Integrated Condition Monitoring Technologies for Energy Saving Applications On Board Ships

Mr. TSR Chary

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Mr. TSR Chary is a Mechanical & Marine engineer with MOT First Class, Chief Engineer sailed experience. His shore and sea service experience is with container, tankers product and crude, chemical tankers, bulk carriers. He is with M/S Green Sails Singapore Self operated technical consultancy company with technical audits, thermo-graphic surveys, Air borne and structure borne ultra sound surveys, non-destructive examinations, and Vibration analysis with noise emission tests from vessels, pre purchase inspections etc., added qualifications Level 2 thermographer licence and level 1 air borne ultra sound and level 2 vibrations analysis inspector licence. Prior to that he has worked with P.T. Meratus lines, Surabaya as senior technical manager and ship manager, fleet manager. He has also worked with NYK ship management. Mr. Chary has presented papers at various technical seminars including Mar-tech international conference in Singapore.

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Abstract:

Condition monitoring of machines provides knowledge about the condition of machines.
Any deterioration in machine condition can be detected and preventive measures taken at an appropriate time to avoid catastrophic failures. This is achieved by monitoring such parameters as
- Vibration,
- Thermography,
- Ultra sound/ acoustic emission etc.(High Frequency above 20 k Hz Ultra sound)
- Marine Diesel Engine performance analysers with IM(Integrated Monitoring) technologies

The changes in these parameters help in the detection of the development of faults, diagnosis of causes of problem and anticipation of failure. The application of condition monitoring in plants results in savings in maintenance costs, and improved availability and safety. The techniques covered in this presentation are performance, vibration, motor stator current, shock pulse, acoustic emission, and thermography and wear debris monitoring. The instrumentation required, Vibration recording Analysis in Software, Air and contact borne ultra sound Ultra probe, Infrared thermal image camera, Noise recording instrument method of analysis and applications with some examples are explained. FFT and Time wave forms in velocity and acceleration spectrum signal processing techniques to gain more benefits of vibration monitoring are covered. Wear debris monitoring methods include magnetic plugs, ferro-graphy, particle counter and spectrographic oil analysis is not discussed in this presentation.
The benefits added with the-

- improved Reliability giving extended Mean Time Between Failures and
- Avoid catastrophic failures
- Additional Plant Availability.
- Operators confidence
- Economical maintenance by planned shutdown, procure spares and service without ship stopped.