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2. Record Nr.	UNINA9910299610103321
Autore	Zohuri Bahman
Titolo	Thermodynamics In Nuclear Power Plant Systems // by Bahman Zohuri, Patrick McDaniel
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ISBN	3-319-13419-1
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Descrizione fisica	1 online resource (693 p.)
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Soggetti	Nuclear energy Thermodynamics Heat engineering Heat - Transmission Mass transfer Nuclear Energy Engineering Thermodynamics, Heat and Mass Transfer

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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Definitions and Basic Principles -- Properties of Pure Substances -- Mixture -- Work and Heat -- First Law of Thermodynamics -- The Kinetic Theory of Gases -- Second Law of Thermodynamics -- Reversible Work, Irreversibility, and Exergy (Availability) -- Gas Kinetic Theory of Entropy -- Thermodynamic Relations -- Combustion -- Heat Transfer -- Heat Exchangers -- Gas Power Cycles -- Vapor Power Cycles -- Circulating Water Systems -- Electrical System -- Nuclear Power Plants -- Nuclear Fuel Cycle -- The Economic Future of Nuclear Power -- Safety, Waste Disposal, Containment, and Accidents.
Sommario/riassunto	This book covers the fundamentals of thermodynamics required to understand electrical power generation systems, honing in on the application of these principles to nuclear reactor power systems. It includes all the necessary information regarding the fundamental laws to gain a complete understanding and apply them specifically to the challenges of operating nuclear plants. Beginning with definitions of thermodynamic variables such as temperature, pressure and specific volume, the book then explains the laws in detail, focusing on pivotal concepts such as enthalpy and entropy, irreversibility, availability, and Maxwell relations. Specific applications of the fundamentals to Brayton and Rankine cycles for power generation are considered in-depth, in support of the book's core goal- providing an examination of how the thermodynamic principles are applied to the design, operation and safety analysis of current and projected reactor systems. Detailed appendices cover metric and English system units and conversions, detailed steam and gas tables, heat transfer properties, and nuclear reactor system descriptions. Dedicated volume focusing on the thermodynamic properties at work in nuclear plants Full coverage, from underlying scientific principles to applications throughout the nuclear cycle, from fuel processing to waste disposal Gives in-depth consideration to thermodynamic fundamentals in Brayton and Rankine cycles for power generation Handy appendices span steam and gas tables, heat transfer properties, and nuclear reactor system descriptions.