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Aviation Week & Space Technology
Pen and Sword

Because of the important national defense contribution of large, non-fighter aircraft, rapidly increasing fuel costs and increasing dependence on imported oil have triggered significant interest in increased aircraft engine efficiency by the U.S. Air Force. To help address this need, the Air Force asked the National Research Council (NRC) to examine and assess technical options for improving engine efficiency of all large non-fighter aircraft under Air Force command. This report presents a review of current Air Force fuel consumption patterns; an analysis of previous programs designed to replace aircraft engines; an examination of proposed engine modifications; an assessment of the potential impact of alternative fuels and engine science and technology programs,

and an analysis of costs and funding requirements.

La Lettre Hebdomadaire Elsevier

This book comprises research studies of novel work on combustion for sustainable energy development. It offers an insight into a few viable novel technologies for improved, efficient and sustainable utilization of combustion-based energy production using both fossil and bio fuels. Special emphasis is placed on micro-scale combustion systems that offer new challenges and opportunities. The book is divided into five sections, with chapters from 3-4 leading experts forming the core of each section. The book should prove useful to a variety of readers, including students, researchers, and professionals.

Interavia Springer Nature

Aircraft Leasing and FinancingElsevier

ASME Technical Papers Springer Nature

Aircraft Financing and Leasing: Tools for Success in Aircraft Acquisition and Management provides researchers, industry professionals and students with a thorough overview of the skills necessary for navigating this dynamic field. The book details the industry ' s foundational concepts, including aviation law and regulation, airline credit analysis, maintenance reserves, insurance, transaction cost modeling, risk management tools, such as fuel hedging, and the art of lease negotiations. Different types of aircraft are explored, highlighting their purposes, as well as when and why airline operators choose specific

models over others. In addition, the book also covers important factors, such as maintenance reserve development, modeling financial returns for leased aircraft, and appraising aircraft values. Most chapters feature detailed case studies, applying concepts to actual industry circumstances. Users will find this an ideal resource for practitioners or as an outstanding reference for senior undergraduate and graduate students. Presents the foundations of aircraft leasing and financing, including aviation law and regulation, airline credit analysis, maintenance reserves, insurance, transaction cost modeling, and more Provides an overview of the different types of aircraft, their purposes, and when and why operators choose specific models over others Offers a blend of academic and professional views, making it suitable for both student and practitioner Serves as an aircraft finance and leasing reference for those starting their careers, as well as for legal, investment, and other professionals

Indian Defense Review BoD – Books on Demand

Reconnaissance aircraft have always been the spearhead of the various air forces, helping to provide the basis for any further military operations. At the time of the Cold War and before the satellite era, the use of reconnaissance aircraft reached its zenith, as the warring nations were determined to know what was happening on the other side. Consequently, powerful aircraft emerged during this time, especially in terms of deployment altitude, speed and flight time; achievements which have been largely unrecognised until now.

Aircraft Leasing and Financing John Wiley & Sons

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asked the National Research Council (NRC) to examine and assess technical options for improving engine efficiency of all large non-fighter aircraft under Air Force command. This report presents a review of current Air Force fuel consumption patterns; an analysis of previous programs designed to replace aircraft engines; an examination of proposed engine modifications; an assessment of the potential impact of alternative fuels and engine science and technology programs, and an analysis of costs and funding requirements.

Novel Combustion Concepts for Sustainable Energy Development Lancer Publishers

Covering an important material class for modern applications in the aerospace, automotive, energy production and creation sectors, this handbook and reference contains comprehensive data tables and field reports on successfully developed prototypes. The editor and authors are internationally renowned experts from NASA, EADS, DLR, Porsche, MT Aerospace, as well as universities and institutions in the USA, Europe and Japan, and they provide here a comprehensive overview of current R & D with an application-oriented emphasis.

Airfinance Annual Aircraft Leasing and Financing

This book comprises select peer-reviewed proceedings of the 26th National Conference on IC Engines and Combustion (NCICEC) 2019 which was organised by the Department of Mechanical Engineering, National Institute of Technology Kurukshetra under the aegis of The Combustion Institute-Indian Section (CIIS). The book covers latest research and developments in the areas of combustion and propulsion, exhaust

emissions, gas turbines, hybrid vehicles, IC engines, and alternative fuels. The contents include theoretical and numerical tools applied to a wide range of combustion problems, and also discusses their applications. This book can be a good reference for engineers, educators and researchers working in the area of IC engines and combustion.

Standard & Poor's Stock Reports National Academies Press

Presents industry reviews including a section of "trends and forecasts," complete with tables and graphs for industry analysis.

Aircraft & Aerospace Asia-Pacific

Springer Science & Business Media

This book provides state-of-the-art advances in several areas of importance in energy, combustion, power, propulsion, environment using fossil fuels and alternative fuels, and biofuels production and utilization. Availability of clean and sustainable energy is of greater importance now than ever before in all sectors of energy, power, mobility and propulsion. Written by internationally renowned experts, the latest fundamental and applied research innovations on cleaner energy production as well as utilization for a wide range of devices extending from micro scale energy conversion to hypersonic propulsion using hydrocarbon fuels are provided. The tailored technical tracks and contributions from the world renowned technical experts are portrayed in the respective field to highlight different but complementary views on fuels, combustion, power and propulsion and air toxins with special focus on current

and future R&D needs and activities.

The energy and environment sustainability require a multi-pronged approach involving development and utilization of new and renewable fuels, design of fuel-flexible combustion systems that can be easily operated with the new fuels, and develop novel and environmentally friendly technologies for improved utilization of all kinds of gas, liquid and solid fuels. This volume is a useful book for practicing engineers, research engineers and managers in industry and research labs, academic institutions, graduate students, and final year undergraduate students in Mechanical, Chemical, Aerospace, Energy and Environmental Engineering. [Thermo Economic and Risk Analysis for Advanced Long-range Aero Engines](#) Taylor & Francis

To conceive and assess engines with minimum global warming impact and lowest cost of ownership in a variety of emission legislation scenarios, emissions taxation policies, fiscal and Air Traffic Management environments a Techno economic and Environmental Risk Assessment (TERA) model is needed. In the first part of this thesis an approach is presented to estimate the cost of maintenance and the direct operating costs of turbofan engines of equivalent thrust rating, both for long and short range applications. The three advanced types of turbofan engines analysed here are a direct drive three spool with ultra high bypass ratio, a geared turbofan with the same fan as the direct drive engine and a turbofan with counter rotating fans. The baseline engines are a three spool for long range (Trent 772b) and a two spool (CFM56-7b) for short range applications. The comparison with baseline engines shows the gains and losses of these novel cycle engines. The economic model is composed of three modules: a lifing module, an economic module and a risk module. The lifing module estimates

the life of the high pressure turbine disk and blades through the analysis of creep and fatigue over a full working cycle of the engine. These two phenomena are usually the most limiting factors to the life of the engine. The output of this module is the amount of hours that the engine can sustain before its first overhaul (called time between overhauls). The value of life calculated by the lifing is then taken as the baseline distribution to calculate the life of other important modules of the engine using the Weibull approach. The Weibull formulation is applied to the life analysis of different parts of the engine in order to estimate the cost of maintenance, the direct operating costs (DOC) and net present cost (NPC) of turbofan engines. The Weibull distribution is often used in the field of life data analysis due to its flexibility; it can mimic the behavior of other statistical distributions such as the normal and the exponential. In the present work five Weibull distributions are used for five important sources of interruption of the working life of the engine: Combustor, Life Limited Parts (LLP), High Pressure Compressor (HPC), General breakdowns and High Pressure Turbine (HPT). The Weibull analysis done in this work shows the impact of the breakdown of different parts of the engine on the NPC and DOC, the importance that each module of the engine has in its life, and how the application of the Weibull theory can help us in the risk assessment of future aero engines. Then the lower of the values of life of all the distributions is taken as time between overhaul (TBO), and used into the economic module calculations. The economic module uses the time between overhaul together with the cost of labour and the cost of the engine (needed to determine the cost of spare parts) to estimate the cost of maintenance of the engine. The direct operating costs (DOC) of the engine are derived as a function of maintenance cost with the cost of taxes on emissions and noise, the cost of fuel, the cost of insurance and the cost of interests paid on the total investment. The DOC of the aircraft include also the cost of cabin and flight crew and the cost of landing,

navigational and ground handling fees. With knowledge of the DOC the net present cost (NPC) for both the engine and the aircraft can be estimated over an operational period of about 30 years. The risk model uses the Monte Carlo method with a Gaussian distribution to study the impact of the variations in some parameters on the NPC. Some of the parameters considered in the risk scenarios are fuel price, interest percentage on total investment, inflation, downtime, maintenance labour cost and factors used in the emission and noise taxes. The risk analyses the influence of these variables for ten thousands scenarios and then an accumulative frequency curve is built by the model to understand the frequency of the most probable scenarios. After the conclusion of the analysis of the VITAL engines as they were specified by the Original Engine Manufacturer (OEM) (Rolls Royce, Snecma and MTU), an optimisation work was done in order to try to improve the engines. The optimisation was done using two numerical gradient based techniques. Firstly the Sequential Quadratic Programming (SQP) and secondly the Mixed Integer Optimization (MIO); the objectives of the optimisation were two: minimum fuel burn and minimum direct operating costs. Because the engines were already optimized for minimum fuel burn, the optimization for minimum fuel burn didn't show any meaningful results; instead the results for minimum DOC showed that the engines can have some improvements. The ability of the three VITAL configurations to meet the future goals of the European Union to reduce noise and gaseous emission has been assessed and has showed that the three engines cannot fully comply with future legislation beyond 2020. In the second part of this thesis three further advanced configurations have been studied to determine whether these are potential solutions to meet the ACARE goals of 2020. For these more advanced aero engines only a performance and gaseous emissions analysis has been done, because it was not possible to do an economic analysis for the new components of these engines. These advanced configurations feature components that have

been studied only in laboratories, like the heat exchangers for the ICR, the wave rotor and the constant volume combustor, and for these it has not been done a life analysis that is fundamental in order to understand the costs of maintenance, besides in order to do a proper direct operating costs analysis many operational flight hours are needed and none of these engine have reached TRL of 7 and more which is the stage where flight hour tests are conducted. In this thesis a parametric study on three different novel cycles which could be applied to aircraft propulsion is presented: 1. Intercooled recuperative, 2. wave rotor and 3. Constant volume combustion cycle. These three cycles have been applied to a characteristic next generation long range aero engine (geared turbofan) looking for a possible future evolution and searching for benefits on specific thrust fuel consumption and emissions. The parametric study has been applied to Top of Climb conditions, the design point, at Mach number 0.82, ISA deviation of 10 degrees and an altitude of 10686 m and at cruise condition, considering two possible designs: a) Design for constant specific thrust and b) Design for constant TET or the current technology level. Both values correspond to the baseline engine. For the intercooled engine also a weight and drag impact on fuel consumption has been done, in order to understand the impact of weight increase on the benefits of the configuration, considering different values of the effectiveness of the heat exchangers, the higher the values the greater is the technical challenge of the engine. After studying the CVC and Wave rotor separately it has been decided to do a parametric study of an aero engine that comprises both configurations: the internal combustion wave rotor (ICWR). The ICWR is a highly unsteady device, but offers significant advantages when combined with gas turbines. Since it is a constant volume combustion device there is a pressure raised during combustion, this will result in having lower SFC and higher thermal efficiency. It is an advanced and quite futuristic, with a technology readiness level (TRL) of 6 or higher only by 2025, so only a preliminary

performance study is done, leaving to future studies the task of a more improved analysis.

U.S. Industrial Outlook for ... Industries with Projections for ... Springer

This book comprises five chapters on developed research activities on organic Rankine cycles. The first section aims to provide researchers with proper modelling (Chapter 1) and experimental (Chapter 2) tools to calculate and empirically validate thermophysical properties of ORC working fluids. The second section introduces some theoretical and experimental studies of organic Rankine cycles for waste heat recovery applications: a review of different supercritical ORC (Chapter 3), ORC for waste heat recovery from fossil-fired power plants (Chapter 4), the experimental detailed characterization of a small-scale ORC of 3 kW operating with either pure fluids or mixtures (Chapter 5).

Advances in IC Engines and Combustion Technology

Aerospace Marketing Management is a marketing manual devoted to: -the aeronautics sector: parts suppliers, aircraft manufacturers, and airlines, -the space sector: suppliers, integrators, and service providers. It presents the essentials of marketing from basic concepts such as segmentation, positioning and the marketing plan, to the product policy, pricing, distribution and communication. This book also includes specific chapters on project marketing, brand policy, gaining loyalty through maintenance and training, compensation, and alliance strategies. The different chapters show the new changes due to Internet: -e-procurement for the purchase strategy, -interactive communication with websites, -e-ticketing for the airlines to reach final consumers.

Technology Report and Product Directory, Land, Sea & Air

International Aerospace Abstracts

Jane's International Defense Review

Organic Rankine Cycles for Waste Heat Recovery

F & S Index United States Annual

*Improving the Efficiency of Engines for Large
Nonfighter Aircraft*

Indian Defence Review