

Future Aircraft Power Systems Integration Challenges

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Advances in Energy Systems - Peter D. Lund
2019-04-29

A guide to a multi-disciplinary approach that includes perspectives from noted experts in the energy and utilities fields **Advances in Energy Systems** offers a stellar collection of articles selected from the acclaimed journal *Wiley Interdisciplinary Review: Energy and Environment*. The journal covers all aspects of energy policy, science and technology, environmental and climate change. The book covers a wide range of relevant issues related to the systemic changes for large-scale integration of renewable energy as part of the on-going energy transition. The book addresses smart energy systems technologies, flexibility measures, recent changes in the marketplace and current policies. With contributions from a list of internationally renowned experts, the book deals with the hot topic of systems integration for future energy systems and energy transition. This important resource: Contains contributions from noted experts in the field Covers a broad range of topics on the topic of renewable energy Explores the technical impacts of high shares of wind and solar power Offers a review of international smart-grid policies Includes information on wireless power transmission Presents an authoritative view of micro-grids Contains a wealth of other relevant

topics Written forenergy planners, energy market professionals and technology developers, **Advances in Energy Systems** is an essential guide with contributions from an international panel of experts that addresses the most recent smart energy technologies.

Commercial Aircraft Propulsion and Energy Systems Research - National Academies of Sciences, Engineering, and Medicine 2016-09-09
The primary human activities that release carbon dioxide (CO₂) into the atmosphere are the combustion of fossil fuels (coal, natural gas, and oil) to generate electricity, the provision of energy for transportation, and as a consequence of some industrial processes. Although aviation CO₂ emissions only make up approximately 2.0 to 2.5 percent of total global annual CO₂ emissions, research to reduce CO₂ emissions is urgent because (1) such reductions may be legislated even as commercial air travel grows, (2) because it takes new technology a long time to propagate into and through the aviation fleet, and (3) because of the ongoing impact of global CO₂ emissions. **Commercial Aircraft Propulsion and Energy Systems Research** develops a national research agenda for reducing CO₂ emissions from commercial aviation. This report focuses on propulsion and energy technologies for reducing carbon emissions from large, commercial aircraft—single-aisle and twin-

aisle aircraft that carry 100 or more passengers" because such aircraft account for more than 90 percent of global emissions from commercial aircraft. Moreover, while smaller aircraft also emit CO₂, they make only a minor contribution to global emissions, and many technologies that reduce CO₂ emissions for large aircraft also apply to smaller aircraft. As commercial aviation continues to grow in terms of revenue-passenger miles and cargo ton miles, CO₂ emissions are expected to increase. To reduce the contribution of aviation to climate change, it is essential to improve the effectiveness of ongoing efforts to reduce emissions and initiate research into new approaches.

Scientific and Technical Aerospace Reports - 1995

Aeronautical Engineering - 1990

A selection of annotated references to unclassified reports and journal articles that were introduced into the NASA scientific and technical information system and announced in Scientific and technical aerospace reports (STAR) and International aerospace abstracts (IAA)

Army R, D & A - 1982-07

Annual Index/Abstracts of Sae Technical Papers, 2004 - Society of Automotive Engineers 2005-08

Supply Chain Integration Challenges in Commercial Aerospace - Klaus Richter 2016-12-13

This book presents firsthand insights into strategies and approaches for the commercial aerospace supply chain in response to the numerous changes that airlines, aircraft OEMs and their suppliers have experienced over the past few decades. In doing so, it investigates the entire product value chain. Accordingly, the chapters address the challenges of configuration and demand, and highlight the specificities of customization in the aviation industry. They analyze component manufacturing, share valuable insights into assembly and integration activities, and describe aftermarket business models. In order to ensure more varied and balanced coverage, the book includes contributions by researchers, suppliers, and

experts and practitioners from consulting companies and the aircraft industry. Taken together, they provide a holistic perspective on the transformation drivers and the innovations that have either been implemented or will be adopted in the near future. The book introduces and describes new concepts and innovations such as 3D printing, E2E demand management, digital production, predictive maintenance and open innovation in general, supplementing them with sample industrial applications from the aviation sector.

Aeronautical Technologies for the Twenty-First Century - National Research Council 1992-02-01
Prepared at the request of NASA, Aeronautical Technologies for the Twenty-First Century presents steps to help prevent the erosion of U.S. dominance in the global aeronautics market. The book recommends the immediate expansion of research on advanced aircraft that travel at subsonic speeds and research on designs that will meet expected future demands for supersonic and short-haul aircraft, including helicopters, commuter aircraft, "tiltrotor," and other advanced vehicle designs. These recommendations are intended to address the needs of improved aircraft performance, greater capacity to handle passengers and cargo, lower cost and increased convenience of air travel, greater aircraft and air traffic management system safety, and reduced environmental impacts.

Joint Strike Fighter Acquisition Reform - United States. Congress. House. Committee on Government Reform. Subcommittee on National Security, Veterans Affairs, and International Relations 2001

Reports and Documents - United States. Congress

Management - 1989

Chemical Energy from Natural and Synthetic Gas - Yatish T. Shah 2017-03-16
Commercial development of energy from renewables and nuclear is critical to long-term industry and environmental goals. However, it will take time for them to economically compete with existing fossil fuel energy resources and their infrastructures. Gas fuels play an important

role during and beyond this transition away from fossil fuel dominance to a balanced approach to fossil, nuclear, and renewable energies.

Chemical Energy from Natural and Synthetic Gas illustrates this point by examining the many roles of natural and synthetic gas in the energy and fuel industry, addressing it as both a "transition" and "end game" fuel. The book describes various types of gaseous fuels and how they are recovered, purified, and converted to liquid fuels and electricity generation and used for other static and mobile applications. It emphasizes methane, syngas, and hydrogen as fuels, although other volatile hydrocarbons are considered. It also covers storage and transportation infrastructure for natural gas and hydrogen and methods and processes for cleaning and reforming synthetic gas. The book also deals applications, such as the use of natural gas in power production in power plants, engines, turbines, and vehicle needs. Presents a unified and collective look at gas in the energy and fuel industry, addressing it as both a "transition" and "end game" fuel. Emphasizes methane, syngas, and hydrogen as fuels. Covers gas storage and transport infrastructure. Discusses thermal gasification, gas reforming, processing, purification and upgrading. Describes biogas and bio-hydrogen production. Deals with the use of natural gas in power production in power plants, engines, turbines, and vehicle needs.

Decadal Survey of Civil Aeronautics -

National Research Council 2006-10-27

The U.S. air transportation system is very important for our economic well-being and national security. The nation is also the global leader in civil and military aeronautics, a position that needs to be maintained to help assure a strong future for the domestic and international air transportation system. Strong action is needed, however, to ensure that leadership role continues. To that end, the Congress and NASA requested the NRC to undertake a decadal survey of civil aeronautics research and technology (R&T) priorities that would help NASA fulfill its responsibility to preserve U.S. leadership in aeronautics technology. This report presents a set of strategic objectives for the next decade of R&T. It provides a set of high-priority R&T

challenges"-characterized by five common themes"-for both NASA and non-NASA researchers, and an analysis of key barriers that must be overcome to reach the strategic objectives. The report also notes the importance of synergies between civil aeronautics R&T objectives and those of national security. NASA SP-7500 - United States. National Aeronautics and Space Administration 1986

Energy: a Continuing Bibliography with Indexes
- 1981

Aircraft Thermal Management - Mark Ahlers 2016-05-02

Aircraft thermal management (ATM) is increasingly important to the design and operation of commercial and military aircraft due to rising heat loads from expanded electronic functionality, electric systems architectures, and the greater temperature sensitivity of composite materials compared to metallic structures. It also impacts engine fuel consumption associated with removing waste heat from an aircraft. More recently the advent of more electric architectures on aircraft, such as the Boeing 787, has led to increased interest in the development of more efficient ATM architectures by the commercial airplane manufacturers. The ten papers contained in this book describe aircraft thermal management system architectures designed to minimize airplane performance impacts which could be applied to commercial or military aircraft. Additional information on Aircraft Thermal Management System Architectures is available from SAE AIR 5744 issued by the AC-9 Aircraft Environmental System Committee and the SAE book Aircraft Thermal Management Integrated Analysis (PT-178). SAE AIR 5744 defines the discipline of aircraft thermal management system engineering while Aircraft Thermal Management Integrated Analysis discusses approaches to computer simulation of the simultaneous operation of all systems affecting thermal management on an aircraft.

Hybrid Energy Systems - Yatish T. Shah
2021-04-05

Hybrid Energy Systems: Strategy for Industrial Decarbonization demonstrates how hybrid energy and processes can decarbonize energy

industry needs for power and heating and cooling. It describes the role of hybrid energy and processes in nine major industry sectors and discusses how hybrid energy can offer sustainable solutions in each. Introduces the basics and examples of hybrid energy systems Examines hybrid energy and processes in coal, oil and gas, nuclear, building, vehicle, manufacturing and industrial processes, computing and portable electronic, district heating and cooling, and water sectors Shows that hybrid processes can improve efficiency and that hybrid energy can effectively insert renewable fuels in the energy industry Serves as a companion text to the author's book Hybrid Power: Generation, Storage, and Grids Written for advanced students, researchers, and industry professionals involved in energy-related processes and plants, this book offers latest research and practical strategies for application of the innovative field of hybrid energy.

Technology for Large Space Systems - 1987

Nuclear Science Abstracts - 1966-10

Energy - 1982

Air Traffic Management and Control - Longbiao Li 2021-12-15

This book presents an overview of air traffic management and control. Chapters cover such topics as human factors in quality control, behavioral modeling of electric aircraft, aviation English, radar target classification, occupational health and safety, and terminal airspace sector capacity.

Assessing China's Naval Power - Sarah Kirchberger 2015-06-23

This book analyzes the rise of China's naval power and its possible strategic consequences from a wide variety of perspectives - technological, economic, and geostrategic - while employing a historical-comparative approach throughout. Since naval development requires huge financial resources and mostly takes place within the context of transnational industrial partnerships, this study also consciously adopts an industry perspective. The systemic problems involved in warship production and the associated material, financial, technological, and political

requirements currently remain overlooked aspects in the case of China. Drawing on first-hand working experience in the naval shipbuilding industry, the author provides transparent criteria for the evaluation of different naval technologies' strategic value, which other researchers can draw upon as a basis for further research in such diverse fields as International Security Studies, Naval Warfare Studies, Chinese Studies, and International Relations.

Care and Repair of Advanced Composites - Keith B Armstrong 2020-12-31

The new edition of the well known Care and Repair of Advanced Composites, 3rd Edition, improves on the usefulness of this practical guide geared towards the aerospace industry. Keith B. Armstrong, the original lead author of the first edition was still in charge of this project, counting on the expert support of Eric Chesmar, senior composites specialist at United Airlines. Mr. Chesmar is also an active member of SAE International's CACRC (Commercial Aircraft Composite Repair Committee), an elite group of industry experts dedicated to the standardization, safety, security, and efficiency of composite repairs in the airline industry. Mr. Francois Museux (Airbus) and Mr. William F. Cole II also contributed. Care and Repair of Advanced Composites, 3rd Edition, presents a fully updated approach to the training syllabus recommended for repair design engineers and composite repair mechanics. Metal bonding has been included partly because the definition of "composite" can be interpreted to include metal-skinned honeycomb panels, and partly because some composite parts have metal fittings or reinforcements that must be treated before bonding. This third edition also covers a number of the problems experienced in service, some of which may be applicable to metallic sandwich panels, offers suggestions for design improvements, including repair design as a particular topic, and regulatory changes. Care and Repair of Advanced Composites, 3rd Edition, provides solid technical information and training for a wide range of airline staff.

Budget of the United States Government - United States. Office of Management and Budget 2005

Management: A Bibliography for NASA Managers - 1989

The National Academy of Sciences' Decadal Plan for Aeronautics - United States. Congress. House. Committee on Science. Subcommittee on Space and Aeronautics 2007

Green Aviation - Ramesh Agarwal 2016-09-20
Green Aviation is the first authoritative overview of both engineering and operational measures to mitigate the environmental impact of aviation. It addresses the current status of measures to reduce the environmental impact of air travel. The chapters cover such items as: Engineering and technology-related subjects (aerodynamics, engines, fuels, structures, etc.), Operations (air traffic management and infrastructure) Policy and regulatory aspects regarding atmospheric and noise pollution. With contributions from leading experts, this volume is intended to be a valuable addition, and useful resource, for aerospace manufacturers and suppliers, governmental and industrial aerospace research establishments, airline and aviation industries, university engineering and science departments, and industry analysts, consultants, and researchers.

Handbook of Clean Energy Systems, 6 Volume Set - Jinyue Yan 2015-06-22

The Handbook of Clean Energy Systems brings together an international team of experts to present a comprehensive overview of the latest research, developments and practical applications throughout all areas of clean energy systems. Consolidating information which is currently scattered across a wide variety of literature sources, the handbook covers a broad range of topics in this interdisciplinary research field including both fossil and renewable energy systems. The development of intelligent energy systems for efficient energy processes and mitigation technologies for the reduction of environmental pollutants is explored in depth, and environmental, social and economic impacts are also addressed. Topics covered include: Volume 1 - Renewable Energy: Biomass resources and biofuel production; Bioenergy Utilization; Solar Energy; Wind Energy; Geothermal Energy; Tidal Energy. Volume 2 - Clean Energy Conversion Technologies:

Steam/Vapor Power Generation; Gas Turbines Power Generation; Reciprocating Engines; Fuel Cells; Cogeneration and Polygeneration. Volume 3 - Mitigation Technologies: Carbon Capture; Negative Emissions System; Carbon Transportation; Carbon Storage; Emission Mitigation Technologies; Efficiency Improvements and Waste Management; Waste to Energy. Volume 4 - Intelligent Energy Systems: Future Electricity Markets; Diagnostic and Control of Energy Systems; New Electric Transmission Systems; Smart Grid and Modern Electrical Systems; Energy Efficiency of Municipal Energy Systems; Energy Efficiency of Industrial Energy Systems; Consumer Behaviors; Load Control and Management; Electric Car and Hybrid Car; Energy Efficiency Improvement. Volume 5 - Energy Storage: Thermal Energy Storage; Chemical Storage; Mechanical Storage; Electrochemical Storage; Integrated Storage Systems. Volume 6 - Sustainability of Energy Systems: Sustainability Indicators, Evaluation Criteria, and Reporting; Regulation and Policy; Finance and Investment; Emission Trading; Modeling and Analysis of Energy Systems; Energy vs. Development; Low Carbon Economy; Energy Efficiencies and Emission Reduction. Key features: Comprising over 3,500 pages in 6 volumes, HCES presents a comprehensive overview of the latest research, developments and practical applications throughout all areas of clean energy systems, consolidating a wealth of information which is currently scattered across a wide variety of literature sources. In addition to renewable energy systems, HCES also covers processes for the efficient and clean conversion of traditional fuels such as coal, oil and gas, energy storage systems, mitigation technologies for the reduction of environmental pollutants, and the development of intelligent energy systems. Environmental, social and economic impacts of energy systems are also addressed in depth. Published in full colour throughout. Fully indexed with cross referencing within and between all six volumes. Edited by leading researchers from academia and industry who are internationally renowned and active in their respective fields. Published in print and online. The online version is a single publication (i.e. no updates), available for one-time purchase or through annual subscription.

Defense Issues -

Commercial Aircraft Propulsion and Energy Systems Research - National Academies of Sciences, Engineering, and Medicine 2016-08-09

The primary human activities that release carbon dioxide (CO₂) into the atmosphere are the combustion of fossil fuels (coal, natural gas, and oil) to generate electricity, the provision of energy for transportation, and as a consequence of some industrial processes. Although aviation CO₂ emissions only make up approximately 2.0 to 2.5 percent of total global annual CO₂ emissions, research to reduce CO₂ emissions is urgent because (1) such reductions may be legislated even as commercial air travel grows, (2) because it takes new technology a long time to propagate into and through the aviation fleet, and (3) because of the ongoing impact of global CO₂ emissions. Commercial Aircraft Propulsion and Energy Systems Research develops a national research agenda for reducing CO₂ emissions from commercial aviation. This report focuses on propulsion and energy technologies for reducing carbon emissions from large, commercial aircraft—single-aisle and twin-aisle aircraft that carry 100 or more passengers—because such aircraft account for more than 90 percent of global emissions from commercial aircraft. Moreover, while smaller aircraft also emit CO₂, they make only a minor contribution to global emissions, and many technologies that reduce CO₂ emissions for large aircraft also apply to smaller aircraft. As commercial aviation continues to grow in terms of revenue-passenger miles and cargo ton miles, CO₂ emissions are expected to increase. To reduce the contribution of aviation to climate change, it is essential to improve the effectiveness of ongoing efforts to reduce emissions and initiate research into new approaches.

Analysis and Design of Power Converter Topologies for Application in Future More Electric Aircraft - Amit Kumar Singh
2018-04-20

This thesis proposes new power converter topologies suitable for aircraft systems. It also proposes both AC-DC and DC-DC types of converters for different electrical loads to improve the performance these systems. To

increase fuel efficiency and reduce environmental impacts, less efficient non-electrical aircraft systems are being replaced by electrical systems. However, more electrical systems requires more electrical power to be generated in the aircraft. The increased consumption of electrical power in both civil and military aircrafts has necessitated the use of more efficient electrical power conversion technologies. This book presents a comprehensive mathematical analysis and the design and digital simulation of the power converters. Subsequently it discusses the construction of the hardware prototypes of each converter and the experimental tests carried out to verify the benefits of the proposed solutions in comparison to the existing solutions.

New Scientist - 1977-10-13

New Scientist magazine was launched in 1956 "for all those men and women who are interested in scientific discovery, and in its industrial, commercial and social consequences". The brand's mission is no different today - for its consumers, New Scientist reports, explores and interprets the results of human endeavour set in the context of society and culture.

Indian Air Force: The Case for Indigenisation - Air Commodore Jasjit Singh 2013-03-15

Just think: the last combat aircraft designed by the 74-year old HAL (Hindustan Aeronautics Ltd) with its expansive infrastructure was in the 1950s - and it was an excellent aircraft. Thirty years later an ad-hoc, interim institution called ADA (Aeronautics Development Agency) was set to design the LCA (Light Combat Aircraft) under the DRDO management. Thirty years later the aircraft has yet to enter service although the Indian Air Force has ordered 40 aircraft knowing they do not meet the qualitative requirements set in the early 1980s, leave alone the 21st century! Even the primary trainer for rookie pilots has just begun to be imported. Obviously something is wrong for a long time; and obviously it is a systemic problem. This volume sets out to historically examine and present a balanced understatement of the facts. Some of the leading experts in the profession of aerospace identify the problems. The reader is left to form his judgment and what appears an obvious solution. The Air Force is the most concerned stakeholder in the quality and

quantity of military aircraft; but it seems to have been left on the sidelines in the process of to be criticised as being against indigenisation. We recognise that India is way behind the developed countries — and China now, in design and development of military aviation. We don't have to go far to find the way ahead. Ninety-five percent of the Indian Navy's warships and submarines are designed and manufactured in the country (though many systems inside, like its missiles, may be acquired from the best in the world). The reason is starkly so simple that South Block itself does not notice it! Naval Headquarters contain within its organisation under the leadership and the Chief of Naval Staff, the Directorate of Naval Design as well as the Controller of Warship Production besides the other supporting organisations like WESEE etc. Hence when the indigenous INS Delhi sailed out in the 1990s, the international community began to look at Indian Navy with new respect. Why can't similar system be established for the Army and the Air Force? Read the volume to ask your questions and mull over possible solutions.

Fundamentals of High Lift for Future Civil Aircraft - Rolf Radespiel 2020-10-17

This book reports on the latest numerical and experimental findings in the field of high-lift technologies. It covers interdisciplinary research subjects relating to scientific computing, aerodynamics, aeroacoustics, material sciences, aircraft structures, and flight mechanics. The respective chapters are based on papers presented at the Final Symposium of the Collaborative Research Center (CRC) 880, which was held on December 17-18, 2019 in Braunschweig, Germany. The conference and the research presented here were partly supported by the CRC 880 on "Fundamentals of High Lift for Future Civil Aircraft," funded by the DFG (German Research Foundation). The papers offer timely insights into high-lift technologies for short take-off and landing aircraft, with a special focus on aeroacoustics, efficient high-lift, flight dynamics, and aircraft design.

Power Electronics-Enabled Autonomous Power Systems - Qing-Chang Zhong 2020-06-08

Power systems worldwide are going through a paradigm shift from centralized generation to distributed generation. This book presents the

SYNDEM (i.e., synchronized and democratized) grid architecture and its technical routes to harmonize the integration of renewable energy sources, electric vehicles, storage systems, and flexible loads, with the synchronization mechanism of synchronous machines, to enable autonomous operation of power systems, and to promote energy freedom. This is a game changer for the grid. It is the sort of breakthrough — like the touch screen in smart phones — that helps to push an industry from one era to the next, as reported by Keith Schneider, a New York Times correspondent since 1982. This book contains an introductory chapter and additional 24 chapters in five parts: Theoretical Framework, First-Generation VSM (virtual synchronous machines), Second-Generation VSM, Third-Generation VSM, and Case Studies. Most of the chapters include experimental results. As the first book of its kind for power electronics-enabled autonomous power systems, it • introduces a holistic architecture applicable to both large and small power systems, including aircraft power systems, ship power systems, microgrids, and supergrids • provides latest research to address the unprecedented challenges faced by power systems and to enhance grid stability, reliability, security, resiliency, and sustainability • demonstrates how future power systems achieve harmonious interaction, prevent local faults from cascading into wide-area blackouts, and operate autonomously with minimized cyber-attacks • highlights the significance of the SYNDEM concept for power systems and beyond *Power Electronics-Enabled Autonomous Power Systems* is an excellent book for researchers, engineers, and students involved in energy and power systems, electrical and control engineering, and power electronics. The SYNDEM theoretical framework chapter is also suitable for policy makers, legislators, entrepreneurs, commissioners of utility commissions, energy and environmental agency staff, utility personnel, investors, consultants, and attorneys.

NASA Scientific and Technical Publications - 1987

National Academy of Sciences' decadal plan for aeronautics : hearings -

The Budget of the United States

Government - United States 2006

Control of Power Inverters in Renewable Energy and Smart Grid Integration - Qing-Chang Zhong 2012-11-16

Integrating renewable energy and other distributed energy sources into smart grids, often via power inverters, is arguably the largest “new frontier” for smart grid advancements. Inverters should be controlled properly so that their integration does not jeopardize the stability and performance of power systems and a solid technical backbone is formed to facilitate other functions and services of smart grids. This unique reference offers systematic treatment of important control problems in power inverters, and different general converter theories. Starting at a basic level, it presents conventional power conversion methodologies and then ‘non-conventional’ methods, with a highly accessible summary of the latest developments in power inverters as well as insight into the grid connection of renewable power. Consisting of four parts - Power Quality Control, Neutral Line Provision, Power Flow Control, and Synchronisation - this book fully demonstrates the integration of control and power electronics. Key features include: the fundamentals of power processing and hardware design innovative control strategies to systematically treat the control of power inverters extensive experimental results for most of the control strategies presented the pioneering work on “synchronverters” which has gained IET Highly Commended Innovation Award Engineers working on inverter design and those at power system utilities can learn how advanced control strategies could improve system performance and work in practice. The book is a

useful reference for researchers who are interested in the area of control engineering, power electronics, renewable energy and distributed generation, smart grids, flexible AC transmission systems, and power systems for more-electric aircraft and all-electric ships. This is also a handy text for graduate students and university professors in the areas of electrical power engineering, advanced control engineering, power electronics, renewable energy and smart grid integration.

Diagnostics and Prognostics of Aerospace Engines - Ravi Rajamani 2018-11-28

The propulsion system is arguably the most critical part of the aircraft; it certainly is the single most expensive component of the vehicle. Ensuring that engines operate reliably without major maintenance issues is an important goal for all operators, military or commercial. Engine health management (EHM) is a critical piece of this puzzle and has been a part of the engine maintenance for more than five decades. In fact, systematic condition monitoring was introduced for engines before it was applied to other systems on the aircraft. *Diagnostics and Prognostics of Aerospace Engines* is a collection of technical papers from the archives of SAE International, which introduces the reader to a brief history of EHM, presents some examples of EHM functions, and outlines important future trends. The goal of engine health maintenance is ultimately to reduce the cost of operations by catching problems before they become major issues, by helping reduce repair times through diagnostics, and by facilitating logistic optimization through prognostic estimates. *Diagnostics and Prognostics of Aerospace Engines* shows that the essence of these goals has not changed over time.