CHAPTER 1

INTRODUCTION

1.1 PROJECT BACKGROUND

Incremental forming processes have been introduced in the recent past as an alternative to the money consuming stamping technology, when small batches have to be manufactured. Incremental forming is still a new and not fully assessed process, which is interesting that manufacturing applications start to appear in the world scenario.

Single-point incremental forming (SPIF) is a flexible sheet metal forming process that is economically promising for low production run manufacturing. In this process, a small sized tool moves along a programmed tool path and shapes the part in an incremental fashion. The process is mainly performed by shear deformations.

A particular application has been developed highlighting the point of strength of such a technology. It is, by now, a widely diffused opinion that Incremental forming processes are very suitable when high customized products have to be manufactured. In fact, due to the very low set up cost, the use of this technology may be strategic when industries require small batch or single products.
1.2 PROBLEM STATEMENTS

i. The Incremental forming machine now does not have the proper guide to optimize the machining parameters.

ii. The outcome results of the workpiece after forming is usually not good enough. Some also results by cracking or tearing of the sheet metal.

1.3 OBJECTIVES

The objectives of this project are

i. To study and understand the concept and principle of Single point incremental forming (SPIF).

ii. To investigate the process parameters to obtain a good quality product and the optimization of manufacturing.

iii. To determine the limits of formability by using a scheduled tool path.

iv. To investigate the effect of springback on different types of thickness.

1.4 SCOPE OF STUDY

i. To perform research and to optimize the machining parameters by analysis on ALGOR software.

ii. To have a variable distance of stepdowns to find the most suitable machine parameter on the specific thickness of material.

iii. To analyze the displacement by the springback effect on different thickness of material.

1.5 CONCLUSION

The whole project will be guided by this chapter throughout the whole process. The objectives must be achieved, the scope of study must be completed and the Gantt chart is to be followed to complete the project in the time given.