

ABSTRACT

This case study aims to investigate the results of implementing flexible manufacturing system in a fertilizer plant, for reducing waste. The main problems identified during the study are loss of material, low productivity, low machines utilization, low overall equipment effectiveness and high quantity of reworked material. To achieve the goals of the study, engineering tools such as Flexible Manufacturing System (FMS) and Total Productive Maintenance (TPM) are used. PDSA cycle is followed in developing the framework of the study. A team is formed, which consists of 6 executives to execute the flexible manufacturing systems and engineering tools. An effective flexible manufacturing system is integrated into the Group Technology (GT) cell to manage the flow of materials and the moving speed of conveyor belts. Total Productive Maintenance has been performed to identify the types of waste (or losses) and find the means of its reduction. The overall equipment effectiveness (OEE) has been noticed to have improved from 32.44 percent to 69.01 percent. The monthly output is increased from 6628.16 tons to 8731.48 tons. The percentage of loss of material per hour is decreased from 32.76 percent to 12.44 percent. The quantity of reworked material is reduced from 153.12 tons to 77.89 tons. The study has contributed new ideas for problem solving, through system development and used of engineering techniques production. The study has reduced wastes, inventory and problems induced by wastes. Due to time constraint, this study is focused on the key machines only.

ABSTRAK

Kajian ini bertujuan untuk menyiasat keputusan penggunaan FMS dalam kilang baja, dengan mengurangkan pembaziran bahan. Masalah utama yang telah dikesan dalam kajian ini ialah kerugian bahan, produktiviti yang rendah, OEE yang rendah dan amoun pemulihan bahan yang tinggi. Untuk mencapai sasaran kajian ini, teknik kejuruteraan seperti FMS dan TPM telah digunakan. Bulatan PDSA telah digunakan untuk membina rangka kajian ini. Enam eksekutif telah dikumpulkan dalam sepasukan untuk menjalankan FMS dan teknik kejuruteraan. FMS telah diintegrasikan dalam GT untuk mengendalikan pengedaran bahan dan kelajuan tali “conveyor”. TPM telah digunakan untuk mengenal pasti jenis pembaziran dan cara untuk mengurangkan pembaziran tersebut. OEE telah dipertingkatkan dari 32.44 peratus ke 69.01 peratus. Hasil keluaran bulanan telah dipertingkatkan dari 6628.16 tan ke 8731.48 tan. Peratus kerugian bahan sejam telah dikurangkan dari 32.76 peratus ke 12.44 peratus. Amoun pemulihan bahan telah dikurangkan dari 153.12 tan to 77.89 tan. Kajian ini telah memberi sumbangan dalam idea baru untuk menyelesaikan masalah, menerusi pembinaan sistem baru dan penggunaan teknik kejuruteraan. Kajian ini telah mengurangkan pembaziran, inventori dan masalah yang dipengaruhi oleh pembaziran kilang baja tersebut. Oleh kerana masa yang singkat, kajian ini hanya fokus pada mesin yang utama sahaja.

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