Advisory Circular

Subject: Use of Child Restraint Systems on Aircraft

Date: 12/1/06

AC No: 120-87A

Initiated by: AFS-200

1. PURPOSE. This advisory circular (AC) provides information and practices regarding the use of Child Restraint Systems (CRS) on aircraft. It is intended to be used as a resource during the development, implementation, and revision of aircraft operator procedures and training programs regarding the use of CRS. This AC is (1) part of several Federal Aviation Administration (FAA) initiatives designed to address safety concerns of the National Transportation Safety Board (NTSB); and (2) part of the FAA's ongoing commitment to educate and inform aircraft operators, crewmembers, and airline passengers regarding the use of CRS on aircraft in order to encourage and increase the use of approved CRS. For more information, see the following FAA Web site: http://www.faa.gov/passengers/fly_children/crs/.

2. CANCELLATION. AC 120-87, Use of Child Restraint Systems on Aircraft, dated November 3, 2005, is cancelled.

3. RELATED REGULATIONS. Title 14 of the Code of Federal Regulations (14 CFR) part 21, § 21.305; part 91, §§ 91.107 and 91.1035; part 121, § 121.311; part 125, § 125.211; and part 135, § 135.128 (http://www.gpoaccess.gov/ecfr).

4. RELATED FAA GUIDANCE. This AC provides information and suggested practices regarding the use of CRS on aircraft. This AC also supplements and contains information previously published in:

- AC 91-62A, Use of Child Seats In Aircraft (http://www.faa.gov/safety/programs_initiatives/aircraft_aviation/cabin_safety/regs/ac/)
- FSAT 99-03, Types of and Use of Child Restraint on Air Carriers (http://www.faa.gov/safety/programs_initiatives/aircraft_aviation/cabin_safety/regs/handbook_and_bulletins/)
- FAA-AM-78-12, Child Restraint Systems for Civil Aircraft (http://www.faa.gov/library/reports/medical/oamtechreports/1970s/media/AM78-12.pdf)
- FAA-AM-94-19, Performance of Child Restraint Devices in Transport Airplane Passenger Seats (http://www.faa.gov/library/reports/medical/oamtechreports/1990s/media/AM94-19.pdf)

- Order 8400.10, Change 26, volume 3, chapter 16, section 6, Cabin Safety and Flight Attendant Management (http://www.faa.gov/library/manuals/examiners_inspectors/8400)

5. AUDIENCE. People involved in the development of aircraft operator procedures and training programs, as well as crewmembers 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 people associated with operations under parts 125, 135, and 91.

6. HISTORY OF CRS REQUIREMENTS AND APPROVAL STANDARDS.

a. Civil Air Regulations Section 40.174. The permissive language that does not require children under the age of 2 to be restrained can be found in the 1953 Civil Air Regulations, section 40.174, which stated that "A seat and an individual safety belt are required for each passenger and crewmember excluding infants…"

b. Federal Motor Vehicle Standard (FMVSS) No. 213. In 1982, the Department of Transportation (DOT) had two standards for CRS. CRS 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) C100. 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 CRS. One of those recommendations was that DOT simplify its two different standards setting 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 CRS. The agencies proposed that NHTSA would be the sole agency responsible for administering the new FMVSS No. 213, which would be applicable to both CRS designed for use in motor vehicles and CRS designed for use in aircraft (Title 49 of the Code of Federal Regulations (49 CFR) part 571, § 571.213) (http://www.gpoaccess.gov/ecfr).

c. United Nations 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 United Nations or are approved by a foreign government (57 FR 42662) (http://www.gpoaccess.gov/fr/index.html).

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) (http://dmses.dot.gov/docimages/pdf93/343347_web.pdf).

e. FAA Approval through Section 21.305(d), or TSO C-100b, 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 C-100b, or a later version (http://dmses.dot.gov/docimages/pdf97/405418_web.pdf).

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

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

b. STC Process. The STC process allows a specific CRS that meets testing and evaluation criteria established by the FAA to be used on a specific type of aircraft.

(1) Under the STC process, a CRS manufacturer would approach the FAA to obtain approval, via STC, for CRS to be used on specific aircraft. This allows the FAA to address novel and unusual design features associated with any new type of CRS, when the applicable regulations do not contain adequate and appropriate safety standards for the design features of a CRS presented for FAA approval. The STC process is appropriate for a CRS not meeting FMVSS No. 213.

(2) When the FAA considers granting an STC, it may publish proposed special conditions in the Federal Register for notice and comment. These proposed special conditions contain the additional safety standards the FAA considers necessary to establish a level of safety equivalent to that established by existing regulations, the required performance of the CRS, and the capability of the CRS to be installed and used without creating safety concerns. An example of special conditions that were part of an STC the FAA granted to a manufacturer for a CRS (70 FR 18271) may be viewed at: http://www.gpoaccess.gov/fr/index.html.

c. TSO Process.

(1) A TSO is a minimum performance standard (MPS) issued by the FAA for specified materials, parts, processes, and appliances used on aircraft. These MPSs 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 C-100b, Child Restraint System, contains MPSs for the testing and evaluation of CRS. The MPS references Society of Automotive Engineers (SAE) Aerospace Standard (AS) 52761. It also requires the manufacturer to provide operating instructions, equipment limitations, installation procedures and limitations, as well as instructions for continued airworthiness and maintenance of the CRS.

(2) A TSO is an MPS similar to FMVSS No. 213. However, TSO C100b provides more realistic CRS testing regarding CRS 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 C-100b (http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgTSO.nsf/MainFrame?OpenFrameSet).

d. Section 21.305(d) Process.

(1) Under the FAA's certification rules, § 21.305(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 § 21.305 over 40 years ago 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 § 21.305(d), the FAA must ensure the CRS meets an equivalant level of safety (ELOS) to other approval processes. For a CRS, the FAA's technical experts look at the benchmark (TSO C-100b, or a later version) and identify safety-critical features. They ensure the ELOS addresses each of these features adequately. This ensures a CRS approved by the FAA under § 21.305(d) will meet a high level of safety regarding testing, quality, and performance standards.

8. AVIATION CHILD SAFETY DEVICES (ACSD).

a. Avoiding Consumer Confusion. The FAA recognizes that the term "Child Restraint System" originally was 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 "CRS" to describe devices not meeting the requirements of FMVSS No. 213. The FAA will continue to use the general term "CRS" to refer to any approved seat or device used to restrain children on aircraft. However, in an additional effort to reduce consumer confusion regarding devices meeting the requirements of FMVSS No. 213 and are safe for use in motor vehicles, as well as those devices that do not meet FMVSS No. 213, the FAA has introduced a new term referring to CRSs only approved for aviation use. The FAA will call these aviation-only restraints "Aviation Child Safety Devices".

b. Warning Label. FAA-approved CRSs that do not meet FMVSS No. 213 are not safe for use in motor vehicles. The FAA worked closely with NHTSA to ensure that labeling on an ACSD does not confuse consumers into thinking that devices meeting the requirements of FMVSS No. 213 are safe for use in motor vehicles. The FAA requires that CRSs only meeting the aviation performance standards contained in TSO C-100b, or a later version, or § 21.305(d), have a clear warning label stating the CRS 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 1. REQUIRED WARNING LABEL FOR AVIATION CHILD SAFETY DEVICES WITHOUT FMVSS NO. 213 APPROVAL

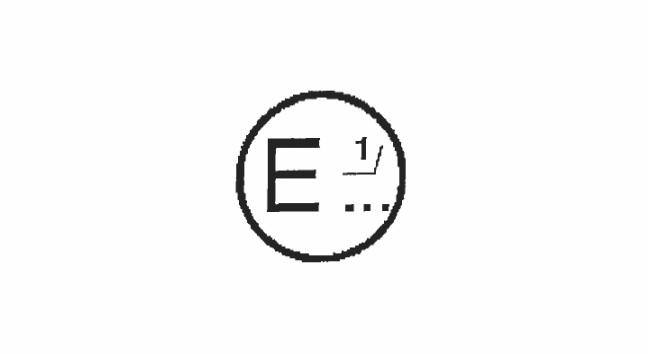
c. Consumer Education. The FAA is taking steps to educate consumers regarding the difference between devices that are safe for use in both motor vehicles and aircraft vs. those that are safe only for use in aircraft. The FAA revised the information on its Web site for passengers traveling with children (http://www.faa.gov/passengers/fly_children/crs/) 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, 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.

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

a. The CRS must bear two labels, although 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. The following is an example of this required labeling:

b. The CRS must bear either a label showing approval of a foreign Government or a label showing the CRS was manufactured under the standards of the United Nations. The following is an example of the required labeling for a CRS manufactured under the standards of the United

Nations (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):



c. The CRS must bear a label or markings showing FAA approval through an STC. The following is an example:

d. CRSs approved under TSO C-100b, must be permanently and legibly marked “TSO C-100b.”

e. 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).” The following is an example:

10. REGULATORY REQUIREMENTS CONTAINED IN SECTIONS 91.107, 121.311, 125.211, AND 135.128, REGARDING THE USE OF CRS ON AIRCRAFT.

a. During takeoff, landing, and movement on the surface, each person on board shall occupy an approved seat or berth with a separate safety belt 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.

b. 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.

c. If a child occupies a CRS, a parent/guardian or attendant 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.

d. 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, or under § 21.305(d). Booster-type, vest-type, and harness-type CRS approved by the FAA through a TC, STC, TSO, or under § 21.305(d), may be used during all phases of flight.

e. 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 unticketed children to occupy empty passenger seats, even if the child uses a CRS.)

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

g. The regulations allow aircraft operators to determine the most appropriate forward-facing passenger seat location for a CRS based on safe operating practices.

11. WHAT AN AIRCRAFT OPERATOR SHOULD DO IF A PASSENGER PRESENTS A CRS FOR USE, BUT THE LABELING HAS WORN OFF OR BECOME UNREADABLE. 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 United Nations, or approval by the FAA through a TC, STC, TSO, or under § 21.305(d)). Current operating rules require the CRS used on an aircraft during ground movement, takeoff, and landing must bear labels or markings to indicate to the aircraft operator that the CRS meets safety standards. 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.

12. TYPES OF CRSs MEETING THE CRITERIA OF FMVSS NO. 213, STANDARDS OF A FOREIGN GOVERNMENT, OR STANDARDS OF THE UNITED NATIONS. 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). An aircraft operator's personnel, specifically flight attendants, should be aware of the following items pertaining to CRSs meeting the criteria of FMVSS No. 213, the standards of a Foreign Government, or the United Nations:

a. The CRS should have a solid back and seat.

b. The CRS should have internal restraint straps installed to securely hold the child in the CRS.

c. The CRS must be labeled, stating that it has been approved for aviation use.

Example of a Forward-Facing CRS with Internal Harness

Example of an Aft-Facing CRS with Internal Harness

13. TYPES OF CRSs THAT MAY BE APPROVED BY THE FAA THROUGH A TC, STC, TSO, OR UNDER SECTION 21.305(d). Typically, a CRS approved by the FAA through the TSO process will be similar in design to a CRS meeting FMVSS No. 213 requirements. However, CRS approved by the FAA through a TC, STC, or under § 21.305(d), may contain novel and unusual design features. In addition, the regulations allow the use of booster-type or vest- and harness-type CRSs, if the FAA has approved them through a TC, STC, TSO, or under § 21.305(d) (§§ 121.311(b)(2)(ii)(C)(3), 121.311(b)(2)(ii)(C)(4), and 121.311(c)(1); http://www.gpoaccess.gov/ecfr). The aircraft operator is responsible for ensuring that crewmembers have proper training and information regarding the use of CRSs approved for use on aircraft through a TC, STC, TSO, or under § 21.305(d). The following is an example of a CRS that has been approved by the FAA through STC, as well as under § 21.305(d):

Example of a CRS approved through STC and under § 21.305(d)

14. 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 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. Dynamic video of the FAA Office of Aerospace Medicine Report, "The Performance of Child Restraint Devices in Transport Airplane Passenger Seats," may be viewed at: http://www.faa.gov/education_research/research/med_humanfacs/aeromedical/biodynamics/index.cfm. 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.

NOTE: Except for CRSs approved by the FAA through a TC, STC, TSO, or under § 21.305(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
- Booster-type child restraints (even though they may bear appropriate labels showing that they meet applicable United Nations standards or are approved by a foreign Government)

15. FAA DEFINITION OF "BOOSTER SEAT." 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.

Example of a Backless Booster Seat

16. CRS MANUFACTURERS' USE OF THE TERM "BOOSTER SEAT."

a. 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. The CRS in the following image (CRS with Internal Restraint Marketed as a Booster Seat) would be approved for use during all phases of flight:

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

17. PASSENGER USE OF NON-APPROVED CRSs ON AN AIRCRAFT, SUCH AS A CLOTH BABY CARRIER OR A VEST/HARNESS DEVICE THAT ATTACHES THE CHILD TO THE PARENT DURING FLIGHT.

a. 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. Also, there is no regulatory requirement that an aircraft operator permit the use of "non-approved" CRSs during the cruise portion of the flight. If an aircraft operator decides to implement a policy to prohibit the use of non-approved CRSs inflight, they have the operational flexibility to do so.

18. PLACEMENT OF CRS ON THE AIRCRAFT. CRSs must be installed in forward-facing aircraft seats, 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 CRSs 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 flight attendants 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 placement of CRSs 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 seatback 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 seatbacks 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 CRS 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) 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 CRS

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.

19. TRAVELING WITH MORE THAN ONE CHILD. In the event a parent/guardian is traveling with more than one child in CRSs or is traveling with several small children, only one of whom is occupying a CRS, good judgment should be used regarding placement of the CRSs. 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/guardian's) egress to the aisle used to evacuate the aircraft

- 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

20. RESPONSIBILITY FOR ENSURING THE PROPER USE OF CRS. If the approved CRS is supplied by the parent or guardian, typically he or she will check to ensure the CRS is approved, the child is the right size and weight for the CRS, and the CRS is properly installed in a forward-facing passenger seat. However, aircraft operators still have overall responsibility to ensure 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); http://www.gpoaccess.gov/ecfr).

21. EFFECTIVE PRACTICES THAT AN AIRCRAFT OPERATOR MAY CONSIDER IN ITS PROGRAM. Effective practices can 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

- The child should always be properly secured in the CRS whenever other passengers are required to fasten their seatbelts

22. FAA INTENT REGARDING THE AGE OF 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/safety/programs_initiatives/aircraft_aviation/cabin_safety/regs/legal/).

23. CONSIDERATIONS REGARDING THE 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 a restraint system provides in order to travel

safely on aircraft. Aircraft operators should ensure flight attendants are aware that older children (who have not reached their eighteenth birthday) may use a properly approved CRS 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.

24. CONSIDERATIONS REGARDING THE 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 a non-approved CRS or restraint system provides in order to travel safely on aircraft, 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 CRS on aircraft. Upon application, the FAA will determine whether the exemption request will be granted in order to allow the use of any non-approved restraint systems during all phases of flight. While not required, it has been found to be an effective practice for the individual or the parent/guardian to have a copy of the grant of exemption available for aircraft operator review when using a non-approved CRS or restraint system on aircraft. See paragraph 25 for information on requesting an exemption.

25. HOW A PETITION FOR EXEMPTION IS SUBMITTED. To find out how to submit a petition for exemption, visit http://www.faa.gov/regulations_policies/rulemaking/petition/. Exemption information is also available for review on the DOT Docket Management System Web site. To review previously granted exemptions regarding the use of restraint systems, visit http://dms.dot.gov/. To view previously granted exemptions regarding the use of specialized restraint for adults, type "12485," or "9364" in the blank "Docket Search" field. To view previously granted exemptions regarding the use of non-approved restraint for children, type "17184," "29824," or "28630" in the blank "Docket Search" field.

26. IMPROVING EMERGENCY EVACUATION CAPABILITIES WHEN A CHILD IS USING A CRS. 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, 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. The purpose of the first study, 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. The purpose of the second study, DOT/FAA/AM-05/02, 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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