ABSTRACT

Computer aided process planning has started gaining more and more acceptability in the industrial scenario in this country. A review of literature survey indicates that considerable research work have already been initiated but all these are basically limited in the area of conventional metal cutting and metal forming based products but a logical approach to process planning in Electric Discharge machining does not appear to exist.

As a first step towards the automation in EDM process planning the present work attempts to develop a systematic mathodology for generation of computerised process plan.

The input module takes the information about the raw material, features to be machined and available machine tool.

The planning module combines the features in a logical fashion to achieve economics of tooling and machine tool capability. The application of proposed methodology will reduce time, efforts and costs involved in development of the process plans for EDM.

The present work can be divided into two parts :

1. Input Module 2. Planning Module.

In the Input module necessary input information are collected. The necessary input information are blank dimension, finished part dimension, shape, surfare roughness, material and machinability requirement. Blank dimension are used during the stage of the preliminary selection of the machine tool. Machinability refers to the case of metal removal. A material is said to have good machinability if it can machined with less tool wear.

The planning module first select the machine available on the basis of conditions of the machines available (i.e. busy, idle, breakdown) time. Machining areas are determined from the drawing of the component and by applying geometrical formulas. Volume of material to be removed are calculated from machining areas and depth of cut.

After this the Operation are sequenced and various process parameters such as current, voltage, metal removal rate etc. are determined. The mathematical model for Metal Removal Rate (MRR) for different electrode with different W/P material has been developed by using Regression/Co-relation analysis with the parameter surface roughness and Intensity level for EDM and W/P thickness and Intensity Level for WEDM.

The process sheet generated both for EDM and WEDM will highlight the following output informations

* M/C number selected
* Type of M/C
* Machining Speed
* Machining Time
* S.R. of Finished Job
* Direction of Flush
* Operating M/C Current
* Metal Removal Rate

In the last part of the present work an attempt to optimise the lead time and cost by Hungerian Method are developed.

Based on the experience already available in the domain on the mechanism of the EDM processes its optimisation and also on the techniques of computer

aided process planning as applied to metal cutting based process, the present work reports a portion of attempts to synthesize both set of knowledge and provide a logical analysis of the decisions of process planning activities including the aspects of

- Selection of machine tool
- Sequencing the operation
- Deciding the operating parameters
- Calculation of overall time required for machining both for EDM & Wire EDM
- Generation of process sheet both for EDM & Wire EDM