STI Vibration Monitoring Inc.

Field Application Note

Machine Classification for Monitoring

CLASSMAC

The type of vibration monitoring system to install on a machine train will depend upon how the machine train is used in the plant process. A very important machine train will require more instrumentation to monitor its health and operation condition, while other machine trains having less important roles in plant operation will have less monitoring requirements. Using the techniques presented in this application note the machine trains may be classified as critical, essential, or general purpose. Topics such as how the machine train relates to plant production, plant and personnel safety, and whether they are spared is used as classification criteria. Additionally, costs, such as lost production, replacement, insurance, and maintenance expenses are factored into this classification.

CRITICAL

Critical machine trains are required to maintain plant production and many times are an integral part of the plant process. They are high capital cost items and must operate continuously, may not be spared, or have an installed backup unit, because interruption of the process to startup the backup machine train would have an undesirable effect on the plant operation. Other machine trains may be involved in an operation, which is important to plant or personnel safety.

Some plant designs that incorporate several identical units may appear to have installed spares, but all units will be rewired for 100% plant output. Other plants will have certain machine trains, which are required to operate continuously during emergency situations.

High horsepower and high speed machines would be classified critical if they are required to operate continuously for extended periods without interruption of the plant process. All of these machine trains should be considered critical to continued plant operation and, therefore, qualify for higher expenditure on monitoring instrumentation.

Vibration monitoring instrumentation should provide continuous, full time monitoring capabilities. Some systems will display every channel simultaneously so that rapid assessment of the entire machine train can be made. See STI Application Note, Monitoring Classification, Classif-1 for addition discussion about monitoring instrumentation.

ESSENTIAL

Essential machine trains may have the same attributes as critical machine trains, but their importance to the plant production process will not be as important. They may have installed spare units, which can be started without significant interruption of the plant process. They may be high horsepower or high speed, but will not have to operate for extended periods or continuously. Maintenance budgets will not be as costly when the machine fails, thus classifying these machines as essential and will not have the same monitoring instrumentation requirements as critical machines.

Vibration monitoring systems installed on essential machines can be of a scanning type, where the system switches from one sensor to the next to display the sensor output levels. Many of these systems are controlled with solid-state multiplexers and switch channels every second or so.

GENERAL PURPOSE

General-purpose machine trains are all others, which are not classified as critical or essential. They are usually spared and are not critical to plant production. They usually have auxiliary roles or support other processes, may only operate on demand, stocked replacement parts, and maintenance costs are relatively low when compared to critical or essential machine.

Due the machine classification, these machines do not qualify for permanently installed instrumentation and a continuous monitoring system. These machines are usually monitored with a portable instrument.

Machine Classification Checklist

1. Critical
2. Essential
3. General Purpose

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