PREFACE

This Doctoral Thesis entitled “HALF LOGISTIC SOFTWARE RELIABILITY: TWO STEP APPROACH” was taken up at the instance of Dr. R. Satya Prasad, Associate Professor of Computer Science, Acharya Nagarjuna University, motivated, as I was, by a desire to study some problems of using Statistical Process Control (SPC) techniques and Sequential Probability Ratio Test (SPRT) for assessing software reliability using Non-Homogeneous Poisson Process (NHPP) based Half Logistic Software Reliability Growth Model (HLSRGM) as mean value function. Control mechanisms to develop control charts and to assess whether process is under control or out of control were developed. Chapter 1 is on motivation of the research and some preliminaries which were used to carry out the thesis. Chapter 2 is having an exhaustive literature relevant to the proposed study. In all we studied three problems which in brief are

(i) A mechanism to calculate the reliability of the software based on the cumulative observations of time domain failure data using mean value function of HLSRGM using two step approach is illustrated with different datasets are presented in Chapter 3.

(ii) A process control mechanism using SPC based on the cumulative observations of time domain failure data using mean value function of HLSRGM using two step approach is illustrated with different datasets are presented in Chapter 4.

(iii) An attempt is made to adopt the methodology of Stieber to an NHPP with a general mean value function and specialize it for our specific NHPP based Software Reliability Growth Model (HLSRGM) in time domain using two step approach is illustrated with different datasets are presented in Chapter 5. The work of Stieber (1997) dealt with detection of unreliable software components using the theory of Wald’s sequential probability ratio test procedure as a statistical quality control tool. It is about a homogenous Poisson process.
The respective brief contents of these four problems are given in the “Introduction”. The numerical calculations and subsequent tables are provided at appropriate places in the respective chapters. The reprints of some of our findings in published form are appended towards the end of the thesis. List of references arranged alphabetically is also provided towards the end of the thesis.