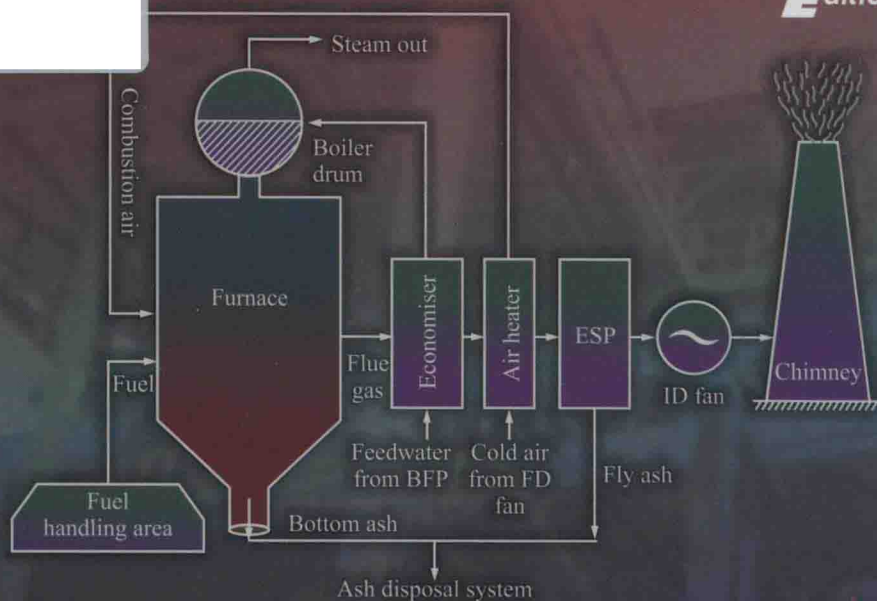


FOURTH EDITION

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Practical Boiler Operation Engineering and Power Plant



Amiya Ranjan Mallick

PRACTICAL BOILER OPERATION ENGINEERING AND POWER PLANT

FOURTH EDITION

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Amiya Ranjan Mallick

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I dedicate this book to

my Godlike uncle

Sri Raghunath Mallick

who has brought me from darkness and illuminated my life.

Preface

I would like to thank all my esteemed readers and well wishers for their valuable feedback and suggestions for the improvement of the book. The fourth edition of the book has been published considering these suggestions and feedback. Some of the sections like *Package and Small Boilers*, *Pulverised Boiler* and *CFBC Boiler* have been updated in this edition to make the book more useful to the reader.

An important chapter *Environmental and Safety Aspects of Thermal Power Plants* has been incorporated into this edition to update the reader with a major challenge in thermal power generation. Many sections like *Softener*, *Water Treatment of Supercritical Boiler*, *Wet Mode and Dry Mode Operation of Supercritical Boiler*, *Electromatic Pressure Relief Valve*, *Orsat Apparatus*, *PRDS* and *Safety Interlocks and Auto Control Logics in Boiler* have also been added to the text.

I thank the followers of the book from countries like US, UK, UAE, Zimbabwe, Spain, Libya, Sudan, Malaysia, Indonesia, Philippines, Myanmar, Sri Lanka, Bangladesh, Pakistan and also the followers from all corners of India.

Modification and updation is a continuous process. I request the readers to give their valuable feedback for further improvement of the book in future.

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Preface to the Third Edition

I am fortunate enough to be associated with power generation industry for more than two decades and got an opportunity to work at different power plants at different hierarchies. This book is the collection of my field experience. Based on my practical experience at various thermal power plants, I have tried to make the book very practical. A reader can feel the practical approach of the subject while going through it. Well balance between theory and practical aspects and the use of lucid language provide an ease to its readers to grasp the basic concepts.

In the beginning, I prepared some notes when I was preparing myself for BOE examination. Finally, those small notes have taken this present shape after a lot of additions and modifications.

The book covers the entire cross-functional aspects of a thermal power plant. Some basic concepts of engineering related to power plant are discussed in Chapters 1, 2, 3 and 4. Water chemistry which is very important for a boiler is discussed in Chapter 5. From Chapters 6 to 13, details of various types of boiler, boiler auxiliary systems and operation of boiler are discussed. Tube, pipe and pipe fittings are discussed elaborately in Chapters 14 and 15. Chapters 16 to 19 describe steam turbine, steam turbine auxiliary system, operation of turbine and generator, respectively. Commissioning and maintenance of power plant are described in Chapters 20 and 21, respectively. Control and instrumentation (C&I) for power plant is explained in Chapter 22. Chapter 23 describes the scope of energy conservation in thermal power plant. *Plant Calculations or Numericals* given at the end of the chapters involves various types of calculations required in day-to-day functioning of a power plant.

Feedbacks from my readers, friends and well wishers encouraged me to widen the scope and make this book suitable as a better reference book on thermal power generation. To make the book more useful, some essential topics like PC boiler, AFBC/CFBC boiler, supercritical boiler, combined cycle power generation, advanced supercritical (AD700) technology, IGCC, best available technology, next generation technology, capacity selection of generating sets, coal handling plant, RO plant, large capacity steam turbine, basics of welding, bearing, coupling, shaft alignment, machine vibration, pump, fan, etc. have been incorporated in this book.

Around 500 self-test questions are given at the end of each chapter in total. I am personally associated with BOE examination. I suggest BOE examinees to prepare these questions which cover almost full syllabus of BOE examination conducted by various boiler boards.

This book will be highly useful for the professional engineers, job seekers, BOE examinees and the students of various engineering colleges and power plant training institutes. I will be fortunate enough if this small book can satisfy the readers and this will be my little contribution to power generation industry.

Modification and refinement is an ongoing process. I request all my readers to give their valuable feedback so that the book can be made more appreciable in future.

My wife, Mrs. Amita Mallick and son, Amitya R. Mallick have sacrificed a lot for me. Thanks for their understanding, cooperation and support.

I would like to thank my colleagues, friends and critics who encouraged me to write this book.

Amiya Ranjan Mallick

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