

Description of the power system of the 2-seater airplane powered by fuel cells. The fuel cell system was installed in the light sport aircraft RAPID 200, manufactured by Sky Leader Aircraft. The requested mission performance is reported in Ref. [17], however can be summarized as follow: 1. Take-off (max 40 kW); 2.

Parametric noise assessment in the context of low-noise aircraft design and flight procedure optimization has been around for more than 15 years. Yet reliable and comprehensive uncertainty analysis of the overall aircraft noise-prediction process was not available for parametric tools in the past. This paper presents a methodology to assess the overall ...

Early in the aircraft design cycle uncertainty exist in both aircraft requirements and simulation predictions. ... The power and thermal management system (PTMS) proposed by Honeywell is an ...

Accurate identification of electrical load working status can provide information support to the remote electrical distribution system (EDS) of more electric aircraft (MEA), which could use it to realize redundant switching and protection. This paper presents a method to automatically identify the load status on the remote power distribution unit (RPDU) of MEA by ...

With the availability of multi-electric aircraft, the amount of airborne electrical and electronic equipment has dramatically increased, which further improve the importance of the ...

This paper shows that architects of largescale complex systems can better describe, quantify and communicate system attribute tradeoffs under uncertainty by embedding Bayesian belief propagation algorithms in Object-Process Methodology (OPM), and applies this framework to an architectural tradeoff case study of an aircraft power system. Architects of complex systems ...

Uncertainty in aircraft trajectory planning and prediction generates major challenges for the future air traffic management system. Therefore, understanding and managing uncertainty will be necessary to realize improvements in air traffic capacity, safety, efficiency, and environmental impact. Meteorology (in particular, winds) represents one of the most relevant ...

In the aircraft industry, there is a shift towards more and all-electric power systems resulting in great research efforts on single components like batteries. At the same time there is an increasing need to investigate and evaluate the long-term behavior of the whole electric power system to ensure safe and sustainable aircraft operation. Focusing on this challenge, the ...

Abstract: As a safety critical system, affected by cognitive uncertainty and flight environment variability, aircraft electrical power system proves highly uncertain in its failure occurrence ...

Abstract: As a safety critical system, affected by cognitive uncertainty and flight environment variability, aircraft electrical power system proves highly uncertain in its failure occurrence and...

This evaluation system can predict the weak points existing in the MEA power system, as well as providing theoretical support for maintenance schedule, and is proposed which shows the reliability of the overall system with the reliability of specific nodes. The More Electric Aircraft (MEA) stands for the direction of aviation development in the new era, and the ...

This paper proposes a system-level operational management strategy for MEA based on the CC-SMPC strategy coping with the uncertainty in the aircraft power consumption at both HV and LV sides under normal and abnormal operating conditions.

Safety issues related to the electrification of more electric aircraft (MEA) need to be addressed because of the increasing complexity of aircraft electrical power systems and the growing number of safety-critical sub-systems that need to be powered. Managing the energy storage systems and the flexibility in the load-side plays an important role in preserving the ...

As a safety critical system, affected by cognitive uncertainty and flight environment variability, aircraft electrical power system proves highly uncertain in its failure occurrence and consequences.

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DOI: 10.1016/j.est.2022.105629 Corpus ID: 252351541; Chance-constrained model predictive control-based operation management of more-electric aircraft using energy storage systems under uncertainty

The development of distributed renewable energy, such as photovoltaic power and wind power generation, makes the energy system cleaner, and is of great significance in reducing carbon emissions. However, weather can affect distributed renewable energy power generation, and the uncertainty of output brings challenges to uncertainty planning for distributed ...

with system time even though the uncertainty of each component's failure is quite small; therefore it is necessary to quantify system uncertainty for safer flight, and our proposed method could be an effective way to accomplish this quantization task. Keywords: aviation electric power system (AEPS); reliability; uncertainty; failure rate; minimal

This article proposes a near-optimal control strategy based on reinforcement learning, which is applied to the six-degree-of-freedom (6-DoF) attitude control of dual-control aircraft. In order to solve the problem that the existing reinforcement learning is difficult to apply to the high-dimensional multiple-input multiple-output (MIMO) systems, the Long Short-Term ...

Energies 2022, 15, 4109 3 of 37 and security of the energy system [16,17]. The power system in aircraft must have very high reliability and safety; there is a lot of research regarding the fault ...

The results show that the power supply reliability of AEPS is uncertain and the uncertainty varies with system time even though the uncertainty of each component's failure is ...

Diagnosing Faults in Electrical Power Systems of Spacecraft and Aircraft Ole J. Mengshoel USRA/RIACS NASA Ames Research Center Moffett Field, CA 94035 Phone: (650) 604-4199 Ole.J.Mengshoel@nasa.gov ... tic, there is both sensor noise and system state uncertainty in EPSs. Sensor noise is due to the imperfections of sens-ing, while system state ...

The development of Saab Gripen's vehicle systems is described and some methods and challenges related to uncertainties in test and model data are described. In aircraft development, it is crucial to understand and evaluate behaviour, performance, safety and other aspects of subsystems before and after they are physically available for testing. Simulation models are ...

The results show that the power supply reliability of AEPS is uncertain and the uncertainty varies with system time even though the uncertainty of each component's failure is quite small ...

Diagnosing Faults in Electrical Power Systems of Spacecraft and Aircraft Ole J. Mengshoel USRA/RIACS NASA Ames Research Center Moffett Field, CA 94035 Phone: (650) 604-4199 Ole.J.Mengshoel@nasa.gov ... ing, while system state uncertainty is due to failures of EPS components and sensors. These two technical challenges are our main concern in ...

Narrow body and wide body aircraft are responsible for more than 75% of aviation greenhouse gas (GHG) emission and aviation, itself, was responsible for about 2.5% of all GHG emissions in the ...

Abstract: As aircraft electrical power system (AEPS) is critical for flight safety, a system-level reliability modelling method for large complex AEPS is proposed with a typical power system ...

Jiao et al. [12] proposed a new type of fly-by-wire aircraft power braking system (PWABS), which only consumes the electric power from the aircraft to realize the braking function, rather than ...

Based on the state of the art technology development for EMS and architecture optimization, this paper intends to present the industry's common sense and future trends on aircraft power system ...

The AC power is typically a three-phase wye generator at 115VAC using 400Hz. Use of 400Hz power has been a standard for decades as the power can be produced with smaller and lighter generators than 50/60Hz systems. Although the use of higher frequencies is not ideal for long distance power transmission (more sensitive to voltage drop), the benefit of the lighter ...

system reliability uncertainty, which can be a theoretical guidance for aircraft electrical power system reliability design. Keywords: aircraft electrical power system; reliability; variance decomposition; minimal path set; importance measure index 1. Introduction The aircraft electrical power system (AEPS) is a system that provides ...

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