CIVL Paragliding Competition Safety Task Force

Interim Report 1

07 December 2011

Contents

1 Executive Summary

This first interim report of the CIVL Paragliding Competition Safety Task Force is produced to provide CIVL delegates with input for the next CIVL Plenary in February 2012.

The paragliding world as a whole is currently in a state of flux, with changes regarding wing certification underway that might impact some of the recommendations in this report. The task force decided that at this point it is important to publish the results of the work done so far, for the delegates to start building their opinions. But the on-going development will be closely watched and commented on by the task force over the next few months, until the plenary.

The report gives a short overview of the current state of paragliding competitions, an insight into the task force's underlying philosophy and goals, and then in its main sections covers the following areas:

1. Incident Investigation and Data Analysis
2. Equipment
3. Pilot skills and education
4. Competition Structure, Task Setting and Scoring

For each of these areas, the report lists the work done by the task force, the findings, the conclusions drawn, and further on-going or planned work, where applicable. This results in a series of recommendations to CIVL, both for the 2012 season and for the long term.

The main recommendations for the 2012 season are:

1. A re-organisation of the glider class definitions used within Section 7 of the FAI Sporting Code. Most notably, this includes:
    a. the official introduction and definition of a Serial Class to be used in Category 2 events
    b. the inclusion of Serial Class as its own class in Category 1 events, and
    c. proposals for Competition and Serial Class definitions, in conjunction with lifting the current suspension of Competition Class gliders from Category 1 events.
2. Improvements to the Incident Reporting system, to the effect that complete and reliable data regarding incident rates of all FAI-sanctioned competitions within CIVL's domain becomes available, is analysed and published on a regular basis.
3. Increase the qualification level of pilots admitted to Category 1 competitions by adapting entry requirements to a higher level of current competition experience, and by requiring pilots to complete training in areas relevant to competition performance and safety.

The report concludes with an outlook on the future of the task force.

2 Introduction

After the stopped 12th Paragliding World Championships in Piedrahita, the CIVL Bureau initiated the formation of a task force. This task force's purpose is to find ways for improving safety in paragliding competitions, and especially in FAI Category 1 championships. Since it does not carry any controlling power within CIVL, we are making recommendations to the CIVL Bureau and the CIVL Plenary.

This is a first interim report, outlining the work done so far within the task force and the first recommendations resulting from that work. While most of the work is still at a very early stage and more effort is required from our point of view, we recognize the fact that important decisions must be made shortly regarding the 2012 competition season. To support these decisions and provide guidance towards a safer paragliding competition environment, we created this interim report.

If the task force is to continue, further reports will focus on more detailed analysis of safety data, reviewing the extent of implementation of these recommendations, their effectiveness, and making further recommendations as necessary. There is the potential for an annual report, made to the CIVL Plenary at the start of the northern hemisphere paragliding season.

3 Current State of Paragliding Competitions

In July 2011, the CIVL Bureau suspended the permission to fly Competition Class paragliders in FAI Category 1 paragliding championships. This was expressed to be a temporary measure, put in place until the incidents that occurred at the World Championships in Piedrahita were investigated, and the reasons for the incidents identified. With the suspension, a recommendation was made to NACs to evaluate whether Competition Class paragliders should still be flown in racing tasks in their competitions. Many NACs decided to follow CIVL's lead and suspended Competition Class gliders from competitions held in their territory. Some NACs went further than CIVL's recommendation and also excluded Competition Class wings from their year-long online cross country competitions.

With Competition Class gliders suspended, many of the remaining 2011 competitions were flown with Serial Class wings. While there is currently no formal classification for "Serial Class", the de facto standard is to include all wings which passed a flight certification, currently either EN or LTF. Therefore, "Serial Class" is in general understood to be "All certified wings up to and including EN-D or LTF-D". This is what is generally flown in national and international competitions where Competition Class gliders are no longer accepted.

In August 2011, the Paragliding World Cup Association (PWCA) also decided to require Serial Class for the 2012 season, recognizing the fact that it would be difficult to organize competitions for Competition Class gliders in countries where these gliders are banned from competitions. This includes the 2011 Super Final, in January 2012, meaning that in 2012 most top level competitors would be expected to be mainly flying EN-D certified wings.

In early October 2011, the Paragliding Manufacturers Association (PMA) discussed the topic of certified vs. uncertified competition wings, and came to the conclusion that a competition class outside of the EN certification schema is required. They tasked some of their members with the development of a definition for a competition class. This work is on-going.

In early November 2011, one manufacturer announced that their competition wing for the 2012 season had passed EN-D flight tests. They also made it very clear in their statement that this wing should not be compared with previous EN-D certified wings, but requires the same piloting skills and proficiency as a Competition Class glider to be flown safely. Several other manufacturers active in the competition scene have similar gliders in the process of certification for the 2012 season.

The existence of EN-D certified competition wings creates a new and fundamental issue for FAI Category 2 competitions:

- Until 2011, all competitors had been scored together, with Serial Class results taken from a subset of the overall results.
- With the discontinuance of the Competition Class following Piedrahita, competitions were effectively limited to the Serial Class. This was mostly acceptable to those pilots who chose to compete in Serial Class before, since the former Competition Class pilots were flying the same kind of wings as themselves.
- That position has now changed with the potential for Competition Class wings to be EN-D certified.

If pilots who traditionally compete in Serial Class wish to remain competitive within that class, they must now step up to what was previously a Competition Class wing (now certified EN D) – a step many of them explicitly chose not to take before. Alternatively, they could step down onto an EN-C wing and compete in the Sports Class, with a repetition of the same issues.

Just before this report was published, there was a new development: After an accident during a certification test flight for a potential EN D wing, the three testing houses are now considering suspending all certification of EN/LTF-D wings until at least a meeting between PMA and testing houses. That meeting is scheduled to take place on December 9th. During this meeting, a unification of test procedures and the use of folding lines will be discussed, in order to provide homogenous test results across the three testing houses.

4 Task Force Philosophy and Goals

The paragliding competition world is a highly interconnected system of many players at many levels. While CIVL primarily governs FAI Category 1 competitions, Section 7 rules are largely followed by organisers of Category 2 sanctioned events, and many non-sanctioned and local competitions. Section 7 rule changes therefore impact thousands of competition pilots, manufacturers, dealers, organizers and national associations, as can be seen after CIVL's suspension of Competition Class gliders.

Decisions on Category 1 competition rules will also have a trickle-down effect on cross country and recreational pilots through design and certification decisions made by manufacturers to address new equipment requirements.

We feel that it is important to be aware of this interconnectedness. When choosing methods for improving safety in Category 1 competitions, CIVL needs to be careful not to disrupt the whole system. A system that, in our impression, is working very well in large parts. We are therefore aiming to keep a holistic view and to consider the ripple-effects of every proposed action, so that the whole competition world benefits from those actions and any negative effects are minimized as far as possible.

We are convinced that safety in paragliding competitions cannot be directly controlled. It is influenced by many factors. Controlling such a system and moving it in a desired direction is a notoriously difficult task. It is generally accepted that such control should happen in small steps, with enough time between each step to verify the effect on the system. This is what we recommend.

As we developed this interim report, it also became apparent that we need to broaden our approach beyond simply trying to reduce the incident rate in Category 1 competitions. The entire paragliding competition world is currently in turmoil. We feel our immediate concern should be how to ensure the 2012 competition season is successful, with the emphasis on safety, rather than concentrating on long-term proposals for safety improvements. Any set of safety recommendations that does not relate to how competitions will be organized in the next one or two years will be utterly useless. And right now, the questions of whether and how competitions will be organized, what wings will be flown in which classes, by what level of pilots, are central to the future of our sport.

5 Work, Findings and Conclusions

5.1 Incident Investigation and Data Analysis

5.1.1 Work Done

The task force worked on the following topics in this area:

1. Fact collection on all incidents that occurred during the World Championships in Piedrahita: Incident reports, CIVL Jury and Steward Report, interviews with most involved pilots.
2. Analysis of the Pilot Experience Forms provided by all 2011 World Championship participants.
3. Analysis of additional data available through competition organizers and NACs.
4. Analysis of complete WPRS data with the goal of identifying statistically relevant factors contributing to pilots being involved in incidents during FAI Category 1 paragliding XC competitions. This work is on-going.

5.1.2 Findings

5.1.2.1 Incidents in Piedrahita

The primary causes for the nine incidents recorded for Piedrahita were: Excessive speed (4), wing behaviour (1), turbulent goal (1), pilot error (2), and scratching low in partial lee (1).

Contributing factors to the nine incidents were: wing behaviour, post initial cause (for 8 incidents), pilot overconfidence (5), turbulent goal (4), and pilot error (2).

Excessive speed: We found that gliders involved in incidents were often flown at speeds above the manufacturer's recommendation. For example, despite the fact that the manual for the Ozone R11 states clearly that when applying full speed bar, the trim tabs must be set to "neutral", several of the incident pilots reported flying at full speed with the trim tabs partially or fully open.

Pilot overconfidence: Several incidents occurred to pilots while flying at high speed through turbulent air at a time when they felt so secure underneath their glider that they started performing additional activities, like taking pictures, adjusting cockpits or operating their instruments.

5.1.2.2 Pilot Experience Form

Each participant of the World Championships in Piedrahita filled in a Pilot Experience Form beforehand. The information given in this form was only for informational purposes and was not used as a qualification criterion. No verification of the entered data through pilot interviews or similar took place. Therefore the data cannot be seen as reliable or statistically sound. Nevertheless we performed some analysis, also to demonstrate how such information may be used in the future when its entry is done in a more standardized and scientifically sound way.

	All pilots	Incident pilots
Total average flight time	2439 h	1722 h
Average Thermic time last year	160 h	142 h
Proficient[1] in search for spin	46%	22%
Proficient in frontal collapse	41%	22%
Proficient in asymmetric collapse	55%	56%
Proficient in parachutal stall	33%	11%
Proficient in full stall	33%	11%
Proficient in fast descent	55%	33%
Average time with current glider	29 h	31 h
Average time on Open/Competition Class gliders	1169 h	794 h
Average Competition tasks last 5 years	78	59

Table 1: Analysis of Pilot Experience Form

Most notably in this, from our viewpoint, were the differences in total flight time and time on Open or Competition Class gliders, as well as the difference in proficiency for manoeuvres like spin search, frontal collapses, parachutal and full stall between all competitors and the ones involved in incidents.

The data also shows that the competition field as a whole is not necessarily very proficient in many of the manoeuvres required to fly a Competition Class paraglider safely. An impression that was supported by the kind of questions and remarks brought forward in Piedrahita during the session held by Luc Armant and Russ Ogden, amongst others, to explain the characteristics of flying a modern Competition Class glider.

5.1.2.3 Additional Data

Until now, no systematic collection of data on incidents in Category 2 events has taken place. There exists a wealth of anecdotal information, along with a few localized studies, most notably one done by the French Association, the FFVL.

But even the anecdotal data available now shows clearly that incidents, even fatalities, do occur in Category 2 events. Establishing rates, and determining whether these rates are acceptable or not, is currently not possible, though, for the lack of completeness.

An evaluation of the first 43 Category 2 paragliding competitions after Piedrahita shows 23 competitions where no incidents occurred, 15 with incidents, and 5 where the organizer did not respond to CIVL's request for incident information. So we can safely assume that roughly 50% of those competitions were accident and incident-free. On the other hand, two of the incidents resulted in a fatality each.

Of those 43 competitions, 24, or 56%, were restricted to EN certified gliders. Of the 15 competitions with incidents, 9, or 60%, were restricted to EN certified gliders. There is no detailed information available on the distribution of incidents over EN certified and open gliders in open competitions. The two fatalities occurred on EN certified gliders.

The FFVL study mentioned above covers the years 2008 to 2010 and compares accident and fatality rates of leisure flying (20'000 pilots) with those in organized, central competitions (1000 pilots) for French pilots. The numbers for competitions is thought to be complete, since organizers report them

[1] Proficient: Pilot chose „Many times". Not proficient: Pilot chose „Several times", "Once/Occasionally" or "Never"

to FFVL, while there is some reason to believe that accidents in leisure flying may be under-reported. The study does not correct its data for the fact that the competition pilots are amongst the most active within the pilot population. Unfortunately, the study does not define what exactly is being counted as an accident.

The study finds that leisure flying in France has an accident rate of 2%, in terms of participating pilots; the rate in competitions is 1.3%. The fatality rate for leisure flying over the observed period lies at 0.04%, or roughly 9 per year. There were no fatalities in competitions.

Within competitions, 55% of the scored flights were on certified gliders, and these were responsible for 52% of all accidents within competitions. The remaining 45% of the scored flights were flown on Open or Competition Class gliders, and they were responsible for the remaining 48% of all competition accidents.

The FFVL study also finds that overall, the accident rate in competitions, in terms of tasks flown, is 0.2%: About every 500th flight leads to an accident.

5.1.2.4 Analysis of WPRS Data

The task force is currently collaborating with the Swiss Council for Accident Prevention on a statistical analysis of the WPRS data, with the goal of using this rich set of data to identify additional risk factors for incidents in Category 1 competitions. The work is progressing and results are expected within the next two months.

While preparing the data for this analysis, it became obvious that CIVL's current incident form is not suitable for its purpose. The extensive details required in the form make filling in the report a daunting task, which prevents completeness, and makes it nearly impossible to draw any conclusions from the data. The analysis will now be largely based on incident information provided in Jury and Steward Reports after each Category 1 competition.

5.1.3 Conclusions

From the data gathered so far, we were not able to identify a single causal factor responsible for the incidents in Piedrahita, nor for the fatality rate in FAI Category 1 paragliding XC competitions. We came to the conclusion that a multitude of factors play into each incident, such as pilot skills and experience, local meteo conditions, task setting, pilot attitude, and flying equipment. We therefore went on to explore these areas, as outlined in the following sections.

The only common denominators in the incidents in Piedrahita were the fact that they all happened during a competition, and that the gliders involved were Competition Class gliders.

On the other hand, the French study shows that within competitions, the accident rate is generally lower than in free flying, and that Competition Class gliders contribute only very slightly disproportionally towards the accident rate within competitions. This view is supported by the evaluation of the first 43 competitions filed for the WPRS after Piedrahita: Even assuming that all incidents in open competitions occurred on non-EN-certified gliders, incidents were distributed evenly over open competitions and those restricted to EN-certified gliders, with a slightly higher rate in the restricted competitions.

More data is required and further work needs to be done to confirm or revise our initial conclusion that the existence or absence of an EN certification is not a large factor in overall incident rates in competitions.

Data from the Pilot Experience forms, from pilot interviews and from discussions with pilots in Piedrahita and afterwards indicate that pilots at the World Championships fall into two groups, roughly: Competitors with a lot of current experience in international high-level competitions and a high skill level regarding wing handling on the one hand, and competitors with no or little experience in international high-level competitions and a considerably lower level regarding the handling of modern Competition Class wings. From this we conclude that for the future, CIVL should either alter the entry requirements for Category 1 events so that only the first of those two groups may enter, or alternatively provide the second group with the possibility of flying gliders, tasks and conditions more appropriate to their skill levels. We elaborate on this conclusion in the following sections.

Pilot attitudes to safety must also be recognized as a significant factor in incident analysis. It does not lend itself to easy assessment, nor is it capable of an easy fix. This will change over time, with education and greater understanding of risk. It has also been discussed that the format of national competitions may need to be revised to remove some of the incentives for risk taking.[2]

Incident reporting is an important data gathering tool, but fulfils its purpose only if it achieves a high level of completeness and if the data is collected in a way that can be statistically evaluated. To achieve this, the form should be revised, and it should become a requirement for all event organizers to provide all incident data when submitting the event results for the WPRS.

In this short time, it was not possible for us to create a full picture of all the factors influencing safety in paragliding competitions, let alone to evaluate how to control those factors to improve overall safety. This is an area where further work should be done.

5.1.4 Further Work

The analysis of WPRS data is on-going. We are currently expecting to deliver results by the end of February, 2012, in time for the CIVL Plenary.

5.2 Equipment

5.2.1 Work Done

Work in this area was focused on two topics: Wings, and harnesses. Helmets and other safety equipment have not been discussed in the task force as yet.

The wing question revolves mainly around certification and classification. We outlined and investigated a total of eight different short term scenarios in depth, for safety, pilot acceptance and feasibility:

1. Combine uncertified Competition Class with Serial Class in Category 1 events
2. Enforce a requirement for “Serial Class” (EN certified up to EN-D) for Category 1 competitions
3. Redefine Competition Class to require EN certification, up to EN-D
4. Same as Scenario 3, but publish guidelines for Category 2 event organizers on how to separate EN-D wings into Serial and Competition Class

[2] See section 5.4 Competition Structure, Task Setting and Scoring.

5. Same as Scenario 4, but include Serial Class in Category 1 events
6. Allow only gliders certified before November 1st, 2011, in Category 1 events
7. Define that only gliders certified up to EN-C may be flown in Category 1 events
8. Define that only gliders certified up to EN-B may be flown in Category 1 events

The work for harnesses concentrates on the reserve parachute systems currently in use, mainly how they are deployed.

5.2.2 Findings

5.2.2.1 Wings

The CIVL Bureau's suspension of Competition Class gliders in Category 1 events and the accompanying recommendation to NACs caused or at least strongly influenced effects throughout the paragliding world far beyond what the Bureau may have anticipated:

- Almost immediately, the competition landscape became split between events where Competition Class or Open Class Gliders are still allowed and others where only certified gliders are permitted.
- Most pilots who previously flew Competition Class wings were forced to acquire a certified wing mid-season, re-train on it and, depending on their competition schedule, had to switch back and forth between two gliders from one competition to the next.
- An analysis of the WPRS shows a 14% drop in competitors in 2011, compared to 2010. It also shows a 13% drop of competitions in 2011, compared to the previous year. Both drops occur in the months following the World Championships. The World Cup's last 2011 event alone experienced a drop of 20% of participants through last-minute cancellations. The Swiss League's final run (not CIVL sanctioned, though) was cancelled for fear of litigation problems in connection with the suspension in the case of an accident.
- The perception and the discussions of paragliding safety, both within and outside of competitions, have become overly focused on blaming the equipment. This has detracted from the important insights on other risk factors coming out of the OCTWG as well as other air sports.
- With many national associations now requiring EN certification for all competitions within their territory, the Paragliding World Cup Association (PWCA) saw itself forced to adapt and require the same for their 2012 season. "The PWC can remain Open, all other competitions must be flown on Serial wings" – a statement often heard – proved to be impractical. The PWCA's move also has an impact on manufacturers, who until now used World Cup as a controlled high-level environment to fine-tune and compare new designs and technologies.

Discussions with pilots and organizers showed that they in general approve of the CIVL's Bureau decision to stop the competition in Piedrahita, or if not then at least acknowledge the difficulty of the situation at that time. But the fact that the "temporarily" issued suspension of Competition Class gliders is still active, with little information on the progress towards it being lifted, is a cause for great uncertainty, frustration and anger towards CIVL. The frustration sits deepest with those pilots who are affected the most: Top-level pilots, especially those competing in the PWC, who feel that through the run of events the PWCA was forced to perform a step in glider regulation that was not justified by its safety record.

The imminent certification of wings that would normally be considered Open or Competition Class has caused another major stir. Initial reactions among pilots, and members of the task force were:

- Competition gliders to be certified to EN-D will be of significantly higher performance, and require a significantly higher level of pilot experience, they should therefore be considered as a separate class to existing EN-D gliders.
- The move could have a serious impact on the safety of recreational pilots normally flying EN-D gliders. They are likely to consider that if a glider is EN-D certified, then they are good enough to fly it (despite extensive warnings and explanations by manufacturers to the contrary).
- The development not only negates the impact of CIVL's temporary suspension of Competition Class gliders in Cat 1s, but arguably makes the situation worse, as competition pilots who hesitated to fly open or Competition Class wings, will believe they can compete with the top pilots by flying these gliders.
- It upsets a large number of traditional Serial Class pilots who (effectively) stand little chance of competing well in their class unless they move up to this new breed of EN-D certified glider, which has the potential to recreate the experience of Piedrahita on a wider scale.
- There is a concern about what CIVL might then do, if there were to be another serious accident (which must be expected to occur eventually, especially if the new breed of gliders becomes certified).
- It has highlighted misconceptions in the marketplace that need to be clarified: The reality is that EN certification is necessary primarily to ensure a wing meets a minimum level of passive safety, and that certification is NOT a method by which to assess pilot suitability.

There is a widely held view that the EN-D certification class is too broad, given the range of performance gliders that may now soon be certified in this class. It is also widely believed, both within the task force and amongst other experts, including the PMA, that there should be a separate Competition Class certification. Unfortunately, the EN process is considered to be unsuitable for such a purpose because it is too slow, evolving on a five-year cycle. Changes suggested over the last few years will only be incorporated in 2012. The next round of changes, which could include redefining EN-D and creating a competition class as part of EN926-2, therefore will not take effect until 2017.

We therefore find ourselves in a deadlock situation: Industry experts such as testing house and manufacturer representatives are very wary of EN certified competition wings, and recommend avoiding the certification of such wings at all cost. But as long as Competition Class wings are suspended from Category 1 events, and effectively banned from most Category 2 competitions as well, EN-D seems to be the only option for competitions going forward. As long as EN-D seems to be the only option for competitions, EN-D gliders will be pushed for high performance, to the limits of EN-D.

5.2.2.2 Harnesses

One of the fatalities in Piedrahita is partially attributed to the fact that the pilot was unable to deploy his reserve parachute with his left hand, since the deployment handle was placed on the right-hand side of his harness. The task force discussed advantages and disadvantages of harnesses with two reserves or two reserve handles, one on each side. There is some concern that while such a design may provide additional safety in some situations, this gain may well be neutralized again by the higher probability of accidental reserve deployments. The task force also feels that introducing rules

that require pilots to change costly parts of their gear should be done only with great care and when absolutely sure of the positive consequences.

5.2.3 Conclusions

To avoid further turmoil, we concluded that any regulation regarding pilot equipment should fulfil these criteria, both in the short and the long term:

1. Stay in alignment with PWCA rules: The PWC is a major arena for high-level competition pilots. Enabling pilots to fly the same wings both in PWC (Category 2) and FAI Category 1 competitions is important for safety (no change mid-season) and for pilot acceptance (avoid re-training, avoid the cost a wing change would incur). It will also allow manufacturers to concentrate their resources on one competition wing design for a season.
2. Avoid forcing competition pilots to change their gear more often than they can afford: Competition pilots, with a few exceptions, pay for their gear, although often at reduced prices. For a PWC pilot, a wing is expected to last one whole season; the harness is usually flown for 3 to 5 seasons. Not all participants in World or Continental Championships are PWC pilots, though, and these other pilots expect their wings usually to last 2 to 3 seasons; they also tend to keep their harnesses 5 or more seasons.

5.2.3.1 Wings

In order to provide some much-needed stability going forward, the terms and classifications used so far should continue to be used and adapted where necessary. Therefore, the class of gliders to be used in Category 1 competitions should continue to be named “Competition Class”. The definition for this class must be reviewed for the 2012 season, adapted if necessary, as it should be for every season.

Additionally, the suspension of Competition Class wings should be lifted, to pave the way for a class re-definition. This task force to date was not able to find conclusive indication that Competition Class wings were causal factors to the incidents in Piedrahita, to a degree that would justify maintaining the suspension any longer. Lifting the suspension will break the deadlock described above, and create options for a class definition that ensures the required level of passive safety without polluting EN-D. It would also be a welcome and highly needed step to defuse a lot of the emotions surrounding this whole topic. And not the least, it would allow us all to re-focus on the many other aspects that influence safety, by removing the argument “it must be the wings, or they wouldn’t be forbidden”.

To avoid further confusion, the lifting of the suspension should be announced with the class definition for 2012. If that is not possible, it should be clearly stated that the class definition will be finalized at the 2012 CIVL Plenary.

Taking all our findings into account, and concentrating on short term measures that would, in our expectation, increase safety in competitions for 2012, the eight scenarios we initially outlined boiled down to scenarios 1, 4 or 5:

- Scenario 1: Combine Competition Class, as defined for 2011 (no EN certification) and adapted for 2012 with a newly defined Serial Class, which is based on EN-D
- Scenario 4: Require Competition Class to be EN certified up to EN-D, and provide a definition for a Serial Class, also within EN-D, for the use in Category 2 events

- Scenario 5: Require Competition Class to be EN certified up to EN-D, and provide a definition for a Serial Class, to be used to introduce Serial Class in Category 1 events.

The feasibility of these scenarios depends on several external factors, and it is ultimately up to the CIVL delegates to decide. Considering the information available on the 2012 generation of competition wings, expected to be certified EN-D, we expect Scenarios 1 and 5 to be equivalent in terms of safety in Category 1 events. Scenario 4 is less favourable in that respect. The disadvantages of Scenario 5 over Scenario 1 are increased cost to manufacturers for certification, and potentially, a reduction of general safety, especially amongst EN-D pilots flying a more demanding wing than they are used to.

As the current situation clearly demonstrates, there is an imminent need for class definitions beyond the passive safety standards as defined and applied for EN or LTF certification. Going forward, a collaboration between the manufacturers (most likely represented by the PMA), the testing houses, CIVL and the PWCA is required to establish and revise adequate class definitions, to be used in competitions throughout. This is in line with the PMA's decision from October to develop a Competition Class definition.

Within the task force, some expect that after what has happened in the context of EN-D certification of competition wings over the last few weeks, NACs and the PWCA can be convinced to revisit their decision of requiring EN certification for the 2012 season. Such a move would certainly be welcomed by the testing houses, which had great reservations towards EN-D certified competition wings from the beginning.

The task force also concluded that a second class, "Serial Class", should officially be recognized and defined by CIVL. This is a class that is flown by a high number of pilots already in most Category 2 events, usually with its own ranking. However there is no clear class definition beyond a requirement for some sort of passive safety certification (EN, LTF, DHV).

The task force notes that the CIVL Bureau has already decided to create a Serial class ranking in the WPRS.

Officially recognizing and defining Serial Class achieves two things:

1. In case that EN certification becomes a requirement for Competition Class, long-time Serial Class competitors can still continue to compete amongst themselves, without being forced to step up to the new breed of EN-D certified wings, or step down to an EN-C certified wing in order to still have a class to themselves.

2. It provides CIVL with the option to introduce such a class in Category 1 competitions. A step which, in the task force's opinion, would increase safety in such events by offering less experienced pilots a choice of competing on a wing that may be more adequate for their skill level.

Whether or not Serial Class should become a class in Category 1 events as well depends on the overall course of action chosen by CIVL, as outlined in section 6 Recommendations below. But it should be noted that shortly before the World Championships in Piedrahita, officials from DHV indicated towards the OCTWG that having a Serial Class ranking in Category 1 events would be sufficient for them to accept uncertified gliders being flown in those competitions as well.

In summary, in the long term, class development should go towards a clearly defined Competition Class that may or may not be EN certified, and an EN certified Serial Class. For the short term, for the 2012 season, much will depend on the current development regarding certification: If the newest breed of competition gliders is certified to EN-D, then the EN-D class should effectively be split for the purpose of competitions, to distinguish between "classic" EN-D wings (becoming Serial Class) and Competition Class EN-D wings. This would serve to counter some of the negative impact that is feared to occur through the possible certification of competition wings. It would also help support initiatives to re-educate the paragliding community: that pilots should not judge their ability to fly a glider on the basis of its EN certification, and that more notice should be taken of manufacturers' recommendations of the target pilot group for their wings.

On the other hand, if the current discussions between manufacturers and testing houses conclude in the decision to not certify the wings in question, the situation will have to be completely re-evaluated.

However, the Competition Class should migrate out of EN D into its own defined class as soon as possible. This class should be defined by collaboration between the PMA and the testing houses and in consultation with CIVL and the PWCA. It should be introduced as early as 2013, on the basis of the existing definition, and then developed further on an annual schedule.

In the interim, in addition to the distinction between Serial Class and Competition Class gliders in EN D, the task force would like to see a change in the way gliders are marketed, with less focus on certification criteria, and more emphasis on wing behaviour or flying style, so that pilots can make informed and sensible glider choices.

5.2.3.2 Harnesses

Further research should be done on the topic of ambidextrous and/or automatic reserve deployment, answering, amongst others, the following questions: Is there an actual need; how can it be achieved; are front-mounted reserves a solution, even in high-g spiral incidents; how can the higher risk of accidental deployment be mitigated; one or two reserves? A reserve system that would automatically deploy upon detecting G forces sufficient to produce blackout would be attractive if the cost could be kept within reach of most pilots.

5.2.4 Further Work

Discussions in this area are still on-going. As new information emerges, for example after the PMA/testing houses round table on December 9th, we will take that into account and adapt our recommendations accordingly.

5.3 Pilot Skills and Education

5.3.1 Work Done

As part of the holistic approach to improving safety in competitions, pilot aptitude, skill and competence were considered. It was found that participation in a Category 1 competition should require a minimum level of aptitude and skill and that CIVL should review the levels it specifies in the Sporting Code.

5.3.2 Findings

Aptitude is the innate mental and physical ability of the pilot. Skills are related to aptitude but can be improved by training and practice. Improving pilot skill is absolutely fundamental to improving safety in competitions.

5.3.2.1 Basic Skills

The basic skills necessary to fly in a Cat 1 competition are the ability to:

1. Take off and land safely
2. Fly in a crowded environment, with respect for the rules and other pilots
3. Navigate a safe path through the air, avoiding areas of turbulence and rotor
4. Handle the wing correctly in the air to avoid spins and stalls
5. Feel the wing and use correct inputs to avoid collapses, even in extreme turbulence
6. Manage collapses in a way that minimises their severity to avoid cascades
7. Recover from collapses and other flight incidents e.g. parachutal stall

A pilot's level of competence depends upon a combination of aptitude, experience and training.

Aptitude plays a very important role and cannot be easily quantified. Good mental aptitude, which is basically the decision making process, is absolutely fundamental to safety, as is physical aptitude. Characteristics that contribute to physical aptitude are both gross and fine motor skills: feel, reaction times, core balance, situational and spatial awareness, and the ability to react correctly in stressful situations.

Experience is the accumulation of knowledge. For the average pilot, it takes many years and many hours of flying before they acquire enough competency and experience to fly high aspect ratio wings in a competitive environment. The time taken depends on a multitude of factors and varies between individuals. Some, this will have to be accepted, may never reach the required minimum standard.

Training is the effective way for skills to be developed.

There are generally 3 recognised stages of learning:

1. **Cognitive Phase**: Theoretical and practical learning. This stage is fast, starting with initial training or first SIV course.
2. **Associative Phase**: The refinement of skills acquired in the cognitive phase. Improvements are more gradual as awareness slowly increases and inputs become more precise. This phase can last for a very long time.
3. **Autonomous Phase**: This phase takes years to reach and is when the pilot automatically reacts correctly to a situation without having to pay a great deal of attention to it.

From the task force's observation, most top level pilots (as defined by WPRS and who compete in Cat 1 and/or World Cup competitions) are currently at or close to the autonomous phase of the basic skills 1-5 as listed above (some task force members argue that this is true except for launch skills in high or nil wind conditions). However, concerning skills 6 and 7, pilots lay somewhere between the cognitive and associative phases, there are very few who operate autonomously in this area.

The very top pilots (who are either full time professionals or very experienced and naturally talented) are autonomous in both. These skills allow them to push to the limit of the wing in the given air mass and recover from collapses if necessary. Safety is compromised when pilots without an autonomous level try to match the speeds of the highly skilled. The skill level of the average pilot needs to increase in order to fly safely within such a competitive environment.

5.3.2.2 Training

There is an endemic poor attitude to further training within the paragliding community. This needs to be addressed at all levels in order for safety to improve.

SIV training is considered by many as almost a secondary requirement, a skill set that once learned does not need to be practiced regularly. SIV courses are generally expensive and are not readily available to everyone due to lack of nearby qualified instructors and suitable sites. They also expose pilots to more risk. However controlling paragliders at the extreme edge of the envelope is a fine motor skill that needs constant practice, more akin to playing a musical instrument than riding a bike. Even experienced test pilot's skills and situational awareness are adversely affected after a 2 weeks break. NACs play an important role here; most do not make SIV training a mandatory requirement for pilots at any level, rather it is left to the discretion of the pilots themselves.

This situation is very much unique within aviation, where in general systems are in place to assess skills on an annual basis. For example, BGA (British Gliding Association) requires annual pilot checks to prove a basic competency of stall and spin recognition/recovery, landing approaches and emergency landing procedures.

Within paragliding there exist already a few ways to assess pilot suitability. For example the Acro World Cup uses qualification runs to demonstrate safe and precise execution of the basic manoeuvres before the pilot is allowed to compete.

The Swiss paragliding league has now made SIV training compulsory for all competition pilots, this we believe to be a good thing. However the danger with higher degrees of regulation is the loss of the essence of free flight. This is a fundamental point that must be considered before imposing strong regulations.

5.3.2.3 Core Requirements to Improve Basic Skills 1-5: Practice and Airtime

Pilots should be encouraged to practice a more structured method of self-training with the aim to refine their feel for the wing, and to be able to recognise its limitations in normal flight, throughout the speed range. This with the goal to learn to use the correct input necessary to keep the wing flying and react quickly to the wing's departure from normal flight.

It is very hard if not close to impossible to quantify competence in this aspect of flying. As a general rule though, pilots higher up the WPRS have a very good, almost autonomous command of these skills. It is difficult to recommend a set standard of formal training for these types of skills beyond the established normal spread of information. There is no substitute for self-development. Increasing the current minimum WPRS entry requirement will naturally result in better trained and practiced pilots participating in the competitions.

5.3.2.4 Core requirements to Improve Basic Skills 6 & 7: SIV Training

Regular SIV training, with specific goals and aims, will help pilots increase skill sets 6 and 7, collapse management and recovery.

- Pitch, pressure, roll control, wing overs
- Collapse management and recovery
- Edge of flight envelope; search for stall, spin
- Full stall
- Parachutal stall

SIV training must be conducted with the usual safety precautions in place, and preferably under the eye of an experienced SIV instructor. It is recommended that the process be first learned on EN B certified wings. Only once a basic level of competency is reached and the learning process has reached the associative phase should a pilot attempt to use a wing of a higher category. This is true even for existing high level pilots if they have not already made lots of SIV type practice. EN D wings should only be used for training purposes by high level pilots who operate in the autonomous phase.

5.3.3 Conclusions

Pilot aptitudes and skills are hard to assess in an objective way. WPRS is a relative rank of a pilot's ability to race XC. It can be used to give a general indicator of the competency of basic skills 1-5 however it is not as relevant for 6 and 7.

As a general observation, canopy control skills after departures from normal flight (basic skills 6-7) are at a lower than acceptable standard, even within the top 100 WPRS ranked pilots. Improving these skills through systematic training will have a direct impact on safety by reducing cascading events and reserve deployments.

Assessment of recovery skills (basic skill 7) can be done within organised SIV courses under the guidance of experienced SIV instructors.

Pilots competing in Cat 1 competitions should reach a minimum level of competence:

- Controlled management and recovery from asymmetric and symmetric collapses: managing correct collapse proportions and recovering without cascading events
- Developed collapses: ability to cope with auto rotational G forces and disorientation, and show good recovery
- Dealing with riser twists: untwisting
- Controlled entrance and recovery from full stall; symmetric full stall entrance whilst keeping the span (without the tips touching). Controlled full descent without rotation and clean recovery by building the span completely before flight
- Effective recovery from tip cravats
- Appreciation of spin point, show the ability to reach the point of spin and react immediately
- Recover from a developed spin
- Perform stable parachutal stall and recovery

5.3.4 Further Work

The task force discussed the introduction of a certification for competition pilots, on the basis of the ParaPro program. The goal is to assess pilots' skills, and to increase their incentive to train the skills necessary to fly a glider safely in competition. Further work in this area is still needed.

The task force would further like to investigate the Pilot Experience form, to evaluate its use in the selection process and in incident analysis, and to recommend improvements if necessary.

Another topic discussed briefly within the task force is the psychological approach to competition safety. This should be further explored. Work done within the hang gliding and sailplane competition scene will need to be further explored. Noteworthy here is especially the theory that talking and educating about "safety" does not reach pilots, but that talking and educating them about performance improvements through safer procedures may very well increase their awareness and, ultimately, their safety level.

5.4 Competition Structure, Task Setting and Scoring

5.4.1 Work Done

Work in this area was focused on the overall structure of Category 1 competitions, on task setting, and on scoring. This work consisted mainly in discussions between task force members and outside experts both from within our sport and elsewhere.

5.4.2 Findings

Over time, a theory emerged from the work within this area:

Theory: The higher the degree of homogeneity within a competition, the higher the competition's safety level.

This can be homogeneity in pilot skills, in goals these pilots try to achieve, in equipment these pilots use. Incidental data to support this theory can be found in Switzerland, where the competition with the highest accident rate is the Swiss Interclub Championship. This competition pits pilots with virtually no competition experience against former and current world champions in an attempt to determine the best paragliding club of Switzerland, while every pilot still tries to rank as high as possible on the unofficial individual ranking. Similarly, we consider the homogeneity within the PWC, in all the factors mentioned, as high, and attribute the relatively low incident and fatality rate within the PWC circuit at least in part to this.

Therefore, we tried to identify ways to increase homogeneity within Category 1 competitions.

5.4.2.1 Competition Structure

It has been noted elsewhere, that FAI Category 1 events appear to have a higher level of incidents than Category 2 competitions, most notable the PWCs, and that the nature or structure of these championships may be a causal factor. It is recognised that Category 1 events, by their nature, are much higher profile, and therefore any incidents are reported by FAI Officials, and receive greater media attention. Similarly, by their nature, these events are highly competitive, potentially inducing pilots to take greater risks, and generating greater mental pressure on competitors. Yet, while taking into account these points, the task force has considered whether there are other factors related to the current structure of Category 1 events that might further influence the higher number of incidents.

Paragliding cross country, is by far the most popular free flying discipline within CIVL's remit, and the number of pilots and nations wanting to compete at the highest level has increased steadily year on year. With a finite limit on the number of pilots who can enter an FAI competition (150), there has been considerable difficulty, for at least 6 years, in balancing the dual aims of determining the World Champion pilot and the World Champion nation. Under the current system, many of the world's top pilots do not have the opportunity to compete in the World Championship because they may only be 4th or 5th ranked in their nation, yet they may rank hundreds of places above the top pilots from some other nations who are awarded places. From a safety perspective, the result of this allocation system is a competition field of widely varying skills and experience. Competitive and peer pressures are pushing the lesser ranked, lesser experienced pilots onto the latest racing gliders with potentially disastrous consequences. Incident data shows that the bulk of incidents occurring in Category 1 events are not among the lowest ranked pilots, but mid-field. These pilots are possibly more likely to push themselves onto racing gliders and take more risks in order to keep up with the top of the field.

The bid evaluation process is another area that the task force considers requires some review. Despite the efforts of the PG Subcommittee to review bids in terms of Safety, it appears that most Delegates vote on bids purely on the basis of where their national top pilots have indicated they would like to go next.

Lastly, the task force found that by suspending Competition Class wings, the CIVL Bureau had to resort to a rather unorthodox method to achieve their goal of stopping the competition in Piedrahita. It concluded that in the future, if such a step appears to be required, the Bureau, or those FAI officials on site, should have the power to stop a competition by following clearly defined procedures.

5.4.2.2 Task Setting

In the early days of our sport we had to fly at the strongest time of the day, along massive ridges and convergence zones in order to stay up and fly far. With the performance explosion in today's paragliders, this is no longer the case. Competition organisers and task setters can mitigate risk by being more selective concerning the site and time of year for competitions and time of day and routes for tasks.

The recommendations in this area are designed to highlight that there is, or can be, a choice of task styles. We are not suggestion replacing Race to Goal tasks, but want to encourage task setters to consider other options, to vary the challenge – maybe just once per competition – and with safety in mind if conditions are not optimal.

Racing vs. skill: To some pilots, the more interesting or challenging parts of a task are picking lines, choosing speed to fly, spotting birds, working with gaggles, etc.

Many pilots enjoy the thrill of racing in to goal as fast as possible, but it should be acknowledged that in turbulent conditions this is relatively risky. Stronger lift leads to higher optimal speeds. Setting tasks in less than full-on conditions, either through choice of time of day or by avoiding ridges and convergence zones will result in more technical flying. There is also a certain thrill to eking out a long downwind final glide.

The aim of some of these recommendations is not to forbid fast gliders, but to reduce the emphasis on maximum speed. When top speed becomes less of a decisive factor, there may be a positive impact on pilot attitude to risk and on glider design. We know pilots take more risks on the final glide to goal, so techniques that reduce the bonus for racing into goal (e.g. altitude at goal, conical ESS) may help to change attitudes and behaviour.

Many ideas were discussed for ensuring tasks are set appropriately for terrain, weather, and pilot ability:

1. Task styles
    a. Race to goal
    b. In out in
    c. Elapsed time
    d. Assigned area tasks (AAT)
    e. Cat's cradle
2. Task features

a. Exclusion zones: for permanent airspace or restricted areas, or for temporary exclusions to avoid dangerous leeside areas due to specific conditions of the day (wind direction or strength).
   Pilots need practice in navigating exclusion zones (e.g. 32 penalties for airspace infringements in Task 1 of Worlds at Piedrahita).
   Organisers will have to include a file with all the exclusion zones (e.g. OpenAir format) to download along with the turn point file during registration.
   The scoring software needs to be developed to handle this in an automated way.
b. Altitude bonus points at ESS/goal (cylinder or cone) – see separate section on Scoring Development
c. Time points for the "gaggle arrival" rather than individually to avoid the final race to goal
d. Height Above Ground points, when the option exists, to (gently) encourage staying high enough for safe reserve deployments (would require scoring software to include a Digital Elevation Model).
   Enhancing the current Leading Points system to include altitude may just revert their intended effect by rewarding those pilots who stay higher behind the leaders.
e. Avoid setting tasks with timings such that pilots are likely to arrive at thermic goal fields during period of strong thermic activity
f. Avoid setting tasks and especially final glides along lines of convergence (or diverge from them to avoid long high speed glides)
g. Mostly avoid mountain top turn points, a holdover from the days of cameras
h. Increase the technical challenge by setting turn points in less obviously thermic (but safer) locations
i. Clock starts – as in hang gliding (different from elapsed time): smaller gaggles, avoids hanging around for air race start. It also rewards pilot judgements on choice of time to start, the lines they take etc.
   Even though crowding does not appear to have been an issue among the incidents in Cat 1 championships in recent years, introducing new features and variety, such as clock starts, might help pilots adjust their attitudes (slightly) away from aggressive racing and towards tactics.
   Delay starting tasks or use clock starts if conditions are weak to avoid congestion at the start
j. Use plenty of wind dummies to show and feedback information on conditions
k. Consider running short tasks much later in the day if conditions are not ideal at the normal time
l. Encourage pilots, team leaders and safety committee to report more often on the safety frequency on areas where conditions are at or approaching level 2 or beyond.
m. Set the landing zone as an additional waypoint after ESS and goal cylinder if appropriate.
n. After one or two consecutive long tasks, consider setting a shorter or later task to minimise effects of fatigue

When exploring alternative task methods, it is important to consider the amount of time spent flying at high speed. During a Race to Goal task, pilots tend to stay together, flying at a moderate speed, until the final glide where the speed is often increased to the maximum. With alternative task forms, like Elapsed Time or AAT, where pilots fly mainly against the clock rather than against the pilots in their vicinity, the time spent flying at high speeds is assumed to be higher – potentially increasing the incident risk.

Ideas for educating/promoting to task setters the variety of options that are available that can enhance safety without (necessarily) removing all race aspects:

1. Series of tutorial style articles on CIVL website, XC Mag and translated for national magazines
2. Case studies of competitions trying out some of these features, interviews with pilots, organisers, scorers etc. – especially high profile events like PWCs
3. Encourage discussion of these ideas on forums

The best strategy in most paragliding Race to Goal tasks is to climb higher than the wing's best glide slope and then fly full speed to goal. This can be dangerous, as demonstrated in Piedrahita, and may be considered not very interesting from a sporting perspective by some. It also has resulted in gliders being optimized for top speed, which has allowed speed (and kinetic energy) to exceed the domain where deflations respond predictably.

The 1 or 2 km End-of-Speed-Section (ESS) was a step toward addressing this, by stopping the high-speed race at some distance from goal, and therefore with some altitude above the ground. This has no doubt been an improvement, but has not prevented reserve deployments at altitude. Also some cases are known where pilots raced to get the ESS very low and then thermalled back up to make goal.

We explored alternatives to the existing goal forms that would encourage pilots to reach goal as high as possible, and potentially even at a speed below their wing's maximum speed. One interesting concept is the Conical ESS, as devised by Luc Armant. He demonstrates it in a video (http://www.youtube.com/watch?v=OBx-QYkj3Bg).

5.4.2.3 Scoring

The changes in scoring affecting competition safety are all connected to task setting features mentioned in the previous section: Altitude bonus, either over the whole course, when reaching turn points, and/or in goal, conical ESS, alternative task forms like AAT, etc. It is important to be aware that implementing these features in FS will require considerable work, so enough lead-time should be planned when updating the Sporting Code. Additionally, fine-tuning such new options may take some time and experimentation, so it may not be a good idea to use them already in Category 1 events in 2012.

5.4.3 Conclusions

5.4.3.1 Competition Structure

One of the recommendations coming out of the task force's work is to increase the pilot qualifications needed to fly in Category 1 events, especially on Competition Class gliders and, longer term to introduce a competition pilot licence. If such an increase in required qualification were to be combined with class-based World Championships, this would have the double advantage of not pressuring lower ranked pilots onto the highest performance wings that they might not have the skills, experience or inclination to fly, yet still giving them the opportunity to compete for medals at the highest level of their class.

In order to allow the above re-structuring to have optimum effect, CIVL should further consider separating World Championships into separate events to determine the World Champion (male and female) and the World Champion nation. The latter event could be restricted to Serial Class gliders, for example, with a more unilateral allocation process to determine maximum nation entries. There would still need to be a sufficiently high pilot qualification level, but without the extra factors associated with a Competition Class. Both Category 1 events are likely to appeal to organisers if marketed correctly, so we would not anticipate problems finding two bidders every two years.

Regarding the selection of a competition site, a more expert team should be assembled to assess bids, taking into account factors including: site suitability for the target event, time of year, task style options and staff expertise. The team should include, or have access to, an expert independent from the organisers, to report on the site and its potential and secure reports on past Category 2 events that have been held there.

It may also be necessary to review the relevant sections of the sporting code regarding the interaction of the Safety and Task Advisory Committees to avoid the possibility of conflicts of interests. An idea may be for the organising team to develop a task setting strategy before the start of the championship, identifying certain risk situations (lee areas in certain wind directions, marginal conditions, policy for delaying launch opening etc.). Sufficient time should be incorporated into the daily schedule to allow a thorough review of provisional tasks before they are set.

5.4.3.2 Task Setting and Scoring

Regarding task setting, the conclusion was that task setters should be better informed and educated on the different task formats that are currently possible, and that CIVL should encourage the setting of alternatives to Race to Goal tasks when appropriate. Category 2 events should be set up to explicitly explore these options. CIVL should also consider offering task setters the option to assign bonus points for the altitude at which a pilot crossed the goal line (or End-of-Speed-Section if exists), as is done in 2012 within the PWC. A further alternative goal form would be a conical End-of-Speed-Section or goal. Both will require a change in the scoring software.

FS, CIVL's scoring software, should be enhanced to reflect the many options identified for alternative task formats, additional safety features like altitude bonus or conical ESS, etc.

5.4.4 Further Work

Currently, there is no further work being done or planned in this area.

6 Recommendations

As was once said in reference to the increasing complexity in big software projects: "There is no silver bullet"[3] – and that applies to our situation here as well: There simply is no single measure that we can fire at competitions and make them safe. Or as Robbie Whittall states in his recent interview with XC magazine: "To make competitions safe we would all have to stay on the ground and play cards instead." But there are a lot of things we can do to improve competition safety, in small steps. And because those steps are so small, it is important to establish a measure for paragliding competition safety, otherwise we risk going in the wrong direction for a long time without noticing.

What follows here is a list of recommendations, some interconnected, some independent. It may seem odd that out of the many areas of work done by the task force, the wing question seems to be central and guiding many of the recommendations presented here. This was far from being our intention on the outset of this work, but events over the last few weeks made us realize that without a workable solution for the wing question, we may very well end up with a truly safe 2012 season where we all sit on the ground playing cards.

6.1 Recommendations for 2012

1. (A)[4] Drastically simplify the Incident report form, but in turn require every organizer of FAI sanctioned competitions to submit reports on all incidents that occurred during their competition before competition results can be processed for the WPRS (could be implemented within FS).
    a. As a basis for the form, use the format used within the WPRS analysis project.
    b. Establish a process of annual evaluation of this data which includes publishing a summary of the results.
    c. Define a measure for safety in CIVL cross country competitions, both hang gliding and paragliding. Suggestion: Incidents per pilot per task.
2. (E) Lift the temporary suspension of Competition Class gliders, as early as possible, preferably before the CIVL Plenary in February 2012, in combination with an announcement regarding the definition of the 2012 Competition Class.
3. (E) In addition to Competition Class, formally introduce Serial Class within Section 7, with a recommendation to Category 2 organizers to consider running their events as joint competitions for Competition and Serial Class gliders (as most of them already do now). This step is crucial, especially if Competition Class is required to be EN certified for 2012 – even if Serial Class is not introduced in Category 1 events (see 5.).
4. (E) Define Serial Class and Competition Class for 2012 according to Appendix A at the end of this document.
5. (E, C) Introduce Serial Class in Category 1 competitions, as an alternative to Competition Class.
    a. Pilot selection follows the existing procedure, for the whole competition. No separate selection for the two classes.
    b. At registration, each pilot states what class he or she will fly in.
    c. No class changes within a competition.

[3] Fred Brooks in "The Mythical Man Month"

[4] All recommendations are marked as follows to indicate which area of work they stem from: A=Incident Investigation and Data Analysis, C=Competition Structure, E=Equipment, P=Pilot Skills and Education

d. Competition Wings can only be flown in the Competition Class; Serial Class wings can be flown in either the Serial or the Competition Class.
e. In general, both classes fly the same task. But at the task setter's discretion, depending on conditions and existing infrastructure, the following variations can be considered:
    i. Same task, with different start times
    ii. Same task, with larger turn point radii for Serial Class, smaller radii for Competition Class (e.g. 2 km for Serial Class, 1 km for Competition Class)
    iii. Different tasks, provided that safety and retrieves can always be ensured for along both course lines
f. Both classes are to be scored independently, unlike what is current practice in Category 2 events (where Serial Class is generally a sub-set of the "Overall" ranking). This to establish the two classes as independent and of equivalent value.
g. World Champion titles are only awarded to classes with 10 pilots or more.

6. (P, C) Adapt entry requirements for Category 1 competitions to require a higher level of current competition experience, at least for pilots flying Competition Class gliders: Higher minimum WPRS ranking in a shorter period (e.g. top 300 in the last 2 years) and no exceptions around this requirement.
7. (P) Require pilots competing in Category 1 competitions to have completed an organised SIV training within 12 months before the competition and reach the standards as outlined in the section "Pilot Skills and Education".

Even if recommendation 5 is not implemented, its prerequisites (recommendations 2, 3 and 4 combined) should still be implemented, as they stand for themselves.

6.2 Long Term Recommendations

8. (A,P,C) At the outset of Category 1 competitions, hold sessions similar to the one in Piedrahita, where manufacturers and test pilots explain in detail about the current wings, how to fly them safely, how to deal with them in extreme situations.
9. (A,P) In order to continue gathering and providing data for long term improvements, continue the requirement for Category 1 competition participants to complete the Pilot Experience form.
10. (A, P) Consider developing and introducing a Competition Pilot training and certification program. Require all pilots flying Competition Class wings in Category 1, possibly also in Category 2 competitions, to be recently (e.g. within the last 3 years) certified.
11. (A) Initiate a research project, to identify all risk factors in paragliding competitions, their causal interconnections, and find ways to mitigate the most significant risks without increasing others.
12. (E) Collaborate with PMA, PWCA and testing houses to develop class definitions for Serial and Competition class, independent of current certifications for passive safety, to become effective by 2013, at the latest by 2014.
    These definitions are to be reviewed on an annual basis by the defining body.
13. (E) Establish in CIVL's procedures and regulations that all rule changes affecting wings, particularly class definition changes, must be made with a minimum lead time of 10 months: Changes accepted by the CIVL Plenary in 201x will become effective for the seasons starting in 201x+1 (both in the northern as in the southern hemisphere) at the earliest.

14. (E) Establish in CIVL's procedures and regulations that all rule changes affecting harnesses are only to be made with a minimum lead time of 22 months: Changes accepted by the CIVL Plenary in 201x will become effective for the seasons starting in 201x+2 (both the northern and the southern hemisphere) at the earliest.
15. (E) Encourage, support, fund research and development in the area of paragliding reserve systems.
16. (P) Encourage NACs to incorporate SIV training as part of the pilot license syllabus, especially for competition pilots.
17. (C) Adapt rules to provide the CIVL Bureau and/or FAI officials on site (Steward, Jury) with the power to stop a Category 1 event for safety reasons based on clearly defined criteria (like for instance a simple or 2/3 majority vote of all team leaders). Establish appropriate procedures for such a step, including provision for the continuation of a competition under conditions established at the time of the stop.
18. (C) Add an alternative goal option (Altitude at Goal Bonus, Conical Goal or ESS) as an option to task setters. This requires work on FS.
19. (C) Educate task setters on different task options, their advantages and disadvantages, what conditions they are best used in.
20. (C) Initiate test competitions where alternative task formats are used. Encourage Category 2 event organizers to include alternative task formats in their competitions.

7 The Task Force and its Future

The task force was initially drawn together at the end of August by Gregory Knudson, on the request of the CIVL Bureau, following Piedrahita. Greg shaped the original Terms of Reference for the task force and provided the framework to direct the discussions to cover the many aspects of this very broad brief. Unfortunately, after a few weeks, Greg resigned for personal reasons. Many of his initial thoughts and clear analyses have helped the task force continue the work that he started, and this Interim Report reflects his early contribution.

The paragliding industry and competition scene is in a state of flux, and will evolve rapidly as new gliders are launched over the coming months. The PWC Super Final in January may be the first competition outing of many of these new designs. It is possible that new issues will arise that may invalidate some of our recommendations or make them less feasible or relevant.

Therefore the task force will continue its work in many areas, as outlined above, will develop its ideas and recommendations, and keep a watching brief, up until the next CIVL Plenary in February. We will aim to produce an Update Report in time to circulate just prior to the Plenary.

The future of the Paragliding Competitions Safety task force will be decided by the Plenary. Some members of the task force have indicated that they would be willing to continue some of the work they have started. Whether this will be as smaller working groups established under the Paragliding or Safety Subcommittees, or whether this task force should continue in its present format, will need to be determined.

7.1 Task Force Members

Josh Cohn (USA) - Competition pilot and organiser
Jörg Ewald (SUI) - Competition pilot and organiser
Louise Joselyn (GBR) - CIVL secretary, CIVL steward and competition organiser
Gregory Knudson(LUX) - CIVL delegate, competition pilot, aviation professional (safety/accident investigation background)
Russell Ogden (GBR) - Competition pilot, professional test-pilot
Hannes Papesh (AUT) - Designer/manufacturer
Torsten Siegel (GER) - Designer, competition pilot and professional test-pilot
Mads Syndergaard (DEN) - Competition pilot and organiser
John Walton (NZ) - Legal counsel/mediator, long-time paragliding pilot

Appendix A: Wing Class Definitions

The recommended definitions of Serial and Competition Class for 2012 depend on the answer to the following question:

Can CIVL, the NACs and the PWCA come to an agreement that in the 2012 season, the use of gliders adhering to the 2011 Competition Class standard will be permitted both within Category 1 and Category 2 events under the condition that additional safety measures, as recommended above, are implemented?

A.1 Yes, 2011 Competition Class gliders are permitted in 2012 competitions

1. Serial Class
    a. All gliders to be used in this class must be certified, up to and including EN-D or LTF-D, respectively, or their equivalents from older certification norms.
    b. All gliders must be flown within the weight range for which they were certified.
    c. Uncertified sizes of certified models are permitted if they came to market before December 31st, 2011.
    d. No modification of the glider is permitted, except for the length of the main brake line.
2. Competition Class
    a. As defined in the 2011 Sporting Code, with further refinements as recommended by the OCTWG, the PMA or testing houses.

A.2 No, 2011 Competition Class gliders are not permitted in 2012 competitions

1. Define that for 2012, the class definition for both Competition and Serial Class gliders includes a requirement for a certification up to EN-D or LTF-D (or their equivalents from older certification norms for Serial Class gliders only).
2. In addition, the two classes should be separated by a small set of clearly defined parameters, as outlined in Table A-1. This process should be carried out by an expert group consisting of representatives from both the PMA and from the testing houses. Gliders falling between the given criteria will be admitted to Serial Class only if the expert group is presented a joint document by the manufacturer and the certifying testing house to the effect that the glider exhibits a flying behaviour (by reference to ease of use, predictability, handling, speed and any special piloting skills required) similar to pre-November-2011 EN-D-certified gliders.

	Serial Class	Competition Class
Decisive	• EN/LTF-C or below • EN/LTF-D before Nov. 2011 (or smaller/larger size of such a wing, if marketed before Nov. 2011) • Has 3 rows[5] of lines on > 60% of span • Manufacturer has higher performance Competition Class glider • Flat A/R < X • Further factors as identified by the experts group	• Manufacturer declaration • Has 3 rows[6] of lines on < 30% of span • Specs within 5% of 2011 Competition Class glider from same manufacturer • Flat A/R > Y • Further factors as identified by the experts group
Contributing	Available in a full range of sizes (from 80-125 kg) Manufacturer declaration	Lower class of EN D glider available from the same manufacturer, in its current glider range

Table A-1: Glider ClassificationTable 2: Glider Classification

3. Establish and maintain a public list of all 2012 Serial Class gliders, to be updated once a month according to manufacturers' information.

Explanation: Table A-1 summarizes proposed criteria for placing EN-D gliders into either Serial or Competition Classes. If any criterion in the "Decisive" row is satisfied, then the glider belongs in that column. For example, if a manufacturer declares its glider to be a Competition Class glider, then it is. On the other hand, if the manufacturer declares its glider as Serial Class, that would be taken into account but not be the end of the decision-making process. It would of course be much simpler, and some of us believe preferable, if we could agree on a single value for one or several parameter(s) such as Flat A/R or rows of lines that would draw the line. So far, such a consensus has not been reached.

The two values X and Y are flat aspect ratio thresholds, introduced to facilitate the distinction between Serial and Competition Class gliders:

- Any glider certified EN-D after November 2011 with a flat aspect ratio smaller than X is classified as Serial, regardless of other factors in the table.
- Any glider certified EN-D after November 2011 with a flat aspect ratio bigger than Y is classified as Competition, regardless of other factors in the table
- For gliders whose flat aspect ratio lies between X and Y, other factors must be considered to perform the classification.

The standardized procedure to perform flat aspect ratio measurements, as well as defining the numeric values for X and Y, should be done by PMA in collaboration with the testing houses.

[5,6] "Rows of lines" counts lines that extend over a minimum of 40% of the total line length between riser and canopy. Therefore, high bifurcations such as on the R10/R11 would not count.