

Robinson's Rules

...and Other Safety Guidelines

story and photos by Guy R. Maher

It's Monday morning, 8:00 am sharp, and Frank Robinson has quietly taken the podium in front of 60 students. After he introduces himself (not that this is even necessary), he opens the lecture with, "Flying a light airplane or light helicopter is one of the most dangerous things you'll do. But, one good mitigating thing is that the pilot has control over his or her own fate, because over 90% of accidents are caused by the pilot."

As he proceeded with a discussion on accident rates, he stopped mid-sentence and asked those few students who were sipping coffee to remove those drinks from the room. It was certainly an appropriate request as there were two signs plastered on the wall at the front of the class which made it perfectly clear that no food or drinks were allowed.

This one simple event was, to me, a metaphor for why the 60 of us were there in the first place. If we wanted to fly Robinson helicopters safely, it would be by Frank's rules. This three and a half day course was to teach us the how and why of those rules. And, this is a good thing, as I know of no single person in the industry who takes his business more personally, and takes safety more seriously.

Well before the mid-1990s implementation of SFAR 73 to Part 61 of the Federal Aviation Regulations (US), which addresses specific training and experience requirements to fly and teach in Robinson helicopters, Frank Robinson had begun this safety course. Starting in 1982, the class was taught to 12 instructors once every month. In fact, its original name was the Flight Instructor Safety Course, and it was offered only to those who instructed in the R22.



With over 3,700 units produced since 1979, the R22 is the sales volume leader for light utility, training, and personal use.



A fleet of R22's and R44's await the 60 students who must complete a flight training session to get their PHPSC certificate.

■ (below) Pat Cox explains the cyclic... in detail.

(right) The Safety Course has helped reduce most R22 accidents to training "metal benders", and has provided for exceptional improvement in the fatal accident rate. *File Photo*

(bottom right) It is proven that the R22 can be a very safe and reliable helicopter when operated by Robinson's rules.



Now called the Robinson Helicopter Pilot Safety Course (RHPSC), it is offered twice a month to 60 students each session, but is typically sold out for four months in advance, so early booking is advisable. The RHPSC is required for most passenger carrying PIC and instructional operations in the R22 and R44, if they are insured by Pathfinder, the primary insurer of Robinson helicopters in the US. However, other insurance companies are now following Pathfinders' lead in requiring this course.

Unlike the typical factory training courses, or the type-specific training offered by specialty companies such as FlightSafety, the RHPSC is dedicated to the safety aspect of flying a Robinson, rather than being an initial or transition course for the R22 or R44. In fact, to register for the course, the applicant must be a rated helicopter pilot with at least three hours in either the R22 or R44.

The mix of students for this class was quite diverse, from new R22 and R44 owners, to recently licensed pilots, and those working on advanced ratings. Quite a few of the attendees were

working on their CFI certificates. The overwhelming majority of the participants had less than 300 hours total time.

Accident Causes in Robinsons

Following his opening statements, Frank Robinson began day one with a discussion on Robinson accident trends. Noteworthy items included the fact that with over 1,700 R44s having been sold over the past 12 years, the four-place helicopter has proven to be extremely reliable, or "almost perfect" as he put it. So, what's bringing them to peril? Simply put, the fact that it's fast, comfortable, and easy to fly. This leads many pilots to fly the ship at night or in bad weather (sometimes both) on cross country flights, as if it were a light airplane. It's the classic VFR into IMC scenario, and it has an 85% kill rate in general aviation.

The majority of R22 accidents are the "metal benders," indicative of the primary training role for this machine. Prior to the start of the safety course, 36% of the fatal accidents in an R22 were student solo flights, 21% were dual instruction flights, and a whopping 14% were ferry flights

from the Robinson factory.

The CFI safety program drastically lowered the training accidents. However, as more pilots became rated and more helicopters were delivered, there was an increase in recreational and "for hire" accidents. This factor is what prompted Robinson to open the safety course to all R22 and R44 pilots.

Before the course, the chief fatal accident causes were: 36% low rotor RPM/rotor stall, 14% weather, 14% trees and wires, 14% fuel exhaustion, 14% mechanical, and 7% mishandling of the controls. This 14% mechanical was a biggie in the very early years because of blade problems in 1980 and 1981. With the advent of the safety course, along with the excellent RPM governor that became mandatory in 1995, low rotor RPM causes dropped to 14% of the fatal accidents from the mid to late 90s. Low G pushovers, though, started to rear their ugly head, and totalled 7% of the fatalities. This was similar to the control mishandling issue. Robinson subsequently ramped up its efforts to deal with improper control use, mast



“Frank Robinson has remained steadfast in his dedication to safety and reliability.”



■ (top left) RHC service manager Pat Cox leads a group through the production facility – a very informative and confidence inspiring segment of the class.

(left) Chief instructor Tim Tucker leads a class of 60 students in the new training facility.

(opposite, left) The class and the aggressive flight session results in a far more informed, skilled, and safer Robinson pilot.

(opposite, right) The R44 is so reliable and easy to fly that their accident causes are similar to light fixed wing airplanes.

bumping, and related prevention and recovery practices.

Tops on the fatal causes list today, at 36%, are wire strikes. This, though, is very much an industry problem, not a Robinson-specific problem. Most of us were shocked to learn that a study on all wire strikes over a five-year period in the state of California, revealed that 85% of wire strikes occurred in good weather, 66% of the pilots had greater than 2,500 hours experience, and in 40% of those accidents, the pilot knew that the wires were there.

In 1996 and 1997, the Robinson fatal accident rate was less than one per 100,000 hours of flying. In 2001, there were 28 total NTSB recorded R22/R44 accidents, of which five were fatal. None of them were caused by aircraft failures, low rotor RPM, or low G pushovers. This was a clear indication that the course was working. Of the five fatalities, three were deemed weather-related, three were night-related, and one was a wire strike. Now, I can hear you thinking that this doesn't add up. It does when you

consider that one of those accidents happened in bad weather, at night, when the ship hit wires.

The top three causes for the 23 non-fatal accidents were practice autorotations, wire strikes, and dynamic rollovers. Accordingly, everything we would learn in class, or subsequently do in the helicopter itself, would be to deal with Robinson's safety concerns.

Getting In-Depth

Day one continued with Robinson chief instructor Tim Tucker at the helm. Tucker has amassed 18,000 hours, evenly divided between military and civilian flying. He purchased the very first production R22 back in 1979 when he was a dealer, and was employed by Robinson in 1982 when the safety course began. He worked at Robinson until the mid-80s, then became a private training contractor to the company. A Designated Pilot Examiner, consultant, accident investigator, and Robinson expert since day one, Tucker is clearly the man to lead the instruction.

He immediately jumped right into more

in-depth analysis of the things that Robinson pilots and instructors need to seriously consider. For example, he knew of no accidents that were as a result of an engine failure in the hover. Yet, there have been over 60 hovering accidents. The accidents were primarily due to hovering too low, and stumbling into a dynamic rollover situation. That's why they like to teach students to hover at five feet, instead of the lower two or three feet.

Next, we received a factory tour conducted by Robinson service manager Pat Cox. What struck me most during the tour, besides how fascinating it is to watch R22s and R44s being built, was observing their people. Heavily focused on their tasks, most workers didn't even know we were there. It was also impressive to see cut blade sections, structures, components, and finish work, not to mention how incredibly clean the production facility was.

After lunch, Tucker dug into helicopter theory and critical flight conditions. We covered low rotor RPM, rotor stalls, low G



most bumping, proper recognition and recovery techniques, and energy management.

Chief test pilot Doug Tompkins, a 20-year veteran with over 14,000 hours experience (11,000 of which are in Robinsons), finished out our first day in class with a discussion of helicopter theory, including settling with power.

Day two started off with us going deep into the POH. We were guided through each section with critical points being discussed. Tucker hit on performance and engine reliability, limitations, and the H/V diagram. We learned about the certification standards for Robinsons, why the limitations are what they are, and how to best apply this knowledge. This information was especially useful when completed with his discussion of emergency procedures. The day ended with Part 61 and 91 of the FARs, as related to the course and SFAR 73.

Flying the Robinson

Everyone who takes the course gets to fly in their choice of either an R22 or R44, with one of the factory instructors. In fact, it's a requirement of the course if you want the certificate of completion. This means that 60 people have to fly before they leave town. On day three, the flying begins. The classroom portion is only a half-day, but is given twice. I was scheduled to fly on Thursday afternoon and attend the afternoon class on Wednesday.

Pat Cox handles the class on day three.

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The room is chock full of parts, and the session is devoted to pre-flight inspections and systems. We see first hand where to look for those critical telltale signs that something is amiss. When one student had a question about the cyclic control, Cox darted out of the room and quickly came back with a complete cyclic assembly, easily answering the question with this handy visual aid. Talk about a home field advantage.

The Thursday class, which is also a half-day, is devoted to the instructors (although, it is still very informative to the non-CFIs), and features how to teach critical maneuvers. It has an overall course review, and then finishes with a closed book written exam. The flying continues throughout Thursday, and at 1pm it was my turn. Doug Tompkins would be my instructor, and what I learned in class would now be applied in our R22 (or R44 if so chosen).

We started with low rotor RPM recognition and recovery, followed by settling with power. He made sure we got deep into settling with power before initiating a recovery. Since I am a CFI, he required that I not only demonstrate the maneuvers, but also explain them and answer his questions as well. Once the


practice area work was done, we proceeded to a nearby airport where we began with normal and steep approaches. But, it wasn't long before we were into the autorotations, straight-ins, then from an OGE hover, and from just after takeoff. Doug covered them thoroughly, then, he took the controls, became the student, and initiated the dangerous stuff that students will do during autos and throttle chops, to see if I'd react as instructed in class. I did, and we were on our way back to the factory. With our flight completed, I received my certificate as well as the logbook endorsement required by SFAR 73. I'm sure that the smile on my face was as big as most of the other students.

Worth the Investment

I really didn't know what to expect when I signed up for the course. Sure, you count on professional presentations, nice classrooms, and meaningful handouts. But, when you consider that the course fee is only \$350 (R22) or \$450 (R44), and this includes the flight of at least an hour, I had to wonder what it would actually entail. In the end, like me, the many students I polled were extremely impressed, and agreed that it was worth

far more than the price of admission.

What struck me most was how up front the course was about Robinson accidents and their causes, including any aircraft problems. We watched videos of R22s crashing, even the fatals. We examined components, were shown how pilot actions can get you hurt or killed. We heard some pretty sad stories. Those four days could scare the crap out of you. However, the customary result is greater confidence in the stature of the aircraft, and getting turned into a far more informed, skilled, and safer Robinson pilot. After all, there is a significant difference between being an experienced pilot flying an R22, and an experienced R22 pilot.

With 25 years and 5,400 helicopters since the first R22 was delivered in 1979, Frank Robinson has remained steadfast in his dedication to safety and reliability. It's not been an easy road. And, while you can't regulate all the risk out of flying, Frank has clearly proven that by doing it his way, the risk is very acceptable and manageable. The positive impact of the RHPSC is quantum and undeniable. Of course, the bittersweet pill for Frank is that even he can't regulate out the stupidity and human factors gaffes that hurt or kill most pilots to begin with. 

It kinda spoils the surprise.



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