



Changes Expand U.S. Helicopter Operations Under Instrument Flight Rules

Copter ILS approaches to 100 feet (30.5 meters), satellite-based helicopter approaches and low-altitude routes, and an air-ambulance exemption from weather reporting requirements are among the changes.

—
Joel S. Harris
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A Sikorsky S-76B twin-turbine helicopter departed recently for Windsor Locks/Bradley International airport, Connecticut, U.S., from Bridgeport, Connecticut. The weather at Bridgeport was marginal for visual flight rules (VFR), and the pilots filed an instrument flight rules (IFR) flight plan. As they approached Bradley, the pilots learned that the Bradley automatic terminal information system (ATIS) was reporting much worse weather than had been forecast. According to the report, Bradley was 100 feet (30.5 meters) overcast with a runway visual range (RVR) of 1,200 feet (366 meters).

In the past, this weather would have required diverting to an alternate airport. But the airport has a newly certified Copter Instrument Landing System (ILS) 058 Approach to a 100-foot decision height (DH) (Figure 1, page 2), and the pilots elected to fly the approach. Said United Technologies Capt. Jim Church: "We used the autopilot for the approach. We engaged the 'Decel' mode to automatically decelerate during the final approach to an airspeed of 70 knots at 200 feet [61 meters].

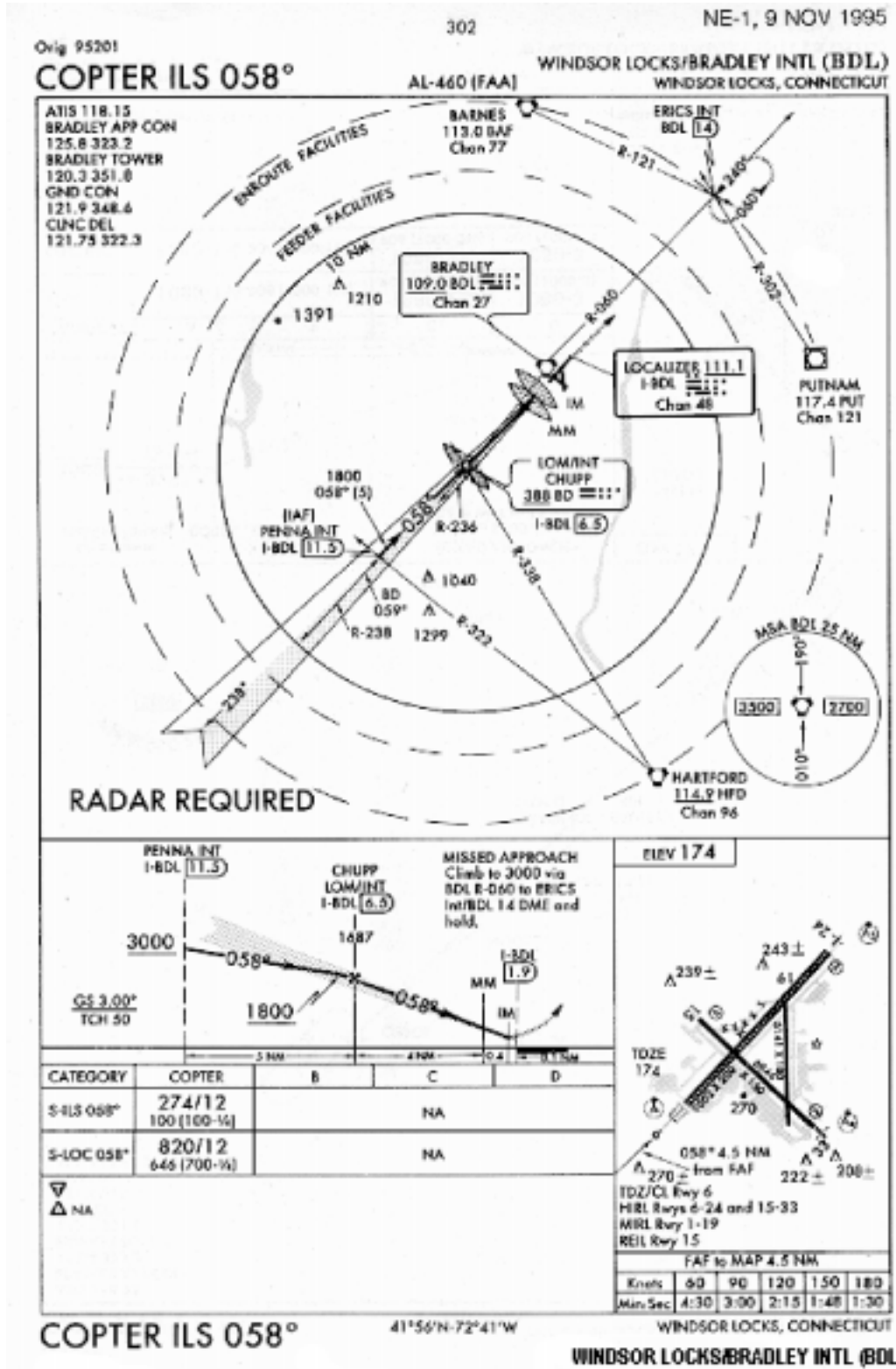
"Our company procedures require a callout of 'approaching minimums' at 100 feet above DH. At the time I made the call, we still did not have a visual on the runway environment. Then as we approached 100 feet I saw the lights. We let the autopilot continue the approach and autolevel at 50 feet [15.3 meters] above the runway before we decoupled the flight director. The

equipment worked great and we landed safely at a location that otherwise would have been denied to us."¹

Helicopters operating under IFR may reduce the required visibility minimum to one-half the published Category A minimum for standard instrument approach procedures (IAP), which is usually 200 feet DH and one-half mile visibility. (Each aircraft operating in U.S. airspace is designated Category A, B, C or D, depending on its weight and other factors.) U.S. terminal instrument procedures (TERPS) describe the requirements: "The minimum visibility may be one-half the computed straight-in CAT [category] A fixed-wing values ... but not less than one-fourth mile/1,200 [feet (366 meters)] RVR."² U.S. Federal Aviation Regulations (FARs) Part 97 also states that "in no case may [visibility] be reduced to less than one-quarter mile [0.4 kilometers] or 1,200 feet RVR." In either description, the intention is clear: Because of their unique maneuvering capability, helicopters can operate safely with lower minimums for instrument approaches than airplanes.

A lesser-known provision of TERPS makes an allowance for helicopters to use a minimum DH for ILS Category I approaches of 100 feet above the touchdown zone elevation (TDZE).³ This provision in TERPS was the subject of extensive discussion at a U.S. Federal Aviation Administration

Copter ILS 058° Approach



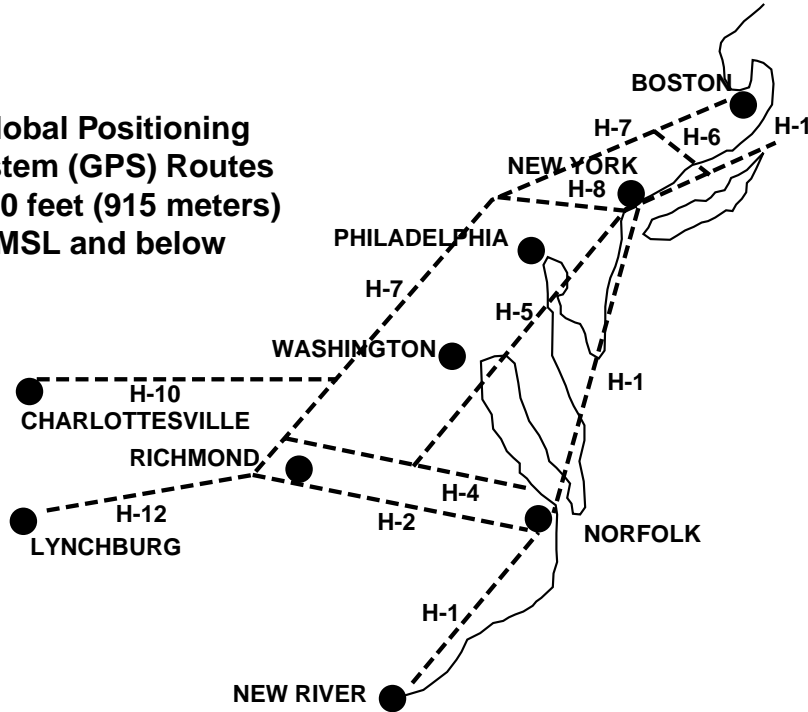
This chart is not to be used for navigation.

Source: U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), National Ocean Service (NOS)

Figure 1

Helicopter Instrument Flight Rules (IFR) Low-altitude Routes in Eastern United States

**Global Positioning
System (GPS) Routes
3,000 feet (915 meters)
MSL and below**



MSL: Mean sea level.

Source: Joel S. Harris

Figure 2

(FAA)-sponsored 1993 workshop, “Extremely Low Visibility Instrument Rotorcraft Approaches (ELVIRA).”⁴

The FAA interpreted this TERPS provision to mean that a separate Copter approach could be issued for an existing ILS approach with a minimum of 100 feet DH and 1,200 feet RVR. Thus, the FAA’s eastern region all-weather operations project manager, William Morris, published five Copter ILS approaches. Said Morris: “In a joint effort between industry and government, the FAA was able to help provide a better service for end users. So far, the approaches are working out fine and New York TRACON [Terminal Radar Approach Control] really likes having them. There are currently plans in the works for the certification of several other Copter ILS approaches within the Eastern Region.”⁵

Another example of the usefulness of these approaches was provided by Philip Morris Chief Pilot William Rio: “In July, we were flying a Sikorsky S-76 from Teterboro, New Jersey [U.S.] to Westhampton Beach, New York [U.S.]. Westhampton was reporting a ceiling at 250 feet [76.3 meters] and one-mile [1.6 kilometers] visibility with calm winds. We executed the Copter ILS Runway 24 Approach. A combination of sun and ground fog restricted flight visibility, and if we had not been able to descend to 100 feet we never would have been able to land. This was the first time either of us had flown the approach and we both agree it made all the difference in being able to land at Westhampton.”⁶

Although descent rates at various airspeeds are charted for the approach, according to TERPS (Paragraph 1106), the criteria for Copter approaches “are based on the unique maneuvering capability of the helicopter at airspeeds not exceeding 90 knots.” The Copter ILS 24 Approach at Westhampton overlays an existing ILS approach to Runway 24 that has a Category A decision height of 200 feet.

Three other Copter ILS approaches, recently published, with minimums of 100 feet DH and 1,200 feet RVR, are:

- Copter ILS/DME Runway 22L — Newark, New Jersey;
- Copter ILS/DME Runway 4L — Newark; and,
- Copter ILS/DME Runway 22 — LaGuardia, New York, New York.

Another result of ELVIRA is the implementation of a helicopter IFR low-altitude route structure from Boston, Massachusetts, U.S., to New River, North Carolina, U.S. (Figure 2). These routes will be exclusively for use by helicopters equipped with global positioning system (GPS) navigation, and the routes will provide maximum altitudes of 3,000 feet (915 meters) mean sea level (MSL).

Tom Salat, chairman of the Helicopter Association International (HAI) Flight Operations Committee, and a captain at ROP

Aviation, said that the routes are operational on a “VFR only” test basis. At approximately the beginning of March 1996, the route structure will be certified for helicopter IFR use.

Salat said that such a route structure offered many advantages. “The routes allow helicopters to operate in the efficiency envelope they were designed for at lower altitudes. These routes keep helicopters away from the complexity and volume associated with Class B (terminal control area) airspace. They also allow flight low enough to avoid many icing problems, but high enough to reduce noise complaints, which have become a bane to the industry. The end result is that they will make IFR more practical for helicopters.”⁷

Because a leading cause of fatal turbine helicopter accidents is operating VFR in instrument meteorological conditions (IMC),⁸ it is important to make IFR “more practical for helicopters.” Salat also said that these routes will eventually tie into GPS Copter approaches and standard instrument departures (SIDs) at heliports located along the routes.

At the 1993 ELVIRA workshop, Steve Hickok, then with the FAA, said that within a year there would be helicopter GPS approaches in the United States. An FAA test program has certified four *private* nonprecision Copter GPS approaches, with a fifth approach nearly completed. The data gathered by this test program were used to write separate Copter TERPS criteria for GPS approaches. According to Hickok, now president of Satellite Technology Implementation (STI), in Manassas, Virginia, U.S., “these new TERPS criteria will reduce the cleared airspace requirements for Copter GPS approaches by about one-half. This will often result in lower MDAs [minimum descent altitudes] than are possible under the present airplane criteria.”

Hickok said that the FAA had distributed the new TERPS criteria for industry review, with the final order establishing the new criteria expected to be issued in February 1996. “For the first time true IFR operations heliport-to-heliport are a possibility,” Hickok said.⁹

A well-known example of the efficacy of helicopter GPS approaches is the Erlanger Medical Center in Chattanooga, Tennessee, U.S. During one year of operations, using one helicopter and one GPS approach, 35 patient lives were saved. Recently, Erlanger has been able to add a second private Copter GPS approach at Jasper, Tennessee. Said Erlanger transportation director Danny Norman: “There are several hospitals we service in the Sequatchie Valley, which is separated from Chattanooga by a ridge line. Until the GPS approach at Jasper was approved, we were limited in providing air medical services to those hospitals. If even the top of the ridge was IMC, we couldn’t go. Now we can go IFR over the ridge and use the Copter GPS to get into the valley and provide service to those hospitals.”¹⁰

In another development resulting at least in part from the ELVIRA workshop, the FAA recently announced a partial

grant of exemption to some FARs Part 135 weather reporting requirements for air ambulance operators. In a July 1995 petition to the FAA, HAI and the Association of Air Medical Services (AAMS) requested an exemption from Part 135 requirements that weather observations used by pilots for IFR operations be taken by an “approved source.” This rule prohibits pilots from approaching or departing under IFR at more than 900 airports and heliports in the U.S. airspace system that have approved instrument approaches but do not have the required weather reporting facilities.

In their petition, HAI and AAMS argued that this rule encouraged emergency medical service (EMS) operators to fly under VFR in marginal weather conditions. They maintained that it is safer to file and fly IFR rather than to continue under VFR in marginal visual meteorological conditions (VMC). They cited the excellent safety record of Canadian air ambulance operations as evidence; Transport Canada regulations allow commercial operators to perform IFR takeoffs and approaches based on area forecasts only. A summary of the petition was published in the *Federal Register* for public comment. No comments were received.

In a letter dated Sept. 29, 1995, the FAA issued a partial grant of exemption from Part 135.213(a) to the petitioners. The letter permits IFR departures at airports and heliports that do not have an approved weather reporting source, subject to certain conditions and limits. The FAA refused the petitioners’ request for relief from the requirement for weather reporting to conduct instrument approaches, and said that the petitioners had not demonstrated “how an equivalent level of safety could be maintained under an exemption that would permit performing IFR approaches at airports and heliports that do not have an approved weather reporting source.”

The letter noted that EMS operators are not prohibited from operating under FARs Part 91 to airports or heliports where a patient will be picked up, and that pilots operating under Part 91 may conduct approaches to locations not served by an approved weather reporting source.

In granting exemption from the weather reporting requirements for IFR departures, the FAA listed the following conditions and limitations:

- Use of the exemption is authorized only at airports or heliports at which an approved weather source is not available;
- Departures under the exemption are authorized only for flights on which there is a patient who has a medical condition that requires transportation by EMS helicopter;
- Each pilot conducting operations under the exemption must be trained in accordance with an approved training program that includes a two-hour block covering methods for determining visibility and ceiling by the pilot;

- Each helicopter operated under the exemption must be certified to conduct IFR operations under Part 135 and be equipped with an approved and operable radar altimeter and weather radar or lightning detection equipment; and,
- IFR departures are authorized only after the PIC [pilot-in-command] of the flight determines that the weather conditions at the departure point are at or above VFR minimums as determined by the PIC's own observation.

Operators were initially baffled by the last provision, requiring VFR weather minimums for an IFR departure. But, in a reply to HAI President Frank Jensen's request for clarification, David Harrington, manager of the FAA Air Transportation Division, said that the VFR minimums referred to in the exemption are those in Part 135. Those minimums are one-half mile (0.8 kilometer) during the day or one mile (1.6 kilometers) at night.¹¹

Because IFR takeoff minimums under Part 135 are one-half mile, this restriction was not judged to be too severe by many operators.

Keith McCutcheon, chief pilot at Indianapolis (Indiana, U.S.) Heliport Corporation (IHC), said that the exemption is an excellent step toward safety. According to McCutcheon, IHC plans to take advantage of the exemption as soon as it can meet the training requirements and have its Part 135 Operations Specifications amended as required.

Under the exemption, he envisioned hospital-to-hospital IFR patient transport. "We would depart on an IFR flight plan under Part 91 and arrive at an airport in the vicinity of the hospital where the patient is," McCutcheon said. "Depending on weather conditions, the pilot may opt to have the patient transported by ground ambulance to meet the helicopter at the airport. Or, if the local weather is above our VFR minimums, we would fly a predesignated VFR GPS route from the airport to the hospital and pick up the patient there.

"In either case, if the weather meets the requirements of the exemption, an IFR departure could be made. The Part 135 requirement for weather reporting at IFR destinations is not a problem, because our programs are located in large metropolitan areas that have an approved weather source. By doing this, our pilots can avoid the dangers of 'scud running' and use the structured and safer IFR option."¹²◆

References

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Joel S. Harris holds an airline transport pilot certificate and a flight instructor certificate with ratings in both helicopters and airplanes. He is an FAA-designated pilot proficiency examiner, FARs Part 135 check airman and safety counselor. He is a program manager at FlightSafety International's West Palm Beach Learning Center in Florida, U.S., and has given over 10,000 hours of flight, simulator and ground school training to professional helicopter pilots. Harris is a frequent author on the subject of helicopter safety.



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