

Letters to the Editor

Dear Editor,

Recently I came across the Indian Journal of Aerospace Medicine Vol 46(1). It carried an article 'Iskra ejection seat system failure and fatal injury'. Since I ejected successfully from an Iskra on 10 Jun 1976, I read the article with more than usual interest. Herewith are my comments.

Auto Separation. The author seems to imply that the Iskra seat has an auto separation feature and that this failed to work during the ejection under discussion. There is no such feature in the Iskra seat. The pilot has to manually separate from the seat. Otherwise, he is liable to go down with the seat.

Pushing the Seat Away. The author correctly says that there are no leg restraints and that the pilot has to withdraw his feet to the footrests. I should add that this takes some effort but is essential for more than one reason. It is not easy to push the seat away for manual separation. Instead, a far more effective method is to merely stand up with the feet on the footrests. This pushes the seat away easily. The leg muscles are far more powerful than the hands. And we use two legs rather than one hand.

The Iskra seat is very similar to the Martin Baker Mark I C seat fitted on Canberra.

We had a large fleet of Canberra and a large pool of Canberra crew. The above method was told to me by a veteran navigator but seems to have remained 'informal' knowledge. It helped me all right but does not seem to have percolated to our Iskra pilots.

Wg Cdr J Thomas VM (Retd)

The editorial board considered the comments of Wg Cdr J Thomas VM (Retd), the reply by the author, Wg Cdr D Chakrobarty and comments of Wg Cdr A Agarwal Aviation Medicine specialist at AF Station

Hakimpet and those of the staff at Training Command Head Quarters. The editorial board gives the following facts.

The manual of Iskra ejection seat confirmed that auto separation takes place following ejection from Iskra aircraft.

The seat fitted with AD3 automatic safety belt releaser does automatically release the pilot from the seat harness but there is no seat stabilization drogue of the type fitted on other modern seats. The drogue, as we know also assists in ensuring a forced and positive separation of the pilot from the seat. Consequently, in the Iskra it would appear that the 'auto separation' in the restricted context of separation from the seat may or may not take place in quick time necessary. Thus, it is necessary, to attain separation, for the pilot to force the seat away with the feet and hands followed by manual opening of the parachute if the AD3 automatic device does not do so.

The procedure of duplicating manual release below an altitude of 4 km has been incorporated in the pilot's orders. The ejection seat simulator at AF Station Hakimpet has been of immense help to pilots to practice the ejection procedure and carry out fault analysis.

Dear Editor,

Reference is made to the article 'Human centrifuge in aero medical evaluation' published in Winter 2003 issue of Indian Journal of Aerospace Medicine. I would like to draw the attention of the authors to certain factual errors / inaccuracies that have been over looked in the article.

In Para two the authors refer to reference number (3), which is from the 1994 issue of IJASM while talking of data from 1984 to 1998. May be a printer's devil.

The medical evaluation profiles used for assessment of straining ROR tolerance of any fighter pilot in the human centrifuge are 4G 15 sec, 5G 30sec and 2 peaks (about 100 sec) of 4G 15sec – 6.5G 15sec SACM. Additionally a 2G run with head movements may be given during evaluation for spatial disorientation or vertigo cases. However, Table II in the article erroneously lists a whole lot of profiles, which are never to be used for medical evaluation. For instance: -

- (a) 7G 15 sec ROR and 9G 2 sec GOR runs have been listed in the table II among the runs used for medical evaluation. These two runs are reserved for the high G course (Advance Fighter Aeromedical Indoctrination Course) only. These are never to be used for medical evaluation even if the pilot is from an Air Superiority Fighter (ASF) squadron. In other words, whether a pilot ejects out of a Mirage 2000, MiG-29 or SU-30 he is never subjected to straining ROR tolerance runs other than the ones listed below. The aim is to check if his back can withstand reasonably high G-levels (6G 30sec) and not to check his tolerance to high sustained Gs (HSGs) of 7G 15sec and above.
- (b) Table II also lists 4G 15 sec – 6.5G sec SACM duration as 300 sec (maximum). It is clarified that only two peaks (about 100 sec) of this SACM is used for medical evaluation after which the run is invariably terminated. A maximum of 300sec (9 peaks) are reserved for the Stage-2 alpha training course, never for medical evaluation. The aim is to test the adequacy of pilot's G-duration tolerance for fighter flying and not to test his maximum endurance.

The authors' recommendation that all cases of episodic unconsciousness / G-LOC in the air must be cleared on the Human Centrifuge (HC) before re-flying is not understood. No doubt all cases of in flight episodic unconsciousness in a fighter pilot need to be evaluated in HC. The only exception is G-LOC. Only an aircrew with repeated G-LOC episodes / suspected low G-tolerance or where there is doubt in diagnosis, need HC evaluation. No modern air force subjects every case of in flight G-LOC to HC evaluation although the incidence of in flight G-LOC is rather high (10.5% in the IAF, 12% in USAF and 19% in RAF). This is because G-LOC is a

purely physiological phenomenon and can be diagnosed in most cases by the local aviation medicine specialist. Isolated cases of G-LOC in-flight are to be left alone with the advice that the concerned pilot must not fly for next 24 hours. IAP 4303 III edition's recommendation that every case of G-LOC be evaluated in the HC and even tilt-table studies needs reconsideration.

The authors assert that a relaxed tolerance of less than 3.5 G with Peripheral light loss at 52 to 56 degrees as end point is considered as low G-tolerance. This observation is erroneous, and is not in conformity with our own standards of high G course or with the available world literature. The figure is less than 3G and not 3.5 G. During the conduct of high-G courses in the last two years the under signed has come across a few fighter pilots whose relaxed tolerance was 3 to 3.3G on the centrifuge. However, their straining tolerances were good enough to successfully complete the high G course and fly Air Superiority Fighters like Mirage 2000, SU- 30 MiG-29.

Last but not the least, the claim that out of the three cases of hypertension evaluated in the centrifuge, two were made unfit for fighter aircraft because of having increased blood pressure response in the post run period, is most intriguing. It is common knowledge that hypertension is diagnosed and treated on the basis of basal blood pressure recordings / ambulatory blood pressure monitoring and never on the basis of blood pressure response post exercise / HC run. And once on anti-hypertensives, the pilot is automatically unfit for fighter flying. A post HC high recording of BP however has no diagnostic value in hypertension and these runs could have been avoided.

Wg Cdr PK Tyagi

Reply by the author, Wg Cdr S Modak

The paragraph wise reply to the comments/ observations are as follows:

In paragraph two read as data from 1984 to 1993 (3) instead of 1984 to 1998(3).

Medical Evaluation Profiles

At first I want to reiterate that it is a retrospective study from the records available at the department of Acceleration Physiology at IAM, IAF.

- (a) 7 G run has been used in the past for some cases of medical evaluation. Refer article IJASM 1994:38(2): 80-83 under neck injuries. Hence, it was mentioned in the table II of my article.
- (b) 4 & 6.5 G SACM for 2 peaks. I have mentioned the availability of the run for a maximum duration of 300 seconds. I am in agreement that two peaks of this SACM run is routinely used for medical evaluation at IAM but there is no embargo laid down in the department of not using more than two peaks of this run in any specific case.

GOR run is of course never used in medical evaluation. Hence, the error is regretted. The author requests it to be amended by the editor in the next issue of IJASM.

Recommendation of evaluation of G-LOC / Episodic unconsciousness in the air in HC holds good as per IAP 4303 3rd edition and it does not require any explanation.

'Relaxed tolerance of less than 3.5 G with PLL at 52 to 56 degrees as an end point is considered as low G-tolerance'. This standard had been followed at IAM and is available in the old case records of the high-G course/Medical evaluation in the Dept. of Acceleration Physiology at IAM, IAF. I have quoted the same figure.

A total of three cases of hypertension have been evaluated in Human Centrifuge till date. Last case was evaluated in early nineties and all records are available in the evaluation case records at the Department of Accn Physiology. It is a retrospective study. Hence, the author does not hold any right to comment on retrospective findings of earlier years.

Guidelines for the authors and the Membership form will be published in the winter issue of the Journal.

These are available on the ISAM website: isam-india.org