CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

The basic mechanisms of wear of tools and different types of wear produced at the tip of the tool can be realized several years ago. Based on experimental measurements of the tool are different, and application of appropriate statistical techniques, it is possible to predict the tool life and hence the intervals of changing tools.

At the same time, the poor prospects were provided for the cutting process because of higher energy waste and economic inefficiency. However, recent developments in machine tools, computer control, automation, combined with improvements related to contingencies when cutting materials and their protective coatings with geometric tools, make such a prediction completely invalid. In addition, the percentage of use of machining operations has actually increased significantly today.

New cutting materials costs to increase efficiency of the tool machining operations of interpretation and also very increase the reliability and cutting quality. All machining problems these changes pose new challenges amazing and tasks for users of tools. If we were able to predict the life of a tool based on measurements of flank wear and crater of the tool, due to changing circumstances with new tools and all related appearances would require us to be unknown consider that the tool wear as a collection of different kinds of door located at the tool tip, difficult to separate form from the usual places.
The study of the dynamics of the machine tool is by "tracking", which is to monitor and improve the functions of the machine. Signals collected by sensors are processed by a computer and the data obtained are used to associate the state with the current operation of a class from a set of classes called the treatment conditions. Process tool wear is a vital aspect of machining and head of the tool is the term generally refers to a non rotary cutting tool used in metal lathes, shapers and planers. One of machining processes using a small machine tool tower is shooting process.

This study focuses on monitoring tool wear in turning machine using acoustic emission technique. By applying this technique to laboratory experiments the maximum level of performance in the transformation process of the tool head is identified, the inability of the head of the tool before breaking surveillance. Acoustic emission technique is the most valuable with respect to the acquisition of information, much of this is achieved by careful monitoring of electronic filtering data received by acoustic emission, but also best practices in order to identify the sustainability of the head of the tool and remove all sources of noise as possible.

1.2 PROBLEM STATEMENT

In many production processes, the processes mean shifts during production. For example, in metal machining operations, the cutting tool is subject to wear and random shocks. If adjustments are not made during a longer production period, the risk of tool failure increases and the quality of the product decreases, resulting in a large proportion of nonconforming items.

The problem often faced is the breakage of tool during cutting, which if not detected in time may lead to various problems associated with spoiled jobs, particularly in unmanned machining shifts. Hence it is necessary to have systems which can detect the breakage of tools through some means. The force drops since the tool may lose contact because of tool breakage.
1.3 RESEARCH OBJECTIVE

In the case of tool monitoring systems, the tool has to be continuously monitored while it is cutting. This would allow for continuously looking for tool wear, as well as the times when the tool breaks because of unforeseen conditions in the machining system. The main objective is monitoring tool wear process in turning machine using effective technique i.e. Acoustic Emission.

This type of system is simple, but can detect tool breakages before the maximum durability achieved. Any tool breakage during cutting remains unnoticed can reduce the process effectiveness caused by broken tools. Tool wear is a phenomenon whose behaviour can be explained qualitatively but not quantitatively. Though some tool life equations do exist, their universal adaptability or their utilisation even in restricted work tool material zones for all parameter ranges are doubtful. Further, direct in process measurement of tool wear is difficult in view of the location of the wear and the measurement techniques employed.

1.4 SCOPES

i. Turning process using the mild steel material for workpiece.
ii. Turning process using uncoated carbides cutting tool.
iii. Capture the Acoustic Emission signal technique during machining process.