

인버터 부착형 농형 유도발전기의 계통고장특성 모의

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Grid faults characteristics simulation of inverter-fed induction generator

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The detail simulation modeling of fully-fed induction generator is investigated through PC based MATLAB/Simulink environment. Generator's stator currents are controlled by indirect vector control method. In this method, generator side converter controls the maximum excitation (air gap flux) by stator d-axis current and controls generator torque by stator q-axis current. Induction generator speed is controlled by tip speed ratio (TSR) upon the wind speed variations in order to generate the maximum output power. The generator torque model is specified as a 3-blade wind turbine with rating, then, the model is simulated under normal operating condition and three different fault conditions. The matlab model designed for fully-fed induction generator based wind farm provides good performance under normal and grid fault conditions. It provides good results for different pwm techniques and fault conditions except the single-phase line to ground fault, which should be verified with real time data from wind farms.

Key words : FFIG:fully-fed induction generator(인버터 부착형 농형 유도발전기), LVRT-low voltage ride through(저전압보상), Wind turbine generator(풍력발전기), DC link inverter(DC링크인버터)

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응력해석을 통한 풍력 발전기용 피치/요 베어링 설계 검증

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Design evaluation of wind turbine pitch/yaw bearings by contact stress analysis

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Wind turbine pitch/yaw bearings are relatively big and have different operating conditions like very heavy load to support compared with widely used industrial bearings. Once pitch/yaw bearings failed, according to their special surroundings, serious damages like higher repair costs and additional costs by stopped electricity generation are occur. Therefore, pitch/yaw bearings must be designed to have enough strength and fatigue life under actual operating conditions.

In this study, with finite element analysis, it was investigated that stress distribution between rolling elements and raceway and comparatively analyzed using widely used guideline (NREL DG03). Design parameters of wind turbine pitch/yaw bearings are also analyzed, and it could be used as reference for the large bearing design field.

Key words : Wind turbine(풍력발전기), Pitch/yaw bearings(피치/요 베어링), Finite element analysis(유한 요소 해석), Stress(응력)

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