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Titolo	Formal Methods for Industrial Applications [[electronic resource]] : Specifying and Programming the Steam Boiler Control / / edited by Jean-Raymond Abrial, Egon Börger, Hans Langmaack
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Disciplina	621.1/83
Soggetti	Software engineering Machinery Business Management science Computer programming Programming languages (Electronic computers) Software Engineering/Programming and Operating Systems Machinery and Machine Elements Business and Management, general Programming Techniques Software Engineering Programming Languages, Compilers, Interpreters
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Nota di contenuto	The steam boiler case study: Competition of formal program specification and development methods -- Structural synthesis of programs from refined user requirements (Programming boiler control in NUT) -- Using Focus, Lustre and probability theory for the design of a reliable control program -- Refining abstract machine specifications of the steam boiler control to well documented executable code -- An algebraic specification of the Steam-Boiler Control System -- A steam-boiler control specification with statecharts and Z -- An action system approach to the steam boiler problem -- The Steam Boiler problem in

Lustre -- The steam-boiler problem — A TLT solution -- The real-time behavior of the steam-boiler -- Specifying and verifying the Steam Boiler Problem with SPIN -- TRIO specification of a steam boiler controller -- A formal specification of the Steam-Boiler Control problem by algebraic specifications with implicit state -- Using HyTech to synthesize control parameters for a steam boiler -- A VDM specification of the steam-boiler problem -- Proving safety properties of the steam boiler controller -- Steam boiler control specification problem: A TLA solution -- Specifying optimal design for a steam-boiler system -- An object-oriented algebraic steam-boiler control specification -- Refinement from a control problem to programs -- VDM specification of the steam-boiler control using RSL notation -- Assertional specification and verification using PVS of the steam boiler control system -- Specifying and verifying the steam boiler control system with Time Extended LOTOS -- Simulation of a steam-boiler -- Steam-boiler control specification problem.

Sommario/riassunto

This book, with the CD-ROM included, is the documentation of a unique collaborative effort in evaluating formal methods for usage under industrial constraints: the major techniques for formally supported specification, design, and verification of large programs and complex systems are applied to a non-trivial and non-academic problem which is typical for industrial informal requirements specifications. The 21 papers included in the book, together with an introduction and competition report, were selected from 33 candidate solutions. This book comes with a CD-ROM containing, besides the printed papers, executable code, full definitions of all parts of the specifications, and detailed descriptions of foundational matters where appropriate.