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STUDYING OF FEATURES CONCERNING FAULT CURRENT IN DOUBLY FED INDUCTION GENERATORS

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ABSTRACT:

General wind turbines which were applicable in traditional wind farms is doubly fed induction generator, because of minute converter capacity, effective power control and its easy designing. Study regarding fault features of power grid is basis for evaluation of performance and study of relaying protection hence we introduce a technique for doubly fed induction generator features of fault current in non-severe fault. In our work we introduce a scheme which is appropriate for studying of doubly fed induction generator features of fault current by various strategies for low voltage ride through. Dynamic response of rotor-side converter is estimate based on the situation when external power control loop is minimized and reference signals regarding inner rotor control loop are set aside stable. Fault characteristics of stator current are considered and analytic expressions of stator fault current are attained.

Keywords: Wind turbines, Doubly fed induction generator, Fault current, Non-severe fault, Rotor-side converter, Power grid, Low voltage ride through.

1. INTRODUCTION:

With increased ability of grid associated wind power, for making of wind turbines to offer grid support all through grid voltage dips, the novel codes are required to contain ability of low voltage ride through. For managing of the protection issues of power grid, fault current features of doubly fed induction generator have to be studied [1]. Theoretical technique in support of fault

current characteristics of doubly fed induction generator in the situations of non-severe fault is projected. For features of fault current when severe fault will occur and crowbar security is turned on, many research works were performed. In non-severe fault circumstances, active response of ac/dc/ac converter will give more difficult features of fault current of doubly fed induction generator that are tricky to analyze. Fault current of doubly fed induction generator is considered on assumption that excitation current will continue stable prior to and following occurrence of faults or else increase speedily to utmost value and then maintain stable throughout grid faults. During fault transient, it is hard to manage process of doubly fed induction generator to function by means of unity power factor and confine utmost wind power. In non-severe faults, fault current that is offered by doubly fed induction generator will include stator fault current as well as fault current of grid side converter. Active features of response as well as stator fault current were considered in or work. In our work we introduce a technique for doubly fed induction generator features of fault current in non-severe fault circumstances [2]. Active response of rotor-side converter is estimate based on the situation when external power control loop is minimized and reference signals regarding inner rotor control loop are set aside stable. The simple models of calculation of rotor fault current are recognized consistent with various principles of designing of inner rotor current controller. Fault features of stator current are considered and analytic expressions of stator fault current are attained. The proposed scheme is appropriate for studying of doubly fed induction generator features of fault current by various strategies for low voltage ride through.

2. METHODOLOGY:

Rising penetration of doubly fed induction generators will provide problems to the established relay protection of power grid, as relaying protection will identify fault element on basis of change features of electrical quantity. For overseeing of the protection issues of power grid, fault current features of doubly fed induction generator have to be studied. In severe faults that takes place close to doubly fed induction generator and cause stator voltage to drop seriously, to ensure the safety of doubly fed induction generator crowbar protection is activated to short circuit rotor windings and

avert surge current from rotor-side converter. For features of fault current when severe fault will occur and crowbar security is turned on, many research works were performed. In non-severe faults which take place far from doubly fed induction generator, crowbar protection is not activated. In these circumstances, active response of ac/dc/ac converter will give more difficult features of fault current of doubly fed induction generator that are tricky to analyze. Theoretical method in support of fault current characteristics of doubly fed induction generator in the situations of non-severe fault is projected. The features of fault current of doubly fed induction generator, for instance transient components as well as damping time constant, are different in severe and non-severe faults [3]. They are different from traditional synchronous generator. It is required to learn features of fault current of doubly fed induction generator in these severe and non-severe faults separately. It is difficult to handle operation of doubly fed induction generator to function by means of unity power factor and confine utmost wind power; additionally, measurements of active with reactive power are imprecise and common method is to shut down external power loop during the identification of fault. We introduce a technique for doubly fed induction generator features of fault current in non-severe fault [4]. Active response of rotor-side converter is estimate based on the situation when external power control loop is minimized and reference signals regarding inner rotor control loop are set aside constant. Fault features of stator current are considered and analytic expressions of stator fault current are attained.

3. AN OVERVIEW OF PROPOSED SYSTEM:

In non-severe faults, fault current that is offered by doubly fed induction generator will include stator fault current as well as fault current of grid side converter. The fault current of grid side that is offered by grid side converter is so minute that it contains restricted control on fault current that is offered by doubly fed induction generator. Hence dynamic features of response as well as stator fault current were considered in or work. We introduce a technique for doubly fed induction generator features of fault current in non-severe fault circumstances. In non-severe faults which take place far from doubly fed induction generator, crowbar protection is not activated. In these circumstances, active response of converter

will give more difficult features of fault current of doubly fed induction generator that are tricky to analyze. It is necessary to learn features of fault current of doubly fed induction generator in these severe and non-severe faults. The characteristics of fault current of doubly fed induction generator are different in severe and non-severe faults. An effective method in aid of fault current characteristics of doubly fed induction generator in the situations of non-severe fault is projected. The system is suitable for studying of doubly fed induction generator features of fault current by various strategies for low voltage ride through. Active response of rotor-side converter is estimate based on the situation when external power control loop is minimized and reference signals regarding inner rotor control loop are set aside stable. Fault features regarding stator current are considered and analytic expressions of stator fault current are attained [5]. The easy models of calculation of rotor fault current are recognized consistent with various principles of designing of inner rotor current controller. During fault transient, it is difficult to manage the operation of doubly fed induction generator to function by means of unity power factor and confine utmost wind power; additionally, measurements of active with reactive power are imprecise. General method is to shut down external power loop during the identification of fault. The operation features of inner rotor control loop are based on proportional gain as well as integral gain of controller. There are two principles of proportional gain as well as integral gain and they are choosing of sufficient controller constraint to create inner rotor controller a characteristic first-order system and the second one is choosing of enough parameters to build inner rotor controller as distinctive second order system [6]. Based on these principles, various models of calculation of rotor fault current is build and is important that constant of rotate inertia time of doubly fed induction generator is extremely huge, and modifications of electrical quantities are faster to rotate speed throughout fault transient time.

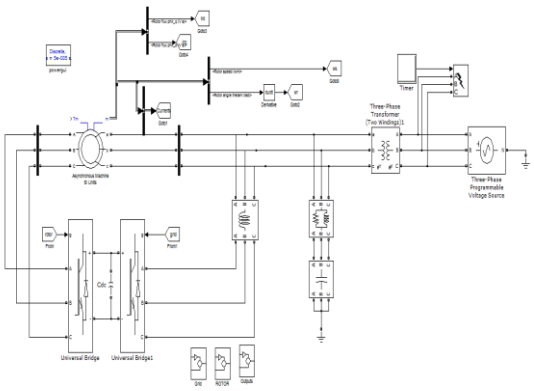

Fig1: model diagram

4. CONCLUSION:

The functional features of doubly fed induction generator in low voltage ride through contain much impact on fault features of voltage as well as current. Fault current concerning doubly fed induction generator is considered on assumption that excitation current will continue stable prior to and following occurrence of faults. In our work we initiate a method for doubly fed induction generator features of fault current in non-severe fault circumstances. The proposed system is suitable for studying of doubly fed induction generator features of fault current by various strategies for low voltage ride through. Energetic response of rotor-side converter is estimate based on the situation when external power control loop is minimized and reference signals regarding inner rotor control loop are set aside stable. Fault features concerning stator current are considered and analytic expressions of stator fault current are attained. The effortless models of calculation of rotor fault current are recognized consistent with various principles of designing of inner rotor current controller. Throughout fault transient, it is tricky to deal with the operation of doubly fed induction generator to function by means of unity power factor and confine utmost wind power; additionally, measurements of active with reactive power are imprecise. Common technique is to shut down external power loop during the identification of fault.

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