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Sinopsis

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With coverage that draws from diverse disciplines, Systems Engineering Tools and Methods demonstrates how, using integrated or concurrent engineering methods, you can empower development teams. Copiously illustrated with figures, charts, and graphs, the book offers methods, frameworks, techniques, and tools for designing, implementing, and managing large-scale systems and includes case studies that exhibit the effect of the systems engineering (SE) concept and its importance during the design and development of a complex system. These case studies provide realistic insights into SE methods.

Emphasizing the importance of an integrated approach to the design life cycle of complex systems, the book stresses the relationship between SE and project management. It reviews the principles of functional analysis as design activities, discusses verification, validation, and testing (VV& T) methodologies and tools for complex systems, and presents a framework for assessing technology integration at the systems level. It also delineates the development of a business process reengineering plan based on one used for the restructuring, retraining, and redeployment of elements of the Kennedy Space Center workforce.

The book includes examples of the design and development of several large complex systems from the DoD and NASA. Each system provides the backdrop for SE learning principles such as technical decision making, requirements definition, logistics support planning, verification, and risk mitigation. Discussions of a proposed integrated reliability management system for faster time-to-market electronics equipment, a new integrative approach to the allocation of adjustability, the importance of manufacturing with regard to designing components of a system, and methods and algorithms used in the solution of combinatorial optimization problems rounds out the coverage.

Waste, inadequate system performance, cost overruns, and schedule problems often result from failure to apply advanced systems engineering early in project development. By applying the methods outlined here, you can anticipate and avoid these costly roadblocks when possible, and

quickly mitigate their damaging effects when necessary.