Turbine Design Review Text

A three-volume publication covering the theoretical, design, and performance aspects of turbines has been written as an outgrowth of an in-house graduate course at the Lewis Research Center.

NASA has an interest in turbines for many applications. Airbreathing turbine engines provide jet and turboshaft propulsion, as well as auxiliary power for aircraft. Propellant-driven turbines provide rocket propulsion and auxiliary power for spacecraft. Closed-cycle turbine engines using inert gases, organic fluids, and metal fluids have been studied for providing long-duration electric power for spacecraft. Other applications of current interest for turbine engines include land-vehicle propulsion power for cars, trucks, buses, trains, etc., and ground-based electrical power.

The first of the three volumes covers thermodynamic and fluid-dynamic concepts, fundamental turbine concepts, and velocity diagram design. The second volume covers turbine blade aerodynamic design and turbine energy losses. The third volume addresses supersonic turbines, radial-inflow turbines, turbine cooling, and aerodynamic performance testing.

These publications can serve as a foundation for an introductory turbine course, a means for self-study, or a reference for selected topics.

Notes:
1. These texts have been published as the following reports:
   - NASA SP-290 (N72-26685), Turbine Design and Application, Volume I
   - NASA SP-290 (N74-33476), Turbine Design and Application, Volume II
   - NASA SP-290 (N75-24741), Turbine Design and Application, Volume III

   Copies may be obtained at cost from:
   - Aerospace Research Applications Center
   - Indiana University
   - 400 East Seventh Street
   - Bloomington, Indiana 47401
   - Telephone: 812-337-7833
   - Reference: B75-10287

2. Specific technical questions may be directed to:
   - Technology Utilization Officer
   - Lewis Research Center
   - 21000 Brookpark Road
   - Cleveland, Ohio 44135
   - Reference: B75-10287

Source: Lewis Research Center
(LEW-12560)