

## 900kW급 영구자석형 동기발전기 3차원 설계 및 코깅 토크 분석

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### 3D Design and Analysis of Cogging Torque in 900kW Permanent Magnet Synchronous Generator

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**Abstract** : Cogging Torque is induced by the magnetic attraction between the rotor mounted permanent magnet(PM) and the stator teeth. This torque is an unwanted effect causing shaft vibration, noises, metal fatigues and increased stator length. A variety of techniques exist to reduce the cogging torque of PM generator. Even though the cogging torque can be vanished by skewing the stator slots by one slot pitch or rotor magnets, manufacturing cost becomes high due to the complicated structure and increased material costs. This paper introduces a new cogging torque reduction technique for PM generators that adjusts the azimuthal positions of the magnets along the circumference. A 900 kW class PMSG model is simulated using a three dimensional finite element method and the resulting cogging torques is analyzed using the Maxwell tensor stress tensor. Using the 3D simulation, the end contribution of the cogging torque is accurately calculated.

**Key words** : 3D Analysis(3차원 분석), Permanent Magnet(영구자석형), Synchronous Generator(동기발전기), Cogging Torque(코깅 토크), Finite Element method(유한요소법), end contribution(끝단 효과)

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