

Preface

The word “dependability” that appears in the title is not used so often to be familiar with. The word has wider meaning and not only means “reliability” but also includes robustness, safety, security, resilience, and so on. Fault-tolerance technology that equips the redundant subsystems or components in preparation for failure in order to improve “reliability” has been used for many decades. In the meantime, J.C. Laprie expanded the term dependability as a wider concept in 1985 [1] because the meaning of “reliability” that the fault-tolerance technology treated had broadened. After then, dependability and dependable have been used in various fields to this day. Based on such situation and as I also belonged to the committees concerning “dependability,” I dare to use “dependability” in this text, thinking it is one of my vocations to spread the term.

As for terms related to reliability, the two terms have been used exclusively in Japanese. The Japanese word *shinrai-do* means quantitative index of reliability and the word *shinrai-sei* means qualitative character of reliability. In my personal opinion, the *shinrai-sei* may fall on the dependability.

As written in the title of this book, mitigation of hardware failures, soft errors, and electro-magnetic disturbances is indispensable in order to realize dependability of electronic systems. This book introduces authors’ original mitigation technologies of soft errors, electro-magnetic interference, and power supply noise, in addition to general mitigation technologies.

The authors have brought up the mitigation technology to realize dependability through a lot of industrial fields such as railroad, atomic energy, and IT networks. The dependable technology starts unifying with the latest LSI technology and being succeeded by the safety processor technology by on-chip redundancy. As a result, great reduction in costs will become possible by the effect of mass production of LSI technology in the future. I am convinced that we can contribute to safety and convenience of our ordinary life using dependable technology in more familiar field such as automobiles.

Lake Hatori, Japan

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Reference

1. J.C. Laprie, “Dependable Computing and Fault Tolerance: Concepts and Terminology,” *Proceedings of the 15th IEEE International Symposium on Fault-Tolerant Computing, Austin, TX, USA*, pp. 2–11 (1985).

Dependability in Electronic Systems
Mitigation of Hardware Failures, Soft Errors, and
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