

# Analisis Rancang Bangun SCADA System untuk Peningkatan Kualitas Produk dan Performa Mesin Pada Proses Washing Component Manufacture Engine Assembling = Analysis of SCADA System Design to Improve Product Quality and Machine Performance in the Washing Component Manufacture Engine Assembling Process

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## Abstrak

Tesis ini menjelaskan tentang peningkatan efektivitas manufaktur automobile terkait fenomena kegagalan kualitas dan performa mesin produksi. Perusahaan automobile merupakan salah satu industri yang banyak berdiri di berbagai negara. Hal ini dikarenakan automobile merupakan produk transportasi yang banyak dipakai baik untuk tujuan pengangkutan manusia maupun barang. Kualitas produk automobile yang buruk berdampak pada keselamatan pengguna, biaya pengeluaran tambahan, dan nama baik merk yang akan jatuh. Kemudian performa mesin produksi yang buruk akan mengganggu produktivitas internal sehingga akan berpengaruh terhadap kestabilan profit industri.

Salah satu faktor penyebab kegagalan kualitas engine adalah pada saat proses pembersihan komponen engine sebelum perakitan. Permasalahan kualitas washing component pada manufacture engine assembling adalah proses washing yang belum efektif dikarenakan performa washing machine abnormal yang disebabkan aktivitas analisis predictive maintenance yang masih belum optimal, dan metode monitoring kualitas temperature water chemical 1x / hari sehingga tidak bisa mendeteksi abnormal kondisi water chemical yang berpotensi produk kualitas buruk akan flow out.

Development SCADA system akan berfokus dalam dua hal yakni monitoring & control kualitas temperature water chemical dan monitoring equipment sebelum abnormal (predictive maintenance) secara real time. Metode monitoring & control dilakukan secara otomatis dengan menggunakan sensor sebagai pengambilan data, Programmable Logic Controller sebagai Remote Terminal Unit kemudian data akan dikirim ke server melalui komunikasi CC-Link IE Field dan nantinya akan di rekam dan dianalisa melalui display SCADA. Kemudian akan dilakukan analisis investasi menggunakan break even Point (BEP) sebagai pertimbangan investasi dalam proses bisnis. Hasil dari penelitian dengan mengoptimalkan kualitas temperature water chemical dan performa mesin menggunakan SCADA system adalah efektif dengan kegagalan kualitas tidak terjadi dan performa mesin washing meningkat 96,2%.

.....This thesis presents ways to increase the effectiveness of automobile manufacturing related to the phenomena of quality failure and production machine performance. Automobile companies are one of the many industries that exist in various countries. This is because automobiles are transportation products that are widely used both for the purpose of transporting people and goods. Poor-quality automobile products have an impact on user safety, Additional expenses, and brand reputation. Then the poor performance of production machines will disrupt internal productivity so that it will affect the stability of industrial profits.

One of the factors causing engine quality failure occurs during the cleaning process of engine components

before assembly. The problem with the quality of washing components in manufacturing engine assembling is that the washing process is not yet effective due to abnormal washing machine performance caused by predictive maintenance analysis activities that are still not optimal, and the method of monitoring the quality of water chemical temperature 1x/day means that it cannot detect abnormal water chemical conditions that have the potential to lead to bad quality products.

The development of the SCADA system will focus on two things, namely monitoring and controlling the quality of water's chemical temperature and monitoring equipment before it becomes abnormal (predictive maintenance) in real time. The monitoring and control method is carried out automatically by using sensors for data retrieval and a Programmable Logic Controller as a Remote Terminal Unit. Then, data will be sent to the server via CC-Link IE Field Communication and will later be recorded and analyzed through the SCADA display. Then an investment analysis will be carried out using a break-even Point (BEP) as an investment consideration in business processes. The results of research show that optimizing the quality of temperature, water, chemicals, and engine performance using the SCADA system is effective, with quality failures not occurring and machine performance of washing process increasing by 96.2%.