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Beware the Dark Side

By Bruce Landsberg, ASF executive director, flies VFR at night using IFR-like procedures.

Sir Alec Guinness, as Jedi Knight Ben Obi-Wan Kenobi, advised young Luke Skywalker in the original 1977 Star Wars movie to beware the dark temptations of the human personality. It's good advice for pilots as well. Not only should we be on guard for the foibles and fantasies of overconfidence, but also for the tricks and temptations of the dark side of the planet, as in nighttime flight. Our night safety record could be far better, and most of the time just a little extra caution will do the trick.

First, some positives about doing it in the dark. There is much less traffic and you will likely have the pattern to yourself. Any traffic that is out and about glows like a neon sign on the Vegas Strip. However, there are always exceptions. Several years ago a Mooney and a Piper Cherokee collided in good VFR conditions on downwind at a towered airport after dark. The NTSB tagged the pilots for not avoiding each other, but also cited air traffic controllers for failing to provide traffic advisories and for making an improper decision to leave only one of three assigned controllers in the tower cab.

En route, away from the main terminals and the city lights, any aircraft showing the requisite anticollision lights will contrast beautifully with the night sky. In congested areas, though, visibility of aircraft among ground lights diminishes greatly, as shown by the Mooney and Piper collision. Other than this accident, we were not able to find another midair collision after dark in the preceding decade.

The winds tend to be much lighter at night. As the sun goes down and the day's heat radiates into the night sky, winds that were gusting 25 knots earlier in the afternoon often fade to less than 10 knots. Turbulence lessens and life is good for the night flier. But as Obi-Wan warned, there is a dark side. Some of it seems so obvious that any fool could spot the signs, but more than a few don't.

A search of the massive AOPA Air Safety Foundation NTSB Accident Database revealed no big surprises but some items of interest. There were 382 fatal VFR night accidents in the past decade. About 11 per year, as much as anybody can tell, involved pilots attempting to continue VFR flight into instrument meterological conditions (IMC). I should point out that this subset of accidents is tough to investigate because it is frequently difficult to determine exactly what the conditions were at the time of the accident, other than to say that the pilot obviously didn't see what he ultimately hit. Those advocating an instrument rating for night flying privileges should know that nearly half the pilots in these accidents were instrument-rated, but obviously not thinking about obstruction avoidance.

On average, about three night-flying pilots per year were incapacitated by drugs, alcohol, or medical problems, and another three took off with known deficiencies in the aircraft. About 11 per year tangled with wires or obstacles; I'm not sure how that differs from the VFR-into-IMC accidents cited previously because the accidents occurred in both visual and instrument conditions. As an aside, four during the decade involved aerobatics at night — I don't know quite what to say about that, other than to decline the offer to ride along.

As a new private pilot, I flew a Cessna Skyhawk into Washington Dulles International Airport to drop off some friends before returning to home base. Landing at Dulles involved working approach control, using the transponder, talking to Tower — the whole enchilada. It was heady stuff for a new driver. The outbound leg at dusk was murky and radar vectors made life easy, but the return to home base after darkness fell was much tougher. There was no problem keeping the airplane right side up — there were thousands of lights below to show terra firma — but navigating was difficult. With one VOR and some uncertain pilotage, I managed to find home port, but let's just say the outcome of the trip was not a sure thing. With GPS it would have been a snap, and that is the genesis of some of today's problem — solve one gotcha and another appears.

Superb navigational accuracy with GPS and moving maps can generate considerable confidence, but the stakes are now raised. Direct to anywhere is easy in the dark, but we still don't see well and the weather is just as implacable as it ever was. Even in good VFR, a hillside with only a few lights disappears into the darkness. A mechanical malfunction at night is possible, but since it doesn't happen often (about 4 percent of all night accidents studied) and is a very uncomfortable thought for those of us flying singles, dismiss it. Instead, focus on weather because of the disproportionate number of accidents after dark that involve clouds.

The nighttime fatal-accident picture is largely a cross-country phenomenon, so the solution is equally obvious — flight plan for terrain and towers. Don't go if you can't maintain visual ground contact. Here's a method that might help. This is not an invitation to cheat, but it does give pilots an alternate plan.

Following an IFR procedure guarantees that night-VFR pilots will not tangle with terrain but, and this is important, if the ceiling and visibility don't allow you to maintain VFR, then the flight is neither smart nor legal. IFR charts do several things well: They provide altitudes and routes that afford terrain separation, they are not cluttered with pilotage landmarks that are largely irrelevant after dark (although the lights of cities and towns do lend considerable assistance), and they are much easier to read in a darkened cockpit.

The old warnings are still valid. Double personal ceiling and visibility minimums at night and if you have to fly VFR in the mountains after dark, something that many experienced mountain pilots won't do, consider tripling the numbers. If you wonder why they don't mess around in the hills after dark, ask one sometime and be prepared for an earful.

Learn to read IFR charts with an emphasis on minimum altitudes. Of particular interest are the minimum en route altitude (MEA) and the minimum obstruction clearance altitude (MOCA). These should become your minimum VFR altitudes on an airway. To be a bit more conservative, use the off route obstruction clearance altitude (OROCA), which shows a safe altitude within the quadrangles of latitude and longitude. This altitude may not give full VOR coverage but if the flight is GPS direct, obstacle clearance is assured. If the forecast won't allow VFR flight at one of these altitudes then the decision is made — VFR isn't an option. Remember that in Class E airspace, which most of it is, the ceiling needs to be at least 500 feet above the MEA, MOCA, or OROCA, as appropriate, for proper cloud clearance. If the OROCA is 3,000 feet, the forecast must exceed ceilings of 3,500 feet.

Don't want to mess with IFR charts? Then use the maximum elevation figure (MEF) that is published in the center of each quadrangle on the sectional chart. The MEF represents the highest elevation, including terrain and other vertical obstacles (towers, trees, and buildings) bounded by ticked lines of graticule. Graticule lines on sectionals are the lines dividing each 30 minutes of latitude and each 30 minutes of longitude. MEFs are depicted to the nearest 100-foot-value msl. It would be smart to add 500 feet to that number to actually clear the obstacle. This procedure is outlined on ASF's Web site (www.asf.org).

Suppose the forecast is OK, but reality isn't. We may spend a future column getting into all the fun stuff that weather can do to unwary pilots after dark. But for now it's enough to say that as soon as the gnawing feeling appears that the weather isn't as advertised and before you get into the clouds, it's time for the alternate plan. Didn't get that uneasy sensation? You're not quite ready for VFR night cross-country flight, and way too trusting to be playing in this environment. Go to the AOPA Air Safety Foundation Web site, click on the accident-analysis button, and look at night fatal accidents. It's sobering reading and highly motivational.

The backup plan generally involves a significant change in direction — at least 90 degrees and likely more. Stay VFR and go to a good-size airport and land. This is not the time to be practicing short-field techniques. We're looking for a long runway, preferably with a rotating beacon and visual approach path guidance. GPS can help immeasurably with the Nearest function. Push a button or two and there's a direct course and distance to a nearby airport.

Waited too long and the aircraft is enveloped in cloud? Clouds do have a way of materializing after dark. It's that pesky temperature and dew point relationship, but no time for that now. Turn on the autopilot, if the aircraft is so equipped, and rotate the heading bug to the direction that is most likely to yield VFR. If you've been following instrument rules, the flight is already at the MEA, MOCA, or OROCA, so if you just entered clouds there is no danger of colliding with terrain or an obstacle. Land now and resolve not to get into that circumstance again.

If you feel uncomfortable flying in IMC-like conditions, then limit night flight to bright moonlit evenings or stay in very well-lit areas. If you feel comfortable flying in IMC but are not rated or are rusty, consider going up with a CFI at night and seeing how proficient you really are. Many night accidents were caused by pilots feeling better about their skills than the facts would support.

Flying below minimum altitudes to stay under the clouds and maintain visual contact is dumb — no other way to describe it. In flat terrain the IFR minimums provide 1,000 feet of terrain or obstacle clearance, and in mountains, the margin is increased to 2,000 feet. The way to safety is up — not down. That's as counterintuitive as pushing forward in a stall to start flying again, but it works. Down low is stuff to hit — guaranteed. Climb and the only things up there are air and the very occasional IFR flight. The odds are overwhelmingly in your favor that a collision will not occur.

Having said that, the British Royal Navy once had some especially odious punishments to hand out to miscreants (keel hauling, yardarm suspensions, and cat-o'-nine-tails, to mention a few), and anybody who deliberately violates the sanctity of controlled airspace without an IFR clearance in IMC is deserving of the worst. However, an inadvertent encounter is allowed, provided that it a) scares the bejabbers out of the pilot and b) he or she vows not to get into that situation again. The death penalty is too strong a punishment for that type of transgression and that is what descending frequently entails. The objective here is to learn and fly again — not to experience the sudden stop!

All of the suggestions here also apply to daytime flight except that clouds are much easier to see and there is far less excuse for inadvertently getting into weather. A little discipline and some common sense will save dozens of lives and millions of dollars annually.