

Curriculum Vitae

Personal data

Claes Fredö, 1963-06-16, Swedish
Married, two children

Education

- PhD, Technical Acoustics, Civil Engineering, Chalmers University of Technology 1995
- Lic.Eng., Technical Acoustics, Civil Engineering, Chalmers University of Technology 1993
- M.Sc. Mechanical Engineering, Chalmers University of Technology 1989

Languages

- Swedish - Very good
- English - Very good
- German - Basic

Employment

- Qring Technology International AB, 2012 - Present. Pricipal Consultant
- Qring Technology AB, 2007 - 2012. Pricipal Consultant
- ÅF-Ingemansson AB [a.k.a. DNV-Ingemansson, Ingemansson Automotive, Ingemansson Technology] 1996-2007: Senior Consultant
- Chalmers University of Technology 1990-1995: Research student
- Chalmers Industrial Technology 1988 - 1990: Consultant

Publications

1. J.C.O. Nielsen and C.R. Fredö, *Multi-disciplinary optimization of railway wheels*, J.SoundVibration, 293(3-5), p 510-521, 2006
2. C.R. Fredö, *A modification of the SEA equations: A proposal of how to model damped car body systems with SEA*, SAE 2005-01-2436, SAE 2005 NVH Conference in Traverse City.
3. C.R. Fredö, A. Hedlund, *NVH optimization of truck cab floor panel embossing pattern*, SAE 2005-01-2342, SAE 2005 NVH Conference in Traverse City.
4. C.R. Fredö, *SEA-like approach for the derivation of energy flow coefficients with a finite element model*, J.SoundVibration, 199 p. 654-666 1997
5. C.R. Fredö, *A Note on Conservative and Non-Conservative Coupling*, Proceedings of the IUTAM Symposium held in Southampton, UK 8-11 July 1997, editors Fahy, F.J.; Price, W.G.
6. FREDÖ, C R; LAVENO, A; SVENSSON, J; WILMAR, O; BRUNNER,O – *Force Measurements during Vibration Tests with Sinusoidal Base Excitation*, Proceedings European Conference on Spacecraft Structures, Materials and Mechanical Testing, 1997.
7. C.R. Fredö Ph.D. Thesis, *Statistical Energy Analysis and the Individual Case* Chalmers University of Technology, (1995).
8. M.A. Sanderson and C.R. Fredö *Direct Measurement of Moment Mobility, Part I: A Theoretical Study*, J.SoundVibration, 179(4), p. 669-684 1995
9. C.R. Fredö, Lic. Eng. Report F93-01, *Derivation of energy flow with a finite element model*, Chalmers University of Technology, (1993).
10. C.R. Fredö - about 40 conference papers on various subjects 1990-2007

Patents

1. C.R. Fredö and J Wigaard, (WO/2005/114035) VISCO ELASTIC DAMPING IN A PIPING SYSTEM.

Short description: Small Bore Fittings (SBFs) account for a large degree of vibration related fatigue failures on gas and liquid carrying piping. Such malfunction can have serious impact on health, safety, environment and economical aspects of plant operation. Damper link elements are applied to improve SBF robustness against vibration - thereby reducing risk and improving SBF fatigue life.

2. C.R. Fredö and A. Hedlund, (WO/2006/052210) STRUCTURAL ELEMENT. **Short description:** An optimization method for stiffening of plate type structural elements is invented. Stiffening is made using computed mode shapes that are imprinted on the original structural element. Use of structure modes or problem vibration shapes is demonstrated to be a very good choice of stiffening pattern. Optimization can be made in several ways and toward multi-disciplinary targets, e.g. localisation of stiffness into designed frequency ranges or tuning of individual modes. The optimization method was benchmarked with favourable results against a commercial shape optimisation product.

Professional Experience

Project examples:

- Car audio system component measurement and analysis, 1989
- Acoustic experimental modal analysis of premium car, 1989
- Measurement error analysis for in-cell powertrain sound power measurement, 1989
- Development of high performance acoustic insulation hangar door system, 1996
- Troubleshooting power steering system pulsation/vibration for premium car, 1996
- Model correlation & updating of FE model for pipe systems in a large building, 1996/7.
- Model correlation & updating of 6-dof Force Measurement Device and ESA Olympus Satellite model, 1996/7.
- Design of building modification for installation of heavy machinery, 1997.
- R&D of vibro-acoustic design methods for heavy vehicle cabs, 1997-2005
- R&D of vibro-acoustic design methods for hearing aids, 1999
- Design of quiet main generator set up for Kvitebjørn platform, 1999-2000
- Design modification of light bus exhaust system, 2000.
- R&D of vibro-acoustic design methods for heavy vehicle power trains, 2000-2005
- Troubleshooting gear whine problem for premium car, 2001-2002.
- Speed test of cardboard winder, 2001-2006.
- Advisory consulting for design based purchasing, 2002.
- Troubleshooting gas export compressor piping pulsation/vibration, offshore north sea platform, 2003-2007
- Acoustic fatigue load analysis of satellite antenna, 2001-2007
- Troubleshooting of vibration problem in luxury yacht, 2005.
- Multi-disciplinary optimization of train wheel wrt radiated noise, weight and fatigue, 2005.
- R&D for oven vibro-acoustic design. 2005.
- Development and application of in-pipe pulsation measurement using externally applied sensor. 2005.
- Design of high performance vibration isolation set up for FTF Nanolab at Lund University, 2005-2007
- 3rd party 'troubleshooting' of screw compressor and problem identification using sound from video recording
- and reports written by other party, Norwegian sector, 2007.
- On-site troubleshooting reciprocating gas export compressor pulsation/vibration and steam turbine, offshore
- Africa FPSO, 2006/7
- On-site troubleshooting of two systems in Nuclear facility, simulation and FE analysis for redesign. 2007-2008
- Research project on detection of fouling in waste furnace using vibration data. Värmeforsk. 2008-2010.
- Electrum Laboratory, Measurement and analysis of vibration in relation to new tram installation. 2009.

- On-site troubleshooting mudpump and project work on redesign of piping system for improved vibration robustness, how to remove shock and pulsation, Norwegian Sector 2008-Present
- Ekofisk 2/4L, FE design of new wall system, advanced testing on mockup and analysis, SMOE via Markhus AS, 2010-2011.
- Maxlab IV synchrotron radiation facility, Lund. Principal Advisor and 3rd party review. 2010-Present
- Participation in FEED studies for Aibel AS, 2000-present:
 - Gudrun
 - Troll A, TPC34, also A- and B- studies.
 - Ekofisk 2/4L
 - Ormen Lange (as subcontractor for FMC Technologies)
- Participation in EPC studies for Aibel AS, 2000-present:
 - Kvitebjørn. Analysis of structureborne sound transmission in platform using SEA.
 - Kvitebjørn, via Dresser-Rand. Design of a 2-stage AVM system for main generators.
 - Kollsnes plant. Design of damping countermeasure to reduce risk for Small Bore fatigue in gas piping.
 - Volve, FE analysis of deck vibration and countermeasure design.
 - Alvheim FPSO, FE analysis of deck vibration and countermeasure design.
 - Ettrick FPSO, FE analysis of deck vibration and countermeasure design.
 - Troll A, TPK system. Acoustic FE analysis and aeroacoustic troubleshooting wrt flow induced pulsation. Sea water return caisson. On-site measurement and analysis.
 - Kvitebjørn risers. Advisory consulting on the simulation of damping.
 - TC Mongstad. Aeroacoustic analysis, FE analysis of infrasound transmission through pipeshells, FE analysis of acoustic modes and advisory consulting.
 - Oseberg C updating of mudsystem. Design of a vibration decoupling system for new Triplex mudpump.
- Third Party Reviewer for Aibel
 - Risk for fatigue & vibration of- and pulsation from- heat exchanger unit.
- Measurement of dynamic strain on various platform structures. 2010-present.
- Troubleshooting and advisory guidance on how to deal with pulsation induced piping vibration for pumps during acid well stimulation. Guidance involves pump pulsation mitigating countermeasures as well as making piping more robust against pulsation loads. Installation of data logger onboard stim wessel for analysis of pump pulsation. 2011-present
- Measurement and qualification test of large return water caisson. 2011.
- Measurement and Experimental Modal Analysis of pipe system at large power plant. 2011.
- Pulsation measurement on low noise pump installation using piezocable. 2011-2012.
- Torsion laser vibration measurement and troubleshooting of large steam turbine vibration. 2012.
- Design guidance for offshore pump skid structure. 2011.
- Site survey for installation of new scientific machine. Site survey can entail magnetic field, sound and vibration measurements as well as guidance on how to isolate or reinforce site for improved machine performance. 2012
- Measurement of vibration and noise induced by Helicopter at offshore landing/take off. 2012
- Advisory guidance on experimental and computational methods to assess vibration risk for piping. 2012.
- Evaluation of Polytec Scanning Laser Vibrometer, 2013.
- Design of a low vibration piping system that is exposed to severe pulsation loads, 2012.
- Advisory Consulting on the Purchase of Condition Monitoring System, 2013.
- TLP Platform, jumper hose vibration measurement, 2013-ongoing.

Software Experience

1. SimLab, user revisions 5.1 to 7
2. MSC.Patran, experienced user since 1996
3. MSC.Nastran, experienced user since 1996
4. ABAQUS, user 1990-1995
5. FEMAP, occasional user since 1996
6. LMS OPTIMUS, experienced user since 1997
7. LMS Gateway, LMS Link, LMS PreTest, experienced user since 1996. Have held three courses on model correlation and quality assurance.
8. LMS SYSNOISE, experienced user since 1990. Have held five courses on SYSNOISE application.
9. LMS SEADS, experienced user since 1999
10. AutoSEA, experienced user since 1990 (world's 1st AutoSEA user). Have held two courses on SEA.
11. Matlab, [Octave, SciLab, etc], experienced user since 1989
12. DADS, occasional user since 1999
13. LMS FALANCS, occasional user since 1999
14. LMS Test.Lab, occasional user since 2005
15. LMS Cada-X, occasional user since 1996
16. Code Aster FE code, experienced user since 2007
17. Salome, Pre/Post, , experienced user since 2007.
18. AcqMat_1432, measurement software, experienced user since 2007
19. NI Sound & Vibration Measurement Suite, experienced user since 2007.
20. ModalView, measurement analysis and visualization software, experienced user since 2007
21. SpectraPro, software for Condition Monitoring, e.g. Route definition and data analysis, experienced user since 2005.

Certificates

OLF basic course with Helicopter Underwater Escape Training (HUET)
Safety and Security training for Oskarshamn, Ringhals, Barsebäck, and Forsmark plants. .