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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Introduction to systems approaches and nuclear fusion -- Doublet III and DIII-D – robustness and adaptation -- TCV – A case study in systems approaches and robustness -- JET and fusion plasmas – systems optimization -- ITER – fusion proto-reactor and large scale systems integration -- Mirrors and other reactor concepts -- Alternative systems approaches -- Conclusions on systems approaches.
Sommario/riassunto	This book offers an overall review, applying systems engineering and architecture approaches, of the design, optimization, operation and results of leading fusion experiments. These approaches provide a unified means of evaluating reactor design. Methodologies are developed for more coherent construction or evaluation of fusion devices, associated experiments and operating procedures. The main focus is on tokamaks, with almost all machines and their important results being integrated into a systems design space. Case studies focus on DIII-D, TCV, JET, WEST, the fusion reactor prototype ITER and the EU DEMO concept. Stellarator, Mirror and Laser inertial confinement experiments are similarly analysed. The book examines the engineering and physics design and optimization process for each machine, analysing their performance and major results achieved, thus establishing a basis for the improvement of future machines. The reader will gain a broad historical and up-to-date perspective of the

status of nuclear fusion research from both an engineering and physics point of view. Explanations are given of the computational tools needed to design and operate successful experiments and reactor-relevant machines. This book is aimed at both graduate students and practitioners of nuclear fusion science and engineering, as well as those specializing in other fields demanding large and integrated experimental equipment. Systems engineers will obtain valuable insights into fusion applications. References are given to associated complex mathematical derivations, which are beyond the scope of this book. The general reader interested in nuclear fusion will find here an accessible summary of the current state of nuclear fusion.

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