

CONTENTS

ACKNOWLEDGMENTS ix

INTRODUCTION: PURPOSE, SCOPE, AND STRUCTURE xv

I THE AVIATION PARADOX 1

1 CATASTROPHIC TECHNOLOGIES: THE RISE OF RELIABILITY AS A
VARIABLE OF CONSEQUENCE 3

2 FINITISM AND FAILURE: ON THE LOGICAL IMPLAUSIBILITY OF
ULTRAHIGH RELIABILITY 17

3 THE AVIATION PARADOX: ON THE IMPOSSIBLE RELIABILITY OF
JETLINERS 29

II CONFRONTING ULTRAHIGH RELIABILITY 39

4 ORGANIZING AVIATION SAFETY: RELIABILITY REQUIREMENTS AND
LOGICS 41

5 WHEN THE CHICK HITS THE FAN: TESTING AND THE PROBLEM OF
RELEVANCE 53

6 THE SUM OF ALL PARTS: MODELING RELIABILITY WITH
REDUNDANCY 71

7 RATIONAL ACCIDENTS: ON FINITISM'S CATASTROPHIC
IMPLICATIONS 89

III	MASTERING ULTRAHIGH RELIABILITY	109
8	PARADOX RESOLVED: TRANSCENDING THE LIMITS OF TESTS AND MODELS	111
9	DESIGN STABILITY REVISITED: CONTEXT, CAVEATS, COMPOSITES, AND CONCORDE	131
10	SAFETY COSTS: THE STRUCTURAL FOUNDATIONS OF ULTRARELIABLE DESIGN	151
11	INCENTIVES IN ACTION: ON DEFICIENT 737s AND NEGLECTED SURVIVABILITY	173
IV	RECKONING WITH CATASTROPHIC TECHNOLOGIES	191
12	BURDENS OF PROOF: THE HIDDEN COSTS OF POSITIVISM	193
13	THE MYTH OF MASTERY: ON THE UNDERAPPRECIATED LIMITS OF TECHNOLOGICAL AMBITION	211
14	FUKUSHIMA REVISITED: REAPING THE WHIRLWINDS OF CERTAINTY	223
	NOTES	235
	REFERENCES	255
	INDEX	293