Chapter 9

CONCLUSIONS AND FUTURE SCOPE

9.1 Conclusions:

The various findings of the work carried out here are summarized as below.

1. Surface roughness generated during the boring process is the direct function of boring bar vibrations.

2. Boring bar vibrations depend on the machining parameters viz. speed, feed and depth of cut. Other conditions are assumed to be constant.

3. Increase in spindle speed increases the vibrations but improves the surface finish.
   Feed has an adverse effect on both boring bar vibrations and surface roughness.
   The effect of depth of cut was not prominent as compared to spindle speed and feed.

4. There exists a good correlation between acceleration generated and machining conditions.

5. A feedback control system was developed for automatic adjustment of machining conditions for specified value of surface roughness by using tool vibrations as feedback.

6. Optimizing the values of machining parameters for specific value of surface roughness has maximized the material removal rate which has reduced the machining time.

7. On-line measurement of boring bar vibrations can help to monitor and control the surface roughness during machining which is perhaps difficult by any other technique available due to their own limitations.

8. The technique is proposed for mass production and for the job-tool material combination under consideration. However this can be employed for other job-tool material combinations for which some trials will be necessary to establish a correlation between tool acceleration and surface roughness.
9.2. Future scope:

Following are the recommendations for continuing the research work in this area.

1. Improved method for surface roughness measurement with higher sampling rate can be helpful to locate the principal frequencies of boring vibrations in the surface roughness spectrum.

2. In depth study of dynamic cutting force can be carried out regards to frequency content.

3. An intelligent machine controller can be developed as per the technique proposed in the present work for automatic adjustment of the machining parameters.

4. Detail analysis of time delays in control action and stability analysis of the control system can be carried out.