Safety Recommendation Number:	IRLD2022001
AAIU Event Reference:	IRL00919027
AAIU Report Number:	2022-06
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Safety Recommendation Status:	Not accepted, closed

Safety Recommendation:

BRM Aero should review the Weight and Balance documentation for all NG5 variants to take account of all values obtained during its weighing of the aircraft, including those values that were greater than 750 mm aft of the wing rib 4 datum for the moment arm for persons seated in the NG5 aircraft. The effects of seat cushion thickness should be included in the review. The review should be monitored by the Czech LAA, and amendments arising from the review circulated to all owners/operators of the NG5 variants.

Response:

The Aircraft Manufacturer provided the following response on 30 November 2022:

'The BRM continues to believe that determining crew arm based on actual aircraft weighing with pilots of different physiques and weights is the most practical and closest to reality. The weighing already performed has shown that no clear mathematical relationship between pilot height/weight and crew arm can be established.

Therefore, the average value found by real weighing was used for the crew arm. Using only the rearmost position would result in the majority of flights being conducted at a more forward center of gravity position than calculated. Furthermore, flight tests have clearly demonstrated that even exceeding the aft CG limit by up to 2% does not result in any unsafe flight characteristics'.

AAIU Reply:

On 23 January 2023, the AAIU responded to the Aircraft Manufacturer as follows:

'Safety Recommendation IRLD2022001 relates to the Weight and Balance Documentation for all NG5 variants, and recommends the documentation takes account of all values obtained during BRM's weighing of the aircraft, including those values that were found to be greater than 750 mm aft of the wing rib 4 datum, as outlined in Section 1.6.10.8 of the AAIU's Final Report. This review should also take account of the effects of seat cushion thickness.

BRM's response relates to the process used to determine the crew moment arm and not the documentation. This response will be published on the AAIU website, through a hyperlink in the Final Report and on the publicly accessible SRIS website. The AAIU therefore suggests that BRM reconsider the recommendation and provide a response that accurately reflects the content of the Safety Recommendation'.

Response:

The Aircraft Manufacturer provided the following response on 16 March 2023:

‘SR Not Accepted. Reason: BRM Aero will keep crew arm as specified, i.e. 1,156 mm from the new reference plane - fire wall.

A compression of the seat upholstery has been considered when determining the crew arm. Moreover, BRM AERO has carried out thorough flight tests (report ULHD-REP-2-13-1-EN-0003_2021) at CG 37 % of MAC (which corresponds to CG movement of 28 mm behind the CG aft limit 35% MAC) which have clearly demonstrated, that even with this centre of gravity position the aircraft is fully controllable and its stall characteristics are not significantly affected. The above flight tests by BRM AERO have demonstrated that change of crew arm within a couple of mm is not essential from this point of view. The AAIU was informed of the tests on 10 September 2021’.

AAIU Comment:

The AAIU considers the status of this Safety Recommendation as ‘Not accepted, Closed’.