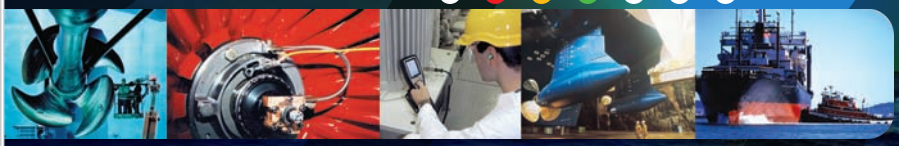
SPM Marine Solutions



CONTENT

Crisis danger & opportunity!

The economic turbulence has caused future predictions and plans to change dramatically. Many vessels ordered for delivery in the coming years may become seaborne when the market is down.

Companies which have not kept up with improving ship efficiency and maintenance strategies will be struggling and may have difficulties controlling their own destiny. At times like this, it is critical to understand the right priorities when it comes to improvements necessary to ensure long term survival. The Chinese word for "crisis" is a compound of "danger" and "opportunity". What is seen as crises by some is seen is opportunities by others. Let us look at the opportunities!

Now is the right time to improve efficiency and go back to basics in order to understand how maintenance can be used to improve reliability and reduce long term operating costs. The change to Condition Based Maintenance supported by major Class societies will improve machine reliability in several ways: fewer inspections requiring opening up of machines, knowing in advance what needs replacing reduces spare part stocks, avoiding the inefficiency of unnecessary time based maintenance reduces manpower needs, and prolonging equipment lifetime increases revenues.

Ships under construction may possibly still be complemented with Continuous Monitoring Systems so when taken in operation, they will have lower operating costs. There may be time to invest in training of personnel and implement the new CM Class for the existing fleet.

The old Roman saying "Si vis pacem, para bellum" ("If you want peace, prepare for war") still applies. We know for certain from previous economic slowdowns that companies using the downturn of the economy to become more efficient and invest in the future are the long term winners.

Let's all be winners and take advantage of the opportunities!

NOVEMBER • 2008

The first international **Marine User Meeting** *held in sunny Amsterdam on October 9 – 10.*

The user meeting was held with 25 participants from eight countries and representation from various sectors in the marine industry. The participants are either users or looking at implementing Condition Monitoring (CM) on the existing fleet and several are also considering large investments including Continuous Monitoring solutions on new builds.

The conference was very interactive, where learning from each other was one of the spearheads. The feedback from the participants was very positive so that has encouraged us in believing that organizing meetings like this on a more regular basis is really worthwhile.

Stefan Lindberg, MD of SPM, opened the meeting with a warm welcome to the participants and presented the global SPM organization supporting the Marine industry. SPM has been in shipping for almost 40 years and over the past few years, we have seen a definite increase in interest as well as sales.

The discussions at the meeting concluded that there are more and more demands on the staff onboard and any extra work is near impossible to motivate. Condition Monitoring can be justified by working smarter and avoiding unnecessary inspections and breakdowns by getting control of the health of the machines. There was a common conclusion that due to the benefits in improved reliability and cost reductions for avoiding unnecessary maintenance, Condition Based Maintenance is here to stay.

Francesca Bondini, Rina

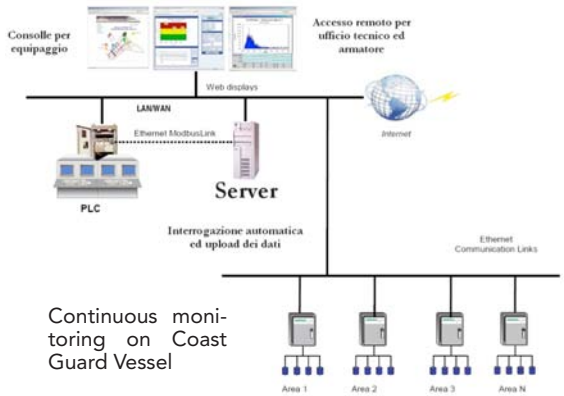
Francesca Bondini from Rina, the Italian Class society, presented their experience on what is required to get Class approval for Condition Monitoring so that time based inspections can be avoided or postponed

The difficulty facing the Class is the evaluation of OEM recommendations that require time based inspections. It was concluded that the practical experience from maintaining the application on the ship is the most important factor. The Class will typically support CBM when referring to this experience, but also considering the general quality of the maintenance onboard. The better the ship maintenance is performed, the easier it is to get Class approval for CM. The CM class approvals are so far mainly covering individual applications and not the entire ship.

Rina as a society is very positive to all initiatives by ship owners to go for Condition Based Maintenance and has the same view as DNV and Lloyds in this respect.

Alessandro Pescetto, Cetena

Cetena have run a project with Continuous Monitoring onboard a Coast guard vessel to optimize availability. The objective was to give the Captain a percentage figure on the probability for success to perform the next assignment and get back to port. This system included measurements of machine condition for critical equipment. Mr Pescetto showed how the system was set up and the results that had been achieved. The participants got a clear picture of how maintenance fits perfectly in with the assignment of the vessel and overall performance.



Continuous monitoring on Coast Guard Vessel

Bart Brinkman, Jan de Nul

Jan de Nul run dredgers all over the world and the vessels are like large factories. Mr. Brinkman presented their experience from using CM for many years and agreed with Mr. Schreiber of RCCL (see below) that motivation of the staff is the driving force for success. Today, Jan de Nul has confirmed that the maintenance costs have been reduced considerably since starting up.

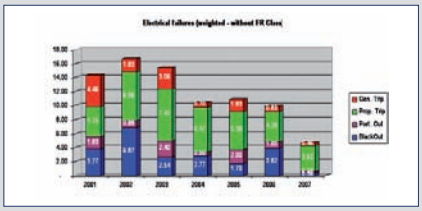
When starting up the CM process, time was spent to select a method for bearing monitoring that was easy simple to understand and instrumentation that is easy to use. The focus was on gearboxes, generators, electric motors larger than 30 KW and preparing the pickup points with permanently installed adapters and transducers. Some critical gearboxes have been equipped with continuous monitoring as well. Experience also showed developing standardization of measuring protocols and reporting to the central management was essential to understanding the benefits of CM. In the coming years, CM will be further implemented and also Continuous Monitoring will be expanded further.

Eric Schreiber, RCCL

Eric Schreiber from Royal Caribbean Cruise Line showed the impressive results they have achieved in improved reliability through the new maintenance strategy, using the SPM Leonova on 22 vessels, measuring also electric motors over the past four years (see fig).

The work to implement CBM required a systematic approach where a suitable organization was established first. The selection of staff to implement CM was very important both in the central organization and onboard.The enthusiasm of this staff together with the support of the management have been the main success factors. The success stories have to be communicated and the fact that CM will result in less maintenance work has to be repeated many times to motivate the change.

There is always resistance to changes when the reason is not clear, and when stories are being spread that CM has not worked in a specific case. When you investigate closer, it is clear that most of the time, unsuccessful CM efforts are due to lack of training.



Bench marking electric failures

RCCL therefore has implemented an extensive training program where over the past three years, more than 100 engineers have participated in a three day training program conducted by SPM. The training involves the justification for CM, product training and practical measurements. Mr. Schreiber concluded that RCCL will expand the CM program step by step and that the future will involve more continuous monitoring on critical RCCL applications.

Condmaster® Nova 2008

One of many useful new features in the new version of Condmaster is the ability to import and export data via OPC.

OPC Data Access is an international standard for communication between computer controlled devices in industrial automation. OPC uses client/server technology and makes it possible to transfer measurements or process data between systems from different suppliers.

In most companies, large amounts of data are produced on a daily basis. The ability to use the same information in several systems reduces the amount of redundant data and renders unneccessary investments in extra hardware and software. For example, the same data from a temperature transducer used by your PLC system can also be transferred to Condmaster and used there.

Via OPC, Condmaster can export raw measurement values, condition status (green-yellow-red), symptom values and alarms from the Intellinova online system. Data import to Condmaster may be pressure, flow, temperature or load, for instance.

The information can be used to raise alarms or in connection with RBE (Rule Based Evaluation), etc. Additionally, Intellinova users may use these data as input for measurement conditions. To import and export OPC data to and from Condmaster, you need to install the LinX communication software. OPC functionality in importing/exporting systems is also required.

Many industrial systems of various kinds today come with OPC communication capability. Some examples are WIN-CC, iFix, MatLab och Siemens PCS 7.

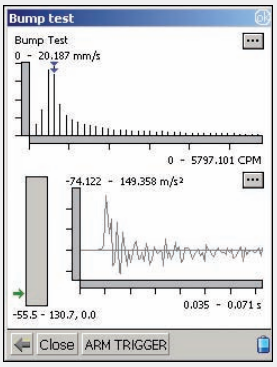
Tips & Tricks

Finding machine resonance frequency

Did you know that the portable instrument Leonova™ Infinity can be used to find the resonance frequency of a machine construction through what is called a bump test? Knowing the resonance frequency is a good help to avoid running the machine at its critical speed(s).

The bump test is carried out by hitting the machine with e.g. a rubber mallet while the machine is not running. Once the bump test parameters are set, the instrument measures the vibration caused by the impact. When studying the frequency range, the highest peak of the machine's natural frequency is displayed.

When this frequency coincides with that of the machine at running speed, or with any other signal generated by the machine, the signals are amplified. This causes higher than normal vibration levels, which may over time cause machine damage or failure. If the natural frequency is at or close to the normal running speed, steps should be taken to change this frequency.



To perform a bump test, a Leonova™ Infinity with vibration transducer and the Bump Test function (article no. LEO137) is required, plus the corresponding Condmaster Nova module (MOD137).

SPM condition monitoring solutions

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