

FOREWORD

Pulsed Power which was once a borderline curiosity is now being pursued as a career. Many universities and laboratories in the world are offering specialized courses on Pulsed Power. The importance of pulsed power and its future impact was recognized early at BARC and the research was initiated in the early 1960s. Soon after that in the 70s and 80s, Pulsed Power Technology at BARC advanced to great heights and was successfully employed for Garter Spring Repositioning in the nuclear power reactors at Narora and Kakrapar, as well as, useful deployment of indigenously developed flash X-ray systems for terminal ballistics in defense. Most of the research and achievements in pulsed power do not appear in open literature because of its strategic nature, and it is a daunting challenge to enter the field. BARC met this challenge very successfully.

The Beam Technology Development Group at BARC under the able and unassuming leadership of Dr. Archana Sharma as its Director, has now brought out this valuable document on Pulsed Power Technology, which should be useful for beginners as well as professionals. Starting from basic concepts up to most advanced applications implemented at BARC, the scientific articles prepared by a talent pool of committed scientists and engineers are presented lucidly with numerous schematics, figures, equations, simulation, photographs and even tutorials. The impactful work done on development of novel Pulsed Power Techniques and their applications in numerous fields are also reported. A few applications worth mentioning are: high velocity impact welding of end-plugs in prototype Fast Breeder Reactors, generation of bursts of super power electromagnetic waves for defense use, electron beam pumping of CO₂ laser. The research results on pulsed power and advanced systems developed at BARC are discussed at great length in a book *Foundations of Pulsed power Technology* published [2017] by John Wiley, US.

Dr. Archana Sharma, has meticulously developed a talent pool of young scientists and engineers, with a lot of love and care. Any amount of acknowledgement and appreciation to the effective leadership of Dr. Archana Sharma falls short of the reality.

Dr. Pralhad Ron