

PERANCANGAN SISTEM KERJA TERINTEGRASI UNTUK PERBAIKAN PROSES PENGOLAHAN SAMPAH MENJADI PRODUK RDF PADA TPST SENTIONG BERBASIS LEAN-ERGONOMI

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ABSTRAK

TPST Sentiong merupakan fasilitas pengolahan sampah menjadi *Refuse Derived Fuel (RDF)*. Pada kondisi eksisting, terdapat akumulasi RDF di area penyimpanan akibat belum optimalnya sinkronisasi antara proses produksi dan penyaluran kepada offtaker. Selain itu, kegiatan operasional masih melibatkan aktivitas manual yang berpotensi menimbulkan pemborosan gerakan dan risiko ergonomi pada operator. Penelitian ini bertujuan menganalisis kondisi aliran proses dan sistem kerja operator, mengidentifikasi waste dan risiko ergonomi, serta merancang sistem kerja terintegrasi berbasis Lean-Ergonomi. Analisis Lean dilakukan menggunakan *Value Stream Mapping (VSM)*, sedangkan analisis ergonomi dilakukan melalui survei Gangguan Otot dan Rangka Akibat Kerja (GOTRAK) dan REBA. Hasil kedua analisis diintegrasikan untuk menentukan permasalahan prioritas, kemudian akar penyebab dianalisis menggunakan *Fishbone Diagram* dan *5 Why Analysis*. Hasil penelitian menunjukkan empat waste utama, yaitu *inventory*, *waiting*, *transportation*, dan *motion*. Penilaian ergonomi menunjukkan adanya aktivitas dengan tingkat risiko tinggi hingga sangat tinggi, terutama pada Conveyor Feeder, Balpress, Centris, dan Crusher. Berdasarkan hasil tersebut, dirancang sistem kerja terintegrasi berupa monitoring produksi hingga penyaluran RDF, pengendalian storage berbasis zona, pengendalian Stage sebagai controlled buffer, pengurangan rehandling, serta perbaikan metode kerja pada stasiun kerja.

Kata kunci: Ergonomi, Lean, *Refuse Derived Fuel (RDF)*, Sistem Kerja, *Value Stream Mapping*.

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ABSTRACT

TPST Sentiong is a waste processing facility that converts municipal waste into Refuse Derived Fuel (RDF). Under the existing conditions, RDF accumulates in the storage area due to insufficient synchronization between the production process and distribution to the off-taker. In addition, operational activities still involve a considerable amount of manual work, which may result in unnecessary motion and ergonomic risks for operators. This study aims to analyze the existing process flow and operator work system, identify waste and ergonomic risks, and design an integrated Lean-Ergonomics-based work system. The Lean analysis was conducted using Value Stream Mapping (VSM), while the ergonomic analysis employed the Work-Related Musculoskeletal Disorders survey (GOTRAK) and REBA. The results of both analyses were then integrated to determine priority problems, and the root causes were further analyzed using a Fishbone Diagram and 5 Why Analysis. The results identified four major types of waste, namely inventory, waiting, transportation, and motion. The ergonomic assessment showed that several activities were categorized as having high to very high risk levels, particularly at the Conveyor Feeder, Balpress, Centris, and Crusher workstations. Based on these findings, an integrated work system was designed, consisting of RDF production-to-distribution monitoring, zone-based storage control, Stage management as a controlled buffer, reduction of rehandling, and improvements to work methods at selected workstations.

Keywords: *Ergonomics, Lean, Refuse Derived Fuel (RDF), Work System, Value Stream Mapping.*

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ABSTRAK

TPST Sentiong mangrupa fasilitas pikeun ngolah runtah jadi *Refuse-Derived Fuel* (RDF). Dina kaayaan ayeuna, aya akumulasi RDF di wewengkon panyimpenan alatan sinkronisasi antara prosés produksi jeung panyaluran ka *off-taker* anu can optimal. Sajaba ti éta, kagiatan operasional masih ngalibetkeun rupa-rupa pagawéan manual anu berpotensi nimbulkeun kaborosan gerakan sarta résiko ergonomi pikeun operator. Ieu panalungtikan miboga tujuan pikeun nganalisis kaayaan aliran prosés jeung sistem gawé operator, ngaidéntifikasi *waste* jeung résiko ergonomi, sarta ngarancang sistem gawé terintegrasi dumasar kana pendekatan Lean-Ergonomi. Analisis Lean dilaksanakeun ngagunakeun *Value Stream Mapping* (VSM), sedengkeun analisis ergonomi dilaksanakeun ngaliwatan survéi Gangguan Otot jeung Rangka Balukar tina Gawé (GOTRAK) sarta REBA. Hasil tina éta dua analisis dihijikeun pikeun nangtukeun masalah anu jadi prioritas. Saterusna, akar panyabab masalah dianalisis ngagunakeun *Fishbone Diagram* jeung *5 Why Analysis*. Hasil panalungtikan némbongkeun ayana opat jinis *waste* utama, nyaéta *inventory*, *waiting*, *transportation*, jeung *motion*. Penilaian ergonomi ogé némbongkeun ayana sababaraha kagiatan anu miboga tingkat résiko luhur nepi ka kacida luhurna, utamana di stasiun Conveyor Feeder, Balpress, Centris, jeung Crusher. Dumasar kana éta hasil, dirancang hiji sistem gawé terintegrasi anu ngawengku monitoring prosés produksi nepi ka panyaluran RDF, pangendalian panyimpenan dumasar kana zona, pangendalian Stage salaku *controlled buffer*, pangurangan *rehandling*, sarta perbaikan métode gawé di unggal stasiun gawé.

Kecap konci: Ergonomi, Lean, *Refuse-Derived Fuel* (RDF), sistem gawé, *Value Stream Mapping*.