

Preface

This book is focused on the practical aspects of radiation safety organization, and is intended for a broad range of professionals in industry, research, education, agriculture, and medicine.

After an introduction to the interaction of ionizing radiation with matter, this book calls attention to important physics fundamentals of the discipline with definitions of quantities and units, current approaches to dose and shielding calculations, details of practical use of existing measurement instruments, and refers to the concerns about the effects of low doses of ionizing radiation. Furthermore, this book discusses the requirements for the different exposure situations according to the most updated recommendations of the International Commission of Radiological Protection (ICPR 103) and the International Basic Safety Standards for Radiation Protection (IAEA GSR Part 3 2014), and emphasizes the role of optimization and a well-structured and controlled Radiation Protection Program in building a strong safety culture, and seeking levels of dose As Low As Reasonably Achievable (ALARA).

This book also highlights the relevant legislation and regulations governing Radiation Safety in USA, and incorporates other topics of interest, including: radioactive waste management practices and transport of radioactive materials regulations as part of the control of public exposures, the importance of the assessment of potential exposures of workers and the public, data on accidents and their consequences, and a general overview of emergency planning and preparedness.

Finally, the book focuses on the practical aspects of radiation safety organization with examples of radiation protection programs for common applications such as: product irradiation, industrial radiography, well logging, nuclear gauges, custom and border inspection, and laboratories with unsealed radioactive sources.

Miami, USA

Haydee Domenech

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Domenech, H.

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