



# WEST WIND February 2000



Inverted at Truckee – *Photo by Ken Ward, San Jose, CA*

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## Statement of Purpose

The purpose of the Pacific Soaring Council, Inc., a non-profit, 501(c)3 corporation, is to initiate, sponsor, promote and carry out plans, policies and activities that will further the education and development of soaring pilots. Specifically, activities will promote and teach the safety of flight; meteorology; training in the physiology of flight, and the skills of cross country and high altitude soaring. Other activities will be directed towards the development of competition pilots and the organization and support of contests at the local, regional, national and international levels of soaring. PASCOC is the acronym for the Council. WestWind is the monthly publication of PASCOC. Material may be reprinted without permission. The present board will remain in office until November 1999. Current dues are \$25 annually from the month after receipt of payment.

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**VALLEY SOARING ASSOCIATION** <http://www.community.net/~soaring/>

# Minutes of the PASCO Board of Directors

Dec. 1, 1999

Meeting called to order at 7:35 p.m.

ATTENDEES: Sumner Davis, Charlie Hayes, Rosemary Hayes, Sergio Colacevich and Fran Allendar. Guests: Bob Korves, Rolf Peterson.  
ABSENT: Mike Schuster, Dick Horn, Bruce Roberts, Tony Gaechter

MINUTES: All accepted.

### CONFIRMATION OF DIRECTORS

Confirmed

### CONFIRMATION OF COMMITTEE MEMBERS

Confirmed

- Cindy Donovan: Awards
- Ty White: Membership
- Steve Smith: Competition
- Sergio Colacevich: Sawyer Award
- Rolf Peterson: FAA Liaison
- Eldon Henkle: Equipment
- Tony Gaechter : PASCO League
- \*Dave Penning: Safety
- \*\*Janice Hoke: West Wind Editor
- Charlie Hayes: PR/Fund Raising

Sergio will talk with Dave Penning with regard to overseeing the Safety committee. Duties of the Safety Committee Chair were discussed i.e., spring seminars, articles in West Wind, keep abreast of safety issues and pass that information on to PASCO members. Discussed possibility of holding Safety Seminars at Hollister, Byron, and Williams - seminar 4 hours in the morning with flying in the afternoons. We are an educational organization so we want to continue to educate those in this sport.

\*\*Charlie Hayes will contact Janice Hoke and confirm her availability to be the West Wind Editor.

Ty White will send bylaws to all new members.

### TREASURER REPORT

Current Balance

Checking: ..... \$11,527.86

Current Balance

Savings: ..... \$ 2,927.82

Current Balance

Scholarship Fund: ..... \$ 5,884.74

In answer to a question regarding fee for National Contest - Minden 2001 18M Sports Class, a \$150 entry fee was required and paid.

Action Item: Rosemary will audit books for 1999.

### COMMITTEE REPORTS

SAWYER AWARD: There was discussion on Peter Kelly's proposal for simplified rules. Charlie was in favor of Peter's proposal with the addition of better reporting procedures. Sergio reported the last update on the rules was in 1992. He would like to reinstate the below-2000' or above-2000' rule. California valley flights would get double the points of flights in the Sierra.

Discussion followed on how to award points. Some believe the attempt to make rules less complicated has eliminated some valuable items. Some think simplifying the rules will encourage people to participate. This is a work in progress. Sergio would include sample worksheets to assist participants.

The submission of flight reports periodically during the season, with posting in West Wind, might enhance the competitive nature of the award and give it more visibility to the PASCO membership.

Action Item: Sergio will contact Peter to discuss how to proceed. He will present recommended simplified rules at the next meeting.

PASCO LEAGUE: Tony Gaechter sent his report via Sumner. Avenal would host a May event. Possible dates would be May 6-7 or May 13-14. The cost would be \$10 per day and they would host a barbecue. He has not had an opportunity to contact other sites yet. (ASI, Truckee, Williams)

Discussion followed on what brought people together in the past and how can we get people interested now. Team captains make or break the contest. Many are burned out at being team captain. There is a lack of new novices and people have not moved up to the team captain position.

The Chico Distance Camp uses a pundit and novice as team. Recommend tasks go in same general direction to keep sight of each other and keep novices involved in the task. Explored the possibility of having more than three on a team. Also suggested the possibility of having a pundit escort a novice one-day and an intermediate escort a novice the next day.

Will ask Tony to be a booster/recruiter and try to identify individuals in clubs to promote PASCO League participation.

CROSS COUNTRY SEMINAR: Carl Herold's group will host a spring seminar at UC Berkeley, Feb. 19-20, 2000. The seminar will be "Physics and Aerodynamics of Unpowered Flights in Theory and Practice." Details will be worked out with regard to 1000K group and a 500K group. It will be videotaped to ROM for CD using UCB equipment and personnel. Parking will be \$5 without a permit. The room holds 250 people.

CALENDAR: Charlie Hayes volunteered to coordinate an "All Soaring Events Calendar." BASA sent in their schedule for 2000. Fran will contact NCSA for their calendar. Bob will contact Silverado, Charlie will contact Williams. The calendar would be posted on the PASCO website by Mark Ramsey. Charlie will talk with Ty White about coordinating soaring dates and events. Need to contact Dale Bush and Stew Tuttle re: Montague and Gary Kemp and Elden Hinkle re: Chico.  
July 10-14 ASI Women's Soaring Seminar - Pam Sutton  
July 15-27 Parowan UT (Parowan Air Show 28/29)

FAA LIAISON: Rolf Peterson reported the changes to the San Francisco Class B are scheduled to be on chart by March 2000. Submittals for revisions must be in by January 2000. Soaring input has already been submitted.

OLD BUSINESS: Bruce Roberts sent a report that there has been no change in the way NCSA handles PASCO membership requirements.

NEW BUSINESS: PASCO Board meetings will be moved to the first Tuesday of each month if that night is available. Rosemary Hayes will check into the options and inform members before the meeting in January 2000.

Meeting closed at 9:15p.m.

Tuesdays were not available so all future meetings will be held on the first Monday of each month.

# SOAR MINDEN



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\* Daily rate includes unlimited use of glider, O<sub>2</sub>, Barograph, Parachute plus one 3000 ft tow.

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# MINI SAFETY TIPS

## *on takeoffs and tows*

by Sergio Colacevich

Having pre-flighted (In Germany they say pre-streckensegelflугed, I guess) our plane in the last edition of this column (January 2000), we are ready to be launched into the infinite blue.

The cream on the cake of a flying day is the interaction with other fellow pilots. We meet at the field, in the place where we like to be, knowing that we will be flying today. We are happy, eager to help and do things together; it is sweet to greet each other, easy to joke, and our being sings in the sun.

But from time to time, we have to take a minute with ourselves and do things with a cool head. We know that bad things have happened in the past, when pilots have been distracted by other people. Will we be able to be cool today? We want to be, and our friends want us to be, too.

Just before moving the glider to the starting line, it would be wise to check to see if we have forgotten anything. What we need is a written check list. Hat, water, oxygen open, etc. If we are in a hurry to take our place in the queue, some of these last checks may be done also while waiting in line, I don't see anything wrong with that.

When we firmly believe that everything is on board the plane, everything working etc., then we can do the positive control check. Blessed check. I never found that I did not pass this check, nor I ever heard of

any pilot whom I know not passing it.

But then, we can be wrong only once. So better be never wrong on this: the consequences are disproportionate to the lightness of the fault (Spanish speakers would say: "Cuidado, hombre." "Be careful, man.")

When it is our turn to be launched, that is the moment when we really have to demonstrate that we are mature pilots. This moment is so critical and many accidents have been born at this time.

We have to install ourselves in the plane, fasten the belts, arrange around us our water bottle, microphone, hat, glasses, complete the last checks regarding canopy closed, airbrakes closed, straps fastened, etc. Right at this moment people are active around us, removing the tail dolly, showing it to us, so that we have to look and nod, someone else asking to open and then close the tow hook. At any time they are ready to do it, not when we ask for it. People are talking to us, giving information, commenting, joking or calling: for the wing to be lifted, asking where we want to go, how high etc. And there is the noise of the tow plane taking position, the propeller blows your hat, the canopy must be held for a second, everything conspires to distract and confuse.

Are we cool pilots? We try to be, we want to go through it with coolness (In France they would say "avec nonchalance"), we want to show that we can handle it, as the consummate pilots we are.

But if we feel overwhelmed, if we want to be real cool: let's say it. Say that we need just a bit of time, that we have to slow down.

Then a magical thing will happen: everybody will slow down and wait for us in silence. They understand, they are our friends, they are all people that have been there or have seen it so many times. We do not lose any of our status; in fact, we gain some.

When the glider starts to move, of course our attention is very crisp. We have a very precise notion of where the release knob is, or we have our hand on it. We know that any

rolling movement of the wings must be immediately counteracted by very quick, full action of the stick.

If a wing touches the ground, we may still continue with the take off, unless the wing has water, in which case there is no way to lift the wing. If this is the case, release immediately (some pilots have not done this and experienced a ground loop, with a heavy wing scratching the ground).

So now we are on tow. Are we prepared if something goes wrong on tow? We know that 200 feet above the ground, we have the possibility to do a 180-degree turn and land on the very runway we started from.

But before then? Gray area here. It depends on who we are, what glider we fly, and mostly, the environmental condition of the runway length, presence of other runways, width of the airfield, presence of landable fields beyond that etc.

The only possible advice: Have a plan ready in our mind. Decide before taking off what we will do, if something happens. For example; first option could be to land straight, second option would be aim for the cross runway, third option, go for the field on the right.

At some gliding sites, they tell you the options during the familiarization flight. There should be more emphasis on this issue, everywhere, because we tend to forget. It would be good if this information were written in every gliding site in a place that is easily caught by our eyes.

I conclude with another item: airborne signals, which have to be immediately recognized and acted upon: We need to increase speed: roll the wings. We need to decrease speed: waggle. We cannot release: move out and roll the wings. Towplane waggles: cannot release either (The two will land together). Towplane fans the rudder: spoilers out. Towplane rocks the wings: release immediately.

May the lift be with you all.

Sergio Colacevich is a transportation engineer and works for Caltrans in Sacramento. He came from Italy in 1984 with a Silver badge, gained the Gold badge in 1991, and the three-in-one-shot Diamond in 1996.

# Goldens at My Wingtips *Soaring high above a Pennsylvania ridge*

by David Brandes

Bald Eagle Mountain is the westernmost ridge of the ridge-and-valley geographic area of central Pennsylvania. This long, linear ridge (approximately 90 miles from Williamsport to Altoona) is well known by glider pilots for providing superb conditions for ridge soaring.

On a windy spring or fall day, the local glider port is busy towing gliders up to 2,000 feet, just above the ridge, where they can easily spend the day skimming the ridge or soaring in thermals thousands of feet over the valley. But they are not alone - a semi-annual migration of raptors occurs here, as happens on many or perhaps all of the parallel ridges of central Pennsylvania. The late-fall golden eagle migration in particular is excellent along this ridge far west of the famous Kittatinny.

After several years of watching the procession of hawks, eagles, and gliders along the mountain from the ground, I was wondering what the view might be like from one of those gliders.

Lucky for me, during these years I had developed a friendship with Karl Striedieck, the legendary glider pilot who held a world gliding record for many years of 1,000 miles, from Lock Haven, Pa., to Oak Ridge, Tenn., and back (see National Geographic, March 1978). Karl is also a raptor and golden eagle enthusiast and had offered to take me up for a hawk's-eye view of the king of North American birds.

The weather forecast sounded right for a golden eagle flight (strong northwest winds, partly cloudy skies, and occasional flurries) one Saturday in mid-November and we agreed to meet the next day to give it a try.

I got to the hawk watch early that morning, on the hunch that we were due for a good flight. Sure enough, the first golden flew by at 8 a.m., just as I got there. By the time we headed out to the glider port at 11:30, I had already counted 11 goldens and one adult bald eagle, with a smattering of redtail hawks.

What was already a great day was about to get better. We were in the air just after noon, getting the short tow from the valley floor to the top of the ridge. With a pop of the tow, we were free to float the ridge with the eagles. I was fortunate enough to be sitting in the front seat of the cockpit where I could spot birds as we approached.

Almost immediately upon climbing the updraft, we passed some redtails, and then I noticed our first big bird, high and straight ahead - an adult golden eagle facing out over the valley into the strong northwest gale.

The trick to a close encounter is to get above and behind the bird and then glide up alongside as slowly as possible. Unfortunately, a Grob two-seater glider does not have quite the aerodynamic performance of a golden eagle, and so the maneuver can take several turns, especially since the typical flight speed of the eagles (approximately 20-50 mph) is much less than that of the glider.

We never did get very close to that first eagle but did notice some interesting behavior: The bird seemed to head out into the wind over the valley below cloud streets to gain altitude, and then to turn and glide off to the south toward the ridge. Cloud streets are often present on windy fall days after the passage of a strong cold front, and are a very reliable source of lift for glider pilots (and apparently, eagles).

We headed off to the southwest accompanied by the sound of the whistling wind, buzzed past my friend at the hawk watch and continued down the ridge. A few miles far-

ther we found another adult golden riding the ridge updraft. After several excruciating (for me) banked turns we were in position for a close pass.

It is an exhilarating and mind-numbing experience, cruising past a gliding golden eagle at less than 30 feet. It was interesting that the eagle seemed completely unconcerned about the big stiff white "bird" alongside - must have something to do with being the boss of the airways. When a glider does get too close, eagles either bank off and flap away, or just drop and steer out over the valley.

After a couple circles to regain altitude, we realized that we were unable to get enough lift to get above the eagle again, as that section of ridge has a rather gentle slope and the updraft was not very strong. We then decided to head back upridge, with the idea that we would intercept more birds coming toward us down the ridge.

By the time we got back to the hawk watch, we had passed two more goldens and a good number of redtails. We pressed on to the northeast along the smooth northwest flank of the ridge.

Then, crossing the Interstate-80 gap, I noticed a juvenile golden eagle circling below. We tried briefly to circle with it, but with our much larger turning radius it was difficult to keep track of the bird. As we pulled out to head upridge, another eagle cruised by just overhead, this time an immature bald.

Soon Bald Eagle Lake was stretched out below us, and I realized what a convenient fast-food stop it must be for the eagles migrating along the ridge.

While gliding on to the north at 80 knots, we spotted another adult golden zipping by below. Then we flew what seemed like a long empty stretch of ridge, seeing only the occasional redtail; however, I noticed that any birds low along the brown oak treetops of late fall would be effectively invisible from above.

I continued to enjoy the new perspective and feel from above the ridge as the strong current of air pressed up from below. It was now

past 1 p.m., and the snow showers were building, so we turned back south at Lock Haven toward home.

Before long we saw a pair of goldens below us and out over the valley to the right. Two adults, male and female, were gliding within 30 yards of each other, perhaps a mated pair. This time we already were in perfect position for another close pass, and we sneaked up behind. Going as slowly as possible, we slid past the pair of unconcerned birds at pointblank range.

The sight of a wild golden eagle staring back at me from just outside the glider was as close to raptor heaven as I've ever been. Soon, however, the eagles shook us off by flapping southward toward the ridge. Unable to resist, we circled back for a second pass. Again we got so close to the unwary pair that I briefly contemplated that checking out at 30 years old with a golden eagle in my lap wouldn't be such a bad way to go.

After that, the rest of the flight back to home base was anticlimactic, but we did notice a handsome dark-morph roughleg below us just upridge from the hawk watch and calculated it should be there in about 10-15 minutes.

Upon returning to solid ground and straightening my stiff back, it was back to the hawk watch, where we were enveloped in a snow squall;

I learned that a dark roughie went past right on cue, and nine more goldens had been sighted.

The day's final tally included 22 golden eagles and two balds, but it is not these numbers I will always remember. Rather, it is the privilege of gliding the ridge with those magnificent golden eagles.

David Brandes is an assistant professor of civil and environmental engineering at Lafayette College, Easton, Pennsylvania. Since his teens, he has been an avid student of raptor migration. His most recent raptor project involves documentation of the spring migration of golden eagles through Pennsylvania.

## Sawyer Award Call For Entries

This is a call to every pilot belonging to the PASCO community to participate in this year's Sawyer Award. This is a honorable award, and fun to participate in. The name of each recipient is engraved on the trophy, and the presentation is made annually. Many winners over the 42 years of its existence went on to become key persons in our sport in the region, the nation, and the world of soaring.

The Sawyer Award was founded after the fatal mid-air collision of Doc Sawyer with Harner Selvedge, who survived, in the White Mountains at the U.S. National Soaring Championships in Bishop, CA, in 1957. Tom Brandes and Doc Sawyer's brother who lived near Winters, Calif., founded the Sawyer Award as a result. The award was initiated in the 1960s by Northern California Soaring Association, based in Hummingbird Haven Airport, Livermore, Calif.. It was later sponsored by PASCO in 1969 until today. In 1970, 26 pilots competed.

The award encourages participation and competition in cross country soaring, provides a standard of measurement, and honors the winner. The pilot wins the award by accumulating the greatest number of points which are awarded for the number of flights, height gained, distance flown, duration of each flight, field of origin of the flight.

A recent winner, Peter Kelly, initiated a proposal to enhance participation to the award by reviewing the rules and making them more in line with the times. Sergio Colacevich, the current administrator of the award, undertook the task of analyzing the rules, acquire statistical information, propose to the attention of the pilots the items where modernization could be useful.

The inspiring principle has been to try and maintain the original intent of the award, which was to encourage the pilots, especially the novice pilots, to fly cross country, and to fly a lot. In this view, I hope that the factor for the less experienced pilots will be increased, so as to give them better chances. Ideally, everybody should have the same chance to win.

My own approach will be to facilitate more participation by giving more publicity to the award. I have the intention to report on its status in every number of the West Wind, and keep a Sawyer page on the PASCO Web page. I will ask for the participants to send their scores every month and I will publish the scores as well as the best flights of the individual pilots.

I encourage you all to fly cross country. Can you imagine? Touching the clouds, exploring new territories, floating over a scenery that you never saw before. Get help from the clouds, dodge the sink, balance your wings over the lift beyond. It does not get any better than this.

Send in your Sawyer flights, even if you don't know how much and how far you can fly this year. Yes, there is only one winner, but the fun is there for everybody to grab. The contest has already begun: just keep track of your flights in your log books. The next issue of WestWind will include the renewed rules for the award, and how and where to send the report of your flights. *—Sergio Colacevich*

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# Generic Safety and Its Application to Soaring

by Bill Reuland  
ole-bill@worldnet.att.net

## **Introduction:**

### ***Principles of safety***

It is hard to conceive of a structure, machine or device that has absolutely zero potential to cause or be a factor in an accident. Therefore we must be concerned with all machines and activities that can have accidents with high consequences and with reasonable probability.

Operating a glider is a good example. We have lost a lot of friends over the years. However, we are bombarded with advice on how to practice safe soaring. Perhaps a fresh look at generic safety and its application to other activities with potential risks will be fun and provide useful insights that will enhance your soaring safety.

The objective of this talk is to discuss generic safety principles and have the audience transfer them to their own experiences and perceptions in aviation.

To keep this talk from being a “do this-do that” lecture, I will try to limit the examples to non-aviation applications of general safety principles. During this brief description of some basic principles of safety, I want you to be thinking of applications of these principles to soaring.

We will spend the last half of our time with an open discussion of your experiences and thoughts about how the basic safety items are applied or could be applied to soaring.

The generic safety items to be discussed are the following: The list is not exhaustive, but contains some items that are applied or studied by engineers who make safety a career. I think they can be applied to every activity where risk is a factor. They have been applied to the technology used to keep commercial nuclear re-

actors safe.

- The ingredients of serious accidents
- Safety in the design
- Safety margin
- The regulator
- Energy boundaries
- Quantifying safety
- Accident history, root cause
- Levels of consciousness
- Human factors

### ***Three Ingredients of Major Accidents***

There are three ingredients that have been observed by accident analysts to characterize many serious accidents and near misses to serious accidents. The value of knowing about these characteristics is that by recognizing them, many accidents can be avoided. Even avoiding any one of the ingredients can go a long way to improving the safety of most activities. These ingredients are

1) Operation of a machine outside of the prescribed or real limits of safe operation

2) Lack of knowledge by the operator of the design basis for these limits and why the operation as it is presently being conducted is dangerous

3) Failure to recognize one or more existing indicators that an accident is likely, and/or denial that the symptoms indicate a dangerous or deteriorating situation.

Safety is designed into most machinery. When the design is completed and tested, certain limitations are placed on its operation. All of these limits taken together are often referred to as the safety design envelope. All of the safety design requirements and specifications for the machine constitute the safety design basis. The design basis also contains functional requirements so that the machine will perform its intended purpose.

Training, operating instructions and placarding all convey safety design limits to the operator. Because there are limitations to the ability to completely analyze and test a design, safety margins are employed to ensure that operations within these limits are safe with a reasonable probability. For those activities that are regulated, such as nuclear power and

aviation, these limits become a part of the design certification process and become regulatory limits on the operator.

### ***Operation out of limits***

Operation outside of specified limits is the first ingredient of most serious accidents. At Chernobyl the reactor designers, based on the specific reactor design, had specified that operation was prohibited below 30% power and that a certain number of control rods be inserted and available to halt criticality. When the accident happened, both of these limits were being violated, and once in that condition, the accident was unavoidable.

The story doesn't end here. The second ingredient listed above was also involved at Chernobyl. Until a few minutes before the accident, there were no operators in the control room who understood enough about the design to know why these safety limits were important. When a nuclear engineer did arrive, he realized that the accident was unavoidable. Had the operators understood the design and the consequences, they may not have been willing to venture outside the safe envelope of operation.

Finally there was at least one clear symptom that should have signaled the operators of the peril of their actions. That symptom is perhaps the one that is most ignored by operators, the machine was not doing what they expected it to do. In many serious accidents, there are several indicators that the situation is likely to lead to disaster. In the Chernobyl accident, the operators were not trained to recognize the other more subtle symptoms that would have warned them and maybe avoided the accident. We have only discussed part of the Chernobyl picture, but in spite of the risky design, the accident could have been avoided by following the rules.

### ***Danger of group think***

The Challenger accident is another example of an accident having the above symptoms. A limitation existed on operation of the solid propellant booster at low temperature.

Data existed that demonstrated a high probability of O-ring failure on a joint of the solid propellant booster at temperatures that had been measured at the launch site during the night and morning of the launch. However, the launch was not cancelled.

The concerns of the engineer most familiar with the O-ring design were overridden, not followed. Although the contractor management had reservations, the message that was perceived by NASA management was what they wanted to hear.

A phenomenon called "group think" led the combined group of contractor managers to make the decision that they thought the group wanted and denied their individual concerns. There was nothing malicious here. The group simply focused on success and placed their false hopes in some test data that demonstrated successful firings in some instances where the temperatures were low and the fact that there had been at least one failure at high temperature. We have all been in situations where individual want to please all of the other individuals, and in the end no one is happy with the group decision.

### ***Operators making changes***

While we are on the subject of the design basis, it would be a good time to bring up operators making changes to a design and operator performed maintenance. Many accidents are the result of changes made by owners who do not understand the technical basis to the design of equipment. Usually the motivation to make changes is improved performance.

Even knowledgeable engineers will make this mistake. Often without the knowledge held by the original designer, they omit certain calculations and tests needed to assure that all specifications are met and safety limits are changed accordingly.

Maintenance of safety critical machinery also requires fundamental knowledge and close adherence to maintenance procedures which can be complex and often not available to the operator. The more the operator

knows about the design basis of his machine, the more likely he will be to let an expert fix it. I hope this discussion has not been a great disappointment to those of you who have read *Zen and the Art of Motorcycle Maintenance*.

### ***Energy Boundaries***

One of the methods for identification and avoidance of potential accidents is to identify energy boundaries. Nearly every accident involves the rapid transfer of energy across some boundary such as the walls of a steam boiler.

The boundary does not have to be physical. It may just be the space between the diamond lane and the center lane on the freeway. It is avoiding or controlling these energy boundaries that constitutes a major part of safety.

Energy boundaries include the following:

- Differences in height and velocity
- Pressure boundaries
- Temperature (internal energy) boundaries
- Chemical reaction boundaries
- Radiation energy boundaries
- Electrical boundaries
- Biological boundaries

Energy boundaries are protected in a variety of ways. The railing on a stairway helps protect the potential energy boundary between the top and bottom. Other protection of this energy boundary is the lighting and the stair surface.

A traffic light is a control for the kinetic energy boundary between cars traveling in different directions. Electrical insulation keeps energy from crossing the boundary between conductors and causing fire or electrocution.

### ***Dodging boundaries***

Humans are very proficient at defeating the devices designed to protect them from energy boundaries. Many of the devices are inconvenient for people. A member of our family stepped over a retaining wall so that his fiancée could get a better picture of him at the Grand Canyon. You can guess the rest of the story.

Sometimes too much confidence

is placed on the method used to protect the boundary, and it fails. "Child proof" medicine bottles are a good example. Poisonings have happened because parents assumed these bottles were safe. More will be said about traps later.

By now I hope that you have a long list of energy boundaries that exist for the pilot and have thought of the ways in which they are protected.

Just so one won't forget some of the generic principles of safety, lets think about the following accident.

An avid and inventive ice fisherman discovered that he could propel himself across the ice by sliding on slick bottom boots powered by the chainsaw that he used for cutting holes in the ice. One day a momentary hesitation of the chain saw motor caused him to override the saw which came up between his legs and did the unthinkable.

This is an example of failure to respect an energy boundary and the use of a machine for a purpose other than that for which it was designed. The writers of the instructions for use of the saw did not consider the possibility of this use for the saw. Although this example seems to have been an obvious mistake that we would never make, more subtle variations of this type of accident happen regularly.

### ***Colorcoding awareness***

Chas. Harral, pilot examiner in the Phoenix area, first presented the color-code ideas during an AOPA Flight Instructor Refresher Clinic which I attended some years ago. His paradigm can be applied to a wide range of safety applications.

The model is based on four states of mental awareness, and a color code is assigned as a memory device to each level of awareness. If you call Chas. at (602) 969-8504, you can obtain an audio tape that will provide you with some valuable training in the color code method.

### ***The awareness states:***

- White: oblivious to what is going on, daydreaming, or feeling that there is no potential threat. Often referred to as "fat, dumb and happy"

when recounting an accident.

- Yellow: scanning and evaluating the situation at all times, looking for potential threats and asking yourself if anything looks wrong with this picture.
- Orange: recognizing the need for an immediate decision to take action.
- Red: reacting to the need for immediate action, often involving panic or the wrong decision. The brain creates the fight-or-flight physiology and often causes a default to primacy. You have experienced this condition if you have ever thought you were about to die. Your actions speed up and time appears to slow down.

The paradigm is that one tends to go from white to red when a situation arises while you are day dreaming and trusting that nothing can go wrong. However, red can often be avoided by maintaining the yellow state during activities where safety is involved. For a law enforcement officer, this is all the time.

While in the yellow or scanning

and evaluating mode, a best method of coping with a possible change in the expected situation is being planned as a continuous process. If a problem arises and the orange state occurs, a decision can be made without panic, and one has the best chance of avoiding the threat.

It might seem that staying in the yellow state would be exhausting. However, the converse is actually true. Time passes quickly and the feeling of confidence actually reduces stress and fatigue. Marv Martin, who taught me to fly gliders at Hummingbird Haven and a friend for many years, said once that safety is never being surprised. Good managers stay in this condition on the job. Safety can be thought of as good management.

**Managing panic**

More can be said about condition red, because survivors of panic situations have made some interesting observations. Some of these are a slowing of time so that everything

seems to be in slow motion and reversion to primacy.

Different people respond differently to panic. Reversion to primacy includes actions that we were first trained perform or that are instinctive. However, primacy may impede survival, although survival is the apparent reason for this response.

One of the best ways to survive panic is to be well trained and practice emergency procedures. In this way, reversion to primacy is to enter the correct emergency procedure. Sometimes it is better to be trained for a procedural response to a symptom rather than being trained to assess the situation, especially when there is little time to react. This is a good topic for aviation examples.

During the Three Mile Island nuclear plant accident, the operators stopped adding water to the reactor because their earliest training taught them not to overfill the system. Hence in the confusion, they failed to recognize that water was being lost in the reactor vessel due to an open

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valve. Lack of sufficient water in the vessel eventually caused severe damage to the fuel from heating by the continued radioactive decay even though the chain reaction was stopped.

**Assessment of Operating Experience**

Operating experience can provide valuable insights that can be applied to preventing accidents. The nuclear industry reviews significant accidents and near misses in detail. These reviews are performed by the plants, the US Nuclear Regulatory Commission (NRC) and the industry sponsored Institute of Nuclear Power Operations. Of course the FAA, the AOPA, the SSA and the manufacturers do much the same thing.

An accident review involves a thorough understanding of the progression of failures and consequences. Data recorded in the control room is reviewed, operators are interviewed and damage to equipment is evaluated to determine the proximate causes of the event. The proximate cause is the mechanism of failure.

Categorizing accidents by proximate cause provides useful data for accident prevention. For example knowing the percentage of car accidents caused by brake failures.

The root cause of the accident is then determined. The root cause is

an action or situation that could have been avoided through proper management or operation and that not only led to the accident, but likely would have caused an accident to happen eventually.

For example, a part may have failed, causing an accident, and the part's failure may have been caused by poor maintenance. The poor maintenance may have been caused by poor training, the wrong tool, no self checking, the wrong procedure, the wrong part, etc.

At some reasonable point a cause is found that, if corrected, will help

avoid similar accidents in the future, and the industry is notified by the organizations listed above.

The proximate cause of the Challenger accident was O-ring failure. The root cause was a group decision that denied the warning from test data that signaled a potential accident could happen with an unacceptable probability. Often the root cause is traced to poor management. Proper management of the operations of a complex machine is one of the keys to safety.

**Risk Assessment**

Risk is defined as the probability

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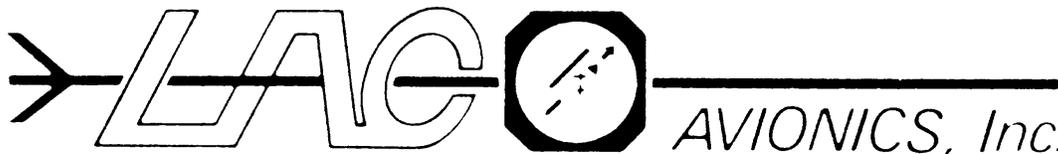
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of an accident times the consequences of the accident. In general people tend to associate risk with consequences only. This association causes aversion for many people to many useful or rewarding activities that have a very low probability but a high perceived or actual risk.

For example, you have heard the expression, "You'll never get me up in one of those things." It is not important to the risk averse person that many familiar and acceptable activities present greater actual risk than flying in a sailplane.

Being able to quantify is useful for evaluating safety alternatives. For example, how many sources of auxiliary power does it make sense to have at a nuclear plant?

Calculating risk is difficult and not particularly accurate, but the technique is used by NASA, the NRC and the FAA. Calculating probabilities for all potential accidents for a complex machine requires a computer. However, the logic can be demonstrated using an event-tree model shown in the figure above.

Essentially risk assessment is done as follows: First all credible hypothetical accidents for the operations being evaluated are assembled. Then each event that can initiate the sequence of events that occur in each accident are determined.

An example of an accident event is the failure of a critical component or an operator action that must succeed in order to avoid the accident. For each hypothetical accident a decision tree is constructed that starts with an initiating event and has a branch for the success or the failure of each intermediate event. Each branch is given a failure probability.

The failure probabilities are combined to yield the probability of each hypothetical accident. The events are assumed to be random and inde-

pendent.

The process of quantifying risk is far from exact. Failure probabilities

The advertisements would have us think that a four wheel drive vehicle can be driven at high speed in the snow. However, all properly maintained cars have four wheel brakes, and it's being able to stop that is important.

Stress is an important cause of operator error accidents. Stress management involves understanding the causes of stress and knowledge of the impact of stress on safety.

Stress management course material points out that people in the highest category of stress in terms of stress-causing factors in their lives have a 90% chance of having a serious accident or illness during the year.

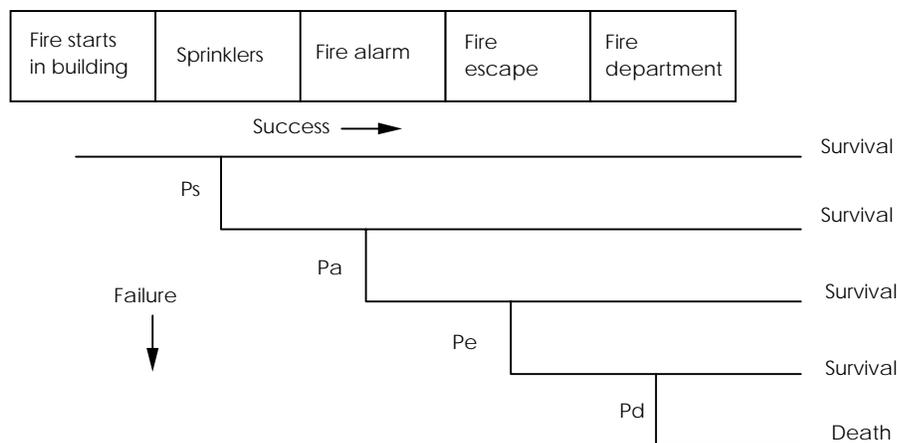
Stress is accumulative and can be caused by family problems, money problems, work-related concerns, diet, drugs and conditions that cause the operator to be in a hurry or pre-occupied.

One last item and we will open the discussion to the audience's applications of these general safety topics to aviation. This last topic is motivation to accept unnecessary risk.

Most risks we take offer some reward, and reasonable risk can be acceptable. However, it is common to find the need to be accepted by others or to be thought of as one of the leaders in an activity causing people to attempt operations beyond their ability.

The sad thing stemming from this motivation is that the opposite of what is desired is usually achieved. Consistent excellence requires knowledge and acceptance of limitations. This is true for individuals and also for organizations. Improvement comes through study, training, practice, hard work and attention to detail.

Event Tree



are often estimated from sparse statistics and there is no guarantee that all events that can combine to cause an accident have been uncovered. The events in a real accident are often not independent, and accidents are not usually random. However, the following is a list of things that a risk assessment can facilitate:

- Evaluating if equipment should be repaired or run to failure
- Demonstrating the contribution of operator action to accidents
- Helping the designer determine the need for redundant systems

**Traps for human nature**

In maintaining safety, "traps" should be avoided.

A trap is situation that draws an operator or innocent victim into an accident.

A six year old boy was paralyzed by drinking insecticide that was had been stored in a Coke can in the garage.

Some two unit nuclear plants were designed with mirror image control boards causing operator errors when an operator switched units.

Think about the traps that glider pilots set unwittingly for other glider pilots. A safety device or safety margin is often a trap.

Does the safety on a firearm make it safe. It does only if you don't count on it!

Before our discussion of how the applications of the generic safety principles discussed above may be applied to soaring and aviation, there are some general conclusions to be reviewed.

Safety is a matter of good management. Good management involves awareness and thinking ahead. Planning, maintenance, training, knowledge about design and safety limitations, and physiological aspects are all under management control.

A good manager assesses risks, reviews and understands prior mistakes, and isn't satisfied with a decision when indications of a potentially serious problem are being overlooked.

Bill Reuland first soloed in 1957 and now has a Diamond badge and has flown in several national and regional contests. A Ph.D. in mechanical and aerospace engineering, he is a

project management and systems engineering consultant. His background in safety has resulted from 32 years as an airplane, instrument and glider CFI plus being a safety consultant for the commercial nuclear power industry.

This talk was written for Reno 95. It also has been presented at two PASCO safety seminars and a couple of flight instructor refresher clinics. Bob Semans was Reuland's consultant and sounding board in putting the talk together.

# MINI SAFETY SEMINAR

A **Safety Seminar** where we talk safety first, and then we fly immediately thereafter will happen at the Williams Airport, the last weekend of March, **Saturday/Sunday March 25/26.**

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9 a.m.: Richard Pearl, "It's a Small Thing."

10 a.m.: Peter Deane, "Racing Across Country"

**On Saturday evening**, the celebrated Williams barbecue grill will be in operation: just take your own meat and a side dish to share with friends. You can spend the night at the airport by making a reservation: (530) 473-5600.

**The weather** can be very decent in Williams by the end of March. It is the season of the cold fronts passing by, leaving behind a bubbling of

unstable air. The sky is bright, the clouds are a crisp white, and the ground is green. The gliders seem to become alive, feeling the power of the born-again soaring season, thrilling in the warmer breeze, sharing the blue with the other creatures of the air, listening to the songs of the new generation of birds.

**Fly the ridge**; soar above the Three Sisters; ride the wave to 18,000'. Try the unique dual tow to the mountains: if you try, you can fly

above the snow. All this may happen, if you just hit the road and travel to Williams, the place to be, the place to share with friends, the place to fly.

**Everybody** will be there, don't miss it - they are all gossipers, and they'll love to talk about you if you are absent!

For more information, ask Sergio Colacevich. See address under Directors, page 2. No fees, no registration. Just be there.



Report from a Secret Agent:

Dear Editor, Acting on rumors, I had a look at one of BASA's Twin Grobs recently and must confirm the truth: BASA has apparently merged with a multilevel marketing (aka pyramid scheme) giant corporation named Amway. What else can explain their new logo, Buy Amway Soap Associates?

After taking this photo, I was confronted by a BASA member with glazed eyes trying to hand me mysterious white cassette tapes which he said, "would explain everything." Fearing for my sanity, I scattered a few shiny pennies on the ramp, and whilst he was grubbing for them, I made a vaporous escape.

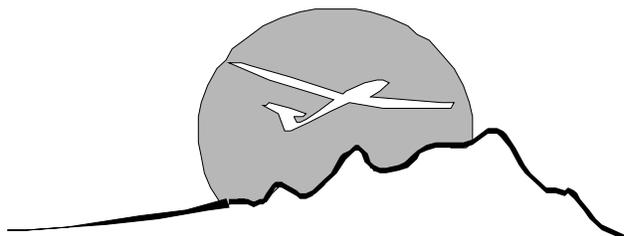
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## Use of Mode C Transponders

*Reno, Nevada*

The potential conflict between gliders and commercial air traffic near Reno has increased with the growth of commercial jet traffic into Reno-Tahoe Airport (RNO) during the past few years. PASCO emphasizes that glider pilots operating in the Reno area must be alert for all air traffic arriving and departing RNO.

Transponder signals are received by Traffic Collision Avoidance Systems (TCAS) on board commercial aircraft as well as by Air Traffic Control (ATC) Radar. By Air Traffic Control (ATC) Letter of Agreement, gliders in the Reno area can transmit the 0440 transponder code in the blind, without establishing radio contact with Reno Approach Control.

PASCO recommends that gliders operating cross country, within 50 NM of Reno-Tahoe Airport, install and use a Mode C altitude encoding transponder.



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**Sam Whiteside. CFG RE/MAX Realty Affiliates**

# Calendar of Events

**March 6:** PASCO Board Meeting, 7:30 pm, Old Terminal Building, Buchanan Field, Concord. All members invited

**April 3:** PASCO Board Meeting, 7:30 pm, Old Terminal Building, Buchanan Field, Concord. All members invited

**April 22-29:** 2nd Annual Western Seniors Contest, April 22-29, Estrella Sailport, Phoenix, AZ. Sponsored by ArizonaSoaring, Inc. Contact Bruce Stephens (520) 568-2318, bruce@azsoaring.com

**April 29:** The Arvin Remembrance and National Landmark of Soaring Dedication, Arvin, CA. The Arvin Remembrance is a series of events to commemorate the Arvin-Sierra Gliderport. Many activities are planned, both at the Arvin site and at Mountain Valley Gliderport, Tehachapi, CA. For more information see <http://tehachapi.com/arvingliderport> or contact Janice Armstrong at (661) 822-8852 or e-mail danarmstro@aol.com.

**May 6,7:** PASCO League Meet #1, Williams Soaring Center, Williams, CA. Contact Tony Gaechter, (408) 867-2182 h, tgaechter@home.com

**May 17-21:** Central California Soaring Club Spring Contest, Avenal, CA. Practice Day May 17. Contact Dan Gudgel, 134 South Olive Street, Lemoore, CA 93245-3412, (559) 924-7134 home, dgudgel@cnetech.com, or Mario Crosina, 1747 Bobolink Lane, Fresno, CA 93727, (559) 251-7933, crosina@pacbell.net.

**June 3,4:** PASCO League Meet #2, Avenal Gliderport, Avenal, CA. Contact Tony Gaechter, (408) 867-2182 h, tgaechter@home.com

**June 19-23:** 2000 Air Sailing Thermaling Camp, Air Sailing, NV. Contact Rolf Peterson, 2618 Tahoe Dr., Livermore, CA 94550, rolfpete@aol.com, (925) 447-4255 h, (925) 447-5620 w.

**June 26 - July 1:** Y2K Air Sailing Sports Class Contest, Air Sailing Gliderport, NV. Practice Day June 25. SSA-Sanctioned Regional Contest. Contact Ty White, Contest Director, 41600 Marigold Dr., Fremont, CA 94539. (408) 616-8378 w, (510) 490-6765 h, tywhite@a.crl.com.

**July 3-7:** NSA Safari from AirSailing, NV. Contact Vern Frye for information at (775) 825-1125.

**July 10-14:** The 22nd annual Women's Soaring Seminar, Air Sailing Gliderport NV. Pilots of all abilities are invited to join us for a week of seminars, badge and record pursuit and lots of flying. C Pam Sutton at 820 California Ave. Reno, NV 89509, (775) 684-5847 or pvsutton@doit.state.nv.us.

**July 15-27:** Parowan 2000 Badge, Record, and Distance Gathering, Parowan, UT. Contact Rolf Peterson, 2618 Tahoe Dr., Livermore, CA 94550, rolfpete@aol.com, (925) 447-5620 h or (925) 447-4255 w.

**July 17-21:** 2000 Air Sailing Cross-Country Camp, Air Sailing, NV. Contact David Volkmann, PO Box 64, Shasta, CA 96087, (530) 246-7559 or e-mail volkmann@snowcrest.net

**July 22, 23:** PASCO League Meet #3, Truckee Airport, Truckee, CA. Contact Tony Gaechter, (408) 867-2182 h, tgaechter@home.com

**July 24-28:** Second Annual Air Sailing Badge and Record Camp, Air Sailing, NV. For soaring pilots desiring to begin or continue the achievement of their Silver, Gold and Diamond badges as well as those pilots seeking to pursue Nevada and California state records, especially in the sports class category. Pilots attending should have x/c experience in high desert conditions. Services provided include wx briefings, x/c planning, and SSA qualified badge observers. Dual x/c and record flying instruction available prior to and during the camp. For information contact Charlie Hayes, 9732 Pyramid Lake Highway, PMB 356, Sparks, NV. 89436. Email badgcamp@soar-palomino.com. (775) 475-2440

**August 5,6:** PASCO League Meet #4, Air Sailing Gliderport, Palomino Valley, NV. Contact Tony Gaechter, (408) 867-2182 h, tgaechter@home.com

**August 12,13:** The Third Annual Gerlach Dash, Air Sailing Gliderport to Gerlach, NV. Sponsored by NSA. Contact Vern Frye for information at (775) 825-1125. Motel reservations at Bruno's in Gerlach (775) 557-2220.



## PASCO

Pacific Soaring Council  
41600 Marigold Drive  
Fremont, CA 94539