Staying Safe in Wave

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December 2008

PacificSoaring.org

Wave season is upon us in PASCO-land, and it's time to review some considerations of flying at high altitudes for extended periods of time.

Lenticulars over Minden

The first consideration, because it can kill, is hypoxia. Remember, if you're flying in wave you'll be flying where you need oxygen. The FAA requires you to use oxygen if you're **above 12,500'** for more than 30 minutes,*(ed. note: oxygen is required at all times above 14,000 feet)* but the truth is hypoxia cannot be planned for by legal definition. And it's nothing to take lightly.

I tell people that if they're coming to Minden from sea level (the Bay Area, for example), and if they're my age, chances are about even they'll feel some side effects of the altitude just standing on the runway. Oxygen is not expensive, and it's good insurance against impaired judgment, so start using it when you strap into the plane. Don't wait until the FAA regulations tell you it's time.

If you plan to stay below Class A airspace you'll be ok using a Nelson constant-flow regulator with the little green ball adjusted to your altitude. If you plan to go up in the wave window you'll want either an A-14 regulator or an EDS Mountain High system. In either case, read the instructions and/or ask for a briefing before using the system. You don't want to be guessing how to adjust your oxygen when you're climbing in wave at a thousand feet a minute! And that's not the time either to wonder if you remembered to turn on the tank when you preflighted the glider.

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So include a good oxygen preflight before you strap in (I use PRICE, but use whatever you're comfortable with) and make sure the system is working before you need it.

How about taking a high altitude chamber ride? I took a chamber ride at Beale AFB a number of years ago, and it illustrated to me conclusively just what my personal hypoxia symptoms were. I occasionally experience the same symptoms flying around 14,000', and know it's time to check my oxygen. You might consider taking the same course – it's $50 for a day-long session by people who really know what they're doing. The down side is it's only offered a few times a year. You need to register with the FAA first, then make reservations with the folks at Beale. I have been told the chamber ride kills brain cells, but I never noticed any problems never noticed any problems never noticed any problems.

Another aero medical factor to consider is the cold. You'll likely be standing around on frozen pavement in a biting wind before you take off, so you're chilled to begin with. Then you'll be flying at high altitude (remember the temperature lapse rate? What does a 15,000' altitude gain mean if it's only 20 degrees above zero on the ground? Bottom line is, dress with layers and pay particular attention to your head, hands and feet. You'll need dead air space in your clothing to trap your body heat, so look for loose boots and gloves. I use the cheap **shearling boots** available from discount stores for about $40 and they're perfect – except that they're pretty big to fit in the tight space around the rudder pedals. Test them before taking off just to make sure you can work the rudders.

The same cold that you're dressing for will cause your kidneys to work overtime. That's a physiological fact of life. And sitting in a reclined position does the same thing. So be prepared for a full bladder early in the flight, and consider options for relieving yourself in the glider. Various options exist for men, including an empty soda bottle, a zip-lock bag, a motorman's helper (check with your pharmacist) or a diaper (about the only option for women). Don't think you can hold it unless you'll be back on the ground in less than an hour, and don't be embarrassed to ask about your options – commercial operators will help you plan for what we all experience. And finally, increased kidney function means you'll dehydrate faster, so don't forget to drink lots of water. I know, it's a vicious cycle, but you're flying in a harsh environment and you need to protect yourself.

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Another issue with wave flying is that you'll be flying through rotor. You'll probably do so on tow, testing your ability to stay behind the tow plane, and you'll certainly fly through rotor when you return from the wave and approach the airport. I cannot emphasize strongly enough that you must be strapped in very securely and must have all loose items secured. Don't leave your camera loose in your lap; tuck it under your elbow. Same with your water bottle and same with yourself. You don't want your head going through the canopy any more than you want your camera punching through the Plexiglas. You're going to be thrown around very violently, so be prepared for it in advance.

Finally, chances are pretty good you'll be flying near cloud. It is both illegal and dangerous to allow yourself to be blown into cloud, but it is a lot easier than you might think. To begin with, the wind speed will be increasing as you climb (wave depends on a wind gradient) so your forward speed (into

the wind, away from the lenticular) needs to increase too or you'll be blown backwards. If you have reached the altitude of the lenticular it will be behind you, and if you don't increase speed you'll be blown back into it very quickly. Since lenticular clouds are wider at the bottom than at the top, pushing your nose down to speed up and try to move forward into the blue will also result in you increasing the distance through cloud you need to fly before exiting. It's another vicious cycle.

If you have practiced a benign spiral mode and you're sure the bottom of the cloud is well above the mountains you might consider using that to descend safely. You'll still be illegal (and possibly using the same airspace as an airliner approaching Reno), but at least you won't tear the wings off the glider by entering a spiral dive. A much better plan is to be watching your cloud clearance at all times so you don't find yourself all of a sudden in IMC without instruments or clearance to be there. Oh, and by the way, if you have not practiced the benign spiral in the glider you're presently flying, this is NOT the moment to try it for the first time. And if you're going to use it, you absolutely MUST trust it – the NTSB has a large file with the names of very many pilots who thought they could fly IFR without instruments, just trusting their sensory inputs.

Flying in wave is a thrilling experience, whether you're going for an altitude diamond or using the wave for cross country flying. I don't mean to scare you with any of the above comments, but flying in wave means you're in an extreme environment that requires preparation, proper equipment, and awareness of the dangers out there. If you have not previously flown in wave I strongly recommend you fly with an instructor the first time. No matter what your experience, it pays to consider some of the points I've highlighted above. Your life might just depend on some of this information.

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