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.”


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, ¶ 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.


9 Ibid.

10 Ibid.

11 Ibid.

12 Ibid.


16 Interview of Allen Coates, September 24, 1998.


18 Deposition of Al Wittmann, November 6, 1998.

19 Ibid.

20 Ibid.

21 Deposition of Al Wittman, November 6, 1998.


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.  
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.  
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.  
52 Ibid.
53 Ibid.
54 Ibid.
55 Minister Liu Jiynan is also President of China Aerospace Corporation.
57 Ibid.
58 Deposition of Al Wittmann, November 6, 1998.
59 Ibid.
60 Ibid.
64 Ibid.
65 Ibid.
66 Ibid.
67 Deposition of Donald E. Leedle, October 29, 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.
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.
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.
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.
100 Deposition of Donald Cromer, December 17, 1998.
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.

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SELECT COMMITTEE OF THE UNITED STATES HOUSE OF REPRESENTATIVES
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.
163 Ibid.
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

171 Department of Defense Assessment.
172 Ibid.
173 Ibid.
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.
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.
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


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.


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.


12 Hughes Investigation Report.

13 Ibid.

14 Ibid.


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.
28 Loral Voluntary Disclosure, June 17, 1996.
31 Ibid.
32 Loral Voluntary Disclosure, June 17, 1996.
33 Ibid.
34 Ibid.
35 Ibid.
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.
42 Intelsat Internet web site.
43 Ibid.
44 Ibid.
45 Ibid.
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.
56 Deposition of Robert Berry, November 18, 1998.
Loral Memorandum to John Merizon, from Muhammad Wahdy to John Merizon, Subject: “Retrieval of Spacecraft parts from the crash site,” February 17, 1996.


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.)

Ibid.


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.)

Ibid.

Feith & Zell interview notes of Paul O’Connor.

Minutes of LM-3B Failure Investigation Meeting, April 10-12, 1996.


Minutes of LM-3B Failure Investigation Meeting, April 10-12, 1996.

Deposition of Robert Berry, November 18, 1998.

Ibid.


Loral Voluntary Disclosure.


Testimony of Dr. Stephen Bryen, September 2, 1998.

Loral Voluntary Disclosure.

Deposition of Julie Bannerman, November 24, 1998.

Deposition of Robert Berry, November 18, 1998.

Ibid.


Testimony of Dr. Stephen Bryen, September 2, 1998.

Duncan Reynard interview, October 9, 1998.

Ibid.

Ibid.

322
Feith & Zell interview notes of Duncan Reynard.

Deposition of Julie Bannerman, November 11, 1998.


Loral Voluntary Disclosure, June 17, 1996.

Duncan Reynard letter to Department of State, April 3, 1996.

Ibid.

Apstar License No. 653324, attached to Loral Voluntary Disclosure.

Mabuhay License, No. 653324, Attachment to Loral voluntary disclosure.

Apstar 1A Pre-Flight Technical Briefing, Beijing, April 15-16, 1996.

Ibid.


William Schweickert’s briefing presentation charts dated 4/22/96, titled “Long March Failure Review, Technology Export Briefing.” (Duncan Reynard Deposition)

Feith & Zell interview of Duncan Reynard.

Interview of Duncan Reynard, October 9, 1998.

Ibid.

Ibid.

Deposition of Julie Bannerman, November 24, 1998.

Minutes of Palo Alto Independent Review Committee Meeting dated April 22-24, 1996.

Attachment 1 to Minutes of first Independent Review Committee Meeting, Palo Alto, April 22-24, 1996.


Minutes of Palo Alto Independent Review Committee Meeting, April 22-24, 1996.

Hughes Investigation Report.

Minutes of Palo Alto Independent Review Committee Meeting, April 22-24, 1996.

Hughes Investigation Report.

Nick Yen Memorandum to Kirk Keer, May 15, 1996.

111 Ibid.
112 Ibid.
113 Loral Voluntary Disclosure, June 17, 1996.
114 Final Independent Review Committee Preliminary Report, Attachment IV.
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.
127 Loral Voluntary Disclosure, June 17, 1996.
128 Ibid.
129 Ibid.
130 Feith & Zell notes of interview of Wah Lim.
132 Independent Review Committee Preliminary Report; Deposition of Karl Kachigan.
134 Ibid.
135 Ibid.
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.
158 Ibid.
159 Ibid.
161 Interview of Duncan Reynard, October 9, 1998.
162 Ibid.
163 Ibid.

Deposition of Julie Bannerman, November 24, 1998.

Deposition of Julie Bannerman, November 24, 1998.


Deposition of Julie Bannerman, November 24, 1998.

Ibid.

Loral Voluntary Disclosure, June 17, 1996.

Ibid.

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.

Loral Voluntary Disclosure, June 17, 1996.

Deposition of Duncan Reynard, November 4, 1996.


Duncan Reynard Interview, October 9, 1998; Julie Bannerman Deposition, November 24, 1998.

Deposition of Julie Bannerman, November 24, 1998.

Bill Schweickert interview, September 23, 1998.

Feith & Zell interview notes of Bill Schweickert.

Deposition of Duncan Reynard; Deposition of Julie Bannerman.

Deposition of Julie Bannerman.

Deposition of Duncan Reynard; Deposition of Julie Bannerman.

Deposition of Julie Bannerman.

Deposition of Bernard Schwartz (CEO); Interview Memorandum of Michael Targoff (President);
Deposition of Eric Zahler (General Counsel).

191 Duncan Reynard Deposition; Julie Bannerman Deposition.


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.


201 Loral Voluntary Disclosure, “Failure Tree” presentation made at Beijing Independent Review Committee meeting.


204 Department of Defense Report, August 6, 1996.


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.
225 Ibid.
226 Ibid.
228 Defense Department Report, August 6, 1996.
238 Ibid.


Ibid.

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.

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.


“U.S.-PRC Commercial Launch Services Talks,” White House, U.S. Trade Representative.


White House, U.S. Trade Representative, document, “U.S.-PRC Bilateral Agreement on Space Launch Services.”

White House, U.S. Trade Representative, document, “China Space Launch.”


DSP-5 for license 533593.

DSP-5 for license 544724.


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.


FF docs.

Hughes Investigation Report.

Interview of John Merizon, October 20, 1998.

Loral Memorandum to John Merizon, from Muhammad Wahdy to John Merizon, Subject: “Retrieval of Spacecraft parts from the crash site,” February 17, 1996.

Letter to He Xing, China Great Wall Industry Corporation, from Paul O’Connor, February 21, 1996.


Letter to He Xing, China Great Wall Industry Corporation, from Paul O’Connor, J&H Marsh & McLennan, February 26, 1996

Ibid.

Ibid.

Hughes Investigation Report.


Hughes Investigation Report.

Ibid.

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.


282 Loral letter to Liu Zhixiong, Vice President, China Great Wall Industry Corporation, Beijing, China, from Kirk D. Keer, March 21, 1996.


286 Loral letter to Liu Zhixiong, Vice President, China Great Wall Industry Corporation, Beijing, China, from Wah Lim, March 29, 1996.


288 Letter to Bao Miaqin, APT and Freeman Zhang, J&H Marsh & McLennan, from Zhou Wei, China Great Wall Industry Corporation, April 5, 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

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.


305 Hughes Investigation Report.

306 Ibid.


308 Hughes Investigation Report.


310 Loral Voluntary Disclosure, June 17, 1996.


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.


Fax to Wah Lim, from J. A. Holt, May 3, 1996.


Letter to Wah Lim, from Frederick N. Ormsby, May 4, 1996.

E-mail message to John Holt, from John Smay, May 4, 1996.


Hughes Investigation Report.

Loral Voluntary Disclosure, June 17, 1996.


Interview Notes from Feith & Zell interview of Wah Lim on May 31, 1996.


Fax to Wah Lim, from J. A. Holt, titled “URGENT” and “IRC [Independent Review Committee] Preliminary Report,” May 9, 1996.


Hughes Investigation Report.

Feith & Zell interview notes of Wah Lim, June 5, 1996.

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.

Loral Voluntary Disclosure, June 17, 1996.

Loral letter to Independent Review Committee Members, from Dr. Wah Lim, Subject: “LM-3B Launch Failure Investigation and Evaluation,” May 10, 1996.

Loral Voluntary Disclosure, June 17, 1996.

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.
343 Hughes Investigation Report.
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)
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.
360 Loral letter to Paul O’Connor, Vice President, Space & Telecom Group, Johnson & Higgins, Washington, D.C., from Wah Lim, June 6, 1996.

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.

Hughes Investigation Report.

Loral Voluntary Disclosure, June 17, 1996.


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).

Hughes letter to Philip S. Rhoads, State Department, from Mary Lou Cahir, September 26, 1998.


Ibid.


Committee on Science Report.


Ibid.

Interview of John Merizon, October 20, 1998.

Loral Memorandum to John Merizon, from Muhammad Wahdy to John Merizon, Subject: “Retrieval of Spacecraft parts from the crash site,” February 17, 1996.

Interview of John Merizon, October 20, 1998.

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.


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.


9 Memorandum from Sumner Benson to the Department of State, October 27, 1998.


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.


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.

19 Department of State License Number 531326 issued to Hughes Aircraft Company, April 5, 1993.
23 Ibid.
26 Interview of Frank Cirillo, Lockheed Martin, October 6, 1998.
27 Deposition of Keith Patterson, November 13, 1998.
28 Ibid.
30 Deposition of Keith Patterson, November 20, 1998.
31 Deposition of Keith Patterson, November 13, 1998.
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.
37 Interview of Martin Dome, November 12, 1998.
38 Deposition of Keith Patterson, November 13, 1998.
42 Ibid.


Ibid.


Ibid.

Ibid.


Memorandum from MSgt J.C Chandler, Jr., April 12, 1998.


Testimony of Steven Prichard, August 27, 1998.

Testimony of Steven Prichard, August 27, 1998; Deposition of Kenneth Davis, October 23, 1998.


Interview of Peter Snow, September 16, 1998.


Ibid.

Ibid.

Deposition of Keith Patterson, November 13, 1998.

Memorandum from Steven Prichard, March 8, 1996.

Deposition of Kenneth Davis, October 23, 1998.

Ibid.

Ibid.

Interview of Peter Snow, November 24, 1998.

Deposition of Kenneth Davis, October 23, 1998.

Testimony of Steven Prichard, August 27, 1998.

Deposition of Kenneth Davis, October 23, 1998.
CHAPTER 8 – Commercial Space Insurance

4 Ibid.
8 Marham Space Consortium is a London, England-based space insurance underwriting syndicate. Marham Space Consortium is a part of Lloyd’s of London.
10 Ibid.
11 Ibid.
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.
17 Ibid.
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.
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 Miaqin, 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.
35 Letter from Jacques Masson to Professor Bao Miaqin and Paul O’Connor, March 20, 1996.
36 Letter from Jacques Masson to Professor Bao Miaojin, Janet Sie, and Paul O’Connor, March 20, 1996.
37 Letter from Jacques Masson to Professor Bao Miaojin, Janet Sie, and Paul O’Connor, March 21, 1996.
38 Letter from Chuck Rudd to Sheila Nicoll, March 21, 1996.
39 Ibid.
41 Letter from Paul O’Connor to Professor Bao Miaojin, April 1, 1996.
42 Letter from Paul O’Connor to Gerald Swanson, April 2, 1996.
43 Letter from Paul O’Connor to Professor Bao Miaojin, April 2, 1996.
44 Letter from Bao Miaojin 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 Miaojin, April 4, 1996.
48 Ibid.
49 Ibid.
50 Letter from Zhou Wei to Professor Bao Miaojin 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.
55 Ibid.
58 Ibid.
59 Ibid.
60 Ibid.
61 Ibid.
64 Ibid.
67 Ibid.
68 Letter from Paul O’Connor to Diane Dwyer, April 17, 1996.
70 Memorandum for the Record of Select Committee Testimony of Timothy Rush, J&H Marsh & McLennan, September 15, 1998.
72 Letter from Paul O’Connor to Professor Bao Miaqin, 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 Franceska O. Schroeder to Wah Lim, May 14, 1996.
77 Letter from Franceska 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 Miaqin, 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.
85 Internet Article from Dowa Fire, Marine & Space Industry Department: “Insurance Contributes to Space Development - Unique Risks of Space.”


Internet Article from Dowa Fire, Marine & Space Industry Department: “Insurance Contributes to Space Development - Unique Risks of Space.”

Ibid.


Ibid.

“Ibid.


Internet Article from Dowa Fire, Marine & Space Industry Department: “Insurance Contributes to Space Development - Unique Risks of Space.”

Internet Article from Dowa Fire, Marine & Space Industry Department: “Insurance Contributes to Space Development - Unique Risks of Space.”


Ibid.

Preliminary Quotation for the Apstar 1 and 2 Program, March 1993.


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