Cancelled 10-19-76

TAD 444.6

AC NO: 91-42

DATE: 6/17/75

ADVISORY CIRCULAR

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

SUBJECT: HAZARDS OF ROTATING PROPELLERS

1. PURPOSE. The purpose of this advisory circular is to provide information on propeller accidents and to offer suggestions to reduce the frequency of their occurrence.

2. BACKGROUND. A report in the Civil Aeronautics Journal dated May 1, 1941, contained the following information. "Ten fatal and thirty-one serious propeller accidents were reported during 1939 and 1940." Averaged over this two-year period, these 41 accidents show a frequency of approximately one every 18 days. Accidents involved with propellers for the years 1972, 1973, and 1974 totalled 62. Of these 62 accidents, 31 proved to be fatal. For this three-year period, the average was one propeller accident every 17.6 days. In relation to the 12,850 general aviation accidents for this three-year period, the propeller accidents are only .0048% of the total. However, with proper education and discipline, this figure could be reduced to zero.

3. GENERAL. It is particularly tragic that propeller accidents have included bystanders, passengers, and children among the injured persons. Propeller accidents differ from other aircraft accidents in that they usually result in fatal or serious injury. This is due to the fact that a propeller rotating under power, even at slow idling speed, has sufficient force to inflict serious injury. It should be remembered that a rotating propeller under power is a potent force which can be extremely dangerous and should be treated with all due caution.

4. NONFLIGHT CREW PERSONNEL. Persons directly involved with enplaning or deplaning passengers and aircraft servicing should be instructed as to their specific duties through proper training, with emphasis placed on the dangers of rotating propellers. Ramp attendants and passenger handling personnel should be made aware of the proper procedures and methods of directing passengers to and from parked aircraft.

Initiated by: AFS-830

a. When the possibility of passengers wandering on the ramp exists, physical barriers should be provided, such as rope-stanchions from the aircraft to the terminal doors.

b. Airport management personnel should be on the alert for spectators or unauthorized persons milling around on the ramps or among parked aircraft, and be especially alert to unwanted movement of propellers by anyone.

5. AIRCRAFT SERVICE PERSONNEL. Persons directly involved with aircraft service are most vulnerable to injuries by propellers. Working around aircraft places them in the most likely position for possible propeller accidents.

a. Treat all propellers as though the ignition switches were "on."

b. Before moving a propeller, always check to be sure the ignition switches are in the "off" position, and the throttle and mixture control levers are in the "closed" and "idle cut-off" positions.

c. Always stand clear of the propeller blade path, especially when moving the propeller. Particular caution should be practiced around warm engines.

6. FLIGHT PERSONNEL AND FLIGHT INSTRUCTORS. Prior to starting an engine, flight personnel should make certain that all personnel are clear of the propeller.

a. Boarding or deplaning of passengers with an engine running should only be allowed under the strictest of supervision. The pilot in command should have knowledge that ground attendants are fully trained in their specific duties when boarding or deplaning passengers while an engine is running.

b. Unlike a helicopter, the engine of a fixed wing aircraft should be shut down while boarding or deplaning passengers. This is the simplest method of avoiding accidents.

c. Flight instructors and ground school instructors should provide their students with a thorough knowledge of rotating propeller dangers. Safety through education is the best and most positive means available for reducing potential accidents from rotating propellers.

d. The proper use of the aircraft checklist should be taught to all students. The pre-start portion of the checklist should include an item to make sure the propeller is clear.

7. SUMMARY

a. In reviewing propeller accidents, the most impressive fact is that every one of them was preventable. Each accident represents at least one person killed or severely injured, and the casualty list includes not only airmen and passengers, but a high percentage of innocent bystanders - men, women, and children. The danger of a rotating propeller is universally recognized, and regulations have been carefully prepared to minimize this hazard.

b. The propeller is difficult to see when in operation, and the nonprofessional public is often not aware of its danger. Even personnel familiar with the danger of a turning propeller are likely to forget it.

c. There is an obligation on the part of the pilot to ensure that his passengers arrive and depart the vicinity of his airplance safely, whether this is accomplished by stopping his engine completely at the time of loading and unloading, or by providing a definite means of keeping them clear of the propeller if it is left in motion.

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