Rapid creation of a vibration analysis programme at Lakeland Dairies, Killeshandra facility, Republic of Ireland-A Case Study

<u>Abstract</u>

Following a catastrophic failure of a major piece of equipment, Lakeland dairies searched for a low cost but effective tool for diagnosing machinery defects in rotating element machines. Applied Maintenance Technology (A.M.T.) Ltd recommended an ADASH Vibrio M vibration data collector, enabling route based data collection across the site. After procurement of the instrument and a two day training course the site maintenance personnel were ready to execute a site wide vibration analysis programme.

Graham Simpson, Principal consultant, Applied Maintenance Technology Ltd.

"The simplicity of the Vibrio M and the intuitive DDS2014 software from Adash enables A.M.T. to train personnel (with no previous experience in the field of vibration analysis) effectively and efficiently. Rapid development of the vibration database is made possible using the predefined templates for measurement points and cut/paste functionality for identical types of equipment and machinery. This removes the need for tricky data collection specification settings and repetitive data input to create equipment hierarchy.

Relevant data collection routes are created within minutes when the hierarchy is complete. This cumulates in a fully functional vibration monitoring programme within two site training days"

"When you consider the low cost base for the unit and the free software, clearly this puts vibration monitoring within reach of industry sectors that were previously restricted by capital procurement constraints

Work completed

Instrument selection

Lakeland identified the need for a vibration measurement device and contacted A.M.T. with regard to the ADASH Vibrio product. After some discussion about requirements A.M.T. recommended the Vibrio M with memory function and complimentary DDS2014 software, enabling route based vibration data collection as well as the standard measurement options.

• Equipment Supply

Adash A4900 Vibrio M kit complete with DDS software.

Figure 1 the Adash A4900 Vibrio M Kit



• On-site training

A.M.T. delivered the training course at the Lakeland site. Four site technicians were trained over the two days.

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Figure 2 Classroom training activity



The training involved classroom activity, learning to use the hardware and software and practical exercises on a test rig and out on site with real machinery.

The culmination of the training was the development of the site equipment hierarchy, measurement points and data collection routes to enable regular vibration monitoring activity on identified critical machines.

Figure 2 Test rig Hierarchy



Figure 3 Test rig vibration data obtained during training



<u>Results</u>

The Lakeland technicians were trained in the use of the Adash A4900 Vibrio M and the DDS2014 software.

Items were created within the DDS2014 hierarchy tree for all plant areas and critical equipment functional locations were populated.

Appropriate measurement points were set for each piece of equipment and relevant vibration measurements were defined using the inbuilt templates.

Appropriate data collection routes were constructed ready for frequent use.

Sample data was taken on site to familiarise the users with the Vibrio M operation. Routes were downloaded, executed and uploaded back into the software database.

The Lakeland participants were able to identify problems with the measured machinery at site using the knowledge acquired during the training.

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Seamus McGovern, Engineering manager, Lakeland Dairies, Killeshandra.

"The Vibrio M was a device that fell into our price range and has given us the ability to carry out vibration data capture and analysis using our own people. Previously this activity has been limited to external personnel. "

"Understanding the condition of our machinery will help us better schedule maintenance, prevent unwanted breakdowns and save money. When we experience problems we no longer have to wait for external resources to begin the troubleshooting process"

New capabilities

The trained Lakeland technicians can now add additional plant areas and equipment into the database, setup data collection points and create relevant data collection routes within the DDS software.

They can capture regular vibration measurements, consistently and efficiently at the touch of a button following on screen instructions using the routes created.

Subsequent to data capture, guided by the Vibrio M and it's on board fault diagnosis, the technicians can make a first sweep assessment of the measured machinery condition, identify faults relating to bearings, gears and general precision and raise the need to investigate specific failure modes.

At a glance, using the inbuilt traffic light system and/or predetermined alarms levels for each monitored point, the site personnel can view overall trend data to assess the relative change in condition of the monitored machinery. As a direct result they can now make better informed decisions about the need to maintain or investigate machinery performance.

Along the way the Vibrio M will automatically obtain the necessary vibration data required for subsequent professional analysis by internal or third party specialists. This is transferred automatically from the Vibrio M memory and stored in the DDS2014 software database.

Conclusions

The Vibrio M and DDS2014 software presents an opportunity to implement a vibration analysis programme at extremely low cost. This can be done with personnel with little to no previous experience in the field.

The in-built alarm functions and automatic diagnosis of certain failure modes give an instantaneous first sweep assessment of machinery condition, alerting users of all capabilities to impending failure modes and adverse machinery condition.

All necessary vibration data is collected by the Vibrio M to allow future professional analysis with the DDS2014 database.

Condition monitoring in the form of vibration analysis does need not be necessarily have high initial implementation costs and can the implemented rapidly with minimal training requirements.

Therefore this presents an opportunity to implement a vibration analysis (condition monitoring programme) where it was previously deemed not possible.