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Enchanced Fault RIDE-THROUGH Technique for PMSG Wind Turbine Systems Using DC Link Based Rotor-Side Controlled

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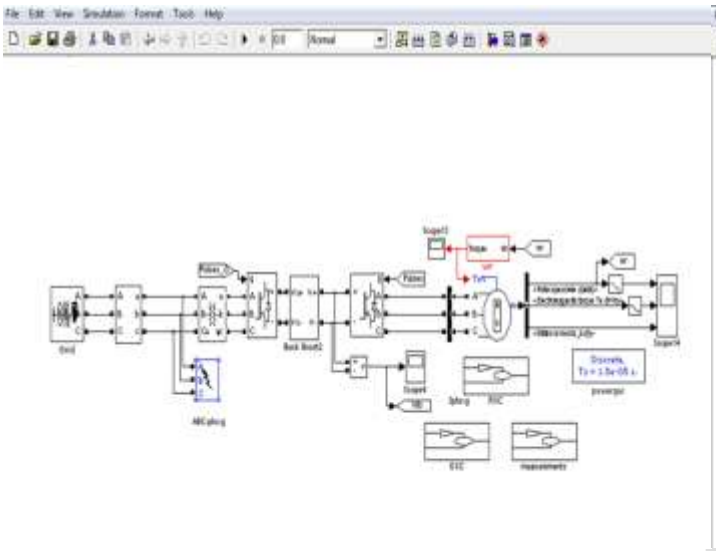
Abstract— Stations that run on electric power production of energies employer is wind power - as technology be a healthy environment disbursement of oil may be non-existent and more dynamic and depend on the nature and especially the movement of wind and the cost of a simple piece increased interest by the consumer - and one of the types of engines that are used by engine wind PMSG is a device fluctuates according to the volatility of the atmosphere, especially wind speed and electric power unsteady be important in the network to produce electric power by the movement and direction of the wind - is important to intervene network with wind power inverter where - there are good things and some not so good use generators variable interval and speed - and a magnet permanently be mostly from based on wind generator to change load WECS bearing on the conditions of network variable - in technology generator has the ability to turn side to reduce the oscillations obtained from the train engine and is controlled by the part of the network by controlling - and there are laws that bind b laws that serve the network control - and works to reduce to some extent the changes that occur in the network and with the mistakes that may occur on the side of the network - in some generators often, reduce current by converting automatically by the generator and keep any effort strategy compared to Alternative Carriers Dc chopper.

Keywords— PMSGs, WECS, ESS, STATCOM, LSC.

Compare DESIGN OF WIND TURBINE BASED PMSG between literature survey CONTROL SCHEME and PROPOSED CONTROL SCHEME:

A PMSG-based WECS is simulated and analyzed when subjected to the system faults. The PMSG-based wind power unit connected to the utility grid via a step-up transformer and transmission line. This PMSG-based WECS was implemented in MATLAB/ SIMULINK, where the above three different converter models are used separately for the purpose of comparison.

Design of the Unified Power Control for the MW Class PMSG-Based WECS IN MATLAB



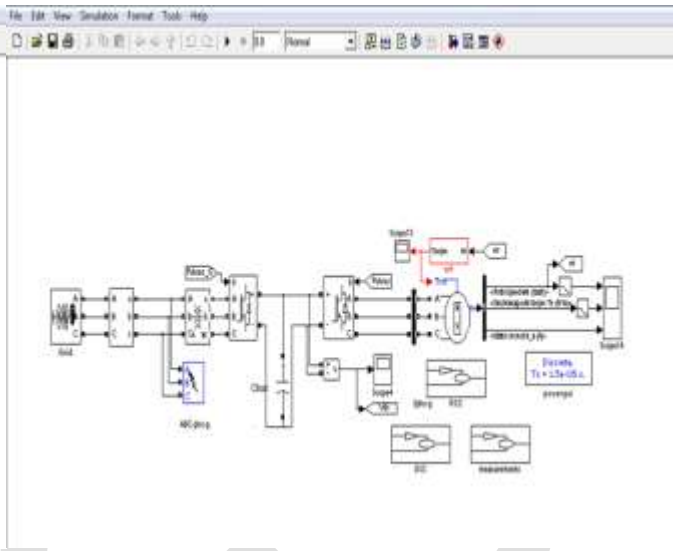
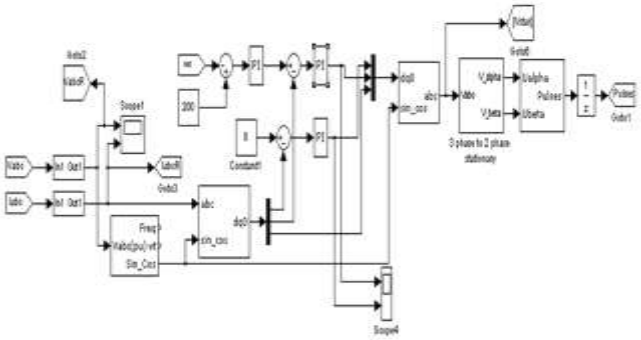


Fig. 1: PMSG BASED WECS WITH DC CHOPPER.Fig.2: PMSG BASED WECS WITH OUT DC CHOPPER

We have different between the CONVENTIONAL CONTROL SCHEME and PROPOSED CONTROL SCHEME in block diagram (RSC)and(GSC) in fig3 .fig4 .fig5 fig6



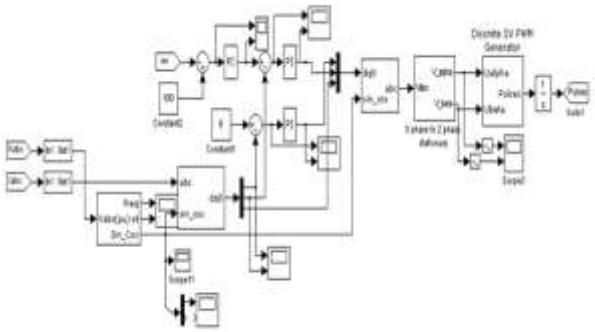
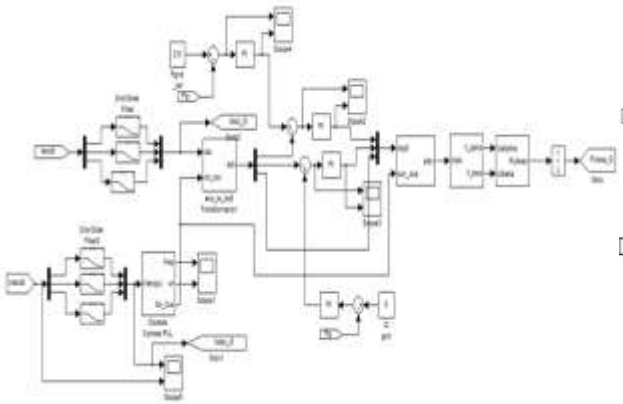


Fig3/the system RSC in proposed control schemeFig4/ the system RSC literature survey control scheme



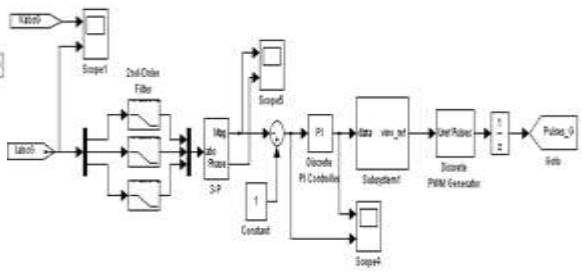


Fig5/the system GSC in proposed control schemeFig6/the system GSC literature survey control scheme

SIMULATION RESULTS WITH PROPOSED AND LITERATURE SURVEY

1)Operation With Unsymmetrical Grid Faults

A)With literature survey without Dc chopper and proposed technique with chopper –AG:

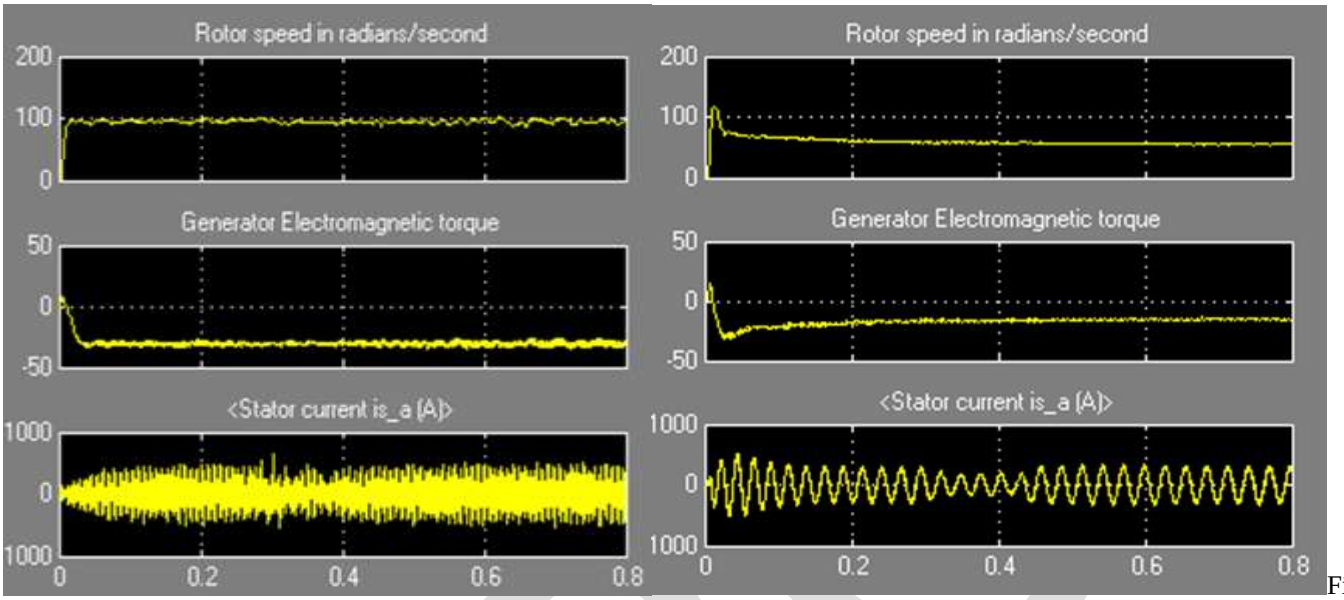


Fig.7 : Rotor speed, EM torque and stator 'A' phase current for literature survey control scheme system for AG fault

Fig.8: Rotor speed, EM Torque and stator 'A' phase current for proposed system with chopper for un symmetrical fault AG

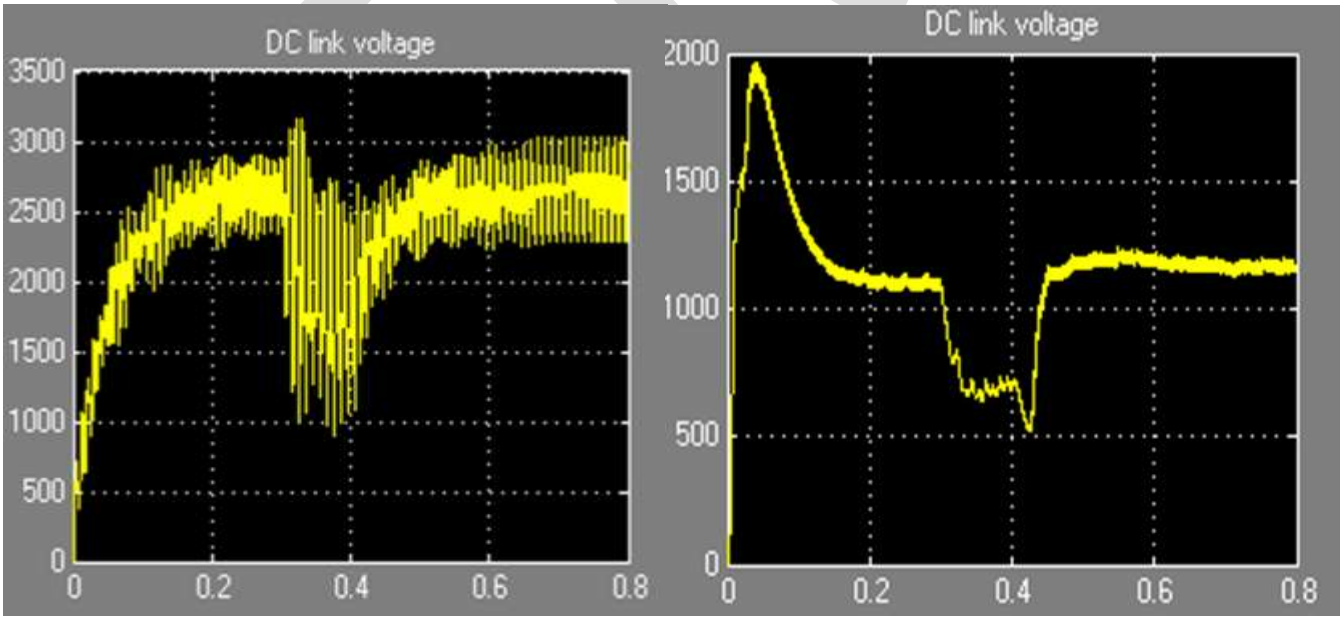


Fig.9: DC link voltage for literature survey control schemeFig10:DC link voltage for proposed system with without dc chopper system for AG faultchopper for un symmetrical fault AG

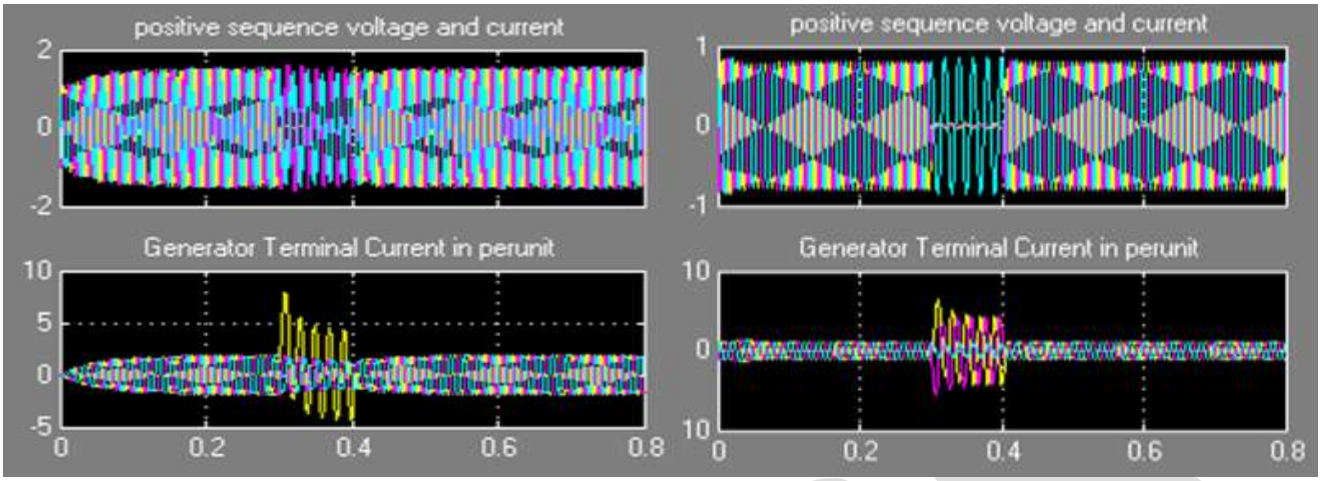


Fig.11: stator voltage and current for literature surveyFig.12: Grid voltage and current for proposed system Without dc copper control scheme system for AG faultwith chopper for un symmetrical fault AG

B)With literature survey without dc chopper and proposed technique with chopper –abg fault

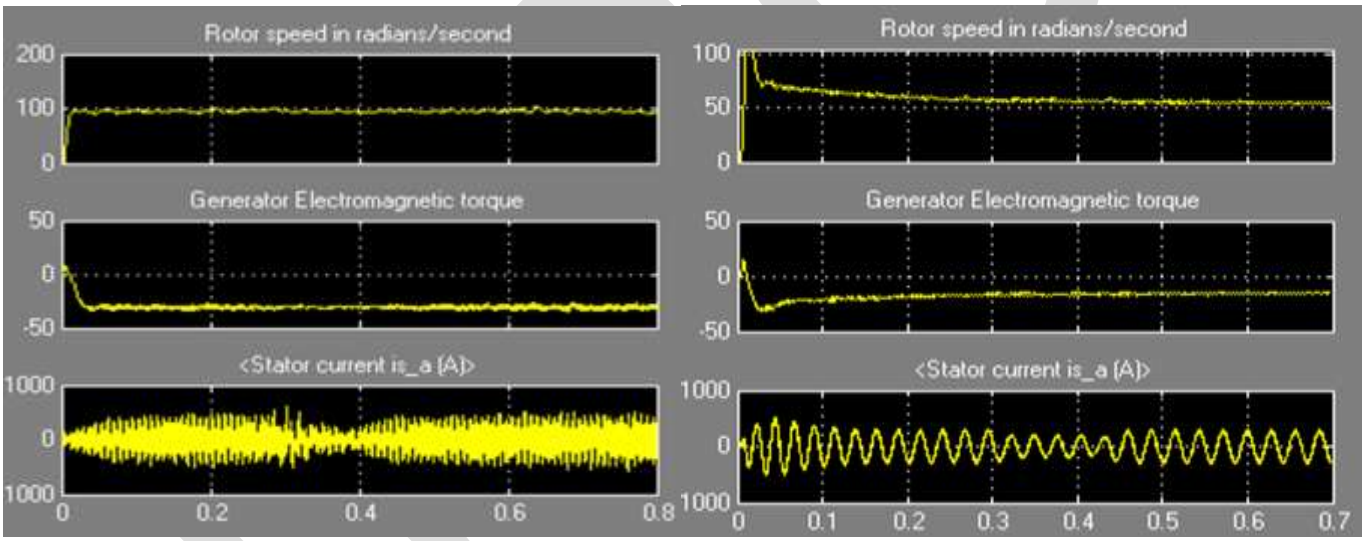
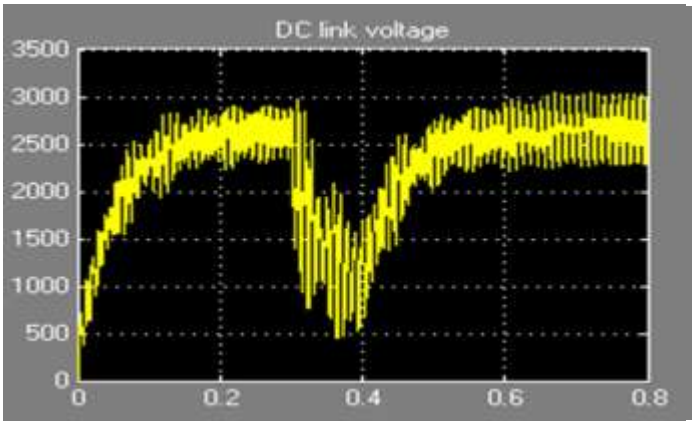


Fig.14: Rotor speed, EM torque and stator 'A' phase currentFig.15: Rotor speed, EM Torque and stator 'A' phase current for literature survey without dc chopper control scheme system for ABG fault for proposed system with chopper for un symmetrical fault ABG



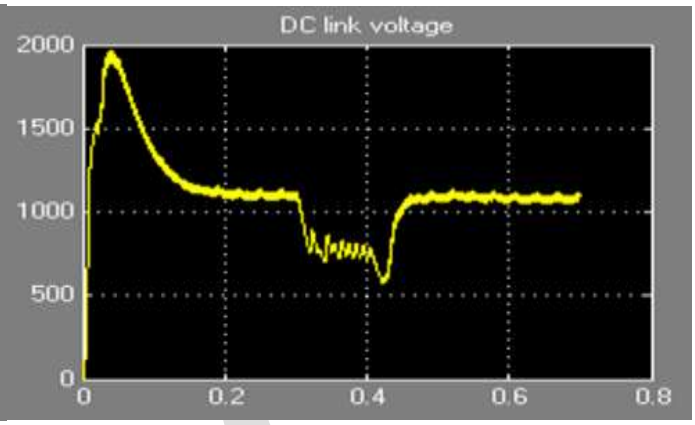
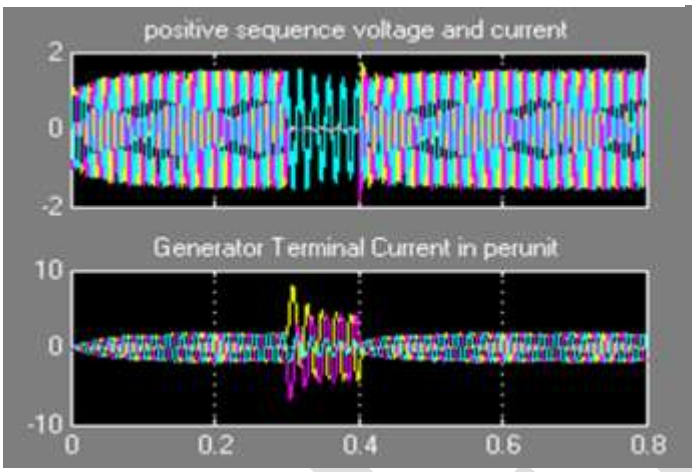


Fig16: DC link voltage for literature survey system for ABG fault

Fig17: dc link voltage across capacitor for proposed system with dc control scheme chopper for un symmetrical fault ABG



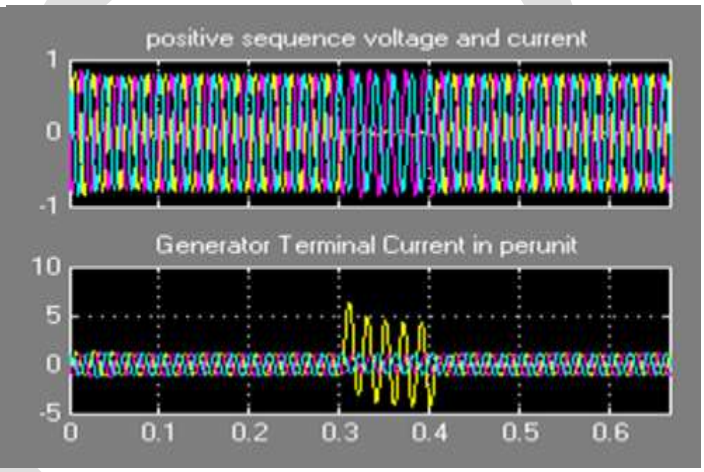
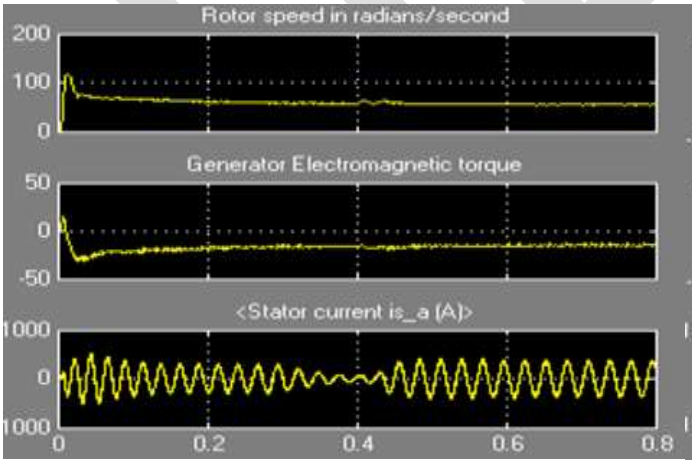


Fig.18 stator voltage and current for literature survey control scheme system for ABG faultwith chopper for un symmetrical fault ABG.

Fig.19 Grid voltage and current for proposed system

2) Operation With Symmetrical Grid Faults: With literature survey without dc copper and proposed with dc chopper technique



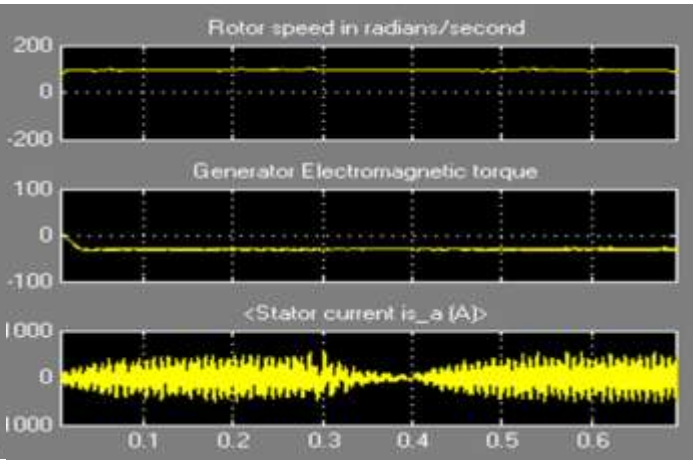


Fig.20: Rotor speed, EM Torque and stator 'A'

Fig.21: Rotor speed, EM torque and stator 'A' phase current for literature

phase current for proposed system with choppersurvey without dc chopper control scheme system for ABCG fault

It can be observed that speed and torque oscillations were high without chopper compared to with chopper and stator current drops to nearly zero value.

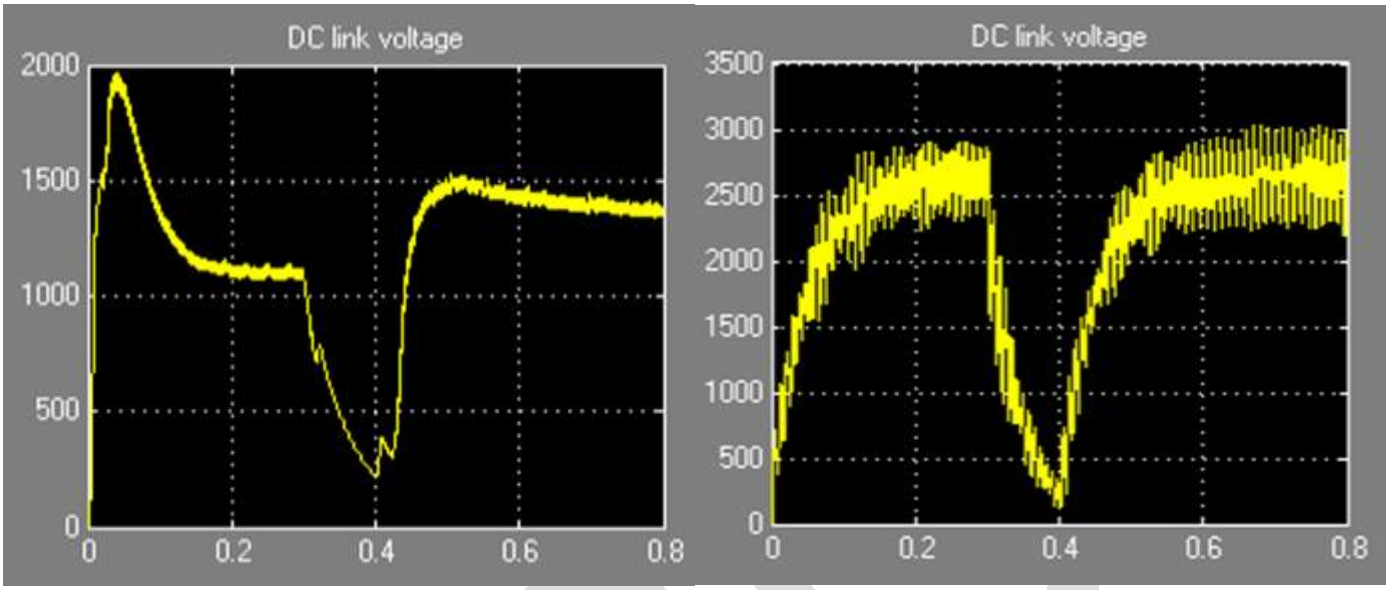


Fig.22: DC link voltage for proposed system without chopperFig.23: DC link voltage for literature survey without dc chopper

symmetrical fault.control scheme system for ABCG fault

The DC link voltage at capacitor also decreases from 1000V to zero without chopper and voltage decreases from 1000V to 400Volts. Hence voltage can be maintained much better with chopper circuit. It can also be verified that voltage and current at generator terminals decreases from unity pu to zero value without chopper and is maintained at 0.1pu with chopper.

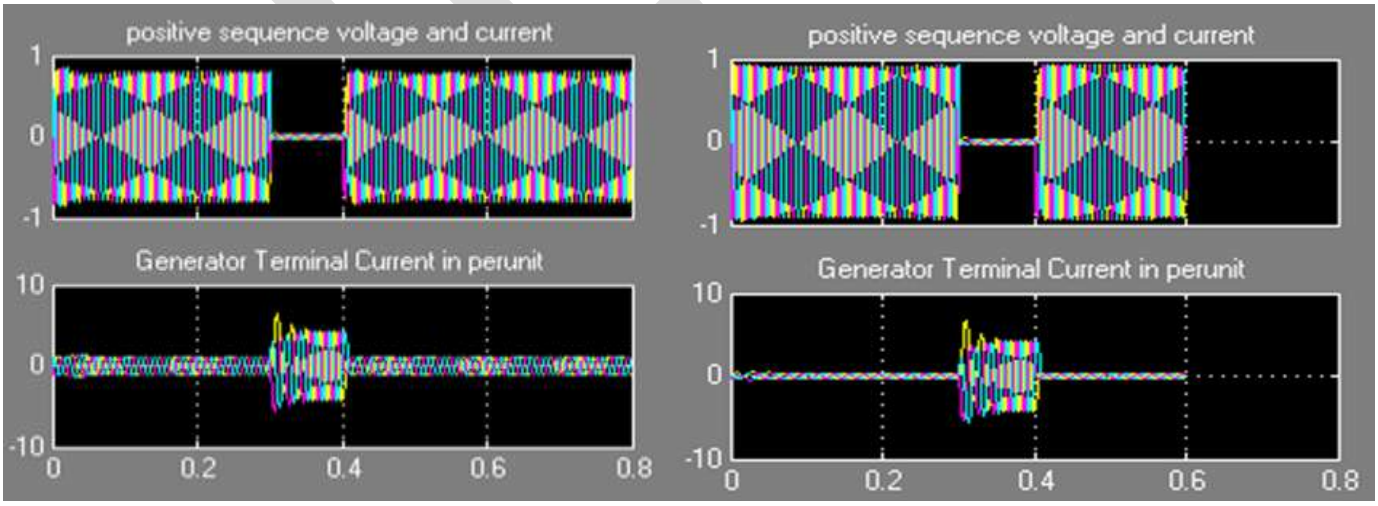


Fig.24: Grid voltage and current for proposed system Fig.25 stator voltage and current for literature survey control scheme

with dc chopper for symmetrical faultsystem for ABCG fault

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CONCLUSION

Speed of energy is the main reason why WECS preclude the ability and improve the balance - this system may be based on a maximum limit on the devices Power - systems sometimes need a technique developed that meet the needs of wattage - PMSG based WECS is strategy be working on the basis of the generator are correct and be control by organizing force in the side of the network and the changes that occur in the engine part may cause increased problems on thrusting, which does not accept the basic idea - and control on the part of the birth of the b damping and collects rings extra accuracy on the part of the network and gives speed and more accurate when error occurs in the network-Dc chopper is controlled and change is necessary strategy required that cause changes (distortions) and works to reduce when the error occurs - it is important for engineering designs to be simple implementation and be responsive any variable occurs on the part of the generator and the link voltage may cause volatility must strategy useful for some kind of change and about the best piece to be requested operation used when the error occurs

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