CURRICULUM VITAE

Arne Nysveen

PERSONAL DATA:

Date of Birth:	June 21st 1965 in Hamar, Norway
Address:	Nordre Hallsetveg 99, N-7023 Trondheim
Nationality:	Norwegian

PRESENT POSITION:

Professor in Electrical Power Engineering (power apparatus), Department of Electrical Power Engineering, NTNU.
Scientific Advisor, SINTEF Energy Research, Trondheim, Norway.
Norwergian Hydropower Centre (NVKS), Research coordinator Electro-discipline
FME HydroCen. Research manager for Work Package on “Turbine and Generator Innovation”
Direktør Sven Adolf Solbergs Forskningsfond ved Norges tekniske høgskole. Chairman of the Board.
IEC/NEK. National Chairman NK-2: Rotating machines.

ACADEMIC BACKGROUND:

1994	Dr. ing. (PhD) from Norwegian Institute of Technology (NTH), Department of Electrical Power Engineering. Thesis on numerical calculations of transient magnetic fields in moving systems.
1988	Sivilingeniør (M.Sc.) from Norwegian Institute of Technology, Department of Electrical Power Engineering.

PROFESSIONAL EXPERIENCE:

2013	**Smartmotor AS** Position: Research fellow. Sabbatical stay for 7 months.
2011	**Smartmotor AS** Position: Research fellow. Sabbatical stay for 5 months.
2002 -	**Norwegian University of Science and Technology, Department of Electric Power Engineering** Position: Professor
2002 -	**SINTEF Energy Research** Position: Scientific Advisor
2001 - 2002	**Norwegian University of Science and Technology, Department of Electric Power Engineering** Position: Professor II (Adjunct professor in Electric Machinery)

1995 - 2002 **ABB Corporate Research, Norway**
Position: Principal Scientist

1994-95 **Norwegian Electric Power Research Institute (EFI)**
Position: Research Scientist

AWARDS:

"1999 Woefel Best Mechanical Design Innovation Award", Awarded by American Society of Mechanical Engineers (ASME), Offshore Technology Conference (OTC), May, 1999 for MECON High-Voltage Connector (Received together with I. Østergaard and T. Romanisko).

PUBLICATIONS:

Journals and Transactions:

1. Magnusson, Niklas; Eliassen, Jan Christian; Abrahamsen, Asger Bech; Hellesø, Svein Magne; Runde, Magne; Nysveen, Arne; Moslått, Lars-Erik; Bjerkli, Jarle; King, Patrick. "Fabrication of a scaled MgB2 racetrack demonstrator pole for a 10 MW direct drive wind turbine generator". IEEE transactions on applied superconductivity. vol. 28:5207105 (4), 2018.
2. Valavi, Mostafa; Devillers, Emile; Le Besnerais, Jean; Nysveen, Arne; Nilsen, Roy. "Influence of Converter Topology and Carrier Frequency on Airgap Field Harmonics, Magnetic Forces, and Vibrations in Converter-Fed Hydropower Generator". IEEE transactions on industry applications. vol. 54 (3), 2018
3. Valavi, Mostafa; Jørstad, Kari Gjerde; Nysveen, Arne. " Electromagnetic analysis and electrical signature-based detection of rotor inter-turn faults in salient-pole synchronous machine". IEEE transactions on magnetics. vol. 54 (9), 2018.
4. Valavi, Mostafa; Nysveen, Arne. " Variable-speed operation of hydropower plants: past, present, and future". IEEE Industry Applications Magazine. vol. 24 (5), 2018.
5. Zhang, Zhaoqiang; Nilssen, Robert; Muyeen, S.M.; Nysveen, Arne; Al-Durra, Ahmed. "Design optimization of ironless multi-stage axial-flux permanent magnet generators for offshore wind turbines". Engineering optimization (Print). vol. 49 (5), 2017.
6. Abdelmalik, Abdelghaffar Amoka; Borge, Malin Drevdal; Nysveen, Arne; Lundgaard, Lars Esben; Linhjell, Dag. "Statistical analysis of dielectric breakdown of liquid insulated printed circuit boards". IEEE transactions on dielectrics and electrical insulation. vol. 23 (4), 2016.
7. Abdelmalik, Abdelghaffar Amoka; Nysveen, Arne; Lundgaard, Lars Esben. "Partial discharges in liquid embedded power electronics: Effects of pressure and liquid nature under negative pulse voltage stress". IEEE transactions on dielectrics and electrical insulation. vol. 23 (2), 2016.
8. Lotfi, Abbas; Hoidalen, Hans Kristian; Agheb, Edris; Nysveen, Arne. «Characterization of magnetic losses in the transformer tank steel". IEEE transactions on magnetics. vol. 52 (4), 2016.
9. Valavi, Mostafa; Le Besnerais, Jean; Nysveen, Arne. « An Investigation of Zeroth-Order Radial Magnetic Forces in Low-Speed Surface-Mounted Permanent Magnet Machines". IEEE transactions on magnetics. vol. 52 (8), 2016.
10. Abdelmalik, Abdelghaffar Amoka; Nysveen, Arne; Lundgaard, Lars Esben. "Influence of fast rise voltage and pressure on partial discharges in liquid embedded power electronics". IEEE transactions on dielectrics and electrical insulation. vol. 22 (5), 2015.
11. Magnusson, Niklas; Eliassen, J. C.; Abrahamsen, A.B.; Nysveen, Arne; Bjerkli, Jarle; Runde, Magne; King, Patrick. "Design aspects on winding of an MgB2 superconducting generator coil". Energy Procedia. vol. 80. 2015.
12. M. Valavi, A. Nysveen, R. Nilssen. "Effects of Loading and slot harmonic on Radial Magnetic Forces in Low-Speed Permanent Magnet Machine with Concentrated Windings". IEEE Transactions on Magnetics, Vol. 51, 2015.

13. M. Valavi, A. Nysveen, R. Nilssen, R. D. Lorenz, and T. Rølvåg. "Influence of pole and slot combinations on magnetic forces and vibration in low-speed PM wind generators. *IEEE Transactions on Magnetics, vol. 50, No. 5,* May, 2014.
14. Z. Zhang, A. Chen, A. Matveev, R. Nilssen and A. Nysveen. "High-power generators for offshore wind turbines." *Energy Procedia, pp 52-61, vol. 35,* 2013.
15. M. Istad, M. Runde, A.Nysveen. "A Review of Results From Thermal Cycling Tests of Hydrogenerator Stator Windings". IEEE Transactions on Energy Conversion. Vol. 26, No.3, pp. 890-903, 2011.
16. A. Chen, R. Nilssen, A. Nysveen. "Performance Comparisons Among Radial-Flux, Multistage Axial-Flux, and Three-Phase Transverse-Flux PM Machines for Downhole Applications". IEEE Transactions on Industry Applications. Vol. 46, No.2, pp. 779-789,2010.
17. M. T. Do, A. Nysveen, L. E. Lundgaard, S. Ingebrigtsen. "An Experimental Study on the Effect of DC Bias on Streamer Initiation and Propagation in a Dielectric Liquid under Impulse Voltage". IEEE Transactions on Dielectrics and Electrical Insulation, Vol. 16, No.6, pp.1623-1631, 2009.
18. A. Nysveen, H. Kulbotten, J. K. Lervik, A. H. Børnes, M. Høyer-Hansen, J. J. Bremnes. "Direct electrical heating of subsea pipelines - Technology development and operating experience", IEEE Trans. on Ind. Applications, vol 43, no.1, pp. 118-129, 2007.
19. I. Østergaard, G.Sande, A. Nysveen and F. Greuter, "MECON: - a novel high-voltage subsea power connector". ABB Review , No. 3, June, 1999.
20. A. Nysveen and R. Nilssen, "Time Domain Simulation of Magnetic Systems with general Moving Geometry", IEEE Trans. on Magnetics, vol. 33, No. 2, March 1997.

Refereed conference papers (since 2011):

1. Aakre, Torstein Grav; Ildstad, Erling; Hvidsten, Sverre; Nysveen, Arne. "Review of Partial Discharge and Dielectric Loss Tests for Hydropower Generator Bars". Proceedings of the Nordic Insulation Symposium. vol. 25, 2017.
2. Chen, Anyuan; Nysveen, Arne; Høyer-Hansen, Martin; Lervik, Jens Kristian. "Analytical and FEM Calculation of Electrical Parameters of Carbon Steel Pipe in DEH Systems". *Proceedings IEEE International Magnetic Conference - INTERMAG-2018.* ISBN 978-1-5386-6425-4. 2018
3. Chen, Anyuan; Nysveen, Arne; Lervik, Jens Kristian; Høyer-Hansen, Martin. «Prediction of Heating Power in Magnetic Pipe Conducting Large AC Current With High Frequencies Up to 200Hz". *Proceedings IEEE International Magnetic Conference - INTERMAG-2018.* ISBN 978-1-5386-6425-4. 2018.
4. Engevik, Erlend Løklingholm; Valavi, Mostafa; Nysveen, Arne. «Analysis of Additional Eddy-Current Copper Losses in Large Converter-Fed Hydropower Generators". Proceedings 2018 XIII International Conference on Electrical Machines (ICEM), pp.1067-1073. IEEE, ISBN 978-1-5386-2477-7. 2018.
5. Engevik, Erlend L.; Hestengen, Truls; Valavi, Mostafa; Nysveen, Arne. «Effects of lifting reactance requirements on the optimal design of converter-fed synchronous hydrogenerators". Proc*. IEEE International Electric Machines and Drives Conference - IEMDC.* ISBN 9781509042814. 2017.
6. Engevik, Erlend L.; Valavi, Mostafa; Nysveen, Arne. «Influence of winding layout and airgap length on radial forces in large synchronous hydrogenerators". *Proc. 20th International Conference on Electrical Machines and Systems (ICEMS).* ISBN 978-1-5386-3246-8. 2017.
7. Valavi, Mostafa; Nysveen, Arne; Nilsen, Roy. «Investigation of magnetic field and radial force harmonics in a hydrogenerator connected to a three-level NPC converter". *Proc. 43rd Annual Conference of the IEEE Industrial Electronics Society (IECON 2017).* ISBN 978-1-5386-1127-2. 2017
8. Valavi, Mostafa; Nysveen, Arne; Nilsen, Roy; Le Besnerais, Jean; Devillers, Emile. "Analysis of magnetic forces and vibration in a converter-fed synchronous

hydrogenerator". *Proc. IEEE Energy Conversion Congress and Expo (ECCE) 2017*. ISBN 978-1-5090-2998-3. 2017.

9. Engevik, Erlend L.; Valavi, Mostafa; Nysveen, Arne. «Efficiency and loss calculations in design of converter-fed synchronous hydrogenerators". *Proc. XXII International Conference on Electrical Machines (ICEM 2016) IEEE Conference Proceedings.* pp. 1636-1642. ISBN 978-1-5090-2538-1. 2016.
10. Valavi, Mostafa; Nysveen, Arne. "Variable-Speed Operation of Hydropower Plants: Past, Present, and Future". *Proc. XXII International Conference on Electrical Machines (ICEM 2016) IEEE Conference Proceedings.* pp. 640-646. ISBN 978-1-5090-2538-1. 2016.
11. Valavi, Mostafa; Pascal, Jules; Nysveen, Arne. "Analysis of Radial Magnetic Forces in Hydrogenerators with Fractional-Slot Windings". *Proc. XXII International Conference on Electrical Machines (ICEM 2016) IEEE Conference Proceedings.* pp. 1318-1324. ISBN 978-1-5090-2538-1. 2016.
12. Lervik, Jens Kristian; Iversen, Øyvind; Nysveen, Arne. «Low Power DEH System for Flow Assurance". *Proceedings of the twenty-fifth International Ocean and Polar Engineering Conference - ISOPE 2015*. International Society of Offshore & Polar Engineers, ISBN 978-1-880653-89-0, 2015
13. Matveev, Alexey; Valavi, Mostafa; Nysveen, Arne; Nilssen, Robert. "Permanent Magnet Generator with Three Stators for Renewable Energy Converters". *Proc. IEEE International Magnetics Conference (INTERMAG),* 2014.
14. Valavi, Mostafa; Matveev, Alexey; Nysveen, Arne; Nilssen, Robert. "Multiple-airgap iron-cored direct-driven permanent magnet wind generators". *International conference on Electrical Machines, ICEM*. IEEE conference proceedings. ISBN 978-1-4799-4389-0. pp. 578-584, 2014.
15. Valavi, Mostafa; Nysveen, Arne; Nilssen, Robert. «Effects of loading on radial magnetic forces in low-speed permanent magnet machine with concentrated windings". *International conference on Electrical Machines, ICEM.* IEEE conference proceedings. ISBN 978-1-4799-4389-0. pp. 1128-1132. 2014.
16. Solheim, Kristian Thinn; Nysveen, Arne. "Hydrate Management of Jumpers by Electrical Heating." *Proceedings of the Twenty-fourth (2014) International Offshore and Polar Engineering Conference,* International Society of Offshore and Polar Engineers (ISOPE) pp. 52-55, June, 2014, ISBN 978-1-880653-91-3.
17. Lervik, Jens Kristian; Solheim, Kristian Thinn; Nysveen, Arne. "Design of DEH Systems for Hydrate Management." I: *Proceedings of the Twenty-fourth (2014) International Offshore and Polar Engineering Conference,* International Society of Offshore and Polar Engineers (ISOPE) pp. 265-269, June, 2014, ISBN 978-1-880653-91-3.
18. Zhang, Zhaoqiang; Matveev, Alexey; Nilssen, Robert; Nysveen, Arne. "Ironless multi-stage axial-flux permanent magnet generator for offshore wind power application." Proc. 12th Joint MMM/IEEE Intermag Conference, Januaray, 2013.
19. Valavi, Mostafa; Nysveen, Arne; Nilssen, Robert. «Influence of slot harmonics on radial magnetic forces in low-speed PM machine with concentrated windings." *IEEE International Conference on Electrical Machines and Systems (ICEMS), October, 2013*, ISBN 978-1-4799-1446-3
20. Valavi, Mostafa; Nysveen, Arne; Nilssen, Robert. «Analysis of a low-speed PM Wind generator with concentrated windings in eccentricity conditions." *IEEE International Conference on Electrical Machines and Systems (ICEMS), October,* 2013, ISBN 978-1-4799-1446-3.
21. Lervik, Jens Kristian; Kulbotten, Harald; Nysveen, Arne; Iversen, Øyvind. «Developments of electrical heating for subsea pipelines." *Proc. International Conference on Heating by Electromagnetic Sources : induction, dielectric and microwaves, conduction & electromagnetic processing - HES-13*, pp 397—407, Padova, Italy, 2013 ISBN 978-8889884256.
22. Lervik, Jens Kristian; Kulbotten, Harald; Nysveen, Arne. «Flow Assurance by Electrical Heating of Long Pipelines". *Proceedings of The 23rd International Ocean and Polar Engineering Conference (ISOPE 2013)*. International Society of Offshore & Polar Engineers, pp. 113-117, June, 2013, ISBN 978-1-880653-99-9.
23. Valavi, Mostafa; Nysveen, Arne; Nilssen, Robert. «Characterization of radial magnetic forces in low-speed permanent magnet wind generator with non-overlapping

concentrated windings." *ICEM2012-XXth International Conference on Electrical Machines*. Marseille, France, Sept. 2012.

24. Valavi, Mostafa; Nysveen, Arne; Nilssen, Robert. "Magnetic forces and vibration in permanent magnet machines with non-overlapping concentrated windings: A review." *IEEE International Conference on Industrial Technology (ICIT) 2012.* Athens, Greece, March, 2012.
25. Zhang, Zhaoqiang; Matveev, Alexey; Nilssen, Robert; Nysveen, Arne. "Large-diameter Ironless Permanent Magnet Generator for Offshore Wind Power Application." *ICEM2012-XXth International Conference on Electrical Machines*. Marseille, France, Sept. 2012.
26. Zhang, Zhaoqiang; Matveev, Alexey; Nilssen, Robert; Nysveen, Arne. "Efficiency Calculation and Improvement of a Large-diameter Ironless Permanent Magnet Generator." *ICEMS 2012-International Conference on Electrical Machines and Systems*, Sapporo, Japan, Oct, 2012.
27. Hasheminezhad, Seyed Majid; Nysveen, Arne; Ildstad, Erling. "Evaluation of Dielectric Strength of the Solid-Solid Interfaces using Statistical Analysis of Contact." *IEEE PowerTech 2011 conference.* Trondheim, Norway, Jun, 2011
28. Lervik, Jens Kristian; Nysveen, Arne. "Improved Direct Electrical Heating Method for Flow Assurance". *ISOPE - International Offshore and Polar Engineering Conference.* Maui, Hawaii, Jun, 2011.
29. Zhang, Zhaoqiang; Matveev, Alexey; Øvrebø, Sigurd; Nilssen, Robert; Nysveen, Arne. "Review of modeling methods in electromagnetic and thermal design of permanent magnet generators for wind turbines." *International Conference on Clean Electrical Power (ICCEP-2011)*, Ischia, Itlay, Jun, 2011.
30. Zhang, Zhaoqiang; Matveev, Alexey; Øvrebø, Sigurd; Nilssen, Robert; Nysveen, Arne. "State of the art in generator technology for offshore wind energy conversion systems." *International Electric Machines and Drives Conference (IEMDC 2011)*. Niagara Falls, Canada, May, 2011.
31. Chen, Anyuan; Nilssen, Robert; Nysveen, Arne. "Analytical Design of a High-torque flux-Switching Permanent Magnet Machine by a Simplified Lumped Parameter Magnetic Circuit Model". *ICEM 2010 - 19th International Conference on Electrical Machines*. Rome. Italy.

OTHER PUBLICATIONS:

1. Nysveen, Arne; Korpås, Magnus. "Electricity for the future". Pan European Networks: Science and Technology Magazine, No. 11, pp. 90-91, 2014.

SELECTED PATENTS (Published):

WO0195177: "Method to provide maintenance and service for a power network", A. Nysveen, J.O. Gjerde, T. Haugen.
WO 0117092: "Electric Power Supervision", L. Gertmar, A. Nysveen, J.O. Gjerde, P.A. Löf.
WO 0117084: "Intelligent Synchronous Machine with rotating sensor and processing unit", L. Gertmar, A. Nysveen, J.O. Gjerde, P.A. Löf.
WO 0117085: "Material-Utilized alternating current machine", L. Gertmar and A. Nysveen.
WO 0034495: "Rotating Power System Stabilizer", L. Gertmar, A. Nysveen, P.A. Löf, T.F. Nestli.
WO 0034495: "Power Converter with rotating/stationary Communicating/Processing Means", L. Gertmar, A. Nysveen.
NO304.569/WO 9934495: "Anordning ved terminering av kabel", A. Nysveen, S. Rocke, F. Greuter, E. Jülke, J. Rhyner.
NO303.954 /US5.834.721/WO9821785: "Koblings- og brytersystem for undervanns elektrisk kraftdistribusjon", I. Østergaard, A. Nysveen.

PROFESSIONAL SOCIETIES:

- Senior member of the Institute of Electrical and Electronics Engineers (IEEE)
- Norsk Elektroteknisk Forening (NEF)
- TEKNA (Norske Sivilingeniørers Forening)

PROMOTED DOCTORS:

Erlend L. Engevik. 2019.
"Design and Operation Investigations for large Converter-Fed Synchronous Machines in Hydropower Applications". Main supervisor.

Astrid Røkke. 2017.
"Permanent Magnet Generators for Marine current Tidal Turbines". Co-supervisor.

Edris Agheb. 2017.
"Medium Frequency High Power Transformers for All-DC Wind Parks - Design, Modeling and Optimization".

Majid Hasheminezhad. 2016.
"Tangential Electric Breakdown Strength and PD Inception Voltage of Solid-Solid Interface". Co-supervisor.

Nina Sasaki Aanensen. 2015
"Air Load Break Switch Design Parameters." Co-supervisor.

Mostafa Valavi. 2015
"Magnetic Forces and Vibration in Wind Power Generators". Main supervisor.

Zhaoqiang Zhang. 2015
"Ironless Permanent Magnet Generators for Direct-driven Offshore Wind Turbines". Co-supervisor.

Erik Jonsson. 2014.
Thesis: ""Load Current Interruption in Air for Medium Voltage Ratings". Co-supervisor

Øystein Krøvel. 2011.
" Design of Large Permanent Magnetized Synchronous Electric Machines – Low Speed, High Torque Machines – Generator for Direct Driven Wind Turbine - Motor for Rim Driven Thruster". Co-supervisor.

Anyuan Chen. 2011.
"Investigation of PM Machines for Downhole Applications". Co-supervisor.

Atle Pedersen. 2008.
Thesis: "Forces Acting on Water Droplets in electrically Energized Oil Emulsions". Co-supervisor.

Frank Mauseth. 2007.
Thesis: "Charge accumulation in rod-plane air gap with covered rod". Main supervisor.

DOCTORIAL STUDENTS:

Hossein Ehya.
Research topic: "Electromagnetic Analysis and on-line fault description in Hydropower Generators". Main supervisor.

Wei Wang.
Research topic: "Investigation of power transformer core losses and stray losses under special working conditions". Main supervisor.

Raghbendra Tiwari.
Research topic: "Frequency converter solutions and control methods for Variable Speed reversible pump-turbine systems". Co-supervisor.

Torstein Grav Aakre.
Research topic: "Condition assessment of hydropower stator insulation". Co-supervisor.

Andre Büttner.
Research topic: "High frequency magnetic components for power electronics". Main supervisor.

Martin Høyer-Hansen.
Research topic: "Subsea electrical pipeline heating". Main supervisor.