

## **PROPOSAL TO IGC PLENARY 2007**

### **Proposed by IGC Bureau**

#### **It is Proposed That:**

1. That the IGC endorses the work of the OSTIV SDP in developing reinforced glider cockpits to improve safety and the IGC urges OSTIV to work with EASA to ensure that modern standards for reinforced glider cockpits are incorporated in CS 22."
2. That the IGC require that energy absorbing foam cushions be used in all gliders flying in IGC sanctioned competitions after 1 October 2007."
3. That the IGC investigate whether the safety modifications proposed in the OSTIV SDP Crashworthiness Subcommittee Report, be applied to all gliders flying in IGC sanctioned competitions."

#### **This Proposal affects:**

Sporting Code Section – SC3

Annex A

Local Procedures for 2007 IGC Sanctioned Competitions

#### **Reasons supporting the Proposal:**

Following a suggestion from Italy, The IGC Bureau has asked the OSTIV Sailplane Development Panel (SDP), more specifically the Crashworthiness Subgroup (CWS) to think about how we might make glider cockpits safer. The exact questions were as follows:

1. Whether we could require, after some date in the future, that all gliders being used in IGC sanctioned competitions have reinforced (safety) cockpits.
2. What a reasonable and achievable date for the implementation of this requirement would be.
3. Whether we would need to consider "grandfather rights" for gliders flying in the Club Class, or whether some modification could be made to such gliders to enhance the safety of their cockpits.

The following summary, based on responses from 6 Sub group members, was received back from the CWS Chairman:

#### **1. Introduction**

1.1. First of all we should unify and accept the correct common terminology: The crucial problem is the definition of "Safe Cockpit". During many years work in "crashworthiness area" we have many times emphasized, that we are not able to ensure the "100% Safety" of glider crew in the whole

crash scenario, which should be expected. The crash presents a very wide spectrum of combinations of attitudes, energies, impact site characteristics etc.. It is a typical stochastic process. It is not in the “designer - human being” capability to invent the absolutely Safe Cockpit.

1.2 Nevertheless, based on statistics, we were able to find out the most frequent impact attitude / kinetic energy configuration, carry out the extensive crashtests program and embody the results into Airworthiness Code. We consider the glider cockpit, which complies with these requirements, to be a “Crashworthy Cockpit”. It is not “absolutely safe”, but should protect the crew from serious injuries in the most frequent case of “survivable” crash scenario.

1.3 The above mentioned crashworthiness requirements, based on the current knowledge and applied technologies, are enclosed in the OSTIV AS 3.75 Emergency Landing Condition and coherent AGM in Appendix, page A-6, 3.5 Emergency landings (see [www.ostiv.fai.org](http://www.ostiv.fai.org)) . However, OSTIV AS has no legal status, like JAR (now CS) 22. This standard, equal in many aspects to OSTIV AS, contains also the “Emergency landing” paragraph, but in the original wording, not amended after extensive theoretical and experimental investigations, accomplished mainly in Germany. From this point of view “crashworthiness community” considers requirements of the “mandatory” (EASA accepted) standard as a little bit obsolete. Nevertheless, all new gliders are certified according to JAR 22 and application of latest crashworthiness information was not mandatory during their certification procedure. Fortunately, the part of most important designers accepted the crashworthiness investigation results and philosophy and applied the requirements, despite they are not mandatory. Many new gliders have the crashworthy cockpit. This is good news, but from the legal point it cannot be used as argument for implementing new requirements on yet certified models.

1.4 OSTIV SDP also started the campaign for application the “Cockpit Damage Report” document within the world-wide gliding community. This report would provide the feedback to designers on the crashworthiness of their models and enable to amend the current requirements in Airworthiness Standards. IGC and OSTIV TSP members are well informed.

## 2. Summary of received replies (answers on Bob Henderson questions)

“Could we require, after some date in the future, that all gliders being used in IGC sanctioned competitions have reinforced (safety) cockpits ?“

First we should note, that all IGC proposed improvements should be considered as “Proposed Amendments/ Modifications”. Civil Aviation Authority (EASA in Europe) is the only competent Body to issue modification approval and/or CS 22 amendment. The consensus among IGC, Competitors, Type Certificate Holders and Authority must be reached.

If we accept the definition of the “Reinforced (safety) cockpit” as the one, complying with the requirements of OSTIV AS 3.75 Emergency Landing Condition, the position of all responders to the first question is NO.

This would discriminate a lot of sailplanes regularly type-certificated according to the commonly accepted Airworthiness Standard (JAR/CS 22) at competitions.

The necessary full retrofit means practically total rebuilding of the cockpit area, which would mean the immense economical burden and would be hardly acceptable from the legal point of view.

IGC could discuss some date in far future only after EASA amends the current CS 22 to reflect the recent crashworthiness knowledge (as reflected in OSTIV AS). The IGC initiative should be pointed at this direction, i.e. supporting appropriate amendments in CS 22.

“What a reasonable and achievable date for the implementation of this requirement would be?“

See discussion above.

„ Would we consider "grandfather rights" for gliders flying in the Club Class, or whether some modification could be made to such gliders to enhance the safety of their cockpits?“

The half of responders expressed directly the need to consider „grandfather rights“, in other replies is this position expressed indirectly, pointing out that the full retrofit is practically impossible. Nevertheless the responders propose, that some simple and relatively cheap modifications might become mandatory (for each competition class, after consensus of involved parties). Such modifications / improvements for competition sailplanes could be:

Replacement of old seat cushions by the new ones, made of the energy absorbing foam (DYNAFOAM or equivalent material).

Installation of the „bail-out“ assistance system (NOAH or similar). Here should be pointed out, that installation of integral Sailplane Parachute Rescue System requires the „crashworthy cockpit“ for absorbing the kinetic energy at ground impact of sailplane torso. This is not necessary when Pilot Rescue System is used.

Removal of sharp edges and obstacles from the cockpit in front of the pilot, modification of safety harness attachment points (if possible!), refastening of loose objects behind the pilot etc.

Installation of main landing gear with bigger tyre, providing better energy absorption at flat impact - if technically possible!

Installation of anti-collision system, safe arrangement of cockpit instruments, namely modern „hand-held“ navigation equipment, not disturbing the pilot's look - out.

### 3. „Administrative“ provisions increasing the safety.

Besides the sailplane design improvements some responders mention also the possible administrative measures, like penalization of fast and low finishes, application the handicap system in case, that participant would not respect some accepted „cheap improvements“ (see above) etc.

### 4. Conclusion.

OSTIV SDP- Crashworthiness Subcommittee welcomes the initiative of IGC in increasing the passive safety in gliding competitions, which in fact means the reflection of our more than one decade effort! We would nevertheless recommend to continue in applying the proposed mandatory requirements very carefully and circumspectly to avoid discrimination of „elder“ model owners.

We are prepared to further more detailed discussion

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The suggestion of the IGC Bureau is that we cannot make a formal proposal to change the cockpit design and therefore enhance safety because the design requirements are set by EASA, not OSTIV or the IGC, but we would like to make the proposals at the top of this document.