

**PRESS SHOP DIE HANDLING INVESTIGATION THROUGH SIMULATION**

**BY:**

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## **Abstract**

This report has investigated the handling of the dies in a press shop of a major car company and in particular, the utilisation of the die transporter. The activity based simulation method of analysis particularly Extended Control Simulation Language (ECSL) has been applied to investigate the system behaviour in which to obtain solution that maximises the system performance. Activity Cycle Diagram (ACD) has been used as mechanism to both structure the model logic and develop the coding program of the system. A number of operating scenarios has been explored and performance measures such as queuing time, length and resource utilisation have been analysed. The effects of different operating scenarios such short pressing time and high volume dies have presented graphically to show the variation of results in the utilisation of the transporter. Hence, based on these analyses, recommended solutions are proposed to optimise the system performance which is the objective of the report. These investigations would be useful for the manufacturing engineers in applying the use of activity based simulation and the ACD in manufacturing systems.

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## **Introduction**

This report concerns both a car manufacturer's press shop and the use of simulation. These are introduced in this order.

### **1.1 Press Shop**

Press shop is usually closely related to automotive manufacturing. It involves pressing activity of metal sheets into car's body parts such as doors and hoods. It consists of several press machines or also known as press lines. The dies for the press lines have different shapes and sizes in which depends on the size of the cars that need to be produced in the factory. Since the dies need to be change and refurbish throughout the production period, a material handling vehicle is needed for this purpose. A die transporter is used to transfer the dies from the press lines to the storage or to the die refurbishment shop. The die refurbishment shop repairs and restores the condition of the dies in which to be used in the upcoming pressing activity.

A major car company is planning to acquire a new die transporter for their press shop manufacturing system for improving the dies transfer. The objective of this report is to determine whether one or two transporter is required to accomplish the die movements. This includes eliminating the queues, increasing the production rate substantially and improving the overall utilization of the press lines. The development of a simulation of the die movement system using data supplied by the company is used to determine the number of transporters required. A number of operating scenarios will be considered so that the demands on the transporter can be determined through the simulation.