Comparative analysis and simulation of selected components of modern power systems (EPS, PES) of 'classical' aircraft and 'More/ All Electric Aircraft' (MEA/ AEA)

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Abstract— The work deals with the issues of modern architecture of power in the field of electrical power systems EPS (Electric Power Systems) and power electronic power systems PES (Power Electronics Systems), both civil 'classical' aircraft airline concerns Airbus and Boeing (A-320, B-767) and military Lockheed Martin (F-16), as well as civil aircraft more/ fully electric MEA/ AEA (A-380 and A-350XWB, B-787) and military JSF (Joint Strike Fighter) F-35 and F-22 Raptor. Based on the above, the authors conducted a comparative analysis of these systems, with particular emphasis on making the simulation of selected components of individual systems (EPS, PES) including their mathematical models in a dynamic perspective. The main objective of this work was to simulate a range of EPS (synchronous motor) and on the PES converter (48-pulse), presenting their mathematical models and based on them making a comparative analysis of advanced power systems with the trend of MEA/ AEA plane. In the final part, the paper presents the main conclusions arising from the analysis and simulation of selected components of the architecture of power systems (EPS, PES) of 'classical' aircraft and the advanced in line with the new trend of 'MEA/ AEA.