

CHAPTER 5 – Satellite Launches in the PRC: Hughes

- 1 See a more detailed discussion of U.S. export controls and licensing requirements in the chapter entitled “U.S. Export Policy Toward the PRC.”
- 2 22 U.S.C. § 2778.
- 3 22 C.F.R., Part 120.
- 4 Recently, the Defense Technology Security Administration has been renamed the Technology Security Directorate and made a part of the new Defense Threat Reduction Agency.
- 5 Air Force Instruction 10-1210, ¶ 1.1.1.
- 6 Air Force Instruction 10-1210, ¶ 3.1.
- 7 Air Force Space Command Technology Safeguard Monitor Handbook, November 1997, 11 4.13. No earlier version of this publication is available, although Defense Technology Security Administration monitor Lt. Col. Allen Coates advises that similar written directives were in effect at the times of the Hughes launch failures.
- 8 Hughes Space and Communications Company, Long March 2E/Optus B2 Failure Investigation Spacecraft Final Report, October 1993.
- 9 Ibid.
- 10 Ibid.
- 11 Ibid.
- 12 Ibid.
- 13 Deposition of Stephen Cunningham, December 2, 1998.
- 14 Hughes Long March 2E/Optus B2 Failure Investigation Spacecraft Final Report, October 1993.
- 15 Deposition of Stephen Cunningham, December 2, 1998.
- 16 Interview of Allen Coates, September 24, 1998.
- 17 Deposition of Allen Coates, November 20, 1998.
- 18 Deposition of Al Wittmann, November 6, 1998.
- 19 Ibid.
- 20 Ibid.
- 21 Deposition of Al Wittman, November 6, 1998.
- 22 Hughes Apstar2/LM-2E Independent Review Team Report, July 1995.
- 23 Deposition of Donald E. Leedle, October 29, 1998.
- 24 Ibid.



- 25 Ibid.
- 26 Ibid.
- 27 Ibid.
- 28 Smolker was responsible for licensing accountability. Deposition of Steven Dorfman, December 15, 1998.
- 29 Deposition of Donald E. Leedle, October 29, 1998.
- 30 Deposition of Steven Dorfman, December 15, 1998.
- 31 Deposition of Donald E. Leedle, October 29, 1998.
- 32 Deposition of Donald E. Majors, October 28, 1998.
- 33 Ibid.
- 34 Interview of Kenneth Peoples, October 1, 1998.
- 35 Ibid.
- 36 Ibid.
- 37 Ibid.
- 38 Deposition of Stephen Cunningham, December 2, 1998.
- 39 Ibid.
- 40 Ibid.
- 41 Ibid.
- 42 Ibid.
- 43 Ibid.
- 44 Deposition of Peter Herron, November 13, 1998.
- 45 Deposition of John S. Perkins, November 5, 1998.
- 46 Ibid.
- 47 Ibid.
- 48 Ibid.
- 49 Ibid.
- 50 Bangsang Lee was born in China in 1949. He received a Master's and Ph.D in Electrical Engineering from Princeton in 1976, and is a naturalized U.S. citizen. For several years preceding 1991, he had worked for a patent law firm that did some consulting work for Hughes. Deposition of Bansang W. Lee, November 16, 1998.
- 51 Deposition of Bansang W. Lee, November 16, 1998.
- 52 Ibid.



- 53 Ibid.
- 54 Ibid.
- 55 Minister Liu Jiynan is also President of China Aerospace Corporation.
- 56 Deposition of Bansang W. Lee, November 16, 1998.
- 57 Ibid.
- 58 Deposition of Al Wittmann, November 6, 1998.
- 59 Ibid.
- 60 Ibid.
- 61 Deposition of Steven Dorfman, December 15, 1998.
- 62 Deposition of Donald Cromer, December 17, 1998.
- 63 Deposition of Allen Coates, November 20, 1998.
- 64 Ibid.
- 65 Ibid.
- 66 Ibid.
- 67 Deposition of Donald E. Leedle, October 29, 1998.
- 68 Deposition of Stephen Cunningham, December 2, 1998.
- 69 Deposition of Donald E. Leedle, October 29, 1998.
- 70 Exhibit to deposition of Bansang W. Lee, November 16, 1998.
- 71 Ibid.
- 72 Ibid.
- 73 *Space News*, August 23, 1993.
- 74 Deposition of Stephen Cunningham, December 2, 1998.
- 75 Deposition of Donald Cromer, December 17, 1998.
- 76 Exhibit to deposition of Bansang W. Lee, November 16, 1998.
- 77 Ibid.
- 78 Ibid.
- 79 Deposition of Bansang W. Lee, November 16, 1998, and exhibit thereto.
- 80 Deposition of Donald Cromer, December 17, 1998.
- 81 Deposition of Stephen Cunningham, December 2, 1998.
- 82 Ibid.



- 83 Ibid.
- 84 Deposition of Allen Coates, November 20, 1998.
- 85 Deposition of Donald L. Cromer, December 17, 1998.
- 86 Deposition of C. Michael Armstrong, December 17, 1998.
- 87 Deposition of Allen Coates, November 20, 1998.
- 88 Deposition of Steven Burke, November 5, 1998.
- 89 Ibid.
- 90 Exhibit to deposition of Steven Burke, November 5, 1998.
- 91 Ibid.
- 92 Deposition of Steven Burke, November 5, 1998.
- 93 Ibid.
- 94 Deposition of Peter Herron, November 13, 1998.
- 95 Deposition of Steven Burke, November 5, 1998.
- 96 Deposition of Donald Leedle, October 29, 1998.
- 97 U.S. Department of Commerce, License # D204878, dated February 1, 1994.
- 98 Hughes Long March 2E/Apstar2 Failure Investigation Final Report, July 1995.
- 99 Deposition of Stephen Cunningham, December 2, 1998.
- 100 Deposition of Donald Cromer, December 17, 1998.
- 101 Hughes Long March 2E/Apstar2 Failure Investigation Final Report, July 1995.
- 102 Ibid.
- 103 Ibid.
- 104 Deposition of Stephen Cunningham, December 2, 1998.
- 105 Ibid.
- 106 Deposition of Donald Leedle, October 29, 1998.
- 107 Ibid.
- 108 Ibid.
- 109 Interview of Gene Christiansen, August 28, 1998.
- 110 Deposition of Donald Leedle, October 29, 1998.
- 111 Exhibit to deposition of Donald Leedle, October 29, 1998; Interview of Gene Christiansen, October 1, 1998.



- 112 Deposition of Donald Leedle, October 29, 1998.
- 113 Deposition of Al Wittmann, November 16, 1998.
- 114 Ibid.
- 115 Ibid.
- 116 Ibid.
- 117 Interview of Jerry Beiter, September 21, 1998.
- 118 Deposition of Pat Bowers, November 9, 1998.
- 119 Interview of Sara Jones, September 22, 1998.
- 120 Interview of Jerry Beiter, September 21, 1998.
- 121 Ibid.
- 122 Deposition of Donald Leedle, October 29, 1998.
- 123 Interview of Sara Jones, September 22, 1998.
- 124 Ibid.
- 125 Ibid.
- 126 Ibid.
- 127 Interview of Pat Bowers, November 9, 1998.
- 128 Deposition of Donald Leedle, October 29, 1998.
- 129 Deposition of Spencer Ku, November 6, 1998.
- 130 Ibid.
- 131 Ibid.
- 132 Ibid.
- 133 Ibid.
- 134 Document received from Hughes.
- 135 Ibid.
- 136 Deposition of Donald Leedle, October 29, 1998.
- 137 Ibid.
- 138 Ibid.
- 139 Document received from Hughes
- 140 Ibid.
- 141 Ibid.



- 142 Interview of CIA analyst, November 4, 1998.
- 143 Ibid.
- 144 Ibid.
- 145 Ibid.
- 146 Ibid.
- 147 Ibid.
- 148 Ibid.
- 149 Deposition of Donald Leedle, October 29, 1998.
- 150 Interview of CIA analyst, November 4, 1998.
- 151 Ibid.
- 152 Ibid.
- 153 Document received from Hughes.
- 154 Deposition of Donald Leedle, October 29, 1998.
- 155 Ibid.
- 156 Ibid.
- 157 Interview of Sara Jones, September 22, 1995.
- 158 Interview of Gene Christiansen, August 28, 1998.
- 159 Ibid.
- 160 Ibid.
- 161 Document received from Hughes.
- 162 Department of Defense Background Paper, January 26, 1995.
- 163 Ibid.
- 164 Interview of Mark N. Rochlin, December 11, 1998.
- 165 Department of Defense Memorandum for Record, Office of Assistant Secretary of Defense, International Security Policy, May 31, 1995, by LTC Mark N. Rochlin.
- 166 Interview Report of Mark N. Rochlin, December 11, 1998.
- 167 Ibid.
- 168 Ibid.
- 169 Ibid.
- 170 Department of Defense, "Department of Defense Initial Assessment of Certain Documents Concerning Investigation by Hughes Space And Communications Company into the Failure of the Launch of the Apstar



- II on China’s Long March 2E Launch Vehicle,” December 7, 1998 (hereinafter, Department of Defense Assessment).
- 171 Department of Defense Assessment.
- 172 Ibid.
- 173 Ibid.
- 174 Hughes Long March 2E/Apstar2 Failure Investigation Final Report, July 1995.
- 175 Ibid.
- 176 Department of Defense Assessment.
- 177 Ibid.
- 178 Ibid.
- 179 Ibid.
- 180 Ibid.
- 181 Ibid.
- 182 Ibid.
- 183 Ibid.
- 184 Memorandum to Chairman Cox from Barbara Larkin, Assistant Secretary of State for Legislative Affairs, dated December 18, 1998.
- 185 Dr. Alexander Flax, “Nose Fairings on Space Launch Vehicles and Ballistic Missiles,” paper prepared for the Select Committee, December 1998.
- 186 Briefing to the Select Committee, December 2, 1998.
- 187 Briefings to the Committee, December 2 and 11, 1998.
- 188 *United States v. Trie*, 23 F. Supp. 55, 2-3 (D.D.C. 1998).
- 189 Daihatu International Certificate of Incorporation (November 14, 1991).
- 190 Lena H. Sun, “Pacific Trade Commission Appointee Was Considered a White House Must,” *Washington Post*, December 18, 1996.
- 191 Testimony of Jerome Campane before the U.S. Senate Committee on Governmental Affairs, July 29, 1997.
- 192 Deposition of Zhi Hua Dong by the U.S. Senate Committee on Governmental Affairs; June 17, 1997; testimony of Jerome Campane before the U.S. Senate Committee on Governmental Affairs, July 29, 1997.
- 193 Executive Order 12964, sec. 2, 31, Weekly Comp. Pres. Doc. 1095.
- 194 Letter from Charlie Trie to President William J. Clinton, March 21, 1996.
- 195 Department of Defense Assessment.



CHAPTER 6 – Satellite Launches in the PRC: Loral

- 1 Loral Voluntary Disclosure, June 17, 1996. Documents submitted at the insistence of the Department of State export licensing office to the Compliance Analysis Division, PM/DTC, SA-6, Room 200, Office of Defense Trade Controls, Bureau of Political-Military Affairs, United States Department of State, on June 17, 1996, by Feith & Zell, P.C., Washington, D.C., on behalf of Loral. Includes a 21 page report signed by Michael Poliner, an appendix containing a certification by Loral President Robert Berry, and several volumes of tabbed exhibits (L16); Hughes Investigation Report, “Report of Investigation of Alleged Violations of International Traffic in Arms Regulations (ITAR),” from Hughes Space and Communications Company, June 27, 1996. Includes a 24-page report, a 14-page chronology, and 53 tabbed exhibits.
- 2 “Crash of Intelsat VII Feb. 1996 Full Version,” Videotape recording of Intelsat 708 launch failure from Intelsat.
- 3 “China’s Space Program: A Brief Overview Including Commercial Launches of U.S.-Built Satellites,” Congressional Research Service Report by Marcia Smith, June 23, 1998.
- 4 “China Space Chief Ready to Expend Human Lives,” Nigel Hawkes, *The Times Newspapers Limited*, June 15, 1996.
- 5 Intelsat Internet web site, <http://www.Intelsat.com>; Intelsat letter to Select Committee, from Diane Hinson, VP & General Counsel, Intelsat, Re: “Responses to Questions Posed by the Select Committee,” December 4, 1998, letter with attachment.
- 6 Intelsat letter to Select Committee, from Diane Hinson, VP & General Counsel, Intelsat, Re: “Responses to Questions Posed by the Select Committee,” December 4, 1998, letter with attachment.
- 7 Ibid.
- 8 Interview of Daniel Lilienstein, October 28, 1998.
- 9 Intelsat letter to Select Committee, from Diane Hinson, VP & General Counsel, Intelsat, Re: “Responses to Questions Posed by the Select Committee,” December 4, 1998, letter with attachment.
- 10 China Great Wall Industry Corporation Information Release, February 27, 1996.
- 11 “Technical & Technology Transfer Aspects of the Intelsat 708 Launch Failure Investigation,” by Dr. Alexander Flax.
- 12 Hughes Investigation Report.
- 13 Ibid.
- 14 Ibid.
- 15 Loral memorandum from C. Patrick DeWitt, subject: “Minutes of the 11 April 1996 GSC [Government Security Committee] Meeting,” April 15, 1996.
- 16 Loral Voluntary Disclosure, June 17, 1996.
- 17 Ibid.



- 18 Ibid.
- 19 Ibid.
- 20 Ibid.
- 21 Ibid.
- 22 Interview of Karl Kachigan, October 19, 1998.
- 23 Letter dated May 29, 1996, from William J. Lowell, Director, Office of Defense Trade Controls, State Department to Eric J. Zahler, General Counsel, Loral, and John J. Higgins, General Counsel, Hughes Electronics.
- 24 “DOD Assessment of Certain Unlicensed Activities by Loral Space Systems, Inc. and Hughes Aircraft Co.,” May 16, 1997.
- 25 U.S. State Department form DSP-5, “Application/License for Permanent Export of Unclassified Defense Articles and Related Unclassified Technical Data,” License No. 533593, Applicant: Loral, Date Prepared: 5/11/92, Date Approved: 9/18/92, Approved by: Ken Peoples, Destination Country: PRC, Commodity: “Technical Data in support of technical discussions for the launch of an Intelsat VIIA Spacecraft.” DSP-5 form with continuation page and letter from State Department containing limitations and provisos.
- 26 William Schweickert’s briefing presentation charts, “Long March Failure Review, Technology Export Briefing,” April 22, 1996.
- 27 Wah Lim’s briefing presentation charts, “Independent Oversight Committee Status Report” and “LM-3B Launch Failure Investigation Independent Review Committee,” April 16, 1996.
- 28 Loral Voluntary Disclosure, June 17, 1996.
- 29 “Independent Review Committee Preliminary Report,” May 10, 1996; Loral Voluntary Disclosure, June 17, 1996.
- 30 “Independent Review Committee Preliminary Report,” May 10, 1996.
- 31 Ibid.
- 32 Loral Voluntary Disclosure, June 17, 1996.
- 33 Ibid.
- 34 Ibid.
- 35 Ibid.
- 36 Deselding, Peter B., “Long March Review Finished,” *Space News*, May 13-19, 1996.
- 37 Loral Voluntary Disclosure, June 17, 1996.
- 38 Loral Voluntary Disclosure, June 17, 1996. On December 2, 1998, Loral responded to a Select Committee interrogatory that asked Loral to update its 1996 Voluntary Disclosure to the State Department so as to be true, correct, and complete based on the totality of information regarding the Independent Review Committee that had been learned since June 1996. Loral’s response included minor revisions to reflect



additional information about Independent Review Committee activities. It continued to maintain, however, that “Based on further analysis of the law and facts, it is the Company’s position that, despite the violation of company policy, Loral did not provide any ‘assistance’ to the PRC within the meaning of the ITAR [International Traffic in Arms Regulations] — that is, SS/L [Loral] did not provide a ‘defense service’ as defined by the ITAR.” The updated response went on to say, “none of the PRC’s announced improvements to its Long March 3B rockets was the result of Loral’s participation in the IRC [Independent Review Committee].”

- 39 Hughes Investigation Report.
- 40 Interagency review team report, July 22, 1998.
- 41 Intelsat Internet web site, <http://www.Intelsat.com>. Intelsat launched the world’s first commercial communications satellite in 1965, providing service to the Atlantic Ocean region. In 1969, Intelsat provided global television coverage of the Apollo lunar landing to an audience of 500 million people around the world. In 1974, Intelsat activated a direct communications link, named the “Hot Line,” between the White House and the Kremlin. In 1992, Intelsat and NASA collaborated on a historical and successful space mission to retrieve and reboost the Intelsat 603 satellite, stranded after a failed launch in 1990. Most recently, Intelsat helped broadcast live coverage of the 1998 Winter Olympic games from Nagano, Japan.
- 42 Intelsat Internet web site.
- 43 Ibid.
- 44 Ibid.
- 45 Ibid.
- 46 Intelsat Internet web site. Internet web site: <http://msl.jpl.nasa.gov/>.
- 47 Loral Internet web site: <http://www.loral.com>, <http://www.ssloral.com>.
- 48 Ibid.
- 49 Ibid.
- 50 Ibid.
- 51 Ibid.
- 52 Intelsat letter to Select Committee, from Diane Hinson, VP & General Counsel, Intelsat, Re: “Responses to Questions Posed by the Select Committee,” December 4, 1998.
- 53 Department of State, Intelsat Technical Data export license, September 18, 1992.
- 54 Department of State, Intelsat Satellite export license, July 14, 1993.
- 55 Letter to Terry Edwards, Intelsat, from Ma Qimin, China Great Wall Industry Corporation, March 8, 1996, enclosing the Preliminary LM-3B Failure Analysis Report.
- 56 Deposition of Robert Berry, November 18, 1998.
- 57 *New York Times*, Eric Schmitt, June 24, 1998.



- 58 Loral Memorandum to John Merizon, from Muhammad Wahdy to John Merizon, Subject: "Retrieval of Spacecraft parts from the crash site," February 17, 1996.
- 59 China Great Wall Industry Corporation Information Release, March 28, 1996.
- 60 E-mail message to Peter Herron, Hughes, from Chris Lanzit, Hughes, Subject: "Meeting at CALT on LM-3/Apstar 1A & LM-3B failure," March 14, 1996. (Hughes Investigation Report.)
- 61 Ibid.
- 62 "Technical and Technology Transfer Aspects of the Intelsat 708 Launch Failure Investigation," Dr. Alexander Flax, Washington Advisory Group, December 20, 1998.
- 63 E-mail message to Peter Herron, Hughes, from Chris Lanzit, Hughes, Subject: "Meeting at CALT on LM-3/Apstar 1A & LM-3B failure," March 14, 1996. (Hughes Investigation Report).
- 64 Ibid.
- 65 Feith & Zell interview notes of Paul O'Connor.
- 66 Minutes of LM-3B Failure Investigation Meeting, April 10-12, 1996.
- 67 Lim letter to Liu Zhixiong, dated March 29, 1996.
- 68 Minutes of LM-3B Failure Investigation Meeting, April 10-12, 1996.
- 69 Deposition of Robert Berry, November 18, 1998.
- 70 Ibid.
- 71 LM-3B Launch Failure Investigation Independent Review Committee Charter, dated April 14, 1996.
- 72 Loral Voluntary Disclosure.
- 73 Loral memorandum from C. Patrick DeWitt, subject: "Minutes of the 11 April 1996 GSC [Government Security Committee Meeting]," April 15, 1996. (Loral Voluntary Disclosure)
- 74 Testimony of Dr. Stephen Bryen, September 2, 1998.
- 75 Loral Voluntary Disclosure.
- 76 Deposition of Julie Bannerman, November 24, 1998.
- 77 Deposition of Robert Berry, November 18, 1998.
- 78 Ibid.
- 79 Loral memorandum from C. Patrick DeWitt, subject: "Minutes of the 11 April 1996 GSC [Government Security Committee] Meeting," April 15, 1996.
- 80 Testimony of Dr. Stephen Bryen, September 2, 1998.
- 81 Duncan Reynard interview, October 9, 1998.
- 82 Ibid.
- 83 Ibid.



- 84 Feith & Zell interview notes of Duncan Reynard.
- 85 Deposition of Julie Bannerman, November 11, 1998.
- 86 Robert Berry Deposition, November 18, 1998; Government Security Committee Meeting Booklet, July 11, 1996.
- 87 Loral Voluntary Disclosure, June 17, 1996.
- 88 Duncan Reynard letter to Department of State, April 3, 1996.
- 89 Ibid.
- 90 Apstar License No. 653324, attached to Loral Voluntary Disclosure.
- 91 Mabuhay License, No. 653324, Attachment to Loral voluntary disclosure.
- 92 Apstar 1A Pre-Flight Technical Briefing, Beijing, April 15-16, 1996.
- 93 Ibid.
- 94 Apstar 1A Meeting Participant Document, dated April 15-16, 1996.
- 95 “Technical and Technology Transfer Aspects of the Intelsat 708 Launch Failure Investigation,” Dr. Alexander Flax, Washington Advisory Group, December 20, 1998.
- 96 William Schweickert’s briefing presentation charts dated 4/22/96, titled “Long March Failure Review, Technology Export Briefing.” (Duncan Reynard Deposition)
- 97 Feith & Zell interview of Duncan Reynard.
- 98 Interview of Duncan Reynard, October 9, 1998.
- 99 Ibid.
- 100 Ibid.
- 101 Deposition of Julie Bannerman, November 24, 1998..
- 102 Minutes of Palo Alto Independent Review Committee Meeting dated April 22-24, 1996.
- 103 Attachment 1 to Minutes of first Independent Review Committee Meeting, Palo Alto, April 22-24, 1996.
- 104 China Great Wall Industry Corporation Information Release, March 28, 1996. Minutes of Palo Alto Independent Review Committee Meeting, April 22-24, 1996.
- 105 Minutes of Palo Alto Independent Review Committee Meeting, April 22-24, 1996.
- 106 Hughes Investigation Report.
- 107 Minutes of Palo Alto Independent Review Committee Meeting, April 22-24, 1996.
- 108 Hughes Investigation Report.
- 109 Nick Yen Memorandum to Kirk Keer, May 15, 1996.
- 110 Loral Memorandum to Kirk Keer, from Nick Yen, Subject: “Trip Report for Briefing to the U.S. Trade Commission in D.C.,” cc: R. Berry, Dr. W. Lim, J. Bannerman, D. Reynard, E. McFarlane, May 15, 1996.



- 111 Ibid.
- 112 Ibid.
- 113 Loral Voluntary Disclosure, June 17, 1996.
- 114 Final Independent Review Committee Preliminary Report, Attachment IV.
- 115 China Great Wall Industry Corporation Information Release, February 29, 1996.
- 116 China Great Wall Industry Corporation Information Release, March 28, 1996.
- 117 Independent Review Committee Preliminary Report.
- 118 China Great Wall Industry Corporation Insurance Briefing on LM-3B Failure Investigation, April 15-16, 1996, Loral Voluntary Disclosure.
- 119 Ibid.
- 120 Loral Voluntary Disclosure; Deposition of Karl Kachigan.
- 121 Meeting Minutes, April 22-26, 1996.
- 122 Independent Review Committee Preliminary Report, Attachment IV.
- 123 Ibid.
- 124 Loral Voluntary Disclosure, June 17, 1996, Independent Review Committee Preliminary Report, May 10, 1996.
- 125 “Independent Review Committee Preliminary Report,” May 10, 1996.
- 126 Loral Voluntary Disclosure and Exhibit A-9, Fried Frank Interrogatory Response, December 2, 1998.
- 127 Loral Voluntary Disclosure, June 17, 1996.
- 128 Ibid.
- 129 Ibid.
- 130 Feith & Zell notes of interview of Wah Lim.
- 131 Independent Review Committee Preliminary Report.
- 132 Independent Review Committee Preliminary Report; Deposition of Karl Kachigan.
- 133 Independent Review Committee Preliminary Report.
- 134 Ibid.
- 135 Ibid.
- 136 Final Independent Review Committee Preliminary Report.
- 137 “Independent Review Committee Preliminary Report,” May 10, 1996.
- 138 Deposition of Julie Bannerman, November 24, 1998.
- 139 Ibid.



- 140 Ibid.
- 141 Ibid.
- 142 Ibid.
- 143 Ibid.
- 144 Ibid.
- 145 Ibid.
- 146 Ibid.
- 147 Ibid.
- 148 Ibid.
- 149 Ibid.
- 150 Ibid.
- 151 Ibid.
- 152 Interview of Duncan Reynard, October 9, 1998.
- 153 Ibid.
- 154 Wah Lim letter to Paul O'Connor, VP, Space and Telecom Group, J&H Marsh & McLennan, May 13, 1996.
- 155 Lim refused to be interviewed or deposed without a grant of immunity, citing his Fifth Amendment right against self-incrimination. The Department of Justice objected to a grant of immunity for Lim and the Select Committee decided not to grant immunity to him.
- 156 Deposition of Julie Bannerman, November 24, 1998; Loral memorandum to Bob Berry, from D.L. Reynard, cc: Wah Lim, Julie Bannerman, Pat Dewitt, Hal Bradshaw, Subject: "SS/L [Loral] Involvement in the Investigation of the LM-3B Launch Failure," marked "URGENT" and "SS/L [Loral] Proprietary," May 14, 1996. (Deposition of Duncan Reynard).
- 157 Deposition of Julie Bannerman, November 24, 1998.
- 158 Ibid.
- 159 Ibid.
- 160 Interview of Duncan Reynard, October 9, 1998. Loral memorandum to Bob Berry, from D.L. Reynard, cc: Wah Lim, Julie Bannerman, Pat Dewitt, Hal Bradshaw, Subject: "SS/L [Loral] Involvement in the Investigation of the LM-3B Launch Failure," marked "URGENT" and "SS/L [Loral] Proprietary," May 14, 1996, 2 pages. (Deposition of Duncan Reynard)
- 161 Interview of Duncan Reynard, October 9, 1998.
- 162 Ibid.
- 163 Ibid.



- 164 Ibid.
- 165 Handwritten memorandum to Bob Berry, et al., from D. Reynard titled “Summary of Advice from DOS/ODTC [Department of State/Office of Defense Trade Controls] and DTSA [Defense Technology Security Administration],” May 15, 1996 (Deposition of Duncan. Reynard); Interview of Bob Kovac, November 6, 1998.
- 166 Deposition of Julie Bannerman, November 24, 1998.
- 167 Ibid.
- 168 Ibid.
- 169 Ibid.
- 170 Ibid.
- 171 Ibid.
- 172 Ibid.
- 173 Deposition of Duncan Reynard, November 4, 1998.
- 174 Deposition of Julie Bannerman, November 24, 1998.
- 175 Ibid.
- 176 Loral Voluntary Disclosure, June 17, 1996.
- 177 Ibid.
- 178 State Department letter to Eric J. Zahler, from William J. Lowell, Vice President, Secretary and General Counsel, Loral, Re: “3UA000-DLR-96-0521A,” May 29, 1996.
- 179 Loral Voluntary Disclosure, June 17, 1996.
- 180 Deposition of Duncan Reynard, November 4, 1996.
- 181 Government Security Committee Meeting Minutes, July 11, 1996 (listing date of assignment December 25, 1995 and listing due date January 25, 1996).
- 182 Duncan Reynard Interview, October 9, 1998; Julie Bannerman Deposition, November 24, 1998.
- 183 Deposition of Julie Bannerman, November 24, 1998..
- 184 Bill Schweickert interview, September 23, 1998.
- 185 Feith & Zell interview notes of Bill Schweickert.
- 186 Deposition of Duncan Reynard; Deposition of Julie Bannerman.
- 187 Deposition of Julie Bannerman.
- 188 Deposition of Duncan Reynard; Deposition of Julie Bannerman.
- 189 Deposition of Julie Bannerman.
- 190 Deposition of Bernard Schwartz (CEO); Interview Memorandum of Michael Targoff (President);



Deposition of Eric Zahler (General Counsel).

- 191 Duncan Reynard Deposition; Julie Bannerman Deposition.
- 192 Memorandum for the Record by Mark N. Rochlin, Lt. Col., U.S. Army, Assistant for Aerospace Technology (retired), dated May 31, 1995. Spaulding and Wright interview of same
- 193 Intelsat 708 License No. 533593, attached to Loral Voluntary Disclosure.
- 194 Duncan Reynard letter to State Department and Commerce Department, April 3, 1996.
- 195 Apstar License, No. 653324, attached to Loral Voluntary Disclosure.
- 196 Mabuhay License, No. 651982, attached to Loral Voluntary Disclosure.
- 197 Loral Voluntary Disclosure, June 17, 1996.
- 198 Ibid.
- 199 Invitation letter to attend China Great Wall Industry Corporation's LM-3B Failure Review Presentation by Zia Oboodiyat, Ex. Dir., Mabuhay Program, Loral, dated October 9, 1996.
- 200 China Great Wall Industry Corporation Information Release, September 10, 1996.
- 201 Loral Voluntary Disclosure, "Failure Tree" presentation made at Beijing Independent Review Committee meeting.
- 202 Final Independent Review Committee Preliminary Report, "Summary of Observations."
- 203 China Great Wall Industry Corporation briefing charts, "Content of LM-3B Failure Review," October 21-22, 1996.
- 204 Department of Defense Report, August 6, 1996.
- 205 "DOD [Department of Defense] Assessment of Certain Unlicensed Activities by Loral Space Systems, Inc. and Hughes Aircraft Co.," May 16, 1997.
- 206 Interagency review team report, July 22, 1998.
- 207 Ibid.
- 208 Loral Voluntary Disclosure, June 17, 1996.
- 209 Loral letter to Liu Zhixiong, VP China Great Wall Industry Corporation, from Wah Lim, Loral, cc: Independent Review Committee members, no date, containing minutes of the April 22-24, 1996 Independent Review Committee meeting in Palo Alto.
- 210 Loral Voluntary Disclosure, June 17, 1996.
- 211 Ibid.
- 212 Ibid.
- 213 Ibid.
- 214 Ibid.



- 215 Ibid.
- 216 Ibid.
- 217 Ibid.
- 218 Ibid.
- 219 William Schweickert's briefing charts, April 22, 1996.
- 220 Ibid.
- 221 Ibid.
- 222 Ibid.
- 223 Department of Defense Assessment, May 16, 1997.
- 224 Interagency review team report, July 22, 1998.
- 225 Ibid.
- 226 Ibid.
- 227 Interagency review team report, July 22, 1998.
- 228 Defense Department Report, August 6, 1996.
- 229 Department of Defense Assessment, May 16, 1997.
- 230 China Great Wall Industry Corporation LM-3B Failure Review briefing package presented at Loral offices on October 21-22, 1996.
- 231 Department of Defense Assessment, May 16, 1997.
- 232 Interagency review team report, July 22, 1998.
- 233 Department of Defense Report, August 11, 1997.
- 234 Briefing package titled "Agenda for Mabuhay Pre-shipment Review," by China Academy of Launch Vehicle Technology, April 14, 1997.
- 235 "Independent Review Committee Preliminary Report," May 10, 1996, 27 pages; Briefing package titled "Agenda for Mabuhay Pre-shipment Review," by China Academy of Launch Vehicle Technology, April 14, 1997.
- 236 Letter to Rick Cinquegrana, Chief Investigative Counsel, Select Committee, from John Boese, Fried Frank, Harris, Shriver & Jacobson, Re: "Interrogatory Response," December 2, 1998, with enclosure titled "Response of Space Systems/Loral to the November 18, 1998 Interrogatory of the Select Committee on U.S. National Security and Military/Commercial Concerns with the People's Republic of China."
- 237 China Great Wall Industry Corporation briefing package titled "LM-3B/Intelsat-708 Failure Review, Apstar-1A Pre-Flight Briefing," April 15-16, 1996.
- 238 Ibid.



- 239 China Great Wall Industry Corporation briefing package titled “LM-3B/Intelsat-708 Failure Review, Apstar-1A Pre-Flight Briefing,” April 15-16, 1996. (Loral Blue book, Vol. 2); Briefing package titled “Agenda for Mabuhay Pre-shipment Review,” by China Academy of Launch Vehicle Technology, April 14, 1997.
- 240 “DOD [Department of Defense] Assessment of Certain Unlicensed Activities by Loral Space Systems, Inc. and Hughes Aircraft Co.,” May 16, 1997.
- 241 Interagency review team report, July 22, 1998.
- 242 “93062: Space Launch Vehicles: Government Requirements and Commercial Competition,” Congressional Research Service Issue Brief for Congress, by Marcia Smith, Updated July 2, 1998.
- 243 Interview of Daniel Lilienstein, October 28, 1998.
- 244 “93062: Space Launch Vehicles: Government Requirements and Commercial Competition,” Congressional Research Service Issue Brief for Congress, by Marcia Smith, Updated July 2, 1998.
- 245 Ibid.
- 246 GEO is an acronym for Geostationary or Geosynchronous Earth Orbit. GEO orbits are extensively used by communications satellites because they orbit every 24 hours and remain relatively fixed above a location on Earth.
- 247 LEO is an acronym for Low Earth Orbit. LEO orbits are used by a wide variety of satellites and orbit the Earth at 200 to 1000 km in altitude.
- 248 “93062: Space Launch Vehicles: Government Requirements and Commercial Competition,” Congressional Research Service Issue Brief for Congress, by Marcia Smith, Updated July 2, 1998.
- 249 “China’s Space Program: A Brief Overview Including Commercial Launches of U.S.-Built Satellites,” Congressional Research Service Report by Marcia Smith, June 23, 1998.
- 250 “U.S.-PRC Commercial Launch Services Talks,” White House, U.S. Trade Representative.
- 251 White House U.S. Trade Representative Trade Policy Staff Committee, Draft Document 1993-20, Subject: “China Space Launch: Intelsat VII-A Satellite,” April 26, 1993.
- 252 White House, U.S. Trade Representative, document, “U.S.-PRC Bilateral Agreement on Space Launch Services.”
- 253 White House, U.S. Trade Representative, document, “China Space Launch.”
- 254 “93062: Space Launch Vehicles: Government Requirements and Commercial Competition,” Congressional Research Service Issue Brief for Congress, by Marcia Smith, Updated July 2, 1998.
- 255 U.S. State Department form DSP-5, “Application/License for Permanent Export of Unclassified Defense Articles and Related Unclassified Technical Data,” License No. 533593, Applicant: Loral, Date Prepared: May 11, 1992, Date Approved: September 18, 1992, Approved by: Ken Peoples, Destination Country: PRC, Commodity: “Technical Data in support of technical discussions for the launch of an Intelsat VIIA Spacecraft.”
- 256 DSP-5 for license 533593.



- 257 U.S. State Department form DSP-5, "Application/License for Permanent Export of Unclassified Defense Articles and Related Unclassified Technical Data," License No. 544724, Applicant: Loral, Date Prepared: September 4, 1992, Date Approved: July 14, 1993, Approved by: Ken Peoples, Destination Country: Intelsat, Commodity: "Intelsat VIIA Communications Satellite FM 708, Associated equipment and documentation."
- 258 DSP-5 for license 544724.
- 259 Loral Briefing Presentation Charts, "Briefing for China Aerospace Corat," April 7-8, 1995.
- 260 "Memorandum of Agreement between China Aerospace Corporation and Space Systems / Loral regarding Long Term Cooperation," signed on June 9, 1995 by Robert E. Berry and Zhang Xin-Xia, with signed copy in Chinese.
- 261 Loral letter to Li Zuhong, Vice President, Chinese Academy of Space Technology, from Edward M. Hunter Subject: "Furtherance of the Technology Cooperation Agreement Between CAST [China Academy of Space Technology] and SS/L [Loral]," November 2, 1995.
- 262 Interview of Daniel Lilienstein, October 28, 1998.
- 263 FF docs.
- 264 Hughes Investigation Report.
- 265 Interview of John Merizon, October 20, 1998.
- 266 Loral Memorandum to John Merizon, from Muhammad Wahdy to John Merizon, Subject: "Retrieval of Spacecraft parts from the crash site," February 17, 1996.
- 267 Letter to He Xing, China Great Wall Industry Corporation, from Paul O'Connor, February 21, 1996.
- 268 Letter to Paul O'Connor, Michael Hewins and Timothy Wright, J&H Marsh & McLennan, from Jacques Masson, J&H Marsh & McLennan, February 22, 1996.
- 269 Letter to He Xing, China Great Wall Industry Corporation, from Paul O'Connor, J&H Marsh & McLennan, February 26, 1996
- 270 Ibid.
- 271 Ibid.
- 272 Hughes Investigation Report.
- 273 Letter to He Xing, China Great Wall Industry Corporation, from Paul O'Connor, J&H Marsh & McLennan, February 28, 1996.
- 274 Interview of Daniel Lilienstein, October 28, 1998. Memorandum to Intelsat management, from Daniel Lilienstein, titled "Management Briefing," Subject: "China Launch Experience," March 4, 1996.
- 275 Hughes Investigation Report.
- 276 Ibid.
- 277 Ibid.



- 278 China Great Wall Industry Corporation letter to Robert E. Berry, President, Loral, from Liu Zhixiong, Vice President, China Great Wall Industry Corporation, Subject: "Invitation to the Failure Investigation," March 14, 1996.
- 279 Loral letter to Liu Zhixiong, Vice President, China Great Wall Industry Corporation, Beijing, China, from Wah Lim, March 18, 1996.
- 280 China Great Wall Industry Corporation letter to Wah Lim, Loral, from Liu Zhixiong, March 20, 1996, 1-page.
- 281 Letter to Bao Miaoqin, Janet Sie and Paul O'Connor, from Jacques Masson, J&H Marsh & McLennan, March 20, 1996.
- 282 Loral letter to Liu Zhixiong, Vice President, China Great Wall Industry Corporation, Beijing, China, from Kirk D. Keer, March 21, 1996.
- 283 Letter to Sheila Nicoll, J&H Intermediaries, to Chuck Rudd, ACE Ltd., March 21, 1996.
- 284 China Great Wall Industry Corporation letter to Kirk Keer, VP, Loral, from Liu Zhixiong, Vice President, China Great Wall Industry Corporation, Subject: "The Issues on the LM-3B Failure Investigation Meeting," March 27, 1996.
- 285 China Great Wall Industry Corporation Information Release, March 28, 1996.
- 286 Loral letter to Liu Zhixiong, Vice President, China Great Wall Industry Corporation, Beijing, China, from Wah Lim, March 29, 1996.
- 287 Hughes Investigation Report. China Great Wall Industry Corporation letter to Peter M. Herron, VP Marketing, Hughes Space and Communications International, Inc., from He Xing, subject: "Signing ChinaSat 7 Launch Contract and Others," April 4, 1996.
- 288 Letter to Bao Miaoqin, APT and Freeman Zhang, J&H Marsh & McLennan, from Zhou Wei, China Great Wall Industry Corporation, April 5, 1996.
- 289 Handwritten notes by Nabeeh Totah, Loral, titled "Mtg. with 'China Great Wall' – Beijing," April 10, 1996. Deposition of Nabeeh Totah, October 14, 1998. Loral letter to Liu Zhixiong, Vice President, China Great Wall Industry Corporation, Beijing, China, from Wah Lim, March 29, 1996.
- 290 Loral Voluntary Disclosure, June 17, 1996.
- 291 Loral memorandum from C. Patrick DeWitt, Subject: "Minutes of the 11 April 1996 GSC Meeting," April 15, 1996.
- 292 Hughes Investigation Report. Loral fax to Robert Steinhauer, Chief Scientist, Hughes, Space & Communications, from Wah Lim, April 16, 1996, 5-pages total, including 3-page charter titled "LM-3B Launch Failure Investigation Independent Review Committee (IRC) Charter," April 14, 1996, and a second fax cover sheet showing W. Lim faxed this on April 16, 1996 to Carolyn from China asking her to fax it to Independent Review Committee members.
- 293 Hughes Investigation Report.
- 294 Wah Lim's briefing presentation charts "Independent Oversight Committee Status Report" and "LM-3B



- Launch Failure Investigation Independent Review Committee,” April 16, 1996.
- 295 Ibid.
- 296 Loral letter to He Xing, Deputy General Manager, Space Division, China Great Wall Industry Corporation, from Wah Lim, April 17, 1996.
- 297 Hughes Investigation Report.
- 298 Loral Voluntary Disclosure, June 17, 1996.
- 299 Hughes Investigation Report.
- 300 William Schweickert’s briefing charts, April 22, 1996.
- 301 Loral Voluntary Disclosure, June 17, 1996.
- 302 Ibid.
- 303 Hughes Investigation Report.
- 304 Loral Memorandum to Kirk Keer, from Nick Yen, Subject: “Trip Report for Briefing to the U.S. Trade Commission in D.C.,” cc: R. Berry, Dr. W. Lim, J. Bannerman, D. Reynard, E. McFarlane, May 15, 1996. Loral Voluntary Disclosure, June 17, 1996.
- 305 Hughes Investigation Report.
- 306 Ibid.
- 307 Loral Voluntary Disclosure, June 17, 1996; Loral letter to Liu Zhixiong, VP China Great Wall Industry Corporation, from Wah Lim, Loral, cc: Independent Review Committee members, no date, containing minutes of the April 22-24, 1996 Independent Review Committee meeting in Palo Alto.
- 308 Hughes Investigation Report.
- 309 Briefing presentation charts “Launch Failure Investigation Agenda, Independent Review Committee,” April 30, 1996 and May 1, 1996, included as “Attachment II” to the Loral generated minutes of the Independent Review Committee meetings in China.
- 310 Loral Voluntary Disclosure, June 17, 1996.
- 311 “Summary of IRC [Independent Review Committee] Review and Preliminary Observations,” and “Day Two (May 1, 1996) Revised Agenda,” included as “Attachment III” to the Loral-generated minutes of the Independent Review Committee meetings in China.
- 312 Interview of Karl Kachigan, October 19, 1998.
- 313 E-mail message to Leslie Block, Loral, from J. Rodden, June 12, 1996.
- 314 E-mail message to John Holt, from John Smay, May 4, 1996.
- 315 Hughes Investigation Report.
- 316 Loral memorandum to W. Lim, from N. Totah, Subject: “LM-3B Failure,” May 3, 1996, 3 pages, signed by W. F. Schmidt for N. I. Totah.



- 317 Handwritten memorandum to W. Lim, from N. Totah Subject: "IRC [Independent Review Committee] Summary Position – Draft from J.A. Holt," May 3, 1996.
- 318 Fax to Wah Lim, from J. A. Holt, May 3, 1996.
- 319 Fax to Wah Lim, from John Smay, document "Long March 3B Failure International Review Committee Preliminary Report," May 3, 1996, transmitted on May 4, 1996.
- 320 Letter to Wah Lim, from Frederick N. Ormsby, May 4, 1996.
- 321 E-mail message to John Holt, from John Smay, May 4, 1996.
- 322 Fax to Wah Lim, from R. Hildebrandt, Subject: "Long March – 3B / IRC [Independent Review Committee] in Beijing," May 5, 1996.
- 323 Fax to Wah Lim, from J. A. Holt, "IRC [Independent Review Committee] Preliminary Assessment Report," May 6, 1996.
- 324 Hughes Investigation Report.
- 325 Loral Voluntary Disclosure, June 17, 1996.
- 326 Loral Memorandum to "The IRC [Independent Review Committee] Members," from N. Yen, Subject "The Draft of the IRC [Independent Review Committee] Preliminary Report," May 7, 1996. Loral Voluntary Disclosure, June 17, 1996.
- 327 Interview Notes from Feith & Zell interview of Wah Lim on May 31, 1996.
- 328 Fax to Nick L. Yen, from J. A. Holt, "Draft of IRC [Independent Review Committee] Preliminary Report," May 8, 1996.
- 329 Fax to Nick L. Yen, from R. A. Steinhauer, Subject: "Comments on Draft IRC [Independent Review Committee] Report + Additional Comments," May 8, 1996.
- 330 Fax to Wah Lim, from J. A. holt, titled "URGENT" and "IRC [Independent Review Committee] Preliminary Report," May 9, 1996.
- 331 Fax to Nick Yen, from Reinhard Hildebrandt, Subject: "The Draft of the IRC [Independent Review Committee] Preliminary Report," May 9, 1996.
- 332 Hughes Investigation Report.
- 333 Feith & Zell interview notes of Wah Lim, June 5, 1996.
- 334 Loral letter to Liu Zhixiong, Vice President, China Great Wall Industry Corporation, Beijing, China, from Wah Lim, May 10, 1996. Interview of Duncan Reynard, October 9, 1998.
- 335 Loral Voluntary Disclosure, June 17, 1996.
- 336 Loral letter to Independent Review Committee Members, from Dr. Wah Lim, Subject: "LM-3B Launch Failure Investigation and Evaluation," May 10, 1996.
- 337 Loral Voluntary Disclosure, June 17, 1996.
- 338 Ibid.



- 339 Interview of Duncan Reynard, October 9, 1998.
- 340 Loral letter to He Xing, Deputy General Manager, China Great Wall Industry Corporation, in Beijing, China, from Dr. Wah Lim, May 13, 1996.
- 341 Loral letter to Paul O'Connor from Wah Lim, May 13, 1996.
- 342 Loral memorandum to Bob Berry, from D.L. Reynard, cc: Wah Lim, Julie Bannerman, Pat Dewitt, Hal Bradshaw, Subject: "SS/L [Loral] Involvement in the Investigation of the LM-3B Launch Failure," marked "URGENT" and "SS/L [Loral] Proprietary," May 14, 1996, 2 pages. (D. Reynard deposition).
- 343 Hughes Investigation Report.
- 344 Loral Memorandum to Kirk Keer, from Nick Yen, Subject: "Trip Report for Briefing to the U.S. Trade Commission in D.C.," cc: R. Berry, Dr. W. Lim, J. Bannerman, D. Reynard, E. McFarlane, May 15, 1996.
- 345 Handwritten memorandum to Bob Berry, et al, from D. Reynard titled "Summary of Advice from DOS/ODTC and DTSA!," May 15, 1996.
- 346 Loral memorandum to Eric Zahler, from J. Bannerman, May 15, 1996.
- 347 Hughes Investigation Report.
- 348 Fax message to Duncan Reynard, from Hal Bradshaw, May 17, 1996. (D. Reynard deposition)
- 349 Loral letter to William J. Lowell, State Department, from Duncan L. Reynard, Subject: "Intelsat 708 Launch Failure Review – Initial Notification," May 21, 1996. (D. Reynard deposition)
- 350 Loral Voluntary Disclosure, June 17, 1996.
- 351 Hughes Investigation Report.
- 352 Ibid.
- 353 State Department letter to Eric J. Zahler, from William J. Lowell, Vice President, Secretary and General Counsel, Loral, Re: "3UA000-DLR-96-0521A," May 29, 1996.
- 354 Loral Voluntary Disclosure, June 17, 1996.
- 355 Ibid.
- 356 Loral letter to William J. Lowell, State Department, from Eric J. Zahler, Vice President, Secretary, and General Counsel, cc: Julie B. Bannerman, Esq. and Douglas J. Feith, Esq., May 31, 1996.
- 357 Memorandum to Wah Lim, from D. Reynard, Subject: "Retrieval of IRC [Independent Review Committee] Documents Sent Out," June 3, 1996.
- 358 Loral Voluntary Disclosure, June 17, 1996.
- 359 Hughes letter to William J. Lowell, State Department, from John T. Kuelbs, Re: "Your letter of May 29, 1996," cc: John J. Higgins, Philip S. Rhoads, June 4, 1996.
- 360 Loral letter to Paul O'Connor, Vice President, Space & Telecom Group, Johnson & Higgins, Washington, D.C., from Wah Lim, June 6, 1996.



- 361 Loral letter to Independent Review Committee Members, from Dr. Wah Lim, Subject: "Retrieval of IRC [Independent Review Committee] Distributed Documents," June 6, 1996. Hughes Investigation Report.
- 362 Loral letter to Liu Zhixiong, Vice President, China Great Wall Industry Corporation, Beijing, China, from Wah Lim, Subject: "Retrieval of IRC [Independent Review Committee] Distributed Documents," June 6, 1996.
- 363 Hughes Investigation Report.
- 364 Loral Voluntary Disclosure, June 17, 1996.
- 365 Hughes letter to William Lowell, from Mary Lou Cahir, June 27, 1996: Hughes Investigation Report.
- 366 CASC Letter to Wah Lim, Loral, from Liu Jiyuan, President, CASC, cc: Fred Ormsby, Karl Kachigan, Robert Steinhauer, John Holt, John Smay, Reinhard Hildebrandt, June 18, 1996. (Kachigan Deposition).
- 367 Hughes letter to Philip S. Rhoads, State Department, from Mary Lou Cahir, September 26, 1998.
- 368 Interview of Karl Kachigan, October 19, 1998. Loral memorandum to D. Reynard, J. Rodden, N. Totah, N. Yen, F. Ormsby, K. Kachigan, Maj. P. Smith, and others, from Zia Oboodiyat, Executive Director, Mabuhay Program, Loral, Subject: "Invitation to attend China Great Wall Industry Corporation's LM-3B failure review presentation," October 9, 1996. (Kachigan Deposition).
- 369 "DOD [Department of Defense] Assessment of Certain Unlicensed Activities by Loral Space Systems, Inc. and Hughes Aircraft Co.," May 16, 1997.
- 370 "China's Space Program: A Brief Overview Including Commercial Launches of U.S.-Built Satellites," by Marcia Smith, Congressional Research Service, June 23, 1998. "Presidential Satellite Waivers and Other Related Launch Information," table by Aerospace Industries Association, Internet web site: http://aia-aerospace.org/homepage/china_table1.html.
- 371 Ibid.
- 372 "Background Re: Independent Review Committee (IRC) Activities Relating to the 1996 Long March Launch Failure," report to U.S. House of Representatives Committee on Science, May 7, 1998.
- 373 Committee on Science Report.
- 374 Memorandum for the Record documenting Defense Department briefing to Select Committee on September 22, 1998, by Eric Desautels, September 25, 1998.
- 375 Ibid.
- 376 Interview of John Merizon, October 20, 1998.
- 377 Loral Memorandum to John Merizon, from Muhammad Wahdy to John Merizon, Subject: "Retrieval of Spacecraft parts from the crash site," February 17, 1996.
- 378 Interview of John Merizon, October 20, 1998.
- 379 Ibid.
- 380 Memorandum for the Record documenting briefing to Select Committee on September 22, 1998, by Eric Desautels, September 25, 1998.



381 Ibid.

382 Ibid.

CHAPTER 7 – Launch Site Security in the PRC

- 1 Memorandum of Agreement on Satellite Technology Safeguards Between the Governments of the United States of America and the People’s Republic of China, February 11, 1993.
- 2 Arms Export Control Act, 22 U.S.C. § 2778, International Traffic in Arms Regulations, 22 C.F.R., part 12D, 120-30.
- 3 Interview of Frank A. Cirillo, Director of Security, Lockheed Martin Company, October 6, 1998.
- 4 Interview of Frank A. Cirillo, Director of Security, Lockheed Martin Company, October 6, 1998. For a detailed discussion of PRC intelligence and technology transfer efforts, see Chapter 1, Volume I.
- 5 *See* the charts at the end of this chapter.
- 6 Deposition of David Tarbell, November 20, 1998.
- 7 Ibid.
- 8 Comments of Defense Technology Security Administration monitor Joseph Chandler, April 9, 1998.
- 9 Memorandum from Sumner Benson to the Department of State, October 27, 1998.
- 10 “20/20”, ABC News, November 29, 1998, Statement of Lt. Col. (Ret.) Allen D. Coates.
- 11 “Form, fit and function” data include the satellite-related “orbit requirements; launch window; weight; center of gravity; envelope; dynamic loading; power usage/conditioning; interface adapter requirements; environmental requirements; propellant requirements; frequency plans, including telemetry, tracking and control; safety plans; test flows; separation characteristics; ground handling/test equipment; and test/flight sequence.”
- 12 Ibid.
- 13 Memorandum of Agreement on Satellite Technology Safeguards Between the Governments of the United States and the People’s Republic of China, February 11, 1993 and December 17, 1988.
- 14 Memorandum of Agreement on Satellite Technology Safeguards Between the Governments of the United States of America and the People’s Republic of China, February 11, 1993.
- 15 22 U.S.C. 2778; Department of Defense Authorization Act, Sec. 1513 (a).
- 16 *See* the chapter of this Report entitled “U.S. Export Policy Toward the PRC.”
- 17 Previously, when satellites were on the U.S. Munitions List, Defense Technology Security Administration monitors were required to attend launches of U.S. satellites in the PRC. Following the change in licensing jurisdiction from State to Commerce, three launches were authorized in the PRC without any Defense Department monitors. Without Defense Department monitors at these launches, there can be no assurances



as to whether any controlled information was or was not transferred. Since 1996, the Department of Commerce has resumed the practice of notifying the Department of State of all launches in the PRC and Defense Department monitors are assigned to such launches.

- 18 Interview of Joseph Chandler, September 30, 1998.
- 19 Department of State License Number 531326 issued to Hughes Aircraft Company, April 5, 1993.
- 20 Order of the Secretary of the Air Force, Technology Safeguard Monitoring for Foreign Launches of U.S. Commercial Satellites, Section 2.1.5.1, July 21, 1994.
- 21 Deposition of Lt. Col. Allen Coates, November 20, 1998.
- 22 Deposition of David Tarbell, November 20, 1998.
- 23 Ibid.
- 24 Deposition of Lt. Col. Allen Coates, November 20, 1998.
- 25 Interview of Col. Nick Alexandrow, September 24, 1998.
- 26 Interview of Frank Cirillo, Lockheed Martin, October 6, 1998.
- 27 Deposition of Keith Patterson, November 13, 1998.
- 28 Ibid.
- 29 Deposition of Lt. Col. Allen Coates, November 20, 1998.
- 30 Deposition of Keith Patterson, November 20, 1998.
- 31 Deposition of Keith Patterson, November 13, 1998.
- 32 Order of the Secretary of the Air Force, "Technology Safeguard Monitoring for Foreign Launches of U.S. Commercial Satellites," July 21, 1993.
- 33 Deposition of Keith Patterson, November 13, 1998.
- 34 Testimony of Capt. Steven Prichard, August 27, 1998. As is explained elsewhere in this Report, it was later determined that the encryption-decryption equipment was actually not recovered by Loral from the Intelsat 708 crash site. See chapter entitled "Satellite Launches in the PRC: Loral."
- 35 Memorandum of Steven Prichard, March 8, 1996.
- 36 Deposition of Lt. Col. Allen Coates, November 20, 1998.
- 37 Interview of Martin Dome, November 12, 1998.
- 38 Deposition of Keith Patterson, November 13, 1998.
- 39 Interview of Alvin A. Ulsch, September 16, 1998.
- 40 "Technology Safeguard Monitor Training," HQ Air Force Space Command, June 17-19, 1998.
- 41 Deposition of David Tarbell, November 20, 1998.
- 42 Ibid.



- 43 Order of the Secretary of the Air Force, “Technology Safeguard Monitoring for Foreign Launches of U.S. Commercial Satellites,” July 21, 1993.
- 44 Interview of Maj. Mike Starring, December 10, 1998.
- 45 Ibid.
- 46 Order of the Secretary of the Air Force, “Technology Safeguard Monitoring for Foreign Launches of U.S. Commercial Satellites,” July 21, 1993.
- 47 Interview of Maj. Mike Starring, December 10, 1998.
- 48 Deposition of David Tarbell, November 20, 1998.
- 49 Ibid.
- 50 Ibid.
- 51 Interview of Col. David Garner, September 25, 1998.
- 52 Memorandum from MSgt J.C Chandler, Jr., April 12, 1998.
- 53 Optus B3 Weekly Status Report #3, Report of Kenneth E. Riggs, August 8, 1994.
- 54 Testimony of Steven Prichard, August 27, 1998.
- 55 Testimony of Steven Prichard, August 27, 1998; Deposition of Kenneth Davis, October 23, 1998.
- 56 Memorandum for Col. Nick Alexandrow from Capt. Steven Prichard, “Summary of Security Operations for Intelsat Program/XSLC,” Undated.
- 57 Interview of Peter Snow, September 16, 1998.
- 58 Deposition of Lt. Col. Allen Coates, November 20, 1998.
- 59 Deposition of David Tarbell, November 20, 1998.
- 60 Ibid.
- 61 Ibid.
- 62 Deposition of Keith Patterson, November 13, 1998.
- 63 Memorandum from Steven Prichard, March 8, 1996.
- 64 Deposition of Kenneth Davis, October 23, 1998.
- 65 Ibid.
- 66 Ibid.
- 67 Interview of Peter Snow, November 24, 1998.
- 68 Deposition of Kenneth Davis, October 23, 1998.
- 69 Testimony of Steven Prichard, August 27, 1998.
- 70 Deposition of Kenneth Davis, October 23, 1998.



- 71 *Orange County Business Journal*, August 17, 1998.
- 72 Interview of Margaret Qualls, August 18, 1998.
- 73 Testimony of Margaret Qualls, August 27, 1998; Interview of Joseph Chandler, September 30, 1998.
- 74 Interview of Joseph Chandler, September 30, 1998.
- 75 Testimony of Margaret Qualls, August 27, 1998.
- 76 Interview of Joseph Chandler, September 30, 1998.
- 77 Interview of Frank Cirillo, October 6, 1998.
- 78 Interview of Keith Patterson, November 13, 1998.
- 79 Deposition of Lt. Col. Allen Coates, November 20, 1998.
- 80 Interview of Keith Patterson, November 13, 1998.
- 81 Deposition of David Tarbell, November 20, 1998.
- 82 Interview of Keith Patterson, November 13, 1998.
- 83 Department of Defense Authorization Act.
- 84 Department of Defense Authorization Act, Subtitle B, Sec. 1511.
- 85 Deposition of David Tarbell, November 20, 1998.

CHAPTER 8 – Commercial Space Insurance

- 1 Memorandum for the Record of Intelsat Document Review, October 13, 1998.
- 2 Memorandum for the Record of Intelsat Document Review, October 13, 1998. International Space Brokers is a space insurance brokerage firm based in Rosslyn, Virginia.
- 3 Memorandum for the Record of Intelsat Document Review, October 13, 1998.
- 4 Ibid.
- 5 Interview Report of Timothy Rush, former Intelsat employee, September 9, 1998.
- 6 Memorandum for the Record of Intelsat Document Review, October 13, 1998.
- 7 Interview Report of Timothy Rush, former Intelsat employee, September 9, 1998.
- 8 Marham Space Consortium is a London, England-based space insurance underwriting syndicate. Marham Space Consortium is a part of Lloyd's of London.
- 9 Memorandum for the Record of Intelsat Document Review, October 13, 1998.
- 10 Ibid.
- 11 Ibid.



- 12 Interview Report of Timothy Rush, former Intelsat employee, September 9, 1998.
- 13 Memorandum for the Record of Select Committee Testimony of Timothy Rush, J&H Marsh & McLennan, September 15, 1998.
- 14 J&H Marsh & McLennan is a multinational, privately held company controlling the largest international insurance brokerage system in the world. J&H's Space Projects Group is a broker for commercial space launches and space vehicles such as satellites and rockets.
- 15 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 16 Memorandum for the Record of Select Committee Testimony of Timothy Rush, J&H Marsh & McLennan, September 15, 1998.
- 17 Ibid.
- 18 Interview Report of Terry Edwards and Donald L. Bridwell, Intelsat, Inc., October 14, 1998.
- 19 Memorandum for the Record of Intelsat Document Review, October 13, 1998.
- 20 Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.
- 21 Interview Report of Terry Edwards and Donald L. Bridwell, Intelsat, Inc., October 14, 1998.
- 22 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 23 Letter from Paul O'Connor to He Xing, February 21, 1996. O'Connor provided He Xing with the text of a letter to *Space News*, which Liu Zhixiong, Vice President of China Great Wall Industry Corporation, could sign.
- 24 Letter from Paul O'Connor to He Xing, February 21, 1996.
- 25 Letter from Jacques Masson to Paul O'Connor, Michael Hewins and Timothy Wright, February 22, 1996.
- 26 Letter from Paul O'Connor to He Xing, February 26, 1996.
- 27 Ibid.
- 28 Ibid.
- 29 Ibid.
- 30 Letter from Paul O'Connor to Professor Bao Miaoqin, February 28, 1996.
- 31 Ibid.
- 32 Letter from Jerry Burke to Paul O'Connor, March 8, 1996.
- 33 Letter from H. Stackpole to Paul O'Connor, March 11, 1996.
- 34 Apstar-1A Satellite Program – Insurance Meeting, March 14 & 15, 1996.
- 35 Letter from Jacques Masson to Professor Bao Miaoqin and Paul O'Connor, March 20, 1996.



- 36 Letter from Jacques Masson to Professor Bao Miaoqin, Janet Sie, and Paul O'Connor, March 20, 1996.
- 37 Letter from Jacques Masson to Professor Bao Miaoqin, Janet Sie, and Paul O'Connor, March 21, 1996.
- 38 Letter from Chuck Rudd to Sheila Nicoll, March 21, 1996.
- 39 Ibid.
- 40 Letter from Diane M. Dwyer to Warwick Jones, March 28, 1996.
- 41 Letter from Paul O'Connor to Professor Bao Miaoqin, April 1, 1996.
- 42 Letter from Paul O'Connor to Gerald Swanson, April 2, 1996.
- 43 Letter from Paul O'Connor to Professor Bao Miaoqin, April 2, 1996.
- 44 Letter from Bao Miaoqin to Paul O'Connor, Mme. Shao Dand-di, Li Ming, Zhou Wei, Zhang Hao Qing, and Michael A. Pucher, April 2, 1996.
- 45 Letter from Jacques Masson to Paul O'Connor, April 3, 1996.
- 46 Letter from Paul O'Connor to Flore Martini, Jacques Masson, Diane Dwyer, and Michael Hewins, April 4, 1996.
- 47 Letter from Paul O'Connor to Professor Bao Miaoqin, April 4, 1996.
- 48 Ibid.
- 49 Ibid.
- 50 Letter from Zhou Wei to Professor Bao Miaoqin and Freeman Zhang, April 5, 1996.
- 51 Memorandum for the Record of Select Committee Testimony of Timothy Rush, J&H Marsh & McLennan, September 15, 1998.
- 52 Interview Report of Terry Edwards and Donald L. Bridwell, Intelsat, Inc., October 14, 1998.
- 53 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 54 Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.
- 55 Ibid.
- 56 Interview Report of Terry Edwards and Donald L. Bridwell, Intelsat, Inc., October 14, 1998.
- 57 Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.
- 58 Ibid.
- 59 Ibid.
- 60 Ibid.
- 61 Ibid.
- 62 Interview Report of Terry Edwards and Donald L. Bridwell, Intelsat, Inc., October 14, 1998.



- 63 Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.
- 64 Ibid.
- 65 Interview Report of Terry Edwards and Donald L. Bridwell, Intelsat, Inc., October 14, 1998.
- 66 Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.
- 67 Ibid.
- 68 Letter from Paul O'Connor to Diane Dwyer, April 17, 1996.
- 69 Information Release by China Great Wall Industry Corporation, April 23, 1996.
- 70 Memorandum for the Record of Select Committee Testimony of Timothy Rush, J&H Marsh & McLennan, September 15, 1998.
- 71 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 72 Letter from Paul O'Connor to Professor Bao Miaoqin, May 7, 1996.
- 73 Letter from Paul O'Connor to Diane Dwyer, May 13, 1996.
- 74 Letter from Paul O'Connor to Nick Yen, May 13, 1996.
- 75 Letter from Dr. Wah Lim to Paul O'Connor, May 13, 1996.
- 76 Letter from Francesca O. Schroeder to Wah Lim, May 14, 1996.
- 77 Letter from Francesca O. Schroeder to Paul O'Connor and Diane Dwyer, May 14, 1996.
- 78 Letter from Nick Yen to Paul O'Connor, May 14, 1996.
- 79 Letter from Paul O'Connor to Professor He Kerang and Professor Bao Miaoqin, May 31, 1996.
- 80 Letter from Jacques Masson to Paul O'Connor and Timothy Wright, June 1996.
- 81 Letter from Jacques Masson to He Xing and Paul O'Connor, June 5, 1996.
- 82 Letter from Wah Lim to Paul O'Connor, June 6, 1996.
- 83 Letter from Diane Dwyer to Wah Lim, June 19, 1996.
- 84 Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998; Johnson & Higgins Information Booklet "Optus B2 – Presentation on the 1992 Launch Failure."
- 85 Internet Article from Dowa Fire, Marine & Space Industry Department: "Insurance Contributes to Space Development - Unique Risks of Space."
- 86 Internet Article from Frost & Sullivan: Increasing Deployment Expected To Send Satellite Revenues, July 21, 1998.
- 87 Internet Article from Dowa Fire, Marine & Space Industry Department: "Insurance Contributes to Space Development - Unique Risks of Space;" Internet Article from Frost & Sullivan: "Increasing Deployment Expected To Send Satellite Revenues, July 21, 1998."



- 88 Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998.
- 89 Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998.
- 90 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 91 Internet Article from Dowa Fire, Marine & Space Industry Department: “Insurance Contributes to Space Development - Unique Risks of Space.”
- 92 Ibid.
- 93 Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998.
- 94 Johnson & Higgins Information Booklet “Optus B2 – Presentation on the 1992 Launch Failure.”
- 95 “Satellite Insurance; Leonids and More on the Agenda,” Peter Brown, *Via Satellite*, September 1998.
- 96 Johnson & Higgins Information Booklet “Optus B2 – Presentation on the 1992 Launch Failure;” Preliminary Quotation for the Apstar 1 and 2 Program, March 1993.
- 97 Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998.
- 98 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 99 Ibid.
- 100 “Satellite Insurance; Leonids and More on the Agenda,” Peter Brown, *Via Satellite*, September 1998.
- 101 Johnson & Higgins Information Booklet “Optus B2 – Presentation on the 1992 Launch Failure;” Preliminary Quotation for the Apstar 1 and 2 Program, March 1993.
- 102 Ibid.
- 103 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 104 Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998.
- 105 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 106 Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998.
- 107 Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.
- 108 Internet Article from Dowa Fire, Marine & Space Industry Department: “Insurance Contributes to Space Development - Unique Risks of Space.”
- 109 Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998.



- 110 Internet Article from Dowa Fire, Marine & Space Industry Department: “Insurance Contributes to Space Development - Unique Risks of Space.”
- 111 Internet Article from Dowa Fire, Marine & Space Industry Department: “Insurance Contributes to Space Development - Unique Risks of Space.” Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998.
- 112 Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998.
- 113 Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.
- 114 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 115 Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998.
- 116 Ibid.
- 117 Preliminary Quotation for the Apstar 1 and 2 Program, March 1993.
- 118 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 119 Memorandum for the Record of Select Committee Testimony of Timothy Rush, J&H Marsh & McLennan, September 15, 1998.
- 120 Preliminary Quotation for the Apstar 1 and 2 Program, March 1993.
- 121 Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998.
- 122 Internet Article from Dowa Fire, Marine & Space Industry Department: “Insurance Contributes to Space Development - Unique Risks of Space.”
- 123 Preliminary Quotation for the Apstar 1 and 2 Program, March 1993.
- 124 Ibid.
- 125 Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998.
- 126 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 127 Ibid.
- 128 Preliminary Quotation for the Apstar 1 and 2 Program, March 1993.
- 129 Memorandum for the Record of Select Committee Testimony of Timothy Rush, J&H Marsh & McLennan, September 15, 1998.
- 130 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.



- 131 Memorandum for the Record of Select Committee Testimony of Timothy Rush, J&H Marsh & McLennan, September 15, 1998.
- 132 Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998.
- 133 Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998; Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998.
- 134 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 135 Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998.
- 136 Preliminary Quotation for the Apstar 1 and 2 Program, March 1993; Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 137 Preliminary Quotation for the Apstar 1 and 2 Program, March 1993.
- 138 Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998.
- 139 Preliminary Quotation for the Apstar 1 and 2 Program, March 1993.
- 140 Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998.
- 141 Preliminary Quotation for the Apstar 1 and 2 Program, March 1993.
- 142 Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998.
- 143 Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998
- 144 Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998; Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 145 Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998
- 146 Internet Article from Dowa Fire, Marine & Space Industry Department: “Insurance Contributes to Space Development - Unique Risks of Space.”
- 147 Insurance Program of Apstar-2 Project (APT Satellite Co., LTD) – May 1994. Internet Article from Frost & Sullivan: Increasing Deployment Expected To Send Satellite Revenues, July 21, 1998.
- 148 “Satellite Insurance; Leonids and More on the Agenda,” Peter Brown, *Via Satellite*, September 1998.
- 149 Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998.
- 150 Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998.
- 151 Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998.
- 152 Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998.



- 153 Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.
- 154 Ibid.
- 155 Ibid.
- 156 Ibid.
- 157 Ibid.
- 158 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998; Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.
- 159 Memorandum for the Record of Select Committee Testimony of Timothy Rush, J&H Marsh & McLennan, September 15, 1998.
- 160 Ibid.
- 161 Interview Report of Terry Edwards and Donald L. Bridwell, Intelsat, Inc., October 14, 1998.
- 162 Ibid.
- 163 Memorandum for the Record of Select Committee Testimony of Timothy Rush, J&H Marsh & McLennan, September 15, 1998.
- 164 Ibid.
- 165 Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.
- 166 Memorandum for the Record of Select Committee Testimony of Timothy Rush, J&H Marsh & McLennan, September 15, 1998.
- 167 Interview Report of Terry Edwards and Donald L. Bridwell, Intelsat, Inc., October 14, 1998.
- 168 Deposition of Donald L. Cromer, December 17, 1998.
- 169 Interview Report of Terry Edwards and Donald L. Bridwell, Intelsat, Inc., October 14, 1998.
- 170 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 171 Memorandum for the Record of Select Committee Testimony of Timothy Rush, J&H Marsh & McLennan, September 15, 1998.
- 172 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 173 Memorandum for the Record of Select Committee Testimony of Timothy Rush, J&H Marsh & McLennan, September 15, 1998; Interview Report of Frederick H. Hauck, Patrick Rivalan, and Lynne Vollmer, AXA Space, September 9, 1998.
- 174 Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.
- 175 Interview Report of Terry Edwards and Donald L. Bridwell, Intelsat, Inc., October 14, 1998.
- 176 Ibid.



- 177 Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.
- 178 Ibid.
- 179 Interview Report of Timothy Rush, J&H Marsh & McLennan, September 10, 1998.
- 180 Ibid.
- 181 Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.
- 182 Interview Report of Michael Hewins, Space Ventures International and Willis Corroon Inspace, November 12, 1998.
- 183 Interview Report of Mark Quinn, Willis Corroon Inspace, October 19, 1998.



