In this paper, an outlook about the present of electrical aviation is given. The relatively small energy density of current battery technologies is adequate to build usable electric car, but not suitable for electric aircraft. Because of the very limited amount of energy available on-board, a couple of percent in efficiency can give significant increase in range and flight time, hence the development of more efficient propulsion system and E-motor is as important as the development of...

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ABSTRACT The first aircraft electrical power system generated and distributed hundreds of watts of electricity to a very small number of loads. Today's aircraft electrical system has grown by 3 orders of magnitude in the amount of power generated and distributed (1.2 megawatts on the USAF E-4B Command Post). During the 1960s, 1970s and 1980s aircraft electrical power requirements and complexity grew. INTRODUCTION The past, present and future of aircraft electrical power systems cannot be captured in a single technical paper. Therefore, it is the intent of this paper to review significant historical events that have shaped today's aircraft electrical power systems. The paper will also briefly project the future of military aircraft electrical power systems. Keywords: electric aircraft; hybrid electric configuration; electric aircraft sizing. The final section presents the authors' views towards future directions of electric aircraft developments.

2. Electric Propulsion System: Concepts, Benefits, and Challenges. The history of electric aircraft dates back to 1972, when a manned electric aircraft was flown, propelled by a nickel cadmium (Ni–Cd) battery on-board. A fully electric system relies upon a battery or some other means of electrical energy source as a sole means to power the propulsion system. Such design features the advantages of a highly efficient conversion system and is the only configuration which has the potential for zero inflight emission and is much quieter in operation. “Unannounced failures” of aircraft electrical systems that led to crashes. 4. Electrocution of an electric-utility lineman. Electrically operated accessories such as engine control actuators, amplifiers, air control valves, and solenoids, are supplied with power from the aircraft electrical system or an engine-driven dedicated electrical generator. Mechanically driven units, such as generators, constant speed drive units, hydraulic pumps, low- and high-pressure fuel pumps, and engine speed signaling, measuring, or governing units are driven from the engine through internal and external gearboxes. 15 Electrical Power Uses Aircraft electrical power is used to operate: Aircraft Flight Instruments Essential Systems Passenger Services. 16 Electrical Power Uses (cont.) Essential power is power that the aircraft needs to be able to continue safe operation Passenger services power is the power that used for: Cabin lighting Operation of entertainment systems Preparation of food. 36 Typical Aircraft Electrical System Primary (main) power source Emergency power source Secondary power conversion equipment System control and protection devices Interconnection network Power distribution system. 37.