

# PROGRAMMABLE LOGIC CONTROLLERS

## ASSIGNMENT No. 1

### SELECTION CRITERIA

In this assignment you must produce a written report explaining all the items detailed below. You should read your notes, study textbooks and draw on any other source of information such as manufacturers catalogues.

### BAR TRIMMING MACHINE

#### PART 1

A steel company requires a single custom built machine to do the following.

Batches of flat bars are to be trimmed to length and stacked.

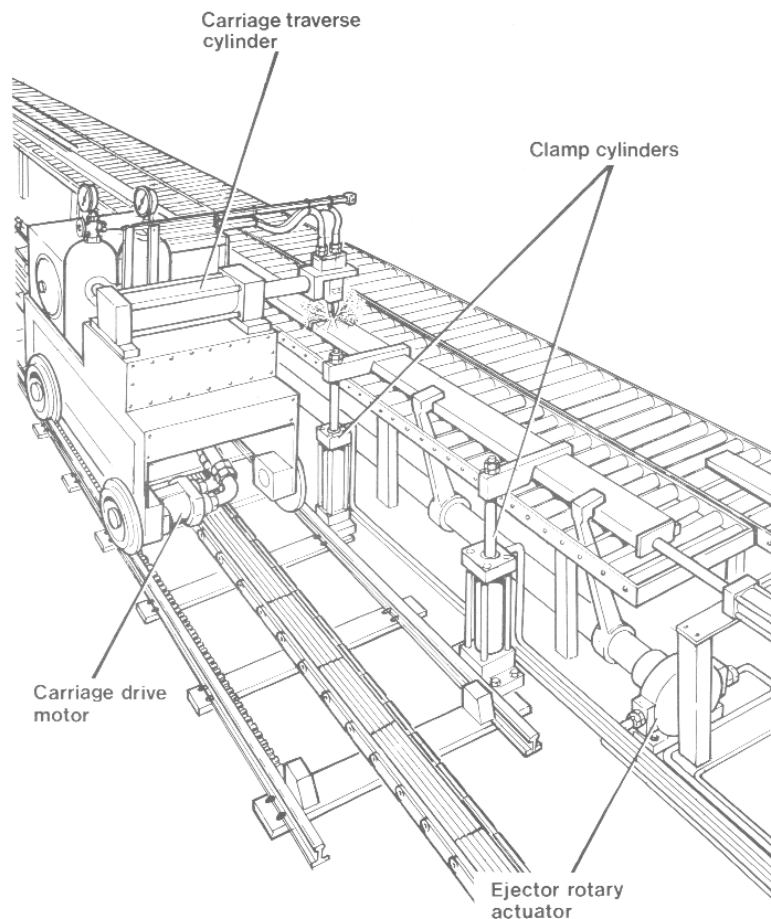
The bar comes along a roller track and hits an end stop.

The bar is clamped tightly.

An acetylene cutter head moves to the correct cutting position for the batch.

The cutter cuts the length in a controlled manner and retracts.

The cut bar must be ejected and the process repeated.



All the actuators are hydraulic and controlled by electric solenoid valves and they are fitted with position sensors to signal their movements. Recommend a PLC that would be suitable to control the valves. What would be the cheapest method of programming the PLC? Be sure to explain all your reasons.

## **PART 2**

At some later stage after installation it is decided to integrate the machine with all the other machines and processes in the production line so that overall control and monitoring takes place with a mimic panel in a central control room. All the PLCs in the production line must be reprogrammable from a central source and interrogation of the PLCs must take place to obtain statistical data about quantities and sizes.

Explain in outline how the whole system may operate with a local area network and field bus system.

## **PART 3**

Bearing in mind the type of workshop where the machine is installed, what sort of risks do you think would have to be considered if a Job Safety Analysis was conducted? What kind of Personal Protection Equipment would be needed by anyone working around the machinery?

What sort of risks would apply to anyone working in the control room?

Outline the dangers to persons working on the production line when the operators is making adjustments to the PLC programme and testing them out.