

Log 1679

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: June 14, 1984

Forwarded to:

Honorable Donald D. Engen
Administrator
Federal Aviation Administration
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-84-58 through -60

On May 1, 1984, a Sikorsky S-76A helicopter, N763AL, was forced to make an emergency water landing in the Gulf of Mexico. The helicopter, with 10 passengers and a crew of 2 onboard, was inbound to shore from an oil rig when the pilot reported a loud bang, followed by a loss of engine power, a loss of electrical power, and smoke in the cockpit/cabin area. Despite these conditions, the pilot executed a successful autorotational landing. All passengers and the copilot successfully escaped from the helicopter before it rolled over. The pilot escaped after it rolled over and also was able to retrieve the liferaft for use by the survivors. The passengers and crew, none of whom was injured, were rescued later by boat. The helicopter was subsequently recovered and transported to New Iberia, Louisiana, where the investigation is continuing.

Preliminary examination of the engine compartments revealed that the Detroit Diesel Allison 250-C30 engine installed in the No. 1 position had an uncontained failure in the area of the two-stage gas producer turbine. Pieces of turbine wheel which had exited through the engine casing severed the No. 1 section of the tail rotor drive shaft, cut several electrical wiring bundles, and started a fire. There was also evidence of the fire and smoke progressing into the No. 2 engine compartment and being ingested by the No. 2 engine during the autorotational descent. Review of the engine maintenance logs indicated that the No. 1 engine had recently been overhauled and was installed in the helicopter about 16 operating hours before the accident.

Review of the S-76A service history revealed that this was the fourth known turbine failure of a Detroit Diesel Allison 250-C30 engine in the past 18 months. Although this occurrence was the most serious, the other three also resulted in loss of electrical power, smoke, fire, and emergency landings which resulted in substantial damage to the helicopters. The Safety Board is concerned that this type of engine failure mode can result in a catastrophic accident and that appropriate action should be taken immediately to minimize the possibility of another occurrence. There are over 200 S-76A helicopters with the Allison 250-C30 engine in service throughout the world.

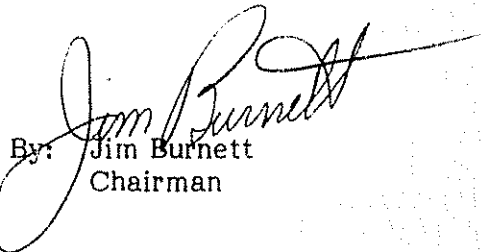
Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue an Airworthiness Directive to require the installation of a containment shield or deflector on the engine or in the engine compartments of the Sikorsky S-76A helicopter equipped with Allison 250-C30 engines on an urgent basis after the device(s) is available. Urge the manufacturer to accelerate design and fabrication of the device(s) to provide protection from debris resulting from turbine failure for the No. 1 section of tail rotor driveshaft, the electrical wiring, the adjacent engine, and the fuel and hydraulic system components. (Class II, Priority Action) (A-84-58)

Review and evaluate the Detroit Diesel Allison 250-C30 engine certification data to assure that the engine complies with the requirements of 14 CFR Sections 33.75 (Safety Analysis) and 29.903 (Engines) regarding turbine rotor structural design, and take appropriate action if the safety analysis and engine design do not meet the requirements. (Class II, Priority Action) (A-84-59)

Review the engine compartment designs of all certificated multiengine helicopters with regard to the probability that an uncontained engine failure will result in catastrophic damage to drive train, electrical, and/or fuel and hydraulic system components and require appropriate design changes if warranted. (Class III, Longer Term Action) (A-84-60)

BURNETT, Chairman, GOLDMAN, BURSLEY, and GROSE, Members, concurred in these recommendations.


By: Jim Burnett
Chairman