

Contents

Acknowledgment

vii

1. Introduction	1
2. Multistate aging systems	19
2.1 Multistate approach description	19
2.2 Multistate approach in relation to two-state reliability analysis	28
2.3 Basic reliability structures of multistate systems and their reliability functions	33
2.4 Applications	42
References	56
3. Reliability of aging multistate dependent systems	59
3.1 Local load-sharing model of system components dependency	59
3.2 Equal load-sharing model of system components dependency	95
3.3 Mixed load-sharing model of components and subsystems dependency	106
3.4 Applications	121
References	134
4. Availability analysis of aging-dependent systems under imperfect repair	137
4.1 Renewal stream and renewal process	138
4.2 Characteristics of renewal stream with imperfect repair	140
4.3 Renewal function under imperfect repair	144
4.4 Local load-sharing dependency model	148
4.5 Equal load-sharing dependency model	159
4.6 Mixed load-sharing dependency model	175
4.7 Application	178
4.8 Related problems—System cost optimization under imperfect repair	192
References	203

5. Safety of multistate networks with cascading effects	207
5.1 Assumptions and approach description	207
5.2 Basic safety structures of multistate networks and their safety functions	211
5.3 Application	234
References	280
6. Summary	283
<i>Index</i>	285