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Nota di contenuto	Front Cover; Mission-Critical and Safety-Critical Systems Handbook: Design and Development for Embedded Applications; Copyright Page; Contents; About the Editor; About the Contributors; Chapter 1: Best Practices in Mission-Assured, Mission-Critical, and Safety-Critical Systems; 1. Roadmap to This Book; 1.1. Systems Engineering; 1.2. Important Issues; 1.3. Material Covered; 2. Best Practices; 2.1. What and Why?; 2.2. Rationale; 2.3. Standards and Guidelines for a QMS; 3. Project Management and Systems Engineering; 3.1. Project Management; 3.2. Systems Engineering; 3.3. Mission Assurance 4. Process Flows for Developing Products4.1. Plan, Execute, Review, Report, and Update (PERRU); 4.2. Development Processes; 4.3. Processes vs. Procedures; 4.4. General Process Models; 4.5. An Example of Phases, Processes, and Procedures; 5. Standards; 5.1. General Standards Organizations; 5.2. Industry-Based Standards Organizations; 5.3. Military Standards Organizations; 5.4. Aviation and Aerospace

Standards Organizations; 6. Potential Procedures, Checklists, and Documents; 7. Review of Procedures and Processes; 7.1. Difference between Procedures and Processes
7.2. Why Review Procedures and Processes? 7.3. Types of Review; 7.4. Frequency of Review; 7.5. Review Content; 7.6. Course of Action, Changes, and Updates Following Review; 7.7. Review Responsibilities; 8. Configuration Management; 8.1. Rationale for Configuration Management; 8.2. Configuration Management Coverage; 8.3. Records Responsibility; 8.4. System and Location; 8.5. Version Control; 8.6. Design Repository; 8.7. File Structure; 8.8. Obsolete Documents; 8.9. Training for Use of the System; 9. Documentation; 9.1. Rationale for Documentation
9.2. Coverage and Responsibility for Documentation 9.3. Types of Documentation; 9.4. Best Practices for Documentation; References; Appendix A: Example Document Outlines; Work Order (WO); Minutes; Problem Report/Corrective Action (PRCA); Engineering Change Request (ECR); Engineering Change Notice (ECN); Project Management Plan (PMP); Interface Control Documents (ICDs); Development Plans; Requirements; Risk Management Plan; Configuration Management Plan; Documentation Plan; Analysis Reports; Design Description; Test Plan; Operation Plan; Metrology Concerns and Procedures
Appendix B: Program Management Documents for Project Development
Appendix C: Technical Project Documents for Project Development; Chapter 2: Failsafe Software Design: Embedded Programming in a Fail-Certain World; 1. Software Matters; 2. The Essence of Process; 3. Three Principles for Design and Coding; 3.1. What Does It Mean to Be Failsafe?; 3.2. Safety (and Mission) First; 3.3. Verification and Redundancy in the Implementation Process; 4. The User Interface; 5. Rolling Your Own; 6. Hardware as Software: A Thought Exercise in Crossover Thinking; 7. Conclusions
Chapter 3: Compliance Concerns for Medical Equipment

Sommario/riassunto

This handbook provides a consolidated, comprehensive information resource for engineers working with mission and safety critical systems. Principles, regulations, and processes common to all critical design projects are introduced in the opening chapters. Expert contributors then offer development models, process templates, and documentation guidelines from their own core critical applications fields: medical, aerospace, and military. Readers will gain in-depth knowledge of how to avoid common pitfalls and meet even the strictest certification standards. Particular emphasis is placed
