World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Parallel Operated Rotary Frequency Converters within a Ship Micro-Grid System

Authors : Hamdy Ahmed Ashour

Abstract : This paper studies the parallel operation of rotary frequency converters which can be used within a ship micro-grid system and also to supply ships and equipment in a harbour during off-sail and maintenance periods with their suitable voltage and frequency requirements in order to overcome the possible associated problems of overloading on a single converter. The paper theoretically and experimentally investigated the operation of 3-ph induction motor / 3-ph synchronous generator based rotary converters set. Concept of operation and merits of such converters has been discussed. Overall dynamic simulation model of two parallel operated rotary converters has been developed. Active and reactive load sharing of the two converters has been analyzed. Experimental setup has been implemented for proof of concept and practical validation. Simulation and experimental results have been obtained and well correlated; showing how the rotary converters based setup can be manipulated to achieve different requirements of operating conditions.

Keywords : experimental, frequency-converters, load-sharing, marine-applications, simulation, synchronization
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020