HIGHER TECHNICAL INSTITUTE
MECHANICAL ENGINEERING DEPARTMENT

DIPLOMA PROJECT

FEASIBILITY STUDY FOR THE INTRODUCTION OF INDUSTRIAL ROBOTICS IN A METAL INDUSTRY

by

ANTONIS MAVROU (M/716)

JUNE 1995

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This project
is dedicated to
my family

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ABSTRACT

This project is concerned with the introduction of industrial robotics in a metal industry for a specific application. The objective and scope of this project is to carry out a feasibility study with the potential of utilizing robotics in its operations and the impact of this adoption. Such a feasibility study was carried out in G&C Stelco Company which manufactures and purchases exhaust systems. The study was done during my working period in the company as a part of the Industrial Training module.

Chapter 1 is an introduction to industrial robotics giving their definition, historical overview, development and use in the manufacturing industry, and their advantages and benefits when applied.

Chapter 2 describes the basic element which make up the complete robot for industrial applications.

Chapter 3 describes the classification of industrial robots according to their geometrical configuration and work envelope, application of function, control system, programming method and intelligence level.

Chapter 4 introduces the foundations of Stelco describing its manufacturing operations for the production of exhaust systems. Then a survey of the application areas, considered for robot introduction is given from which one application is selected for further study with the reasons of robot adoption stated. The rest of this chapter is concerned with the technical factors of the robotic system operation and the main consequences of this adoption.

Chapter 5 includes an economic justification analysis using the Discounted Cash Flow method and data concerning the company. The meaning and evaluation of this analysis is consolidated in the final conclusions.