

Proposed Special Condition on "Passenger sleeping compartments"
Applicable to Airbus A380
Issue 1

Introductory note:

The following Special Condition has been classified as an important Special Condition and as such shall be subject to public consultation, in accordance with EASA Management Board decision 12/2007 dated 11 September 2007, Article 3 (2.) of which states:

"2. Deviations from the applicable airworthiness codes, environmental protection certification specifications and/or acceptable means of compliance with Part 21, as well as important special conditions and equivalent safety findings, shall be submitted to the panel of experts and be subject to a public consultation of at least 3 weeks, except if they have been previously agreed and published in the Official Publication of the Agency. The final decision shall be published in the Official Publication of the Agency."

Statement of Issue

An A380 customer has requested the installation of a passenger sleeping compartment on the upper deck forward area. The passenger sleeping compartment is designed for 2 occupants for in-flight use only.

The applicable airworthiness regulations do not contain adequate or appropriate safety standards for these design features. Special conditions are therefore required to allow passenger sleeping compartments installation.

Airbus A380 - Special Condition D-53 - Passenger Sleeping Compartments -

- 1) Passenger sleeping compartments occupancy is not allowed during Taxi, Take off and Landing (TT&L) phases.
- 2) During flight, maximum 2 occupants are allowed in each passenger sleeping compartment.
- 3) If a sleeping compartment door is installed, it must be closed and locked for TTOL..
- 4) There must be appropriate placards, inside and outside (as appropriate) each entrance to the passenger sleeping compartment to indicate:
 - a) The maximum number of occupants allowed during flight
 - b) That occupancy is not allowed during Taxi, Take off and Landing and that the compartment must be locked at these times.
 - c) That smoking is prohibited.
 - d) That the passenger sleeping compartment is limited to the stowage of the compartment occupants' personal belongings and is further limited by the suitability of the provided stowage provisions.
 - e) The passenger sleeping compartment must not be used for any other stowage.
- 5) There must be at least one ashtray on the inside and outside of any entrance to the sleeping compartment.
- 6) A limitation in the Airplane Flight Manual or other suitable means must be established to restrict occupancy to passengers briefed for the use of the compartment.

Cabin Crew procedure must ensure that the occupants are briefed of the following:

- a) - Use of the berth seat belt.
 - b) - Emergency procedures and escape routes.
 - c) - Actions in case of decompression.
 - d) - Smoking restrictions.
 - e) - Stowage of personal belongings.
- 7) Cabin crew procedures must include monitoring the access to the sleeping compartment, and ensuring doors to the sleeping quarters (if provided) are in their proper configuration for taxi, take-off, and landing.
- 8) For each occupant permitted in the passenger sleeping compartment, there must be an approved seat or berth, designed to meet the requirements of CS 25.785(f) (CS 25 at Amdt. 15), that must be able to withstand the maximum flight loads when occupied.
- 9) If doors will be installed, there must be a means to preclude anyone from being trapped inside the passenger sleeping compartment. If a locking mechanism is installed, it must be capable of being unlocked from the outside without the aid of special tools. The lock must not prevent opening from the inside of the compartment at any time.
- 10) It must be shown that no one can be trapped in the passenger sleeping compartment due to fire (inside or outside the passenger sleeping compartment), mechanical or structural failure.
- 11) There must be a means in the event of failure of the aircraft's main power system, or of the normal passenger sleeping compartment lighting system, for emergency illumination to be automatically provided for the passenger sleeping compartment.
- a) This emergency illumination must be independent of the main lighting system.
 - b) The sources of general sleeping compartment illumination may be common to both the emergency and the main lighting systems if the power supply to the emergency lighting system is independent of the power supply to the main lighting system.
 - c) The illumination level must highlight the exit (in particular the door handle) compared to other areas of the compartment.
 - d) The illumination level must be sufficient for each occupant of the passenger sleeping compartment to locate a deployed oxygen mask.
- 12) There must be a means for manual activation of an aural emergency alarm system, audible during normal and emergency conditions, to enable crewmembers at each pair of required floor level emergency exits to alert occupants of the passenger sleeping compartment of an emergency situation. Use of a public address will be acceptable. The system must be powered in flight, after the shutdown or failure of all engines and auxiliary power units (APU), for a period of at least ten minutes.
- 13) At least one Attendant Call Button must be provided in the sleeping compartment. The location must be obvious and reachable for each occupant while lying on the bed. The current level of software approval driving the attendant call function is considered to be sufficient.
- 14) There must be a means, readily detectable by seated, lying or standing occupants of the passenger sleeping compartment, which indicates when seat belts should be fastened. There must be a placard requiring that the berth restraints be fastened whenever the berth is occupied. If compliance with any of the other requirements of these special conditions is predicated on a specific lying orientation, there must be a placard identifying this position. Seat belt type restraints substantiated per CS 25.785 must be provided for each seat and berth. For berths, the seat belt must be compatible for the sleeping attitude during cruise conditions

- 15) Means must be provided to address turbulence. If the passenger sleeping compartment interior does not intrinsically provide adequate firm handholds, there must be handgrips or rails to enable persons to steady themselves while moving within the compartment, in moderately rough air.
- 16) The following safety equipment must be readily accessible outside to the passenger sleeping compartment for cabin crew use:
- a) At least one approved hand-held fire extinguisher appropriate for the kinds of fires likely to occur,
 - b) One Portable Protective Breathing Equipment (PBE) device approved to European Technical Standard Order (ETSO)-C116 or equivalent and meeting JAR 25.1439, close to each hand-held fire extinguisher
 - c) One flashlight
- 17) A smoke or fire detection system must be provided that monitors the passenger sleeping compartment. This system must provide:
- a) A visual indication to the flight crew within one minute after the start of a fire
 - b) An aural warning in the passenger sleeping compartment, certain to wake a sleeping occupant
 - c) A warning in the passenger cabin. This warning must be readily detectable by at least one cabin crew member, taking into consideration the positioning of cabin crew throughout the passenger cabin during various phases of flight.
- 18) Fire fighting precautions:
- a) The design of the sleeping compartment must allow crewmembers equipped for fire fighting to have unrestricted access to the compartment.
 - b) The fire fighting procedures must describe the methods to search the passenger sleeping compartment for fire sources(s). Training and procedures must be demonstrated by test and documented in the suitable manuals. If the design is such that it is readily apparent by a cabin attendant stepping into the sleeping quarters where the fire source is located, then additional training, procedures, and manuals are not required.
 - c) The time for a crewmember on the passenger deck to react to the fire alarm, to don the fire fighting equipment and to gain access to the sleeping compartment must not exceed the time for the compartment to become smoke-filled, making it difficult to locate the fire source.
 - d) Large enclosed stowage compartments (i.e., those greater than 1.6 cubic meters/57 cubic feet) with subsequent impact on the crewmembers' ability to effectively reach any part of the compartment with the contents of a hand fire extinguisher are not allowed within the sleeping compartment.
 - e) It must be demonstrated that the complete sleeping compartment fire detection and fire fighting procedure can be conducted effectively without causing a hazard to passengers due to excess quantities of smoke and / or extinguishant accumulating and remaining in other occupied areas.
- 19) There must be a supplemental oxygen system equivalent to that provided for passenger cabins for each seat and berth in the sleeping compartment (automatic drop down system with means by which the oxygen masks can be manually deployed from the flight deck). The system must provide an aural warning. The aural warning sound volume and duration must be justified as being certain to wake any sleeping occupant of the sleeping compartment (similar to crew rest compartments this could be a continuously sound for a minimum of five minutes or until a reset push button is pressed by the cabin crew). Simultaneously with mask drop it must be automatically assured that the lighting level in the sleeping compartment will be sufficient for occupants to locate a deployed oxygen mask.

20) Materials, seat cushions and mattresses must comply with the requirements of CS25.853, including CS25.853(c) in the case of mattresses.

21) Where a waste disposal receptacle is fitted, it must be equipped with an automatic fire extinguisher that meets the performance requirements of JAR 25.854(b).

22) A means must be provided to allow the cabin crew to determine the actions and demeanour of the occupants of the compartment at any time throughout the flight. The effectiveness of this means must be demonstrated and must allow for all possible lighting conditions and location of the compartment occupants. In the case of an abnormal situation e.g. depressurization, severe turbulence, etc, the mandatory procedure must be that the cabin crew enter the compartment for the purpose of checking the actions and demeanour of the occupants. The procedures should be clear that the cabin crew performs the check once it is safe to move about the cabin

23) If electrical power supply capable of being used by the occupant(s) during flight will be installed in the sleeping compartment it must be shown that this is not introducing an additional fire risk for this type of installation.

Background information: A fire developing in such compartment may not be easily extinguished as the cabin crew will have to enter the compartment with the firefighting equipment. The compartment may be smoke filled and the fire source may be difficult identify. In this case the fire may become uncontrollable. Airbus is required to demonstrate that this is extremely improbable.

24) Installation of the sleeping quarters must not introduce any additional obstructions or diversions to evacuating passengers, even from other parts of the cabin.