Training Agenda of Vibration Online
PROJECT: PLCPP Control System Retrofit

One and a half day

**Online Vibration System**

1) The difference and various types of online and offline vibration monitoring/protection system
2) The difference of relative vibration (proximity probes) and absolute vibration (accelerometer or velocity probes)
3) The uses of ICP accelerometers and seismic velocity sensors
4) The selection of sensors, vibration cable and connector
5) The selection of sensor installation
6) How to set a proper frequency filter for bearing, gear drive fan, belt drive fan, compressor, pump, turbo expander, etc.
7) How to set a proper maximum frequency for bearing, gear drive fan, belt drive fan, compressor, pump, turbo expander, etc.
8) How to set a proper band frequency for bearing, gear drive fan, belt drive fan, compressor, pump, turbo expander, etc.
9) How to select a proper location to install online sensors
10) How to set a proper unit for detecting bearing, gear, absolute vibration or relative vibration
11) How to set alarm for bearing, gear drive fan, belt drive fan, compressor, pump, turbo expander, etc.

**Basic Vibration Technology**

1) Maintenance Philosophy
2) Time and Spectrum Domain
3) Basic of FFT analysis in order
4) ISO Standard for different application, e.g. ISO2372, 10816 and 7919 for Turbine/Generator
5) Vibration Analysis for
   - Unbalance
   - Mechanical Looseness
   - Resonance
   - Misalignment, Soft Foot/ Distortion
   - Pump/Fan (Hydraulic Problem)
   - Blade/Vane Pass Frequency
   - Pulley/Belt Problem
   - Oil Whirl/ Oil Whip
   - Bearing Failure Analysis
   - Gear Defected Analysis
   - Motor Analysis
One and a half day

**System Troubleshooting for both Hardware & Software**

1) Hardware & Software architecture
2) Software’s error troubleshooting;
   - Equipment IP
   - LAN
   - Server
   - Devicenet to LAN
   - Devicenet to TCP IP MODBUS
   - RSview
   - RSmacc
   - Odyssey
3) Hardware’s error troubleshooting;
   - XM 121
   - XM 440
   - Sensors
   - Cable
   - Connector

**How to PM the System**

1) The procedure and frequency of XM 121 and sensors calibration
2) When does it need to be recalibrated or test certified?
3) Checking fault signal if come from real hardware fault or just looseness of wiring
4) When to check the looseness between connector and sensor
5) The definition of display status and alarm status at the hardware
6) The definition of display status and alarm status at the software