

**ALL-VOLUME OVERVIEW .....i**

**CHAPTER 5**

**Satellite Launches in the PRC: Hughes**

**CHAPTER SUMMARY ..... 2**

**OPTUS B2, APSTAR 2 LAUNCH FAILURES: PRC GAINS**

**SENSITIVE KNOWLEDGE FROM HUGHES INVESTIGATIONS ..... 6**

**THE PROHIBITION AGAINST TECHNOLOGY TRANSFER**

**IN FOREIGN LAUNCHES ..... 8**

International Traffic in Arms Regulations and the U.S. Munitions List ..... 8

Department of Defense Monitoring Role ..... 9

**OPTUS B2 ..... 10**

The Optus B2 Licenses ..... 10

The Optus B2 Fails To Achieve Orbit ..... 12

Failure Investigation Teams ..... 14

Failure Investigation Begins ..... 14

Hughes’ Export Administrators Deal with the Licensing Question ..... 17

A ‘Political’ Business Solution ..... 21

The Optus B3: Hughes’ Efforts to Improve the Long March Continue ..... 36

**APSTAR 2 ..... 40**

The Apstar 2 License ..... 40

The Apstar 2 Failure ..... 40

Failure Investigation Teams ..... 42

Failure Investigation Schedule ..... 42

The Need for a License ..... 42

Commerce Department Conference ..... 46

Same Fairing Failure Identified by Hughes ..... 47

A ‘Political’ Business Solution, Again? ..... 48

The Commerce Department Approves Data Release to the PRC ..... 50



Hughes Tries to Get the PRC to Accept Its Findings .....	51
CIA Analyst Visits Hughes .....	56
A ‘Consolidated Solution’ .....	58
Final Failure Investigation Report Released to the PRC by the Commerce Department ...	60
Implementing the ‘Consolidated Solution’ .....	64
U.S. Government Actions Following the Apstar 2 Launch Failure .....	66
Defense Department Assessments of Damage to National Security .....	68
<i>Damage to National Security from the Apstar 2 Failure Investigation</i> .....	69
<i>Damage to National Security from the Sharing of Coupled Loads Analysis</i> .....	72
<i>Damage to National Security from Providing the PRC with</i> <i>Information Concerning Deficiencies in the Fairing, and</i> <i>Resultant Improvements to PRC Rockets and Ballistic Missiles</i> .....	73
<i>Other Information Learned by the PRC, and Defense Department Reaction</i> .....	74
State Department Assessments of Damage to National Security .....	75
Damage to National Security Identified by the Select Committee’s Technical Consultant .....	85
<b>CHARLIE TRIE, THE PRC, AND HUGHES ELECTRONICS</b> .....	87
<b>FURTHER INVESTIGATION WARRANTED</b> .....	88
<b>TECHNICAL AFTERWORD: Nose Fairings on Rockets and Ballistic Missiles</b> .....	90

## CHAPTER 6

### Satellite Launches in the PRC: Loral

<b>CHAPTER SUMMARY</b> .....	96
<b>INTELSAT 708 LAUNCH FAILURE: LORAL INVESTIGATION PROVIDES</b> <b>PRC WITH SENSITIVE INFORMATION: OVERVIEW OF EVENTS</b> .....	100
The PRC’s Launch Failure Investigation .....	107
The Asia Pacific Telecommunications Insurance Meeting .....	107
The PRC’s Creation of an ‘Independent Review Committee’ .....	108
The Independent Review Committee’s Meetings .....	109
The Independent Review Committee’s Report .....	110



Substance of the Preliminary Report ..... 110

The Report Goes to the PRC ..... 112

Defense Department Analyst Discovers the Activities  
of the Independent Review Committee ..... 113

Loral and Hughes Investigate the Matter ..... 114

The Aftermath: China Great Wall Industry Corporation Revises Its  
Findings on the Cause of the Accident ..... 114

U.S. Government Assessments of the Independent Review  
Committee’s Report, and Referral to the Department of Justice ..... 115

**DETAILS OF THE FAILED LONG MARCH 3B-INTELSAT 708 LAUNCH  
AND INDEPENDENT REVIEW COMMITTEE ACTIVITIES** ..... 116

Background on Intelsat and Loral ..... 116

*Intelsat* ..... 116

*Loral Space and Communications* ..... 117

*Space Systems/Loral* ..... 118

*Intelsat 708 Launch Program* ..... 118

The Intelsat 708 Launch Failure ..... 119

*Events Leading Up to the Creation of the Independent Review Committee* ..... 121

*The Government Security Committee Meeting at Loral* ..... 124

The Apstar 1A Insurance Meeting ..... 128

The April 1996 Independent Review Committee Meetings in Palo Alto ..... 129

*Meeting on April 22, 1996* ..... 129

*Meeting on April 23, 1996* ..... 131

*Meeting on April 24, 1996* ..... 132

United States Trade Representative Meeting on April 23, 1996 ..... 132

The April and May 1996 Independent Review Committee Meetings in Beijing ..... 134

*Meeting on April 30, 1996* ..... 134

*Members’ Caucus at the China World Hotel* ..... 134

*Meeting on May 1, 1996* ..... 138

The Independent Review Committee Preliminary Report ..... 140

*Writing the Report* ..... 140

*Loral Sends the Draft Report to the PRC* ..... 140

*The Contents of the Draft Report* ..... 141



<i>Notification to Loral Officials That a Report Had Been Prepared</i> .....	142
<i>Loral Review and Analysis of the Independent Review Committee Report</i> .....	143
The Final Preliminary Report is Sent to the PRC .....	144
<i>Another Copy of the Report is Sent to Beijing</i> .....	145
Loral Management Actions After Delivery of the Report to the PRC .....	146
Defense Department Official Discovers the Activities	
of the Independent Review Committee .....	147
<i>Meeting with the Defense Technology Security Administration</i> .....	148
<i>Meeting with the State Department</i> .....	148
<i>Reynard's Telephone Call to Loral</i> .....	149
Loral Management Discovers the Independent Review Committee	
Report Has Been Sent to the PRC .....	150
Loral's 'Voluntary' Disclosure .....	151
<i>Investigation by Loral's Outside Counsel</i> .....	151
<i>Loral Submits Its 'Voluntary' Disclosure to the State Department</i> .....	151
The PRC Gives Its Final Failure Investigation Report .....	157
Assessments By U.S. Government Agencies and Referral to the Department of Justice ..	158
<i>Defense Department 1996 Assessment</i> .....	158
<i>Central Intelligence Agency Assessment</i> .....	159
<i>Department of State Assessment</i> .....	159
<i>Defense Technology Security Administration 1997 Assessment</i> .....	159
<i>Interagency Review Team Assessment</i> .....	160
Outline of What Was Transferred to the PRC .....	161
<i>Independent Review Committee Meeting Minutes</i> .....	161
<i>Independent Review Committee Preliminary Report</i> .....	162
Loral's Inaccurate Instructions on Releasing Public Domain Information to Foreigners ..	162
<i>Instructions to the Independent Review Committee</i>	
<i>Regarding Public Domain Information</i> .....	162
<i>State Department Views on Public Domain Information</i> .....	164
The Defense Department Concludes That the Independent Review Committee's	
Work Is Likely to Lead to the Improved Reliability of PRC Ballistic Missiles .....	164
The Cross-Fertilization of the PRC's Rocket and Missile Design Programs .....	166
The Independent Review Committee Aided the PRC in Identifying the Cause	
of the Long March 3B Failure .....	167



The PRC Implemented All of the Independent Review Committee’s Recommendations . 168  
The Independent Review Committee Helped the PRC Improve the Reliability  
of Its Long March Rockets ..... 171

**AFTERWORD: U.S. COMPANIES’ MOTIVATIONS  
TO LAUNCH SATELLITES IN THE PRC ..... 172**

**CHRONOLOGY OF KEY EVENTS ..... 176**

**TECHNICAL AFTERWORD: Technical Aspects of Technology Transfer  
During the Loral Failure Investigation: Background ..... 194**

## **CHAPTER 7**

# **Protecting Sensitive Information at PRC Launch Sites**

**CHAPTER SUMMARY ..... 218**

**PROTECTING SENSITIVE INFORMATION AT PRC  
LAUNCH SITES: BACKGROUND ..... 220**  
U.S.-PRC Bilateral Agreement ..... 220  
Export Licenses for PRC Launching of U.S. Satellites ..... 220  
Defense Department Monitors ..... 222

**UNAUTHORIZED ACCESS ALLOWS OPPORTUNITIES TO GAIN  
INFORMATION CONCERNING U.S. SATELLITES AND  
OTHER CONTROLLED TECHNOLOGY ..... 222**

**INADEQUACY OF CURRENT SAFEGUARDS ..... 227**

**SAFEGUARDING U.S.-BUILT SATELLITES AND U.S. ROCKET  
TECHNOLOGY AT PRC LAUNCHES ..... 237**  
Country-to-Country Agreements ..... 237  
Export Licenses ..... 237



<b>THE DEFENSE DEPARTMENT'S RESPONSIBILITIES FOR SAFEGUARDING U.S. TECHNOLOGY AT LAUNCHES</b> .....	238
<b>DEFICIENCIES OBSERVED IN THE CURRENT SYSTEM</b> .....	239
U.S.-PRC Technical Discussions Occur Prior to the Issuance of Export Licenses .....	239
Technology Transfer Control Plans and Security Plans Vary Throughout the Space Industry .....	239
Temporary Assignments of Defense Department Monitors Disrupt Continuity of Launch Site Security .....	240
An Inadequate Number of Defense Department Monitors Is Assigned to PRC Launches .....	242
Uneven Prior Technical Experience of the Defense Department Monitors .....	244
Inadequate Headquarters Review of Monitor Reports .....	245
Lack of Headquarters' Support .....	246
Lack of Intermediate Sanction Authority .....	247
Conflicting Industry Priorities .....	249
Satellite Manufacturers, Not the Defense Department, Supervise Site Security Personnel .....	250
Reliance on Private Contractor Security Is Inadequate .....	250
Insufficient Numbers of Security Guards at PRC Launch Sites .....	252
<b>CORRECTING SECURITY DEFICIENCIES</b> .....	253
The 1999 Defense Authorization Act .....	254
<b>EXCERPTS FROM DEFENSE DEPARTMENT MONITORS' REPORTS OF SECURITY LAUNCHES OF U.S. SATELLITES</b> .....	255



# **CHAPTER 8**

## **The Role of Commercial Space Insurance in Technology Transfer to the PRC**

<b>CHAPTER SUMMARY</b> .....	268
<b>THE ROLE OF COMMERCIAL SPACE INSURANCE IN TECHNOLOGY TRANSFER TO THE PRC</b> .....	270
Insurance Aspects of the Long March 3B-Loral-Intelsat 708 Failure .....	270
The Formation of the Independent Review Committee .....	276
The April 15-16, 1996 Insurance Meeting in Beijing .....	289
The Space Insurance Industry’s Involvement in the Release of the Independent Review Committee’s Interim Report .....	292
<b>CHRONOLOGY OF KEY EVENTS</b> .....	298
<b>TECHNICAL AFTERWORD: The Commercial Space Insurance Industry</b> .....	300
<b>NOTES</b> .....	312





