, resulting in less than normal seat width and the inability to raise the armrest out of the way. This situation is handled by attempting to relocate the passenger and CRS/child to another seat location. If this is not possible the CRS is not used and is stowed elsewhere.

We have also seen passengers struggle with trying to get the seat belt tightened through the attachment points on the CRS. The forward position of the adult passenger seat belt attachment points makes it difficult to tighten the belt sufficiently to prevent forward motion of the CRS. In a crash situation, it is extremely important to ensure that the seat is correctly and tightly installed.

At some of our carriers we have seen problems with aft-facing CRS's due to a minimal seat pitch between rows. When the seats rows are too close together, it is difficult to get an
aft-facing CRS into the seat. The seat back in front prohibits the CRS from sitting properly in the designated seat, thereby a proper fit and tight belt restraint is not ensured.

There are also problems in applying the existing regulation because it allows passengers to bring the CRS onboard an aircraft but does not require its use. Parents may bring the CRS and hope to find an unoccupied seat nearby for use. This creates a shuffling of passengers as seat locations are switched to accommodate the CRS and leads to potential animosity among passengers and crew in the cabin.

These problems have been largely addressed by the Society of Automotive Engineers ARP4466, Dimensional Compatibility of Child Restraint Systems and Passenger Seat Systems in Civil Transport Airplanes. That document was based on measurements of seat types representing over 180,000 passenger seats in service during 1996. It defines criteria for passenger seats and CRS necessary to assure that a CRS can be installed in a passenger seat. These criteria are reasonable and practical, and should be incorporated in Motor Vehicle Safety Standard 213 (MVSS-213) for those seats that are approved for use on aircraft. In the interim, those installed passenger seats that do not accept CRS should be identified and marked for use only by adult passengers when seats are assigned, prior to boarding the aircraft.

(2) & (3) Forward-Facing and Aft-Facing CRSs

The 1994 CAMI Study found that some forward-facing CRS currently produced under the requirements of MVSS-213 can provide adequate performance under airplane specific test conditions and that aft-facing CRS performed well. In addition, we understand that the prototype CRS developed in the U.S. and Canada also meet MVSS-213 requirements. Thus, it is reasonable and practical to build CRS that meet both MVSS-213 requirements and aircraft specific requirements. Aircraft specific tests should be included in MVSS-213 for those restraint systems made for dual use in aircraft and automobiles. Those tests should use an airplane type seat fixture, with cushions and seat belt anchorage locations representative of the unfavorable position found in transport airplanes. If the automobile test pulse produces results at least as severe as the 16 g test pulse used for evaluating transport airplane seats, it should be an option for the airplane-specific tests in lieu of the 16 g test pulse. (CAMI should evaluate that possibility. The optional use of the automobile test pulse could reduce the cost of testing, and should be allowed if appropriate.)

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4. Approval of CRSs

AFA believes that dual-use certification for CRS is mandatory. Adults must be responsible for their children on the airplane, and must know the techniques used when placing the child in the CRS and removing the child from the CRS. Familiarity of adults with the CRS is essential to assure that the child can be rapidly extracted from the CRS by the adult in the event of an emergency evacuation. If this is not done, the post-crash risk of injury or death to the adult, the child, and cabin crew will increase. This would be unacceptable. The benefit of using a CRS in an airplane crash must not be compromised by increasing the post crash hazard. Familiarity with the CRS can only be assured if the adult is using the same CRS that he/she uses daily in the automobile.

5. Research on Child Restraint Systems

The CAMI Studies have shown that aft-facing CRS and some forward-facing CRS that are built under the current requirements of MVSS-213 work well in transport airplane seats, even though the lap-belt anchorage points and the seat cushions differ from those used in the MVSS-213 tests. FAA data indicate that some of the adult seats on transport airplanes already have lap-belt anchor locations that provide adequate restraint for most forward-facing CRS. CAMI has developed a prototype seat insert platform that compensates for the poor lap-belt anchor locations found in the other seats and resolves many of the “ease of use” problems. See attachments. Thus, practical technology exists to produce CRS that meet current requirements for both automobiles and transport airplanes. It would appear that all that is necessary is a modification to the current MVSS-213 to include an aircraft specific test.

The question of the impact of future changes in automobile requirements on the performance of CRS in airplanes is unresolved, largely because the future automobile requirements are undefined. The European community is considering automobile CRS with attachment techniques that differ from those in the NHTSA (National Highway Traffic Safety Administration) NPRM. However, it would appear that simple modifications of the CAMI seat insert platform could accommodate most of the proposed new automobile seat attachment techniques. The direct load provided between the CRS and the passenger seat frame by the CAMI seat insert may well eliminate the need for top tether anchorage straps on the CRS. The CAMI seat insert platform, as currently conceived, requires the removal of the passenger seat cushion for use. This is necessary if the seat insert platform is to be used in a wide variety of different passenger seat designs by different manufacturers. Removal of the seat cushion may be unnecessary if the seat insert platform is designed to fit only the seats used by a specific carrier. Questions of platform storage and handling can be resolved as the platform design is advanced from a prototype concept to an operational reality.
(6) Changing Anchor Point Locations for Aircraft Passenger Seat Belts

An attempt to change the anchor point locations or provide top tether anchorages on only a few existing passenger seats on transport airplanes is likely to prove overly restrictive in seating locations for parents with a child in a CRS and may not provide enough seats on some flights to accommodate a larger number of CRS passengers. However, seat insert platforms could be offered as an alternative to the installation of passenger seat rows with appropriate anchor point locations in place of existing seats in airplanes. These inserts could be installed on the spot, as needed, and just as easily removed as soon as passengers with a CRS deplane. The operator could choose either option, and could implement the installation of passenger seats with appropriate CRS anchors at their own schedule. The lap belts in these seats with CRS anchors provide better restraint protection for adults seated therein, as well as for the child in a CRS.

(7) Evacuation of Aircraft with Children in Child Restraint Systems

We are not aware of any data on the effect of using child restraint systems on passenger egress times. While the egress time for the child and accompanying adult will undoubtedly increase, the overall egress time should not increase if the locations for CRS installations are limited to areas where delays will not influence the overall evacuation time. The preferred location for a CRS is a window seat in non-exit rows since this eliminates concern about passage between the seat rows. 14 CFR 121.585(b)(2) already prohibits persons under 15 years of age from sitting in an exit seat or row. It is also preferable not to place the CRS in the seat rows fore and aft of an overwing exit row due to procedures or actions to create more exit row space in an emergency evacuation, such as pushing forward the seatbacks in front of the emergency exit row, or a need to put the over-wing exit hatch in the row aft of the exit row.

(8) Mandatory Use of Child Restraint Systems for Children Under 40 Inches and Under 40 Pounds

All children like all other people on the airplane, should be properly restrained during taxi, takeoff, landing, and for protection against turbulence.

Although studies differ somewhat in results, it appears that a 40 inch stature could represent children ranging in age from a 5th percentile 5 1/2 year old to a 95th percentile 3 1/2 year old child. A 40 pound weight could mean a 5th percentile 7 year old child or a 95th percentile 3 1/2 year old child. A 5th percentile two year old child would have a stature of 22 inches and a weight of 32 pounds, while a 95th percentile two year old would weigh 36 pounds and stand 32 inches tall. None of these dimensions define the injury tolerance of the child. The requirement for use of a CRS should depend on the ability of a child to use an adult restraint and not be injured in a crash. That ability may depend on skeletal maturity as well as size.
The criteria for older children is not as clear. It would appear that a large two year old toddler would approach the 40 pound weight criteria. But specifying the 40 pound weight criteria could also include some 7 year old children. This seems extreme. The 40 inch stature would include some 5 year old children. Is there evidence that 5 year old children have not been adequately protected by the adult lap belt in airplane crashes? Finally, there is the question of measuring the criteria during boarding. Weight could be measured by having the child stand on a scale. Height could be measured by using a height gauge similar to those used at amusement parks for admission to rides. But it may be difficult to measure children just before they board the airplane. And if a child no longer uses the CRS in an automobile (as interpreted by local law), the parent may well object to a requirement that the child use a CRS in an airplane unless it can be well documented as beneficial.

There is overwhelming evidence (mostly from automobile crashes) that shows that infants should be protected by a rear-facing CRS. The criteria to mandate that other children use a CRS should be established by accident injury experience. In the interim, however, those children under two years of age who are currently allowed to be lap held should be placed in child restraint systems.

(9) Providing Child Restraint Systems on Aircraft

CRS should be provided by the parents of the child. The importance of familiarity with the use of the CRS has already been identified under question (4). It is the parent (adult) traveling with the child that will be responsible for the child during taxi, takeoff, landing, potential turbulence, crashing, and emergency evacuation. If the CRS is furnished by the air carrier, the parent may not know how to use it in an emergency. Although we realize there is a risk of unfamiliarity with a strange CRS furnished by the air carrier, there may be some parents in need of a CRS for their flight.

For the rare cases when parents do not have a child restraint, the airline should prepare to make CRS available, for example, by making contractual arrangements with auto rental companies to provide CRS rentals as needed by passengers.

(10) Impact on Small Business

No data to offer.

(11) Using a Dedicated Method for Aircraft Applications

The use of a dedicated anchorage system for CRS, as proposed by NHTSA for automobiles, is a logical progression. However, automobiles and automobile CRS have a
relatively short life span compared to transport airplanes. Changes are readily made in automobile seating systems, and it is of little consequence if new developments obsolete those changes. That is not the case with airplane seating systems that may last 30 years or longer. If the automobile industry can define a dedicated anchorage system for CRS, and if that anchorage system is shown to be stable over a number of years, then the anchorage system should be incorporated in aircraft seats. In the interim, an adapter, such as the seat platform insert, should suffice.

(12) Current Practices

The current practice of allowing an adult to hold a child under two years of age on his or her lap is dangerous and should be abolished.

(13) Additional Rear Facing Seats

Additional rear-facing seats would be of benefit to all passengers seated in those seats. They would be specially beneficial to children, elderly adults, and disabled passengers. Those passengers are at higher risk of injury during a crash, and the simple benefit of providing whole body restraint by the seat back and bottom would significantly increase their protection. Rearward facing seats also diminish spinal loading in those crashes that have significant vertical deceleration. The benefits of rear-facing seats are well known and genuine. It is only the people who design airplanes who think that rear facing seats are unacceptable. Any action to increase the number of rear-facing seats, for the benefit of all passengers, is long overdue.

Of course, rear-facing seats must be designed to provide a comfort level equivalent to that provided by current forward facing seats. Merely reversing a forward facing seat will not provide adequate comfort, even though it may be structurally sound. In addition, overhead baggage compartments, and other items in the cabin, must be properly restrained in the dynamic crash environment to prevent secondary impact injury to passengers seated upright in rear-facing seats.

Rear-facing seats throughout the cabin, and adequate prevention of flying objects during a crash, is the optimal restraint for all occupants in the airplane.

(14) Children Per Flight Requiring Child Restraint Seats

No data to offer.
(15) Other Solutions

There have been several studies on child restraint in aircraft. Most of these are maintained as proprietary by the industry. As far as is known about the results of those studies, no solution has been suggested that is more effective than rear-facing seats or CRS. Efforts should be made to make those studies public.

Thank you for the opportunity to comment. We look forward to a notice of proposed rulemaking to ensure that children under two years of age are given the protection of proper restraints aboard aircraft.

Sincerely,

Christopher J. Witkowski
Director of Air Safety and Health

2 Attachments: Prototype seat insert platform diagram and photo