

Belgium, april 2017

In an attempt to find an answer towards the increasing problems with the current Naviga Lipo Rules, Belgium would like to suggest to allow the use of Energy limiters as per 01/01/2018.

We feel that the current battery rules should be adjusted because the current rules are outdated and make battery life very short. Ever since we started using Lipo batteries, the capacity has always increased, but the restriction on weight makes these batteries less and less reliable. We feel that we have come to a point where we are worse off than when we decided to allow the use of Lipo batteries to resolve the problems we had back then with the high capacity, low lifespan of NiMh batteries. We thought that with the use of Lipo batteries we would resolve that problem, yet instead we are now at the very same point again. We are back at the point where batteries can only be used a few times before they are worn out, or even plain dead.

Short battery life is mainly caused by draining the cells too far, emptying Lipo batteries almost completely is very bad for them. Leaving at least 20 to 25% of Capacity in those batteries will increase their lifespan enormously, but under the current Rules people just use all the Energy those batteries will deliver, even at the risk of destroying them very rapidly.

Another issue that comes with a weight limit on batteries is that people start to look for ways of reducing the total weight of Lipo packs in order to stay within the maximum weight. Cutting cables to a minimum, even soldering connectors directly on the tabs, removing the shrink wrap, leaving Lipo cells totally unprotected and open inside their boats.

Therefore Belgium proposes to allow, alongside the current Rules, the use of Energy Limiting devices. However only under very strict conditions and appropriate Rules. At this point we have 2 working models of Energy Limiting devices, under no specific preference or other order, these are the following:

The E-Lim and the MDLE4. Both are designed, developed and produced by active modelers who firmly believe this could be a decent solution to the battery problems. Both these devices work in a similar way, with only minor differences between them. However both of them have the same principle, allowing only a certain amount of Energy to pass through them. When this amount of Energy is used, the Energy Limiter will slow down and come to a stop, and not re-arm till a fixed amount of time has passed. After that "dead" time has passed, it will re-arm allowing the boat to be driven back to the shore without having to be retrieved. However, both devices will indicate that more than the allowed amount of Energy has been used. The main advantage to this system is that in combination with higher Capacity batteries everyone has exactly the same amount of Energy available, yet will always be assured there is at least 20% of Capacity left in the battery resulting in much longer battery life.

In Belgium we started with the principle of Energy Limiting in the summer of 2016, and the batteries we bought for those very first tests are still in use now. Some of those batteries have over 50 cycles on them and are still in perfect conditions.

In order to have an even platform against the Naviga weight legal batteries we calculated through extensive testing the following Limit values for the different classes:

Compared to 110gr Lipo weight an Energy limit of 20 Watt/hour which is the equivalent of 1200 Watt/minutes

Compared to 280gr Lipo weight an Energy limit of 53W/h or 3180W/min

Compared to 560gr Lipo weight an Energy limit of 106W/h or 6360W/min

Compared to 840gr Lipo weight an Energy limit of 159W/h or 9540W/min

Once this limit is reached the Limiter will slow down (we prefer this slowing down over a 3 to 5 second period), allowing the racer to move to the inside of the track. After this slow down the Limiter will cut all power for 2 minutes, making it impossible for the competitor to continue racing. The suggested amount compares to a typical 2S 2600 mAh battery in 110 gr or a 3S 4800mAh in 280 gr. These numbers are stated on the labels of those cells and according to the manufacturer the amount of Energy they can deliver. Since the Energy limiter must be mounted directly on the battery (meaning before the kill switch) we suggest to use the possibility of not starting to count until more than 5 Amps pass through it. In other words, a radio check will not trigger the Limiter to start counting.

By mounting the limiter before the kill switch, it is impossible to reset the limiter externally, meaning that for as long as the boat is not opened there is no way to reset the values, even if the kill switch is unplugged. Should for some reason the boat need to be opened during a race, this must be done under the supervision of the platform Judge (which is already the case under the current Rules to prevent cheating, eg changing of batteries).

With the use of Energy Limiters the whole procedure for weighing and measuring batteries can be simplified. Before the race the only thing that needs to be verified is that the device is set in the correct program (can be checked on both versions visually) and after the race it can visually be checked if the limit has been passed or not, no need for any extra equipment to do so. Both versions of Limiter are designed in such a way cheating becomes virtually impossible. On the E-Lim this can be checked with the "Official" code protected Control box, whilst the MDLE4 has the display that shows the values. Any form of cheating, changing of parameters will be punished by immediate disqualification for the event.

With this proposal we want to offer a cheaper alternative for the current battery Rules, and end the next battery-war. We are not fixed on exact numbers, and are open to ideas. We feel these details should be dealt with by a Technical Committee under the supervision of the Section Leader, but we ask for a positive vote on the principle of Limiter use.

In summary Belgium proposes the following Rule changes:

- 1) To allow the use of both types of Energy Limiters (E-Lim and MDLE4) as per 01/01/2018 alongside with the current battery Rules
- 2) If the answer to this is yes, to have the values (parameters) set according to our suggestions mentioned before, but with the possibility to alter these values if needed to stay competitive against possible increase in Capacity in 280 gram batteries
- 3) If needed form a Technical committee (all National Teamleaders) who will decide by no later than 01/12/2017 together with the Naviga M Section Leader what those values (parameters) should be. Should the need arise that those values need to be raised, only this committee can decide so.

Another proposal concerns the often heard remark that World Championships take too long.

In our opinion, "team" events should not be held anymore because they do not represent an official class in any Country. We feel that mini Eco Team and Eco Team have no place at a World Championship and are just an excuse to run an extra class, since no National competition of that nature is run on National level.

Furthermore we think a lot of time can be won if the WC gets split up in 2 parts. 1 part where all the triangular classes are held and a second part where all the oval classes are held. By doing so, competitors who do not run in both formats of racing do not have to stay for the whole duration of the event, saving time (holidays, family time) and money.

In summary

- 1) strike the Team classes
- 2) Split up the WC into 2 parts.