U.S. Department of Transportation
Federal Aviation Administration

Advisory Circular

Subject: Use of Child Restraint Systems on Aircraft

Date: 9/24/15 **AC No:** 120-87C

Initiated by: AFS-200 **Change:**

1. PURPOSE. This advisory circular (AC) provides information and practices regarding the use of child restraint systems (CRS) on aircraft. The Federal Aviation Administration (FAA) intends for operators to use this as a resource during the development, implementation, and revision of an air carrier's standard operating procedures (SOP), Web sites and training programs regarding the use of CRSs.

a. FAA Initiatives. This AC is one of several FAA initiatives designed to address safety concerns of the National Transportation Safety Board (NTSB). It is a part of the FAA's ongoing commitment to educate and inform aircraft operators, crewmembers, and airline passengers regarding the use of CRSs on aircraft in order to encourage and increase the use of approved CRSs. For more information, refer to the following FAA Web site: http://www.faa.gov/passengers/fly_children/.

b. Regulatory Requirements. In addition, this AC provides information to air carriers conducting Title 14 of the Code of Federal Regulations (14 CFR) part 121 operations about the requirement to make available on their Web sites the width of the narrowest and widest passenger seats in each class of service for each make, model, and series (M/M/S) of airplane used in passenger-carrying operations. If an air carrier does not have a Web site, the air carrier is not required to establish a Web site in order to comply with this regulation.

2. CANCELLATION. AC 120-87B, Use of Child Restraint Systems on Aircraft, dated September 17, 2010, is cancelled.

3. RELATED REGULATIONS. Title 14 CFR part 21, § 21.8; part 91, §§ 91.107 and 91.1035; part 121, §§ 121.311 and 121.583; part 125, § 125.211; and part 135, § 135.128.

4. RELATED FAA GUIDANCE (CURRENT EDITIONS). This AC provides information and suggested practices regarding the use of CRSs on aircraft. This AC also supplements and contains information previously published in the documents listed below.

- AC 91-62A, Use of Child Seats in Aircraft;
- Information for Operators (InFO) 11007, Regulatory Requirements Regarding Accommodation of Child Restraint Systems – Update;
- FAA Office of Aerospace Medicine Technical Report FAA-AM-78-12, Children Restraint Systems for Civil Aircraft;

- FAA Office of Aerospace Medicine Technical Report FAA-AM-94-19, The Performance of Child Restraint Devices in Transport Airplane Passenger Seats; and
- Order 8900.1 Volume 3, Chapter 33, Section 6, Operations—Cabin Safety.

5. AUDIENCE. Air carrier personnel involved in the development of aircraft SOP and training programs, as well as crewmembers, engineers, Web site designers, and others involved in flight operations under part 121, should be familiar with the contents of this AC. This AC may also be valuable to others associated with operations under parts 91, 125, and 135.

6. HISTORY OF CRS REQUIREMENTS AND APPROVAL STANDARDS.

a. Civil Air Regulation (CAR) Section 40.174. The permissive language that does not require children under the age of 2 to be restrained can be found in the 1964 CAR, § 40.174, which stated in part that "A seat and an individual safety belt are required for each passenger and crew member excluding infants, who are in other than a recumbent position."

b. Federal Motor Vehicle Safety Standard (FMVSS) No. 213. In 1982, the Department of Transportation (DOT) had two standards for CRSs. CRSs for use in motor vehicles were required to be certified as complying with the requirements of FMVSS No. 213. CRS for use in aircraft were required to be certified as complying with the requirements of FAA's Technical Standard Order (TSO)-C100c, Aviation Child Safety Device (ACSD). In early 1983, the NTSB considered the safety problems posed for young children traveling in motor vehicles and aircraft and urged that a variety of actions be taken to promote increased use of CRSs. One of those recommendations was that DOT simplify its two different standards and set forth requirements for CRSs by combining the standards. The FAA and the National Highway Traffic Safety Administration (NHTSA) agreed upon a single government performance standard that would satisfy both aviation and highway safety requirements for CRSs. The agencies proposed NHTSA as the sole agency responsible for administering the new FMVSS No. 213, which would be applicable to CRSs designed for use in motor vehicles and CRSs designed for use in aircraft (Title 49 of the Code of Federal Regulations (49 CFR) part 571, § 571.213).

c. United Nations (UN) Standards or Approval by a Foreign Government. On October 15, 1992, the FAA broadened the categories of CRSs allowed to be used on aircraft to include CRSs meeting the standards of the UN or approved by a foreign government (57 Federal Register (FR) 42662).

d. FAA Approval Through a Type Certificate (TC), Supplemental Type Certificate (STC) or TSO. On August 26, 2005, the FAA once again broadened the categories of CRSs that aircraft operators may furnish for use on aircraft to include CRSs approved by the FAA through TC, STC, or TSO (70 FR 50902).

e. FAA Approval Through § 21.305(d) (2010 ed.) (i.e., AmSafe Child Aviation Restraint System (CARES), Part No. 4082), 14 CFR § 21.8(d), or TSO-C100b, or a Later Version. On July 14, 2006, the FAA further broadened the categories of CRSs that both passengers and aircraft operators may furnish and use on aircraft to include CRSs approved under § 21.305(d) or TSO-C100b, Child Restraint System (CRS), or a later version (71 FR 40003). On October 16, 2009, the FAA published a final rule entitled, Production and

Airworthiness Approvals, Part Marking, and Miscellaneous Amendments (74 FR 53368). In this final rule, the FAA amended its certification procedures and identification requirements for aeronautical products and articles. As a result of this amendment, § 21.305 was redesignated as § 21.8, effective April 14, 2010. On May 20, 2014, the FAA amended the provision in § 121.311 relating to the label required for FAA-approved CRSs onboard aircraft to reflect this redesignation of § 21.305 to § 21.8 (refer to 79 FR 28811). The May 20, 2014 amendment also corrected minor technical errors in the codified regulations. The technical amendment ensures that CRSs previously approved under § 21.305(d) (2010 ed.) (i.e., CARES, Part No. 4082) can continue to be used and CRSs approved under § 21.8(d) may also be used.

f. TSO-C100c. Additionally, the FAA published TSO-C100c, effective April 6, 2012. Therefore, approvals under § 21.8(d) would use TSO-C100c as the basis for approval.

7. FAA APPROVAL PROCESSES USED FOR APPROVED CRSs ON AIRCRAFT. The TC, STC, TSO, § 21.305(d) (2010 ed.), and § 21.8(d) approval processes address differences in CRS design and performance as follows:

a. TC Process. A TC is an FAA design approval in which an applicant applies for, and if approved, receives a TC for a product or a major design change to a product. A product is defined as an aircraft, an aircraft engine, or an aircraft propeller. The TC process is appropriate if a CRS is incorporated into the original design of the aircraft.

b. STC Process. The STC process allows a specific CRS meeting FAA-established testing and evaluation criteria to be used on a specific type of aircraft.

(1) Under the STC process, a CRS manufacturer would submit an application for his or her product to be used on specific type of aircraft. This allows the FAA to deal with novel and unusual design features associated with any new type of CRS not addressed by current regulations and safety standards. The STC process is appropriate for a CRS not meeting FMVSS No. 213.

(2) When the FAA considers granting an STC for a CRS, it may publish proposed special conditions in the FR for notice and comment. These proposed special conditions discuss the additional safety standards the FAA deems necessary for the CRS to comply with existing regulations. It also discusses the required performance of the CRS and the capability of the CRS to be installed and used without creating safety concerns. Refer to 70 FR 18271, for an example of special conditions that were part of an STC which the FAA granted to a manufacturer for a CRS.

c. TSO Process.

(1) A TSO is a minimum performance standard issued by the FAA for specified materials, parts, processes, and appliances used on aircraft. These minimum performance standards must be used for an applicant to receive TSO authorization or a letter of design approval (LODA) in the case of manufacturers located outside the United States. TSO-C100c contains minimum performance standards for the testing and evaluation of CRS. The minimum performance standard references Society of Automotive Engineers (SAE) Aerospace Standard (AS) 5276/1. It also requires the manufacturer to provide operating instructions, equipment

limitations, installation procedures and limitations, as well as instructions for continued airworthiness (ICA) and maintenance of the CRS.

(2) A TSO is a minimum performance standard similar to FMVSS No. 213. However, TSO-C100c provides more realistic CRS testing regarding performance in an aviation environment. The TSO process is appropriate if a CRS is similar in design to a CRS meeting FMVSS No. 213 requirements, as well as designed to meet the specific aviation performance standards contained in TSO-C100c.

d. Section 21.8(d) Process.

(1) Under the FAA's certification rules, § 21.8(d) allows a material, part, process, or appliance to be approved in any manner approved by the Administrator. One of the reasons that the FAA included this provision in § 21.8 was to address the unique challenges presented by certain types of equipment for use on aircraft.

(2) When approving a CRS under the provisions of § 21.8(d), the FAA must ensure the CRS meets an equivalent level of safety (ELOS) to other approval processes. For a CRS, the FAA's technical experts look at the benchmark (current edition of TSO-C100, Child Restraint Systems) and identify safety-critical features. The technical experts ensure that each of these features meets an ELOS adequately. This ensures a CRS approved by the FAA under § 21.8(d) will meet a high level of safety regarding testing, quality, and performance standards.

8. AVIATION CHILD SAFETY DEVICE (ACSD).

a. Avoiding Consumer Confusion. The FAA recognizes that the term "child restraint system" was originally used to refer to child restraints meeting the requirements of FMVSS No. 213 and designed to perform effectively in motor vehicles. However, in recent rulemakings, the FAA uses the term "child restraint system" to describe any approved seat or device used to restrain children on aircraft regardless of whether or not it complies with the requirements of FMVSS No. 213. To reduce consumer confusion between a CRS meeting the requirements of FMVSS No. 213 (safe for use in motor vehicles) and a CRS designed only for use in aircraft (not safe for use in motor vehicles), the FAA has introduced a new term referring to a CRS only approved for aviation use. The FAA will call these aviation-only restraints an ACSD. Regulations regarding the use of a CRS in aircraft also apply to an ACSD. Figure 1 is an example of an ACSD (also shown in paragraph 13).

FIGURE 1. EXAMPLE OF A CRS (ACSD)

b. Warning Label. An ACSD only meeting the aviation performance standards contained in TSO-C100c previously approved under § 21.305(d) (2010 ed.), or meeting the aviation performance standards contained in TSO-C100c and approved under § 21.8(d) is not safe for use in a motor vehicle. The FAA worked closely with NHTSA to ensure that labeling on an ACSD clearly illustrates that an ACSD is not safe for use in motor vehicles. The FAA also plans to require a similar warning label on ACSDs approved by the FAA through the STC process.

FIGURE 2. REQUIRED WARNING LABEL FOR AVIATION CHILD SAFETY DEVICES WITHOUT FMVSS NO. 213 APPROVAL

c. Consumer Education. The FAA is taking steps to educate consumers regarding the difference between devices safe for use in both motor vehicles and aircraft versus those safe only for use in aircraft. The FAA revised the information on its Web site for passengers traveling with children (http://www.faa.gov/passengers/fly_children/), and put additional educational material on the site to remind people that ACSDs are not safe for use in motor vehicles. The FAA also encourages airline personnel, especially flight attendants (F/A), to take advantage of opportunities to educate parents and guardians who use ACSDs on aircraft regarding the differences between those “aviation only” ACSDs and devices that can be used safely in both aircraft and motor vehicles.

NOTE: Unless indicated otherwise, any information regarding CRSs and pertinent regulations also apply to ACSDs.

9. LABELING ON A CRS APPROVED FOR USE DURING GROUND MOVEMENT, TAKEOFF, AND LANDING. Current operating rules in parts 91, 121, 125, and 135 require that a CRS used on aircraft during ground movement, takeoff, and landing meet one of the following labeling or marking requirements:

a. Required Labels. The CRS must bear two labels. However, typically the text for these two required labels is merged onto one label. The labeling must include the text "This child restraint system conforms to all applicable Federal Motor Vehicle Safety Standards" and "This Restraint is Certified for Use in Motor Vehicles and Aircraft," in red lettering. Figure 3 is an example of this required labeling.

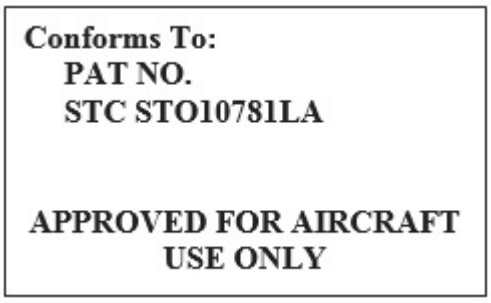
FIGURE 3. EXAMPLE OF REQUIRED LABELING

b. Approval Labels. The CRS must bear either a label showing approval of a foreign government or a label showing that the CRS was manufactured under the standards of the UN. Figure 4 is an example of the required labeling for a CRS manufactured under the standards of the UN (the "E" is consistently used in the label, but the number to the right of the "E" can change because it is the distinguishing number of the country that has granted approval).

FIGURE 4. EXAMPLE OF THE REQUIRED LABELING FOR A CRS MANUFACTURED UNDER UNITED NATIONS (UN) STANDARDS

c. FAA Approval Label. The CRS must bear a label or markings showing FAA approval through an STC. Figure 5 is an example of this required labeling.

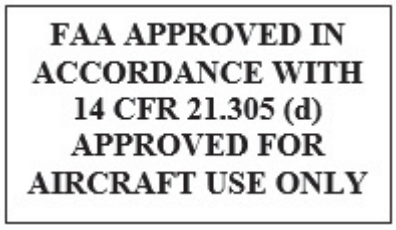
FIGURE 5. EXAMPLE OF REQUIRED LABELING FOR CRS APPROVED UNDER AN STC



d. TSO Label. A CRS approved under the current version of TSO-C100 must be permanently and legibly marked "TSO-C100" and must include the TSO version under which it was approved. For instance, a CRS approved under TSO-C100c must be permanently and legibly marked "TSO-C100c."

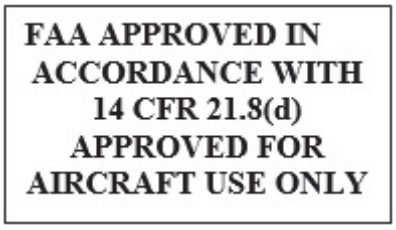
e. Label Indicating Approval Under § 21.305(d) (2010 ed.). The CRS must be clearly marked showing FAA approval under § 21.305(d) and bear the label "FAA Approved in Accordance with 14 CFR § 21.305(d)."

FIGURE 6. EXAMPLE OF REQUIRED LABELING FOR CRS APPROVED UNDER 14 CFR PART 21, § 21.305(d)



f. Label Indicating Approval Under § 21.8(d). The child restraint device manufactured by AmSafe, Inc. (CARES, Part No. 4082) and approved by the FAA in accordance with § 21.8 is the only device that may bear a label or markings showing FAA approval in accordance with § 21.8. Figure 7 is an example of an appropriate label for this device.

FIGURE 7. EXAMPLE OF REQUIRED LABELING FOR CRS APPROVED UNDER 14 CFR PART 21, § 21.8(d)



10. REGULATORY REQUIREMENTS REGARDING THE USE OF CRSs ON AIRCRAFT.

a. Children Under the Age of Two. Under the provisions in parts 121, 125, and 135, during takeoff, landing, and movement on the surface, each person on board shall occupy an approved seat or berth with a separate seatbelt properly secured about him/her. However, a person who has not reached his/her second birthday may be held by an adult occupying a seat or berth. During takeoff, landing, and movement on the surface, a child under the age of two may be held in an adult's lap or be placed in a regular passenger seat and use a standard seatbelt.

b. Proper Use of CRS. If a child occupies a CRS, a parent/guardian must accompany the child, and the aircraft operator must comply with the requirements that the child is properly secured in the CRS, the CRS is properly secured in a forward-facing seat, the child does not exceed the weight limits of the CRS, and the CRS is approved and has the proper labels or markings.

c. CRS Restrictions. No aircraft operator may permit a child to occupy a booster-type, vest-type, harness-type, or lap-held CRS during takeoff, landing, and movement on the surface, except when the CRS has been approved by the FAA through a TC, STC, TSO, under § 21.305(d) (2010 ed.), or under § 21.8(d). Booster-type, vest-type, and harness-type CRSs approved by the FAA through a TC, STC, TSO, under § 21.305(d) (2010 ed.), or under § 21.8(d), may be used during all phases of flight.

d. Regulations. Under the provisions in parts 121, 125, and 135, no certificate holder may prohibit a child from using an approved CRS when the parent/guardian purchases a ticket for the child. Certificate holders are encouraged to allow the use of empty seats to accommodate CRS; however, they are not required to allow non-ticketed children to occupy empty passenger seats, even if the child uses a CRS.

e. Approved CRSs. The regulations allow aircraft operators to provide approved CRSs for use.

f. Operators Prohibiting CRS Use. No aircraft operator may prohibit a child from using an approved CRS when the parent/guardian purchases a seat for the child. If an approved CRS, for which a ticket has been purchased, does not fit in a particular seat on the aircraft, the aircraft operator has the responsibility to accommodate the CRS in another seat in the same class of service. The regulations also permit an aircraft operator to use its discretion in identifying the most appropriate forward-facing passenger seat location, considering safe operating practices. For example:

(1) A CRS with a base that is too wide to fit properly in a seat with rigid armrests can be moved to a seat with moveable armrests that can be raised to accommodate the CRS in the same class of service.

(2) An aft-facing CRS that cannot be installed properly, because of minimal pitch (distance between seats) between rows, can be moved to a bulkhead seat or a seat in a row with additional pitch in the same class of service.

(3) A harness type CRS (approved under § 21.305(d) (2010 ed.) (i.e., CARES, Part No. 4082) or under § 21.8(d)) with an upper strap unable to encircle some sleeper seats or very large first-class seats, can be moved to another seat that can accommodate the strap in the same class of service.

> **NOTE: An aircraft operator may have policies, based on safe operating practices, that establish certain seat locations for passengers who use a CRS on a specific aircraft. However, prohibiting the use of a CRS (if a ticket has been purchased), when there are seats on the aircraft in the same class of service where the CRS could be used safely, is not consistent with the requirements in parts 121, 125, and 135.**

11. SEAT DIMENSION DISCLOSURE. Consistent with the FAA Modernization and Reform Act of 2012, § 121.311(k) requires air carriers conducting part 121 operations to make available on their Web sites the width of the narrowest and the widest passenger seats in each class of service for each airplane used in passenger-carrying operations. This rule facilitates the use of a CRS onboard an airplane and provides greater information to assist a caregiver to determine whether a particular CRS will fit in an airplane seat.

a. Class of Service. "Class of service" is the most relevant break point for information disclosure as it remains the prevailing terminology used to distinguish seat products, including the seat size variations and amenities that are associated with those products. The DOT defines "class of service" to mean seating in the same cabin class such as First, Business, or Economy class, or in the same seating zone if the carrier has more than one seating product in the same cabin (e.g., Economy and Premium Economy class); or seats that are wider or have more legroom that are available at a higher cost to passengers. Because no certificate holder may prohibit a child from occupying a CRS if the child holds a ticket for an approved seat, the agency has stated that the aircraft operator need only accommodate the CRS in another seat in the same class of service.

b. Measurement of Seat Width. Section 121.311 includes a definition of seat width applicable to seat dimension disclosure requirements. The definition specifies that seat width is the distance between the inside of the seat armrests.

c. Accommodation of a CRS. An operator may have policies, based on safe operating practices that establish certain seat locations for a passenger who uses a CRS on a specific aircraft. Even if a certain seat can accommodate an approved CRS, an operator does not have to permit the CRS in that location if the operator's policies disallow the CRS in that seat. However, prohibiting the use of a CRS (if a ticket has been purchased) when there are seats on the aircraft, in the same class of service, where the CRS could be used safely is not consistent with the requirements stated in part 121. As an operator determines how best to meet the requirement of § 121.311(k), it would be beneficial to the air carrier and would help facilitate the use of a CRS onboard an airplane, if the air carrier only provides seat widths for seats that an air carrier allows for CRS use.

d. Effective Practices Regarding Air Carrier Information. In addition to the seat width information required by § 121.311, the FAA encourages air carriers to include information on

their Web sites about their operational policies and limitations regarding the placement of CRS in specific seats or locations on their aircraft. For example, if an air carrier prohibits a CRS in aisle seats, it would be beneficial to list this on the air carrier's Web site because it would provide greater information to a caretaker when choosing assigned seats and determining whether a particular CRS will fit in an airplane seat.

12. WORN OR UNREADABLE LABELS.

a. Regulatory Requirement. When an approved CRS is labeled or marked by the manufacturer, it certifies the CRS meets a set of safety standards (FMVSS No. 213, the standards of a foreign government, the standards of the UN, or approval by the FAA through a TC, STC, TSO, or under § 21.305(d) (2010 ed.) or § 21.8(d)). Current operating rules require the CRS used on an aircraft during ground movement, takeoff, and landing bear labels or markings to indicate to the aircraft operator that the CRS meets safety standards.

b. CRS with a Worn or Unreadable Labels. When a parent/guardian presents an approved CRS for use on aircraft with a worn off or unreadable label, the CRS must be furnished with a letter or document from the manufacturer that specifically ties the CRS (through a detailed description or specific make and model number) to approval for use on aircraft. An owner's manual is also acceptable as proof of safety standards, as these booklets contain pictures or illustrations of the CRS and information that the CRS meets FMVSS No. 213.

13. TYPES OF CRSs MEETING THE CRITERIA OF FMVSS NO. 213, STANDARDS OF A FOREIGN GOVERNMENT, OR STANDARDS OF THE UN. Basic design features for the majority of approved CRSs for use on aircraft have remained fairly constant, although some changes and innovations in the design of CRSs have occurred as a result of FAA approval of CRSs through a TC, STC, TSO, or under § 21.305(d) (2010 ed.) or § 21.8(d). An aircraft operator's personnel, specifically F/As, should be aware of the following items pertaining to a CRS meeting the criteria of FMVSS No. 213, the standards of a foreign government, or the UN. The criteria include:

- The CRS should have a solid back and seat,
- The CRS should have internal restraint straps installed to securely hold the child in the CRS, and
- The CRS must have a label showing approval for aviation use.

FIGURE 8. EXAMPLE OF A FORWARD-FACING CRS WITH INTERNAL HARNESS

FIGURE 9. EXAMPLE OF AN AFT-FACING CRS WITH INTERNAL HARNESS

14. TYPES OF CRSs APPROVED BY A TC, STC, TSO, UNDER SECTION 21.305(d) (2010 ed.) OR § 21.8(d). Typically, a CRS approved by the FAA through the TSO process will be similar in design to a CRS meeting the requirements of FMVSS No. 213. However, a CRS approved by the FAA through a TC, STC, TSO, or under § 21.305(d) (2010 ed.) or § 21.8(d), may contain novel and unusual design features. In addition, the regulations allow the use of a booster-type or vest- and harness-type CRS, if the FAA has approved it through a TC, STC, TSO, under § 21.305(d) (2010 ed.) or § 21.8(d) (§§ 121.311(b)(2)(ii)(C)(3), 121.311(b)(2)(ii)(C)(4), and 121.311(c)(1)). The aircraft operator is responsible for ensuring that crewmembers have proper training and information regarding the use of a CRS approved for use on aircraft through a TC, STC, TSO, under § 21.305(d) (2010 ed.) or § 21.8(d). Figure 10 is an example of a CRS that has been approved by the FAA through an STC, as well as under § 21.305(d) (2010 ed.).

FIGURE 10. EXAMPLE OF A CRS (ACSD) APPROVED THROUGH STC AND UNDER § 21.305(d) (2010 ed.)

15. CRSs NOT APPROVED FOR USE DURING GROUND MOVEMENT, TAKEOFF, AND LANDING. In 1994, the FAA issued a study entitled, The Performance of Child Restraint Devices in Transport Airplane Passenger Seats. The research for the study conducted by the FAA Civil Aerospace Medical Institute (CAMI) involved dynamic impact tests with a variety of CRSs installed in transport category aircraft passenger seats. The results of this study were used as the basis for prohibiting the use of the following devices during ground movement, takeoff, and landing. The FAA Office of Aerospace Medicine (AAM) Technical Report, The Performance of Child Restraint Devices in Transport Airplane Passenger Seats (FAA-AM-94-19), may be found at: http://www.faa.gov/data_research/research/med_humanfacs/oamtechreports/1990s/media/AM94-19.pdf. The CAMI study revealed:

a. Belly Belts. These devices attach the child to the accompanying adult. The child is restrained by an abdominal belt attached to the adult's seatbelt. During dynamic testing, the forward flailing of the adult and the child resulted in severe body impacts against the forward seat. The child Anthropomorphic Test Dummy (ATD) moved forward to impact the forward row seat back, followed by the adult ATD torso striking the child ATD. Then, the adult ATD torso continued to move forward after contact with the child ATD, crushing the child ATD against the seat back.

b. Harness Restraints. The devices tested consisted of a torso harness for the child ATD placed in its own seat with the airplane seatbelt routed through a loop of webbing attached to the back of the harness. During dynamic testing, the devices allowed excessive forward body excursion, resulting in the test dummy sliding off the front of the seat with a high likelihood of the child's entire body impacting the seat back of the seat directly in front of it. Then, elasticity in the webbing of the harness and seatbelts pulled the ATD rearward and this rebound acceleration presented further risk of injury.

c. Booster Seats. A key concern for backless booster seats used in airplane seats is the combined effect of seat back breakover and impact of an adult seated behind the child. Booster

seats may expose the child occupant to potential abdominal injury due to the combined effects of these forces.

d. Prohibition. Except for ACSDs approved by the FAA through a TC, STC, TSO, under § 21.305(d) (2010 ed.), or § 21.8(d), the following CRSs continue to be prohibited for use during ground movement, takeoff, and landing:

- Lap-held child restraint (commonly referred to as a belly belt);
- Vest- and harness-type devices that attach the child to the parent, the parent's restraint system, or to the aircraft seatbelt; and
- Booster-type child restraints (even though they may bear appropriate labels showing that they meet applicable UN standards or are approved by a foreign government).

16. FAA BOOSTER SEAT DEFINITION. The FAA defines booster seats as those that are a raised platform base on which the child sits. A front shield, over which the lap belts are routed, covers the abdominal area of the child. Booster seats do not have a back or side shell. There are no integral belts to restrain the child. The use of such automotive booster seats is prohibited by the FAA's operating rules during ground movement, takeoff, and landing. A child large enough for a booster seat can also be properly restrained in the normal passenger seat lap belts.

FIGURE 11. EXAMPLE OF A BACKLESS BOOSTER SEAT

17. CRS MANUFACTURERS' BOOSTER SEAT DEFINITION.

a. Overview. Some manufacturers choose to market and label their approved CRSs with backs as "booster seats." These "booster seats" do not meet the FAA definition of a booster seat. However, these "booster seats" fall into two categories, those with and without internal restraints. As per FMVSS No. 213, the manufacturer's labeling will specify that a CRS without internal restraints is not certified for use in aircraft. However, with internal restraints, solid backs, and the proper labeling, these CRSs marketed as "booster seats" will be labeled as certified for use in motor vehicles and aircraft and may be used for all phases of flight.

b. Approved "Booster Seat." The CRSs in the following image (Figure 12, CRS with Internal Restraint Marketed as a "Booster Seat") would be approved for use during all phases of flight.

FIGURE 12. CRS WITH INTERNAL RESTRAINT MARKETED AS A "BOOSTER SEAT"

c. Non-Approved "Booster Seat." The CRS in the following image (Figure 13, CRS without Internal Restraint Marketed as a "Booster Seat") would not be approved for use during all phases of flight.

FIGURE 13. CRS WITHOUT INTERNAL RESTRAINT MARKETED AS A "BOOSTER SEAT"

18. PASSENGER USE OF NON-APPROVED CRSs ON AN AIRCRAFT.

a. Regulations. The regulations contained in § 121.311 prohibit the use of certain types of CRSs during ground movement, takeoff, and landing. However, during the cruise portion of the flight, there is no regulatory prohibition regarding the use of any type of child restraint, including those prohibited from use during ground movement, takeoff, and landing.

b. Operational Flexibility. Also, there is no regulatory requirement that an aircraft operator must permit the use of a "non-approved" CRS during the cruise portion of the flight. If an aircraft operator decides to implement a policy to prohibit the use of a non-approved CRS in-flight, the operator has the operational flexibility to do so.

19. PLACEMENT OF CRS ON THE AIRCRAFT. A CRS must be installed in a forward-facing aircraft seat, in accordance with instructions on the label. This includes placing the CRS in the appropriate forward- or aft-facing direction as indicated on the label for the size

of the child. A window seat is the preferred location; however, other locations may be acceptable, provided the CRS does not block the egress of any passenger, including the child's parent or guardian, to the aisle used to evacuate the aircraft. The regulations contained in §§ 91.107, 121.311, 125.211, and 135.128 allow aircraft operators to determine the most appropriate passenger seat location for a CRS based on safe operating practices. In making this determination, an aircraft operator should consider the following:

a. Aisle Seats. CRSs should not be placed in an aisle seat because this placement has the highest risk of slowing down the passenger flow rate during an evacuation. For example, a parent or guardian traveling with the child in a CRS may step out into the aisle to release the child from the CRS, or the CRS may impede F/As who may need to climb over the top of aisle seats to get past passengers in the aisle to reach an emergency exit.

b. Rows Forward and Aft of Emergency Exit Rows. Each aircraft operator's specific evacuation procedures should be considered during the development of procedures regarding the placement of a CRS on aircraft.

(1) In an evacuation, space has to be rapidly cleared forward or aft of the exit row so that no one would be hurt or trapped if the exit hatch was thrown in this area. A delay may occur as a parent/guardian removes a child from a CRS. If the aircraft operator's crewmember evacuation procedures or instructions to passengers demonstrate the removal and placement of Type III exit hatches (as defined in 14 CFR part 23, § 23.807, part 25, § 25.807, and part 29, § 29.807) in the row forward or aft of the emergency exit row, the aircraft operator should restrict the placement of CRSs accordingly.

(2) Installation of a CRS in the row forward of an exit keeps a seat back from breaking over. Aircraft seats are not required to break over, but if an aircraft operates with this feature and evacuation procedures include breaking over seat backs forward of an exit to create space for a crewmember or to create a wider evacuation path for passengers, the aircraft operator should restrict the placement of CRSs accordingly.

c. Proper Installation.

(1) Some CRSs will not fit into certain aircraft seats. In this instance, the CRS may not be used on those seats. Examples of this include:

- When the base of a CRS with a solid back and seat is wider than an aircraft seat with rigid armrests or
- When the strap encircling the seat back on a harness-type CRS approved under the provisions of § 21.305(d) (2010 ed.) or § 21.8(d) does not fit around some sleeper seats or very large first-class seats.

(2) Certain aircraft seat models have a recessed tray table cavity with rigid sides into which the tray table fits when closed. If the strap encircling the seat back on a harness-type ACSD is installed underneath the tray table, then this seat back design will not allow the tray table to be properly secured during ground movement, takeoff, and landing. In this case, the strap

must be placed completely over both the seat back and stowed tray table during these phases of aircraft operation.

(3) Some seats are equipped with inflatable seat belts. A seat belt extender must always be used with a CRS installed in a seat equipped with an inflatable seat belt. The seat belt extender will deactivate the inflation component of the seat belt installed in that seat. Not using a seat belt extender with a CRS in a seat equipped with an inflatable seat belt can result in death or serious injury.

20. TRAVELING WITH MORE THAN ONE CHILD. In the event a parent/guardian is traveling with more than one child in a CRS or is traveling with several small children, only one of whom is occupying a CRS, good judgment should be used regarding placement of the CRS. As long as these conditions below are met, the CRS could be placed in a seat other than a window seat. At a minimum:

- The CRS should be placed so it does not block any passenger's (including the parent's/guardian's) egress to the aisle used to evacuate the aircraft and
- The CRS should be placed so the parent/guardian can reach the child in the CRS to release and evacuate with the child, should an emergency evacuation be necessary.

21. RESPONSIBILITY FOR ENSURING THE PROPER USE OF CRS. If the CRS is supplied by the parent or guardian, typically he or she will check to ensure that the CRS is approved and that the child is the right size and weight for the CRS. In addition, the parent will usually ensure that the CRS is properly installed in a forward-facing passenger seat. However, aircraft operators still have overall responsibility to ensure that the CRS is properly secured to a forward-facing seat, the child is properly secured in the CRS and does not exceed the weight limit for the CRS, and that the CRS bears appropriate labels or markings (§ 121.311(b)(2)(iii)).

22. EFFECTIVE PRACTICES FOR CONSIDERATION. Effective practices may include:

- The aircraft operator's training program and crewmember operating manuals should contain information, policy, and procedures regarding CRS use;
- The CRS should be secured to a regular passenger seat at all times or, if not in use, stowed as carry-on baggage; and
- The child should always be properly secured in the CRS whenever other passengers are required to fasten their seatbelts.

23. AN ADULT AS FOUND IN SECTION 121.311. The word "adult," as it appears in § 121.311, is used in the ordinary sense of the word to denote a person 18 years of age or older (http://www.faa.gov/about/initiatives/cabin_safety/regs/legal/media/age_adult.pdf).

24. USE OF AN APPROVED CRS FOR A CHILD WITH DISABILITIES. The majority of individuals using CRSs on aircraft are young children typically weighing 40 pounds or less. However, there are some people who, because of physical challenges, need the support and security that a restraint system provides in order to travel safely on aircraft. Aircraft operators should ensure F/As are aware that older children (who have not reached their eighteenth birthday) may use a properly approved CRS that is appropriate for that child's size and weight.

In this case, the aircraft operator may not prohibit the use of the CRS. There are several companies manufacturing CRSs approved for use on aircraft specifically designed for larger children who are physically challenged.

25. USE OF A NON-APPROVED CRS FOR A CHILD, OR A NON-APPROVED RESTRAINT SYSTEM FOR AN ADULT, WITH DISABILITIES. In the case of a person who, because of physical challenges, needs the support and security of a non-approved CRS or restraint system, the individual, his or her guardian, or the aircraft operator (on the individual's behalf) may request an exemption to certain operating rules addressing the use of the CRS on the aircraft. Upon application, the FAA will determine whether the exemption request will be granted in order to allow the use of a non-approved restraint system during all phases of flight. As part of the conditions and limitations of granting the exemption, the individual or the parent/guardian must advise the air carrier about the contents of the exemption at least 48 hours before the date of each flight and have a copy of the grant of exemption available for the aircraft operator to review when using a non-approved CRS or restraint system on aircraft.

26. HOW TO PETITION FOR EXEMPTION. To find out how to submit a petition for exemption, refer to http://www.faa.gov/regulations_policies/rulemaking/petition/. To review previously granted exemptions regarding the use of restraint systems, refer to the FAA's Automated Exemption System at http://aes.faa.gov/. To view previously granted exemptions regarding the use of specialized restraint for adults, type "12485," or "9364" in the "Docket Search" field. To view previously granted exemptions regarding the use of non-approved restraint for children, type "17184," "29824,", "28630" or "8264", "9834" in the "Docket Search" field.

27. IMPROVING EMERGENCY EVACUATION CAPABILITIES. To improve emergency evacuation capabilities, the CRS should remain attached to the passenger seat during an emergency evacuation, and only the child should be removed from the aircraft. Researchers from CAMI, Aerospace Medical Research Division (AAM-600), have completed two studies designed to determine the most favorable methods for the emergency evacuation of infants from aircraft. All CAMI Aerospace Medicine Technical Reports can be found at: http://www.faa.gov/library/reports/medical/oamtechreports/.

a. Slide Evacuation. The purpose of the first study, Aerospace Medicine Technical Report DOT/FAA/AM-01/18, was to determine the most favorable methods for the evacuation of infants via an inflatable emergency evacuation slide. The results of this study strongly suggest that jumping onto the slide should be the favored boarding maneuver, as opposed to sitting down and sliding which slows the progress of the evacuation. The carrying position that provides the most protection for the child would include cradling the child's head and neck with the hand (for a vertical position) or in the arm (for horizontal positions), keeping the child's arms, legs and feet enfolded as much as possible by the adult's arms.

b. Overwing Exit Evacuation. The purpose of the second study, Aerospace Medicine Technical Report DOT/FAA/AM-05/2, was to determine the most favorable methods for evacuation of infants through a Type III overwing exit. The results of this study suggest that carrying the infant vertically should be the favored egress maneuver through the Type III exit, as opposed to carrying the child horizontally or passing the child to another passenger on the outside of the Type III exit.

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