ABSTRAK

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Pengukuran dan Karakterisasi Kerusakan Sebagai Metode *Condition Monitoring* pada Permesinan Berputar

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Abstrak

Common machinery fault types are investigated and the analysis of the vibration signature is presented in this paper. Fault types being measured were rotor unbalance, shaft misalignment, various types of Rolling Element Bearing (REB) defects, and gear faults. Vibration based condition monitoring was implemented on the elements of interest. The experiments were carried out on a simulator test rig to simulate various faults in rotating machinery. The time signals acquired were transferred to computer to perform digital signal processing. The Fast Fourier Transform was used to convert the time domain signal into frequency domain for spectral analysis. Unbalance and misalignment were analysed to verify their vibration characteristic of their low frequency harmonics. Subsequent processing methods were implemented on REB analysis in order to increase the ability to detect occurring faults. Envelope analysis and phase resampling (order tracking) were also performed. Results from the analysis shows that for the unbalance type faults, vibration level in the frequency of 1 times running speed are dominant. The angular misalignment has high vibration response in axial direction and a vibration characteristic of 2 times running speed is confirmed. Further analysis incorporating demodulation and Hilbert Transform algorithm in envelope analysis helps distinguish the fundamental faults of REB. The order tracking methods is proven to be constructive in RBE analysis and gear mesh frequency feature detection. A database of common machinery fault is acquired.

Kata kunci: *condition monitoring, faults measurement, vibration signal*

Study of Risk Analysis Piping in Heat Recovery Steam Generator (HRSG) Using Risk Based Inspection Method Based on API 581

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Abstrack

Corrosion is one of the main problems that most frequently occur in the industrial sector has a piping installation. The impact of corrosion can cause damage to the pipe resulting in leakage, loss of product, further environmental pollution can threaten the safety of employees. All the risks associated with corrosion in terms of likelihood and consequences of the installations and the environment need to be addressed prior to the commencement of operations on a regular basis. Results of the corrosion risk analysis should be used to formulate a risk-based inspection procedures should be part of the operation of the plant. This paper presents a case study related to boiler tube HRSG (Heat Recovery Steam Generator), begins with a summary of the basic principles and procedures for risk assessment and corrosion RBI apply for Process Industries.

Keyword: *Risk Based Inspection, API 581, Risk Analysis, HRSG.*