

**CHANGEOVER PROCESS IMPROVEMENT TO REDUCE  
CHANGEOVER PROCESS TIME ON OFFSET MACHINE 10  
(CASE STUDY: PT ABC)**

**FINAL PROJECT**

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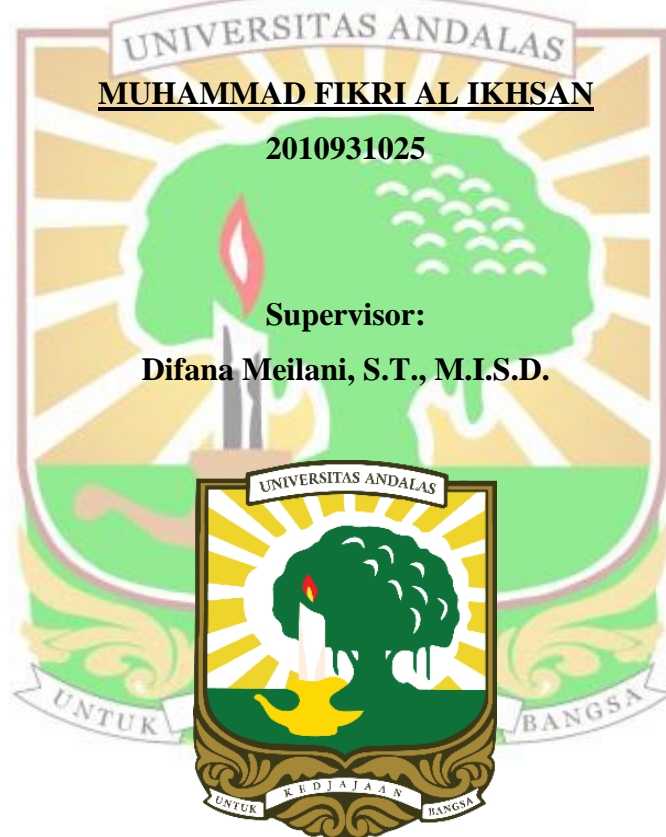


**INDUSTRIAL ENGINEERING DEPARTMENT  
FACULTY OF ENGINEERING  
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PADANG  
2025**

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*Submitted to Fulfill One of the Requirements for Obtaining a Bachelor's Degree  
in Industrial Engineering, Faculty of Engineering, Universitas Andalas*



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## ABSTRAK

Keberadaan industri sangat strategis dalam memberikan kontribusi terhadap Produk Domestik Bruto (PDB), penyerapan tenaga kerja, devisa negara, dan alih teknologi. Industri pulp dan kertas merupakan salah satu sektor manufaktur strategis di Indonesia yang memegang peranan penting dalam perekonomian nasional. PT ABC merupakan salah satu pemain utama dalam industri pulp dan kertas di Indonesia. Berlokasi di Provinsi Banten, perusahaan ini memfokuskan kegiatannya pada produksi berbagai jenis kertas. Saat ini, terdapat permasalahan pada proses produksi mesin offset 10, yaitu waktu proses changeover pada mesin ini melebihi target yaitu 80 menit. Akibatnya, banyak produk yang sudah dijadwalkan untuk diproduksi pada mesin ini mengalami keterlambatan dalam memulai proses produksi. Keterlambatan ini tidak hanya berdampak pada efisiensi internal perusahaan, tetapi juga menurunkan tingkat kepuasan pelanggan. Single Minute Exchange of Dies (SMED) merupakan sebuah metodologi perbaikan terstruktur untuk mengurangi waktu proses pergantian mesin menjadi kurang dari 10 menit. Tujuan dari penggunaan metode SMED ini adalah untuk melakukan banyak langkah pergantian saat mesin sedang beroperasi, menyisakan sesedikit mungkin langkah yang disederhanakan dan disederhanakan selama proses pergantian yang sebenarnya, sehingga mengurangi waktu henti peralatan yang tidak perlu. Oleh karena itu, penelitian ini berfokus pada pengurangan waktu proses changeover dengan menggunakan metodologi SMED, agar produk yang telah dijadwalkan untuk diproduksi selanjutnya tidak mengalami keterlambatan, sehingga tingkat kepuasan pelanggan dapat dipertahankan. Sebelum dilakukan perbaikan, proses changeover mengalami inefisiensi karena beberapa faktor seperti alokasi pekerja yang kurang memadai, kurangnya standarisasi, dan ketergantungan pada metode manual. Analisis akar masalah (RCA) mengungkapkan kemacetan yang signifikan dalam kegiatan seperti pembersihan roll, penanganan pelat, dan pengaturan register, yang menyoroti perlunya intervensi yang ditargetkan. Setelah dilakukan perbaikan, termasuk pemisahan aktivitas internal dan eksternal, penerapan otomatisasi, dan pengenalan alat bantu seperti densitometer, waktu proses pergantian dapat dikurangi secara signifikan. Tingkat peningkatan rata-rata (persentase pengurangan waktu proses pergantian setelah perbaikan) berkisar antara 21% dan 46%, tergantung pada kompleksitas tugas dan ketersediaan pekerja. Hasil ini menunjukkan efektivitas penyelarasan peningkatan teknologi dengan pelatihan tenaga kerja dan standarisasi proses.

**Kata Kunci:** Pergantian, Eksternal, Failure Modes and Effects Analysis (FMEA), Peningkatan, Internal, Single Minute Exchange of Dies (SMED)

## ABSTRACT

The existence of industry is very strategic in contributing to Gross Domestic Product (GDP), employment, foreign exchange, and technology transfer. The pulp and paper industry is one of the strategic manufacturing sectors in Indonesia that plays an important role in the national economy. PT ABC is one of the major players in the pulp and paper industry in Indonesia. Located in Banten Province, the company focuses its activities on the production of various types of paper. Currently, there is a problem in the production process of offset machine 10, namely the changeover process time on this machine exceed the target which is 80 minutes. As a result, many products that have been scheduled to be produced on this machine experience delays in starting the production process. This delay not only impacts the company's internal efficiency, but also lowers the level of customer satisfaction. Single Minute Exchange of Dies (SMED) is a structured improvement methodology to reduce machine changeover process time to less than 10 minutes. The goal of using this SMED method is to perform many changeover steps while the machine is in operation, leaving as few simplified and streamlined steps as possible during the actual changeover process, thus reducing unnecessary equipment downtime. Therefore, this research focuses on reducing the changeover process time using the SMED methodology, so that products that have been scheduled to be produced next do not experience delays, so that the level of customer satisfaction can be maintained. Before improvements, the changeover process was plagued with inefficiencies due to factors such as inadequate worker allocation, lack of standardization, and reliance on manual methods. Root cause analysis (RCA) revealed significant bottlenecks in activities like roll cleaning, plate handling, and register setting, highlighting the need for targeted interventions. After improvements, including the separation of internal and external activities, the adoption of automation, and the introduction of tools like the densitometer, changeover process times were significantly reduced. The average improvement rates (the percentage reduction in changeover process time after improvement) ranged between 21% and 46%, depending on the complexity of the task and worker availability. These results demonstrate the effectiveness of aligning technological enhancements with workforce training and process standardization.

**Keyword:** Changeover, External, Failure Modes and Effects Analysis (FMEA),  
Improvement, Internal, Single Minute Exchange of Dies (SMED)