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An Induction Generator based AC/DC Hybrid Electric Power Generation System for Additional Electrically Powered Airliner

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ABSTRACT- For an additional aircraft power system, both AC and DC power having high voltage levels are required. with various flight loads. This paper introduces an induction generator based on AC / DC hybrid MEA power generation system. In the proposed system structure, a high-speed generator/generator and a low-speed generator are fitted with high pressure (HP) and low pressure (LP) of the spools of the engine, respectively. In production mode, all alternating AC power is generated by the HP generator while the DC power supply is supplied by both HP and LP generators. The control system is designed to control the AC power supply and direct the DC power supply between the two generators. The proposed AC / DC-based induction generator system results in reduced demand for computer hardware compared to the AC and DC production systems.

KEYWORDS- Electric vehicles, power system, battery power, Dynamic Wireless Power Transfer.

I. INTRODUCTION

According to statistics and predictions from International Civil Aviation Organization (ICAO).revenue passenger-kilometers (RPK) of ground air transportation has grown at an annual rate of 6.2 since 2003 and will continue to grow an average of 4.5% by 2030. Electricity generated at The production channel is delivered to consumers through the transmission and distribution network programs. It's hard to draw a line between transmission and distribution of energy systems. Transmission and distribution systems are similar to human circulatory systems [1-3]. I transfer systems may be compared to the human body and distribution systems with capillaries. They serve the same purpose of providing the last buyer in town with life-giving blood and electrical civilization. Electric power is approx only produced, transmitted, and distributed to the current alternating method. Most of the load is there inductive in nature so now it has a time power factor. The low power factor is as high as it is it causes an increase in current, which leads to an increased loss of real strength in all aspects of an energy system from a power generator to a utility device. Nowadays the most commonly used EV / HEV charging system controls, which means it allows for a car battery-powered circuit breaker, however, many research institutes are trying to use a bai regulation charging device, with a battery to the network control stria. A few devices with a battery, or another power source, such as supercapacitors or flywheels, are connected to the front of the charging stations or to the UPS system. Over the past three decades, significant progress has been made in the development of the MEA aircraft, in which ground, electrical, mechanical, and air systems have been replaced in whole or in part by power systems[1-2]. However, the magnitude of the advantages and disadvantages of adopting MEA action varies with different technological approaches that include new power system structures and different types of inaugurators. In this paper, the control system with infinite power and current sinusoidal compensation is specified by the creators. This paper outlines a modified control scheme to compensate for the distribution of feed for indirect loads. Over the past forty years, a large number of research projects have made remarkable progress in advancing electronic aviation systems. In the latest MEA systems, most underground systems that are mechanized, hydraulic, or ventilated are replaced partially or completely by their electrical counterparts. Energy quality is defined as the ability of a system or device that operates satisfactorily in its magnetic field with a circuit that delivers unbearable magnetic disturbances to anything in that environment. Energy quality is a combination of electrical quality and current quality. This power quality is related to voltage deviation and current from the appropriate. Power quality is a set of electrical parameters that allow a piece of equipment to operate in its own way in a cycle of significant operating losses. They were probably at risk for any energy quality disruption that existed at the time but the results were not readily apparent due to the robustness of the equipment and the lack of effective methods for measuring energy quality parameters.

II. EXISTING SYSTEM

The basic plan for the distribution of non-sustainable energy for conventional aircraft is In normal aircraft, jet fuel is used by the gas turbine engine to generate power. Most of this energy is used to propel a plane, and the remaining part is converted into wind power, water, mechanical and electrical power where wind power is obtained from the compressors at the top of a gas turbine engine. This type of energy is used to provide a high-pressure airflow control system (ECS) and anti-crust system. In a 300-passenger plane with 40 MW equivalent to 40 MW, the required wind power is about 1.2 MW. The performance of a non-propulsive power aircraft system has improved over the years, yet its complexity has grown even faster. At present, the standard continuous power system still represents a major factor in the inefficiency and failure of aircraft. In addition, due to the flexible infrastructure of pneumatic and hydraulic systems, system leaks are often difficult to detect or reach, resulting in a large

number of aircraft drop-downs and flight delays In aviation systems, the effect of electric power removal can sometimes have a significant impact on the dynamics and control of the aircraft engine. For example, during a transition from a cruise to descent, the power of the aircraft engine decreases temporarily while maintaining a high demand for electricity. This change creates the possibility that the engine will malfunction and may require significant power outages. In addition, with the increase in power consumption in the MEA, the above effect will be greater if the power is only discharged from the HP spool of the gas turbine engine. This problem can be solved by adding an additional generator to the LP spool engine and sharing power between HP and LP spools[4]. The idea of adding a fan-shaft generator to a low-pressure spool is widely accepted in the MEE concept. In a twin-spool aircraft engine, HP and LP spool generators operate at different frequencies. To be compatible with two generators with improved efficiency and reduced size and weight, DC's main production system capable of converting electrical energy is selected as a more advanced electrical structure. The PM generator has been investigated for this dual spool structure due to its high power density and the ability to amuse itself. A high-speed launcher/generator and a low-speed generator are mounted directly on the HP and LP spool of the engine, respectively. In the engine startup process, the PM launcher/generator in the HP spool can act as an engine to start the engine using low power.

III. PROPOSED SYSTEM

The proposed induction generator system is based on AC / DC hybrid generation in the proposed system, a high-speed installer/generator that opens a high speed and a squirrel-cage wye generator connected to a high-pressure wye (HP) and a low-pressure spools (LP) engine, respectively. In production mode, the HP generator manages to generate all CVVF power, while the DC power requirement is shared by both HP and LP generators. AC / DC hybrid generation can supply CVVF power directly to one side of the generator turning terminals without an external exciter, and generate DC power on the other side of the rotating terminal generator through the inverter/rectifier unit. Compared to AC's main production system, the use of an input generator removes external exciter, while twin-spool twin generator architecture improves overall generation performance. Detailed electrical system configuration. The inverter/rectifier unit and the AC load-resistant loads are connected at each end of the input generator terminals that inject an open HP spool. The active repair unit is connected to the LP spool of the connected induction generator. The DC output of the inverter/rectifier unit and the active adjustment unit are compatible with the DC bus. In many MEA applications, in addition to generating power, the main engine generator is also used as a starter launcher. DC power from an APU production system or low power supply is usually found in this process. In the first engine operating system, the entire LP spool generation system is shut down.

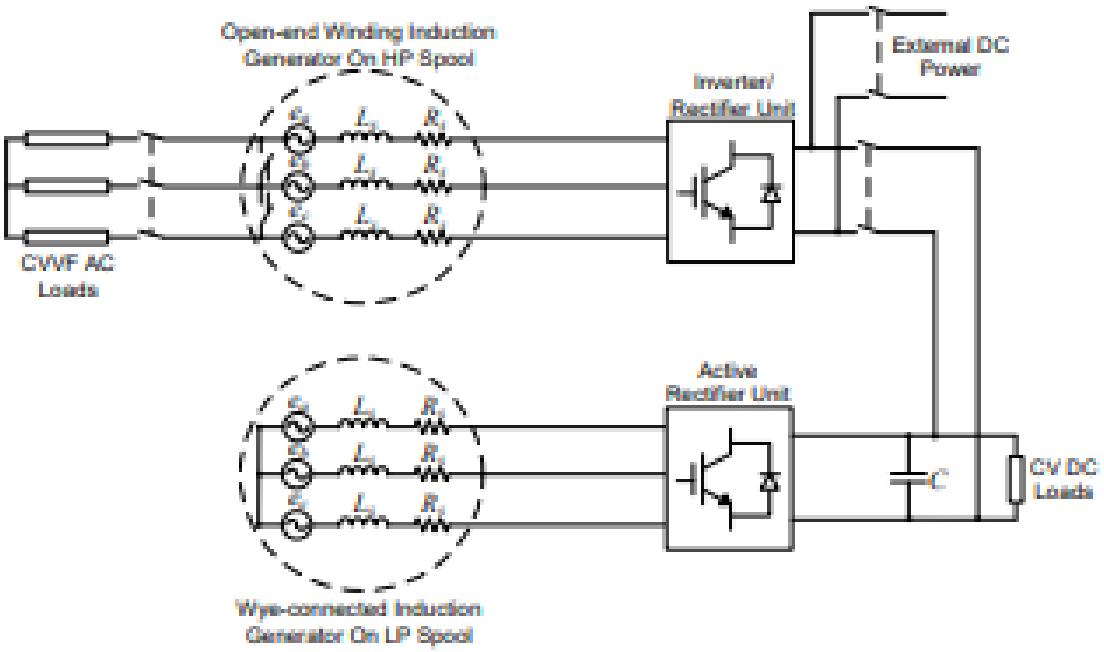

Figure 1: Electronic system configuration

An electronic system configuration with additional details is shown in Fig. 1. The inverter/rectifier unit and frequency are incompatible AC loads connected to each end of the generator terminals that carry the HP spool air intake. It works the repair unit is connected to the connected LP spool import generator. DC exit end of an inverter/rectifier unit and an active repair unit are available and compatible with the DC bus.

IV. CONCLUSIONS

Conclusion This paper describes the simulation studies of the 3- Ø self-excited asynchronous generator (SEASG) feed RL load in accordance with the AC / DC / AC AC circuit supply circuit. circuit due to changes in the frequency of the inverter and its effects on the voltage of the generator terminal have been studied in the control of the open loop. This paper introduces the AC / DC integrated production system based

on the AC / DC MEA. The use of the input generator is handled by the problem of the current extreme error due to the interest of the PM in the PM-based production system. The proposed AC / DC hybrid generation structure provides CVVF power directly to terminals that generate electricity without an external exciter. The simulation results of the AC / DC / AC converter for the Induction generator were successfully implemented in Matlab Simulation, in a separate step.

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