



Universiteit
Leiden
The Netherlands

The international trade in launch services : the effects of U.S. laws, policies and practices on its development

Fenema, H.P. van

Citation

Fenema, H. P. van. (1999, September 30). *The international trade in launch services : the effects of U.S. laws, policies and practices on its development*. H.P. van Fenema, Leiden. Retrieved from <https://hdl.handle.net/1887/44957>

Version: Not Applicable (or Unknown)

License: [Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden](#)

Downloaded from: <https://hdl.handle.net/1887/44957>

Note: To cite this publication please use the final published version (if applicable).

Cover Page



Universiteit Leiden



The handle <http://hdl.handle.net/1887/44957> holds various files of this Leiden University dissertation.

Author: Fenema, H.P. van

Title: The international trade in launch services : the effects of U.S. laws, policies and practices on its development

Issue Date: 1999-09-30

INDEX

| | |
|--|--|
| AADC | 25 |
| Access controls | 206, 207 |
| ACDA | 109, 110, 122, 125, 138, 142, 145-147, 153, 155, 156, 163, 168, 171 |
| Administration | 5, 6, 37, 38, 41, 45, 47, 48, 53, 57, 70, 71, 93, 95, 101, 102, 112, 119, 120, 124-134, 140, 144, 145, 148, 151, 158-160, 165, 166, 168, 169, 171, 172, 173, 174, 177, 184, 185, 189, 192, 194, 195, 197, 212, 213, 215, 217, 218, 219-226, 229, 230, 239, 242-244, 253, 254, 257, 258, 282, 283, 290, 297, 298-301, 303, 305-308, 316, 318-320, 327, 329-334, 336, 337, 340, 342, 345, 347, 349-354, 357, 360, 371, 373, 374, 379 |
| AECA | 110, 114, 117, 145, 146, 148, 159, 167, 173, 218, 221, 335, 359 |
| Aerosat | 265 |
| Aerospatiale | 4, 13, 85, 214, 308, 309, 345, 350 |
| Afristar | 220, 221 |
| Agema | 35, 37, 41 |
| Agni | 157 |
| AIA | 51, 335, 346, 349, 350 |
| AIAA | 102, 211, 222, 328, 346 |
| Air Force | 7, 16, 17, 19, 23, 24, 35, 38, 41, 50, 53, 55, 66, 72, 73, 78, 79, 87, 90, 92, 96, 98, 101, 105, 162, 199, 296, 312, 313, 319 |
| Air Force Model Agreement | 73 |
| Air transport | 57, 99, 376-378 |
| AKO Polyot | 14 |
| Alaska | 24, 25 |
| Alaska Aerospace Development Corporation (AADC) | 24 |
| Albania | 115, 121, 128, 217 |
| Albright | 254 |
| Alcantara | 27 |
| Alcatel | 4, 5 |
| Alenia | 309, 345 |
| American Electronics Association | 149, 334 |
| American Satellite Co. | 89 |
| Andoya Rocket Range | 25 |
| Antrix | 8, 13, 356, 358, 376 |
| APMT | 332, 337, 340 |
| Apollo | 24, 38, 45, 47, 48, 240, 264, 265 |
| Appropriations Act | 212, 213 |
| Apstar | 220, 223, 224, 232, 332, 335 |
| Arab Satellite Communications Organization (Arabsat) | 3 |
| Arabsat | 3, 214, 215, 283 |

Index

- Argentina 109, 138, 143, 146, 152, 153, 157, 176, 338
- Ariane . . . 8, 10, 13, 15, 20, 22, 25, 29, 30, 70, 71, 79, 83, 84, 87, 88,
101, 183, 189, 191, 200, 203, 214, 247-249,
256, 258, 265-269, 271-275, 277, 279, 280,
282, 284, 292-294, 308, 309, 314, 343, 356,
376
- Ariane 1973 Arrangement 266, 269
- Ariane 4 20, 30, 191, 248, 309, 314
- Ariane 5 8, 10, 13, 20, 22, 25, 29, 30, 277, 314
- Ariane preference provision 271
- Ariane Production Declaration 269, 271, 273, 275
- Arianespace . . 6, 8, 11-13, 20, 28, 30, 56, 61, 71, 75, 79, 81-87, 90, 91,
107, 148, 160, 184, 189-192, 214, 215, 222,
229, 242, 247, 250, 255, 266, 268, 269, 271,
272, 274, 276, 278-281, 283, 284, 286, 288,
291, 293, 295, 297-300, 305, 319, 323, 324,
326, 327, 340, 353-358, 376, 378
- Ariel 1 41
- Arms Control . . . 55, 108, 110, 111, 118, 125, 145, 148, 158, 164, 185,
219, 230, 254, 333
- Arms Control and Disarmament Agency (ACDA) 110, 145
- Asia 3, 22, 128, 136, 147, 176, 183, 187, 209, 332, 347
- Asia Pacific Mobile Telecommunications (APMT) 332
- Asiasat . . 183-188, 198, 203-205, 208, 209, 212-215, 220, 221, 223, 232
- Associate Administrator for Commercial Space Transportation (AST) . . 2,
6, 10
- Assured Space Access 14
- AST 2, 6, 7, 9, 10, 23, 24, 30, 253, 295, 317, 318
- Asterix 1 41
- Astrolink 3
- Athena 7, 9, 14, 19, 24, 25, 29, 31, 314
- Atlas . . 7, 12, 13, 16, 24, 30, 35, 37, 38, 50, 51, 70, 79, 147, 183, 189,
199, 248, 249, 255, 274, 293, 311, 314
- Aussat . . 183, 184, 183-186, 188, 189, 195, 198, 203-205, 208, 212, 213,
216-218, 220
- Australia . . 17, 18, 28, 109, 128, 138, 146, 156, 184, 195, 217, 220, 221,
241-243, 259, 260, 263, 290, 298, 317, 338,
371
- Australia Group 109
- Austria 109, 128, 137, 138, 146, 270
- Avatar 23
- Avibras 157
- Baikonur 14, 26, 248, 250, 252
- Ball Aerospace 341
- Ballistic missiles . . . 35, 141-143, 147, 148, 152-154, 156, 161-164, 175,
176, 216, 221, 332, 333, 336

| | |
|--|---|
| Baltic States | 133, 134 |
| Bantam | 19 |
| Beijing | 27, 183, 196, 198, 213, 219, 229, 336 |
| Belgium | 80, 109, 128, 138, 146, 214, 256, 259, 260, 263, 266, 267, 269 |
| Big LEO systems | 237 |
| Bikini list | 166 |
| Blue Streak | 258, 259, 261 |
| Boeing | 4, 7, 9, 12, 15-17, 28, 38, 252, 253, 255, 256, 295, 296, 307, 312-314, 319, 340, 356, 357, 378 |
| Brazil | 3, 7, 9, 27, 143, 146, 152-154, 157, 174, 178-180, 322, 327, 371, 379 |
| British Aerospace/Matra | 188 |
| Broadband | 3, 4 |
| Brussels | 20, 266, 346 |
| Bulgaria | 115, 138, 146 |
| bunching provision | 233, 234 |
| Bureau of Export Administration (BXA) | 112, 119, 125, 172, 330 |
| Buy European | 271, 275 |
| BXA | 5, 112, 119, 120, 125, 126, 129, 139, 168, 169, 172, 173, 330, 345, 347, 349, 350, 360 |
| Cable & Wireless | 183, 187 |
| Cambodia | 218 |
| Canada | 109, 125, 128, 138, 141, 146, 217, 244, 256, 258, 318, 340-342 |
| Canadian Defence Industries Association (CDIA) | 341 |
| Canary Islands | 25 |
| Capacity limitation | 204 |
| Cape Canaveral | 17, 23-25, 41, 72, 79, 203, 249, 255, 310 |
| Cape Canaveral Air Station (CCAS) | 24 |
| Cape York | 241, 242, 290, 298, 316, 356 |
| Cape York Space Agency (CYSA) | 241 |
| Cayman Islands | 252 |
| CCAS | 24 |
| CCF | 134 |
| CCL | 112, 121-124, 139, 145, 168, 170, 173, 228 |
| CDIA | 341 |
| Centaur | 37, 70, 79, 189 |
| Centre National d'Etudes Spatiales (CNES) | 81 |
| CETS | 261-264 |
| CGWIC | 8, 13, 26, 183, 185, 200, 203, 206, 214, 220, 237, 298, 355 |
| Challenger | 70, 73, 75, 86, 88, 93, 94, 105, 183, 200, 205, 291 |
| Chernomyrdin | 134, 150, 244, 249 |
| Chile | 115 |
| China | 3, 7-9, 11, 22, 26, 28, 32, 90, 91, 106, 108, 115-117, 121, 127-129, 133, 137, 140, 146, 152, 153, 156, 168-170, 176, 177, 179-181, 183-188, 190-214, |

Index

- 216-240, 242-245, 249, 250, 275, 281-283,
288, 289, 299, 301, 305, 306, 308, 319, 320,
323, 324, 326, 328, 331-337, 342-349, 351,
354, 355, 361, 367-369, 373-375
- China affair 181, 250, 301, 320, 332, 349, 368, 369, 375
- China Great Wall Industry Corporation (CGWIC) 183
- Chinasat-8 240, 332, 337
- Choke-point technologies 172, 331
- Chrysler 38
- CIA 55, 337
- CIS 123, 124, 154
- Civil space sector guidelines 93
- Cluster 13, 275
- CNES 20, 25, 41, 81, 83, 84, 266-268
- Coast Guard 53, 57
- CoCom 110, 123, 127-140, 159, 166-169, 172, 173, 185, 186, 192, 193,
198, 218, 349
- CoCom Cooperation Forum on Export Controls (CCF) 134
- Cold War 47, 108, 109, 115, 129, 134-136, 157, 168, 249, 348
- Coleman Research Corporation (CRC) 14
- Colin L. Powell 196
- Commerce . . . 5, 53, 55, 57, 59, 60, 62, 64, 65, 70, 72, 76, 80, 82, 101,
110-112, 114, 118, 119-130, 133, 139, 148,
149, 158, 162, 165-173, 177, 210, 212, 213,
223, 224, 225, 228, 306-309, 315, 319, 320,
330-335, 337, 340, 345-347, 359, 360, 372
- Commerce Control List (CCL) 112, 121
- Commerce Regulations 119-121, 126, 128, 139, 169, 170
- Commercial communications satellites 2, 3, 5, 112, 123-125, 167,
170-172, 223, 228, 332, 333, 335, 338, 345,
346, 347, 349, 373, 374
- Commercial Space Act 107, 162, 295, 318, 328, 329
- Commercial Space Launch Act Amendments 68, 87
- Commercial Space Launch Policy 242, 290, 297
- Commercial Space Transportation Advisory Committee (COMSTAC) . . . 2
- Commission . . 39, 53, 59, 62, 86, 87, 119, 134, 163, 209, 249, 256, 280,
281, 283-289, 322, 323, 326, 340, 342, 343,
346, 350
- Committee on government procurement 325
- Commodity Jurisdiction 112
- Commonwealth of Independent States (CIS) 123
- Communication to the Council 286, 287
- Communications Satellite Corporation (Comsat) 39
- Community . . . 18, 27, 32, 41, 53, 59, 67, 73, 76, 87, 88, 98, 126, 156,
166, 168, 169, 175, 178, 211, 225, 226, 243,
261, 283-286, 300, 325, 380

- Comparability factors 235
 Components . . . 19, 44, 63, 112, 124, 140, 143, 144, 147-149, 153, 155,
 156, 159, 169, 170, 174, 178, 179, 186, 191,
 195, 202, 205, 213, 216, 218, 220-222, 230,
 241, 243, 250, 294, 307-309, 338-340, 346,
 350, 351, 368, 376
 Computers . . . 126, 129, 131, 140, 143, 165-168, 172, 217-219, 222, 330,
 331, 367
 Comsat 39, 40, 43-45, 67, 248, 262, 273, 310, 313
 COMSTAC 2, 59, 63, 98, 211, 314
 Condor 152, 153, 157, 158
 Conestoga 53, 54, 164
 Congress . . 16-18, 20, 21, 27, 37, 47, 57, 60, 61, 66, 69, 77, 78, 80, 92,
 95, 97, 103, 104, 105-107, 116, 117, 119, 127,
 132, 133, 144-146, 148, 152, 154, 161, 165,
 168, 171, 172, 174-176, 183-185, 187, 189,
 190, 194-198, 212, 213, 215, 217, 221, 223,
 229, 239-241, 243, 245, 273, 285, 290, 300,
 301, 303, 306, 307-309, 316, 320, 327-329,
 331, 333-337, 340, 343-345, 351-357, 359,
 361, 371, 373, 379
 Congressional Budget Office 105
 Controlled commodities 121
 Convention on International Liability for Damage caused by Space
 Objects 68, 69, 198
 Convention on Registration of Objects launched into Outer Space . . . 100
 Core List 131, 133, 167
 Cosmodrome 14, 26, 248, 250, 252
 Cosmos 7, 14, 26, 250, 341
 Cosmos USA 14
 Cox Report 336
 CRC 14
 CRS 144, 154, 156, 183, 220, 223, 236, 240, 241, 244, 336
 CSLA 60, 68, 84, 87, 89, 90, 92, 99-101, 104-107
 CSLA Amendments Report 87, 89, 90, 101, 106
 Cuba 115, 136, 217, 331, 367
 Cyclone 7, 9, 14
 CYSA 241, 243
 Czechoslovakia 115, 132, 133, 146, 166
 DASA 13, 14, 20, 163, 216, 228, 250, 308, 309, 345, 350
 Debarment 117
 Defence articles 339, 341
 Delta . . 7, 10, 15, 16, 24, 29, 30, 37, 38, 41, 42, 51, 70, 75, 78, 79, 82,
 85, 87, 154, 155, 183, 200, 249, 255, 257,
 258, 272, 273, 275, 294, 307, 311, 314

Index

- Democratic party 332
- Denial list 143
- Denmark 80, 109, 128, 138, 146, 256, 263, 266, 267, 269
- Deregulation 57, 61, 99, 306, 307, 352, 377, 378
- Desert Storm 132, 218, 292
- Designing out 351
- Directive on Commercialization of Expendable Launch Vehicles 56
- DOC 5, 55-58, 62, 88, 120, 126, 130, 139, 141, 158, 164, 168, 169, 198, 212, 231, 268, 269, 276, 322, 326, 330, 345, 360
- DOD 16, 17, 24, 35, 38, 50-58, 62, 64, 66, 72, 87, 93, 94, 99, 107, 161, 162, 165, 190, 250, 289, 291, 294, 296, 305, 306, 316, 318, 325, 335-338, 354
- Dong Fang Hong 216, 220
- DOS 342
- DOT Launch Policy 69
- DOT-OCST 92, 98
- Dual-use 109-112, 118-120, 123, 128, 131, 132, 134-139, 145, 158, 165-170, 173, 175, 179, 240, 330, 333, 335, 349, 364
- E.O. 57, 60, 122, 168, 173
- EAA 119, 120, 145, 148, 159, 218, 221, 335, 359, 360
- EAR 119-121, 125, 126, 330
- Early Bird 39
- Earth Watch Inc. 164
- East Germany 115
- Echo 39, 347
- ECJ 287
- Eclipse Astroliner 19
- EELV 16, 17, 24, 30, 311-313, 315, 319, 354, 356
- ELA-2 25
- ELA-3 25
- Ellipso 313
- ELV 38, 50-61, 63, 65, 67-69, 71, 73-79, 82-90, 92, 94-99, 104, 107, 114, 189, 190, 192, 197, 205, 289, 297, 311, 312, 316, 327
- ELV Commercialization Directive 56, 57, 75, 97
- Encryption 108, 132, 140, 168, 169, 172, 225, 228, 332, 338, 367
- Energia 12, 22, 150, 247, 252
- Energomash 150, 251
- Enhanced Proliferation Control Initiative (EPCI) 125, 126, 173, 330
- Entity List 125, 126
- EPCI 125, 126, 173, 330
- Equator 12, 24, 25, 27, 178, 203, 204, 232, 242, 262
- Equipment 42, 56, 66, 79, 89, 94, 108-112, 114-117, 120, 122, 124-127, 132, 140, 141, 143, 145-147, 154, 158, 166,

- 177, 186, 187, 195, 205-208, 215, 218, 221,
222, 242, 250, 254, 259, 260, 343, 346
- Equipment and Technology Annex 141, 145
- ESRO 39, 41-43, 256-258, 261-266, 268-270
- ESRO-NASA Memorandum of Understanding 257
- Estonia 115
- Eumetsat 271, 274, 275, 277, 293, 303
- Eurockot 13, 14, 26, 163, 250
- European Commission 281, 283-287, 326, 340, 342, 343, 346, 350
- European Community 283, 284, 286, 325
- European launcher policy 270, 280, 284
- European Parliament 285, 287
- European Space Agency 8, 82, 192, 193, 203, 214, 265, 268, 269, 272,
282, 298
- European Space Conference 263-266
- European space policy 263, 270, 279, 284-287
- European Space Research Organization (ESRO) 41
- European Union 109, 281, 285, 287, 323, 324, 357
- Exclusive competence 287
- Exclusively peaceful purposes 270, 275
- Executive Order (E.O.) 57, 122
- Export Administration Act (EAA) 360
- Export control regulations 46, 109, 112, 155, 184, 364
- Export controls 5, 107, 109-111, 114-120, 122, 124, 127, 129-138, 140,
143, 152, 153, 156, 157, 165, 167, 168, 172,
174, 175, 178, 180, 181, 228, 241, 281, 307,
327, 331-335, 337-339, 345, 347-350, 356,
357, 359-361, 364, 367, 371, 379
- FAA 2, 6, 7, 9-11, 24, 30, 53, 54, 56, 57, 253, 314, 317, 318, 328
- FAA-AST 24, 317, 318
- FCC 39, 53-56, 58, 62, 65, 321, 322, 372
- Federal Aviation Administration (FAA) 6, 53
- Federal Communications Commission (FCC) 39, 53
- Finland 109, 128, 137, 138, 146, 217, 270
- Florida 14, 17, 23, 24, 64, 249, 255, 311, 318
- Fly Europe 289, 297
- Fly U.S. 83, 255, 289, 290, 294-297, 300, 319, 324, 326, 327, 354,
356, 373, 378
- Ford Aerospace 188
- Foreign Affairs Committee Hearing 1988 185, 187, 190, 192, 194-197
- Foreign availability 132, 168, 171, 172, 345, 347, 348
- Foreign Relations Authorization Act 212, 213
- France 14, 29, 41-44, 75, 80, 81, 109, 128, 137, 138, 141, 146, 156,
176, 256, 258, 259, 262, 263, 265-269, 276,
277, 324, 340, 344, 355

Index

- Free and fair trade . . . 242, 297-299, 301, 313, 315, 318, 320, 326, 327,
352, 353, 357, 380
- Freja 216-218
- French Guyana 14, 25, 83, 203, 242, 262
- Galaxy 12, 15, 89
- GAO 17
- GATS 289, 320-327, 364, 371, 372, 377
- GATT 283, 289, 320, 324, 325, 377
- GE Astrospace 188
- General Agreement on Trade in Services (GATS) 320
- General Dynamics . . . 12, 38, 74, 79, 148, 184, 189-192, 199, 274, 293,
297
- GEO . . . 2-4, 11, 15, 20-22, 25, 27, 28, 30, 47, 228, 231-235, 237, 238,
241, 242, 244, 245, 246, 248, 249, 255, 299,
301, 304, 309, 311, 314, 318, 339, 354, 356,
358
- Georgia 133, 134
- Geostationary Earth Orbit (GEO) 2
- Geostationary Transfer Orbit (GTO) 314
- Germany . . . 29, 41, 53, 80, 109, 115, 128, 138, 141, 146, 156, 163, 214,
216, 217, 223, 256, 259, 260, 263, 266, 267,
269, 272, 277, 344
- Get-away specials 74
- Gibson Report 286
- Glavkosmos 148, 150
- Glenn Amendment 177, 329, 330, 358
- Global Communications 3, 4, 44, 309
- Global Mobile Personal Communications by Satellite (GMPCS) 322
- Global Positioning System (GPS) 313
- Globalstar 4, 5, 10, 11, 13, 14, 19, 177, 236, 250, 303, 305, 343
- GMPCS 322
- go-it-alone 37, 47, 48, 265, 351, 353, 357, 358, 379
- Gore 134, 150, 174, 244, 249
- Government procurement 117, 320, 325, 326, 372
- GPA 325-327, 364
- GPA notification 325
- GPS 313, 370
- Granada 280, 284, 294
- Greece 109, 128, 138, 146
- Greensat 163
- GSLV 22, 27, 148, 358
- GTO 15, 16, 20, 22, 30, 79, 203, 231, 232, 235, 244-246, 255, 314
- Guidelines . . . 49, 61, 82, 85, 86, 90, 93, 94, 106, 109, 141-148, 150, 154,
160, 161, 163, 164, 174, 178-180, 198, 209,
210, 209-211, 219, 221, 224, 225, 241, 245,
246, 254, 274, 290, 294, 299, 300, 348

- Guyana Space Centre 14, 25, 266, 268, 280
 GWIC 227, 314, 343
 H.R. 60, 87, 89, 90, 101, 106, 107, 162, 187, 295, 328, 329, 333, 345,
 360
 H.R. 1702 107, 162, 295, 328, 329
 H-1 155
 H-2 21, 27, 29, 30, 155, 357
 H-2A 21, 27, 307, 357, 358
 Harmonization exercise 123, 167
 Have-nots 28, 32, 159, 362, 368, 371
 Hawaii 24, 25
 HEOS-A 42
 Hermes 277
 Hong Kong 128, 183, 209, 224, 225
 Hot Bird Plus 274
 House Committee on Science and Technology 100
 House Launch Act Report 60-62
 Hughes 3, 4, 12, 15, 16, 21, 59, 89, 149, 168, 184, 188, 189, 204, 206,
 207, 213, 214, 220-224, 228-230, 239, 252,
 253, 305-312, 314, 332, 335-337, 339, 340,
 346, 347, 349, 352, 358, 375
 Human rights 115, 116, 196, 212, 215, 217, 219, 221, 225, 351
 Hungary 109, 115, 132, 133, 138, 146, 153, 166, 176, 338
 IAF 17, 18, 20, 21, 27, 148, 154
 ICBM 13, 35, 36, 162, 163
 Iceland 109, 128, 146
 ICO 4, 309
 ICSU 36
 IGY 36
 IIL 132
 IL 128, 129
 ILS 12, 26, 248, 255, 295, 296, 378
 India . 7, 8, 13, 22, 23, 27, 28, 108, 109, 116, 126, 143, 147-152, 156,
 157, 174, 176, 177, 180, 181, 241, 243, 244,
 315, 322-324, 327, 329, 330, 350, 358, 375,
 376, 375, 376, 379
 Indian Remote-sensing Satellites (IRS) 8
 Indian Space Research Organization (ISRO) 8, 148
 Indonesia 70, 152
 INF (Intermediate-Range Nuclear Forces) Treaty 158
 Initial programme 259-261
 Inmarsat 3, 4, 232, 243, 244, 248, 271, 273, 278, 279, 303, 305
 Institute for International Economics 352
 Insurance . . 1, 10, 15, 32, 59, 63, 64, 67-73, 81, 84, 89-91, 95-97, 99,
 101, 102, 105, 201, 210, 220, 235, 248, 253,

Index

- 281, 332, 339, 342, 360
Intelsat . 3, 10, 39, 40, 43-46, 70, 86, 87, 147, 220, 221, 232, 261, 262,
267, 271, 273, 303, 332, 359, 360, 362
International Astronautical Congress 17
International Launch Services (ILS) 12, 248
International Space Station 17, 150, 244, 275, 338
International Traffic in Arms Regulations (ITAR) 110, 338, 341
Iran . . 108, 109, 115, 116, 135-138, 153, 154, 156, 176, 177, 179, 184,
217, 220, 222, 230, 254, 331, 342
Iraq . 108, 109, 116, 125, 135, 136, 138, 143, 152, 153, 156, 157, 167,
342
IRBM 35, 196
Ireland 80, 109, 128, 137, 138, 146, 270
Iridium 4, 5, 11, 14, 19, 236, 237, 246, 303, 305, 314
IRIS 4, 257
IRS 8, 241
Israel . 9, 11, 14, 126, 146, 152, 154, 156, 174, 176, 295, 317, 322-327,
338
ISRO 8, 13, 22, 27, 148, 150-152, 356
Italy 25, 41, 80, 109, 128, 138, 141, 146, 156, 256, 259, 260, 263, 266,
267, 269
ITAR 110-118, 120, 122, 124, 140, 159, 338, 339, 341, 342, 350
J-1 21, 27
Jackson-Vanik 217
Japan . . 7-9, 11, 21, 27-29, 90, 109, 118, 125, 126, 128, 136, 138, 141,
146, 154, 155, 156, 183, 200, 244, 292, 300,
309, 315, 322-327, 338, 344, 345, 347, 348,
350, 357, 358, 369, 379
JEA 74
Jiuquan 27
John Glenn 147
Juno 1 37
Jupiter 35, 36
K-1 18, 19, 24, 28
Kampuchea 115
Kansu 27
Kantor 239
Kazakhstan 14, 26, 243, 250-252
Kennedy 24, 42, 47, 80, 87, 147
Kennedy Space Centre 24
Kenya 25
Khrunichev 12-14, 22, 150, 163, 246, 247
Kick-motors 124
Kistler 18, 24, 28, 314, 315
Kodiak Launch Complex 24
Kopernikus 272

| | |
|--|---|
| Korean Peninsula | 176, 218 |
| Kourou | 14, 25, 83, 203, 242, 262, 266, 356 |
| Kuwait | 215, 367 |
| Kvaerner | 12, 252 |
| Laos | 121 |
| Launch assurance policy | 46, 265 |
| Launch facilities 17, 18, 38, 40, 72, 77, 87, 91, 94, 104, 190, 252, 281, 305, 310, 316, 373 | |
| Launch hearing | 248, 281, 291 |
| Launch License | 61, 63-65, 68, 69, 73, 107, 253 |
| Launch licensing regulations | 92, 98 |
| Launch providers | 7, 10, 23, 27, 28, 31, 73, 83, 85, 90, 91, 106, 107, 169, 199, 201, 211, 229, 232, 234, 235, 237, 245, 247, 278, 288, 291, 297, 299, 301, 303, 313, 314, 315-317, 319, 324, 327, 329, 339, 350, 353-355, 365, 368, 369, 372, 373, 377, 378 |
| Launch Safety Review | 63 |
| Launch service providers | 9, 28, 29, 83, 200, 201, 204, 205, 231, 235-238, 246, 275, 284, 304, 316, 351, 359, 370 |
| Launch Services Purchase Act of 1990 | 107, 290, 295, 328 |
| Launch Trade Agreement 9, 12, 150, 163, 164, 183, 186, 199, 208, 209, 212, 214, 215, 223, 226, 229, 231, 244, 247-249, 253, 280, 286, 298, 323 | |
| Launcher/missile controls | 165, 172 |
| Launching state | 69, 100, 193, 198, 209 |
| LeoLink | 14 |
| Liability | 27, 63-65, 67-73, 90, 91, 95-98, 100-102, 104, 107, 154, 185, 191-193, 195, 198, 208, 209, 328, 360 |
| Liability Agreement | 198, 208 |
| Liberalization | 133, 134, 165, 167, 172, 297, 301, 319, 320, 322, 324, 326, 327, 352, 354, 371, 372, 375-379 |
| Liberia | 115 |
| Libya | 115, 135, 136, 138, 156 |
| Limits on third party liability | 95 |
| List of denied persons | 126 |
| Lithuania | 115 |
| LK-1 | 9, 14 |
| LLV | 164 |
| LM-2E | 22, 184, 185 |
| LM-2E(A) | 22 |
| LM-3B | 22, 26 |
| Lockheed Martin Launch Vehicle (LLV) | 164 |
| Lodestar | 160 |

Index

- Loral . 4, 5, 10, 12-15, 19, 21, 170, 177, 221, 229, 240, 246, 305, 307,
332, 336, 337, 339, 343, 346, 358
- LTV Aerospace 38
- Luxembourg 109, 128, 138, 146, 246, 342
- M.o.A. 198, 208
- M.o.U. 41, 42, 150, 158, 258, 275
- M-11 152, 219, 221
- M-5 21, 27, 30
- M-star 4
- Major Defense Equipment (MDE) 116
- Major non-NATO allies 338, 339, 373
- Manufacturing License Agreements (MLA) 117
- Marots 265
- Martin Marietta . 12, 38, 74, 78, 184, 189-192, 199, 223, 229, 239, 248,
291, 297, 359, 360
- Matra Marconi 4, 14, 309
- McDonnell Douglas (MDD) 292
- MDD 79, 239, 255, 292-294
- MDE 116, 117
- Medium Earth Orbit (MEO) 2
- Memorandum of Agreement (M.o.A.) 198
- MEO 2, 4, 309, 354
- Meteosat 265, 268, 275
- MFN 217-219, 221, 225, 229, 320-326, 346
- Middle East 3, 135, 136, 176, 194, 195, 197, 254
- Minotaur 19, 24, 162, 265
- Minuteman 19, 24, 35, 54, 162
- Missile . . 7, 10, 19, 24-26, 28, 29, 32, 35-37, 42, 44, 45, 51, 107, 108,
110, 117, 122, 125, 126, 140-148, 150-165,
172-181, 194-197, 216-226, 230, 239, 243,
244, 251, 254, 258, 293, 315, 330, 336, 343,
348, 349, 355, 358, 359, 364, 368, 374-376,
375, 376, 380
- Missile proliferation . . 145, 151, 157, 159, 173-175, 178, 194-196, 218,
221, 223, 224, 349, 368, 380
- Missiles-turned-launchers 158, 160, 162
- Mission Review 63-65, 99
- Mitsubishi 200, 345
- MLA 117
- Molniya 8, 13
- Motorola 4, 14, 19, 222, 229, 305
- MTCR 110, 127, 141-159, 161, 163, 164, 174-176, 178-181, 216,
218-222, 224, 225, 226, 229, 230, 239, 244,
254, 287, 308, 309, 327, 348, 355, 358, 359,
364, 374, 375
- Multilateral Agreements on Trade in Goods 320

- Munitions List . . . 110-114, 120, 123, 129, 170, 173, 175, 184, 213, 216,
225, 329, 333-335, 338
- N-1 154
- N-2 154
- NASA . . . 7, 14, 17-19, 24, 25, 27, 35, 37-45, 47-59, 62, 64-66, 70-78,
77-79, 85, 86, 87-89, 91-96, 99, 102-107, 111,
112, 134, 190, 200, 242, 257, 258, 275, 291,
294, 296, 305, 310, 311, 316, 319, 325, 328,
338, 370
- NASDA 21, 27, 29, 154, 200, 275
- National Economic Council 299
- National Security Advisor 196, 197, 223
- National Security Council 113, 224
- National Security Decision Directive (NSDD) 88
- National Security Space sector guidelines 93
- National Space Administration 223
- National Space Policy . . . 52, 55, 92, 93, 95, 97, 178, 238, 241, 289, 290,
295, 299, 328
- National Space Transportation Policy 161, 245, 254, 255, 294, 298
- National treatment 321, 324, 325, 371
- NATO 42, 111, 128, 130, 276, 338, 339, 342, 350, 351, 373-375
- Navy 24, 35, 38, 53, 160
- NEC 200, 345
- Netherlands 36, 37, 40, 80, 84, 109, 128, 129, 137-139, 146, 256,
258-260, 263, 266, 267, 269
- Nevada 18, 24
- New Forum 137
- New Zealand 109, 128, 137, 138, 146, 338
- Next . . . 6, 8, 9, 27, 48, 52, 53, 92, 106, 140, 150, 171, 188, 195, 225,
236, 239, 242, 253, 290, 297, 301, 314, 319,
328, 346, 373
- Nigeria 115, 116
- Non-market economy 32, 184, 229, 243, 249, 278, 326, 344, 354
- Non-nuclear State 177
- Non-proliferation . . . 44, 45, 111, 122, 129, 135, 137, 141-146, 149, 155,
156, 159, 164, 169, 173, 174-179, 184, 194,
219, 226, 251, 254, 306, 320, 333, 357
- Non-proliferation and export control policy 155, 174
- NORAD/Space Command 55
- North Korea 11, 108, 115, 129, 135, 136, 138, 146, 156, 179, 217
- Norway 12, 25, 109, 128, 138, 146, 252, 263, 270, 294
- NSDD 56, 77, 88
- Nuclear Suppliers Group 109
- Nuclear tests 176-178, 318
- OCST 57, 58, 63-66, 72-74, 76, 92, 97-100, 114, 237, 253

Index

| | |
|---|---|
| OCST Licensing regulations | 63, 65, 98 |
| (OCST) Interim Regulations | 63, 65 |
| ODTC | 111-113, 116, 117, 129, 173 |
| Odyssey | 4, 12 |
| Ofek 4 | 154 |
| Office of Defense Trade Controls (ODTC) | 111 |
| Office of Munitions Control | 111, 184 |
| OHB-System | 14 |
| On a par | 201, 203, 231, 235, 236, 282 |
| Operation Desert Storm | 132, 218, 292 |
| Optus | 220, 221, 223-225 |
| Orbcomm | 4, 5, 11, 314 |
| OSC | 14, 18, 19, 160, 162, 317 |
| OSP | 162 |
| OSTP | 150, 161, 319 |
| OTS | 265 |
| Outer Mongolia | 115 |
| Outer Space Benefits Declaration | 362, 363, 380 |
| Outer space benefits declaration" | 363 |
| Outer Space Treaty | 65, 67, 68, 198, 208, 209, 361, 363, 380 |
| Pakistan | 108, 116, 143, 152, 156, 176, 177, 179, 216-218, 220-222, 225, 230, 329, 330, 350, 358, 367 |
| PanAmSat | 3, 15, 19, 247, 305, 339 |
| Payload controls | 165, 172, 306 |
| Peaceful purposes | 151, 154, 155, 256, 259, 260, 270, 275, 276, 361, 362, 368 |
| Pearl Harbor | 36 |
| Pegasus | 7, 14, 18, 19, 24, 25, 31, 162, 164, 314 |
| Percheron | 53 |
| Perigee Kick Motor (PKM) | 203, 224 |
| Pioneer Rocketplane | 19, 315 |
| PKM | 203, 224 |
| Plesetsk | 14, 26 |
| PM | 111 |
| Poker Flat Research Range | 24 |
| Poland | 109, 115, 132, 133, 138, 146, 147, 166, 338 |
| Polar Satellite Launch Vehicle (PSLV) | 8 |
| Polaris | 35 |
| Portugal | 109, 128, 138, 146 |
| Poseidon | 160 |
| Post-Apollo programme | 45, 48, 265 |
| PRC | 185-188, 193, 199, 201, 204-206, 208, 210, 211, 218, 232-238, 284, 292, 336 |
| Preferential use | 271, 276, 277, 280 |
| President Bush | 122, 124, 131, 160, 167, 173, 212, 216, 217, 219, 240, 242, 243, 290 |

- President Carter 80, 176
 President Clinton . . . 153, 170, 171, 176, 220, 223, 225, 295, 299, 334,
 337, 352
 President de Gaulle 42
 President Eisenhower 35
 President Johnson 42
 President Kennedy 47, 80, 147
 President Nixon 45, 48, 49, 121
 Presidential Commission 86
 Presidential Directive 44, 51, 52, 56, 74, 89, 92, 123, 173
 Pricing . 73, 74, 77, 78, 81-83, 86, 91, 94, 99, 160, 163, 164, 183, 184,
 190-192, 199, 201-204, 214, 219, 227, 229,
 231, 232, 234-236, 238, 246-248, 250, 255,
 268, 282, 283, 286, 298-300, 316, 373
 Proliferation controls 122, 173, 175, 178
 Promotion Series 84, 268, 269
 Proton 7, 12, 15, 20, 22, 26, 29, 30, 150, 151, 229, 243, 246-249, 274,
 275, 278, 279, 292, 295, 308, 309, 311, 316,
 318, 356, 374
 PSLV 8, 22, 27, 147, 358, 375, 376, 375, 376
 Red flags 126
 Redstone Arsenal 35, 36
 Res communis omnium 376
 Restraint list 143
 RKA 13
 RLV 17-19, 24, 25, 28, 314, 328, 341
 Rocket System Corporation 21, 200
 Rockets . 14, 27, 29, 36, 41, 53, 54, 112, 114, 141-144, 151, 153, 170,
 171, 195, 222, 249, 257, 258, 262, 311, 336,
 341, 349
 Rockots 13
 Rockwell 38, 79, 150, 256
 Rogue' countries 135, 169, 174, 254
 Rohini 27
 Romania 109, 115, 138, 146
 Rotary Rocket Co. 19
 Roton 19
 RPV 142
 Rules of the road 191, 193, 239, 278, 280, 282-285, 288, 300, 316, 320,
 356
 Russia . . 3, 7, 9-14, 22, 26, 28, 32, 108, 116, 123, 134, 135, 137, 140,
 146, 148, 149, 150, 151, 153, 154, 163, 164,
 169, 174, 176, 179, 226, 227, 229, 231, 232,
 236, 238, 240, 243, 244, 246-251, 254,
 277-279, 281, 284, 287, 288, 293, 299, 305,

Index

| | |
|--|---|
| | 306, 308, 314, 318, 319, 323, 326, 331, 344, 354, 358, 361, 373 |
| Russian Federation | 138, 153, 164, 245, 280, 287 |
| Salyut | 149, 150 |
| Samara Space Centre | 13 |
| San Marco | 25, 41 |
| Sanctions 80, 81, 123, 126, 127, 144-146, 148-152, 169, 177, 178, 180, 210, 212, 213, 214-216, 218-226, 228-230, 239, 307, 308, 329-333, 335, 337, 347, 349, 350, 351-354, 358-360, 367, 368, 371, 375 | |
| Satellite debris recovery site | 207 |
| Satellite Industry Association (SIA) | 334 |
| Satellite manufacturers 4, 15, 28, 32, 59, 78, 87, 90, 103, 165, 169, 188, 205, 211, 228, 230, 231, 233, 239, 249, 255, 301, 303, 305, 307, 310, 312, 313, 319, 329, 336, 342, 345, 347, 350, 354, 355, 358, 359, 368, 371 | |
| Satellite manufacturing industry | 5, 107, 170, 308, 333, 342, 346, 356 |
| Satellite operators | 118, 280, 303-305, 307, 311 |
| Saturn | 37, 38, 47, 48 |
| Scout | 25, 37, 38, 41, 51, 257, 258 |
| Sea Launch 10, 12, 25, 30, 250, 252-255, 295, 296, 314, 316, 340, 356, 378 | |
| Secretary of State | 45, 86, 88, 108, 110, 116, 125, 158, 197, 217, 219, 220, 223, 230, 242, 254, 351 |
| Security Council | 113, 115, 224 |
| security exception | 324 |
| Security exemptions | 324 |
| SEI | 240 |
| SELVS | 14 |
| Senate | 5, 64, 70-72, 101, 103, 108, 127, 147, 162, 169-171, 195, 197, 213, 221, 295, 315, 328, 329, 335, 337, 353, 372 |
| Senate Amendments Report | 101 |
| Senate Committee on Commerce, Science and Transportation | 64, 101 |
| Senate Intelligence Committee | 337 |
| SES | 342 |
| Shavit | 9, 14, 29, 31, 154, 295, 318 |
| Shtil | 10 |
| Shuttle pricing policy | 77, 78 |
| SIA | 334 |
| Sichuan | 26 |
| SIG-space | 55 |
| Silkworm | 184, 194 |
| Skybridge | 4, 5 |
| Skynet | 273, 276, 294 |

- SLBM 163
- SME 114, 116, 117
- Sounding rocket 25, 27, 28, 257
- South Africa 115, 116, 146, 152, 153, 156, 163, 174, 176
- South Yemen 115
- Southwest Regional Spaceport 25
- Soviet Union . 26, 32, 35-37, 41, 42, 46, 48, 67, 90, 91, 106, 115, 120,
121, 123, 124, 127, 128-134, 140, 146, 147,
156, 158, 166, 167, 173, 176, 193, 217, 240,
241, 242, 243, 251, 254, 256
- Soyuz 8, 10, 13, 26, 29, 240, 250, 275, 315, 356
- Space Committee Hearing 1988 183, 185-197
- Space Exploration Initiative (SEI) 240
- Space Launch Monitoring Division 337
- Space Liability Convention 65, 68, 69, 91, 102, 193, 198, 208, 209
- Space shuttle 7, 17, 18, 20, 24, 35, 45-52, 54-56, 60, 62, 70, 71, 75, 78,
85-88, 92, 93, 98, 107, 150, 183, 247, 255,
256, 275, 291, 313, 318, 319, 327
- Space Station 1, 17, 47, 57, 88, 149, 150, 179, 240, 243, 244, 275-277,
338
- Space Systems/Loral 4, 5, 13, 15, 19, 21, 221, 229, 246, 305, 307
- Space Task Group 47
- Space Transportation System (STS) 51
- Space Treaty 65, 67, 68, 198, 208, 209, 276, 361-364, 380
- Spacecraft . . 8, 10, 11, 20, 21, 37, 42, 43, 50, 52, 65, 79, 86, 89, 112,
114, 117, 124, 187, 203, 205-207, 216, 220,
232, 246, 248, 251, 257, 289, 292, 293, 295,
296, 338, 341, 347
- Spacelab 265
- Spaceport Florida 24, 311
- Spaceport operators 303, 316
- Spaceports 1, 6, 23, 25, 26, 311, 316-318, 324, 363, 370-373, 378
- Spain 80, 109, 128, 138, 146, 256, 263, 266, 267, 269, 272
- Sputnik I 36, 37
- Sriharikota 27
- SS-19 13, 163, 250, 315
- SSI 24, 53, 54, 57, 60, 64
- Starsat 220, 221
- Starsem 13, 250, 275, 315
- Starstruck 57, 63
- Starsys 4, 5
- Start 2, 4, 7, 18, 26, 27, 31, 32, 49, 53, 71, 73, 75, 79, 158, 159,
161-164, 243, 246, 252, 261, 282, 288, 314,
318, 356, 357, 372
- State Department 39, 45, 48, 53, 54, 57, 58, 64, 67, 68, 108, 110,

Index

- 112-116, 118, 122-124, 129, 131, 137,
148-150, 155, 165, 167-171, 173, 174, 177,
184, 186, 187, 188, 190, 191, 194, 206, 219,
223-225, 228, 230, 241, 306, 308, 309, 319,
328, 330, 331, 333-336, 338-340, 359, 375
- STC Complex 163, 318
- Strom Thurmond Act 172, 332, 333, 338, 343, 345, 348, 355, 358
- STS 51, 52, 74, 75, 82, 83, 93, 94
- Subcommittee on commercial launch services 210
- Subcommittee on Science, Technology and Space 162
- Subsidy 77, 81, 82, 93, 281, 356
- Svobodny 26
- Sweden 25, 80, 109, 128, 137, 138, 146, 217, 256, 257, 266, 267, 269
- Switzerland 80, 109, 128, 137, 138, 146, 163, 256, 263, 266, 269
- Symphonie 43, 46, 265
- Syncom 39
- Syria 115, 136, 143, 156, 217
- TAA 117, 325
- Taiwan 143, 152, 221, 224, 229
- Taiyuan 27
- Tanegashima 27, 309
- Taurus 9, 19, 24, 25, 31, 275
- TCI 78-86, 106, 200, 202, 210, 280, 291
- Technical Assistance Agreements (TAA) 117
- Technical data 112, 113, 117, 119, 205-208, 338, 339
- Technology Safeguards Agreement 198, 205, 206, 250, 251, 254
- Technology transfer control plan (TTCP) 338
- Telecommunications Act 321
- Telekom 272, 273, 294
- Telstar 39
- Thiokol 79, 155, 309
- Third party liability 27, 63, 64, 69-71, 95, 96, 154, 360
- Thor 35, 37, 41, 257, 294
- Thor-Agena 37, 41
- Tiananmen 115, 121, 169, 212, 214, 215, 217, 220, 239, 241, 308, 328,
332, 337, 343, 346, 350
- Titan 7, 12, 16, 17, 20, 24, 29, 30, 35, 37, 38, 50, 51, 70, 79, 87, 183,
189, 200, 255, 273, 311
- Toshiba 200, 345
- TPSC 210, 211
- Trade Act of 1974 80-82, 210, 217, 229, 239
- Trade Policy Staff Committee (TPSC) 210
- Trade Representative 80-82, 185, 198, 212, 213, 299
- Trans-Space Carriers, Inc. (TCI) 78
- TRIPS 320
- Tsyklon 7, 9, 251, 256

| | |
|--|---|
| TTCP | 338 |
| Tubsat | 10, 375 |
| Turkey | 128, 138, 146, 153 |
| U.K. | 109, 128, 141, 146, 183, 263, 277, 294 |
| U.S. Launch Strategy | 88 |
| U.S.S.R. | 133, 242 |
| Uitvoerbesluit Strategische Goederen | 128, 139 |
| Ukraine | 9-12, 14, 28, 138, 147, 163, 164, 249, 251-256, 288, 308, 319, 323, 326, 354, 361, 373 |
| ULV | 94 |
| UNCOPUOS | 67, 68, 164 |
| Unfair competition | 159, 190, 242, 286, 297 |
| Unfair pricing | 192, 201, 255 |
| UNGA | 153, 164, 363 |
| United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) | 67 |
| United Space Alliance (USA) | 17 |
| United States Munitions List (USML) | 111, 184 |
| United States Trade Representative (USTR) | 80 |
| Uruguay Round | 283, 287, 320, 324, 325 |
| USA | 14, 17, 35, 37, 41, 49, 50, 53, 57, 86, 189, 225, 264, 283, 284, 289, 345, 346 |
| USAF | 16, 17, 19, 24, 25, 30, 35, 58, 66, 72, 73, 95, 96, 99, 104, 162, 296, 311, 312, 313, 336 |
| USAF model ELV commercialization agreement | 95, 104 |
| USBI | 241, 242, 298 |
| USTR | 80-86, 198, 209-212, 214, 220, 226, 227, 229, 231, 236, 238, 239, 245, 246, 253, 255, 280-283, 285, 291, 300, 319 |
| VAFB | 24 |
| Vancouver | 134, 150 |
| Vanguard | 36, 37 |
| VCSFA | 24 |
| Vega | 20, 25, 30, 31 |
| Veiculo Lancador de Satellites (VLS) | 9 |
| Venturestar | 18 |
| Véronique | 258 |
| Vietnam | 115, 128, 129, 217 |
| Viking | 36 |
| Virginia Commercial Space Flight Authority (VCSFA) | 24 |
| Virginia Space Flight Centre | 24 |
| VLS | 9, 27, 29 |
| Waiver | 54, 62, 71, 102, 145, 146, 148, 213, 216, 217, 221, 226, 240, 332, 343, 346 |
| Wallops Flight Facility | 24 |

Index

| | |
|---|--|
| Warsaw Pact | 111, 128, 130, 131, 159, 193 |
| Wassenaar Arrangement | 110, 127, 137-140, 169, 348, 349, 375, 376 |
| Weapons of Mass Destruction (WMD) | 374 |
| Wernher von Braun | 35, 37 |
| Western European Union (WEU) | 281 |
| WEU | 281, 282 |
| White House | 46, 49, 50, 52, 92, 133, 134, 136, 147, 153, 155, 160, 161, 163, 175, 176, 178, 218, 219, 221, 240, 241, 319, 334, 337 |
| White Sands Missile Range | 24, 25 |
| WMD | 122, 140, 142, 153, 173, 176, 178, 351, 360, 374, 375 |
| Woomera | 18, 28, 259, 260, 262 |
| Working Group on Information | 210, 245 |
| World Trade Organization (WTO) | 320 |
| World Travel and Tourism Council (WTTC) | 379 |
| WTO | 289, 320-326, 364, 371-373, 377 |
| WTO Agreement on Basic Telecommunications Services (WTO Basic Telecom Agreement) | 321 |
| WTO Basic Telecom Agreement | 321, 322, 372 |
| WTTC | 379 |
| X-33 | 18 |
| X-34 | 18 |
| Xichang | 26, 203, 213, 220 |
| Yeltsin | 134, 137, 151, 243, 278 |
| Yuzhmash | 12 |
| Yuzhnoye | 12, 14, 251, 252, 254, 256 |
| Zaire | 116 |
| Zenit | 8-10, 12, 13, 26, 29, 30, 241, 251, 252, 295, 307, 308, 314 |
| “Unfair impact provision” | 360 |
| “United States commercial providers” | 296 |