

**Olav Roald Hansen, M.Sc.**
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Professional Profile

Olav Roald Hansen is Product Director of GexCon. His responsibilities include contributing to identify and develop new products as well as evaluate and improve current products and services, with main focus on FLACS software related products and services.

From 2008 to 2010 he served as President of GexCon US Inc., a subsidiary of GexCon AS. Mr. Hansen started the company in September 2008. GexCon US offer FLACS CFD-software sales and support, risk and safety studies (dispersion, explosion, fire), accident investigation, R&D services and testing.

From 2001 to 2008 Mr. Hansen was GexCon's R&D Director and Manager of the Software department, responsible for R&D, validation and sale of the FLACS CFD simulator, in this period the number of global FLACS customers increased from 15 to 60. He worked with gas explosion research and as model developer at CMR (Now GexCon) from 1993 and 2001.

FLACS is a world-leading CFD-tool for gas dispersion and explosion analyses for offshore safety, as well as other application areas like gas dispersion and hydrogen safety. In this work, Mr. Hansen has been responsible for various JIPs in the areas of explosion and dispersion (e.g. offshore safety, aerosol explosions, transformer safety, hydrogen safety). He has been central in development and validation efforts (explosion, dispersion, hydrogen, LNG) to make FLACS a leading CFD tool within process safety, and also performed consulting work using the FLACS software. He was central in developing the probabilistic explosion QRA-methodology applied by GexCon.

Mr. Hansen developed and implemented the structure of the 3-day FLACS-I training course in 1997, and has instructed over 300 people in FLACS training courses. He has also been invited to lecture at expert seminars all over the world and served as chairman at several conferences.

Recent focus has been on aerosol explosions, dust explosion modelling (DESC project), hydrogen safety (NoE HySafe, IEA Task 19 expert group) and dispersion (LNG, atmospheric dispersion, expert advisor for DARPA/DTRA/DHS projects).

Academic Credentials

Sivilingeniør (M.Sc.) Dep. of Physics 1992, Norwegian Inst. of Techn. (NTH), Trondheim, Norway

Diploma thesis in numerical modeling at Aerodynamisches Inst., RWTH Aachen, Germany 1991-1992

Languages

Norwegian, English, some German

Peer Reviewer

Reviewer for Journal of Hazardous Materials, International Journal of Hydrogen Economy, Journal of Loss Prevention in the Process Industry, Process Safety Progress, Process Safety and Environmental Protection, Geophysical Research Letters and Journal of Atmospheric Environment.

Selected Publications

Hansen is author or co-author for a range of papers on modelling of dispersion, explosions, validation, blast propagation, water mitigation, hydrogen safety, oil mist explosions, dust explosion modelling and QRA-methodology. Some of the recent papers are listed below.

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Publications 2010

Olav R Hansen, Peter Hinze, Derek Engel and Scott Davis (2010), Using computational fluid dynamics (CFD) for blast wave predictions, in press Journal of Loss Prevention in the Process Industries, doi:10.1016/j.jlp.2010.07.005.

Olav R Hansen, Filippo Gavelli, Mathieu Ichard and Scott Davis (2010), Validation of FLACS against experimental data sets from the model evaluation database for LNG vapor dispersion, in press Journal of Loss Prevention in the Process Industries, doi:10.1016/j.jlp.2010.08.005.

J. García, D. Baraldi, E. Gallego, A. Beccantini, A. Crespo, O.R. Hansen, S. Høiset, A. Kotchourko, D. Makarov, E. Migoya, V. Molkov, M.M. Voort, J. Yanez (2010). An intercomparison exercise on the capabilities of CFD models to reproduce a large-scale hydrogen deflagration in open atmosphere. International Journal of Hydrogen Energy, 35 (9). pp. 4435-4444

Prankul Middha, Olav R. Hansen, Joachim Grune and Alexei Kotchourko (2010). CFD calculations of gas leak dispersion and subsequent gas explosions: Validation against ignited impinging hydrogen jet experiments. Journal of Hazardous Materials, 179,(1-3), 84-94

Davis, S.G. & Hansen, O.R. (2010). New investigation findings on the 2006 Danvers, MA explosion. Journal of Loss Prevention in the Process Industries, 23 (2) 194-210

Publications 2009

Baraldi, D., Kotchourko, A., Lelyakin, A., Yanez, J., Middha, P., Hansen, O.R., Gavrikov, A., Efimenko, A., Verbecke, F., Makarov, D. & Molkov, V. (2009). An inter-comparison exercise on CFD model capabilities to simulate hydrogen deflagrations in a tunnel. International Journal of Hydrogen Energy, 34 (18): 7862-7872.

Hanna, S.R., Hansen, O.R., Ichard, M. & Strimatis, D. (2009). Computational fluid dynamics (CFD) model simulations of dispersion from railcar releases in industrial and urban areas. Atmospheric Environment, 43: 262-270.

Makarov, D., Verbecke, F., Molkov, V., Roe, O., Skotenne, M., Kotchourko, A., Lelyakin, A., Yanez, J., Hansen, O.R., Middha, P., Ledin, S., Baraldi, D., Heitsch, M., Efimenko, A. & Gavrikov, A. (2009). An intercomparison exercise on CFD model capabilities to predict a hydrogen explosion in a simulated vehicle refuelling environment. International Journal of Hydrogen Energy, 34 (6): 2800-2814.

Middha, P. & Hansen, O.R. (2009). Using computational fluid dynamics as a tool for hydrogen safety studies. Journal of Loss Prevention in Process Industries, 22 (3): 295-302.

Middha, P. & Hansen, O.R. (2009). CFD simulation study to investigate the risk from hydrogen vehicles in tunnels. International Journal of Hydrogen Energy, 34 (14): 5875-5886.

Middha, P., Hansen, O.R. & Storvik, I.E. (2009). Validation of CFD-model for hydrogen dispersion. Journal of Loss Prevention in the Process Industries, 22: 1034-1038.

Venetsanos, A.G., Papanikolaou, E., Delichatsios, M., Garcia, J., Hansen, O.R., Heitsch, M., Huser, A., Jahn, W., Jordan, T., Lacomme, J-M., Ledin, H.S., Makarov, D., Middha, P., Studer, E., Tchouvelev, A.V., Teodorczyk, A., Verbecke, F., van der Voort, M.M. (2009). An inter-comparison exercise on the capabilities of CFD models to predict the short and long term distribution and mixing of hydrogen in a garage. International Journal of Hydrogen Energy, 34 (14), 5912-5923.

Publications 2008

Hansen, O.R., Middha, P., 2008, CFD-based risk assessment for hydrogen applications, Process Safety Progress, 27(1), 29-34.

Hansen, O.R., Melheim, J.A., Storvik, I.E. (2008). Validating the data. *LNG Industry*, Spring 2008 Issue: 103-108.

Middha, P., Hansen, O.R., 2008, Predicting deflagration to detonation transition in hydrogen explosions, Process Safety Progress, 27(3), 192-204.

Skjold, T., van Wingerden, K., Hansen, O.R. & Eckhoff, R.K. (2008). Modelling of vented dust explosions – empirical foundation and prospects for future validation of CFD codes. HAZARDS XX, 14-17 April 2008, Manchester, UK. IChemE Symposium Series 154: 838-850.