CIVL PLENARY 2010 – LAUSANNE – ANNEX 17
SLOVAKIA PROPOSAL

Proposal: To change the Class 1 definition in SC7A Ch 1.5.1.1.

From:
Class 1: Hang gliders having a rigid primary structure with pilot weight-shift as the sole method of control, which are able to demonstrate consistent ability to safely take-off and land in nil-wind conditions. Subsidiary controls affecting trim and/or drag are permitted, but only if they operate symmetrically

To:
Class 1: Hang gliders having a rigid primary structure and aerodynamic load transferred solely by flexible material, and which are able to demonstrate consistent ability to safely take-off and land in nil-wind conditions. Subsidiary controls affecting trim, drag and lift are permitted, but only if they operate symmetrically

Background:
The definitions of the glider classes are the result of the attempt to map the situation in the time of their creation. Although they seemed appropriate in the time of their creation, I believe that the Class 1 definition doesn't grasp the essence of the glider technology that is covered by this class and I can prove it. I am not saying that the authors made mistake, I am just saying that the evolution of the definition is inevitable (as is the evolution of our technology).

I propose two changes in the Class 1 definition:

1. The present definition doesn't clearly state if the flexible wing with the trailing edge flap (e.g. Seedwings Sensor 610 CF5) is permissible to compete in Class 1. I think it should, because it is just minor evolution of Class 1 technology (as was the advance from the kingposted gliders to topless gliders). Therefore I propose to change the sentence:
"Subsidiary controls affecting trim and/or drag are permitted, but only if they operate symmetrically."
to:
"Subsidiary controls affecting trim, drag and lift are permitted, but only if they operate symmetrically."

2. The condition "with pilot weight-shift as the sole method of control" is not the essence of the current Class 1 technology. The difference between Class 1 and class 5 doesn't rest in inertial/aerodynamic control. Moreover, none of the present Class 1 gliders fulfills this condition exactly. Practically all Class 1 gliders have crossbar that is permited (to some degree) to move sideways in relation to the position of the keel. The weight shift control input creates side movement of the keel with respect to the position of the crossbar. This creates the sail assymetry (larger billow on one side of the sail) which is in fact the aerodynamic way of control (similar to wing warping on the first Bleriots). It is good for controllability, therefore it would be unreasonable to insist on present definition. We should replace it with other definition, which assures the simplicity, transportability and damage tolerance of the present Class 1 technology. Therefore I propose to change the wording:
"with pilot weight-shift as the sole method of control"
To:
"and aerodynamic load transferred solely by flexible material"

Peter Gasparovic
Slovak delegate CIVL

Discussion:

19 December 2009

Hi Peter,

We were well aware of the modern glider mechanics when we wrote the class 1 definition. Shifting crossbars have been used since 1979 and flaps since the easrly 90s. The weight shift definition is adequate because it defines what the pilot does to control (as opposed to moving a stick, twisting a grip or actuating a control line). I disagree with adding the sentence: "aerodynamic lift transferred soley by flexible material," because for one thing, it would eliminate the winglets that gliders in the past have had, and who knows where we will go in the future? We spent several meetings considering these definitions and what we have now has worked very well. There have been no manufacturers requesting a change or producing something questionable. I think the general wisdom applies here: "If it ain't broke, don't fix it."

Concerning the last sentence, the Sensor flap was considered and discussed during the writing of this rule and the rule was written to allow it. I would be willing to add the word "lift" to the sentence, however, but it doesn't really matter since you cannot change drag without changing either trim or lift.

Dennis Pagen
Chairman HG Subcommittee

20 December 2009

Hi Denis,

I think that it is "already broken" :-)

I admit two objections:
- my definition is not perfect (it eliminates the winglets),
- the definition is not a priority today (no manufacturerers' requests).

However, my original proposal is the evidence that the definition in its present wording is faulty. A non-CIVL-insider, like me, is not able to infer the right conclusion from the definition. Although there is widespread agreement on how the Class 1 glider looks like, and we don't need a definition for 99% gliders, we need to rely on the definition when in doubt (flap, aerodynamic control). The vague definition makes a risk to the innovator - he must defend his creation against the definition or he must propose the change of the definition (uncertain result).

The flap was my primary concern. I cannot agree with "... you cannot change drag without changing either trim or lift". The word "trim" is ambiguous. The Cambridge aerospace dictionary (http://books.google.com/books?id=l5JUAAAAMAAJ) offers seven definitions of the "trim". When we speak about the trim speed, the proper design of the flap on sweep wing can achieve the change of maximum lift without the change of the trim speed. It would be more consistent to talk abou lift, drag and pitching moment (both the trim speed and the trim attitude are implicitly included).

My second concern is aerodynamic control. You cannot prohibit aerodynamic control in the Class 1, when the majority of the present Class 1 gliders don't fulfill the word "sole" in the condition of "... weight-shift as the sole method" (because of shifting crossbars). Do we really need to limit ourselves to weight-shift principle when the partial aerodynamic control is the clear advantage at no cost? We only need to ensure that the present advantages of the Class 1

technology are preserved. The Class 1 has these advantages over Class 5:
- resistance to spin at slow speed and high roll
- good "packability" and transportability (small space, damage tolerant)
- simple technology (cheap)
All of these advantages are directly caused by the flexibility of the wing - I mean that the twist of the wing is not fixed and there are no big rigid and fragile structures to resist aerodynamic torque).

I propose another definition:
"Class 1: Hang gliders having a rigid primary structure and wing shape defined mainly by tension of flexible surface, and which are able to demonstrate consistent ability to safely take-off and land in nil-wind conditions."

The rest is unnecessary.

Peter Gasparovic
Slovak delegate CIVL