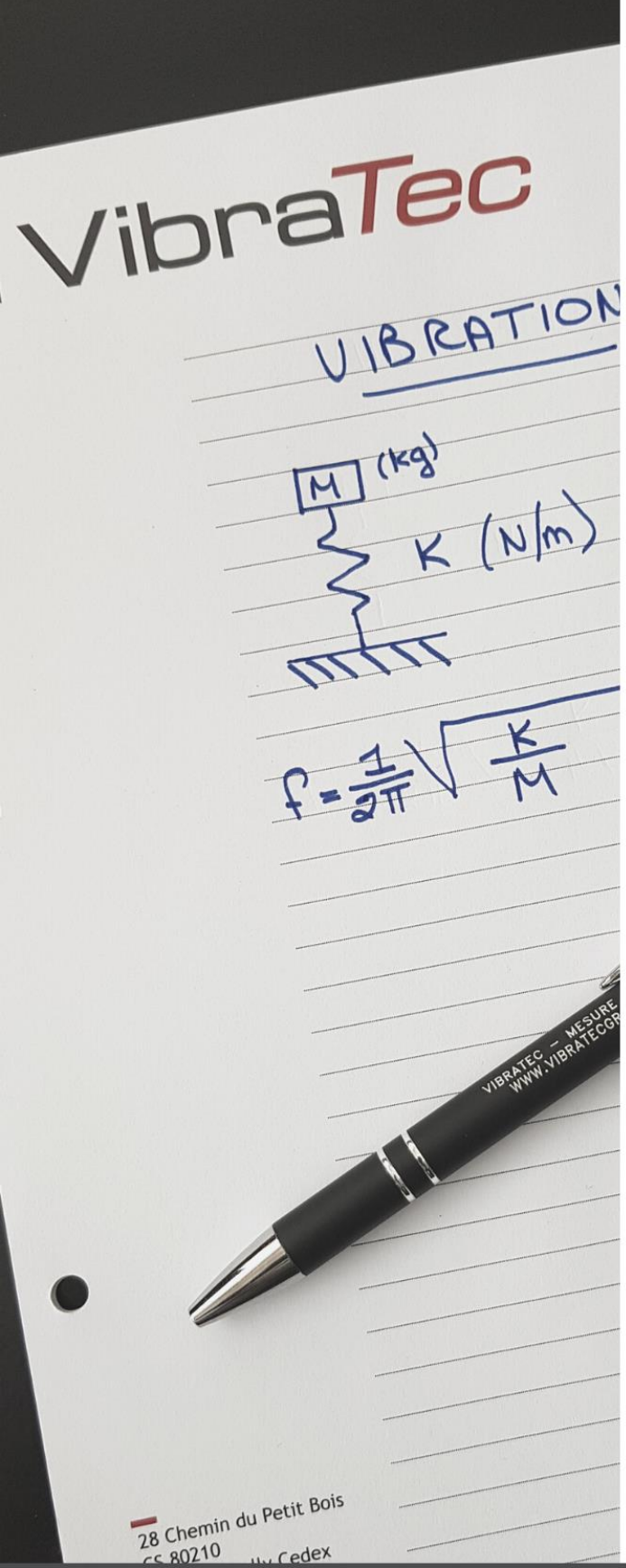

VibraTec

TRAINING PROGRAMS 2022

STRUCTURAL DYNAMICS, MECHANICAL RELIABILITY, NOISE & VIBRATION

CENTER OF EXCELLENCE & INNOVATION IN INSTRUMENTATION, ANALYSIS & COMPUTATION

Accredited training center

Title	Duration	Fee	Dates
Online Sessions			
Fundamentals of Acoustics	0.5 day	500 €	20 Jan - 6 Sept
Fundamentals of Signal Processing	0.5 day	500 €	24 Jan - 26 Sept
Fundamentals of Vibration	0.5 day	500 €	18 Jan - 5 Sept
Implementing Instrumentation	0.5 day	500 €	31 Jan - 19 Sept
General Training Courses			
General Acoustics & Vibration NEW	2 days	1 500 €	25-26 Jan - 7-8 Sept
Experimental Modal Analysis	2 days	1 500 €	10-11 Mar - 14-15 Sept
Experimental Vibration Analysis	2 days	1 500 €	8-9 Mar - 12-13 Sept
Human Vibration Exposure	1 day	900 €	On request
Signal Processing	2 days	1 500 €	2-3 Feb - 21-22 Sept
Vibration-Induced Pipework Failure	2 or 3 days	1 500 € / 2 000 €	15-17 Mar - 27-29 Sept
Industrial Sector Training Courses			
Automotive Acoustics	3 days	1 800 €	29-31 Mar
O&G Industry Vibration Control	2 days	1 500 €	On request
Railway Maintenance & Dynamics	2 days	1 500 €	On request
Railway Noise & Vibration Control	3 days	1 800 €	5-7 Apr - 4-6 Oct
Advanced Techniques			
Advanced Rotating Equipment Vibration Diagnosis NEW	2 or 3 days	1 500 / 1 800 €	22-24 Mar - 11-13 Oct
Accelerated Fatigue Testing	1 day	900 €	21 June - 1 Dec
Acoustic Imagery	2 + 1 days	1 500/900 or 1 800 €	17-19 May
Electronic & Vibrational Reliability	2 days	1 800 €	22-23 June - 6-7 Dec
Finite Element Model Updating	2 days	1 500 €	1-2 June - 15-16 Nov
Reliability Fatigue	2 days	1 500 €	14-15 June - 29-30 Nov
Rotor Dynamics	1 day	900 €	31 May - 8 Nov
Electrified Sub-assemblies - Epowertrain			
Gear Dynamics	2 days	1 500 €	8-9 June - 22-23 Nov
Noise from Electromagnetic Excitation	3 days	2 000 €	10-12 May - 18-20 Oct
Vehicle E-powertrain Integration	2 days	1 500 €	28-29 June - 13-14 Dec

VibraTec DATADOCKÉ

Accredited training center
www.vibratecgroup.com
+33 472 86 6565

Registration / cancellation up to 15 days before each session. For more information, or if you wish to inform us of a sensory or motor deficit, please contact formation@vibratec.fr

BESPOKE TRAINING PROGRAMS

All our training programs can be organized on demand to train a group of employees by targeting the specificities of their activity, their function and their tools (hardware, software). Group pricing applies to these sessions, which can be organized anywhere in the world, in your premises or any suitable location.

Standard Open Programs

Combinations of standard Programs

Custom-made Programs

All of our sessions are based on concrete cases from more than 30 years of experience in all industrial sectors: automotive, railway, aeronautics, energy, mechatronics, etc. Our software and hardware are of various brands, which allows us to use the tools most adapted to your needs.

Establish Goals

Determine Trainee Knowledge

Define Course Content & Duration

Customized training courses:

- Experimental Vibration Analysis & Using Force Sensors
- Rolling Noise Computation (Railway)
- Transfer Path Analysis
- Automotive Parasite Noise Analysis &
- System Vibration Uncoupling / Filtration
- Using Technical Software:
  - Transfer Paths with TestLab
  - Dynamic Model with ANSYS
  - Stardamp

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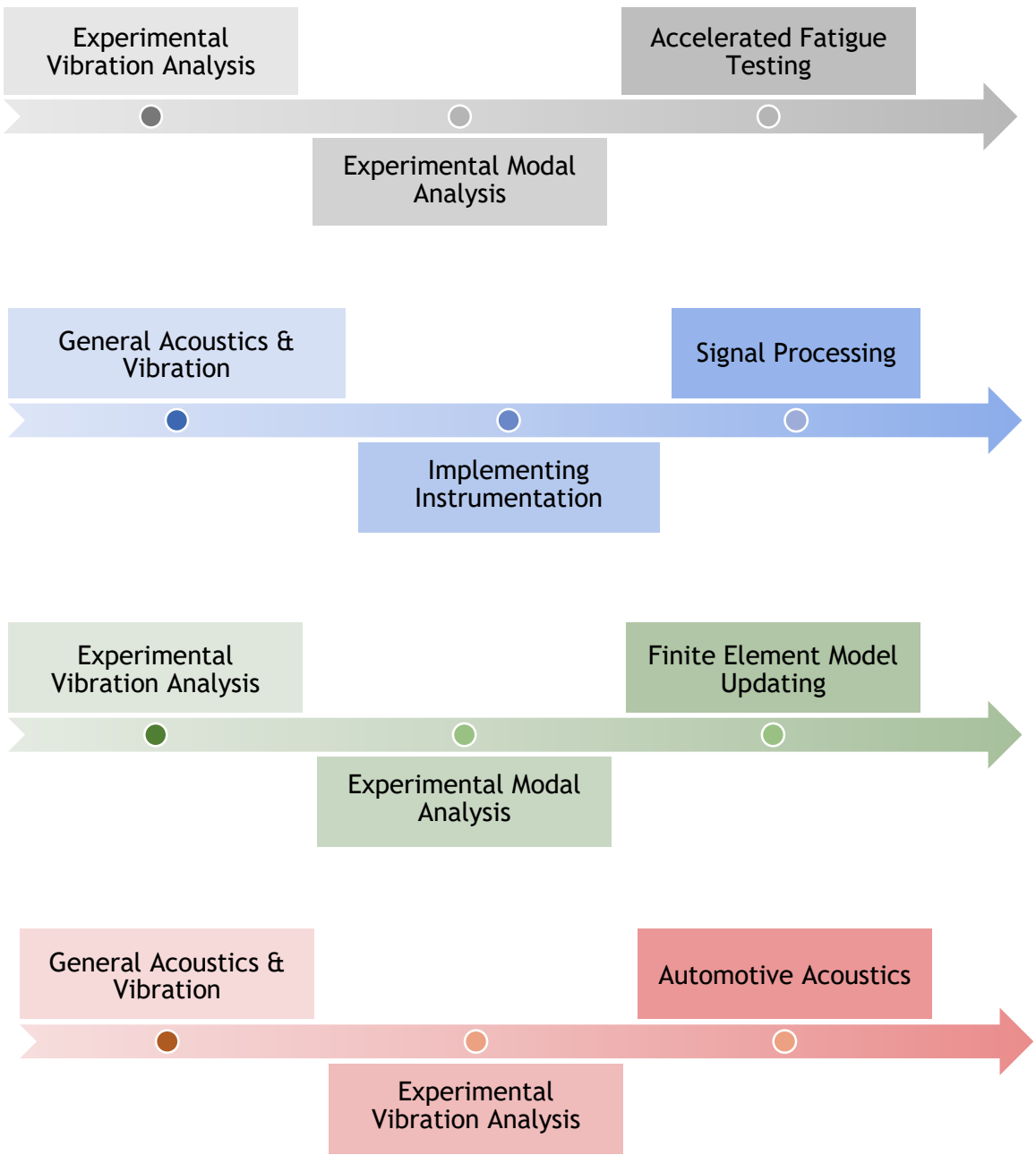
POSSIBLE LEARNING PATHWAYS

Sharing and transmitting our know-how with passion are our DNA. Our training programs are complementary and can be scheduled in sequence for a more consequent rise in competence.



KEY FIGURES

Average global appreciation: 4.6

★★★★★

Length	★★★★½
Content	★★★★½
Documentation	★★★★½
Activites	★★★★★
Reception	★★★★★
Overall appreciation	★★★★½

130
Trainees per year

43
Client companies
(since 2018)

45
Sessions given in client offices
(since 2018)

TESTIMONIALS *(given in French)*

"A good overview of possible measurements on concrete practical cases and all the pitfalls that should be avoided."

"A very good training program with very well-prepared material. The case study exercises during the session are impressive."

"Well-balanced training, between theory and application. Many practical concepts are covered, allowing for an understanding of the physics of the phenomena."

"Very good training (dynamic, pedagogy, popularization, etc)."

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FUNDAMENTALS OF ACOUSTICS

½ day - 500€

Presented by

Aurélien CLOIX

15 years of project experience

Sylvain ROCHE

11 years of project experience

Online sessions

Goals

- Know the terms used in acoustics as well as the main sources and modes of transmission

Participant profile

- Anyone who wants to learn the basics of acoustics

Prerequisites

- High School math & science (calculus, physics, etc)

Program

- Definitions and acoustic quantities
- Sound perception
- Sound sources and radiation
- Propagation in open field and in the presence of obstacles
- Internal acoustics
- Air and solid-state transmission

Sessions

- 20 January 2022 (afternoon CET)
- 6 September 2022 (afternoon CEST)

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.industrie@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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VibraTec

DATADOCKÉ

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FUNDAMENTALS OF SIGNAL PROCESSING

½ day – 500€

Presented by

Hugo SIWIAK

16 years of project experience

Renaud BERTONI

17 years of project experience

Online sessions

Goals

- Understand spectral analysis and know the parameters influencing processing

Participant profile

- Engineers and technicians who may need to use signal processing

Prerequisites

- Basic knowledge of acoustics and vibration

Program

- Temporal analysis
- Fourier Transform
- Sampling
- Spectral folding
- Palisade effect
- Real time analysis
- Averages

Sessions

- 24 January 2022 (afternoon CET)
- 26 September 2022 (afternoon CEST)

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.industrie@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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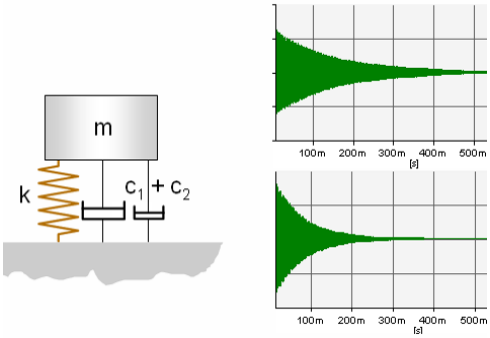
FUNDAMENTALS OF VIBRATION



½ day – 500€

Goals

- Know and understand the parameters used to characterize systems (eigenfrequencies, damping)

Participant profile

- Anyone who wants to acquire the basics in vibration

Prerequisites

- High School math & science (calculus, physics, etc)

Program

- System response at 1 ddl
- System response to N ddl
- Amortization
- Graphic representations
- Vibration isolation

Sessions

- 18 January 2022 (afternoon CET)
- 5 September 2022 (morning CEST)

Presented by

Hugo SIWIAK

16 years of project experience

Sylvain ROCHE

11 years of project experience

Online sessions

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.industrie@vibratec.fr

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IMPLEMENTING INSTRUMENTATION

½ day – 500€

Goals

- Differentiate sensors and to know how to implement a measurement chain.

Participant profile

- Technicians and engineers required to organize and/or carry out measurements

Prerequisites

- Basic knowledge of acoustics and/or vibration

Program

- Goals of the measurements
- Various sensors
- Interfaces with the structure
- Conditioners and analyzers
- Precautions to take
- Associated costs

Sessions

- 31 January 2022 (afternoon CET)
- 19 September 2022 (afternoon CEST)

Presented by

Renaud BERTONI

17 years of project experience

Hugo SIWIAK

16 years of project experience

Online sessions

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.industrie@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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NEW

GENERAL ACOUSTICS & VIBRATION

2 days – 1500€

Presented by

Hugo SIWIAK

16 years of project experience

Renaud BERTONI

17 years of project experience

Sylvain ROCHE

11 years of project experience

Goals

- Know the terms used in acoustics as well as the main sources and modes of transmission
- Know and understand the parameters used to characterize systems (eigenfrequencies, damping)

Participant Profile

- Anyone who wants to acquire a basic understanding of acoustics and vibration in an industrial environment

Prerequisites

- High School math & science (calculus, physics, etc)

Program

- Definitions and acoustic quantities
- Sound perception
- Sound sources and radiation
- Propagation in open field and in the presence of obstacles
- Internal acoustics
- Air and solid-state transmission
- System response at 1 ddl
- System response to N ddl
- Amortization
- Graphic representations
- Vibration isolation
- Hands-on work – industrial applications
- Visit VibraTec's lab

Sessions

- 25-26 January 2022
- 7-8 September 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.industrie@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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VibraTec

DATADOCKÉ

Accredited training center
www.vibratecgroup.com
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EXPERIMENTAL MODAL ANALYSIS

2 days – 1500€

Presented by

Hugo SIWIAK

16 years of project experience

Renaud BERTONI

17 years of project experience

Classroom training only

Goals

- Understand the pertinence of this structural characterization technique
- Explain the pertinence of EMA in vibration diagnosis.
- Demonstrate the basic skills necessary to use the technique
- Analyze results

Participant profile

- Technicians and engineers in maintenance, testing, laboratory & design offices

Prerequisites

- Basic understanding of vibration issues

Program

- Review of basic theory regarding vibration & structural dynamics
- Presentation of mode identification methods
- EMA implementation: measurement procedure & equipment
- Hands-on exercises using a mock-up:
  - Experimental mesh
  - Instrumentation
  - Data acquisition (FRF)
  - Mode parameters
  - Result analysis

Sessions

- 10-11 March 2022
- 14-15 September 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.industrie@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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VibraTec

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EXPERIMENTAL VIBRATION ANALYSIS

2 days – 1500€

Presented by

Hugo SIWIAK

16 years of project experience

Renaud BERTONI

17 years of project experience

Classroom training only

Goals

- Identify the causes of vibration problems
- Select and install the measurement equipment
- Differentiate vibration measurement techniques
- Propose solutions to mitigate vibration problems

Participant profile

- Service technicians / engineers in maintenance, testing, laboratory & design offices
- Project managers

Prerequisites

- Awareness of vibration problems
- Basic understanding of vibration issues

Program

- Presentation of vibration analysis methods
- Implementation of measurements in operation: choice of sensors, signal processing basics, result interpretation and analysis
- Implementation of vibration measurements at standstill: choice of excitation, frequency response functions
- Case studies on an industrial model

Sessions

- 8-9 March 2022
- 12-13 September 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.industrie@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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HUMAN VIBRATION EXPOSURE

1 day – 900€

Presented by

Sylvain ROCHE

11 years of project experience

Classroom training only

Goals

- Understand the basics of vibration analysis
- Differentiate the standards related to workers' exposure to vibration
- Negotiate contractual employee vibration requirements
- Understand how to protect workers from their vibratory environment

Participant profile

- Project or mechanical engineers
- Support technicians (maintenance)
- Workers' health committee / organizations

Prerequisites

- Basic knowledge of vibration
- Basic knowledge of signal processing

Program

- Introduction to vibration
- Presentation of measurement tools and methodologies
- Vibration source identification
- Types and characterization of vibratory responses
- Determination of exposition time
- Definition of vibratory comfort

Sessions

- On request

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.industrie@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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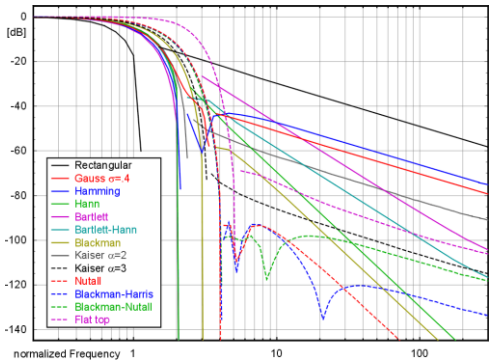
SIGNAL PROCESSING



2 days – 1500€

Goals

- Differentiate the main methods of signal processing applied to acoustics and vibrations
- Choose the type of analysis and the appropriate parameters
- Critically analyze results

Participant profile

- Test or simulation technicians
- Test or simulation engineers
- Engineering / BE managers

Prerequisites

- Basic knowledge of acoustics and vibration

Program

- Explanation of signal classification
- Presentation of time analysis
- Presentation of FFT Spectral analysis
- Presentation of system filtration analysis
- Introduction to Time-Frequency Analysis

Sessions

- 2-3 February 2022
- 21-22 September 2022

Presented by

Hugo SIWIAK

16 years of project experience

Jean-Baptiste DUPONT, PhD

14 years of project experience

Renaud BERTONI

17 years of project experience

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.industrie@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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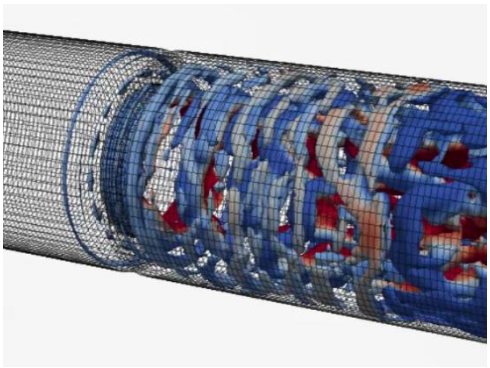
VIBRATION-INDUCED PIPEWORK FAILURE



2/3 days –
1500/2000€

Presented by

Loïc ANCIAN

13 years of project experience

Rémi SALANON

13 years of project experience

Goals

- Apprehend piping vibration issues
- Understand current screening & assessment methods for potentially critical lines
- Differentiate theoretical methods for calculating 'Likelihood of Failure (LOF)
- Define what constitutes 'good practice' for avoiding vibration-induced fatigue problems
- 3rd day: Perform dynamic calculations

Participant profile

- Project Engineers, Specialized Engineers (HSE, mechanical, structural, piping)
- Support services (maintenance, operation)

Prerequisites

- Basic knowledge of vibration
- Basic knowledge of facilities with piping (O&G, nuclear industry, etc)

Program

- Pipe vibrations: causes & consequences
- The Energy Institute Guidelines approach
- FIV - turbulence, AIV, other vibration sources
- Instrumentation & basic measurement techniques
- In-depth measurements & predictive techniques
- Troubleshooting vibration issues
- 3rd day: Dynamic calculations

Sessions

- 15-17 March 2022
- 27-29 September 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

oil.gas-assistant@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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VibraTec

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AUTOMOTIVE ACOUSTICS

3 days – 1800€

Presented by

Pascal BOUVET, PhD

28 years of project experience

Aurélien CLOIX

15 years of project experience

Hugo SIWIAK

16 years of project experience

Goals

- Summarize automotive acoustics
- Understand the analysis of physical & perceptive phenomena related to comfort
- Understand the relevance of integrating a vibro-acoustic approach into the general design & production process
- Identify the associated stakes and constraints

Participant profile

- Experienced engineers & technicians
- Project managers
- Manufacturers & OEMs

Prerequisites

- Notions in acoustics
- Basic knowledge of the automotive industry

Program

- Theoretical review
- Acoustics in the design process
- Automotive sounds and sound quality
- Computation & experimental methods
- Booming noise & case study
- Road noise
- Vehicle aeroacoustics
- Exterior noise

Session

- 29-31 March 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.automobile@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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OIL & GAS INDUSTRY VIBRATION CONTROL

2 days – 1500€

Presented by

Rémi SALANON

13 years of project experience

Loïc ANCIAN

13 years of project experience

Goals

- Understand vibration phenomena
- Appreciate the relevance of vibration calculations & measurements
- Propose effective technical approaches to prevent and/or solve vibration problems

Participant profile

- Project Engineers
- Specialized engineers (HSE, mechanical, structural, piping)
- Support services (maintenance, operation)

Prerequisites

- Basic knowledge of the petro-gas industry

Program

- Oil&Gas industry vibration contexts
- Vibration standards & specifications
- Theoretical bases
- Vibration measurements
- Vibration computation
- Global vibration analysis strategy

Sessions

- On request

Registration/cancellation up to 15 days before each session.
For more information, please contact

oil.gas-assistant@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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RAILWAY MAINTENANCE & DYNAMICS

2 days – 1500€

Presented by

Brice NELAIN

14 years of project experience

Emmanuel REYNAUD

24 years of project experience

Martin RISSMANN

7 years of project experience

Goals

- Present a synthetic view of the physical phenomena of wheel-rail contact related to maintenance & operation
- Understand the appearance & evolution of wheel and rail defects (wear, fatigue, squat, strain, corrugation)
- Present issues related to main lines (TGV, freight) and urban applications (metro, tramway)

Participant profile

- Engineers & technicians involved in the maintenance, operation & management of rail networks or rolling stock fleets

Prerequisites

- Basic knowledge of vibration & acoustics
- Associates degree or equivalent

Program

Rail:

- Defect classification, qualification & quantification
- Material resistance
- Solicitations: contact force
- Tools for operating control

Rolling stock:

- Railway dynamics & safety
- Mechanical behavior during operation
- Residual life assessment

Sessions

- On request

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.ferroviaire@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

If you wish to inform us of a sensory or motor deficit, please contact training@vibratec.fr in order to study adaptations.

Accredited training center
www.vibratecgroup.com
+33 472 86 6565

RAILWAY NOISE & VIBRATION CONTROL

3 days – 1800€

Presented by

Brice NELAIN

14 years of project experience

Emmanuel REYNAUD

24 years of project experience

Martin RISSMANN

7 years of project experience

Goals

- Address noise / vibration issues on existing or planned lines
- Differentiate design & testing approaches & methodologies
- Understand the issues related to main lines (TGV, freight) & urban applications (metro, tramway)

Participant profile

- Engineers & technicians involved in track or rolling stock design & construction

Prerequisites

- Basic knowledge in vibration & acoustics
- Associates degree or equivalent

Program

- Basics of acoustics & vibration
- Current standards & regulations & future trends
- Wheel / rail noise
- Traction & auxiliary noise
- Squeal noise
- Aerodynamic noise
- Theoretical aspects of ground-borne noise / vibration
- Ground-borne vibration control on existing lines and in the design phase

Sessions

- 5-7 April 2022
- 4-6 October 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.ferroviaire@vibratec.fr

Training material & lunches included
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+33 472 86 6565

NEW

ADVANCED ROTATING MACHINE DIAGNOSIS

2/3 days
1500/1800€

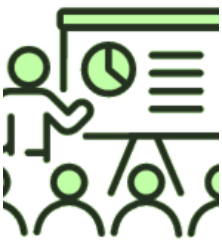
Presented by

Hugo SIWIAK

16 years of project experience

Renaud BERTONI

17 years of project experience



Classroom training only

Goals

- Identify rotating equipment defaults
- Understand & chose diagnosis tools

Participant profile

- Project Engineers, Specialized Engineers (HSE, mechanical, structural, piping)
- Support services (maintenance, operation, technology)

Prerequisites

- Theoretical understanding of vibration
- Basic knowledge of the principles of rotating equipment operation

Program

- The basics of vibration
- Data acquisition
- Basics of signal processing
- Vibration standards
- Theoretical bases
- Presentation of typical defaults
- Detection tools
- Case studies
- Exercises on an industrial model

Sessions

- 22-24 March 2022
- 11-13 October 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

oil.gas-assistant@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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VibraTec

DATADOCKÉ

Accredited training center
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ACCELERATED FATIGUE TESTING

1 day – 900€

Presented by

Brice NELAIN

14 years of project experience

Loïc ANCIAN

13 years of project experience

Goals

- Write precise specifications for suppliers & equipment manufacturers

Participant profile

- Actors in the industrial development process
- R&D or Quality engineers
- Testing laboratories

Prerequisites

- Basic understanding of material behavior

Program

- Review of material fatigue resistance
- Basic assumptions
- Signal processing review
- Customization for modal structures
- Taking dispersion into account (stress, material resistance)
- Method application to concrete cases

Sessions

- 21 June 2022
- 1st December 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.ferroviaire@vibratec.fr

Training material & lunches included
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ACOUSTIC IMAGERY

2 +1 days –
1500+900 / 1800€

Presented by

Sébastien PAILLASSEUR, PhD

11 years of project experience

Simon BOULEY, PhD

3 years of project experience

Olivier MINCK

17 years of project experience

TAUGHT BY MicrodB

Goals

- Theory: understand the theoretical aspects of different imaging methods with their advantages & limitations (holography, focalization, deconvolution, etc)
- Application: choose & apply the 'right' measurement & processing method

Participant profile

- Engineers, students & technical managers

Prerequisites

- Basic knowledge of acoustics
- Knowledge of signal processing
- The theoretical training (or equivalent) is required for the application day

Program

Theory

- Theoretical review of acoustics
- Acoustic beamforming
- Acoustic holography with regular & irregular arrays
- Advanced imaging algorithm methods
- Imagery methods applied to the constraints of aero-acoustic measurements

Application

- Matching tools to requirements
- Measurement preparation
- Using the imaging software in a Testlab environment
- Result analysis

Classroom training only

Session

- 17-19 May 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante@microdb.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

If you wish to inform us of a sensory or motor deficit, please contact training@vibratec.fr in order to study adaptations.

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ELECTRONIC & VIBRATIONAL RELIABILITY

2 days – 1800€

Presented by

Brice NELAIN

14 years of project experience

SERMA TECHNOLOGIES

26 years of electronic reliability experience

TAUGHT WITH SERMA TECHNOLOGIES

Goals: understand

- The challenges of reliability in electronic systems related to vibration constraints
- The relevance of different vibration measurement techniques
- The interest of vibratory dimensioning
- Normative tests

Participant profile

- Project managers
- Test technicians & engineers, laboratory & design office personnel
- Electronics engineers facing vibration issues

Prerequisites

- Basic knowledge of mechanics & electronics

Program

- Introduction to electronic & mechanical reliability
- Defaults of vibrating electronic parts
- Reliability prediction tools (MIL-HDBK217, IEC62380, FIDES) and vibration
- Introduction to the global method of electronics reliability
- Theoretical basis of vibration
- Experimental Vibration Analysis
- Experimental Modal Analysis
- Applied reliability approach

Sessions

- 22-23 June 2022
- 6-7 December 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.ferroviaire@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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FINITE ELEMENT MODEL UPDATING

2 days – 1500€

Presented by

Stéphane TEPPE

26 years of project experience

Hugo SIWIAK

16 years of project experience

Goals

- Understand the relevance of simulation before testing
- Define the types of measurements to perform for FEM updating
- Identify the methods & tools to tune FEM
- Differentiate methods & tools to improve FEM

Participant profile

- Engineers & technicians in charge of FE model validation
- R&D or NVH engineers

Prerequisites

- Working knowledge of structural dynamics
- Working understanding of FE calculation

Program

- The updating / tuning process
- Measurements: theoretical basis, tools, set-up, acquisition of Frequency Response Functions (FRF), modal identification
- Computation: assumptions, resolution, FE modeling, computation in the design process
- FE model correlation & updating: tools & their limits, using a modal basis, using FRF results
- Collaborative work with an industrial model

Sessions

- 1-2 June 2022
- 15-16 November 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.industrie@vibratec.fr

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RELIABILITY FATIGUE

2 days – 1500€

Presented by

Brice NELAIN

14 years of project experience

Goals

- Understand reliability / life cycle management issues in product development
- Understand the ‘stress/resistance’ approach
- Apply this approach to product design

Participant profile

- Actors in the industrial development process
- R&D or Quality engineers
- Testing laboratories

Prerequisites

- Basic understanding of material behavior
- Basic knowledge of structural mechanics

Program

- Principle of the stress-resistance approach (S/R)
- Fatigue strength of structures - review
- Loading in service
- Applying the S/R method to product design
- Applying the S/R method to component design

Sessions

- 14-15 June 2022
- 29-30 November 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.ferroviaire@vibratec.fr

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ROTOR DYNAMICS

1 day – 900€

Presented by

Rémi SALANON

13 years of project experience

Stéphane TEPPE

26 years of project experience

Goals

- Understand the concepts of vibration phenomenon, critical speed, unbalance response, separation margin, amplification factor, stability margin
- Identify important factors in the production & assembly of turbomachines
- Evaluate and/or write an API report on rotor dynamics
- Ask rotor suppliers the right questions to be able to perform studies

Participant profile

- Technicians with a good base in mechanics
- Mechanical Engineers

Prerequisites

- Basic understanding of numerical simulation
- Basic knowledge of structural dynamics

Program

- Principles of vibration
- Theoretical basis of rotor dynamics
- Rotor modeling
- Dynamic stiffness mapping
- Critical speed calculation
- Unbalance response calculation
- Stability analysis
- Specific applications

Sessions

- 31 May 2022
- 8 November 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

oil.gas-assistant@vibratec.fr

Training material & lunches included
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GEAR DYNAMICS

2 days – 1500€

Goals

- Understand the basics of how gear systems work
- Understand the forces, mechanical & dynamic phenomena involved
- Understand the phenomena involved in the production of gear noise
- Define an experimental & numerical approach to understand a gear system's vibratory behavior

Participant profile

- NVH technicians & engineers wishing to apply their know-how to gear systems

Prerequisites

- Basic knowledge of structural acoustic radiation
- Basic knowledge of structural dynamics

Program

- Characterization of a gear mesh (macro- & microscopic scales, kinematics)
- Static transmission error calculation (definition, procedure, mesh stiffness)
- Demonstrations & exercises using VibraGear software
- Dynamic response of gear systems (whining, computation, result analysis, noise reduction)
- Optimization of tooth corrections (structuring data, optimization method, solidity study)
- Non-linear dynamics (contact loss, clicking, grilling)

Sessions

- 8-9 June 2022
- 22-23 November 2022

Presented by

Alexandre CARBONELLI, PhD

12 years of project experience

Renaud BERTONI

17 years of project experience

Sylvain BARCET

12 years of project experience

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.automobile@vibratec.fr

Training material & lunches included
Based on case studies, alternating theory & application exercises

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NOISE FROM ELECTROMAGNETIC EXCITATION

3 days – 2000€

Presented by

Sylvestre LECURU

15 years of project experience

Jean-Baptiste DUPONT, PhD

14 years of project experience

Goals

- Understand basics electric motor operation and power supply
- Understand the efforts & magnetic phenomena involved
- Characterize the phenomena likely to produce electromagnetic noise
- Set up an experimental & numeric approach to understand the vibratory behavior of electric machines

Participant profile

- NVH technicians & engineers wishing to apply their know-how to electric machines

Prerequisites

- Basic knowledge of structural acoustic radiation
- Basic knowledge of structural dynamics

Program

- Review of electricity & electro-magnetism
- Operation & constitution of electric machines
- Electronic Power Converters (EPCs)
- Magnetic excitations
- Electric motor acoustics
- Low-noise (silent) design rules
- Exercise: experimental analysis applied to an electric motor
- Exercise: simulation of the noise radiated by an electric motor

Sessions

- 10-12 May 2022
- 18-20 October 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.automobile@vibratec.fr

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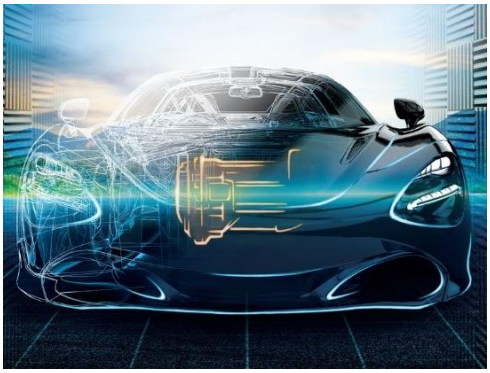
VEHICLE E-POWERTRAIN INTEGRATION



2 days – 1500€

Presented by

Jean-Luc WOJTOWICKI

30 years of project experience

Aurélien CLOIX

15 years of project experience

Classroom training only

Goals

- Understand the dynamic behavior of an E-powertrain
- Understand the NVH specificities of E-powertrain integration
- Interpret, analyze & build integration SOWs
- Lead an E-powertrain integration process

Participant profile

- NVH teams who design, develop or integrate E-powertrains

Prerequisites

- Basic knowledge of structural acoustic radiation
- Basic knowledge of structural dynamics
- Basic knowledge of automotive architecture

Program

- E-powertrain NVH behavior
- Experimental methods to quantify E-powertrain NVH indicators
- Numeric methods to quantify E-powertrain NVH indicators
- E-powertrain contribution to global vehicle NVH
- E-powertrain structure- & air-borne noise contributions
- Vibration isolation design: principle, geometry & elastomer mount dynamic stiffness
- Review of E-powertrain integration designs

Sessions

- 28-29 June 2022
- 13-14 December 2022

Registration/cancellation up to 15 days before each session.
For more information, please contact

assistante.automobile@vibratec.fr

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