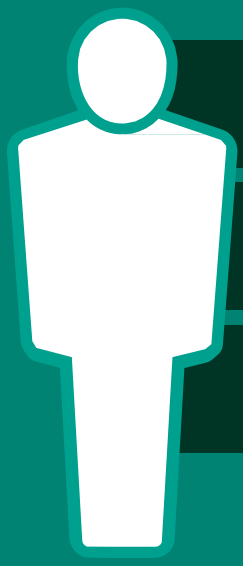
Bently Nevada
a Baker Hughes business

Remote Learning

Best-in-class learning experience while working from your home or office

Talent is one of your company's most valuable assets



Operational performance is a combination of fleet reliability, advanced software, and human capabilities.

Human capital is a key contributor to **production**, **reliability**, and **efficiency.**

The oil and gas industry must **meet industry demand** by fast tracking the development and competency of new operators.

Human capital is a key differentiator for leading the industry.

Introducing Bently Nevada remote learning courses

Why remote learning?

- A safe alternative during uncertain global health crisis
- Eliminates travel costs
- Provides flexibility to your personnel

Virtual classroom experience

- Live interaction between facilitators and learners
- Virtual machines provided to learners for software courses
- Use of virtual breakout rooms for increased learner collaboration

Same expertise as in-person training

- Remote learning facilitators are qualified and certified Bently Nevada instructors
- Remote learning classes follow the same syllabus as in-person training

Remote Learning Sessions

Designed for your specific learning needs

Our technical experts will conduct remote sessions for groups of your people.

Customized topics and Q&A sessions tailored to best fit your remote learning needs.

Remote sessions with key personnel from your organization as “power users” of the products and systems for mentoring.

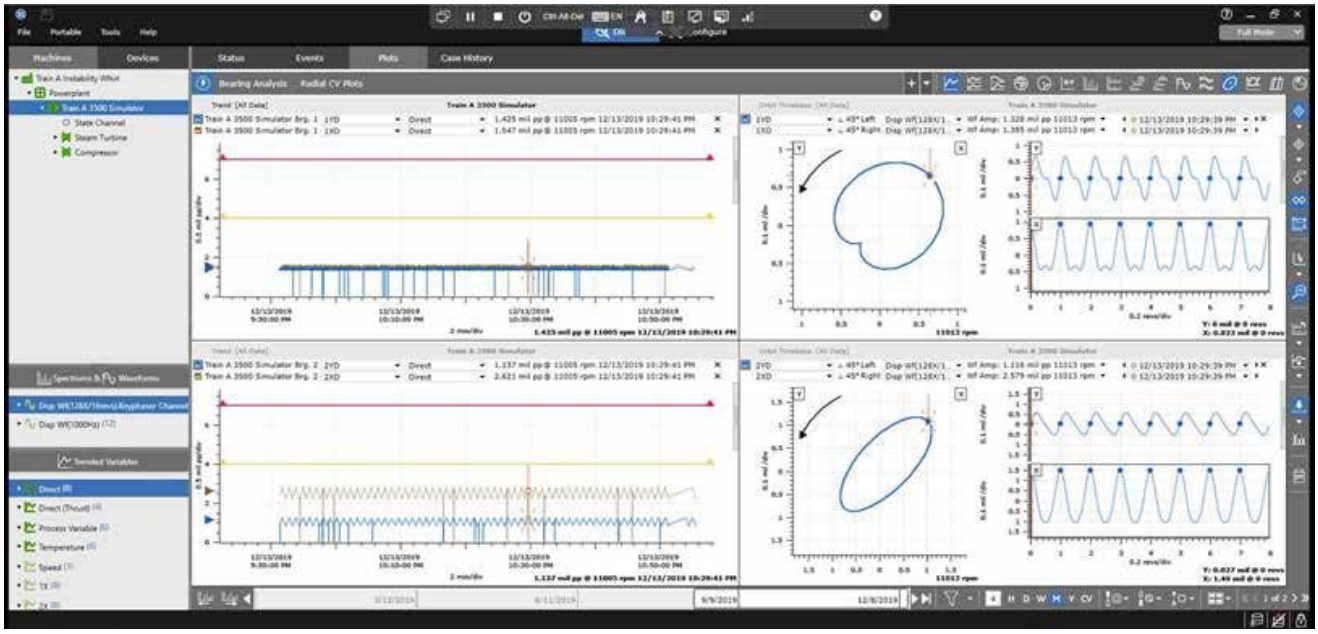
These power users, equipped with plant-specific knowledge and advanced awareness of the systems, will be able to extract maximum benefit from the systems deployed and improve ROI.

Bring your team to a higher level of confidence and competency.

How will remote learning sessions be planned?

- Students need access to the internet to join the training
- Bently Nevada will send conference link for audio/video platform before the session
- Students will join using their own laptop/PC
- For 3500 courses, the 3500 configuration SW must be installed on your computer before joining the class (Any exceptions or alternative arrangements shall be agreed upon separately)
- Access to online/soft copy training material will be provided
- Suitable breaks will be scheduled during the online training period
- It is highly recommended that students use two monitors to view the training and a headset for a better audio experience

Note: Due to the technical nature of the material presented, and the current legal environment, recording Baker Hughes classes using audio or video equipment is strictly prohibited.

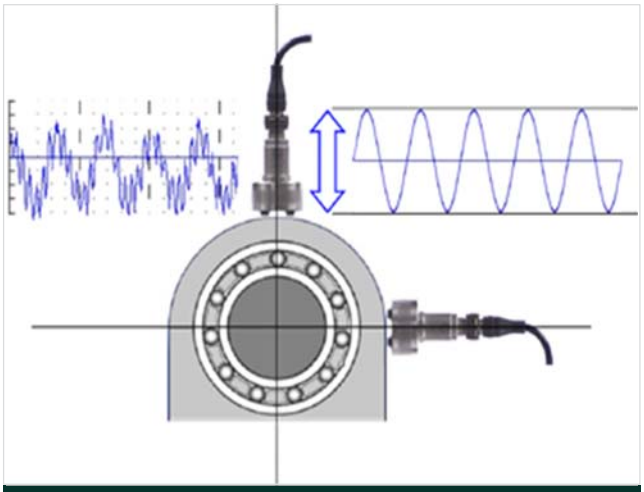


Web-based access to virtual System 1 software for workshops

Remote learning course offerings

Fundamentals of Vibration

https://register.bentlytraining.com/learn/course/external/view/webinar/652/MachineryDiagnostics-RemoteLearning



Duration

14 hours

Audience

- Technicians with a limited experience on vibration machinery
- Technicians working on vibration control with condition monitoring program
- Engineers involved in condition monitoring
- Technicians in preventive maintenance

Objectives

- Explain the reasons for vibration monitoring and maintenance strategies
- Identify key components for vibration motion in a measurement plane
- Define the parameters used to measure vibration motion and units for each
- Describe the principles of vibration transducer operation, the benefits and disadvantages of each type, and typical scale factor of output signal
- Apply selection criteria to choose a useable vibration transducer for a specific machine vibration
- Read values of amplitude, frequency, phase, and recognize sources of vibration indicated by waveform and spectrum plots

Program

- Machinery monitoring: history, benefits, and strategies. Typically monitored machines and considerations
- Basic vibration concepts: definition of vibration, understanding relationships of vibration displacement, velocity, acceleration, units of amplitude, and meaning of vibration amplitude in analysis
- Defining frequency, units of frequency, and meaning of frequency in analysis, defining phase and measuring relative and absolute phase, understanding natural frequencies
- Vibration transducers: theory of accelerometer operation, theory of velomitor operation, theory of Proximity transducer system operation
- Workshops identifying amplitude, frequency, and phase from timebase and spectrum plots. Workshops for transducer and monitoring systems for given machine scenarios

Machinery Diagnostics

https://register.bentlytraining.com/learn/course/external/view/webinar/652/MachineryDiagnostics-RemoteLearning

Duration

35 hours

Audience

- Engineers who interpret machine vibration and position data to determine machine condition
- Engineers involved in the design, acceptance testing, and maintenance of rotating machinery
- Engineers who want to learn about machinery vibration diagnostics

Objectives

- Explain how the fundamentals of machine design and behavior are reflected in the vibration measurements
- Reduce machine vibration data into usable plot formats
- Explain which plot formats are best to use in the different stages of machine diagnostics
- Describe the causes, effects, and indicators of the typical machine malfunctions, including recognition of problems such as unbalance, misalignment, rubs, shaft cracks, and fluid-induced instabilities

Program

- Introduction to machinery diagnostics
- Phase measurements
- Steady state data formats
- Transient response data formats
- Fundamentals of how a rotor responds
- Single plane balancing—demo
- Multi-plane balancing—demo
- Preload
- Radial rubs
- Fluid-induced instabilities
- Shaft crack detection

3500 Operation and Maintenance

https://register.bentlytraining.com/learn/course/external/view/webinar/651/3500Operation&Maintenance-RemoteLearning

Duration

21 hours

Audience

- 3500 monitoring system users
- Engineers who maintain and troubleshoot the 3500 monitoring system
- Instrument Technicians and Operators

Objectives

- Explain the role of the 3500 monitoring system in machinery monitoring and protection
- Identify installation conditions affecting the correct operation of Proximity transducer systems
- Test monitor alarms and verify channel values in a radial vibration monitor
- Use Bently Nevada propriety configuration software to configure and/or reconfigure the 3500 monitor system
- Troubleshoot the 3500 monitoring system and associated transducers using software and hardware techniques

Included in pricing:

- Lab equipment will be provided for sessions held at customer site
- Free access for 1 year to our 3500 troubleshooting video. Details here: https://register.bentlytraining.com/learn/course/external/view/elearning/644/troubleshooting-the-3500-monitoring-system-en

Program

- Overview of 3500 monitoring system
- 3300 Proximity transducer system operation
- 3500 monitoring system support components
- TDI/RIM hardware connections and communications
- Power supply, TDI/RIM, and Keyphasor configuration
- Radial vibration
- Thrust position
- Relays
- 3500 system utilities
- 3500/92 communications gateway
- Troubleshooting the 3500 system

Online Videos

Troubleshooting the 3500 Monitoring System

Now available!

Learn key troubleshooting techniques for the 3500 Monitoring System in this series of short video tutorials.
You will learn how to:

- Connect a rack to the 3500 configuration software
- View the events list using the 3500 config software
- Identify problems when you don't have access to the 3500 configuration software
- Troubleshoot problems from the back of a 3500 rack
- Perform a linearity check on a proximity probe system
- Troubleshoot using 3500 software tools such as Module Self-Tests, Verification, Options and Bypass Switches

Duration

Full series plus final quiz is about 1 hour.
Videos vary from 5 to 15 minutes in length.

Audience:

Engineers and operators

Contact your Bently Nevada regional training manager for pricing.
https://bentlytraining.com/contact/
Or enroll online and we'll contact you
https://bentlytraining.com

Purchase includes a full year of access.

Professional Engineers can earn 1 PD hour by passing the test at the end of the series.

ADRE 408 DSPi/Sxp

https://register.bentlytraining.com/learn/course/external/view/webinar/750/adre-408-dspisxp-remote-learning

Duration

21 to 35 hours

Audience

- ADRE 408 users
- Condition monitoring personnel
- Personnel involved in preventive maintenance

Objectives

- Configure ADRE system to collect machinery data
- Acquire data effectively for real-time analysis
- Display vibration and other data types using various plot types for machine condition analysis
- Edit, document, and store databases for future use.

Program

- ADRE Overview
- Vibration data fundamentals
- Signal processing
- Database configuration
- Data collection
- Plot session management and general plot features
- Display static data
- Advanced features for static data plotting
- Dynamic data plotting
- Standalone data collection
- Share and export data
- ADRE 408 Replay Card
- ADRE Front Panel
- ADRE 408 Transducer Power Supply Card
- More ADRE 408 capabilities

System 1 for Turbomachinery

https://register.bentlytraining.com/learn/course/external/view/webinar/653/system-1-for-turbomachinery-remote-learning

Duration

28 hours

Audience

- System 1 platform users
- Reliability engineers
- Condition monitoring personnel
- Personnel involved in preventive maintenance

Objectives

- Configure and navigate machine and device hierarchy
- Create machine databases and machine templates for data collection
- Verify, analyze, and visualize data to report on machine health and determine appropriate actions
- Monitor machine health during steady state and transient events
- Maintain healthy System 1 databases to ensure operational efficiency

Format

- Short, daily synchronous online classroom sessions.
- Walk through System 1 scenarios on your own cloud-based virtual machine.
- Work at your own pace with daily milestones to maximize learning

Program

- Introduction to System 1
- Database creation and preferences
- Build and instrument machines
- Configure asset properties
- Import and map data
- Manual trended variables and setpoints
- Configure condition monitoring alarms
- Define state-based alarms
- Define statistical set points
- Define region alarms
- 3500 data collection
- Acquire real-time data
- Alarm management
- Steady-state data verification
- Steady State data display and manipulations
- Define and capture transient events
- Transient data verification
- Transient data plot display and manipulations
- Plot sets and plot records
- Configure notifications
- System 1 reports
- Maintain and manage database health

System 1 for Portables

Coming soon!

Duration

28 hours

Audience

- System 1 platform users
- Reliability engineers
- Condition monitoring personnel
- Personnel involved in preventive maintenance

Objectives

- Configure and navigate machine and device hierarchy
- Create machine databases and machine templates for data collection
- Configure, display and manage Spectral bands and fault frequencies
- Configure and manager alarm setpoints with statistical tools
- Configure and manage data collection routes
- Data collection using Scout
- Manage data communication with all the Scouts in the field
- Manage alarms and generate diagnostic reports with actionable information
- Verify, analyze, and visualize data to report on machine health and determine appropriate actions

Program

- Introduction to System 1
- Database creation and preferences
- Build machines using library and templates
- Build measurement points using automated methods
- Configure measurement points manually
- Configure machine alarm setpoints with import/export files and statistical calculations
- Configure fault frequencies and frequency bands
- Condition monitoring alarms
- Configure and manage data collection routes
- Synch route with Scout using File, Instrument and Remote Com methods
- Collect route-based data using Scout
- Display and manipulate trends, spectra, orbit and timebase plots
- Manage alarms and display Spectral bands and fault frequencies
- Generate case histories and diagnostic reports
- System 1 reports
- Database health and management

System 1 Version 6 (Classic)

https://register.bentlytraining.com/learn/course/external/view/webinar/720/system-1-version-6-classic-remote-learning

Duration

21 hours

Audience

- System 1 v. 6 platform users
- Reliability engineers
- Condition monitoring personnel
- Personnel involved in preventive maintenance

Objectives

- Use System 1 software tools and plots to detect subtle changes in asset condition
- Retrieve and display data in bar graphs and various plot formats
- View alarms and events in the event manager
- Enter observations and notes with the journal editor and use DOCUVIEW* to create links to various reference documents
- Create reports on monitored plant assets
- Describe how our communication processors such as TDI or TDXnet™ collect transient data

Program

- System 1 overview
- Viewing Information with System 1 Display
- Event Manager and Asset Active Alarm in System 1 Display
- Customizing trend plots
- Vibration signal fundamentals
- Introduction to plot sessions and plot groups
- Working with plot session and plot groups
- Shaft centerline plots
- Plotting dynamic data and using collection groups
- Collecting data in transient mode
- System 1 Asset Information Storage
- System 1 administrative tasks

Reciprocating Compressor Condition Monitoring and Diagnostics

https://register.bentlytraining.com/learn/course/external/view/webinar/655/ReciprocatingCompressorsConditionMonitoring&Diagnostics-RemoteLearning

Duration

21 hours

Audience

- Engineers who want to learn about reciprocating compressor components, mechanics, and performance
- Engineers who interpret reciprocating compressor vibration and analyze malfunctions to diagnose and optimize assets
- Engineers involved in the design, acceptance testing, and maintenance of reciprocating machinery

Objectives

- Describe the compression process and interpret vibration readings of reciprocating compressors
- Relate reciprocating compressor components to various failure modes
- Recognize and select plots used to assess the health of reciprocating compressors and interpret PV plots
- Calculate rod load conditions (reversal)
- Discover the full application and benefits of rod position instead of rod drop measurements
- Conduct a compressor vibration analysis

Program

- Basic elements of reciprocating compressors
  - Compressor overview
  - Reciprocating compressors in industry
  - Components and nomenclature
  - Lubrication systems
  - Compressors types
- How to monitor a reciprocating compressor
- Importance of vibration and pressure measurements
- Plots used to evaluate health of reciprocating compressors
- Monitoring strategies
- Reciprocating compressor diagnostics:
  - Crosshead and frame vibration
  - Pressure monitoring and diagnostics
  - Rod load and rod reversal
  - Reciprocating compressor capacity control and the impact on vibration and pressure monitoring
  - Rod position and rod drop analysis
  - PV analysis of multistage compressors
  - Workshops and presentation of case histories
- Maintenance practices and condition monitoring

Register at

https://bentlytraining.com

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