

Acknowledgements

If a person is doing a research work at that age when his contemporaries are in the process of hanging up their hard hats & working boots to enjoy their retirement leisure with their grandchildren then the list of the persons who have helped him to accomplish the work tends to belong .To acknowledge in gratitude each person's contribution to his work becomes frightfully tedious as there is always a genuine fear of missing out someone's name. The person in question is none other than me and I had registered as a research scholar in IIT (BHU)-Varanasi, my *alma mater*, on 11th September 2011 when I was one month away from my 60th. Birthday! I had graduated from this college, then known as IT BHU under Banaras Hindu University in 1974 and returned after 37 years to enrol as an industry sponsored part time research scholar in my old Department of Mechanical Engineering.

In the very beginning I wish to thank professor Dr. N K Das Talukdar of my under-graduate college days at then IT_BHU, who encouraged me to do the research work even at the advance age of 60 years when I first approached him with my intention as I was immensely getting interested with my job related work on vibration technology in my work as the Condition Monitoring head of M/s Electrosteel Castings Limited located at the northern fringes in the city of Calcutta. I thank the top management team then of M/s Electrosteel Castings Mr V M Ralli & Mr K K Binani who agreed to sponsor my candidature for the research work related to vibration technology at IIT-BHU Varanasi. The other professor of my time in the college who introduced to the fascinating world of vibration technology in our final year classes and aroused my love for the subject with his lectures –the love that I held on for three decades and ultimately which culminated in this research work –yes I want to thank my professor Dr V Singh but unfortunately at the time of submission of the thesis he is no more with us. I dedicate this thesis to my revered professor Dr. V Singh.

After enrolment my internal supervisors Professor J P Dwivedi & Professor V P Singh were the pillars of knowledge resource to me as I was in academics again after a lapse of nearly 3 decades after my post graduation in Mechanical engineering from NIT Durgapur. They not only as teacher guides but also like a friend patiently introduced to me to the completely restructured subject related syllabus to clear the semester examinations. Without their immense help I would not have been able to complete my course work. I will be failing in my duty if I do not acknowledge with my thanks and my gratitude to Dr. Mihir K Ghosh who was my professor in my under-graduate student years at IT-BHU and now though retired from academic world guided me along in completing my work and never showed his displeasure but on the contrary encouraged when I would ring him up at odd hours to clear any doubts or clarify issues during the experimental work or while working on the mathematical model as proposed by him.

Doing research work from your *alma-mater* has an advantage of its own as one is working in his comfort zone and is known to most of the teaching and non-teaching staff as well. In this way I was lucky as those who were my batch mates or seniors during my graduation day were now head of the departments or reputed professors in their fields of expertise. In this way I am indebted to my Department of Mechanical Engineering to professors Dr.Sushil Sharma, Dr.A K Agarwal, Dr.A P Harsha, Dr.P Ghosh & Dr.S K Panda who went out of their way to help me with my work both in academic and administrative capacity. My special thanks to present Head of the Department Professor A K Jha who also happens to be my classmate to always support me in my work and always cared that I was well attended to during my frequent stay in the campus. I will never forget the immense encouragement I received from ex-professors of the Institute like Dr K P Singh of Electronics Department & Dr Akshoy Ghosh of Metallurgy department who were also my seniors during my undergraduate days and during my numerous visits to the Institute from my place of work in

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I did my work while still working in an industry as the head of the Condition Monitoring cell and executing Plant work with research work needs a fine balance which can never be possible with the whole hearted support from your colleagues at the Plant. In that way I am indebted to Mukul Sadhukhan, Gautam Dutta, Prosenjit Ghosh, Pronab Mohanty, Suman Mukherjee .Mrinal Ghosh, Amit Basu & K G Pilsima from the Calcutta plant of M/s Electrosteel Castings Limited. During my research work I also helped to build up the Condition Based Monitoring cell at my Company's second unit at Bokaro where I was sent on deputation to report to Chief Operating Officer (Projects) Mr. Uma Kant Dixit a well known name in the steel industry who had always released me to visit the BHU campus for my research related work with my internal guides whenever required and I am always grateful to him for his cooperation. My colleagues in the steel plant B K Rao, Amit Awasthi, Sumanjit Singhdeo, Rohit Kumar, Sujit Kumar, Biplab Patra, Santosh Pudi, Sumit Kumar, Gulshan Minz, & Bijay Bauri ensured that nothing went amiss in the Plant and in the Department during my long and frequent absence from the Plant during my visit to the University. I thank all my colleagues in both the plants for their kind support and wish them well in their careers. Special thanks to my colleague at Electrosteel Castings Limited Mr.

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To do research work while working full time also needs lot of help of different issues other than academics and here I was fortunate that my batch mates of IT-BHU -74 class stood like a Gibraltar rock behind me and pushed me all along so I could never even think of giving up midway . If I name all the list will be few pages but if I do not at least express my gratitude to Arunava,Sujit,Nikhil,Amal of Calcutta and Benares based Abhijit,Vyomesh and his doctor wife Anitaji then I will be doing quite a disservice . Thank you all my dear batch mates and also to those I could not mention the names.

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As I said earlier the list will be long but there is still a fear that that I have still missed few names in print to express my gratitude who unselfishly helped me in my pursuit. To them I say if I done so I seek your forgiveness but from my heart I say a big thank you to you all.