

Vibration Analysis

VA Level I - Fundamentals of Vibration Analysis

VA Level II - Vibration Monitoring and Analysis Applications

VA I is Recommended For

Maintenance supervisors, predictive maintenance coordinators, reliability engineers, inspectors, shop supervisors, advanced mechanics, and millwrights who wish *to become familiar with vibration monitoring and analysis*. Engineers and technicians whose responsibilities require them to be proficient in the setup and use of the SKF condition monitoring system.

Course Objective

The course objective is to teach the fundamentals of vibration technology. It aims to provide a practical approach to detecting and analyzing common machine problems using vibration monitoring and analysis.

Course Description

Designed for maximum class participation. A combination of overhead presentations, group exercises, videotapes, and written reviews are used to peak participant interest and encourage participation and understanding. A 'Certificate of Attendance' is given by SKF Philippines, Inc.

Specific topics include:

Basics of vibration

- Time waveform analysis
- Amplitude vs. frequency
- Vibration – measurable characteristics
- Vibration sensors
- Scale factors
- Measurements and units
- Displacement probe/eddy probe
- Multi-parameter monitoring
- Resonance
- Detection vs. analysis

Setting up the vibration measurement

- Physical and database considerations
- Selecting the machinery
- Sensor location and mounting methods
- Cable attachments
- Setting Fmax

Alarm methods and setting alarms limits

- ISO guidelines
- Assessing overall vibration severity
- Exception criteria

Spectral analysis

- Spectral analysis techniques and pattern recognition
- Sidebands
- Harmonics

Analyzing typical machinery problems

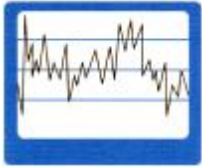
- Imbalance and misalignment
- Bent shaft
- Mechanical looseness

Vibration Diagnostic Tables

- ISO 10816-1 Vibration Diagnostic Table

Prerequisites

Participants should have a basic understanding of rotating equipment. Engineering background and / or industrial experience is an advantage.



Vibration Analysis

VA Level I - Fundamentals of Vibration Analysis

VA Level II - Vibration Monitoring and Analysis Applications

VA II is Recommended For

Maintenance supervisors, predictive maintenance coordinators, reliability engineers, inspectors, shop supervisors, advanced mechanics, and millwrights who wish to *become more knowledgeable and gain skills in vibration monitoring and analysis*. Engineers and technicians whose responsibilities require them to be proficient in the setup and use of the SKF condition monitoring system.

Course Objective

The course objective is to teach more advanced concepts in vibration technology. It aims to provide a practical approach to detecting and analyzing more advanced machine problems using vibration monitoring and analysis.

Course Description

Designed for maximum class participation. A combination of overhead presentations, group exercises, videotapes, and written reviews are used to peak participant interest and encourage participation and understanding. An examination is done at the end of the course. Participants who pass this validation are awarded 'Vibration Analysis Certification' by SKF Philippines, Inc. Otherwise, a 'Certificate of Attendance' is given. Specific topics include:

Review of Fundamentals - Basics of vibration

- Time waveform analysis
- Amplitude vs. frequency
- Vibration – measurable characteristics
- Vibration sensors
- Scale factors
- Measurements and units
- Displacement probe/eddy probe
- Multi-parameter monitoring
- Resonance
- Detection vs. analysis

Alarm methods and setting alarms limits

- Review of ISO guidelines, overall vibration severity, exception criteria
- Spectral enveloping and bands
- Phase alarms

Spectral analysis and phase analysis

- Review of spectral analysis techniques and pattern recognition
- Review of sidebands and harmonics
- Waterfall plot
- Understanding phase

Vibration signal processing methods

- Enveloping
- SEE™ Technology (Spectral Emitted Energy)
- HFD (High Frequency Detection)

Monitoring rolling bearings

- Why do bearings fail?
- Bearing failure stages
- Bearing defect frequencies
- Displaying fault frequencies

Machinery Troubleshooting - Resonance

§ Analysis techniques

- Basic instrumentation – looking for patterns
- Examples of advanced techniques used by analysts

§ Three components of resonance

- Forcing function (source)
- Mass
- Stiffness

§ Troubleshooting techniques

- History
- Speed sensitivity
- Changing mass
- Changing stiffness

§ Quick techniques

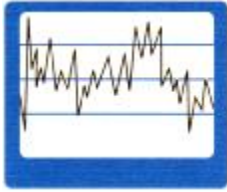
- Plotting of mode shapes
- Evaluating the success of temporary bracing

§ Resonance troubleshooting

- Resonance description
- Resonance identification

Application Exercises

- Measuring and analyzing machinery problems



TRAINING SCHEDULE

Vibration Analysis Level I & II

2009 Public Course Schedule

<u>Course</u>	<u>1st Batch</u>	<u>2nd Batch</u>	<u>Course Fee (VAT Exclusive)</u> <u>per person</u>
VA I	May 13	Aug. 12	Php 7,850.00
VA II	May 14-15	Aug. 13-14	Php 12,350.00

* All trainings are inclusive of Training Manual, Certificate, lunch, am/pm snacks

SKF reserves the right to cancel/move training dates if minimum participant requirement is not met.
Please call us at +63.2.8104058 for confirmation.

Training Options

Training may be given directly to your employees at your site. Aside from savings on cost and higher number of participants, you may opt to integrate site-specific equipment or cases in the course. For further discussions on in-house courses, please contact us or email arnolfo.moncada@skf.com

How to Register

Simply complete the registration form and send to SKF Philippines Inc.:

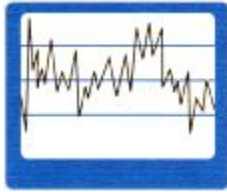
- By fax : +63.2.8130341
- By e-mail : merlyn.pascasio@skf.com

Payment Options (Advance Payment Required)

- By Cash : Payment can be made before the training or handcarried by participant on the 1st day
- By Check : Company checks should be made payable to "SKF Philippines Inc."

Disclaimer

While great care was taken to assure brochure content accuracy, SKF Philippines Inc. is not responsible for any errors or omissions. Information listed in this document is subject to revision without advance notice. Class dates and locations are subject to change.



TRAINING REGISTRATION FORM

Vibration Analysis Level I & II

To confirm attendance to our training programs, please fill out this form, then fax it to (+632) 8130341 or send it via e-mail to Merlyn.Pascasio@skf.com. For inquiries, pls. call Ms. Merlyn at (+632) 8104058 loc. 105.

Seminar Title	Training Fee (Vat Exc)	Seminar & Schedule (Pls. tick)
VA I - Fundamentals of Vibration Analysis	7,850.00	<input type="checkbox"/> <u>VA I</u> <input type="checkbox"/> <u>VA II</u> <input type="checkbox"/> May 13 <input type="checkbox"/> May 14-15 <input type="checkbox"/> Aug.12 <input type="checkbox"/> Aug.13-14
VA II - Vibration Monitoring & Analysis Application	12,350.00	

Company Name: _____
 Address: _____

Contact Person	Designation	
Email Address	Telephone No.	Mobile No.
Mode of Payment <input type="checkbox"/> Cash <input type="checkbox"/> Check	Amount	No. of Participants

Participant/s Name (Lastname, Firstname, M.I.)	
1.	Position Email Address
2.	Position Email Address
3.	Position Email Address
4.	Position Email Address
5.	Position Email Address
6.	Position Email Address

 Signature Over Printed Name of Authorized Representative / Date