

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: April 22, 1975

Forwarded to:
Dr. James C. Fletcher
Administrator
National Aeronautics and Space
Administration
Washington, D. C. 20546

SAFETY RECOMMENDATION(S)

A-75-16

The National Transportation Safety Board has issued a Special Study, "Turbine Engine Rotor Disk Failures." Forty-one case histories of rotor disk failures which occurred during the period 1962 through early 1973 were analyzed and studied. The study revealed that engine disk failures have been, and will continue to be, a problem of the jet engine with its high energy internal rotating components.

One large aircraft manufacturer has concluded, from its study of 50 disk failures and from data developed by an engine manufacturer regarding fragment energies, that most disk failures investigated would have been contained if engine cases had been stressed to contain at least three blades and their included disk serrations, rather than one blade, as required by current Federal Aviation Regulations.

If the above achievement could be implemented by the engine manufacturers for present and future generation jet engines, the hazard potential associated with disk failures would be reduced.

The Safety Board considers the National Aeronautics and Space Administration's rotor disk failure containment research program a logical step toward developing an effective rotor disk failure containment system. In addition, the Safety Board believes that containment of the three blades and their included disk serrations should be required, and a goal of total disk containment should be pursued.

Accordingly, the National Transportation Safety Board recommends that the National Aeronautics and Space Administration:

1425A

AAS-74-4

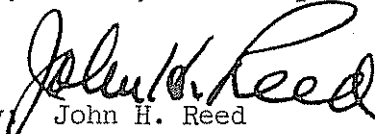
Dr. James C. Fletcher

- 2 -

Provide, as soon as possible, from the Rotor Burst Protection Program, technological guidelines for use by the Federal Aviation Administration in establishing a requirement to contain three rotor blades and their included disk serrations or fragments.

We would appreciate being advised of any action you might take as a result of this Safety Recommendation.

REED, Chairman, McADAMS, BURGESS, and HALEY, Members, concurred in the above recommendation. THAYER, Member, did not participate.


By John H. Reed
Chairman

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