

BY MICHAEL M

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PHOTOGRAPHY E





Sikorsky S-64

# *Dancing with* **Lucille**

A big gal to get you out of tight spots

BY MICHAEL MAYA CHARLES

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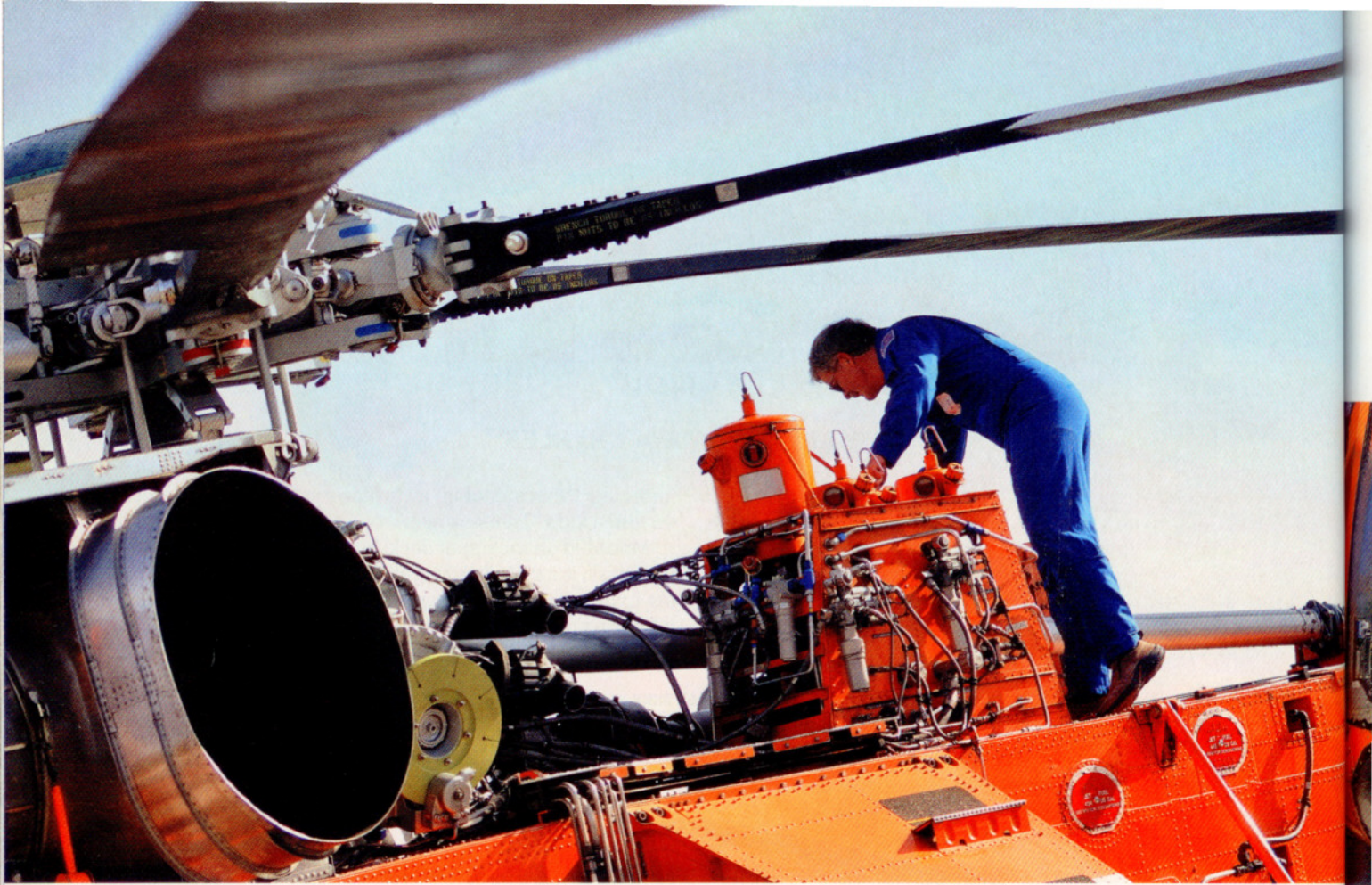
looks like the result of an awkward tryst between an erector set and a kid's "Transformers" toy.

Mounted on the upper deck, beneath the drooping 72-foot rotor disk, is a truly amazing array of industrial clutter, including hydraulic pumps, reservoirs, accumulators, an auxiliary power unit—and, of course, two big, honkin,' uncowed 4,500-horsepower Pratt & Whitney JFTD-12 jet engines.

PHOTOGRAPHY BY MIKE HOUSKA







Mounted seemingly wherever there was open space, the clutter reminds me that there really is no “inside” to a Crane; it’s just a closed box structure supporting the tail rotor on one end and the cockpit pod on the other. Midway between these two points is the hydraulic hook that lifts things, and a set of hard points where one bolts a 2,650-gallon tank for fire suppression.

Truly, the Sikorsky S-64 is one of the most intriguing things that flies.

When talking to people who work on, fly, or provide administrative office support for the Crane, you hear a universal fondness for the big bird, with common descriptions such as “she’s a tough old girl,” “it’s an awesome helicopter,” or phrases such as “purpose-built” and “ugly workhorse.” One older mechanic quietly told me, “I love this machine.” Many of these people have been dancing with this lady since the beginning, which for the civilian version was the early 1970s.

#### **Erickson**

When Jack Erickson bought his first Sikorsky Skycrane in 1972, he quickly appreciated the big machine’s ability to efficiently lift logs out of tight spots in the forest, thus sparing countless trees that

would have been cut down for truck and bulldozer access. Chief Pilot Bob Hawthorne’s personal record is lifting 800,000 pounds of western red cedar off a mountain on Vancouver Island—in an hour.

If you’re wondering why at times you hear this machine called “Skycrane” and “Aircrane,” it’s because Erickson Air-Crane renamed the type “Aircrane” when it bought the certificate from Sikorsky.

Over the years, Erickson’s Cranes have done amazing things, including fighting fires or lifting things in Italy, Australia, Malaysia, Greece, France, and Canada. They were instrumental in saving many homes in the Los Angeles fire in 2008. They’ve removed and replaced the Statue of Freedom from the Capitol dome in Washington, D.C., and placed the antenna structure on Toronto’s CN Tower, the tallest free-standing structure in North America at 1,815 feet. With light fuel, the Crane will nearly pick up its own 20,000-pound empty weight.

Each of Erickson’s Cranes has a name; in the fleet you’ll find such stalwarts as Ichabod (Crane), Incredible Hulk, Olga, Bubba, Goliath, and everybody’s favorite, Elvis. My date’s name is Lucille.

#### **Welcome aboard**

I climb up hefty metal rungs and make

my nest in the wide cockpit. In the right seat is my mentor for the day, Bob Hawthorne, chief pilot of Erickson subsidiary Canadian Air-Crane. He’s starting his eighteenth year of Crane flying, with 7,000 of his 18,000 hours in type.

Seated in the business end of this ungainly machine, the view is as generous as most helicopters—but in this one, you can even see the hook bay, down and aft, through plexiglass windows behind you. Immediately behind and below the cockpit is the aft pilot station; its purpose is to allow a third pilot to fly the big chopper while looking directly down on its load. This certainly improves not only his view but also his ability to finesse whatever is on the hook. The aft position has a hydraulic collective like those in the front cockpit, and an oddly diminutive fly-by-wire cyclic control, looking more like a PC joystick than something to control a macho helicopter. Oddly, there are no tail rotor pedals in this position; the pilot up front does the footwork for the aft pilot as he calls for it. “Give me 10 degrees left.” Thus, the aft pilot only flies the fine motor stuff while hovering over the job.

Throughout the cockpit, there are switches, circuit breakers, lights, knobs, levers, and wire bundles scattered everywhere, reminding me of a Cold War





The author checks the tangle of hydraulic reservoirs, accumulators, and lines on the upper deck before flight (far left). No attempt was made to streamline or cowl anything in the design. A Plexiglas bubble protects the pilot (above). Room with a view (left) allows the pilot to fly the ship for precision placement of its diverse loads.



Soviet submarine. Obviously, ergonomics hadn't been invented when this ship was launched in the early 1960s, after the U.S. military let a contract for a special-purpose, heavy-lift machine for the battlefield. The winning contender was the Sikorsky CH-54 Tarhe, which begat the civilian version, the S-64E Skycrane. Military CH-54s moved artillery, bulldozers, trucks, damaged aircraft—and even 90 very brave troops in an underslung pod—during the Vietnam War. Until 1993, Cranes were operated by the National Guard.

I spent a couple of days in ground school on the machine, smiling at the contrast between the ways things are designed on the Crane compared to the modern McDonnell Douglas MD-11 that I normally fly. But this machine has several innovations, including the early fly-by-wire system I mentioned in the aft position, and a helpful automatic flight control system (AFCS).

This is an all-hydraulic aircraft with six—count 'em, six—hydraulic systems, running such diverse things as the flight controls, cargo hoist, engine starters, grapple hook, landing gear kneeling struts, even the pond snorkel. There is no mechanical connection between the flight controls and the main rotors.

#### Clear!

With the before-start checklist complete, you start the APP, Sikorsky's name for the auxiliary power unit mounted on the upper deck. The APP runs the hydraulic pump, which is used to crank the huge jet engines. The high-pitched whine of the APP is familiar to anyone who has been around business jets or airliners. But when you light off the first jet engine, the resulting shriek encourages small animals and all pilots with any hearing left to abandon the area immediately.

Hawthorne released the rotor brake and the ship rocked noticeably as the six blades with two-foot chords began to rotate counterclockwise above our heads. When you look up into the rotor arc from the pilot seat, you notice a very odd picture: There are two tip path planes, about three inches apart. The S-64 didn't come from the factory that way; Erickson got FAA approval to run this unusual "split"

rotor system, where every other blade runs in a second, slightly different plane. They do this because it's a lot smoother, lifts more, and the helicopter is less likely to experience vertical bounce.

As the blades pick up speed, the crew chief, who was plugged into the side of the fuselage below my cockpit door, verifies that the droop stops have properly pulled. He also checks for leaks or other bad flight omens. None found, we clear him off; he pulls the headset plug and retreats to a hiding place behind a truck parked to my left, well versed on the maelstrom that we're about to unleash when we lift the Crane into the air.

Since we were parked in a rather confined place with expensive things (including a fuel truck) within striking distance, I asked Hawthorne to make the first takeoff. As he pulled the collective gently upward, the odd praying mantis leaped effortlessly to 200 feet.







"You have the aircraft," he said.

I took control of the beast and initially overcontrolled the roll axis, causing a slight pilot-induced oscillation; the cyclic stick is longer than in the smaller helicopters I fly, which precludes you from stabilizing your forearm on the inside of your thigh. But I quickly learned that I could steady my hand and arm by pressing gently on the small shelf at the base of the cyclic stick. No more PIO.

I immediately liked the solid mass and stability of the ship, although it shakes rather enthusiastically. That, I was told, is the "Sikorsky shake," an endearing trait of all Cranes. On smaller helicopters, if you felt that much vibration, you'd be landing immediately to inspect for missing parts.

"Let's head east," Hawthorne suggested, and I gently coaxed the rotor disk forward. The ship translated easily

Bringing it to a hover at about a thousand feet, the Crane again felt solid and capable. Even with full fuel, we were still probably 11,000 pounds below the ship's 42,000-pound gross weight. To demonstrate the machine's awesome climb capability, Hawthorne suggested that I pull the collective to a climb power setting of 68 percent torque and hold 60 knots. A unique snapping sound could be heard as the big blades clawed upward at 3,000 to 3,500 fpm—and fuel burn increased to about 700 gph! I've flown a lot of jets that won't climb that well.

"Wow, let's go hook this thing onto something and do some work!" I mock-pleaded. But today's flight was just for me; there was no work to be done other than to introduce me to this working girl.

After some shameless, smiling steep turns and speed transitions, I headed

your behind, and makes divots in the asphalt at about 14 degrees nose up.

At my request, Hawthorne simulated an engine failure on my next approach to demonstrate what a non-event single-engine flying was—especially at this "light" weight. The "running" engine picked up the load without breaking a sweat, requiring just 50 to 55 percent torque for the approach and landing.

#### A rare bird

This is a rare bird, with only 105 of the type produced. Not only does Erickson operate the largest fleet of Cranes—about 17 of the 34 remaining in the fleet—it also owns the S-64 type certificate, purchased from Sikorsky in 1992. Being the manufacturer allows Erickson to rebuild ships from ex-military hulks, among other things, resulting in an



The Sikorsky S-64 is a hugely capable machine whether slinging a grapple full of logs or dropping retardant on a wildland fire (opposite page). One of the cranes built for the Corpo Forestale dello Stato, the Italian State Forestry Corps (far left). A pond snorkle dangles below the ship—it allows the 2,650-gallon tank to refill from hover in 45 seconds.

into forward flight and we were quickly indicating 80 to 90 knots, again with little effort. Hawthorne told me that they fly the ship cross-country at about 100 knots, burning just more than 500 gallons per hour. That makes for short flights, with "just" 1,351 gallons of fuel available. "After two hours, you want to see your destination landing zone in the windscreen," he said, "At 2:10, you want that landing zone in your chin bubble."

As he watched me make peace with the big ship, Hawthorne commented, "This machine talks to me more than anything I've ever flown." I sensed that, and immediately felt confidence in the machine, discovering that in spite of its size, the ship loves to be flown smoothly and gently, trimmed often, and prefers to be asked rather than commanded to do things. For such a big girl, she's a very stable, very pleasant, instantly familiar aircraft to fly.

back toward the Medford, Oregon, airport for some approaches; I was aware that we were burning a lot of Erickson's kerosene.

My first approach to the displaced threshold of the 150-foot-wide Runway 23 was a different picture than I've ever seen in a helicopter. Because of our aft fuel load, with a nearly full auxiliary tank, the attitude was unusually nose-high on final. I landed across the runway to accommodate ATC's request to play nicely with the other aircraft in the pattern, taking extra care to get the mains (way back there) on the pavement before touching down and lowering the nosewheel.

On my first takeoff, Hawthorne coached me to lift the collective until the nose was at about a 10-degree pitch attitude, then to hold that attitude with forward cyclic pressure while lifting the collective for takeoff. This prevents striking the tailskid, which sits 58 feet behind

increasing number of flying Cranes as time goes on. The company overhauls major parts for itself and the handful of other operators, and it can build parts from scratch. Erickson plans to put the ship back into production one day, with lighter, more efficient rotor blades; more modern (and less thirsty) engines; and an updated glass cockpit similar to that in four ships that Erickson built for the Italian Forestry Service a few years ago.

When we came back to land in the same parking lot we left earlier, it didn't look nearly as tight as before. I had a blast dancing with Lucille; I only wished I could fly her with a tank on her flank or something on the hook. There are only a handful of pilots in the world who fly this machine, and they are some lucky hombres.

ACPA

*Michael Maya Charles is a retired captain on a national airline.*