

ABSTRAK

Evaluasi Supervisory Control and Data Acquisition (SCADA) di IPA Broni 2 Perumdam Tirta Mayang Kota Jambi

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ABSTRAK

Sistem Supervisory Control and Data Acquisition (SCADA) memainkan peran penting dalam pengelolaan instalasi pengolahan air minum, karena memungkinkan pemantauan dan pengendalian proses secara real-time. Penerapan SCADA di IPA Broni 2 Perumdam Tirta Mayang Kota Jambi bertujuan untuk meningkatkan efisiensi pengolahan air bersih dengan memantau berbagai parameter kualitas dan kuantitas air secara otomatis. Penelitian ini bertujuan mengevaluasi kinerja SCADA, termasuk kualitas dan kuantitas air yang dihasilkan, serta efektivitas sensor dalam sistem tersebut, dalam konteks keberlanjutan dan efisiensi pengelolaan sumber daya air, yang merupakan bagian integral dari bidang Teknik Lingkungan. Metode penelitian yang digunakan adalah mixed methods, yang menggabungkan pendekatan kuantitatif dan kualitatif. Data kuantitatif diperoleh dari pengukuran parameter kualitas air seperti pH, turbidity, dan sisa chlor, sedangkan pendekatan kualitatif digunakan untuk mengevaluasi kinerja sensor dan efektivitas sistem SCADA dalam mendukung operasional pengolahan air. Data dikumpulkan selama tiga bulan, dari Oktober hingga Desember 2024, dengan analisis terhadap tren perubahan parameter air serta hubungan antara sensor dan kualitas air produksi. Hasil penelitian menunjukkan bahwa sistem SCADA dapat meningkatkan efisiensi dalam pengelolaan air minum, dengan mayoritas parameter kualitas air berada dalam batas standar yang ditetapkan oleh regulasi lingkungan. Namun, beberapa sensor, seperti sensor pH dan turbidity, mengalami malfungsi yang dapat memengaruhi keakuratan data yang dihasilkan. Selain itu, fluktuasi parameter air baku dan produksi menunjukkan adanya faktor eksternal yang memengaruhi stabilitas sistem, seperti perubahan kualitas air baku akibat curah hujan dan pencemaran. Evaluasi ini menyarankan agar dilakukan kalibrasi dan perawatan sensor secara berkala, serta penguatan sistem kontrol otomatis SCADA untuk meningkatkan efisiensi dan efektivitas pengolahan air. Dengan optimalisasi sistem SCADA, diharapkan Perumdam Tirta Mayang dapat memberikan pelayanan air bersih yang lebih stabil, berkualitas, dan berkelanjutan bagi masyarakat.

Kata kunci: SCADA, Instalasi Pengolahan Air, Supervisory Control, Kualitas Air, Evaluasi Sensor, Teknik Lingkungan

ABSTRACT

Evaluation of Supervisory Control and Data Acquisition (SCADA) at IPA Broni 2 Perumdam Tirta Mayang, Jambi City

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ABSTRACT

The Supervisory Control and Data Acquisition (SCADA) system plays a crucial role in the management of drinking water treatment plants by enabling real-time monitoring and control of processes. The implementation of SCADA at IPA Broni 2 Perumdam Tirta Mayang in Jambi City aims to improve the efficiency of clean water treatment by automatically monitoring various water quality and quantity parameters. This study aims to evaluate the performance of SCADA, including the quality and quantity of the water produced, as well as the effectiveness of the sensors within the system, in the context of sustainability and efficient water resource management, which is an integral part of Environmental Engineering. The research methodology employed is mixed methods, combining both quantitative and qualitative approaches. Quantitative data is obtained from measurements of water quality parameters such as pH, turbidity, and residual chlorine, while the qualitative approach is used to assess the performance of sensors and the effectiveness of the SCADA system in supporting water treatment operations. Data was collected over a three-month period, from October to December 2024, with an analysis of trends in changes to water parameters and the relationship between sensors and the quality of produced water. The findings indicate that the SCADA system contributes to improved efficiency in drinking water management, with the majority of water quality parameters falling within the regulatory standards set by environmental regulations. However, several sensors, such as the pH and turbidity sensors, experienced malfunctions that may affect the accuracy of the data generated. Additionally, fluctuations in raw water and production parameters suggest the presence of external factors impacting system stability, such as changes in raw water quality due to rainfall and pollution. This evaluation recommends regular calibration and maintenance of sensors, as well as strengthening the SCADA automatic control system to improve the efficiency and effectiveness of water treatment. With the optimization of the SCADA system, it is hoped that Perumdam Tirta Mayang can provide more stable, high-quality, and sustainable clean water services to the community.

Keywords: SCADA, Water Treatment Plant, Supervisory Control, Water Quality, Sensor Evaluation, Environmental Engineering