REVIEW

Title :"Electric Machines Design using speed and motor-cad"
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Editor:"Motor Design Limited (www.motor-design.com), 2013

The main audience of the book: industrial engineers that prepare for electric machine design, R&D electrical engineers, graduate electrical engineering students and Faculty, Project Managers in electrical engineering industries.

This book deals with the practical design of electric machinery. Electric machinery are key to electric energy generation (generators) and electric motion control in all industries(motors).While R&D people are abundantly "produced" by Universities ,mainly through Ph.D. programs, there is a scarcity of electric machine engineers; yes, we are talking only high performance electric machines with power electronics control (mainly).

The authors, two of the very experienced people in the field, with wide range visibility, are producing a unique practical guide for designing as many as 11 types of electric machines using the SPEED (for electromagnetics) and Motor-CAD(for thermic) software packages owned by www.motor-design.com , and developed over the years by themselves ,mainly.

The book starts by describing the Software main attributes and then proceeds with design case studies of 11 types of electric machines, most associated with power electronics: BLDC PM motor, IPMSM,BLAC PM motor, reluctance synchronous motor ,3 phase induction motor,1-phase induction motor, PM d.c. commutator motor, universal motor, switched reluctance motor, salient pole wound synchronous generator and axial airgap PMSM.

For each motor the presentation starts with the specifications , describes a few fundamental formulae, calculates the main geometry parameters by the Software (SPEED), discusses the performance and operates changes in open loop until electromagnetic (torque, efficiency etc.) specifications are met by the analytical design methodologies in the Software; then the authors call their embedded (proprietory) FEM for key verifications; and check again the performance and come back again to the analytical design code and so on until the design is satisfactory; then thermal Software (Motor-CAD) is used and illustrated for steady state and transients; again, changes are operated until the thermal constraints are met. On the way the authors introduce hard-learned "wisdom pills for design" based on their experience, as design is both art and science because (among other things) the number of variables is in general larger than the number of equations in the machine model; so intelligent approximations are needed all the way.

This "open loop" thorough design algorithm provides the designer with a solid ground for a healthy design; but not an optimal design; optimal, in the sense of including the optimization mathematical algorithm in the design software with a complex objective (fitting) function etc. It is thus for each designer to do optimization design on his own or this missing link will be completed by authors for a future edition.

This practical EM design guide is different from the design textbooks, where each variable, formula and calculation sequence, is detailed; but it is unique (in the world, so far) in providing key knowledge of industrial (rather than academic only) value in a minimum of time. No wonder the top expertize of the authors in the field contributed to the remarkable clarity depth and insights of their book. Not to mention the joy of its literary-like English.

As of such, I warmly recommend this practical guide in designing electric machines to all interested in electric motors and generators associated (or not) with power electronics control of motion and (or) of electric energy flow; for better energy use and higher industrial productivity.

To acquire the book, please write to:shirley.carnegie@motor-design.com

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