

COVER LETTER

Dedik Romahadi
Universitas Mercu Buana
dedik.romahadi@mercubuana.ac.id
081291412973

27 Juni 2024

Dear,

We wish to submit an original research article entitled "FIR bandpass filter with Welch method for centrifugal cooling water pump fault analysis and validation" for SINERGI's consideration.

We confirm that this work is original and has not been published elsewhere, nor is it currently under consideration for publication elsewhere.

In this paper, we report on / show that:

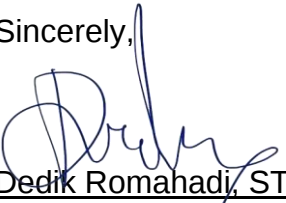
Topic	:	Signal processing for vibration analysis on centrifugal cooling water pump
Brief Background	:	The P9114B pump is a centrifugal pump specifically designed for water cooling in the heat exchanger system. During operation in the field, the P9114B centrifugal pump experienced a reasonably large vibration. Failure to overcome excessive vibrations can cause severe damage to the pump. Predictive maintenance requires using condition-monitoring techniques, especially those related to machine vibrations, to carry out practical maintenance tasks. This study aims to analyze vibrations to identify primary frequencies in the P9114B centrifugal pump responsible for excessive vibrations observed in the frequency domain.
Research Problem	:	The P-9114B centrifugal pump exhibits a high vibration level, the cause of which cannot be determined at this time. The weakness of the FFT method is changing vibrations in the time domain as a whole and the magnitude of the amplitude is influenced by the level of resolution or vibration frequency sample points.
Overview of Method	:	Measuring devices known as Vibxpert II are used to take measurements. This instrument uses three different measurement directions: horizontal, vertical, and axial. The RMS algorithm processes all vibration data, and the results are compared with ISO 10816-3 standards. Welch algorithms

		are used to conduct fault analysis that occurs in centrifugal pumps through the use of frequency domain computing.
Significant finding	:	Based on our best knowledge, no research discusses vibration analysis on centrifugal water-cooling pumping machines. In contrast to previous research efforts, which obtain spectral amplitude by applying the FFT, this research does not cover the method. FIR bandpass filter and the Welch approach are two strategies used in vibration spectrum analysis. We suggest an alternative method and approach to this technique.

We have no conflicts of interest to disclose.

Thank you for considering this manuscript.

Sincerely,



Dedik Romahadi, ST., M.Sc

AUTHORSHIP STATEMENT

We wish to submit an original research article entitled "*FIR bandpass filter with Welch method for centrifugal cooling water pump fault analysis and validation*" for SINERGI's consideration.

All persons who meet authorship criteria are listed as authors, and all authors certify that they have participated sufficiently in work to take public responsibility for the content, including participation in the concept, design, analysis, writing, or manuscript revision.

Author 1	
Name	: Dedik Romahadi
Affiliation	: 1. Universitas Mercu Buana 2. Beijing Institute of Technology
Email Address	: dedik.romahadi@mercubuana.ac.id
Author 2	
Name	: Aberham Genetu Feleke, Ph.D
Affiliation	: Beijing Institute of Technology
Email Address	: abrucag@gmail.com
Author 3	
Name	: Tri Wahyu Adinarto, ST
Affiliation	: Universitas Mercu Buana
Email Address	: dedik.romahadi@mercubuana.ac.id
Author 4	
Name	: Dafit Feriyanto, M.Eng., Ph.D
Affiliation	: Universitas Mercu Buana
Email Address	: dafit.feriyanto@mercubuana.ac.id
Author 5	
Name	: Agung Wahyudi Biantoro, ST., MM., MT., Ph.D
Affiliation	: Universitas Mercu Buana
Email Address	: agung_wahyudi@mercubuana.ac.id
Author 6	
Name	: Fatkur Rachmanu, ST., MT
Affiliation	: Politeknik Enjinering Indorama
Email Address	: fatkur.rachman@gmail.com