



Improvements in Cabin Safety & New Challenges

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Development of ICAO SARPs related to Cabin Safety

Development of ICAO SARPS related to Cabin Safety

- ❑ Since 1972, ICAO has introduced many Cabin Safety Standards and Recommended Practices (SARPS) to enhance passengers' safety and survivability in the event of an emergency situation.
- ❑ Every country is required to promulgate safety regulations to comply with the ICAO SARPS.
- ❑ The following are the developments of ICAO SARPS in relation to Annex 6 Part I, International Commercial Air Transport – Aeroplanes.

Development of ICAO SARPS related to Cabin Safety in Annex 6

1972

- Provision for cabin attendants to be seated and secured during certain prescribed flight phases.

1976

- Provision and Use of Restraining Devices
- Carriage of survival radio equipment for areas with difficulty in search and rescue.

1978

- **Fitting of seats with safety harness and to be used by cabin attendants assigned with emergency evacuation duties.**

Development of ICAO SARPS related to Cabin Safety in Annex 6

1982

- Inclusion of a checklist of emergency and safety equipment in the Ops Manual.

1983

- **Adoption of Annex 18 on carriage of Dangerous Goods by Air and the requirement for the approval of Cabin Crew DG training programme.**

1990

- Requirement to establish specifications related to carry-on baggage.

Development of ICAO SARPS related to Cabin Safety in Annex 6

1990

- Use of search procedure checklist. Training programme for unlawful interference.
- Requirements on carry-on baggage.

1994

- Replacement of survival radio equipment and emergency location beacon with ELTs.

1995

- **Introduction of new definition for cabin attendant.**

Development of ICAO SARPS related to Cabin Safety in Annex 6

1995

- **New provisions on flight time, flight duty periods and rest period for cabin attendants.**

1999

- **Change of terminology from “cabin attendant” to “Cabin Crew”.**
- Provision of mandatory carriage of ELTs operating on 406MHz and 121.5MHz.

2009

- Amendment to provisions for flight time, duty periods, flight duty periods and rest periods for fatigue management.
- **Additional DG training requirements for Cabin Crew.**

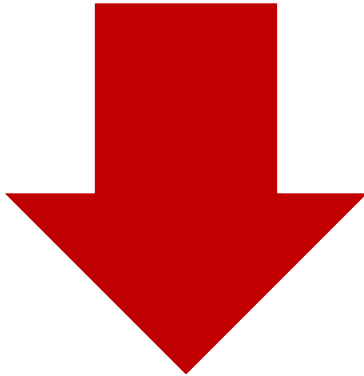


Aircraft Safety Improvements

Aircraft Cabin Safety Improvements



Since the mid 1980s, there were vast improvements in Cabin Safety requirements.



This resulted in decrease in fatality rate due to enhancement in Cabin Safety.

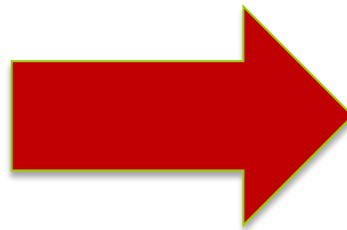
Improvements in Aircraft Safety

- ❑ The following are examples of some of the major improvements in Cabin Safety which contributed to the increase in survival rate.

Improvements in Aircraft Safety

Radiant heat resistant evacuation Slide

- ❑ In June 1983, changes made to Technical Standard Order for emergency evacuation slides to incorporate a radiant heat test for slide material to improve the ability of the slide to resist heat from a large fuel fire nearby.



Improvements in Aircraft Safety

Fire retardant materials in seat cushion

- ❑ Since Oct 1984, new flammability standards are required for seat cushions in passenger and Cabin Crew seats.



- ❑ The new cushion material provides an additional 40 to 60 seconds for aircraft evacuation in the event of a fire.

Improvements in Aircraft Safety

Fire retardant interior materials

- ❑ Since 1985 a new test standard is required for large surface area panels, e.g. ceilings, walls, galleys, overhead bins and partitions to delay the onset of a cabin flashover (flash fire) event.
- ❑ The new standard provides passengers and crews more time to evacuate the airplane after an accident.



Improvements in Aircraft Safety

Installation of floor track lighting

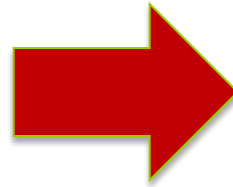
- ❑ In 1986, floor proximity emergency escape path marking was mandated to aid passengers by marking evacuation paths and identifying exits.



- ❑ This improve evacuation rate by 20% under significant smoke conditions in the cabin.

Improvements in Aircraft Safety

From wickers seats to 16 g Seats



Improvements in Aircraft Safety

16 g Seats

- Provide:
 - a) Protection against serious head injury
 - b) Protection from serious chest injury when upper torso restraints are used, and
 - c) Prevent occupants being trapped in their seats due to excessive seat deformation.

Note : Since Oct 2009, all aircraft manufactured after 1958 must comply with the 16 G dynamic standards.



Improvements in Aircraft Safety

16 g Seats not applicable to flight deck

Flight AF 358 (A340/5 Oct 2005)

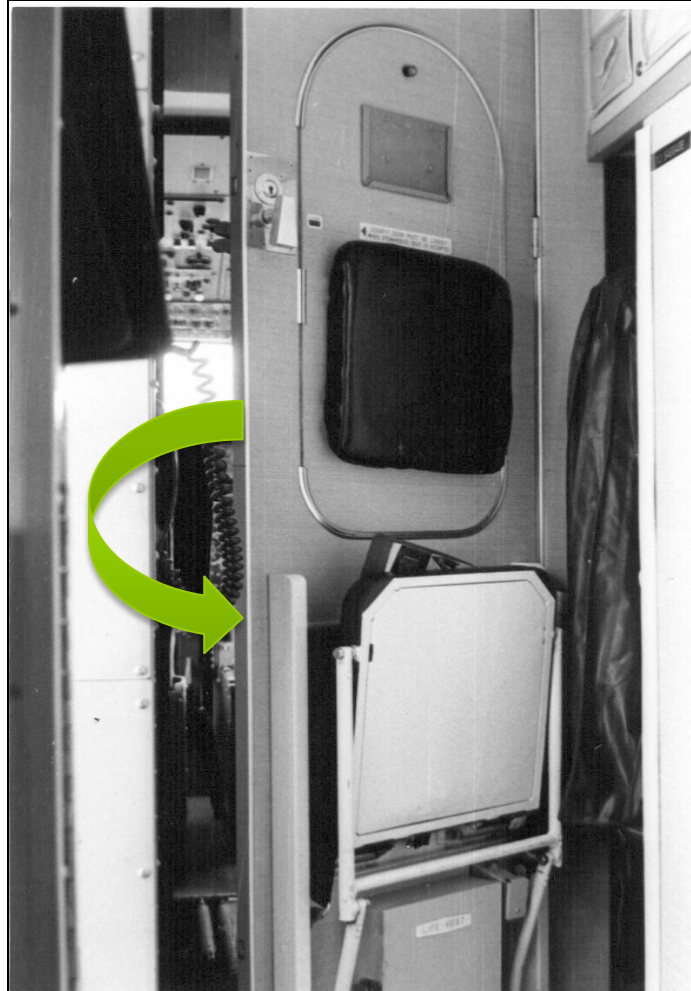


An incentive for pilots not to crash an aircraft?

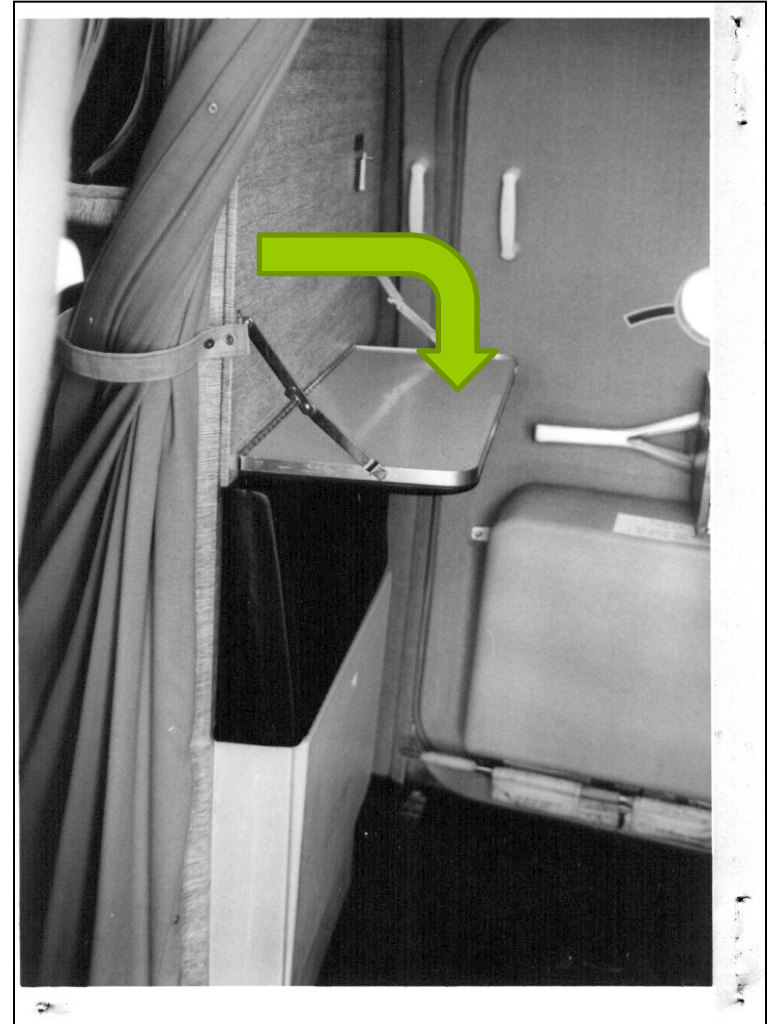
Improvements in Aircraft Safety Cabin Crew Seats. Those were the days.....



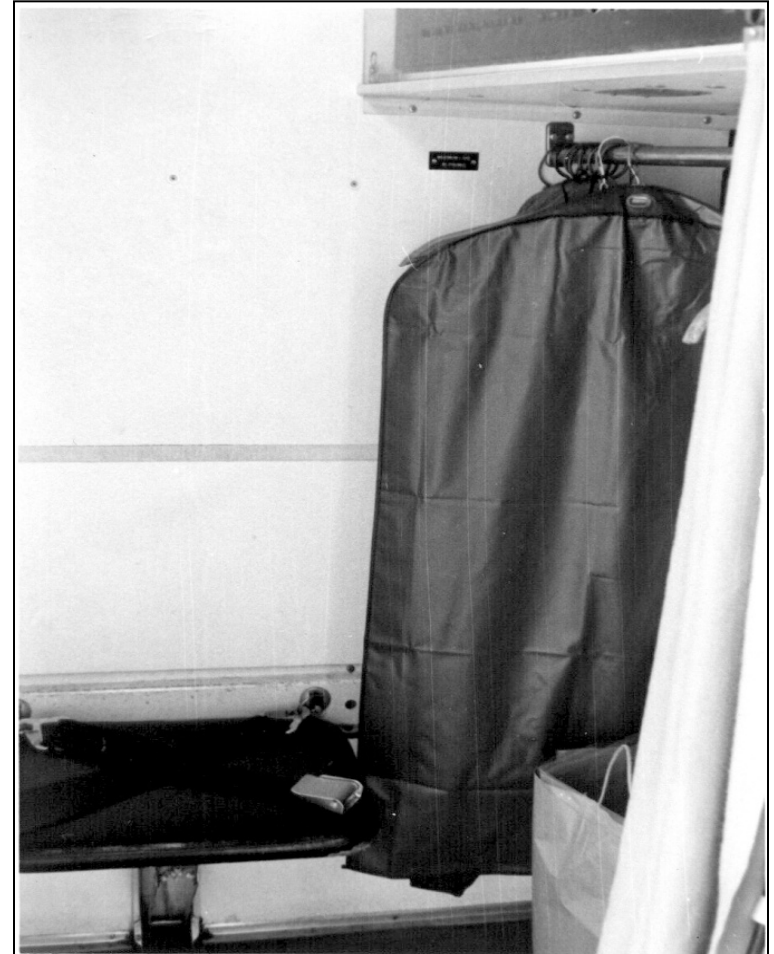
Improvements in Aircraft Safety Cabin Crew Seats. Those were the days.....



Improvements in Aircraft Safety Cabin Crew Seats. Those were the days.....



Improvements in Aircraft Safety Cabin Crew Seats. Those were the days.....



Improvements in Aircraft Safety

Cabin Crew Seats

- ❑ Cabin Crew seats are now required to 16 g seats and fitted with a safety harness for the protection of the Cabin Crew.



- ❑ Required Cabin Crew Seats is an MEL item and must be repaired within an interval of 3 or 10 days.

ATA Chapter AIR COND/23/00		Page 21 of 21
(1) System & Equipment Numbers	(2)	Maintenance Interval
ITEM		(3) Minimum Interval
ATA		(4) Number required for dispatch
21-52-48	TRO 2	(5) Remarks or Exceptions
PACK DISCHARGE PRESSURE SENSOR L		(6) One sensor may be inoperative provided: 1. Opposite pack, opposite PCV and Ram AF Ventilation is fully operational 2. Maximum flight altitude - 20000 feet (7) Switch affected air cooling pack off. REMARK: Refer to AFM for performance limitations (TRC) M 1. Devices/one affected air conditioning pack. 2. Install INOP placards for affected air cooling packs controls (TRC) TMO 2 Both sensors may be inoperative provided: 1. Maximum flight altitude - 10000 feet 2. Flights conducted as they are and with prior coordination with manufacturer and authorities.



Improvements in Aircraft Safety

Exits design

- ❑ Minimum width is specified for the passageway from the aisle to the exit for airplanes with 60 or more passengers.
- ❑ Egress rates through the exits were found to be approximately 14% faster than previous narrower passageways.



Improvements in Aircraft Safety

Automatically Disposable Hatch

- ❑ Use of a new Automatically Disposable Hatch (ADH) for Type III exit on new aircraft types.
- ❑ The ADH ensure that final location of the hatch would not become an obstruction for passenger evacuation.
- ❑ The ADH has been introduced in the B737-800 aircraft.



Improvements in Aircraft Safety

Sixty Feet Rule

- ❑ Since 1989, passenger emergency exits shall be not more than 60 feet from each other.
- ❑ This new rule ensure adequate exits for passengers' use in an emergency.



Cabin Crew Training Developments

Importance of Training

.....Then the captain ordered the evacuation of the aircraft and the Cabin Manager **instinctively** jumped to action.

"I wasn't really thinking, but my body started carrying out the steps needed for an evacuation. I was only thinking about rescuing the next passenger."



Cabin Manager Lee Yong Hye

Crew In Charge Training

- ❑ Since 1990s, some States introduced initial training for Crew In Charge to enable them to carry out specific tasks during normal, abnormal and emergency situations effectively.
- ❑ The training includes the coordination with flight and cabin crew, the management of the cabin, interface with other personnel (e.g. ground crew) and administrative tasks related to the cabin operations.

Crew In Charge Training

- ❑ New Doc 7192 recommends Crew In Charge to receive **both** initial and periodic training.
- ❑ On day 2 of this seminar, Singapore Airlines will be sharing with you its Crew In Charge **Initial** and **Recurrent** Training which started in year 2000.
- ❑ On day 3, Qantas will be sharing with you the vital role played by Crew In Charge during the QF 32 incident.

Crew Resource Management (CRM) Training

In the early 1990s, CRM training was extended to Cabin Crew. Many airlines began joint cockpit – cabin CRM Training. Currently most Cabin Crew CRM Training encompass Threat and Error Management.



The CRM Training help to provide a safe and efficient operations by eliminating, trapping or mitigating errors and identifying systemic threats to safety.

Competency Based Training

- ❑ The new ICAO Doc 7192 which provide guidance materials for competency based training for Cabin Crew.
- ❑ An unedited final draft will be provided to States by Dec 2013. The final document will be published in May 2014.
- ❑ ICAO will be providing more information on competency based training for Cabin Crew in Day 2 of this seminar.

Cabin Safety Training Devices

- ❑ Many States approve Cabin Safety training devices (e.g. cabin mock up, emergency exits, fire fighting training facilities).



- ❑ This is to enhance Cabin Crew training by providing an accurate representation of :
 - (a) Cabin Crew and passenger seat location, dimension and seat pitch.



Cabin Safety Training Devices

(b) emergency equipment and its location in the aircraft.



(c) extent of movement and the required associated force for the exits and equipment.



(d) Markings and lightings of the aircraft cabin.



Cabin Safety Training Devices

(e) Communications equipment and associated control panels.

(f) Evacuation slides, including normal and standby methods of operation.

(g) Height and angle of inflated evacuation slides.





NEW CHALLENGES

New Challenges

- ❑ Aviation is evolving and so is Cabin Safety.
- ❑ This bring new challenges.
- ❑ The following are some new challenges (and old ones which have yet to be resolved) in Cabin Safety.

New Challenges

Next Generation of Aviation Professionals



They don't "make" Cabin Crew like they used to anymore!

New Challenges

Next Generation of Aviation Professionals

- Gen Y are motivated by different skills and issues.



New Challenges

Next Generation of Aviation Professionals

- ❑ Gen Y have different way of learning as compared to the traditional “chalk and talk” method. New ways of training is required to be relevant.
- ❑ Temasek Polytechnics will be sharing their approach and experiences in training Gen Y Cabin Crew on Day 2 of this seminar.

New Challenges

Lithium Ion Batteries

- ❑ Lithium ion batteries is an in-flight fire hazard because they do not need an active circuit to catch fire or a short circuit to overheat.
- ❑ On a typical flight, a single aisle jet carrying 100 passengers could have over 500 lithium batteries on board.
- ❑ FAA recorded 132 cases of lithium batteries related incidents between March 1991 to October 2012.



New Challenges

Lithium Ion Batteries

- ❑ Lithium ion batteries from questionable sources are not tested or certified to manufacturer's recommendations and is a likely source for an in-flight fire.
- ❑ Cabin Crew have no means to determine if such batteries are carried and used during flights.
- ❑ Day 2 of this seminar will highlight problems and challenges related to lithium ion batteries.

New Challenges

Licensing of Cabin Crew

- ❑ ICAO Annex 1 does not require Cabin Crew to be licensed.
- ❑ However, about 50 to 60 countries licensed their Cabin Crew and this trend is increasing.
- ❑ ICAO Document 7192 provides some guidelines on cabin crew qualifications. However, there is no international standard for qualifications for Cabin Crew.

New Challenges

Licensing of Cabin Crew

- ❑ If a State chooses to licence Cabin Crew, the challenge is to ensure that the licensing process is not merely a paper exercise.
- ❑ Licensing should incorporate changes which will improve the training and competency of Cabin Crew.

New Challenges

Competency Based Training Vs Minimum Operating Experience

- ❑ Some countries require a Crew In Charge to have a minimum operating experience of one year.
- ❑ ICAO does not provide any guideline for the minimum operating experience of a Crew In Charge.
- ❑ With the introduction of competency based training, the need for minimum operating experience is now debateable.

Competency Based Training Vs Minimum Operating Experience

“Regardless of the **quality of training** being provided, **a minimum operating experience** is required particularly for the Crew In Charge. This minimum experience should be subject to the complexity of the aircraft operations. It **cannot be a one size fits all** requirement. Had I only have one year of operating experience as mandated by many countries, **I doubt I could have handle the situation as competently as I did** in this particular incident.”

Michael Von Reth
Customer Service Manager
A-380 QANTAS



New Challenges

Use of Portable Electronic Devices

- ❑ FAA will allow passengers to use Portable Electronic Devices (PEDs) during all phases of flight.
- ❑ Passengers will be able to read e-books, play games, and watch videos on their devices during all phases of flight, with very limited exception.
- ❑ However, PEDs must be held or put in the seat back pocket during the takeoff and landing roll.
- ❑ In addition, cell phones cannot be used for voice communications and should be in airplane mode.

New Challenges

Use of Portable Electronic Devices

- ❑ Many countries will be adopting the new FAA s' rules which will pose a new challenge to Cabin Crew with respect to :
 - (a) Ensuring PEDs are selected in airplane mode;
 - (b) PEDs are secured and/or stowed during take off and landing;
 - (c) Passengers' paying attention to safety briefing; and
 - (d) Passengers having situation awareness of an impending emergency.

While we cannot run away from technology, we cannot run away from safety either!

New Challenges

Child Restraint Device



- ❑ Many studies confirmed the need for the use of approved child restraint device to protect the child in the event of a survivable crash.
- ❑ The use of a supplementary loop belt does not offer adequate protection to the child.



Child Restraint Device

- ❑ "Proper restraint use is one of the most basic and important tenets of crashworthiness and survivability." **NTSB Chairwoman Deborah Hersman**
- ❑ The NTSB has been seeking this change in the last 24 years.
- ❑ FAA also believe that it is safer for every passenger, regardless of age or size, to be restrained in a size-appropriate device.



Child Restraint Device

- ❑ However, FAA concluded that requiring such a rule change may result in more child fatalities as more children would be travelling in cars than on aeroplanes.
- ❑ Interestingly, NTSB 's research indicated otherwise during a flight diversion where more children will be travelling in cars, where highway fatalities actually declined.
- ❑ In essence, it is recommendation vs. requirement.
- ❑ The ICAO Cabin Safety Group will address the use of child restraints in their 2014 work programme.

Child Restraint Device

Quotable quote:

"We believe that all occupants deserve the same protection, including infants.

All food service items need to be strapped in for take-off and landing.

A coffee pot has better protection than an infant !"

Candace Kolander, Safety Chair, AFA





Thank You

- End -