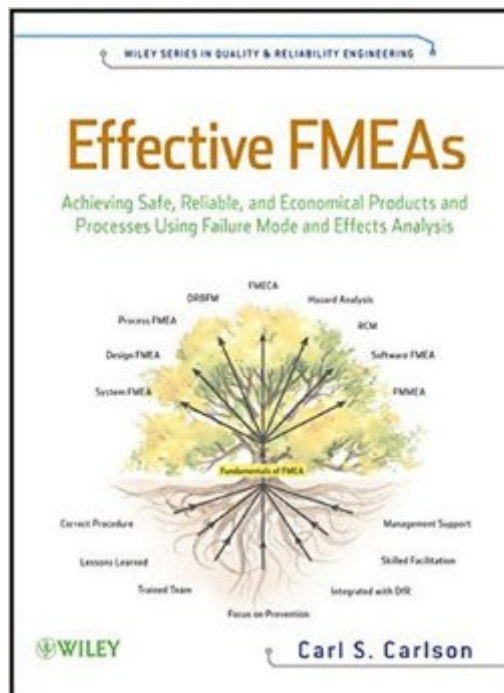


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# Effective FMEAs: Achieving Safe, Reliable, And Economical Products And Processes Using Failure Mode And Effects Analysis



## Synopsis

Outlines the correct procedures for doing FMEAs and how to successfully apply them in design, development, manufacturing, and service applications. There are a myriad of quality and reliability tools available to corporations worldwide, but the one that shows up consistently in company after company is Failure Mode and Effects Analysis (FMEA). Effective FMEAs takes the best practices from hundreds of companies and thousands of FMEA applications and presents streamlined procedures for veteran FMEA practitioners, novices, and everyone in between. Written from an applications viewpointâwith many examples, detailed case studies, study problems, and tips includedâthe book covers the most common types of FMEAs, including System FMEAs, Design FMEAs, Process FMEAs, Maintenance FMEAs, Software FMEAs, and others. It also presents chapters on Fault Tree Analysis, Design Review Based on Failure Mode (DRBFM), Reliability-Centered Maintenance (RCM), Hazard Analysis, and FMECA (which adds criticality analysis to FMEA). With extensive study problems and a companion Solutions Manual, this book is an ideal resource for academic curricula, as well as for applications in industry. In addition, Effective FMEAs covers:

- The basics of FMEAs and risk assessment
- How to apply key factors for effective FMEAs and prevent the most common errors
- What is needed to provide excellent FMEA facilitation
- Implementing a "best practice" FMEA process

Everyone wants to support the accomplishment of safe and trouble-free products and processes while generating happy and loyal customers. This book will show readers how to use FMEA to anticipate and prevent problems, reduce costs, shorten product development times, and achieve safe and highly reliable products and processes.

## Book Information

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## Customer Reviews

Safety and reliability are paramount characteristics of any engineered product. Effective FMEAs by Carl Carlson provides a comprehensive and in-depth look at one the most powerful reliability tools available in industry today. It offers a practical, step-by-step approach for how to effectively and efficiently apply Failure Mode and Effects Analysis within an organization. The real-world case studies are suitable not only for quick understanding by new engineers but also for teaching veteran engineers better ways of doing FMEAs. At over 400 pages, this book offers experience-based guidance on all aspects of FMEA including legal aspects of FMEAs, using sticky notes for capturing the team's failure mode brainstorming, using actual parts for good genchi genbutsu (go & see), and defining management roles and responsibilities for promoting a strong FMEA climate and culture. Mr. Carlson has brought together, in one textbook, useful explanations of the various types of FMEAs (System, Design, Process, Software) as well as more recent tools such as Design Review Based on Failure Mode (DRBFM) and Hazard Analysis. Most important to anyone involved in doing these types of analyses is the preparation. Without good preparation and the right set of visualization and analytical tools, an FMEA / DRBFM team will not make progress.

This 435-page, sixteen chapter book by world-renowned lecturer Carl S. Carlson establishes a new standard for planning, conducting, and effectively implementing the reliability tool called Failure Modes and Effects Analysis (FMEA). Not just a how-to on filling out the FMEA form, the book reaches out to examine in detail the full expanse of an FMEA project, from setting the right objectives, defining the scope of the project, selecting the right team and resources, establishing the correct timing for the project, and developing and executing proper risk reduction actions. The book further examines in detail how to set up an effective company-wide FMEA process so that it becomes ingrained in the company culture. It shows how FMEA naturally morphs into related tools like Criticality Analysis (FMECA), Design Review Based on Failure Mode (DRBFM), Fault Tree Analysis (FTA), and Hazard Analysis (HA) such that these tools become a single set of coordinated, integrated activities instead of separate, unrelated actions so common in today's reliability practice. It discusses FMEA software without trying to sell a certain product. Instead it details the characteristics of the best software to fully implement the FMEA with the other tools discussed above. The book culminates with a series of FMEA checklists, forms, scales, failure modes, and

questions to aid in preparing for and conducting the FMEA. A key highlight of the book is the short section on the quality audit review to assure that the ten most common mistakes of FMEA are avoided. Practical case study examples from the author's experience pervade each chapter, thus making this book useful to reliability practitioners, managers, and even senior management of a company.

C. Carlson has written a very comprehensive book on the subject of FMEA with brief introductions to other related subjects including DRBFM, FTA, RCM, and software selection. It explains FMEA from the perspective of philosophy, history, theory, fundamentals, facilitation, case studies, and student exercises. This book is well written and would work well for introduction of the subject for a beginner as well as a reference for the seasoned practitioner. It would be quite useful in the hands of students in the classroom as well as practitioners working to better understand how they can improve the quality, efficiency, and effectiveness of their work effort. In addition, managers and leaders would appreciate an understanding what it takes to set up an effective FMEA process from a business perspective. The organization of the book is quite logical and builds on the development of the subject as it evolves through an intuitive learning cycle. It begins by establishing the relationship of FMEA as it relates to 'design for reliability' and works through the 'why, what, when, and how' of the analysis work effort. Strong focus of this book is on the objective of doing FMEAs; preventing problems and reducing risk. It does a good job of helping the user understand the fundamentals, concepts, and definitions and does an exceptional job helping the user to discriminate between effects, causes and failures; an area that is typically quite confusing for beginners. It also includes case studies to better develop the concepts and quality objectives to provide good understanding of what works, what doesn't work, and how you can tell how well you're doing. The quality objectives cover what constitutes a good analysis as well as discusses mistakes frequently made by practitioners.

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