

Stamping Die Preparation Time Reduction using Modeling and Simualtion

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Abstract

The operation of a metal stamping manufacturing company was studied. Continuous improvement of the press line with rapid die change capability was the focus of the study. Simulation analysis was used for the new press line for the performances: capacity, throughput and lead time with constraints including rapid die change. The simulation analysis also addresses synchronization between different operations. The data is organized and analyzed for the improvements in the system. The primary focus of the study was the die cleaning and handling time. Five sets of dies are used in the manufacturing process; therefore, storage of the dies was a critical. The research proposed a new approach to accommodate the die preparation area that would support rapid die change presses. Crane utilization was also another major factor. The study identifies potential bottlenecks, as well as, proposed solutions for improvement.

Biography

Nirav Sheth is a student in Master of Science Industrial Engineering program at Lawrence Technological University, USA. HE holds a Bachelor of Engineering in Mechanical from Pune University, India. He has experience in design and quality at Ploytech Cooperation, Mumbai India. His research Interest Includes manufacturing, optimization, productivity, simulation (Arena), Microsoft Project Management, Minitab and 3D Modeling (CATIA, Pro/E, Unigraphics, AutoCAD).

Abass Al-Enzi is a doctorate student of Doctor of Engineering in Manufacturing Systems (DEMS) at Lawrence Technological University. He earned Bachelor of Science and Master of Science in Production Engineering in Production Engineering from University of Technology, Baghdad, Iraq. Enzi was in the dean's list and second in Ranking in college of engineering. He worked as Lecturer at the University of Technology, Iraq. Enzi has experience on metal cutting, metal forming, die design, CAD/CAM, Matlab, programming, LabVIEW, control, simulation and statistical analysis. He has published journal and conference papers. Enzi is a member of the professional societies.

Parth Patel holds bachelor's degree in mechanical engineering from Visvesvaraya Technological University, Bangalore, India. He is pursuing his Master's study in industrial engineering at Lawrence Technological University, Southfield, MI, USA. He has attained an industrial experience working as a mechanical engineer at Apollo Construction Equipment Pvt. Ltd., Mehsana, India. He attended workshops on Geometric Dimensioning and Tolerance (GD&T) stack up, Failure Model and Effect Analysis (FMEA). He completed his training on Industrial Hydraulics at Rexroth Bosch Group, Ahmedabad, India. He has knowledge of ANSYS, Autocad, and Minitab. His expertise lies in CNC Programming, CIM Modeling and Arena. His research interest includes manufacturing systems, reliability and six sigma.

Ahad Ali is an Assistant Professor, and Director of Master of Science in Industrial Engineering in the A. Leon Linton Department of Mechanical Engineering at the Lawrence Technological University, Michigan, USA. He earned B.S. in Mechanical Engineering from Khulna University of Engineering and Technology, Bangladesh, Masters in Systems and Engineering Management from Nanyang Technological University, Singapore and PhD in Industrial Engineering from University of Wisconsin-Milwaukee. He has published journal and conference papers. Dr Ali has done research projects with Chrysler, Ford, DTE Energy, Delphi Automotive System, GE Medical Systems, Harley-Davidson Motor Company, International Truck and Engine Corporation (ITEC), National/Panasonic Electronics, and Rockwell Automation. His research interests include manufacturing,

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Donald M. Reimer is currently a fulltime senior lecturer and Director of The Lear Entrepreneurial Program in College of Engineering at Lawrence Tech. Mr. Reimer holds a Bachelor of Science degree in Industrial Management from Lawrence Technological University and a Master of Arts degree in Political Science from University of Detroit/Mercy. He is a Certified Management Consultant with over 35 years of experience in working with closely-held businesses. He has taught courses in entrepreneurship, management and corporate entrepreneurship and innovation for engineers. Mr. Reimer served as member of the Minority Economic Development Committee of New Detroit. Mr. Reimer serves as a KEEN Fellow for The Kern Family Foundation and is a member of United States Association of Small Business and Entrepreneurship.