

ABSTRAK

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Judul Laporan Akhir : Implementasi *Changeover* Untuk Mendukung
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Perkembangan pesat industri manufaktur baterai menuntut tingkat fleksibilitas produksi yang tinggi guna mengantisipasi tingginya variasi model produk. Salah satu kendala utama yang menghambat kelancaran dan efisiensi lintasan produksi adalah waktu henti akibat lamanya proses ganti model mesin. Penelitian ini bertujuan mengimplementasikan metode *Single Minute Exchange of Die* guna mereduksi waktu *changeover* pada mesin *Leak Test* yang merupakan stasiun kerja kritis di PT Navitasys Technology Indonesia. Metodologi penelitian ini dilaksanakan secara sistematis melalui observasi langsung di lapangan, pengukuran *time study* berbasis perekaman video, pemetaan proses, serta pengklasifikasian aktivitas menjadi *internal setup* dan *external setup*. Untuk mengidentifikasi serta menganalisis akar penyebab permasalahan pada aktivitas yang dominan, digunakan instrumen perbaikan kualitas berupa Diagram Pareto, Diagram Ishikawa, dan *Five Why Analysis*. Hasil pengukuran kondisi awal menunjukkan total waktu *changeover* mencapai 35,50 menit, dengan dua aktivitas pemborosan paling dominan, yaitu *Cleaning* sebesar 12,60 menit (35,49%) dan *Adjustment Fixture* sebesar 9,08 menit (25,58%). Melalui penerapan perbaikan berbasis SMED—seperti konversi *internal setup* menjadi *external setup*, penyediaan perkakas pra-persiapan, serta standarisasi prosedur kerja—waktu *changeover* berhasil dipangkas menjadi 21,00 menit. Penurunan waktu sebesar 14,50 menit ini menghasilkan efisiensi pengurangan waktu *changeover* sebesar 40,85%. Selain itu, penelitian ini mengkaji keandalan teknis sistem *sealing* pada jalur kalibrasi gas *Isobutylene*. Berdasarkan kajian teknis dan karakteristik material, penggunaan *O-ring* berbahan FKM (*Viton*) 75 Shore A direkomendasikan untuk meningkatkan keandalan *sealing* serta mencegah kebocoran gas. Secara keseluruhan, penerapan SMED dan penyempurnaan teknis ini terbukti secara signifikan mampu meningkatkan fleksibilitas produksi *multi-model* melalui efisiensi waktu setup dan peningkatan kesiapan operasional mesin.

Kata kunci: *Changeover*, SMED, *Leak Test*, Fleksibilitas Produksi, O-ring, *Isobutylene*.

ABSTRACT

Implementation of Changeover to Support Multi-Model Production Flexibility in Battery Manufacturing Process

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The rapid advancement of the battery manufacturing industry demands a high degree of production flexibility to accommodate high product model variations. One of the main bottlenecks impeding production line flow and efficiency is downtime caused by prolonged machine changeover processes. This study aims to implement the Single Minute Exchange of Die (SMED) methodology to reduce changeover time on the Leak Test machine, a critical workstation at PT Navitasys Technology Indonesia. The research methodology was systematically conducted through direct field observations, video-recorded time studies, process mapping, and the classification of activities into internal setup and external setup. Quality improvement tools, including Pareto Charts, Ishikawa (Fishbone) Diagrams, and Five Why Analyses, were utilized to identify and analyze the root causes of dominant setup activities. Initial baseline measurements indicated a total changeover time of 35.50 minutes, dominated by two waste activities: Cleaning at 12.60 minutes (35.49%) and Fixture Adjustment at 9.08 minutes (25.58%). Through SMED-based improvements—such as converting internal setups to external setups, pre-staging tools, and standardizing work procedures—the changeover time was successfully reduced to 21.00 minutes. This 14.50-minute reduction translates to a 40.85% efficiency increase in changeover time reduction. Furthermore, the study evaluates the technical reliability of the sealing system on the Isobutylene gas calibration line. Based on technical assessments and material characteristics, the application of FKM (Viton) 75 Shore A O-rings is recommended to enhance sealing reliability and prevent gas leakage. Overall, the implementation of SMED and technical refinements significantly improves multi-model production flexibility through setup time efficiency and enhanced machine operational readiness.

Keywords: *Changeover, SMED, Leak test, Production Flexibility, O-ring, Isobutylene*