

**AN APPROACH TOWARDS IDENTIFICATION OF UNSTABLE
VOLTAGE IN PRODUCTION OF WIND POWER****Karlapudi Jayanth¹, Srirama Avinash Kumar²**¹M.Tech Student, Dept of EEE, Nimra Institute of Engineering & Technology, Ongole, A.P, India²Assistant Professor, Dept of EEE, Nimra Institute of Engineering & Technology, Ongole, A.P, India**ABSTRACT:**

In order to get better consistency of doubly fed induction generator wind turbines, impacts of uneven grid voltage on dc capacitor required to be removed. A new dc-capacitor current control means in support of a grid-side converter to get rid of the unconstructive impact of unstable grid voltage on dc-capacitors was introduced. In the projected system a dc- capacitor current control loop, where an unconstructive succession resonant controller is employed to augment loop gain, is additional towards predictable grid-side converter current control loop. Towards reducing unconstructive impact of second-order harmonic current in dc capacitor and thus increase consistency of dc-link capacitors of doubly fed induction generator converters, a dc capacitor current control means was introduced for a grid-side converter. The projected dc-capacitor current managing algorithm is put into practice in grid-side converter controller devoid of any power information. Quite a lot of control methods were presented for Grid-side converter controller to decrease voltage ripple throughout voltage unbalance, which is divided into feed-forward methods; dual current control methods; along with resonant controller methods. Generally Grid-side converter current control loop consist of necessary current control loop as well as a dc-capacitor current control loop. Projected control process makes Grid-side converter controller autonomous of RSC controller, as a result it is a practicable control means for doubly fed induction generator converters by means of a modular organization.

Keywords: *Grid voltage, Doubly fed induction generator, Dc-capacitor, Wind turbines, RSC controller.*

1. INTRODUCTION:

Outsized number of wind turbine systems is more and more being set up in inaccessible areas and additionally, wind turbines have to stay on associated even for the duration of transitory uneven voltage dips. With permanent augmented capability of installed wind power, effects of wind power making on grid are increasingly significant [1]. Wind power which is generated is necessary to be conveyed towards load centres with extended transmission lines, whose associations might be feeble. A new dc-capacitor current control means in support of a grid-side converter to get rid of the unconstructive impact of unstable grid voltage on dc-capacitors was introduced. In the projected system a dc- capacitor current control loop, where an unconstructive succession resonant controller is employed to augment loop gain, is additional to predictable grid-side converter current control loop [2]. As stator of a doubly fed induction generator is unswervingly associated to grid, an unconstructive succession is additional to stator flux in uneven grid voltage circumstances. Larger

negative sequence currents flow all the way through stator as well as rotor causes important second-order harmonic fluctuations in electromagnetic powers. To assemble a modular proposal, the dc-capacitor current have to be noticed by Grid-side converter controller autonomously. Under uneven conditions, huge low-frequency current as well as voltage ripple in dc-link capacitors of nonstop converter is one of most significant efforts of doubly fed induction generator [3][4]. The managing of dc voltage employed in grid-side converter for doubly fed induction generator is to some extent dissimilar to grid associated converters under uneven conditions, since dc-voltage ripples are caused not merely by uneven grid voltage but moreover by energetic power fluctuations.

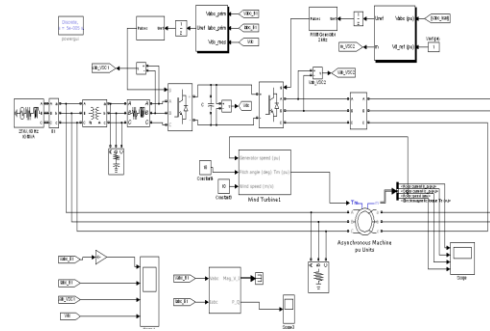
2. METHODOLOGY:

Towards reducing unconstructive impact of second-order harmonic current in dc capacitor and thus increase consistency of dc-link capacitors of doubly fed induction generator converters, a dc capacitor current control means was introduced for a grid-side converter. The projected dc-capacitor

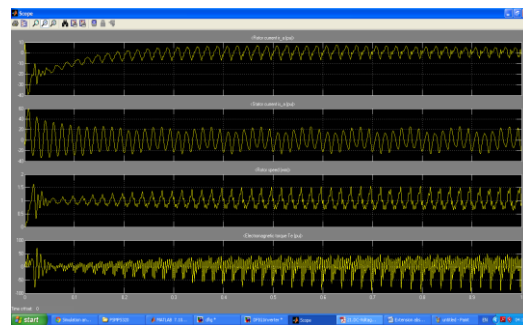
current managing algorithm is put into practice in grid-side converter controller devoid of any power information. Grid-side converter controller can be autonomous of RSC controller by means of projected control method which makes more appropriate for extensive doubly fed induction generator converters with a modular arrangement. Since dc-capacitor current is not directly noticed through measuring dc voltage, no added hardware discovery circuitry is essential, which can set aside cost. The dc-capacitor current is attained by means of noticing dc voltage fluctuation, consequently it does not necessitate any added hardware discovery, which put in cost reduction in method [5]. Dc-capacitor current control process is strong towards measuring variation of dc-capacitor current. Quite a lot of control methods were presented for Grid-side converter controller to decrease voltage ripple throughout voltage unbalance, which is divided into feed-forward methods; dual current control methods; along with resonant controller methods. Feed-forward process consists of a grid voltage feed- forward control as well as an RSC dc-current feed-forward control. Dual current control is a accepted means for changing of positive-

sequence current as well as negative-sequence current at similar instant.

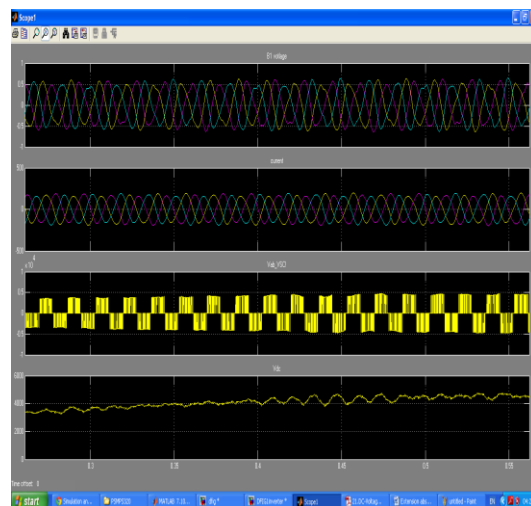
Simulation results:



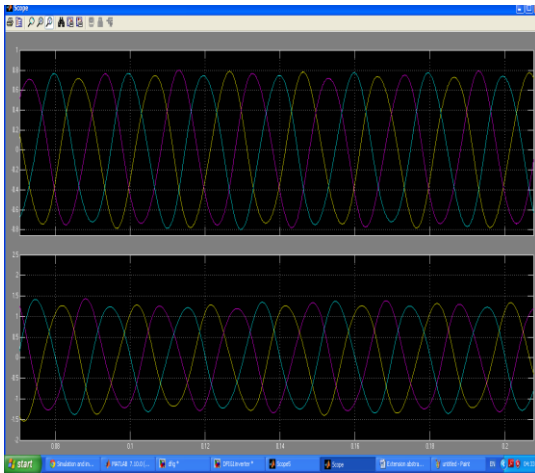
Double fed Induction motor outputs:



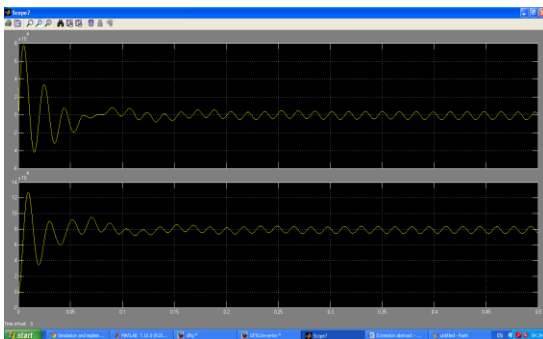
Outputs graphs at B1 Buses:



Voltage and current graphs at grid side:



Active and reactive power at grid side:



3. AN OVERVIEW OF PROJECTED SCHEME OF DC-CAPACITOR CURRENT CONTROL:

In order to get better consistency of doubly fed induction generator wind turbines, impacts of uneven grid voltage on dc capacitor required to be removed. For attaining of the objective, an appropriate control scheme has to be put into practice to augment unconstructive sequence rejection potential of system. Control organization has

to supply towards a modular structure proposal for significant doubly fed induction generator converters. In order to throw out disturbances and towards sustaining an elevated- phase margin, a dc-capacitor current control means was put forward by means of a resonant controller. Output of dc-capacitor current control loop is additional to output of existing control loop as a constituent of Grid-side converter voltage command. Generally Grid-side converter current control loop consist of necessary current control loop as well as a dc-capacitor current control loop. To assemble a modular proposal, the dc-capacitor current have to be noticed by Grid-side converter controller autonomously. In extensive power converters, a covered bus bar construction is utilized for a dc bus and such construction makes undeviating discovery of dc-capacitor current unfeasible. Capacitor current is ultimately detected by means of computing dc voltage of dc link. An overview of active power flow within DFIG turbine was shown in fig1. Projected control process makes Grid-side converter controller autonomous of RSC controller, as a result it is a practicable control means for doubly fed induction generator converters by means of a modular organization. Since dc-capacitor

current is not directly noticed through measuring dc voltage, no added hardware discovery circuitry is essential, which can set aside cost. Loop gain turns out to be huge sufficient to discard disturbances in control loop [6]. Phase margin of projected control system modifies to some extent when evaluated to using predictable control means hence, the impact of commenced.

4. CONCLUSION:

With permanent augmented capability of installed wind power, effects of wind power making on grid are increasingly significant. A new dc-capacitor current control means in support of a grid-side converter to get rid of the unconstructive impact of unstable grid voltage on dc-capacitors was introduced. In the projected system a dc- capacitor current control loop, where an unconstructive succession resonant controller is employed to augment loop gain, is additional to predictable grid-side converter current control loop. Under uneven conditions, huge low- frequency current as well as voltage ripple in dc-link capacitors of nonstop converter is one of most significant efforts of doubly fed induction generator. For attaining of the objective, an appropriate control scheme has to be put into practice to

augment unconstructive sequence rejection potential of system. Towards reducing unconstructive impact of second-order harmonic current in dc capacitor and thus increase consistency of dc-link capacitors of doubly fed induction generator converters, a dc capacitor current control means was introduced for a grid-side converter. The projected dc-capacitor current managing algorithm is put into practice in grid-side converter controller devoid of any power information. Quite a lot of control methods were presented for Grid-side converter controller to decrease voltage ripple throughout voltage unbalance, which is divided into feed-forward methods; dual current control methods; along with resonant controller methods. In order to throw out disturbances and towards sustaining an elevated- phase margin, a dc-capacitor current control means was put forward by means of a resonant controller. Projected control process makes Grid-side converter controller autonomous of RSC controller, as a result it is a practicable control means for doubly fed induction generator converters by means of a modular organization.

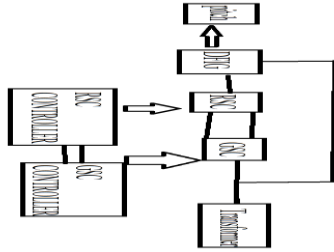


Fig1: An overview of active power flow within DFIG turbine.

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