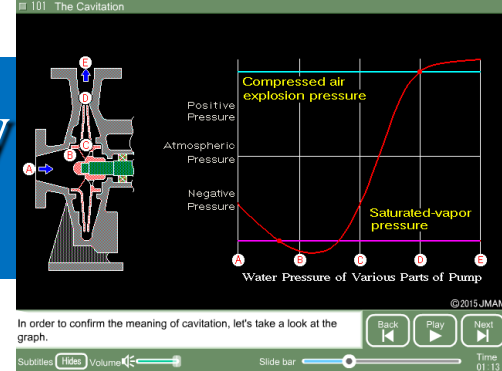


Diagnosis of Rotating Machinery



※本コースは、日本語版「回転機器の保全コース」、「振動法による診断技術コース」からポイントを抜粋し、英訳した教材です。

■ *Become familiar with the key points regarding diagnosis of rotating machinery such as pumps, fans, and compressors.*

Characteristics

- ★ Learn basic knowledge about abnormalities in rotating machinery which manifest as abnormal noises, temperature, and vibrations.
- ★ Learn the knowledge needed in order to perform equipment diagnosis.

Curriculum

- 1.Never Allow the Cavitation!
- 2.Efficiency Drops
- 3.Vibration Diagnosis
- 4.Fan Unbalance
- 5.Blower Surging
- 6.Lubricants Show Abnormalities
- 7.Simplified Diagnosis Procedure
- 8.Precision Diagnosis Procedure

Who should take this course

Production site(factory) new recruits/maintenance personnel, plant operators/on-site workers, supervisors, and managers

Course material outline

Expected learning time

◆ 3hours

◆ Number of tests: 1

Shortest duration

◆ 70minutes

Diagnosis of Rotating Machinery

Curriculum

1.Never Allow the Cavitation!	
101 The Cavitation	104 Inspection of the Intake Side
102 Bearing Vibration Check	105 Inspection Item of Intake Side
103 Looseness of Bolts	106 Pump Noises: Abnormal and Normal
2.Efficiency Drops	
201 Turbine Pumps and Efficiency	207 TEST: Liner Ring Replacement
202 Efficiency Drops and Power Loss	208 Bushes and Efficiency Drop
203 Efficiency Characteristics Graph	209 TEST: Bushes Replacement
204 Water Flow in the Turbine Pump	210 Replacement of Small Parts
205 Water is Flowing Backward	211 Repair of Before and After
206 Liner Ring and Efficiency Drop	
3.Vibration Diagnosis	
301 Is Cavitation Occurring?	307 Movement of Abraded Impeller
302 TEST: Determine	308 Waveforms and FFT Analysis
303 Measurement of Vibration	309 Measurement and Calculation
304 Determine: Change in Amplitude	310 Disassembly of Pump
305 Closer Examination	311 Replacement of Bearing
306 Motor side Vibration Waveforms	
4.Fan Unbalance	
401 Abnormal Noise Occurs	410 Meaning of the Value 'Vr'
402 Abnormal Noise	411 Looseness of Fixed & Fitted Parts
403 Normal Sound	412 Stop Nuts and Tooth-Washers
404 TEST: Reading Total Amplitude	413 A Change in Running Sound
405 Vibration Assessment Standard	414 A Day's Change in Fan Revolutions
406 Bearing Frequency Calculation	415 Resonant Revolution Frequency
407 Fan Revolution Frequency	416 Resonance
408 Summary of Inspection	417 Frequent Resonance and Fatigue
409 Mounting Balance – Check Results	418 Impeller Breaking
5.Blower Surging	
501 Surging Occurrence	507 Fitting Throttle Valve Efficiency
502 Surging Occurs	508 Cross-Section of Blower
503 QUIZ: Where to Check First?	509 Vane and Vane Control Device
504 Checking Blower Characteristics	510 Vane Movement
505 Blower Efficiency	511 Examining Operating Program
506 TEST: Throttle Valve Fitting	
6.Lubricants Show Abnormalities	
601 Discoloration of Lubricating Oil	606 Screw Compressor: Principle
602 ASTM Color Tester	607 Screw Compressor: Cycle
603 Partial High Temperature	608 Rotor Contacts with Casing
604 Screw Compressor: Lubrication	609 Abnormal Contact of Rotors
605 Screw Compressor: Structure	
7.Simplified Diagnosis Procedure	
701 Overview of Equipment	705 Acceleration Assessment Standard
702 Vibration Measurement Location	706 Result of Judgment
703 Vibration Measurement Method	707 Simplified Diagnosis Report
704 Velocity Assessment Standard	
8.Precision Diagnosis Procedure	
801 FFT Analyzer	805 Acceleration Mode & Envelope Mode
802 Vibration Measurement Preparation	806 Damaged Bearing Section
803 Vibration Measurement Method	807 Condition Diagnosis Report
804 Data Analysis for Velocity Mode	808 Abnormality Cause of Machine