

Helicopter Crash Litigation

Contents:

About the Author	v
Foreword.....	vii
Preface.....	ix
Acknowledgments	xi
Introduction.....	xix

Part I: The Basics of Helicopter Structure, Operation and Performance

Chapter 1: Introduction to Helicopter Flight, Operation and Control	3
Introduction.....	3
1.1 Helicopter Structure and Flight Systems	4
A. Basic Structure	4
B. The Rotor System.....	5
C. Helicopter Systems	6
1.2 Flight Controls and Operation	9
A. Collective Pitch Control.....	9
B. Cyclic Pitch Control.....	10
C. Swashplates	10
D. Tail Rotor Pedals.....	10
E. Throttle Control	10
1.3 Helicopter Aerodynamics: What Makes It Fly?.....	11
A. Aerodynamic Forces	11
B. Aerodynamic Lift	11
C. Angle of Attack and Stall	12
D. Translational Lift.....	13
E. Flight Stability.....	13
F. Height Velocity Diagram or Dead Man's Curve....	13
1.4 Piloting a Helicopter	14
A. The Hover	14
B. Take Off to Forward Flight	15
C. Turns.....	15
D. FAA Requirements.....	16
1.5 Emergency Conditions—Flight Irregularities and Systems Malfunction	16
A. Autorotation	16
B. Hydraulic System Failure.....	17
C. Dynamic Rollover	18
D. Settling With Power	18
E. Retreating Blade Stall.....	18

F. Loss of Tail Rotor Effectiveness.....	18
G. Failure of Tail Rotor System.....	18
Endnotes.....	18

Chapter 2: Helicopter Crash Dynamics—Common Crash Sequence and Impact Scenarios	19
Introduction.....	19
2.1 Impact Categories	19
A. Hard Landing	19
B. Survivable Crash	19
C. High Impact Crash	19
2.2 Impact Dynamics	20
A. Direction of Impact.....	20
B. Rotational Inertia.....	21
2.3 Common Mechanical System Failures	23
A. Engine Failure	23
B. Transmission Failure	25
C. Main Rotor System Failure	26
D. Tail Rotor System Failure	26
E. Control System Failure.....	26
F. In-Flight Fire.....	27
G. Restraint System Failures and Crashworthiness...	28
Endnotes.....	28

Part II: The Basics of Helicopter Crash Litigation

Chapter 3: Pre-Filing Matters	31
Introduction.....	31
3.1 Preliminary Factual Investigation.....	31
A. Initial Client Contact and Retention—The Statutory Time Constraints	32
B. Initial Interaction with the National Transportation Safety Board	35
C. Inspection and Documentation of the Helicopter Crash Site	36
D. Acquisition of Investigative Materials from Local Government Agencies and Media Outlets...	39
E. Interviews of All Eye and Ear Witnesses to the Helicopter Crash	39
F. Acquisition and Review of Engine and Maintenance Logbooks	41

Helicopter Crash Litigation

G. Assessing Weather and Environmental Conditions	42
H. Pilot's Training, Certification and Ratings	44
I. Collectibility and Insurance Coverage Issues	45
J. Practice Checklist: Helicopter Crash Initial Factual Investigation Checklist.....	45
3.2 Early Selection, Retention and Utilization of Liability Experts.....	46
A. Criticality of Early Retention	46
B. Selecting the Necessary and Appropriate Fields of Expertise	47
C. Considerations for Hiring Helicopter Crash Experts	48
D. Use of Team Approach for Liability Experts	48
E. Expert Assistance Throughout Investigation and Discovery	49
3.3 Acquisition, Preservation and Storage of the Helicopter Wreckage.....	49
3.4 Inspection and Examination of the Helicopter Wreckage	51
3.5 Factual Investigation of Military Helicopter Crashes	54
3.6 Acquisition of Records from the Federal Aviation Administration	55
A. Air Traffic Control Data.....	56
B. Aircraft Ownership Records	56
C. Pilot's Flight and Medical File.....	56
D. Service Difficulty Reports and Accident/Incident Reports	56
E. Service Letters, Service Bulletins and Airworthiness Directives	57
F. Federal Aviation Regulations	57
3.7 Mining Technical and Professional Journals	57
3.8 Accepting or Declining the Representation	57
A. Standard for Accepting Representation	58
B. Helicopter Crash Cases Which Should Be Declined	58
C. Avoiding Conflicts of Interest in Multiple Representation.....	59
D. Filing Suit Promptly After Representation Accepted	60
Endnotes.....	60
Chapter 4: Filing the Helicopter Crash Lawsuit	61
Introduction.....	61
4.1 Determining the Cause of the Crash	62
A. Loss of Main Rotor Control	62
B. Loss of Tail Rotor Function	62
C. Main Rotor Strike to Fixed Obstacle	62
D. Helicopter Component Part or System Failure	62
E. Helicopter Engine Failure or Power Loss	62
F. Wire Strike Incidents	62
G. Pilot Error	63
H. Pilot Incapacitation	63
I. Improper Maintenance	63
J. Mid-Air Collision	63
K. Avionics or Instrument Failure	64
L. In-Flight Fire or Explosion	64
M. Mid-Air Break-Up or Structural Failure	64
N. Fuel Starvation, Exhaustion or Contamination	64
O. Sabotage and Combat Operations	64
P. Weather or Environmental Factors	65
Q. Air Traffic Control Error	65
4.2 Assessing Survivability and Crashworthiness Issues.....	65
A. Occupant Protection	65
B. Restraint Systems.....	65
C. Structural Integrity	65
D. Post-Impact Fire or Explosion	66
4.3 Non-Occupant Injuries and Deaths	66
A. Boarding or Deboarding Incidents	66
B. Persons On Ground	66
C. Maintenance-Related Accidents	66
4.4 Identification of Potential Target Defendants	67
A. Pilot of Helicopter	67
B. Operator of Helicopter	67
C. Maintenance Personnel	68
D. Manufacturer of Helicopter	68
E. Distributor of Helicopter	68
F. Helicopter Engine Manufacturer	68
G. Helicopter Component Part Manufacturer	68
H. Air Traffic Control	69
I. Lessor of Helicopter	69
J. Owner or Lessee of Helicopter	69
K. Fixed Base Operator	70
L. Pilots of Other Aircraft	70
M. Electrical or Utility Companies	70
N. Wire Strike Protection Manufacturers	70
O. Film Production Companies	70
P. Hospitals or Regional Medical Centers	70
Q. Certification or Testing Laboratory	70
R. Flight Training Schools	71
S. Airport, Heliport, or Helipad Operators	71
T. Helmet, Seat or Seat Belt Manufacturer	71
U. Fire and Rescue Personnel	72
4.5 Jurisdictional and Choice of Laws Issues	72
A. Selection of Lawful and Appropriate Forum	72
B. The Federal versus State Court Decision	76
C. Suing a Foreign Helicopter or Helicopter Component Manufacturer	78
D. Filing Foreign Helicopter Crash Cases in U.S.	79
4.6 Dealing With Specialized Statutes and Regulations Potentially Applicable to Helicopter Crash Lawsuits	80
A. General Aviation and Revitalization Act	80
B. Federal Tort Claims Act.....	81
C. Death on the High Seas Act and the Outer Continental Shelf Lands Act	81
D. Federal Aviation Regulations	82

Helicopter Crash Litigation

E. State Workers' Compensation Statutes	83
F. State Statutes Imposing Liability on Aircraft Owners and Leasees	83
4.7 Finding and Working with Local Counsel	83
4.8 Common Legal Theories in Helicopter Crash Lawsuits	85
A. Negligence	85
B. Strict Products Liability	87
C. Breach of Warranty	88
D. Fraud and Misrepresentation.....	89
E. Liability for Punitive Damages	90
4.9 Pleading Issues.....	90
A. Drafting the Initial Complaint.....	90
B. Challenging Sufficiency of Defendant's Answer	92
Endnotes.....	92
Chapter 5: Discovery and Case Development	99
Introduction.....	99
5.1 Sequence of Discovery	99
5.2 Written Discovery	100
A. Effective Use of Interrogatories.....	100
B. Effective Use of Document Requests	101
C. Effective Use of Request for Admissions	103
5.3 Fact Depositions.....	104
A. On-Scene Witnesses.....	104
B. Maintenance Personnel	104
C. NTSB Investigators.....	105
D. FAA Personnel	105
E. Surviving Passengers	106
F. Pilot and Co-Pilot.....	106
G. Defendant Manufacturer's In-House Engineers and Employees.....	107
H. Remaining Defendants.....	111
I. Plaintiff's Deposition	112
5.4 Expert Depositions.....	113
A. Preparing Plaintiff's Experts.....	116
B. Deposing Defendant's Experts.....	116
5.5 Common Discovery Issues	118
A. Conducting Discovery in Foreign Countries	118
B. Utilizing Freedom of Information Act Requests	120
C. Discovery in U.S. Military Helicopter Accidents.....	121
D. Protective Orders	122
5.6 Case Development Matters	124
A. Consolidation for Discovery or Trial	124
B. Discovery Schedule and Trial Setting.....	125
5.7 In-Depth Examination and Testing	126
A. Of Subject Helicopter, Engine and Component Part or System	126
B. Of Exemplar Helicopter, Engine and Component Part or System	129
5.8 Alternative or Informal Discovery Methods.....	129
A. Networking With Other Aviation Counsel.....	129
B. Patent and Trademark Searches	129
C. Defendant's Litigation History	129
D. Defendant's Website	130
E. Technical and Trade Literature	130
Endnotes.....	130
Chapter 6: Common Defenses in Helicopter Crash Cases.....	131
Introduction.....	131
6.1 Time-Based Defenses.....	131
A. State Statutes of Limitations and Repose.....	132
B. General Aviation and Revitalization Act	132
6.2 Jurisdictional Defenses	134
A. Federal Preemption	134
B. Forum Non Conveniens	135
C. Foreign Sovereign Immunities Act	136
D. Outside of Maximum Reach of Long-Arm Statute	136
6.3 Substantive Defenses	136
A. Product Misuse or Alteration of Component Part.....	137
B. Contributory or Comparative Negligence.....	137
C. Assumption of Risk.....	142
D. Government Contractor Defense	142
E. Useful Safe Life Presumptions	144
F. Compliance with Government Standards	145
G. State of the Art Defense	146
Endnotes.....	147
Chapter 7: Common Evidentiary Issues.....	171
Introduction.....	171
7.1 Preparation and Effective Use of Demonstrative Evidence	171
A. Model of the Subject Helicopter or System.....	172
B. Topographical Model or Map of Crash Site.....	172
C. Computer-Generated Animation or Simulation of Crash Sequence.....	173
D. Computer Animation of Helicopter Component or System Function.....	174
E. In-Court Demonstrations or Experiments.....	175
7.2 Photographs of Crash Scene and Helicopter Wreckage	175
7.3 Jury View of Helicopter Wreckage	176
7.4 NTSB Reports.....	177
7.5 FAA Records	178
A. Air Traffic Control Communications	179
B. Governmental Investigative Reports.....	179
C. Non-Accident Specific FAA Documents and Materials	179
7.6 Service Difficulty Reports, Airworthiness Directives, Service Bulletins and Service Letters, and Malfunction and Defect Reports	180
A. Service Difficulty Reports.....	180
B. Airworthiness Directives	180

Helicopter Crash Litigation

C. Service Bulletins and Service Letters	181
D. Malfunction and Defect Reports	181
7.7 Internal Company Documents	182
7.8 Daubert Motions to Exclude Expert Testimony.....	182
A. Meeting the Daubert Challenge	182
B. Challenging Defense Experts.....	184
7.9 Substantially Similar Incidents and Crashes.....	184
A. Legal Standard for Admissibility	184
B. Meeting the Challenge to Similar Incident Evidence.....	189
7.10 Subsequent Remedial Measures	190
7.11 Prior Lawsuits and Claims	193
7.12 Federal Aviation Regulations	193
7.13 Use of Accident Statistics	194
Endnotes.....	194
Chapter 8: Damages In Helicopter Crash Cases	207
Introduction.....	207
8.1 Non-Unique Damages Issues In Helicopter Crash Cases	207
A. Wrongful Death	207
B. Debilitating Physical Injury	208
8.2 Typical Damages Issues In Helicopter Crash Litigation.....	208
A. Pre-Impact Terror	208
B. Post-Impact Conscious Pain and Suffering.....	212
C. Severe Burn Injuries	214
D. Death on the High Seas Act (DOHSA).....	214
E. Ground Impact Damages	215
F. Hull Damage	215
8.3 Punitive Damages in Helicopter Crash Cases.....	215
Endnotes.....	219
Chapter 9: Pre-Trial Matters	223
Introduction.....	223
9.1 Final Trial Preparation	223
A. Logistics and Witness Scheduling	224
B. Dismissal of Non-Essential Defendants and Claims	224
C. Witness Selection.....	225
D. Editing Videotaped Deposition Testimony	225
9.2 Final Witness Preparation	225
A. Client Preparation for Trial	225
B. Fact Witness Preparation for Trial	225
C. Expert Witness Preparation for Trial.....	226
9.3 Final Briefing Preparation.....	226
A. Motions in Limine.....	226
B. Trial Brief.....	228
C. Trial Memoranda.....	229
9.4 Request for Sequestration of Witnesses.....	230
9.5 Use of Jury Focus Group and Jury Consultants.....	230
9.6 Development of Case Theme for Trial.....	231
A. Case Theme Examples.....	231
B. Case Theme Reversing Principle Weakness in Case	232
C. Case Theme Focusing on Specific Impact of Injury	233
D. Case Theme Directly Contrary to the Main Defense	233
9.7 Jury Instructions.....	233
A. General Considerations.....	233
B. Standard Jury Instructions.....	234
C. Examples of Jury Instructions.....	234
9.8 Settlement Considerations	235
Endnotes.....	238
Chapter 10: Trial	239
Introduction.....	239
10.1 Jury Selection.....	240
A. Objectives	240
B. Suggested Voir Dire Questions, Trial Excerpts and Commentary.....	242
10.2 Opening Statement.....	256
A. Objectives and Suggested Techniques	256
B. Sample Outline of Opening Statement	257
C. Trial Excerpts and Commentary	258
10.3 Plaintiff's Case-In-Chief.....	260
A. Direct Examination of On-Scene Witnesses	260
B. Direct Examination of Defendant's Corporate Representatives	262
C. Direct Examination of Plaintiff's Expert Witnesses	264
D. Direct Examination of Damages Witnesses.....	267
E. Direct Examination of Plaintiffs	269
10.4 Defendant's Case-in-Chief.....	271
A. Cross-Examination of Defendant's Corporate Representative.....	271
B. Cross-Examination of Defense Expert Witnesses	273
10.5 Plaintiff's Rebuttal Evidence	276
10.6 Closing Argument	276
A. Objectives and Suggested Techniques	277
B. Sample Outline of Closing Argument.....	277
C. Trial Excerpts of Liability Argument and Commentary.....	278
D. Trial Excerpts of Damages Argument and Commentary.....	282
10.7 Plaintiff's Rebuttal Argument	284
Part III:	
Safety Recommendations for the Helicopter Industry	
Chapter 11: Generic Safety Improvements for the Helicopter Industry.....	289
Introduction.....	289
11.1 Safer Design and Manufacturing Processes.....	289
A. Addressing Known Design and Manufacturing Deficiencies.....	290

Helicopter Crash Litigation

B. Enhanced Reporting of Helicopter Accidents or Incidents and Component or System Malfunction.....	291
C. Reducing Post-Impact Fires.....	291
11.2 Enhanced Management Oversight.....	291
11.3 Improved Maintenance Procedures.....	292
A. Strict Compliance with Manufacturer's Maintenance Program.....	292
B. Helicopter-Specific Training for Mechanics.....	292
C. Implementation of Health and Usage Monitoring Systems.....	292
11.4 Pilot Training and Flight Restrictions.....	292
11.5 Mandatory Equipment.....	293
A. Night Vision Goggles.....	293
B. Terrain Awareness and Warning System.....	293
C. Global Positioning System Technology.....	294
D. Multi-Engine Helicopters.....	294
E. Flotation and Locator Devices.....	294
F. Flight Data Recorder.....	294
Endnotes.....	294
Chapter 12: Mission-Specific Recommendations for Enhanced Safety.....	297
Introduction.....	297
12.1 Helicopter Touring Industry.....	297
A. Greater Scrutiny and Monitoring of Tour Operator Management and Maintenance Practices.....	298
B. Enhanced Pilot Training and Experience.....	298
C. Pre-Determined Flight Path.....	299
D. Independent Risk Assessment of Weather Conditions.....	299
E. Dedicated Non-Pilot Tour Guide or Recorded Commentary.....	299
F. Minimize Crowded Airspace.....	299
G. Minimum Hover and Flight Distances.....	299
12.2 News-Gathering Operations.....	299
A. Eliminate Reporting Duties for Pilots of News-Gathering Helicopters.....	300
B. Enhanced Visibility of Aircraft.....	300
C. Enhanced Air and Ground Communications Among News-Gathering Pilots.....	300
12.3 Air Ambulance Services.....	300
A. Implementation of Flight Risk Assessment Program.....	300
B. Installation of Terrain Awareness and Warning System.....	300
C. Mandatory Use of Night Vision Goggles.....	301
D. Enhanced Pilot Training.....	301
12.4 Utility Wire Inspection.....	301
A. Advance Ground or Aerial Reconnaissance.....	301
B. Separate Spotter or Observer.....	301
C. Mandatory Attendance at Wire Strike Avoidance Training.....	302
D. Greater Use of Marker Devices on Utility Wires.....	302
12.5 Search and Rescue Operations.....	302
12.6 Law Enforcement and Border Patrol Usage.....	302
12.7 Military Training Exercises.....	302
12.8 Private Transportation.....	302
12.9 Transport to Offshore Oil Platforms.....	302
12.10 Fire-Fighting Operations.....	303
Endnotes.....	303
Appendix A: Sample Pleadings in Helicopter Crash Cases.....	305
A.1 Sample Complaint 1: Helicopter Engine Design (Nozzle Guide Vane Failure).....	305
A.2 Sample Complaint 2: Helicopter Mechanical System Malfunction Due to Manufacturing Defect (Tail Rotor System).....	324
A.3 Sample Complaint 3: Helicopter Pilot Error (Wire Strike).....	329
A.4 Sample First Set of Interrogatories: Helicopter Engine Failure/Design Defect.....	346
A.5 Sample First Set of Interrogatories: Helicopter Component Part Manufacturer.....	355
A.6 Sample First Set of Interrogatories: Helicopter Pilot.....	363
A.7 Sample First Request for Production of Documents: Helicopter Engine Failure/Design Defect...370	
A.8 Sample First Request for Production of Documents: Helicopter Component Part Manufacturer.....	373
A.9 Sample First Request for Production of Documents: Helicopter Pilot.....	376
A.10 Sample Plaintiff's Brief in Opposition to Defendants' Motion to Dismiss Based on GARA.....	379
Appendix B: Significant Helicopter Crash Case Decisions.....	385
B.1 <i>Barnett v. La Societe Anonyme Turbomeca France</i> (1998).....	385
B.2 <i>Boyle v. United Technologies Corporation</i> (1988) ...	410
B.3 <i>Four Corners Helicopters, Inc. v. Turbomeca, S.A.</i> (1992).....	426
B.4 <i>Helicopteros Nacionales de Colombia, S.A. v. Hall</i> (1984).....	435
B.5 <i>Letz v. Turbomeca Engine Corporation</i> (1997).....	446
Table of Cases and Statutes.....	465
Index.....	473