Comment-response document for Airbus A380 D-04 – Crew Rest Compartment

#	Commenter	Comment	EASA position
1	Boeing	*Specific section of concern* Background – a. Identification of issue *What is the proposed requirement?* "Airbus offer in option the possibility to install Crew Rest Compartments (CRC) of different types and at different locations on the A380-800…" *Boeing's suggested change* This section should define whether this Special Condition applies to crew rests on the main passenger deck, crew rests located in the overhead areas from the main passenger deck, and/or crew rests located below the main passenger deck. *Why is the change justified?* The FAA has applied levels of design requirements for crew rests that are on the main passenger deck that are different from requirements for crew rests installed remote from the main passenger deck in the overhead or below inside a cargo compartment. Addition of this detail will provide clarification and, hopefully, harmonization with previously issued parallel FAA Special Conditions.	This Special Condition is written in a generic way to cover different possible installations of Crew Rest Compartment (CRC). Most of the requirements are common to different types of CRC. When needed some conditions are also specific in the EASA SC. In particular when occupancy is allowed during TT&L or when the CRC is located at a passenger deck level.
2	Boeing	*Specific section of concern* Special Condition 2 *What is the proposed requirement ?* *"For all doors installed, there must be a means to preclude anyone from being trapped inside the CRC. 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".* *Boeing's suggested change* The following should be added to the requirements for crew rest doors : "Doors or hatches that separate the overhead crew rest (OHCR) compartment from the main deck must not adversely affect evacuation of occupants on the main deck (slowing	There is no OHCR planned to be installed on the A380. This requirement would only apply to CRC occupied for TT&L. The only

			evacuation by encroaching into aisles, for example) or cause injury to those occupants during opening or while opened. *Why is the change justified ?* To ensure compliance with 25.813; harmonization with previously issued parallel FAA Special Conditions requirements.	CRC occupied for TTL in the A380 is the FCRC. SC N°20 is proposed to be modified accordingly
3	Boeing		*Specific section of concern* Special Condition 10 *What is the proposed requirement?* "Means must be provided to cover anticipated turbulence. If the seat backs do not provide a firm handhold, or if there is no seat installed, there must be a handgrip or rail to enable persons to steady themselves while in the CRC in moderately rough air." *Boeing's suggested change* <u>Delete</u> the requirement. *Why is the change justified?* To ensure harmonization with previously-issued parallel FAA Special Conditions. Additionally, the requirement is inherently covered in the design and other Special Condition requirements. Specifically, Special Condition 9: requiring the "fasten seat belt" sign will force a standing occupant to return to the seat or berth and fasten the seat belt. The area is generally small enough and the layout situated such that the standard features of the crew rest (including sidewalls and ceiling) are readily available to the standing occupant to steady themselves while returning the short distance to the seat / bearth; requiring special handholds would be redundant.	The requirement is not inherently covered in the design and other Special Condition requirements. The "fasten seat belt" sign require to go back to your seat, the handhold or equivalent (set back) shall allow to do so safely. Some of the A380 CRC are of significant size to justify this requirement. The word "anticipated" is removed to cover also unexpected turbulences.
4	Boeing		*Specific section of concern* Special Condition 11 (b) *What is the proposed requirement?* "The following safety equipment must also be provided in the CRC: … (b) One Portable Protective Breathing Equipment (PBE) devices approved to Technical Standard Order (TSO)-C116 or equivalent and meeting JAR 25.1439, closed to each hand-held fire extinguisher…"	Comment not accepted. PBE are used for fire fighting purpose. Their number in the CRC is directly dependant of the number of Fire

		Boeing's suggested change Replace the text of paragraph 11(b) with the following: "Protective Breathing Equipment (PBE) must be provided in accordance with Sec. 25.1439, except that in lieu of a device for each crewmember, the following must be provided: Two PBE devices approved to Technical Standard Order (TSO)-C116 or equivalent, suitable for firefighting, or one PBE for each hand-held fire extinguisher, whichever is greater". Note: Additional PBE and fire extinguishers in specific locations beyond the minimum numbers prescribed in Special Condition 11, may be required as a result of the egress analysis accomplished to satisfy Special Condition 3(a). *Why is the change justifie ?* To ensure harmonization with previously-issued parallel FAA Special Conditions requirements.	extinguishers. Flight CRC are some time very small, there is no justification to require two PBE in such compartment. PBE are only required for Fire Fighting, no relation should be made to egress.
5	Boeing	*Specific section of concern* Special Condition 12(a) *What is the proposed requirement?* "A smoke or fire detection system (or systems) must be provided that monitors each occupiable area within the CRC, including those areas partitioned by curtains. Each system (or systems) must provide: (a) A visual indication to the flight crew within one minute after the start of a fire (JAR 25.858(a)); …" *Boeing's suggested change* Change paragraph 12(a) to read as follows: "(a) A visual indication to the flight crew within one minute after the start of a fire ~~(JAR 25.858(a))~~ ". *Why is the change justified ?* Section 25.858 is applicable to cargo compartment smoke detection systems. The crew rest fire detection system is similar to that required by Section 25.858, but it is not a cargo compartment, and Section 25.858 is not applicable, so deletion of the reference is	Comment accepted. Wording is amended to read: *"12(a) A visual indication to the flight crew within one minute after the start of a fire"*

		appropriate.	
6	Boeing	*Specific section of concern* Special Condition 13 *What is the proposed requirement?* "A means to fight and suppress a fire when the CRC is not occupied must be provided. This means can either be a built-in extinguishing system or manual hand held bottle extinguishing system. …" *Boeing's suggested change* Fire protection (including material flammability, smoke/fire detectors and their placement, liners, etc.) requirements for stowage compartments within the crew rest based on stowage usage and volume should be developed / defined in this Special Condition. Such an additional requirement is consistent with previous special conditions issued on similar designs. *Why is the change justifie ?* The in-flight accessibility of very large enclosed stowage compartments and the subsequent impact on the crewmembers' ability to effectively reach any part of the compartment with the contents of a hand fire extinguisher will require additional fire protection considerations similar to those required for inaccessible compartments, such as Class C cargo compartments. Addition of the requirement would ensure harmonization with parallel FAA Special Conditions requirements.	This SC 13 is not specific to stowage compartments in the CRC but to the CRC itself. SC 1 requires that the crew rest area is limited to the stowage of crew personal luggage and must not be used for the stowage of cargo or passenger baggage. However, it is recognised that if all crew personal luggage are to be placed in one stowage it may end up with a large stowage volume that may require additional fire protection capability. SC 13 is proposed to be amended accordingly.
7	Boeing	*Specific section of concern* Special Condition 13(b) *What is the proposed requirement?* "(b) If a built-in fire extinguishing system is used in lieu of manual firefighting, the system must have adequate capacity to suppress any fire occurring in the crew rest compartment, considering the fire threat, volume of the compartment, the ventilation rate and the minimum performance standards (MPS) that have been established for the agent being used". *Boeing's suggested change* In addition to this requirement, there also should be a requirement stating that if a built-in	Comment accepted, SC 13 (b) is amended to read:

			fire extinguishing system is used, then the fire must be contained within a controlled volume meeting the requirements of Appendix F, Part III. *Why is the change justified?* Built-in extinguishing systems may only suppress, but may not extinguish, the fire until the fire can be extinguished on the ground. The fire should be contained within a control volume, similar to how a class C cargo compartment fire is contained within a controlled volume, until the fire can be extinguished. Allowing a fire to burn without verifying that it is extinguished may result in the fire continuing to burn and cause significant damage if not properly contained. Manual firefighting techniques ensure the fire is positively extinguished, negating the need for containing a suppressed fire. Additionally, this change would ensure harmonization with previously-issued parallel FAA Special Conditions requirements.	*"If a built-in fire extinguishing ... and the minimum performance standards (MPS) that have been established for the agent being used. In addition it must be shown that a fire will be contained within a controlled volume meeting the requirements of Appendix F, Part III ".*
8	Boeing		*Specific section of concern* Special Condition 13(d) *What is the proposed requirement?* "(d) The time for a crewmember on the passenger deck to react to the fire alarm, don the fire fighting equipment and to gain access to the crew rest compartment must not exceed the time for the compartment to become smoke-filled, making it difficult to locate the fire source". *Boeing's suggested change* There should be a flight test demonstration conducted to show compliance with this Special Condition for crew rests not located on the main passenger deck. *Why is the change justified?* The build-up of smoke into the crew rest and the dynamics of being in flight are significantly different between analysis and ground tests, and actual flight test conditions. Stairs present special challenges for accessing a crew rest after donning equipment. Analogous cargo fire accessibility tests are required by FAA / JAA regulations to be flight test demonstrations [ref. Section 25.855(h)(1)].	This is at a level of discussion of means of compliance. SC 13 establishes basic requirements.
9	Boeing		*Specific section of concern*	

		Special Condition 13(d) *What is the proposed requirement?* "(d) the time for a crewmember on the passenger deck to react to the fire alarm, don the fire flight equipment and to gain access to the crew rest compartment must not exceed the time for the compartment to become smoke-filled, making it difficult to locate the fire source." *Boeing's suggested change* Provide a definition for "smoke-filled" as *visibility by an observer in the common area*. *Why is the change justified?* To clarify the requirements of this Special Condition.	Comment not accepted. Intend of the requirement is jugged to be clear enough. Smoke-filled is interpreted as a condition where it is difficult to locate the fire source.
10	Boeing	*Specific section of concern* Special Condition 14 *What is the proposed requirement?* " There must be a means provided to exclude hazardous quantities of smoke or extinguishing agent originating in the CRC from entering any other occupiable compartment. …" *Boeing's suggested change* Add the following: "Flight test must be conducted to show compliance with this requirement". *Why is the change justified?* Prevention of smoke penetration into occupied areas often changes between analysis and ground tests, and actual flight test conditions. Analogous cargo smoke penetration tests are required by FAA/JAA regulations to be flight test demonstrations [ref. Section 25.855(h)(2)]. This change would ensure harmonisation with parallel FAA Special Conditions requirements.	This is at a level of discussion of means of compliance. SC 13 establishes basic requirements.
11	Boeing	*Specific section of concern* Special Condition 14(d) *What is the proposed requirement?*	

		"(d) Hazardous quantities of smoke may not enter any occupied compartment during subsequent access to manually fight a fire in the crew rest compartment." *Boeing's suggested change* This condition should be deleted. *Why is the change justified?* Special Condition 14(c) establishes the performance criteria for smoke penetrating occupied areas when the crew rest compartment is accessed. Repeated access should not have a higher design threshold than the first access, as providing a design to differentiate between the first and subsequent accesses may be extremely complex for the perceived benefit and may not be feasible. It should be noted that the fire threat from a crew rest fire itself should be substantively different than a fire threat in the main passenger deck, except that additional alerting to the crew is required to alert them to the presence of a fire.	Comment accepted. (d) and ref. to (d) in (e) are removed.
12	Boeing	*Specific section of concern* Special Condition 17(e)(2) *What is the proposed requirement?* "The following requirements apply to CRC that are divided into several sections by the installation of curtains or partitions: … (e)(2) Any door between the sections must be shown to be openable when crowded against, even when crowding occurs at each side of the door." *Boeing's suggested change* We suggest revising paragraph (e)(2) as follows: "(e)(2) Any door between the sections must be shown to be openable when crowded against, ~~even when crowding occurs at each side of the door~~". *Why is the change justified ?* Our suggested change clarifies the requirement without creating confusion. It still requires that it is necessary to show the door to be openable when crowding occurs regardless of what side of the door crowding is taking place on; however, it does not	Comment accepted.

			imply that crowding occurs on both sides of the door, as is inferred by the originally written statement. The requirement is meant to address opening of the door when crowded against on either side, but not simultaneously.	
13	Boeing		*Specific section of concern* Special Condition 20 *What is the proposed requirement?* [Requirements apply to Flight Crew Rest Compartment (FCRC) that may be occupied during Taxi, Take off and Landing (TTL) *Boeing's suggested change* We suggest adding a requirement stating that the overall (CS 25.803, 90 seconds) emergency evacuation capability of the aircraft should include accounting for the occupants of the flight crew rest compartment. *Why is the change justified?* To ensure compliance with CS 25.803	Comment not accepted. This comment is related to compliance against 25.803 which is addressed separately when a CRC is certified to be occupied for TTOL
14	Boeing		*Specific section of concern* Special Condition 20 *What is the proposed requirement?* [Requirements apply to the Flight Crew Rest Compartment (FCRC) that may be occupied during Taxi, Take off and Landing (TTL)] *Boeing's suggested change* We suggest adding an additional requirement stating that emergency equipment required for ditching should account for occupants of flight crest compartment (e.g. raft capacity, locations of life vests, etc.). *Why is the change justified?* To ensure compliance with CS 25.801, 25.1411, and 25.1415	Comment not accepted. This comment is related to compliance against CS 25.801, 25.1411, and 25.1415 which are addressed separately when a CRC is certified to be occupied for TTOL.
15	Boeing		*Specific section of concern* Suggested addition of a Special Condition *What is the proposed requirement?* Add the following as an additional Special Condition: *Boeing's suggested change:*	Comment accepted. New paragraph is added.

			"Where a waste disposal receptacle is fitted, it must be equipped with an automatic fire extinguisher that meets the performance requirements of CS 25.854(b)." *Why is the change justified?* To ensure harmonization with previously-issued parallel FAA Special Conditions requirements.	
16	Boeing		*Specific section of concern* Suggested addition of a special condition *Boeing's suggested change* Add the following as an additional Special Condition: "Each stowage compartment in the crew rest compartment, except for underseat compartments for occupant convenience, must be completely enclosed". *Why is the change justified?* To ensure harmonization with previously-issued parallel FAA Special Conditions requirements	Comment not accepted. Retention of stowage must be ensured. Complete enclosure may reduce smoke detection capability.
17	UK CAA		Paragraph 1(a)(3), 1(b) On page 2/8, at paragraph 1 (a)(3) the requirement is for placards inside and outside the (Crew Rest Compartment) CRC indicating that smoking is prohibited, yet condition 1(b), just 4 lines later requires that ashtrays be fitted on the inside and outside entrance to any CRC. If smoking is prohibited – why the need for ashtrays	Comment not accepted. This requirement is consistent with Lavatory compartment requirement (25.853)
18	UK CAA		Paragraph 1 (d) On page 2/8, at paragraph 1 (d) mention is made of the load bearing capacity of the seats or berths in the CRC referring to "flight loads". Would the last part of this condition read better if were worded "… must be able to withstand the weight of any likely occupant under any acceleration to which the aircraft has been certified." ?	Comment not accepted. Flight loads is an accepted terminology
19	UK CAA		Paragraphs 5 (a), 7, 17(d), 17(e)(4), 18, 20(b) In a number of paragraphs it is noted that the symbol "§" 25 is used in lieu of "JAR" 25 which is quoted for other paragraphs (see 11(b) and 12 (a) for example) elsewhere in the document. Is this intentional and if so why? Otherwise it is suggested that for consistency purposes "JAR" for JAR 25 is used. Note paragraph 20(d) doesn't use either the symbol or JAR and just quotes 25.561(d) and 25.562(c)(8)!	Comment accepted.
20	UK CAA		Paragraph 10 Typo – First word should be "Means" not "Mean"	Comment Accepted
21	UK CAA		Paragraph 11(b)	

		In this paragraph TSO C116 is quoted. For correctness shouldn't this be written as "ETSO C116 or TSO C116" ?	Comment accepted. TSO C116 is replaced by ETSO C116 or equivalent.