U.S. Department of Transportation
Federal Aviation Administration

Subject:	INFORMATION: Ram Air Turbine (RAT) Approval	Date:	January 2, 2001
From:	Manager, Transport Airplane Directorate, ANM-100	Reply to Attn. of:	00-112-22 Mahinder Wahi (425) 227-2142
To:	See All ACO Distribution List		

The purpose of this memorandum is to clarify Federal Aviation Administration (FAA) certification policy with respect to Ram Air Turbine (RAT) installations on transport category airplanes. A RAT is typically a slip stream air driven hydraulic pump that is normally stowed and can be deployed to provide emergency hydraulic power to control the airplane in the event of hydraulic system pressure loss, such as due to an all engine failure. RAT's have been added to airplane designs that otherwise could not be shown to comply with the provisions of § 25.671(d), which requires that the airplane be controllable when all engines fail.

One concern about RAT installations is that many RATs installed to date contain a high energy rotor(s)that can pose a threat to the airplane due to a rotor hub or blade failure. The wording of § 25.1461, "**Equipment containing high energy rotors**," which specifies that high energy rotors must be contained or located so that their failure would not create a hazard, could be interpreted as being applicable to a RAT. However, the original intent of this regulation, as stated in the notice and preamble to Amendment 25-41, was not clear as to whether it was intended to apply to equipment that is only operated in an emergency. Compliance with § 25.1461 has not been required for RAT installations in recent transport airplane certification programs based on the assumption that the RAT would only be deployed in an emergency. Instead, the safety analysis requirements of § 25.1309 have been used by applicants to address system failures involving the RAT.

The Transport Airplane Directorate has re-examined whether § 25.1461 should be applied to RATs that are deployed for emergency use (i.e. following a failure) or infrequently (e.g. in-flight maintenance check), and has determined that the past certification practice of not applying the requirements of that regulation to such RAT installations was appropriate and should be continued. However, if a RAT is intended to be used on a frequent basis in normal operation, then the requirements of § 25.1461 should be applied to the RAT. The basis for determining the applicability of § 25.1461 to equipment used frequently in normal operation is found in the preamble to Amendment 25-41 that added § 25.1461. The preamble lists examples of the type of equipment that would be addressed by the new regulation(e.g. engine starters and cooling fans). These equipment examples can be generally characterized as equipment that is used frequently in normal operation (e.g. when no failures have occurred). Section 25.1461 provides specific risk criteria, which address hazards associated with equipment containing high energy rotors that is used frequently in normal operations.

The safety analysis requirements of § 25.1309 apply to the RAT. RATs are not normally deployed inflight for non-emergency reasons. However, if inflight deployments of the RAT are allowed as functional checks, the frequency of those deployments should be included in the § 25.1309 analysis and appropriate airplane flight manual procedures/limitations would need to be developed to support that analysis.

Please note that a recent application of § 25.905, "**Propellers**," to a RAT installation was not appropriate. A RAT neither propels the airplane nor receives a part 35 approval and, therefore, is not a propeller.

The general policy stated in this document is not intended to establish a binding norm; it does not constitute a new regulation and the FAA would not apply or rely upon it as a regulation. The FAA Aircraft Certification Offices (ACO) that certify transport category airplanes with RATs installed should generally attempt to follow this policy, when appropriate; but in determining compliance with certification standards, each ACO has the discretion not to apply these guidelines where it determines that they are inappropriate. Deviations from this policy must be coordinated with the Transport Airplane Directorate via issue paper to ensure standardization. Applicants should expect that the certificating officials will consider this information when making findings of compliance relevant to new certificate actions. Applicants also may consider the material contained in this policy statement as supplemental to that currently contained in Advisory Circular "Certification of Transport Airplane Mechanical Systems", AC 25-22. Also, as with all advisory material, this statement of policy identifies one means, but not the only means, of compliance.

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