



Winds of Change for FPSO Condition Monitoring

Abstract

FPSO operators, like the commercial marine sector, are facing significant challenges to reduce costs, maintain maintenance standards and comply with regulations. Predictive Maintenance (PdM) / Condition Based Maintenance (CBM) strategies are being increasingly adopted by operators. The need to reduce “wrench time”, reduce costs and achieve regulatory compliance being key drivers.

In this article we share our observations and provide some ideas on how to reduce costs for Condition Monitoring and at the same time addressing key sector challenges. These views are based on over 40 years of providing condition based maintenance services, support and training to FPSO operators.

Winds of Change for FPSO Condition Monitoring

Floating Platform Storage and Offloading (FPSO) operators, like the commercial marine sector, are facing significant challenges to reduce costs, maintain maintenance standards and comply with regulations.

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In this article we share our observations and provide some ideas on how to reduce costs for condition monitoring and at the same time addressing key sector challenges. These views are based on over 40 years of providing condition based maintenance services, support and training to FPSO operators.

Whilst of course condition monitoring is carried out by most FPSO operators, we do see varying degrees of effectiveness, with significant opportunities remaining especially through a more integrated approach, and where condition based maintenance is fully adopted and understood.

This “Integration” of all condition monitoring techniques is important for an effective CBM program that satisfies compliance requirements and reduces maintenance costs. Data from all condition monitoring techniques including vibration analysis, oil analysis, thermal imaging and ultrasound should be combined together with watchkeeping data to provide a holistic asset health view and increase diagnostics accuracy and confidence. However, tradition and technology challenges sometimes hinder rather than help make such integration possible in the marine sector, so what can be done?



Watchkeeping and condition monitoring IT tools are widely used by FPSO operators, but they are rarely integrated, are often expensive and almost always difficult for key personnel to get access to important information that would support maintenance decision making & planning.

Latest web-based CBM tools that enable easy integration of all condition monitoring and watchkeeping data do not require a big investment in time & money and slow internet speeds are no longer a problem. This has been proven using AVT's own Machine Sentry system which is the most widely used CBM system in the UK market and is now making waves in the marine sector, it may be time for FPSO operators to rethink....!

Condition monitoring challenges & opportunity summary:

AVT's "Machine Sentry" internet based Condition Monitoring tool was established in 2006 and has over 5 million readings logged, it is now the most widely used in the UK. However, as recent as 2014, the Oil & Gas sector, and FPSOs in particular, demonstrated a preference to stick with what they had always done.

This diagram shows the challenges we were told faced FPSO operators back in 2014. These challenges will have been overcome to some extent as a result of the current market conditions forcing strategic change, however they probably exist to one degree or another.



Machine Sentry has had the capability to overcome the challenges and, working with our FPSO and Oil & Gas clients has meant further development to eradicate them completely. Key improvements for FPSOs:

Integrates data from Bentley panels easily

“Watchkeeping” module removes the need for separate programs and ensures operational data is easily integrated in to the overall asset health view

Tri-axial sensor enables vibration data to be collected five times faster than before

Highly efficient and effective software for the data transfer protocol has unlocked the power of the internet even on poor dial-up speeds

Addressing the challenges:

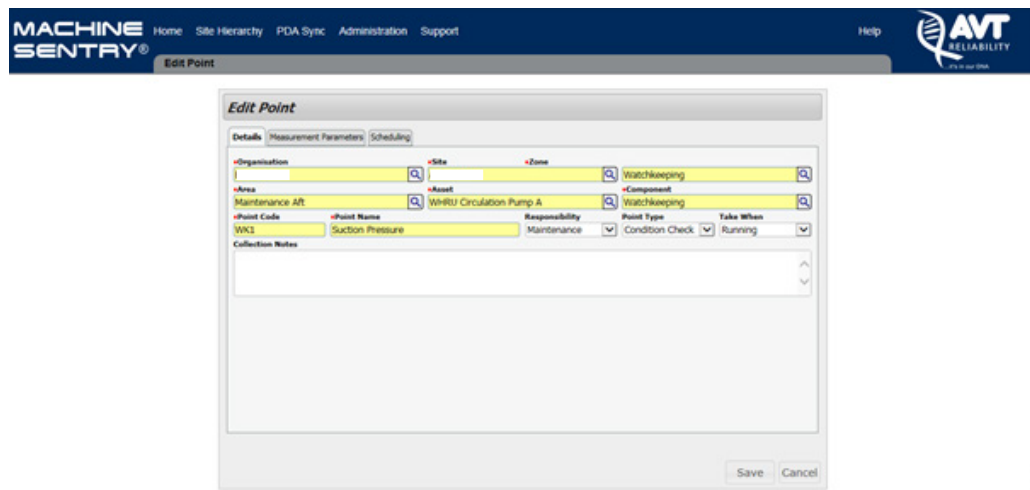
Slow internet speed and bandwidth. Unlike on land-based installations it can take too long to upload/download to a central database, limiting the opportunities for an integrated system. Leading watchkeeping systems are local-server based to overcome the challenge, but that makes them virtually stand-alone.

AVT have deployed Machine Sentry effectively on FPSOs with slow broadband connections. John Sykes, AVT’s Senior Consultant responsible for a number of major FPSO support contracts said

“...we have been successfully operating Machine Sentry on a couple of vessels for over a year. Both have typically slow internet connections but everything is synchronised during off-peak times with no issues”.

Integrating Watchkeeping data.

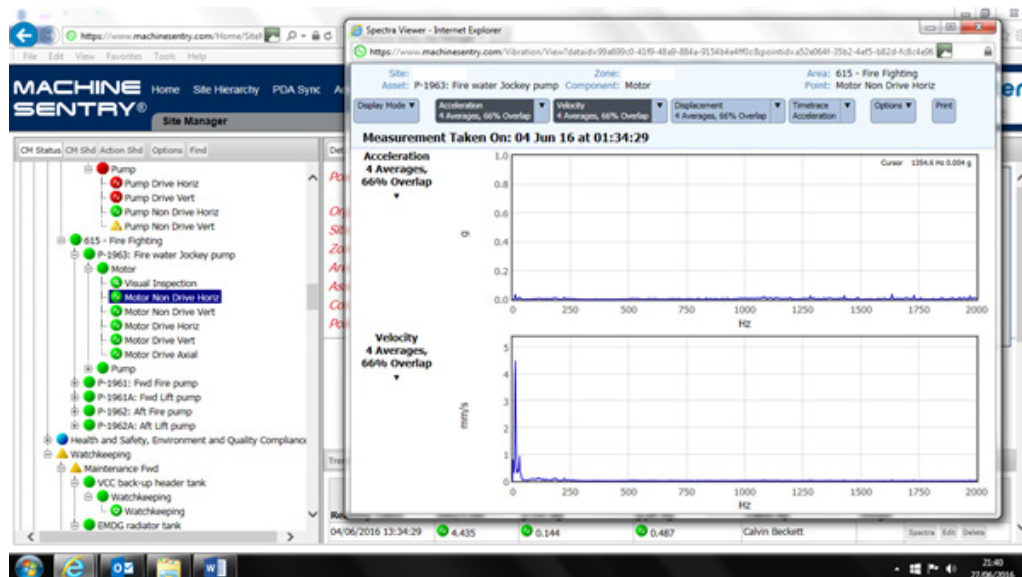
Process and condition information planned and captured through visual inspection is optimised when it can be aligned with data coming from the condition monitoring program (vibration, oil analysis, ultrasound, thermography). Unfortunately traditional integrity watch systems tend to be stand-alone. Machine Sentry’s watchkeeping module is possibly the most flexible on the market today but definitely the most cost-effective and the most widely used integrated system in the UK today, with over 5 million readings logged.

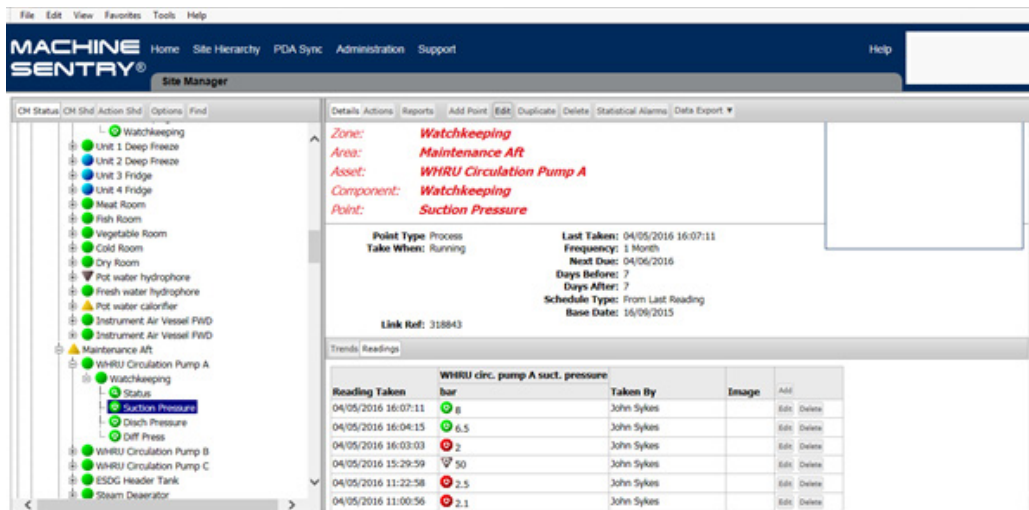


Integrating Watchkeeping & CM data.

Visual inspection information is critical for regulatory compliance and important when it comes to making maintenance decisions which affect reliability, risk and cost. But often the focus for watchkeeping data is for integrity management rather than machine reliability and largely because it is so difficult to integrate or view.

This challenge is overcome with Machine Sentry





Integrating Fixed System Data.

Most FPSOs will have systems such as Bently Nevada 3300/3500 protection systems and fixed sensors. It is important to integrate readings from these systems for an asset-wide view on machine health.



Data Access and Remote Diagnostics

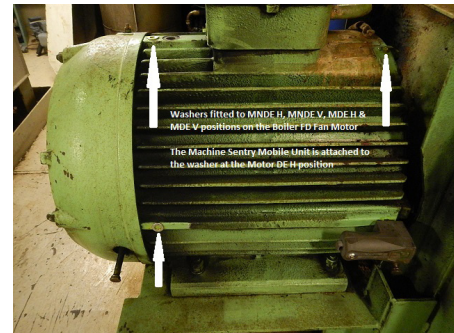
Major advantages with a web-based solution such as Machine Sentry include the ability to quickly access information anywhere there is at least a 3G connection. John Sykes again

“I was in Heathrow airport departures lounge when a call came through for me to give my opinion on a vibration reading that had just been taken. I looked at the reading on my laptop and emailed back my recommendations within just a few minutes. If I'd had to log into citrix and find the information I would probably have missed my flight”

Repeatability & Ease of Use

With numerous personal and different skill sets and priorities, consistency and ease of use are important for any CM system.

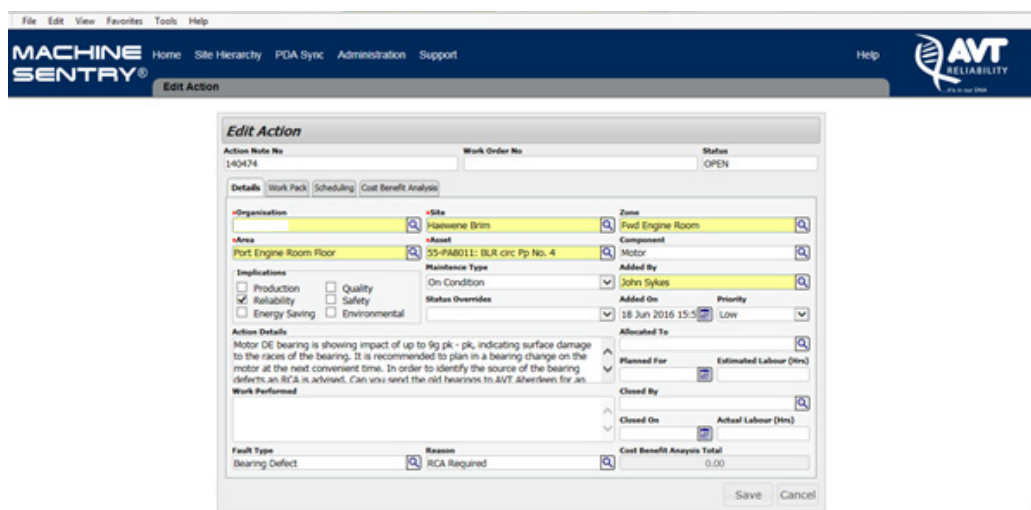
Machine Sentry makes data collection user friendly and we prefer pragmatic solutions such as photos of assets to be monitored displayed on the PDA and washers glued where readings should be taken. Paint wears off, studs fall off and are expensive to replace



Efficiency

Watchkeeping and CM are often tasks of busy Maintenance personnel with numerous other duties. Ease of use is important but so is speed.

Collecting vibration readings can be five times faster using a tri-axial sensor (see video - <https://aesel.wistia.com/medias/6px3oxc41>).



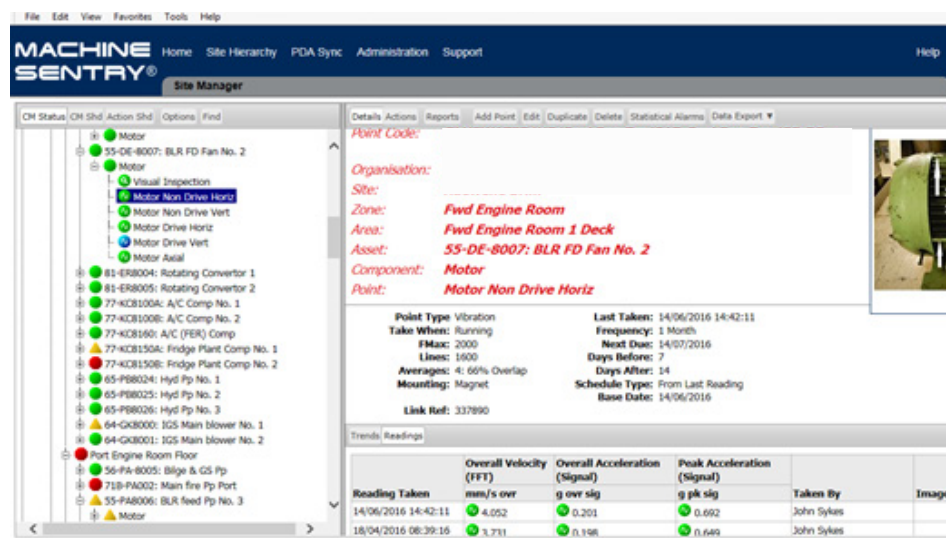
Improving Reliability

Machine Sentry's self-diagnostics capabilities enable maintenance personnel make an accurate "first call" on likely faults.

Remote diagnostics support is easily obtained almost anywhere, anytime:



Spectra from bearing of a pump motor and below is the action note raised to replace the bearings



So, now could be a good time consider a new approach to CM & Watchkeeping. AVT has helped FPSO operators overcome some traditional challenges whilst saving money, reducing data collection times and improving machine fault diagnostics using Machine Sentry.

MACHINE SENTRY®

Condition Monitoring Made Simple!



The most versatile and cost-effective condition monitoring and maintenance system solution on the market.

[Book a demo](#)

www.machinesentry.com

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