EASA	COMMENT RESPONSE DOCUMENT
	Proposed Deviation for Distance between emergency exits Applicable to Large Aircraft Transport Category – VIP cabin configuration Issue 1

Commenter 1 : Airbus Corporate Jet Centre

Comment # [1] – General Comment

Comment :

The proposed deviation contains generic elements that are also the purpose of the on-going EASA Rulemaking task MDM066-RMT0264. The terms of reference (ToRs) issued by the EASA for this Rulemaking task specify this issue typical to VIP interior installation as to be discussed within this group.

On that respect, [*it is*] ask[*ed*] the EASA to withdraw its proposal for determination of generic elements related to emergency exit deactivation, and deal with the current applicant in need for EASA position through project-specific CRI as it has been done so far with for ACJC STC projects pending a generic position is agreed within the rulemaking group. Please note that discussions around this subject are planned in the agenda of the Rulemaking Group discussions as priority item, and it is expected an agreed position before summer 2012.

EASA response: NOTED

The vast majority of subject Deviation was consulted previously and accepted on multiple projects. The only additional criterion that was added in this version of the deviation is the following:

2 each seat occupiable during taxi, takeoff & landing must be located within 30 feet from the nearest exit on each side of the fuselage, as measured parallel to the airplane's longitudinal axis, between the nearest exit edge and the front of the seat bottom cushion;

The comment is focusing on the Rulemaking activity in RM Task group MDM066, and should be addressed in the RM task group forum. This deviation is not mean to set any precedence to the outcome of the RM task.

Comment # [2] – Scope of the Deviation

If deactivating existing emergency exit is often requested to give the best flexibility for some cabin arrangements generally offered for "private use only A/C", the same request exist for cabin arrangements on A/C intended for commercial operations (public use). Also, there are many requests for "convertible" aircraft with dual operational capabilities (non-commercial (private) or commercial (public) use), and it is

unlikely that emergency exits can be re-activated while switching from private to public configurations because the extent of such modification would make it not feasible practically during line configuration change.
The fact the EASA is expressing its consideration to “non-commercial use aeroplanes” only may be interpreted as a limitation linked to the fact the EASA is accepting a deviation to 25.807(d)(7) for private use A/C, whereas it cannot instruct deviations for public use A/C.

However, there are some frequent “Executive Interiors” configurations with emergency exits deactivated and with a limitation to 19PAX that are not properly addressed by this generic deviation proposal, and that shall be taken into account for operations in “private” or “public” categories. Actually, such A/C are not required to comply with 25.807(d)(7) because of their limitation to 19PAX and because 25.807(d)(7) begins with “For an aeroplane that is required to have more than one passenger emergency exit for each side of the fuselage (...)” whereas CS 25.807(d)(1) specifies that only one Type III exit on each side of the fuselage is required for aeroplanes up to 19PAX.

Comment :
Therefore, it shall be clarified by EASA that the proposed generic conditions below are set only in the specific frame of “non-commercial use aeroplanes”, and that it shall not be considered as setting a limitation to private use only for deactivating excess (not required) emergency exits.

EASA response: Noted, see reply to comment #1 above.

Comment # [3] – Condition #1 - Deviation contents

It is understood and well supported that “Executive Interiors” accommodation fitted on aeroplanes originally designed for airline configurations shall not degrade the overall level of safety for passengers and crew, whether private or public use aeroplanes. However, it shall be also considered that in the search for more and more comfortable cabin environments, a large reduction in the maximum number of passenger (generally down to 19PAX maximum) is frequently envisaged on aircraft originally designed for more passengers, thus resulting in the determination that many emergency exits are indeed in excess and can be deactivated to optimize the use of the available space in the cabin. This may lead to the deactivation of more than one excess exit on a same size of the fuselage.

Comment :
Therefore, it shall be clarified by the EASA that this proposed generic condition is applicable to “required” emergency exits only, and that it does not apply to “non-required” emergency exits.

EASA response: Noted, see reply to comment #1 above.

Comment # [4] – Condition #2 - Deviation contents

Some “Executive Interiors” accommodations feature side facing seats. Also, it is not rare that side-facing divans with three TTOL seats have a single cushion that can accommodate more than one passenger for “artistic” reasons.

Comment :
In the case of such side facing divans, the proposed criterion is not sufficiently clear to determine the reference and assess the seating position’s distance to exit. A “universal criterion” must be clarified by EASA.

EASA response: Noted, see reply to comment #1 above.

Comment # [5] – Condition #3 - Deviation contents

The condition #3 covers the condition #2: In both cases, no person can seat more than 30ft from an exit on one side and more than 60ft on an exit on the other side.

Comment :
For sake of clarity we propose to merge conditions 2 and 3, and merge our comment on the criterion for side facing seat.

EASA response: Not agreed. Condition 2 and 3 are not the same.

2 each seat occupiable during taxi, takeoff & landing must be located within 30 feet from the nearest exit on each side of the fuselage, as measured parallel to the airplane’s longitudinal axis, between the nearest exit edge and the front of the seat bottom cushion;

3 the number of passenger seats allowed between two adjacent pairs of emergency exits is limited to 50% of the combined rated capacity of the two pairs of emergency exits;

Comment # [6] – Condition #4- Deviation contents

It should clarified that the proposed 50% rule applies to seating areas between two pairs of emergency exits that are located more than 60ft apart from each other following the deactivation of and intermediate pair. The comment below is based on this interpretation

Comment :
The condition #4 is based on the assumption that the remaining emergency exits arrangement is symmetrical (same locations of exits on each side of the fuselage) further to the deactivation of existing ones. However there may be some cases where the exits deactivation has created a dissymmetry that renders the calculation of maximum number of passenger seats allowed not possible with this condition. For

example, on an aeroplane with two pairs of Type C exits (fwd and aft) and with one pair of Type III exits (overwing), what would be the maximum passenger seating capacity in case of deactivation of one aft Type C exit on one side and one overwing Type III exit on the other side?

In addition, taking only into account the adjacent pairs of emergency exits (symmetrical) has the negative effect as not to motivate to keep excess emergency exits since only the set of constraints associated to such emergency exit remains.

For example, on an aeroplane with two pairs of Type C exits (fwd and aft) and with one pair of Type III exits (overwing), there is no change in the number of passenger allowed whether one Type III is deactivated on one side only, or on both sides. In this example, the maximum passenger seating capacity would be ½x(55+55) = 55 passengers.
There is no motivation in letting active one excess emergency exit, and therefore it is very likely that excess exits will be systematically deactivated even if not truly necessary.

EASA response: Noted, see reply to comment #1 above.

Comment # [7] – Condition #5- Deviation contents

Seating areas between a pair of emergency exits and a bulkhead (dead-end zones) are not a “novel and unusual design features” (in the sense of Part 21A.16B) whose origin is only the deactivation of emergency exits on aircraft with no such seating area in the original type-certificated design. The most famous example is the B747 forward-most seating area on the main deck that is forward of the only accessible emergency exit. The FAA has treated such emergency exit configuration long time ago and issued in the FAA AC 25.807 a “75% rule” of the rated capacity of the pair of emergency exits bordering this area.

Comment :
During many years (and up to now within EASA), “Executive Interiors” have been developed with this criterion (whether private or public) and A/C fitted with interiors developed using this “75% rule” are still currently flying today. Although it is not desirable to gain experience on effectiveness of emergency evacuation to claim for “grandfather rule”, there is no elements sustaining the 21A.16B(a)3 condition that “experience from other similar products in service or products having similar design features, has shown that unsafe conditions may develop”. Therefore, it is not justified today to change the “75% rule” criterion and set a new more restrictive “40% limit”.

The proposed “40% limit” is very restrictive and is not justified (on which basis has the number 40% been elaborated?). Changing the 75% criterion to 40% will result in incapacitating industries to re-sell products that were developed and certified recently (for example in the last 2 years) and thus amortize non-recurrent development costs in designing derivatives with new approval. Worst is the message to pass to operators currently operating one A/C designed with the 75% rule and that would be interested with an additional one, like a very similar

derivative to the difference of the colours. How to explain that a similar derivative could not be certified (because "unsafe" if not compliant to the 40% rule) whereas the first A/C in-service is still considered safe even if developed under the "old 75% rule"?

For all these reasons, ACJC suggests keeping the 75% criterion as the basis for determining the maximum passenger occupancy in dead-end zones.

EASA response: Noted, see reply to comment #1 above.

Comment # [8] – Condition #6- Deviation contents

It should be clarified that the proposed 1/3rd rule applies to theoretical maximum that can be calculated with the remaining number of active emergency exits pairs further to the deactivation of some of them. Even if the example below makes clear that no credit for deactivated exits can be used in the calculation of the total seating capacity, it would be worth stating it clearly in the condition itself. The comment below is based on this interpretation.

Comment :
This last criterion is excessive and too constraining. It is even by itself the leading parameter that supersedes the other proposed conditions #4 and #5. See for example the impact on an aeroplane with two pairs of Type C exits (fwd and aft) and with one pair of Type III exits (overwing) like the A319CJ and with two deactivation scenario:

- 1st scenario: deactivation of aft pair of Type C on A319CJ:

In this case we would have the following remaining exits:
- 1 Type C in the front (door 1 – rated 55p)
- 1 Type III in overwing (door 2 – rated 35p)

Using the current generic position of EASA in the proposed deviation, the maximum total passenger capacity of the A/C would be the minimum of:
- SC 4: "50% of the combined rated capacity of the two pairs of emergency exits" → 50% of {55 + 35} = 45 PAX
- SC 6: "one-third of the theoretical maximum allowed by JAR 25.807" → 33% of {55 + 35} = 30 PAX

- 2nd scenario: deactivation of aft pair of OWE Type III on A319CJ:

In this case we would have the following remaining exits:
- 1 Type C in the front (door 1 – rated 55p)

- 1 Type C in the aft (door 3 – rated 55p)

Using the current generic position of EASA in the proposed deviation, the maximum total passenger capacity of the A/C would be the minimum of:
- SC 4: “50% of the combined rated capacity of the two pairs of emergency exits” → 50% of {55 + 55} = 55 PAX
- SC 6: “one-third of the theoretical maximum allowed by JAR 25.807” → 33% of {55 + 55} = 36 PAX

In both cases the 1/3rd criterion of Condition #6 supersedes the 50% criterion of Condition #4 and become the key parameter.

Moreover, there is no indication regarding the distribution of passenger seats in the cabin with respect to the distribution of the emergency exits. It may indeed result in an evacuation exit arrangement that is not consistent with the passenger distribution inside the A/C, and also in contradiction with the FAA AC 25.807 “uniform distribution of exit” criterion. The example taken by EASA of an A/C with four pairs of Type C and number 3 exit deactivated is symptomatic and unfortunate if applied for example on an Airbus A321:

- If such A/C were designed originally with only 3 type C exits, following the FAA AC 25.807 guidance applied on the A321 would lead to:

Door #	Door longitudinal location	Exit Unit	Zone	Total EU / zone	Total EU	Fuselage Length Factor
Door 1	x= 760cm	1,5	A	3	6	$\frac{3901 - 760}{6} = 523,5$
Door 2	x= 1643cm	1,5				
Door 3	x= 2723cm (suppressed)	-	B	3		
Door 4	x= 3901cm	1,5				

- Therefore the nominal location of exits would be:

Door #	Door longitudinal location	Nominal location	Offset actual vs. nominal	
			(cm)	(%) must be < 15%
Door 1	x= 760cm	x= 760cm (assumption)	0	0
Door 2	x= 1643cm	x = 760 + 3 x 523.5 = 2330,5cm	687,5	**22%**
Door 3	x= 2723cm (suppressed)	-	-	-
Door 4	x= 3901cm	x = 760 + 6 x 523.5 = 3901cm	0	0

Therefore suppressing door 3 on an A321 is not the correct example if it is considered that keeping a uniform distribution of exits is

required. Note that with the same demonstration it is possible to suppress Door 2 only (offset is ~12%).

For this reason, ACJC suggests not to keep the proposed example unless it is EASA interpretation that the “uniform distribution of exit” criterion is not anymore a leading design parameter when deactivating exits, and EASA confirms it is authorized to deactivate Door 3 on an A321.

EASA response: Noted, see reply to comment #1 above.

Comment # [9] – Reworded proposal

As an alternative proposal to address emergency exit deactivation, ACJC would like to propose the following for discussion within the frame of the Rulemaking Group referenced MDM066-RMT0264.

Reworded proposal :

EASA considers that an acceptable level of safety for non-commercial (EIR Package 1) or low density (EIR Package 2) [1] use aeroplanes, could be established by allowing a distance greater than 18,3 m (60 feet) between required [2] exits, provided that:

1. A distance greater than 60 feet between adjacent required passenger emergency exits on the same side of the same deck of the fuselage, as measured parallel to the airplane’s longitudinal axis between the nearest exit edges, is allowed only once on each side of the fuselage.

~~2. When a distance greater than 60 feet between exits exists on each side of the fuselage, each passenger seat occupancy during taxi, take-off & landing must be located within 30 feet from the nearest exit on each side of the fuselage, measured parallel to the airplane’s longitudinal axis, between the nearest exit edge and the front of the seat bottom cushion.~~ [3]

~~3.~~2. When a distance greater than 60 feet between exits exists on only one side or each sides [3] of the fuselage each passenger seat occupancy during taxi, take-off & landing must be located within 60 feet from the nearest exit on ~~that~~ one [3] side of the fuselage, and within 30 feet on the opposite side, measured parallel to the airplane’s longitudinal axis, between the nearest exit edge and the front of the seat bottom cushion (for forward or aft facing seats), or the SRP of any other seat if installed side-facing or with an angle with respect to the airplane’s longitudinal axis. [4]
~~4.~~3. The number of passenger seats allowed between two adjacent pairs of emergency exits is limited to 50% of the combined rated capacity of the two pairs of emergency exits if there is no further intermediate emergency exit on one side resulting from the deactivation of an emergency exit pair (emergency exit on the other side deactivated). [5]

~~5.~~4. For zone between a pair of emergency exits and a bulkhead (dead-end zone), or zones that are open but up to 30ft of a pair of emergency exits (assimilated as dead-end zones) [6] the number of passenger seats is limited to 4075% of the rated capacity of the pair of emergency exits.
~~6.~~ The aeroplane's total seating capacity is reduced to one-third of the theoretical maximum originally determined for Type Certification prior to emergency exit deactivation. [7] ~~allowed by JAR 25.807. The expression "maximum approved passenger seating capacity (or configuration)" is not used in case of emergency exits deactivation because the resultant exit configuration is not likely to have been formally approved to the theoretically allowed maximum. For example, on an aeroplane with four pairs of Type C exits, the type-certificated passenger seating capacity will normally be 220. Assuming the number 3 exits are deactivated, leaving three active pairs of Type C exits, the theoretical maximum currently allowed by JAR 25.807 would be 165. Nonetheless, the maximum capacity would be limited to 55.~~ [8]

Rationales references :

[1] Up to now, distance between exits more than 60ft were generally authorized with a limitation to non-commercial use aeroplanes because seen as a deviation to §25.807. The Authority did not consider however that passenger of private aeroplanes deserved a lower level of safety than passenger flying in other transport categories. As it is developed in the proposed special conditions for this deviation proposal, the primary criteria considered are the distance between a passenger seats and emergency exits, and the effects of passenger seating area density (to avoid slowing evacuation because of crowded aisles). Since the EIR package 2 is developed specifically to address interior arrangements with low densities, it is appropriate to extend this allowance to A/C relevant of EIR Package 2 (ie. low density A/C up to 1/3rd of max TC capacity).

[2] The addition of the term "*required*" is of primary importance to address cases where the modification of an aircraft initially featuring more than one pair of emergency exit results in creation of distance between exit which is more than 60ft simultaneously with a reduction of the number of exit required under 25.807(c) (for example the deactivation of overwing emergency exits on an A319CJ limited to 19 PAX max). In that case a distance between a "required" emergency exit and a "non-required" emergency exit may be more than 60ft without being formally in deviation to §25.807(d)(7).

[3] If a passenger seat is less than 30ft from an emergency exit on one side it is forcefully less than 60ft from this emergency exit. Therefore, unless there are A/C Types not properly addressed without this distinction, ACJC propose to merge this Special Condition number 2 with the condition number 3 that is reformulated to cover both cases.

[4] Side facing seats or divans are common features executive interiors. Seats that are certified with an angle with respect to the longitudinal axis may also be installed. For Seats with an angle, the front of the seat bottom cushion can be taken as the reference for assessing the distance to the emergency exit. For side facing seats however, if the reference is the side of the bottom cushion there might be differences in the distance a passenger would be from an exit because of the seat cushion width. A guidance is also necessary to

address atypical side facing seats or divans designs (for example triple side facing divan with one single bottom cushion...). For such side facing seats, it is therefore proposed to consider the SRP of the seating position as reference for distance to exit.

[5] In case a pair of exit is deactivated and creates a distance between two pairs that is more than 60ft, it is agreed that a reduction to 50% of the combined rated capacity of the two extreme pairs of emergency exits may be set. In case only one exit is deactivated on one side however, the overall evacuation capability of the same area is increased and credit must be taken for this additional capacity to create a motivation to keep the emergency exit on the other side active.

[6] The approach adopted by certification authorities up to now was to address dead-end zones with reference to FAA AC25.807 that recommends a 75% limitation for such zones. This criterion is still in use for type-certificated A/C used for public transportation and currently flying in airlines (typically the Boeing B747). There is no apparent reason (nor substantiation presented) to reduce dead-end zones occupancy to 40% for private use A/C and continue to accept in the same time airliners configurations based on the 75% criterion. It is even unclear if the EASA intends to further reduce to 40% such passenger area occupancy when there is no other change than the use of the A/C in the private transport category? It is therefore proposed to keep the current 75% criterion as currently in force in the FAA AC 25.807. In addition, the question of cabin arrangements between two pairs of emergency exits located more than 60ft is proposed to be addressed as being constituted of two “open” dead-end zones against each other. This proposition makes sense since passengers located more than 60ft from a pair of exit are likely (or can be directed) to evacuate towards the closest emergency exit. This assumption also creates a motivation not to fall in the absurd situation where it might be considered to install a full width partition to physically divide a cabin area in two separated zones to allow more passengers. Finally, it shall be considered that there are several cabin arrangements currently flying based on this 75% rule criterion, and that this situation was considered as acceptable by the Industry partners and the business aviation operators. Unless there are some particular reason for changing an agreed criterion (unknown on Industry side), the current consensus shall be kept.

[7] The overall 1/3rd limitation is proposed to be set with respect to the theoretical maximum passenger capacity prior and not post the exit deactivation. It is actually not clear in the current formulation whether the 1/3rd criterion applies before or after exit deactivation, but in the example detailed just after it is clear that the 1/3rd criterion is intended to be applied on the remaining exits maximum rated capacity post deactivation. As shown in comment #7 above, this criterion is excessive because always supersedes the cabin occupancy allowances defined by zones (even with the proposed 40% criterion).

[8] It is proposed to remove the example of deactivation of door 3 on A/C with 4 pairs of emergency exits for the reason exposed in comment # 7 above: without any additional guidance on the impact on the uniform distribution of exit criterion, this example might mislead applicant by thinking it is authorized to deactivate door 3 on any type-certificated A/C without additional verification (see example on A321).

EASA response: Noted, see reply to comment #1 above.

Commenter 2 : Airbus

Comment # [1] – General

This proposed deviation is based on the criteria of the FAA SFAR 109 for deviations from § 25.807, which requires a maximum distance of 60 feet between adjacent exits.

Comment :
Airbus is concerned about EASA trend to permanently increase the requirements on VIP cabin with no clear safety explanation.

At last, [ ] this deviation be reviewed by the stakeholders group currently working on EASA rulemaking task RMT.0264 (MDM.066), Executive Interiors Accommodation. This will ensure consistency of the requirements, provide accurate safety justification to the applicants on the EASA decision, and prevent variations between the various publications on that subject.

EASA response: Noted, see reply to comment #1 above.

Comment # [2] – Condition #1 – Deviation contents

Airbus would like to repeat the comments made in 2007 on the FAA NPRM 07-13 (SFAR 25 Special requirements for Private use transport category aircraft – now SFAR 109).

Comment :

It is not obvious why a distance of more than 60 ft is allowed only one time on each side of the fuselage. In case of an example with five uniformly distributed pairs of exits, it should be possible to deactivate doors 2 and 4 as far as all other aspects are fulfilled. The situation between 1 and 3 would be the same as between 3 and 5 and the safety level for the occupants would be same in each cabin area.

Cases where only one exit of the pair is deactivated should be added, as credit can be taken of the remaining exit to allow in some cases the installation of passengers at a distance greater than 30 ft.

EASA response: Noted, see reply to comment #1 above.

Comment # [3] – Condition #4, #5, and #6 – Deviation contents

Airbus would like to repeat the comments made in 2007 on the FAA NPRM 07-13 (SFAR 25 Special requirements for Private use transport category aircraft – now SFAR 109).

Comment :

There is no substantiation why the proposed percentages are adequate in all cases. They might be based on the Agency experience over the amount of private airplanes certified and the deviations granted, but flexibility should be possible to match the variety of possible non-compliances and compensating factors.

If the distance between two exits is more than 60 ft, this area can be seen as a “dead-end zone” and a restriction to a maximum of 75 percent of the exit pair rating according to AC 25.807-1 within 30 ft is sufficient.

The aim that the distance from each seat be less than or equal to 30 feet to the nearest exit and less than or equal to 60 feet to the exit in the other longitudinal direction can be fulfilled with restricted areas as well (see figure 1 below). This should not mean a reduction of the maximum seating capacity using the exit ratings listed in § 25.807.

EASA response: Noted, see reply to comment #1 above.

Commenter 3 : Bombardier

Comment # [1] – General comment – Applicability scope

The proposal does not make reference to a specific aircraft model, nor the number, location and type of exits, nor the cabin configuration and number of passengers.

Comment :
The proposal may be considered to apply to all large aircraft required to comply with JAR 25.807(d)(7), Change-15, and can presumably be extended to apply to any new aircraft design certified up to the latest revision of CS-25.807(d)(7), since the requirement has not been changed subsequently.

EASA response: Noted, see reply to comment #1 above. The applicability scope has not been proposed to change.

Comment # [2] – General Comment - Usage

It is unclear though, why the proposed deviation limits its applicability to non-commercial aircraft only.

Comment :
If the seating configuration is unchanged, we see no valid safety reason to make a distinction based on the type of operation. Admittedly, it would be unusual for an air carrier to adopt a VIP interior, but this should be a business decision instead of a regulatory one : it should apply to all interiors and not be limited to non-commercial operators.

EASA response: Noted, see reply to comment #1 above. The applicability scope has not been proposed to change.

Commenter 4 : Dassault

Comment # [1] – General Comment

The EASA/Industry working group MDM.066 [ ] has been tasked by EASA Rule Making to establish a regulation applicable to executive interiors. In this exercise, the working group has found a couple of issues that should be addressed with an applicability not limited to executive interiors. [ ] The working group has identified the distance between exits.

Comment :
Recommend[*ation*] to withdraw the deviation D-13 proposal.
It would be a unique situation to have on one side a rule making group working on a subject, and on another side a rule issued on the same subject before the working group has finished.

EASA response: Noted, see reply to comment #1 above.