Method to qualify carry-on child restraint systems intended for use in aircraft and practical application

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Safety Position for Infants and Children

The situation at present:

Child sitting on the lap

Loopbelt

U.S. approved CRS

FAR Part 121 (§ 121.311,(b) (2) (ii) (B))

“Seats manufactured to U.S. standards on or after February 26,1985,
must bear the following two labels:

„This child restraint system conforms to all applicable Federal motor vehicle safety standards“

+

This restraint is certified for use in motor vehicle and aircraft

Problems of fixing

No equivalent safety for children compared to adults

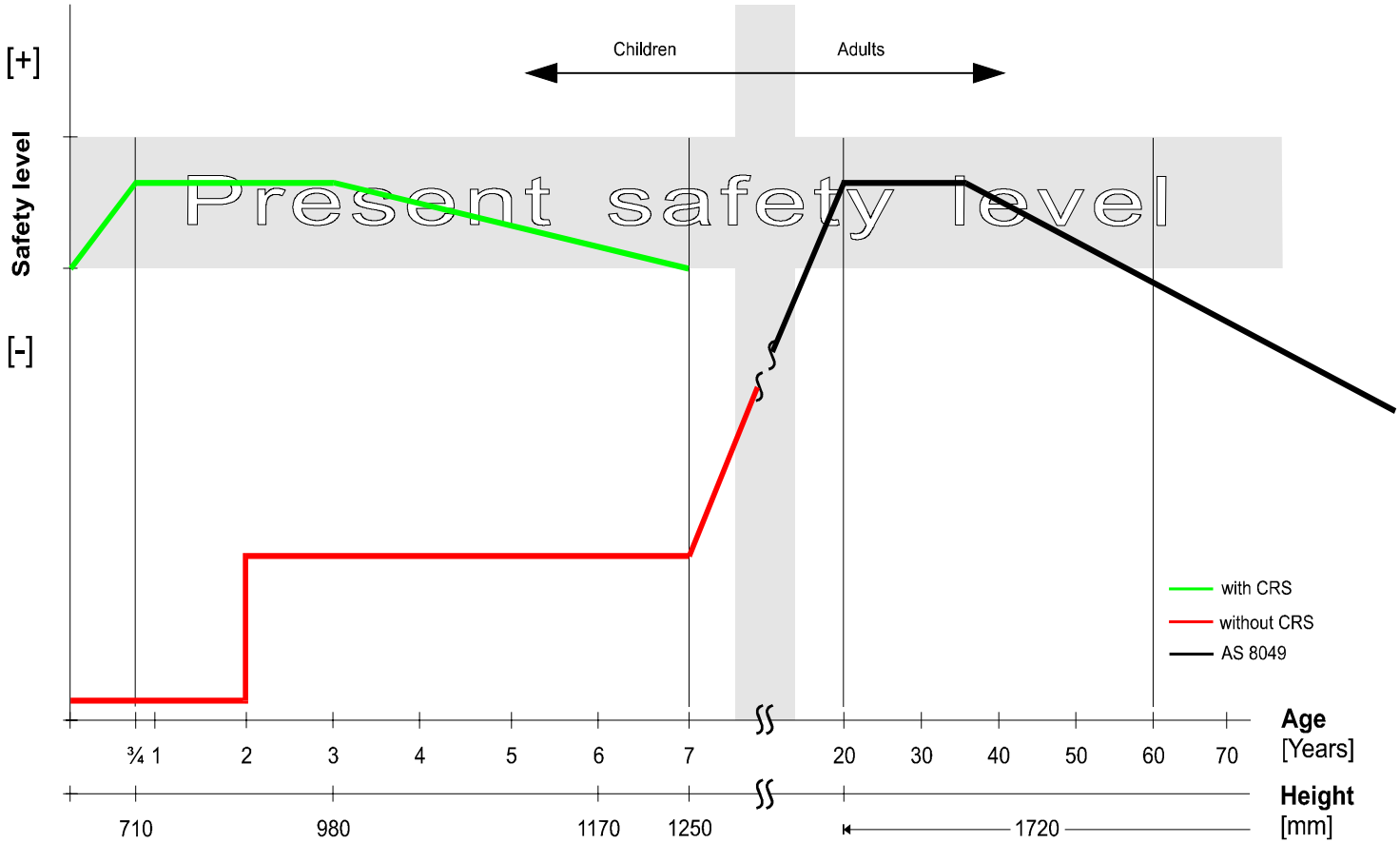
Reasons:

- For children up to two years no own passenger seat !

  ↳ NO OWN SURVIVAL AREA !

- For all children up to 7 years no suitable restraint systems !

Safety level for the 50% passenger



Recommendations

Main results from different research projects

- Passive safety for infants and children, adequate to adults passive safety, can only be achieved with an own seat and a suitable restraint system
- Depending on the age (weight) it must be differentiated between forward- and backward-facing restraint systems
- Children up to 1,25 metres in height must use a suitable CRS
- The enhancement of cabin safety for infants and children can only be improved by a **standard procedure** which describes the **qualification of CRS including operational aspects**

Qualification Procedure

The qualification procedure was developed:

- on the basis of the results from research and development projects
- with the assistance of airlines, CRS Manufacturers, LBA and JAA

It comes up to the needs:

- of the parents for more safety for their children
- the airlines‘ present operational possibilities
- the official requirements pursuant to JAR OPS 1

Qualification Procedure

The procedure

- „Qualification Procedure for Child Restraint Systems (CRS) intended for Use in Aircraft “
  TÜV Doc.: TÜV / 958 – 01 / 2001

- Field of application

  Use of child seats in aircraft with the approval of the Luftfahrt-Bundesamt [German Aviation Authority]

Qualification of CRS

Prerequisite:

- a qualifying organisation
  (an organisation accepted by the national aviation authority for the implementation of the qualification which is independent of the product)

- at least one CRS manufacturer who intends to qualify his or her product in accordance with the Qualification Procedure

  ➡ approval application for use of the qualification mark

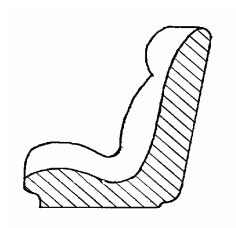
- an airline which intends to qualify one or more CRS for its fleet

  ➡ application for qualification

Qualification of CRS

CRS Manufacturers

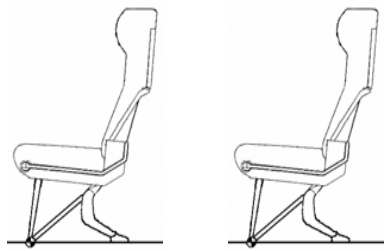
Documentation of the Child Restraint System



- certification in accordance with ECE - R44, FMVSS 213 or other national aviation-technical standards
- geometrical dimensions
- head motion trajectory
- aviation-specific instruction of use
- environmental conditions in the aircraft

Airlines

Documentation of the Seat Configuration



- cabin layouts
- list of dimensions and display of seat configurations
- description of pelvic belts including fittings

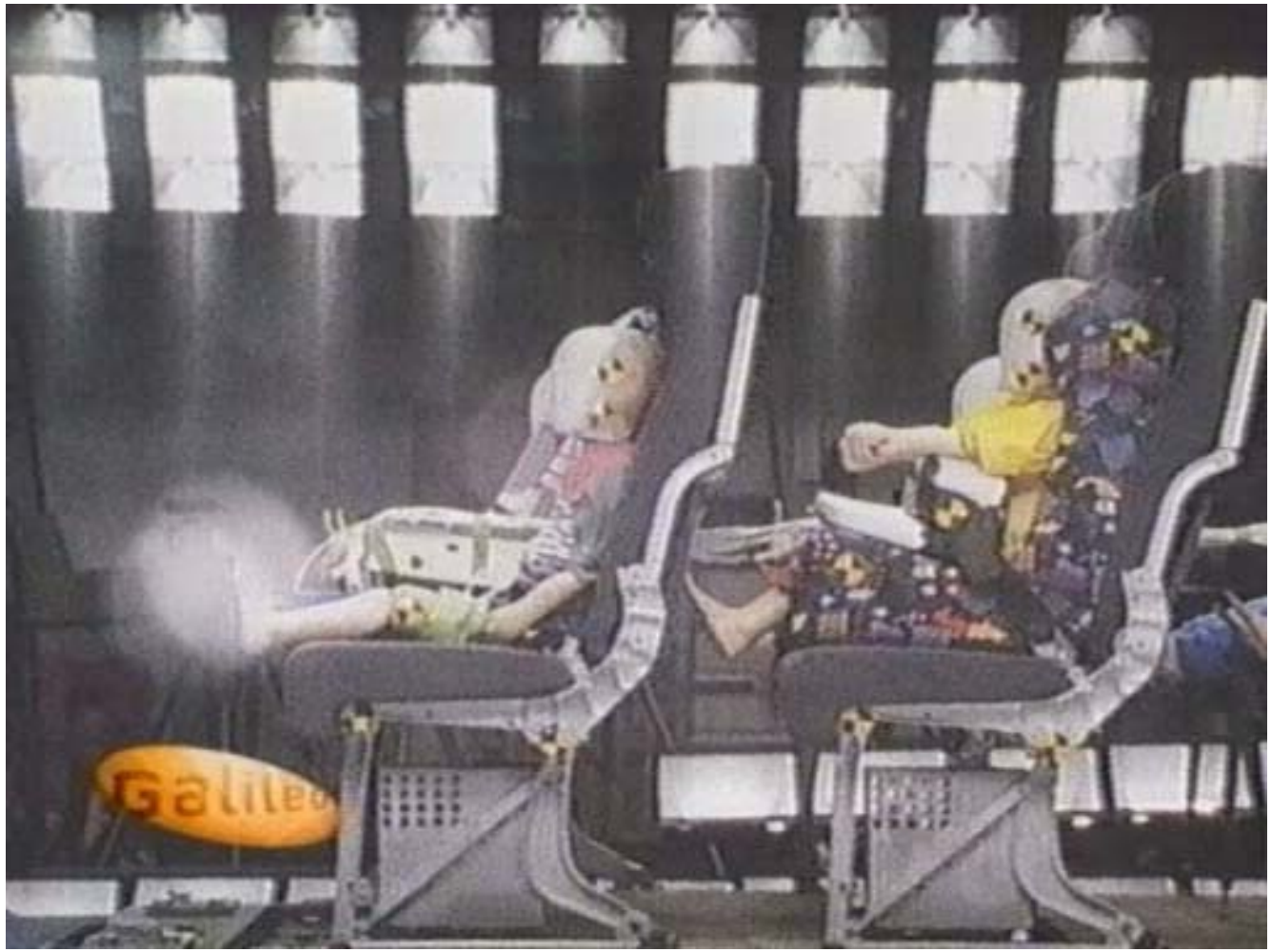
Qualification

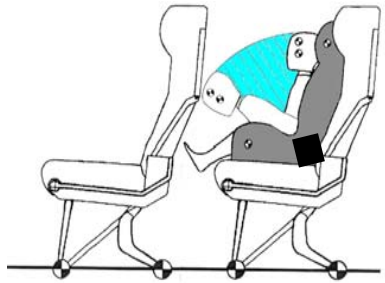
Qualification of CRS

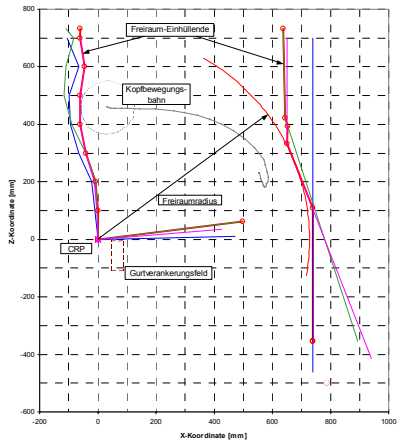
- correlation of the CRS dimensions with seat configuration
- review of the CRS fixing by means of the test seat
- review of head contact and survival space
- issuance of an ID number for the CRS
- assignment of the CRS to specific aircraft seats
- ⇨ seat maps
- preparation of a qualification report

  ⇨ release and use of child seats in the aircraft

Correlation of headcontact and survival space







Qualification Procedure

At present, the following CRS are provided for qualification for Lufthansa:

- Maxi Cosi Mico
- Storchenmühle Maximum
- Römer King quickfix
- Luftikid

Qualified system

Maxi Cosi Mico:

www.tuv.com
TÜV
TÜV Rheinland
ID:8011000571

• For use in Aircraft

Qualified with the restrictions specified under Docket / ID – No. 8011000571

see Internet address: www.tuv.com / ID – No. 8011000571
Date: 10/01/03
Child height: 75 [cm] or less / weight: 0 to 10 [Kg]

Qualified system

Storchenmühle Maximum :

www.tuv.com
TÜV
TÜV Rheinland Group
ID:2711305500

- For use in Aircraft

Qualified with the restrictions specified under Docket / ID – No. 2711305500

see Internet address: www.tuv.com / ID – No. 2711305500
Date: 20/08/04
Child height: 75 [cm] or less / weight: 0 to 10 [Kg]

Qualified system

Römer King quickfix:

www.tuv.com
TÜV
TÜV Rheinland
ID:8811400300

• For use in Aircraft

Qualified with the restrictions specified under Docket / ID – No. 8811400300

see Internet address: www.tuv.com / ID – No. 8811400300
Date: 15/10/03
Child height: 98 [cm] or less / weight: 9 to 18 [Kg]

Qualified system

Luftikid:

www.tuv.com
TÜV
TÜV Rheinland
ID:7011000571

• For use in Aircraft

Qualified with the restrictions specified under Docket / ID – No. 7011000571

see Internet address: www.tuv.com / ID – No. 7011000571
Date: 10/01/03
Child height: 120 [cm] or less / weight: 9 to 25 [Kg]

Assignment (seat maps)

Assignment of the CRS to specific aircraft seats, at the example of Lufthansa CityLine Avro RJ 85

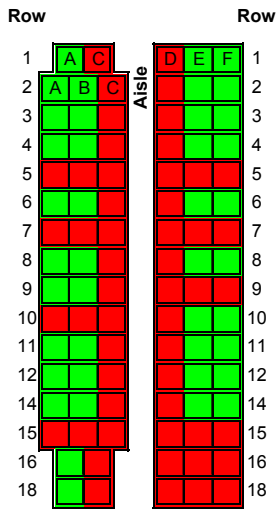
Seatmap for Lufthansa CityLine GmbH

Aircraft Type: AVRO RJ 85

Registration:

D-AVRA	D-AVRB	D-AVRC	D-AVRD	D-AVRE	D-AVRF	D-AVRG
D-AVRH	D-AVRI	D-AVRJ	D-AVRK	D-AVRL	D-AVRM	D-AVRN
D-AVRO	D-AVRP	D-AVRQ	D-AVRR			

Valid Date: 20.08.2004



Kinderrückhaltesysteme (KRS) / Child Restraint Systems (CRS)

Maxi Cosi Mico
ID-Nr.: 8011000571
Kindergröße / Child height: up to 75 cm
Kindergewicht / Child weight: 0 - 10 kg

Storchenmühle Maximum
ID-Nr.: 2711305500
Kindergröße / Child height: up to 75 cm
Kindergewicht / Child weight: 0 - 10 kg

Luftikid
ID-Nr.: 7011000571
Kindergröße / Child height: 71 - 120 cm
Kindergewicht / Child weight: 9 - 25 kg

Römer King quickfix
ID-Nr.: 8811400300
Kindergröße / Child height: max. 98 cm
Kindergewicht / Child weight: 9 - 18 kg

Allgemein gilt / in General:
Für das Kinderrückhaltesystem ist der Fensterplatz zu bevorzugen !

Prefered seat for the child restraint system is the window seat !

Achtung / Attention:
Auf dem mittleren Sitzplatz darf aus Evakuierungsgründen nur dann ein Kinderrückhaltesystem montiert werden, wenn der Fensterplatz ebenfalls durch ein Kinderrückhaltesystem besetzt wird oder unbesetzt bleibt!

From evacuation reasons no adult should be placed on the window seat when a child restraint is placed at the center seat!

KRS erlaubt / CRS allowed

KRS nicht erlaubt / CRS not allowed

- **Airlines applying this qualification procedure and subsequently accepting the use of the respective CRS in their aircraft**

Condor
Ihr Sonnenflieger

Thomas Cook

AIR-BERLIN
We fly Europe

atlasjet

LTU

There's no better way to fly.
Lufthansa

Lufthansa CityLine

Hapag-Lloyd

Use of qualified CRS in an aircraft

Use of qualified CRS in a bus